

Compilation of Changes to the CPC Scheme Between 2023.01 and 2023.02

Presentation Details

- Entries for new symbols and headings: *Black text in italics*
- Entries for existing symbols and headings
- text insertions: *Green text in italics with yellow background*
 - text deletions: ~~Red strikethrough text with grey background~~
- Entries for deleted symbols and headings: ~~Black strikethrough text~~
- Entries arranged by project. Duplicate entries may appear where multiple projects impact the same symbol
 - In cases when the originating project cannot be found, "N/A" is given for the Project information (e.g. the change could be due to an Editorial Correction).
 - Projects ending in "-F" indicate finalisation after reclassification was completed.

Project: MP11762 (C23G)

- M C23G **CLEANING OR ~~DEGREASING~~ *DE-GREASING* OF METALLIC MATERIAL BY CHEMICAL METHODS OTHER THAN ELECTROLYSIS (~~polishing compositions C09G; detergents in general C11D~~)**

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme:

- M C23G 3/00 **Apparatus for cleaning or pickling metallic material (with organic solvents ~~C23G 5/04~~ {; apparatus for continuously conveying articles into baths B65G})**

Project: MP11763 (B03B)

- M B03B **SEPARATING SOLID MATERIALS USING LIQUIDS OR USING PNEUMATIC TABLES OR JIGS (~~removing fluids from solids B01D; magnetic or electrostatic separation of solid materials from solid materials or fluids; separation by high voltage electric fields B03C; flotation differential sedimentation B03D; separating by dry methods B07; screening or sifting B07B; by picking B07C; separating peculiar to particular materials and provided for in other single classes; see the relevant classes~~)**

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme:

- M B03B 1/00 **Conditioning for facilitating separation by altering physical properties of the matter to be treated (~~pretreatment of ores in general C22B {; pretreatment prior to magnetic separation B03C-1/00}~~)**
- M B03B 4/00 **Separating by pneumatic tables or by pneumatic jigs (~~sink-float separation using dry heavy media B03B 5/46~~)**

NOTE

Group [B03B 4/005](#) takes precedence over groups [B03B 4/02](#) - [B03B 4/065](#)

- M B03B 4/04 **· using rotary tables or tables formed by travelling belts (~~separating solids from solids using gas currents and revolving drums B07B-4/06~~)**
- U B03B 5/00 **Washing granular, powdered or lumpy materials; Wet separating (separating by pneumatic tables or by pneumatic jigs [B03B 4/00](#))**
- U B03B 5/28 **· by sink-float separation**
- U B03B 5/30 **· · using heavy liquids or suspensions**

- M B03B 5/32 · · · using centrifugal force (~~centrifuges B04B; cyclones B04C~~)
- M B03B 5/36 · · · Devices therefor, other than using centrifugal force (~~jigs B03B 5/10~~)
- M B03B 5/48 · by mechanical classifiers (~~sink-float separation aspects B03B 5/28~~)
- M B03B 5/60 · by non-mechanical classifiers, e.g. slime tanks (~~using shaken, pulsated or stirred beds as the principal means of separation B03B 5/02~~; hydraulic classifiers [B03B 5/62](#); water impulse classifiers [B03B 5/68](#))
- M B03B 5/68 · by water impulse (~~shaking tables B03B 5/04; jigs B03B 5/10~~; hydraulic classifiers [B03B 5/62](#))
- M B03B 11/00 **Feed or discharge devices integral with washing or wet-separating equipment (~~filling or emptying devices per se B65G 65/30~~)**
- M B03B 13/00 **Control arrangements specially adapted for wet-separating apparatus or for dressing plant, using physical effects (~~detecting, measuring, or analysing devices G01; control devices in general G05~~)**
- M B03B 13/005 · {Methods or arrangements for controlling the physical properties of heavy media, *e.g. density, concentration or viscosity*} (~~in relation with groups B03B 5/30 - B03B 5/46~~); *e.g. density, concentration, viscosity*}

Project: MP11764 (A01N)

- M A01N **PRESERVATION OF BODIES OF HUMANS OR ANIMALS OR PLANTS OR PARTS THEREOF (preservation of food or foodstuff [A23](#)); BIOCIDES, e.g. AS DISINFECTANTS, AS PESTICIDES OR AS HERBICIDES (preparations for medical, dental or ~~toilet toiletry~~ purposes which kill or prevent the growth or proliferation of unwanted organisms [A61K](#)); PEST REPELLANTS OR ATTRACTANTS; PLANT GROWTH REGULATORS**

NOTES

1. This subclass covers:

- compositions, physical forms, methods of application of specific materials or the use of single compounds or compositions
- chemosterilants for the sexual sterilisation of invertebrates, e.g. insects, whereas sex sterilants for other purposes are covered by [A61K](#).

2. This subclass does not cover materials which affect the growth of a plant solely by supplying nutrients, i.e. plant food, ordinarily required for growth or materials which are used to prevent or cure mineral deficiencies in plants, e.g. addition of iron chelates to cure iron chlorosis, which materials are covered by class [C05](#).

3. In this subclass, the following expression is used with the meaning indicated:

- "plant growth regulators" are those materials which alter the plant through a chemical modification of the plant metabolism, such as auxins.

4. Biocidal, pest repellent, pest attractant or plant growth regulatory activity of compounds or preparations is further classified in subclass [A01P](#).

5. {In this subclass, combination sets [C-Sets] are used. The detailed information about the C-Sets construction and the associated syntax rules are found in the Definitions.}

WARNING

The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

A01N 43/824	covered by	A01N 43/82
A01N 43/828	covered by	A01N 43/82
A01N 43/832	covered by	A01N 43/82
A01N 43/836	covered by	A01N 43/82
A01N 53/02	covered by	A01N 53/00
A01N 53/04	covered by	A01N 53/00

A01N 53/06	covered by	A01N 53/00
A01N 53/08	covered by	A01N 53/00
A01N 53/10	covered by	A01N 53/00
A01N 53/12	covered by	A01N 53/00
A01N 53/14	covered by	A01N 53/00
A01N 55/10	covered by	A01N 55/00

Project: MP11764 (A45C)

- U A45C 5/00 Rigid or semi-rigid luggage (collapsible or extensible luggage, bags or the like [A45C 7/00](#))
- M A45C 5/005 · {~~Toilet~~[Toiletry](#) cases}
- M A45C 11/00 Receptacles for purposes not provided for in groups [A45C 1/00](#)–[A45C 9/00](#) (~~especially adapted for toilet or cosmetic equipment A45D 29/20, A45D 44/18; specially adapted for toiletry or cosmetic equipment A45D 29/20, A45D 44/18~~; travelling sewing kits [A45F 3/48](#))
- M A45C 11/008 · {Pocket ~~toilet~~[toiletry](#) etuis}

Project: MP11764 (A45D)

- M A45D HAIRDRESSING OR SHAVING EQUIPMENT (wigs, toupees, or the like [A41G 3/00](#), [A41G 5/00](#); hairdressers' chairs [A47C 1/04](#); hair cutting appliances, razors [B26B](#)); EQUIPMENT FOR COSMETICS OR COSMETIC TREATMENTS, e.g. FOR MANICURING OR PEDICURING
- WARNING
The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
[A45D 97/00](#) covered by [A45D 44/00](#)
- M A45D 33/00 - Containers or accessories specially adapted for handling ~~toilet~~[toiletry](#) or cosmetic substances
- M A45D 33/00 ~~Containers or accessories specially adapted for handling toilet or cosmetic powder~~[powdery toiletry or cosmetic substances](#)
- M A45D 33/006 · {Vanity boxes or cases, compacts, i.e. containing a powder receptacle and a puff or applicator ([A45D 33/025](#) - [A45D 33/34](#) and [A45D 40/22](#) take precedence; ~~toilet etuis A45C 11/008~~; [toiletry etuis A45C 11/008](#))}
- U A45D 33/26 · combined with other objects
- M A45D 33/28 · · with lipstick holders or with other ~~toilet~~[toiletry](#) articles
- M A45D 33/38 · Papers containing [cosmetic](#) powder or other ~~toilet~~[powdery toiletry](#) substances
- M A45D 34/00 Containers or accessories specially adapted for handling liquid ~~toilet~~[toiletry](#) or cosmetic substances, e.g. perfumes ~~{(jewellery dispensing perfume or the like A44C 15/002)}~~
- M A45D 34/06 · in combination with other ~~toilet articles, e.g. lipstick~~[toiletry or cosmetic articles](#)
- M A45D 37/00 Sachet pads ~~for liquid~~[specially adapted for liquid toiletry or cosmetic](#) substances
- M A45D 40/00 Casings or accessories [specially adapted](#) for storing or handling solid or pasty ~~toilet~~[toiletry](#) or cosmetic substances, e.g. shaving ~~soap, lipstick, make-up soaps or lipsticks~~ (features common to containers for handling powdery or liquid ~~toilet~~[toiletry](#) or cosmetic substances [A45D 33/00-A45D 37/00](#); cosmetic or like preparations [A61K 8/00](#), [A61Q](#); sample tables or the like [G09F 5/00](#))

- M A45D 42/00 - Other cosmetic or **personal care toiletry** articles
A45D 44/00
- M A45D 44/00 Other cosmetic or **personal care toiletry** articles, e.g. for hairdressers' rooms

Project: MP11764 (A61K)

- M A61K **PREPARATIONS FOR MEDICAL, DENTAL, ~~OR TOILET~~ OR TOILETRY PURPOSES (devices or methods specially adapted for bringing pharmaceutical products into particular physical or administering forms [A61J 3/00](#); chemical aspects of, or use of materials for deodorisation of air, for disinfection or sterilisation, or for bandages, dressings, absorbent pads or surgical articles [A61L](#); soap compositions [C11D](#))**

NOTES

1. This subclass covers the following subject matter, whether set forth as a composition (mixture), process of preparing the composition or process of treating using the composition:

- a. Drug or other biological compositions which are capable of:
 - preventing, alleviating, treating or curing abnormal or pathological conditions of the living body by such means as destroying a parasitic organism, or limiting the effect of the disease or abnormality by chemically altering the physiology of the host or parasite ([biocides A01N 25/00 - A01N 65/00](#));
 - maintaining, increasing, decreasing, limiting, or destroying a physiological body function, e.g. vitamin compositions, sex sterilants, fertility inhibitors, growth promoters, or the like (sex sterilants for invertebrates, e.g. insects, [A01N](#); plant growth regulators [A01N 25/00 - A01N 65/00](#));
 - diagnosing a physiological condition or state by an in vivo test, e.g. X-ray contrast or skin patch test compositions (measuring or testing processes involving enzymes or microorganisms [C12Q](#); in vitro testing of biological material, e.g. blood, urine, [G01N](#), e.g. [G01N 33/48](#))
- b. Body treating compositions generally intended for deodorising, protecting, adorning or grooming the body, e.g. cosmetics, dentifrices, tooth filling materials.

2. Attention is drawn to the definitions of groups of chemical elements following the title of section [C](#).

3. Attention is drawn to the notes in class [C07](#), for example the notes following the title of the subclass [C07D](#), setting forth the rules for classifying organic compounds in that class, which rules are also applicable, if not otherwise indicated, to the classification of organic compounds in [A61K](#).

4. In this subclass, with the exception of group [A61K 8/00](#), the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.

5. Therapeutic activity of medicinal preparations is further classified in subclass [A61P](#).

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

A61K 9/133	covered by	A61K 9/127
A61K 9/18	covered by	A61K 9/14
A61K 9/22	covered by	A61K 9/20
A61K 9/24	covered by	A61K 9/209
A61K 9/26	covered by	A61K 9/2077 , A61K 9/2081

A61K 9/30	covered by	A61K 9/28
A61K 9/32	covered by	A61K 9/28
A61K 9/34	covered by	A61K 9/28
A61K 9/36	covered by	A61K 9/28
A61K 9/38	covered by	A61K 9/28
A61K 9/40	covered by	A61K 9/28
A61K 9/42	covered by	A61K 9/28
A61K 9/44	covered by	A61K 9/2072
A61K 9/46	covered by	A61K 9/0007
A61K 9/52	covered by	A61K 9/50
A61K 9/54	covered by	A61K 9/5073 , A61K 9/5078 , A61K 9/5084
A61K 9/56	covered by	A61K 9/50
A61K 9/58	covered by	A61K 9/50
A61K 9/60	covered by	A61K 9/50
A61K 9/62	covered by	A61K 9/50
A61K 9/64	covered by	A61K 9/50
A61K 9/66	covered by	A61K 9/48
A61K 9/68	covered by	A61K 9/0058
A61K 9/72	covered by	A61K 9/0073
A61K 39/108	covered by	A61K 39/0258 , A61K 39/0266
A61K 39/112	covered by	A61K 39/0275 , A61K 39/0283
A61K 45/08	covered by	A61K 31/00 , A61K 47/00
A61K 47/04	covered by	A61K 47/02
A61K 50/00	covered by	A61K 9/0009 , C09J 9/02

The following IPC indexing codes are not in the CPC scheme:

[A61K 101/00](#) - [A61K 103/00](#) covered by [A61K 51/00](#) - [A61K 51/1296](#)
[A61K 125/00](#) - [A61K 135/00](#) covered by [A61K 36/00](#) - [A61K 36/9068](#)

2. Subgroups of [A61K 48/00](#) are incomplete (Jan. 2003). Documents are being reclassified from [A61K 48/00](#) to its subgroups

3. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

M A61K 8/00

Cosmetics or similar **toilettoiletry** preparations

NOTES

1. Use of cosmetics or similar **toilettoiletry** preparations is further classified in subclass [A61Q](#).
2. {Use of cosmetics or similar **toilettoiletry** preparations is mandatorily further classified in subclass [A61Q](#).}
3. {Attention is drawn to the Notes in class [C07](#), for example the notes following the title of subclass [C07D](#), setting forth the rules for classifying organic compounds in that class, which rules are also applicable, if not otherwise indicated, to the classification of organic compounds in group [A61K 8/00](#).-}
4. {Salts or complexes of organic compounds are classified according to the base compounds. If a complex is formed between two or more compounds, classification is made for each compound.-}

Project: MP11764 (A61L)

M A61L METHODS OR APPARATUS FOR STERILISING MATERIALS OR OBJECTS IN GENERAL; DISINFECTION, STERILISATION, OR DEODORISATION OF AIR; CHEMICAL ASPECTS OF BANDAGES, DRESSINGS, ABSORBENT PADS, OR SURGICAL ARTICLES; MATERIALS FOR BANDAGES, DRESSINGS, ABSORBENT PADS, OR SURGICAL ARTICLES (preservation of bodies or disinfecting characterised by the **agentagents** employed **A01N**; preserving, e.g. sterilising, food or foodstuffs **A23**; preparations for medical, dental or **toilettoiletry** purposes **A61K**; **preparation of ozone G01B-13/10**)

NOTE

In groups [A61L 2/00](#) - [A61L 12/00](#), it is desirable to add the indexing codes of groups {[A61L 2101/00](#) - [A61L 2101/50](#)}.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

[A61L 33/10](#) covered by [A61L 33/0011](#)

[A61L 33/14](#) covered by [A61L 33/0011](#)

[A61L 33/16](#) covered by [A61L 33/0047](#)

2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

Project: MP11764 (A61M)

M A61M 35/00 Devices for applying ~~{, e.g. spreading,}~~ media, e.g. remedies, on the human body (devices for handling **toilettoiletry** or cosmetic substances **A45D**; absorbent pads, e.g. swabs ~~{for medical use}~~, **A61F 13/15**)

Project: MP11764 (A61Q)

M A61Q SPECIFIC USE OF COSMETICS OR SIMILAR **TOILETTOILETRY** PREPARATIONS

NOTES

1. This subclass covers the use of cosmetics or similar **toilettoiletry** preparations already classified as such in main group [A61K 8/00](#) ~~or in addition thereto in, in~~ subclasses [C11D](#) ~~and/or~~ [C12N](#), or in classes [C01](#), [C07](#) ~~and/or~~ [C08](#).

2. When classifying *in* this subclass, *classification is also made in* subclass [A61P](#) ~~{is for secondary classification and} covers therapeutic activity of chemical compounds or medicinal preparations. if the preparation is stated to have therapeutic activity.~~

3. In this subclass, the use of cosmetics or similar toiletry preparations is classified in all appropriate places.

4. Attention is drawn to cases where the subject of the invention concerns only the specific use of cosmetics or toiletry preparations, and the chemical structure, compound, mixture or composition of this subject of the invention is known. In such cases, classification is made in main group [A61K 8/00](#) or in subclass [C11D](#), and also in subclass [A61Q](#) as invention information. In addition, if the chemical structure, compound, mixture or composition or any individual

ingredient of a mixture or composition is considered to represent information of interest for search, it may also be classified as additional information.

5. The classification symbols of this subclass are not listed first when assigned to patent documents.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

M A61Q 90/00

Cosmetics or similar ~~toilet~~toiletry preparations for specific uses not provided for in other groups of this subclass

NOTE

Classification is only made in this group when a specific use for a cosmetic or similar toiletry preparation has been clearly disclosed, the specific use not being appropriate to any of the preceding groups in this subclass.

Project: MP11764 (B65D)

M B65D 85/00

Containers, packaging elements or packages, specially adapted for particular articles or materials ([B65D 71/00](#), [B65D 83/00](#) take precedence; hand implements or travelling equipment [A45C](#); ~~cosmetic or toilet equipment [A45D](#)~~; ~~cosmetic or toiletry equipment [A45D](#)~~; packages for surgical knives, scalpels or blades therefor [A61B 17/3215](#); containers specially adapted for medical or pharmaceutical purposes [A61J 1/00](#); paint cans [B44D 3/12](#); oil cans [F16N 3/04](#); containers for carrying small arms [F41C 33/06](#); packaging of ammunition or explosive charges [F42B 39/00](#); containers for record carriers, specially adapted for cooperation with the recording or reproducing apparatus [G11B 23/00](#))

NOTE

Attention is drawn to Note (5) following the title of this subclass.

Project: MP11764 (C09K)

U C09K 3/00

Materials not provided for elsewhere

NOTE

When classifying in groups [C09K 3/10](#) - [C09K 3/1028](#) the properties and uses of the material can be further indexed by using indexing codes chosen from [C09K 2003/1034](#) - [C09K 2003/1096](#) and the chemical nature of the materials can be further indexed by using indexing codes chosen from [C09K 2200/00](#) - [C09K 2200/0697](#)

M C09K 3/20

· as substitutes for glycerol in its non-chemical uses, e.g. as a base in ~~toilet~~toiletry creams or ointments

Project: MP11769 (G06)

M G06

COMPUTING; CALCULATING ~~OR COUNTING~~; ~~COUNTING~~

NOTES

1. This class covers:

- simulators which are concerned with the mathematics of computing the existing or anticipated conditions within the real device or system;
- simulators which demonstrate, by means involving computing, the function of apparatus or of a system, if no provision exists elsewhere;
- image data processing or generation.

2. This class does not cover:

- combinations of writing implements with computing devices, which are covered by group [B43K 29/08](#);
 - control functions derived from simulators, in general, which are covered by class [G05](#), although such functions may be covered by the subclass of this class for the device controlled;
 - measurement or analysis of an individual variable to serve as an input to a simulator, which is covered by class [G01](#);
 - simulators regarded as teaching or training devices which is the case if they give perceptible sensations having a likeness to the sensations a student would experience in reality in response to actions taken by him. Such simulators are covered by class [G09](#);
 - components of simulators, if identical with real devices or machines, which are covered by the relevant subclass for these devices or machines and not by class [G09](#).
3. In this class, the following terms or expressions are used with the meanings indicated:
- "data" is used as the synonym of "information". Therefore, the term "information" is not used in ~~subclasses subclass~~ [G06C](#), [G06F](#) or [G06Q](#);
 - *"ICT [information and communication technology]" also covers "IT [information technology]";*
 - "calculating or computing" includes, ~~inter alia~~ *inter alia*, operations on numerical values and on data expressed in numerical form. Of these terms "computing" is used throughout the class;
 - "computation" is derived from this interpretation of "computing". In the French language, the term "calcul" will serve for either term;
 - "simulator" is a device which may use the same time scale as the real device or operate on an expanded or compressed time scale. In interpreting this term models of real devices to reduced or expanded scales are not regarded as simulators;
 - "record carrier" means a body, such as a cylinder, disc, card, tape, or wire, capable of permanently holding information, which can be read-off by a sensing element movable relative to the recorded information.
4. Attention is drawn to the Notes following the title of section [G](#), especially as regards the definition of the term "variable".

Project: MP11769 (G06Q)

M G06Q

~~DATA PROCESSING SYSTEMS OR METHODS, INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING OR SUPERVISORY PURPOSES; SYSTEMS OR METHODS SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING OR SUPERVISORY PURPOSES, NOT OTHERWISE PROVIDED FOR~~

NOTE

1. Groups [G06Q 10/00](#) - [G06Q 50/00](#) and [G06Q 99/00](#) only cover systems or methods that involve significant data processing operations, i.e. data processing operations that need to be carried out by a technological, e.g. computing, system or device. Group [G06Q 90/00](#) covers systems or methods that do not involve significant data processing, when both of the following conditions are fulfilled:
- the systems or methods are specially adapted for the purposes mentioned in the subclass title or the titles of groups [G06Q 10/00](#) - [G06Q 50/00](#); and
 - the systems or methods cannot be classified elsewhere ~~in the IPC~~, for example by applying the principles described in paragraph 96 of the Guide *to the IPC*.

~~When classifying such systems or methods in group [G06Q 90/00](#), additional classification may be made in the most closely related group of this or any other~~

subclass, if this classification gives information about the application of the systems or methods that could be of interest for searching. Such non-obligatory classification must be given as "additional information".

~~2. When classifying in groups G06Q 10/00 – G06Q 40/00, systems or methods that are specially adapted for a specific business sector must also be classified in group G06Q 50/00, when the special adaptation is determined to be novel and non-obvious.~~

~~3. In this subclass, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.~~

2. When classifying such systems or methods in group G06Q 90/00, additional classification may be made in the most closely related group of this or any other subclass, if this classification gives information about the application of the systems or methods that could be of interest for search. Such non-obligatory classification must be given as "additional information".

WARNINGS

1. [G06Q](#) has been largely refined to bring most of the former USPC 705 groups into ECLA, prior to CPC launch. Therefore, most of the new [G06Q](#) subdivisions are not complete pending reclassification. Users are invited to systematically consult also the hierarchically higher groups, up to the first valid IPC group. For example, while searching in [G06Q 50/2053](#), it is appropriate to consult also [G06Q 50/205](#) and [G06Q 50/20](#)

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

M G06Q 90/00

Systems or methods specially adapted for administrative, commercial, financial, managerial, ~~supervisory or forecasting~~ or *supervisory* purposes, not involving significant data processing

Project: MP11769 (G16)

M G16

INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR SPECIFIC APPLICATION FIELDS

NOTES

1. This *subclass/class* does not cover:

- ~~recognising patterns in general~~*pattern recognition, which is covered by group G06F 18/00;*
- digital computing or data processing systems or methods specially adapted for administrative, commercial, financial, managerial, ~~supervisory or forecasting~~ or *supervisory* purposes, which are covered by subclass [G06Q](#);
- image data processing or generation, which is covered by subclass [G06T](#).

2. In this class, the following terms or expressions are used with the meaning indicated:

- "ICT [information and communication technology]" also covers "IT [information technology]";
- "ICT specially adapted for" also covers the expression "digital computing or data processing systems or methods specially adapted for", which is used in group [G06F 17/00](#) ~~and in subclass G06Q~~.

Project: MP11773 (G04F)

M	G04F	<p>TIME-INTERVAL MEASURING (measuring pulse characteristics G01R, e.g. G01R 29/02; in radar or like systems G01S; masers H01S 1/00; generation of oscillations H03B; generation or counting of pulses, frequency dividing, analogue/digital conversion H03K {time fuzes F42C 9/00})</p> <p><u>NOTE</u></p> <p>This subclass covers:</p> <ul style="list-style-type: none"> • apparatus for measuring-off predetermined time intervals; • apparatus for producing such intervals as timing standards, e.g. metronomes; • apparatus for measuring unknown intervals, e.g. precision systems for short time interval measurement. <p><u>WARNINGS</u></p> <p>1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups: G04F 10/08 covered by G04F 5/16</p> <p>2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}</p>
M	G04F 1/00	<p>Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals without driving mechanisms, e.g. egg timer timers (electric time and time-programme switches H01H 43/00)</p>
M	G04F 3/00	<p>Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with driving mechanisms, e.g. dosimeter dosimeters with clockwork (electric time or time-programme switches H01H 43/00)</p>
M	G04F 5/00	<p>Apparatus for producing preselected time intervals for use as timing standards (generating clock signals for electric digital computers G06F 1/04; regulating frequency in general H03C, H03L)</p>
M	G04F 5/02	<ul style="list-style-type: none"> • Metronomes {{(periodic signalisation by acoustic signals in general G04B 21/005)}
U	G04F 5/04	<ul style="list-style-type: none"> • using oscillators with electromechanical resonators {producing electric oscillations or timing pulses}
M	G04F 5/06	<ul style="list-style-type: none"> • using piezoelectric piezo-electric resonators
M	G04F 5/063	<ul style="list-style-type: none"> • . . {Constructional details (details of resonators in general H03H 9/02)}
M	G04F 5/066	<ul style="list-style-type: none"> • . . . {Trimmer condensators (capacitors in general H01G)}
M	G04F 5/16	<ul style="list-style-type: none"> • using pulses produced by radioisotopes radio-isotopes
M	G04F 7/00	<p>Apparatus for measuring unknown time intervals by mechanical non-electric means (using fluidic means G04F 13/06)</p>
M	G04F 7/10	<ul style="list-style-type: none"> • Means used apart from the time-piece for starting or stopping same {{(see provisionally too ÷ G04F 8/08)}
M	G04F 10/00	<p>Apparatus for measuring unknown time intervals by electric means {{(timing devices for clocks or watches for comparing the rate of the oscillating member with a standard G04D 7/12; radar systems, analogous systems G01S 7/00; measuring frequency G01R 23/00; measuring phase angle G01R 25/00)}</p>
M	G04F 10/04	<ul style="list-style-type: none"> • by counting pulses or half-cycles of an alternating current ac {{(G04F 10/005 takes precedence)}
U	G04F 13/00	<p>Apparatus for measuring unknown time intervals by means not provided for in groups G04F 5/00 - G04F 10/00</p>

- U G04F 13/02 · using optical means
- M G04F 13/026 · · {Measuring duration of ultra-short light pulses, e.g. in the pico-second range; particular detecting devices therefor (*photometry, radiation pyrometry G01J 1/00, G01J 5/00*; non-linear optics *G02F 1/35*; *monitoring arrangements for lasers in general H01S 3/0014*; photometry, radiation pyrometry *G01J 1/00, G01J 5/00*)}

Project: MP11775 (G06C)

- M G06C **DIGITAL COMPUTERS IN WHICH ALL THE COMPUTATION IS EFFECTED MECHANICALLY (score computers for card games *A63F 1/18*; ~~construction of keys, printing mechanisms or other parts of general application to the typewriting or printing art B41~~; ~~keys or printing mechanisms for special applications, see the relevant subclasses, e.g. *G05G, G06K*~~; cash registers *G07G 1/00*)**

NOTE

Details This subclass does not cover details of mechanisms covered *in by* main groups *G06C 9/00, G06C 11/00* or *G06C 15/00*, which are applicable to mechanical counters driven only through the lowest denomination, ~~are classified in.~~ *Such details are covered by subclass *G06M*.*

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

- M G06C 1/00 **Computing aids in which the computing members form at least part of the displayed result and are manipulated directly by hand, e.g. abacuses, *or* pocket adding devices**
- M G06C 7/00 **Input mechanisms (~~pin carriage G06C 13/02~~)**
- U G06C 7/02 · Keyboards
- M G06C 7/04 · · Interlocking devices, e.g. between keys (~~interlocking devices covered by this subclass, per se G06C 25/00~~)
- M G06C 7/09 · Transfer of data from record carrier to computing mechanisms (~~sensing record carriers G06K 7/00~~)
- M G06C 11/00 **Output ~~mechanism~~ *mechanisms* (~~marking record carriers in general, visual presentation in general of results of the mathematical operations G06K~~)**
- M G06C 11/10 · Arrangements for feeding single sheets or continuous web or tape, e.g. ejection device (~~conveying record carriers G06K 13/00~~); Line-spacing devices
- M G06C 13/00 **Storage mechanisms (mechanical counters with input only to the lowest order *G06M G06M 1/04*; ~~information storage in general G11~~)**
- M G06C 15/00 **Computing mechanisms; Actuating devices therefor (~~mechanisms for operating automatically upon more than two numbers otherwise than by repeated addition or subtraction G06C 21/00~~)**
- NOTE
Group *G06C 15/00* takes precedence over groups *G06C 15/04 - G06C 15/42*
- M G06C 15/02 · operating on the binary scale
- NOTE
Group *G06C 15/02* takes precedence over groups *G06C 15/04 - G06C 15/42*.
- M G06C 15/24 · Devices for counting the cycles of operation in division or multiplication (~~item counting devices G06C 25/02~~)

- U G06C 15/26 · Devices for transfer between orders, e.g. tens transfer device
- M G06C 15/34 · · where transfer is ~~affected~~*effected* by planet gear, i.e. crawl type
- M G06C 15/40 · · for stepped ~~toothed~~-*toothed*-drum computing mechanism
- M G06C 15/48 · Arrangements for selection of one out of several counting registers
(~~arrangements for controlling subsequent operating functions G06C 21/04; item counters G06C 25/02~~*item-counting devices G06C 25/02*)
- M G06C 21/00 **Programming** mechanisms for determining *the* steps to be performed by the computing machine, e.g. when a key or certain keys are depressed (mechanisms merely for producing multiplication by repeated addition [G06C 15/08](#))
- M G06C 21/04 · Conditional arrangements for controlling subsequent operating functions, e.g. control arrangement triggered by a function key and depending on the condition of the register (arrangements for selection of one ~~cut~~*out* of several counting registers [G06C 15/48](#))
- M G06C 23/00 **Driving mechanisms for functional elements** (~~G06C 23/08 takes precedence over G06C 23/02 - G06C 23/06~~)

NOTE

Group G06C 23/08 takes precedence over groups G06C 23/02 - G06C 23/06.

Project: MP11776 (H05G)

- M H05G **X-RAY TECHNIQUE** (~~apparatus for radiation diagnosis A61B 6/00; X-ray therapy A61N; testing by X-rays G01N; investigating or analysing materials by the use of X-rays G01N 23/00; apparatus for X-ray photography G03B G03B 42/02; filters, conversion screens, microscopes G21K; X-ray tubes H01J 35/00; TV systems having X-ray input H04N 5/321~~)
- WARNINGS
1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
[H05G 1/61](#) covered by [H05G 1/60](#)
2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.
- U H05G 1/00 **X-ray apparatus involving X-ray tubes; Circuits therefor**
- U H05G 1/08 · Electrical details
- U H05G 1/10 · · Power supply arrangements for feeding the X-ray tube {(supply circuits with converters in general [H02M](#); supply circuits for emitters and amplifiers [H04B 1/16](#) - [H04B 1/1623](#))}
- U H05G 1/22 · · · with single pulses
- M H05G 1/24 · · · Obtaining pulses by using energy storage devices (~~pulse generators H03K (-; current and voltage pulse generators H03K 3/53)~~)
- M H05G 1/26 · · Measuring, controlling; *or* protecting (~~measuring electric values G01R; measuring X-ray intensity radiation G01T~~)
- U H05G 1/30 · · · Controlling
- M H05G 1/32 · · · Supply voltage of the X-ray apparatus or tube (~~regulating supply without reference to operating characteristics of the apparatus G05F (-; voltage regulation in general G05F)~~)
- M H05G 1/34 · · · Anode current, heater current; *or* heater voltage of X-ray tube (~~regulating supply without reference to operating characteristics of the apparatus G05F (-; current regulation in general G05F)~~)

- M H05G 1/48 Compensating the voltage drop occurring at the instant of switching-on of the apparatus (~~regulating supply without reference to the operating characteristics of the apparatus G05F~~; ~~voltage regulation in general G05F~~)
- M H05G 2/00 Apparatus or processes specially adapted for producing X-rays, not involving X-ray tubes, e.g. involving generation of a plasma (X-ray lasers [H01S 4/00](#); ~~plasma technique in general H05H~~)

Project: MP11840 (A62B)

- M A62B 17/00 Protective clothing affording protection against heat or harmful chemical agents or for use at high altitudes (protective clothing *or garments* for work or sport [A41D 13/00](#), ~~e.g. overalls A41D 13/02, surgical gowns A41D 13/12~~; ~~e.g. overalls A41D 13/02, surgical gowns A41D 13/12~~; materials for protecting clothing [A41D 31/04](#)); protecting eyes or ears [A61F 9/00](#); composition of materials for protective clothing [A62D 5/00](#); life-saving garments for use at sea [B63C](#); diving suits [B63C 11/02](#); ~~flying suits, anti-g suits~~ [B64D 10/00](#); ~~flight suits B64D 10/00~~; space suits [B64G 6/00](#); bullet-proof clothing [F41H 1/02](#))

Project: MP11840 (B08B)

- U B08B 3/00 Cleaning by methods involving the use or presence of liquid or steam ([B08B 9/00](#) takes precedence)
- U B08B 3/04 . Cleaning involving contact with liquid
- M B08B 3/10 . . with additional treatment of the liquid or of the object being cleaned, e.g. by heat, by electricity; *or* by vibration
- M B08B 3/12 . . . by sonic or ultrasonic vibrations (washing or rinsing machines for crockery or tableware using sonic or ultrasonic waves [A47L 15/13](#); of natural teeth, of prostheses using ultrasonic techniques similar to those used for natural teeth [A61C 17/20](#); application of ultrasonic vibrations to chemical, physical; or physico-chemical processes in general [B01J 19/10](#))
- M B08B 9/00 Cleaning hollow articles by methods or apparatus specially adapted thereto (~~B08B 3/12, B08B 6/00 take~~*takes* precedence)

Project: MP11840 (B64D)

- M B64D EQUIPMENT FOR FITTING IN OR TO AIRCRAFT; ~~FLYING~~*FLIGHT* SUITS; PARACHUTES; ARRANGEMENTS OR MOUNTING OF POWER PLANTS OR PROPULSION TRANSMISSIONS IN AIRCRAFT

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

B64D 15/18	covered by	B64D 15/16
B64D 25/102	covered by	B64D 25/10
B64D 25/105	covered by	B64D 25/10
B64D 25/108	covered by	B64D 25/10
B64D 25/11	covered by	B64D 25/10
B64D 25/112	covered by	B64D 25/10
B64D 25/115	covered by	B64D 25/10
B64D 25/118	covered by	B64D 25/10

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

M B64D 10/00 **FlyingFlight** suits (helmets in general [A42B 3/00](#); breathing helmets [A62B 18/00](#))

Project: MP11840 (B64G)

U B64G 1/00 **Cosmonautic vehicles**

- U B64G 1/22
- Parts of, or equipment specially adapted for fitting in or to, cosmonautic vehicles
- M B64G 1/40
- Arrangements or adaptations of propulsion systems (~~B64G 1/26 takes precedence~~; propulsion plants per se, ~~see see~~ the relevant subclasses, e.g. [F02K](#), [F03H](#))

Project: MP11906 (G01B)

M G01B **MEASURING LENGTH, THICKNESS OR SIMILAR LINEAR DIMENSIONS; MEASURING ANGLES; MEASURING AREAS; MEASURING IRREGULARITIES OF SURFACES OR CONTOURS**

NOTES

- This subclass covers measuring of position or displacement in terms of linear or angular dimensions.
- In this subclass, the groups are distinguished by the **means of measurement** *measurement technique* which is of major importance. Thus, the mere application of other *techniques or* means for giving a final indication does not affect the classification.
- Attention is drawn to the Notes following the title of class [G01](#).
- Machines operated on similar principles to the hand-held devices specified in this subclass are classified with these devices.
- Measuring arrangements or details thereof covered by two or more of groups [G01B 3/00](#) - [G01B 17/00](#) are classified in group [G01B 21/00](#) if no single other group can be selected as being predominantly applicable.

WARNING

{In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

M G01B 3/00 **Instruments as specified in the subgroups and *Measuring instruments characterised by the use of mechanical measuring means techniques* (arrangements for measuring particular parameters [G01B 5/00](#); devices of general interest specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material [B65H 75/34](#))**

NOTE

When classifying in this group, mechanical arrangements for measuring specific parameters can be further classified in group [G01B 5/00](#).

M G01B 5/00 **Measuring arrangements characterised by the use of mechanical *means techniques* (instruments of the types covered by group [G01B 3/00](#) per se [G01B 3/00](#))**

NOTE

When classifying in this group, specific mechanical measuring instruments can be further classified in group [G01B 3/00](#).

M G01B 5/26

- for measuring areas, e.g. *planimeter* *planimeters* (integrators in general [G06G](#))

M G01B 7/00 **Measuring arrangements characterised by the use of electric or magnetic *means techniques***

- M G01B 7/32 · for measuring areas-~~(integrators in general G06G)~~
- M G01B 9/00 **Instruments as specified in the subgroups and *Measuring instruments* characterised by the use of optical *measuring means techniques* (arrangements for measuring particular parameters G01B 11/00)**
NOTE
When classifying in this group, optical arrangements for measuring specific parameters can be further classified in group G01B 11/00.
- M G01B 11/00 **Measuring arrangements characterised by the use of optical *means techniques* (instruments of the types covered by group G01B 9/00 per se G01B 9/00)**
NOTE
When classifying in this group, specific optical measuring instruments can be further classified in group G01B 9/00.
- M G01B 11/28 · for measuring areas-~~(integrators in general G06G)~~
- M G01B 13/00 **Measuring arrangements characterised by the use of fluids-~~((pressure regulation G05D 16/00))~~**
- M G01B 13/20 · for measuring areas, e.g. pneumatic ~~planimeter~~ *planimeters* (integrators in general G06G)
- M G01B 15/00 **Measuring arrangements characterised by the use of *wave electromagnetic waves* or particle radiation, e.g. by the use of microwaves, X-rays, gamma rays or electrons (G01B 9/00, G01B 11/00 take precedence {-; by radar technique G01S} characterised by the use of optical techniques G01B 9/00, G01B 11/00)**
- M G01B 17/00 **Measuring arrangements characterised by the use of *subsonic infrasonic*, sonic or ultrasonic vibrations-~~((by sonar technique G01S 15/00))~~**
- M G01B 21/00 **Measuring arrangements or details thereof ~~in so far as they are not adapted to particular types of measuring means of the preceding groups, where the measuring technique is not covered by the other groups of this subclass, unspecified or not relevant~~**
NOTE
 Measuring arrangements or details thereof covered by two or more of groups G01B 3/00 - G01B 17/00 are classified in this group if no single other group can be selected as being predominantly applicable.
- M G01B 21/28 · for measuring areas-~~(integrators in general G06G)~~

Project: MP11909 (B01L)

- M B01L** **CHEMICAL OR PHYSICAL LABORATORY APPARATUS FOR GENERAL USE** (~~apparatus for medical or pharmaceutical purposes A61; apparatus for industrial purposes or laboratory apparatus whose construction and performance are comparable to that of similar industrial apparatus, see the relevant classes for industrial apparatus, particularly subclasses of B01 and G12; separating or distilling apparatus B01D; mixing or stirring devices B01F; atomisers B05B; {vibrating devices, e.g. shaking tables;} sieves B07B; corks, bungs B65D; handling liquids in general B67; vacuum pumps F04; siphons F04F 10/00; taps, stop-cocks F16K; tubes, tube joints F16L; apparatus specially adapted for investigating or analysing materials G01, particularly G01N; electrical or optical apparatus, see the relevant classes in Sections G and H)~~
- NOTE
This subclass covers only laboratory apparatus which is either applicable solely to laboratory purposes or which, by reason of its simple construction and adaptability, is such as would not be suitable for industrial use.
- WARNINGS
- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
- [B01L 3/14](#) covered by [B01L 3/50](#)
 - {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}
- M B01L 1/00** **Enclosures; Chambers** (~~fume cupboards B08B; provided with manipulation devices; or glove boxes B25J B25J 21/00; {industrial clean rooms F24F 3/167;} cooling chambers F25D~~)
- M B01L 1/04** • Dust-free rooms or enclosures ~~{(clean rooms suitable for industrial purposes F24F 3/167)}~~
- M B01L 3/00** **Containers or dishes for laboratory use, e.g. laboratory glassware** (~~bottles B65D; apparatus for enzymology or microbiology {specially adapted for culturing} C12M 1/00; Droppers {receptacles for volumetric purposes G01F}~~)
- NOTE
Petri dishes for enzymology or microbiology are classified in group [C12M 1/22](#).
- M B01L 3/08** • Flasks ~~{(specially adapted for distillation B01D {B01D 3/10})}~~
- M B01L 5/00** **Gas handling apparatus** (gas jars or cylinders [B01L 3/12](#); cold traps; ~~or cold baffles B01D 8/00; separation of gases or vapours B01D 53/00; gas generators B01J 7/00; steam traps F16T~~)
- M B01L 5/02** • Gas collection apparatus, e.g. by bubbling under water (for sampling ~~G01N G01N 1/22~~)
- M B01L 7/00** **Heating or cooling apparatus** (~~evaporators B01D 1/00; drying gases or vapours, e.g. desiccators, B01D 53/26; autoclaves B01J 3/04; drying ovens F26B; furnaces, ovens F27~~); Heat insulating devices
- M B01L 9/00** **Supporting devices; Holding devices** ~~{(tweezers, tongs B25B)}~~

Project: MP11909 (C12M)

- U C12M 1/00** **Apparatus for enzymology or microbiology**

NOTE

This group covers:

- apparatus where microorganisms or enzymes are produced or isolated;
- apparatus where the characteristics of microorganisms or enzymes are investigated, e.g. which growth factors are necessary;
- apparatus specially adapted to employ microorganisms or enzymes as "reactants" or biocatalysts;
- apparatus of both laboratory and industrial scale.

M C12M 1/22 · Petri ~~type dish~~ *dishes*

Project: MP11910 (B03C)

M B03C

MAGNETIC OR ELECTROSTATIC SEPARATION OF SOLID MATERIALS FROM SOLID MATERIALS OR FLUIDS; SEPARATION BY HIGH-VOLTAGE ELECTRIC FIELDS (~~filters making use of electricity or magnetism B01D 35/06~~; separating isotopes [B01D 59/00](#); combinations of magnetic or electrostatic separation with separation of solids by other means [B03B](#), [B07B](#); ~~separating sheets from piles B65H 3/00~~; ~~magnets or magnet coils per se H01F~~)

WARNING

{In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

U B03C 1/00

Magnetic separation

U B03C 1/02

· acting directly on the substance being separated

U B03C 1/025

· · High gradient magnetic separators

M B03C 1/029

· · · with circulating matrix or matrix elements (~~matrix elements B03C 1/034~~)

M B03C 1/32

· acting on the medium containing the substance being separated, e.g. ~~magnetogravimetric-magneto-gravimetric-~~, magnetohydrostatic-, or magnetohydrodynamic separation (~~(sink-float separation using heavy liquids or suspensions B03B 5/30)~~)

M B03C 3/00

Separating dispersed particles from gases or vapour, e.g. air, by electrostatic effect (~~(use of electrostatic separators in combination with exhausts of machines or internal combustion machines F01N 3/01)~~)

M B03C 3/02

· Plant or installations having external electricity supply (~~electrode constructions B03C 3/40~~)

M B03C 3/32

· Transportable units, e.g. for cleaning room air (~~room air conditioners having an electrostatic separating stage F24F~~)

U B03C 3/34

· Constructional details or accessories or operation thereof

M B03C 3/38

· · Particle charging or ionising stations, e.g. using electric discharge, radioactive radiation, ~~flames or flames~~ (~~electrode constructions B03C 3/40~~; ~~ionising gases H05H~~)

U B03C 3/66

· · Applications of electricity supply techniques

M B03C 3/68

· · · Control systems therefor (~~(electricity supply or control systems for cleaning the electrodes B03C 3/746, B03C 3/763)~~)

M B03C 5/00

Separating dispersed particles from liquids by electrostatic effect (~~(flocculation or agglomeration of electric particles induced by electric field [B01D 21/0009](#); ~~microreactors B01J 19/0093~~); combined with centrifuges [B04B 5/10](#) (~~; treatment of microorganisms and apparatus therefor [C12M 1/42](#), [C12N 13/00](#), [C12Q 1/24](#); analysis of biomaterial by electrical means [G01N 33/48707](#))~~)~~

NOTE

In this group, the following term is used with the meaning indicated:

- "separating" means dimensional modifications of particle-liquid distributions, e.g. particle immobilisation, caging, translational or rotational motion

Project: MP11911 (C09C)

M C09C

TREATMENT OF INORGANIC MATERIALS, OTHER THAN FIBROUS FILLERS, TO ENHANCE THEIR PIGMENTING OR FILLING PROPERTIES (~~preparation of inorganic compounds or non-metallic elements C01~~; treatment of materials specially adapted to enhance their filling properties in mortars, concrete or artificial stone [C04B 14/00](#), [C04B 18/00](#), [C04B 20/00](#)); **PREPARATION OF CARBON BLACK** {; ~~PREPARATION OF INORGANIC MATERIALS WHICH ARE NO SINGLE CHEMICAL COMPOUNDS AND WHICH ARE MAINLY USED AS PIGMENTS OR FILLERS}~~}

NOTES

1. In this subclass, in the absence of an indication to the contrary, a compound is classified in the last appropriate place
2. Treatment by polymerisation onto particle is classified in [C08F 292/00](#). Only treatment by already polymerised agents is classified in [C09C](#)
3. Whenever in groups [C09C 1/00](#) - [C09C 1/66](#) the materials consist of a particulate core bearing a coating or any other deposit, classification is done only according to the composition of the core, unless otherwise stated, e.g. [C09C 1/0015](#), [C09C 1/0078](#)
4. Preparations of those materials which are no single chemical compounds comprise those of many ceramic pigments ([C09C 1/0009](#)), consisting of solid solutions or polycrystalline structures, and those defined as composite materials ([C09C 1/0081](#))
5. Preparation and treatment steps are not always easy to distinguish from each other, e.g. preparation in the presence of treating agents (by precipitation or calcination), precise reacting conditions, affecting pigmentary effects. It is common practice to include these complex topics in [C09C 1/00](#) while avoiding redundancy
6. When classifying in this subclass, the indexing codes of subclass [C01P](#) are used to identify structural or physical aspects of solid inorganic compounds

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
[C09C 1/68](#) covered by [C09K 3/14](#)
2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

M C09C 1/00

Treatment of specific inorganic materials other than fibrous fillers (~~luminescent or tenebrescent materials C09K~~~~tenebrescent materials C09K 9/00~~; ~~luminescent materials C09K 11/00~~); **Preparation of carbon black**

M C09C 1/0015

- {Pigments exhibiting interference colours, e.g. transparent platelets of appropriate thinness or flaky substrates, e.g. mica, bearing appropriate thin transparent coatings (~~C09C 1/0078~~, ~~C09C 1/62 take precedence~~)}

NOTES

1. {The optical properties of the interference pigments are depending on the order of the different layers applied on the substrate in view of their refractive indices; A refractive index $< \text{or} = 1.8$ is considered low, a refractive index > 1.8 is considered high; A dye is always an organic, coloured material. An aluminium lake compound would for classification purposes also fall under this definition, as well as any coloured metal chelate or metal complex with organic ligands; An interference pigment can e.g. have a flaky, spherical or ellipsoidal core;

A pigment comprising a core consisting of a metal is only considered as an interference pigment if it shows properties typical for interference pigments}

2. In groups [C09C 1/0015](#) - [C09C 1/0075](#) it is desirable to add indexing codes relating to the compositional and structural details chosen from groups [C09C 2200/00](#) - [C09C 2220/20](#)

- U C09C 1/40
 - Compounds of aluminium ~~{([C09C 1/0009](#), [C09C 1/0015](#), [C09C 1/0078](#), [C09C 1/32](#) take precedence)}~~
- M C09C 1/42
 - • Clays ~~(preparatory treatment for clay wares [C04B 33/04](#))~~
- U C09C 1/44
 - Carbon
- M C09C 1/46
 - • Graphite ~~{([C09C 1/0015](#) takes precedence; } preparation of graphite [C01B 32/205](#))}~~
- M C09C 1/62
 - Metallic pigments or fillers ~~{([C09C 1/0015](#) takes precedence; } obtaining metal powder, see the relevant class for the method used, e.g. [B22F 9/00](#); [C21B 15/02](#), [C22B 5/20](#), [C25C 5/00](#))}~~
- M C09C 3/00
 - Treatment in general of inorganic materials, other than fibrous fillers, to enhance their pigmenting or filling properties ~~(dyeing other macromolecular particles [C08J 3/20](#); dyeing macromolecular fibres [D06P](#))~~

Project: MP11912 (C23D)

- M C23D
 - ENAMELLING OF, OR APPLYING A VITREOUS LAYER TO, METALS ~~(chemical composition of the enamels [C03C](#))~~
 - WARNING
 - In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.
- M C23D 3/00
 - Chemical treatment of the metal surfaces prior to coating ~~(cleaning and de-greasing of metallic objects [C23G](#))~~
- M C23D 5/00
 - Coating with enamels or vitreous layers ~~{(including applying fused refractory layers [C23C 4/10](#), [C23C 24/10](#))}~~

Project: MP11916 (H02B)

- M H02B
 - BOARDS, SUBSTATIONS, OR SWITCHING ARRANGEMENTS FOR THE SUPPLY OR DISTRIBUTION OF ELECTRIC POWER ~~(basic electric elements, their assembly, including the mounting in enclosures or on bases, or the mounting of covers thereon, see the subclasses for such elements, e.g. transformers [H01F](#), switches, fuses [H01H](#), line connectors [H01R](#); installation of lines, cables, or other conductors for supply or distribution [H02G](#))~~
 - NOTE
 - This subclass covers boards, switchyards, switchgear or their installation, or the association of switching devices with each other or with other devices, e.g. transformers, fuses, meters or distribution boards; such associations constitute substations or distribution points.
 - WARNING
 - {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

U	H02B 1/00	Frameworks, boards, panels, desks, casings; Details of substations or switching arrangements
		<u>NOTE</u> In groups H02B 1/01-H02B 1/56 , the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.
U	H02B 1/015	• Boards, panels, desks; Parts thereof or accessories therefor
M	H02B 1/06	• • having associated enclosures, e.g. for preventing access to live parts (shutters or guards for contacts H02B 1/14)
M	H02B 1/16	• Earthing arrangements (earthing arrangements for substations H02B 5/01 ; for switchgear H02B 11/28 , H02B 13/075 ; earth plates, pins, or other contacts H01R 4/66 ; earthing arrangements for switchgear H02B 11/28 , H02B 13/075)
M	H02B 1/24	• Circuit arrangements for boards or switchyards (devices for displaying diagrams H02B 15/00 ; service supply H02J 11/00)
M	H02B 1/26	• Casings; Parts thereof or accessories therefor (adapted for a single switch H01H ; enclosures for cables, lines or bus-bars H02G ; distribution, connection or junction boxes H02G 3/08 ; casings in general H05K)
		<u>NOTE</u> In groups H02B 1/26 - H02B 1/56 , the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.
M	H02B 1/54	• Anti-seismic devices or installations (for buildings in general E04B 1/98 ; shock absorbers F16F)
U	H02B 11/00	Switchgear having carriage withdrawable for isolation
U	H02B 11/02	• Details
M	H02B 11/04	• • Isolating-contacts, e.g. mountings, shieldings or shieldings (shutters or guards for isolating contacts H02B 1/14 , H02B 11/24 ; switch contacts H01H ; line connectors in general H01R)
M	H02B 11/06	• • Means for duplicate bus-bar selection (layouts for duplicate bus-bar selection H02B 1/22)
U	H02B 11/12	• with isolation by horizontal withdrawal
U	H02B 11/127	• • Withdrawal mechanism
M	H02B 11/133	• • • with interlock (interlock for switches in general H01H)
M	H02B 13/00	Arrangements <i>Arrangement</i> of switchgear in which switches are enclosed in, or structurally associated with, a casing, e.g. cubicle (in association with main transformer H02B 5/00, H02B 7/00; switchgear having carriage withdrawable for isolation H02B 11/00)
U	H02B 13/02	• with metal casing
M	H02B 13/025	• • Safety arrangements, e.g. in case of excessive pressure or fire due to electrical defect (for buildings in general E04B 1/94 ; devices for opening or closing safety wings E05F 1/00 ; emergency protective circuit arrangements for distribution gear, e.g. bus-bar systems, or for switching devices H02H 7/22)
U	H02B 13/035	• • Gas-insulated switchgear
M	H02B 13/045	• • • Details of casing, e.g. gas tightness (gas reservoirs for switches H01H 33/56)
M	H02B 13/055	• • • Features relating to the gas (selection of fluids for switches H01H 33/22)

- M H02B 13/065 . . . Means for detecting or reacting to mechanical or electrical defects ~~(for switches H01H 9/50, H01H 33/26, H01H 33/53)~~
- M H02B 15/00 **Supervisory desks or panels for centralised control or display** ~~(desks in general A47B)~~

Project: MP11917 (H02G)

- M H02G **INSTALLATION OF ELECTRIC CABLES OR LINES, OR OF COMBINED OPTICAL AND ELECTRIC CABLES OR LINES** ~~(distribution points incorporating switches H02B; guiding telephone cords H04M 1/15; cable ducts or mountings for telephone or telegraph exchange installations H04Q 1/06)~~

NOTES

1. This subclass covers installation of communication cables or lines, including those comprising a combination of optical and electrical conductors, or of lightning conductors as well as installation of power cables or lines.
2. This subclass does not cover installation of purely optical cables, which is covered by groups {[G02B 6/4401](#)}, [G02B 6/46](#).
3. In this subclass, the following expression is used with the meaning indicated:
 - "electric cable" includes cables comprising optical conductors, e.g. fibres, in combination with electrical conductors.
4. In this subclass it is desirable to add indexing codes of group [H02G 2200/00](#) whenever appropriate

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

- U H02G 1/00 **Methods or apparatus specially adapted for installing, maintaining, repairing or dismantling electric cables or lines**
- U H02G 1/02 . for overhead lines or cables
- M H02G 1/04 . . for mounting or stretching ~~(wire stretchers in general B25B 25/00)~~
- M H02G 1/06 . for laying cables, e.g. laying apparatus on vehicle ~~(combined with trench digging or back-filling machines or dredgers E02F 5/00)~~
- M H02G 1/12 . for removing insulation or armouring from cables, e.g. from the end thereof ~~(pliers in general B25B; cutters in general B26B)~~
- M H02G 1/14 . for joining or terminating cables ~~(joining electric conductors H01R 43/00)~~
- M H02G 3/00 **Installations of electric cables or lines *or protective tubing therefor* in or on buildings, equivalent structures or vehicles (installations of bus-bars [H02G 5/00](#); overhead installations [H02G 7/00](#); installations in or on the ground [H02G 9/00](#); ~~channels or vertical ducts for receiving utility lines E04F 17/08; wiring of electric apparatus in general H05K~~)**
- U H02G 3/02 . Details
- M H02G 3/04 . . Protective ~~tubings or conduits (or channels or other supports)~~ *tubing or conduits, e.g. cable ladders or cable troughs* ~~(pipes or tubings in general F16L)~~
- M H02G 3/08 . . Distribution boxes; Connection or junction boxes ~~(cable terminations H02G 15/02)~~
- M H02G 3/16 . . . structurally associated with support for line-connecting terminals within the box ~~(terminals H01R 9/00)~~

M	H02G 3/22	<ul style="list-style-type: none"> • Arrangements for leading Installations of cables or lines through walls, floors; or ceilings, e.g. into building buildings (devices for use where pipes, cables or protective tubing pass through walls or partitions F16L 5/00; lead-in or lead-through insulators H01B 17/26; insulating tubes or sleeves H01B 17/58)
M	H02G 3/30	<ul style="list-style-type: none"> • Installations of cables or lines on walls, floors or ceilings (supports for pipes, cables or protective tubing F16L 3/00; hose clips F16L 33/02)
M	H02G 3/36	<ul style="list-style-type: none"> • Installations of cables or lines in walls, floors or ceilings (H02G 3/22 takes precedence)
U	H02G 5/00	Installations of bus-bars
M	H02G 5/04	<ul style="list-style-type: none"> • Partially-enclosed installations, e.g. in ducts and adapted for sliding or rolling current collection (non-rotary current collectors H01R 41/00)
M	H02G 7/00	Overhead installations of electric lines or cables (installations of bus-bars H02G 5/00; trolley wires or contact lines for electric railways B60M; fastening conductors to insulators H01B 17/00, e.g. H01B 17/06, H01B 17/16, H01B 17/22; protection against abnormal electric conditions H01H; hook contacts for temporary connections to overhead lines H01R 11/14)
M	H02G 7/16	<ul style="list-style-type: none"> • Devices for removing snow or ice from lines or cables (from insulators H01B 17/52)
M	H02G 7/20	<ul style="list-style-type: none"> • Spatial arrangements or dispositions of lines or cables on poles, posts; or towers (construction of poles, posts or towers E04H 12/22)
M	H02G 9/00	Installations of electric cables or lines in or on the ground or water (cathodic protection C23F 13/02; detection of buried cables G01V)
M	H02G 9/10	<ul style="list-style-type: none"> • in cable chambers, e.g. in manhole; or in handhole (building aspects of cable chambers Section E, e.g. E04H 5/06)
M	H02G 9/12	<ul style="list-style-type: none"> • supported on or from floats, e.g. in water (floating cables H01B 7/12)
M	H02G 11/00	Arrangements of electric cables or lines between relatively-movable parts (storing means for coiled material specially adapted for repeatedly paying-out and re-storing length of material for particular purposes B65H 75/34); current collectors H01R-; winding-up telephone cord H04M 1/15)
M	H02G 13/00	Installations of lightning conductors; Fastening thereof to supporting structure (indicating, counting or recording lightning strokes G01; lightning arrestors H01C 7/12, H01C 8/04, H01G 9/18, H01T; earth plates, pins or other contacts H01R)
U	H02G 15/00	Cable fittings
U	H02G 15/02	<ul style="list-style-type: none"> • Cable terminations (for gas- or oil-filled cables H02G 15/22)
M	H02G 15/06	<ul style="list-style-type: none"> • Cable terminating boxes, frames; or other structures (terminal blocks H01R 9/00)
M	H02G 15/08	<ul style="list-style-type: none"> • Cable junctions (for gas- or oil-filled cables H02G 15/24; disconnectible junctions, electrical connections H01R for gas or oil filled cables H02G 15/24)
M	H02G 15/10	<ul style="list-style-type: none"> • protected by boxes, e.g. by distribution, connection or junction boxes (terminal blocks H01R 9/00-; distribution boxes per se H02G 3/08)
U	H02G 15/20	<ul style="list-style-type: none"> • Cable fittings for cables filled with or surrounded by gas or oil (H02G 15/34 takes precedence)
M	H02G 15/28	<ul style="list-style-type: none"> • structurally associated with devices for indicating the presence or location of non-electric faults (combined with electric protective means H02H)

Project: MP11921 (A41B)

- M A41B SHIRTS; UNDERWEAR; BABY LINEN; HANDKERCHIEFS**
WARNING
 {In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}
- U A41B 1/00 Shirts**
 U A41B 1/08 · Details
 U A41B 1/10 · · Closures (buttons [A44B 1/00](#); sleeve links [A44B 5/00](#))
- U A41B 3/00 Collars (A41B 1/00 takes precedence)**
 U A41B 3/04 · fastening to shirts (collar-studs [A44B 3/00](#))
 M A41B 3/10 · chemically stiffened (~~processes for stiffening D06~~)
- M A41B 5/00 Fold-line formings for collars or cuffs (~~folding collar or cuff edges while manufacturing A41H 33/00~~)**
- M A41B 9/00 Undergarments (~~corsets, brassières A41C~~ ~~corsets A41C 1/00~~; ~~brassières A41C 3/00~~)**
 M A41B 9/04 · Knickers for ladies, with or without inserted crotch or seat parts (~~menstrual panties A61F 13/496~~)
 U A41B 9/08 · Combined undergarments (panti-hose, body-stockings [A41B 11/14](#))
 U A41B 9/12 · Protective undergarments (combined with swabs or absorbent pads or specially adapted for supporting them [A61F 13/15](#))
 M A41B 9/16 · Shoulder-straps forming part of the undergarments (~~shoulder-straps in general A41F 15/00~~)
- U A41B 11/00 Hosiery; Panti-hose (elastic stockings for curative purposes [A61F 13/08](#))**
 U A41B 11/10 · Stocking protectors (to be put in footwear [A43B 23/28](#))
 M A41B 11/12 · Means at the upper end to keep the stockings up ([A41B 11/04](#) takes precedence; ~~suspenders A41F 11/00~~; ~~stocking suspenders A41F 11/00~~)
- M A41B 13/00 Baby linen (~~babies' napkins or holders therefor A61F 13/15~~ {-; {patients' garments specially adapted for babies [A41D 13/1272](#)};} ~~babies' napkins or holders therefor A61F 13/15~~)**
 U A41B 13/04 · Babies' pants (combined with swabs or absorbent pads or specially adapted for supporting them [A61F 13/15](#))

Project: MP11921 (A41C)

- M A41C CORSETS; BRASSIERES**
WARNING
 {In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

Project: MP11921 (A41D)

- M A41D OUTERWEAR; PROTECTIVE GARMENTS; ACCESSORIES**
NOTE
 In this subclass, the following term is used with the meaning indicated:

- "outerwear" covers dressing-gowns, bathing costumes and pyjamas

WARNING

{In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

Project: MP11921 (A41F)

M A41F GARMENT FASTENINGS; SUSPENDERS

WARNING

{In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

- M A41F 1/00 Fastening devices specially adapted for garments ~~{(for pairing socks A41B 11/002; for fur garments A41D 5/006); fastening devices in general A44B - (; for babies' napkins A61F 13/56))}~~

Project: MP11921 (A41G)

M A41G ARTIFICIAL FLOWERS; WIGS; MASKS; FEATHERS

WARNING

{In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

- U A41G 1/00 Artificial flowers, fruit, leaves, or trees (artificial Christmas trees [A47G 33/06](#)); Garlands
- U A41G 3/00 Wigs (for dolls only [A63H 3/44](#))
- M A41G 9/00 Adornments of natural feathers; Working natural feathers (treatment of bed feathers [B68G 3/00](#), ~~D06M~~)

Project: MP11921 (A41H)

- M A41H APPLIANCES OR METHODS FOR MAKING CLOTHES, e.g. FOR DRESS-MAKING; ~~OR FOR TAILORING, NOT OTHERWISE PROVIDED FOR (machines, appliances, or methods for making particular articles of apparel, see the relevant groups for these articles in A41B - A41F; cutting tools or machines in general B26; weaving, braiding, lace-making, knitting, tufting, treating of textiles D03 - D06; sewing machines, sewing appliances, seam-ripping devices D05B; cutting or otherwise severing textile materials D06H 7/00)~~

WARNING

{In this subclass, non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

- M A41H 1/00 Measuring aids or methods ~~(making patterns by modelling on the human body A41H 3/04; measuring persons for identification purposes A61B 5/117; measuring in general G01, e.g. G01B)~~
- M A41H 1/06 - in combination with marking ~~(marking per se D06H 1/00)~~
- M A41H 3/00 Patterns for cutting-out; Methods of drafting or marking-out such patterns, e.g. on the cloth ~~(woven fabrics characterised by the special disposition of the warp or weft threads D03D 13/00)~~
- M A41H 3/02 - Making patterns by copying ~~(tracing-wheels A41H 11/00)~~
- M A41H 5/00 Dress forms; Bust forms; Stands ~~(for display purposes A47F 8/00)~~

- M A41H 9/00 Devices or methods for trimming, levelling, or straightening the hems of garments ~~(on sewing machines D05B)~~
- U A41H 17/00 Cushions for needles or pins ([A41H 19/00](#) takes precedence)
- M A41H 23/00 Devices for applying chalk; Sharpening or holding chalk ~~(writing or drawing implements B43)~~
- M A41H 25/00 Appliances or methods for marking-out, perforating, or making buttonholes ~~(by sewing D05B)~~
- M A41H 33/00 Machines or appliances for folding the edges of collars, cuffs, or the like while manufacturing ~~(turning inside-out only D06G 3/00)~~
- M A41H 37/00 Machines, appliances or methods for setting fastener-elements on garments ~~(for shoes A43D 100/00; by sewing D05B)~~
- M A41H 41/00 Machines or appliances for making garments from natural or artificial fur ~~(fur garments A41D 5/00)~~
- M A41H 42/00 Multi-step production lines for making clothes ~~(sewing units consisting of combinations of several sewing machines D05B 25/00)~~
- U A41H 43/00 Other methods, machines or appliances
- M A41H 43/02
 - Handling garment parts or blanks, e.g. feeding, piling, separating, ~~reversing or reversing~~ ~~(handling thin material in general B65H)~~
- M A41H 43/04
 - ~~Joining garment parts or blanks by gluing or welding; {Gluing presses} Joining garment parts or blanks by gluing or welding~~ (mending garments by adhesives or adhesive patches [A41H 27/00](#); ~~joining during the manufacture of particular garments, except by gluing or welding, see the relevant subclasses for those garments, e.g. A41D; {hems or seams made by welding or gluing A41D 27/245}; adhesive processes in general G09J 5/00; joining by sewing D05B) {; Gluing presses}~~

Project: MP11922 (A61P)

- M A61P 29/00 Non-central analgesic, antipyretic or ~~anti-inflammatory antiinflammatory~~ agents, e.g. antirheumatic agents; Non-steroidal ~~anti-inflammatory drugs (NSAIDs) antiinflammatory drugs [NSAID]~~

Project: MP11922 (B09B)

- U B09B 2101/00 Type of solid waste
- U B09B 2101/15
 - Electronic waste
- M B09B 2101/17
 - • Printed circuit boards [~~PCBs PCB~~]

Project: MP11922 (G06F)

- U G06F 21/00 Security arrangements for protecting computers, components thereof, programs or data against unauthorised activity
- U G06F 21/70
 - Protecting specific internal or peripheral components, in which the protection of a component leads to protection of the entire computer
- U G06F 21/71
 - • to assure secure computing or processing of information
- M G06F 21/76
 - • • in application-specific integrated circuits [~~ASICs ASIC~~] or field-programmable devices, e.g. field-programmable gate arrays [~~FPGAs FPGA~~] or programmable logic devices [~~PLDs PLD~~]

Project: MP11922 (G06Q)

- U G06Q 20/00 **Payment architectures, schemes or protocols (apparatus for performing or posting payment transactions [G07F 7/08](#), [G07F 19/00](#); electronic cash registers [G07G 1/12](#))**
- U G06Q 20/08 · Payment architectures
- M G06Q 20/18 · · involving self-service terminals [~~SSTs~~[SST](#)], vending machines, kiosks or multimedia terminals

Project: MP11922 (G10L)

- U G10L 17/00 **Speaker identification or verification**
- M G10L 17/16 · Hidden Markov models [~~HMMs~~[HMM](#)]

Project: MP11922 (H01G)

- U H01G 11/00 **Hybrid capacitors, i.e. capacitors having different positive and negative electrodes; Electric double-layer [EDL] capacitors; Processes for the manufacture thereof or of parts thereof**

NOTE

Group [H01G 11/02](#) takes precedence over groups [H01G 11/04](#) - [H01G 11/14](#)

WARNING

Group [H01G 11/00](#) is incomplete pending reclassification of documents from group [H01G 9/155](#).

Groups [H01G 9/155](#) and [H01G 11/00](#) should be considered in order to perform a complete search.

- U H01G 11/04 · Hybrid capacitors
- WARNING
Group [H01G 11/04](#) is incomplete pending reclassification of documents from group [H01G 9/155](#).
Groups [H01G 9/155](#) and [H01G 11/04](#) should be considered in order to perform a complete search.
- M H01G 11/06 · · with one of the electrodes allowing ions to be reversibly doped therein, e.g. lithium-ion capacitors [~~LICs~~[LIC](#)]
- WARNING
Group [H01G 11/06](#) is incomplete pending reclassification of documents from group [H01G 9/155](#).
Groups [H01G 9/155](#) and [H01G 11/06](#) should be considered in order to perform a complete search.

Project: MP11922 (H01J)

- M H01J 11/00 **Gas-filled discharge tubes with alternating current induction of the discharge, e.g. ~~AC-PDPs~~ [~~Alternating Current Plasma Display Panels~~[alternating current plasma display panels](#) [~~AC-PDP~~] (circuits or methods for driving PDPs [G09G 3/28](#)); Gas-filled discharge tubes without any main electrode inside the vessel; Gas-filled discharge tubes with at least one main electrode outside the vessel**

NOTES

1. When classifying in this group, classification is made in all appropriate places.
2. In this group, the following term is used with the meaning indicated:
 - "main electrode" means any of a sustain electrode, scan electrode or address electrode.

Project: MP11922 (H01L)

- M H01L 33/00** Semiconductor devices with at least one potential-jump barrier or surface barrier specially adapted for light emission; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof (**H01L 51/50** **H10K 50/00** takes precedence; devices consisting of a plurality of semiconductor components formed in or on a common substrate and including semiconductor components with at least one potential-jump barrier or surface barrier, specially adapted for light emission **H01L 27/15**; semiconductor lasers **H01S 5/00**)

NOTE

1. This group covers light-emitting diodes [**LEDs****LED**] or superluminescent diodes [**SLDs**], including LEDs or SLDs emitting infra-red **SLD**, which emit visible light, infrared [IR] light or ultra-violet **ultraviolet** [UV] light.

2. In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

Project: MP11922 (H01R)

- M H01R 12/00** Structural associations of a plurality of mutually-insulated electrical connecting elements, specially adapted for printed circuits, e.g. printed circuit boards [**PCBs****PCB**], flat or ribbon cables, or like generally planar structures, e.g. terminal strips, terminal blocks; Coupling devices specially adapted for printed circuits, flat or ribbon cables, or like generally planar structures; Terminals specially adapted for contact with, or insertion into, printed circuits, flat or ribbon cables, or like generally planar structures (printed connections to, or between, printed circuits **H05K 1/11**)
- U H01R 13/00** Details of coupling devices of the kinds covered by groups **H01R 12/70** or **H01R 24/00** - **H01R 33/00**
- U H01R 13/646** • specially adapted for high-frequency, e.g. structures providing an impedance match or phase match (non-coaxed protective earth or shield arrangements **H01R 13/648**; coaxed connectors specially adapted for high frequency **H01R 24/40**)
- U H01R 13/6461** • • Means for preventing cross-talk
- U H01R 13/6464** • • • by adding capacitive elements
- M H01R 13/6466** • • • on substrates, e.g. **PCBs** [**Printed Circuit Boards****printed circuit boards** **PCB**]

Project: MP11922 (H01S)

- U H01S 5/00** Semiconductor lasers (superluminescent diodes **H01L 33/00**)

NOTE

Attention is drawn to Special Rules of classification at **C07F**, which Special Rules indicate to which version of the periodic table of chemical elements CPC refers. In this group, the Periodic System used is the 8 group system indicated by Roman numerals in the Periodic Table thereunder.

- U H01S 5/30** • Structure or shape of the active region; Materials used for the active region
- M H01S 5/34** • • comprising quantum well or superlattice structures, e.g. single quantum well lasers [**SQW**-lasers]**SQW lasers**, multiple quantum well lasers [**MQW**-lasers]**MQW lasers** or graded index separate confinement heterostructure lasers [**GRINSCH**-lasers]**GRINSCH lasers** (**H01S 5/36** takes precedence)

Project: MP11922 (H04B)

U H04B 10/00 **Transmission systems employing electromagnetic waves other than radio-waves, e.g. infrared, visible or ultraviolet light, or employing corpuscular radiation, e.g. quantum communication**

NOTE

In this group, non-optical transmission systems are classified in group [H04B 10/90](#).

- U H04B 10/07** • Arrangements for monitoring or testing transmission systems; Arrangements for fault measurement of transmission systems
- M H04B 10/071** • • using a reflected signal, e.g. using optical time-domain reflectometers [~~OTDRs~~OTDR]

Project: MP11922 (H04H)

U H04H 60/00 **Arrangements for broadcast applications with a direct linking to broadcast information or broadcast space-time; Broadcast-related systems**

- U H04H 60/68** • Systems specially adapted for using specific information, e.g. geographical or meteorological information
- M H04H 60/72** • • using EPGs [~~Electronic Programme Guides~~electronic programme guides [EPG] (focusing on identifying broadcast space-time [H04H 60/39](#) {; menu type display of EPG in television receivers [H04N 21/47](#)})

Project: MP11922 (H05B)

M H05B 45/00 **Circuit arrangements for operating light-emitting diodes [LEDsLED]**

- M H05B 45/60** • Circuit arrangements for operating LEDs comprising organic material, e.g. for operating organic light-emitting diodes [~~OLEDs~~OLED] or polymer light-emitting diodes [~~PLEDs~~PLED]

Project: MP11942 (H04W)

M H04W **WIRELESS COMMUNICATION NETWORKS (broadcast communication [H04H](#); communication systems using wireless links for non-selective communication, e.g. wireless extensions [H04M 1/72](#))**

NOTES

1. This subclass covers :

- communication networks for selectively establishing one or a plurality of wireless communication links between a desired number of users or between users and network equipment, for the purpose of transferring information via these wireless communication links;
- networks deploying an infrastructure for mobility management of wireless users connected thereto, e.g. cellular networks, WLAN [Wireless Local Area Network], wireless access networks, e.g. WLL [Wireless Local Loop] or self-organising wireless communication networks, e.g. ad hoc networks;
- planning or deployment specially adapted for the above-mentioned wireless networks;
- services or facilities specially adapted for the above-mentioned wireless networks;
- arrangements or techniques specially adapted for the operation of the above-mentioned wireless networks.

2. This subclass does not cover :

- communication systems using wireless extensions, i.e. wireless links without selective communication, e.g. cordless telephones, which are covered by group [H04M 1/72](#);

- broadcast communication, which is covered by subclass [H04H](#).

WARNING

1. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

2. *The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:*

<i>H04W 28/082</i>	<i>covered by</i>	<i>H04W 28/085</i>
<i>H04W 28/084</i>	<i>covered by</i>	<i>H04W 28/08</i>
<i>H04W 28/086</i>	<i>covered by</i>	<i>H04W 28/0804</i>
<i>H04W 28/088</i>	<i>covered by</i>	<i>H04W 28/0842</i>

Project: RP11760 in addition to RP11761 (B81B)

B81B

MICROSTRUCTURAL DEVICES OR SYSTEMS, e.g. MICROMECHANICAL DEVICES (~~piezo-electric, electrostrictive or magnetostrictive elements per se H01L 41/00~~ *piezo-electric, electrostrictive or magnetostrictive elements per se H10N 30/00*)

NOTES

1. This subclass does not cover:

- purely electrical or electronic devices per se which are covered by section [H](#), e.g. subclass [H01L](#) *or class H10*;
- purely optical devices per se which are covered by subclasses [G02B](#) or [G02F](#);
- essentially two-dimensional structures, e.g. layered products which are covered by subclass [B32B](#);
- chemical or biological structures per se which are covered by section [C](#);
- structures in atomic scale produced by manipulation of single atoms or molecules, which are covered by group [B82B 1/00](#).

2. Devices or systems classified in this subclass are also classified in appropriate subclasses providing for their structural or functional features, if such features are of interest.

3. Attention is drawn to the following places:

A61K 9/50	Microcapsules for medicinal preparations
B25J 7/00	Micromanipulators
G02B 21/32	Micromanipulators combined with microscopes
G11B 5/127	Magnetic heads
H01P 3/08	Waveguide microstrips.

4. In this subclass, local "residual" subgroups, e.g. [B81B 7/0077](#), are used with the following purpose:

When classifying a document which does not fit in any of a set of subgroups with the same dot-level, the document should be classified in the residual group, if present, and not in the group at the hierarchical level one dot above.

In the example, the document shall be classified in [B81B 7/0077](#) and not in [B81B 7/0032](#) as [B81B 7/0077](#) is "residual" to [B81B 7/0035-B81B 7/0074](#)

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11760 (C30B)**C30B**

SINGLE-CRYSTAL GROWTH (by using ultra-high pressure, e.g. for the formation of diamonds, [B01J 3/06](#)); UNIDIRECTIONAL SOLIDIFICATION OF EUTECTIC MATERIAL OR UNIDIRECTIONAL DEMIXING OF EUTECTOID MATERIAL; REFINING BY ZONE-MELTING OF MATERIAL (zone-refining of metals or alloys [C22B](#)); PRODUCTION OF A HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE (casting of metals, casting of other substances by the same processes or devices [B22D](#); working of plastics [B29](#); modifying the physical structure of metals or alloys [C21D](#), [C22F](#)); SINGLE CRYSTALS OR HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE; AFTER-TREATMENT OF SINGLE CRYSTALS OR A HOMOGENEOUS POLYCRYSTALLINE MATERIAL WITH DEFINED STRUCTURE (for producing semiconductor devices or parts thereof [H01L](#), [H10](#)); APPARATUS THEREFOR

NOTES

1. In this subclass, the following expressions are used with the meaning indicated:

- "single-crystal" includes also twin crystals and a predominantly single crystal product;
- "homogeneous polycrystalline material" means a material with crystal particles, all of which have the same chemical composition;
- "defined structure" means the structure of a material with grains which are oriented in a preferential way or have larger dimensions than normally obtained.

2. In this subclass:

- the preparation of crystals or a homogeneous polycrystalline material with defined structure of particular materials or shapes is classified in the group for the process as well as in group [C30B 29/00](#);
- an apparatus specially adapted for a specific process is classified in the appropriate group for the process. Apparatus to be used in more than one kind of process is classified in group [C30B 35/00](#).

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11760 (F21K)**F21K 9/00**

Light sources using semiconductor devices as light-generating elements, e.g. using light-emitting diodes [LED] or lasers

NOTES

1. In this group, the following expressions are used with the meaning indicated:

- "light source" means a light-generating component intended for installation in a fitting or holder incorporated in a lighting device;
- "retrofit light source" means a light source comprising substantially the same attachment means as those of incandescent lamps or fluorescent lamps. "Retrofit light sources" are specially adapted for replacing or substituting such lamps.

2. Semiconductor devices per se, or assemblies thereof, specially adapted for light emission, e.g. for use in light sources (in the sense of Note (1)) are covered by ~~subclass~~ ~~subclasses~~ [H01L](#), (e.g. [H01L 33/00](#) ~~or~~ [H01L 51/50](#), ~~or by subclass~~),

[H01S](#) (e.g. [H01S 5/00](#)) or class [H10](#) and subclass [H10K](#) (e.g. [H10K 50/00](#) and [H10K 59/00](#))

3. Lighting devices or systems in which light sources are used are covered by subclasses [F21L](#) or [F21S](#).

4. When classifying in this group, classification is also made in subclass [F21V](#) if detail aspects covered by that subclass are of interest.

Project: RP11760 (G09G)

G09G

ARRANGEMENTS OR CIRCUITS FOR CONTROL OF INDICATING DEVICES USING STATIC MEANS TO PRESENT VARIABLE INFORMATION (lighting in general [F21](#); arrangements for displaying electric variables or waveforms [G01R 3/00](#); devices or arrangements for the control of light beams [G02F 1/00](#); indicating of time by visual means [G04B 19/00](#), [G04C 17/00](#), [G04G 9/00](#); arrangements for transferring data between computers and peripheral equipment [G06F 3/00](#); visible signalling arrangements or devices [G08B 5/00](#); traffic control systems [G08G](#); display, advertising, signs [G09F](#), e.g. static indicating arrangements comprising an association of a number of separate sources or light control cells [G09F 9/00](#); static indicating arrangements comprising integral associations of a number of light sources [H01J](#), [H01K](#), [H01L](#), [H05B 33/12](#); circuits in pulse counters for indicating the result [H03K 21/18](#); coding, decoding or code conversion, in general [H03M](#); reproducing a picture or pattern using electric signals representing parts thereof and produced by scanning an original [H04N](#))

NOTES

1. This subclass covers indicator consoles, i.e. arrangements or circuits for processing control signals to achieve the display, e.g. for the calling up, reception, storage, regeneration, coding, decoding, addressing of control signals.

2. This subclass does not cover the structural details of the indicating devices, such as panels or tubes per se, or assemblies of individual light sources, which are covered by the relevant subclasses, e.g. [H01J](#), [H01K](#), [H01L](#), [H10K](#), [G02F](#), [G09F](#), [H05B](#).

3. Contrary to subclass [H04N](#), in which are classified display devices capable of representing continuous brightness value scales, this subclass is limited to devices using only a discrete number of brightness values, e.g. visible/non-visible.

4. The visual effect may be produced by a luminescent screen scanned by an electron beam, directly by controlled light sources, by projection of light, from controlled light sources onto characters, symbols, or elements thereof drawn on a support, or by electric, magnetic, or acoustic control of the parameters of light rays from an independent source.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11760 (G11C)

G11C

STATIC STORES (semiconductor devices for storage [H01L](#), e.g. [H01L 27/108](#) – [H01L 27/11597](#) semiconductor memory devices [H10B](#))

NOTES

1. This subclass covers devices or arrangements for storage of digital or analogue information:

- in which no relative movement takes place between an information storage element and a transducer;

- which incorporate a selecting-device for writing-in or reading-out the information into or from the store.
2. This subclass does not cover elements not adapted for storage and not provided with such means as referred to in Note (3) below, which elements are classified in the appropriate subclass, e.g. of [H01](#), [H03K](#).
 3. In this subclass, the following terms are used with the meaning indicated:
 - "storage element" is an element which can hold at least one item of information and is provided with means for writing-in or reading-out this information;
 - "memory" is a device, including storage elements, which can hold information to be extracted when desired.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

G11C 8/02	covered by	G11C 8/00 , H03K 17/00
G11C 11/4193	covered by	G11C 11/00
G11C 11/4195	covered by	G11C 11/00
G11C 11/4197	covered by	G11C 11/00
2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11760 (H01L)

M H01L

SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR **SEMICONDUCTOR DEVICES NOT COVERED BY CLASS H10** (use of semiconductor devices for measuring [G01](#); resistors in general [H01C](#); magnets, inductors; *or* transformers [H01F](#); capacitors in general [H01G](#); electrolytic devices [H01G 9/00](#); batteries; *or* accumulators [H01M](#); waveguides, resonators; *or* lines of the waveguide type [H01P](#); line connectors; *or* current collectors [H01R](#); stimulated-emission devices [H01S](#); electromechanical resonators [H03H](#); loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers [H04R](#); electric light sources in general [H05B](#); printed circuits, hybrid circuits, casings or constructional details of electrical apparatus, manufacture of assemblages of electrical components [H05K](#); use of semiconductor devices in circuits having a particular application, see the subclass for the application)

NOTES

1. *This subclass is residual to class H10.*

~~1-2.~~ This subclass covers:

- a. ~~electric solid state devices which are not covered by any other subclass and details thereof, and includes: semiconductor devices adapted~~ *semiconductor devices* for rectifying, amplifying, oscillating or switching; ~~semiconductor devices sensitive to radiation; electric solid state devices using thermoelectric, superconductive, piezo-electric, electrostrictive, magnetostrictive, galvano-magnetic or bulk negative resistance effects and integrated circuit devices; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;~~
- b. *semiconductor devices sensitive to radiation; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;*
- b. ~~photoresistors, magnetic field dependent resistors, field effect resistors, capacitors with potential-jump barrier, resistors with potential-jump barrier or surface barrier, incoherent light emitting diodes and thin-film or thick-film circuits;~~

- c. *semiconductor devices for light emission; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;*
- d. processes ~~and apparatus adapted~~ *or apparatus* for the manufacture or treatment of ~~such devices, except where such processes relate to single-step processes for which provision exists elsewhere.~~ *semiconductor or solid-state devices where the type of device is not listed under bullets a to c, above, or not essential;*
- e. *constructional details or arrangements of semiconductor or solid-state devices not covered by class H10 and not specific to types of devices listed under bullets a to c, above;*
- f. *packaging or assembling of semiconductor or solid-state devices covered by this subclass or by class H10.*

2-3. In this subclass, the following terms or expressions are used with the meaning indicated:

- "wafer" means a slice of semiconductor or crystalline substrate material, which can be modified by impurity diffusion (doping), ion implantation or epitaxy, and whose active surface can be processed into arrays of discrete components or integrated circuits;
- *"solid state body" means the body of material within which, or at the surface of which, the physical effects characteristic of the device occur;*
- ~~"electrode" is a region in solid state body" means the body of material within which, or at the surface of which, the physical effects characteristic of the device occur. In thermoelectric devices, it includes all materials in the current path.~~
Regions in or on the body of the device (other than the solid state body itself), which exert an exerts an electrical influence on the solid state body electrically, are considered to be "electrodes", irrespective of whether or not an external electrical connection is made thereto. An electrode may include several portions and the term includes metallic regions which exert influence on the solid state body through an insulating region (e.g. capacitive coupling) and inductive coupling arrangements to the body. The dielectric region in a capacitive arrangement is regarded as part of the electrode. In arrangements including several portions, only those portions which exert an influence on the solid state body by virtue of their shape, size, or disposition or the material of which they are formed are considered to be part of the electrode. The other portions are considered to be "arrangements for conducting electric current to or from the solid state body" or "interconnections between solid state components formed in or on a common substrate", i.e. i.e. leads;
- "device" means an electric circuit element; where an electric circuit element is one of a plurality of elements formed in or on a common substrate it is referred to as a "component";
- "complete device" is a device in its fully assembled state which may or may not require further treatment, e.g. electroforming, before it is ready for use but which does not require the addition of further structural units;
- "parts" includes all structural units which are included in a complete device;
- "container" is an enclosure forming part of the complete device and is essentially a solid construction in which the body of the device is placed, or which is formed around the body without forming an intimate layer thereon. An enclosure which consists of one or more layers formed on the body and in intimate contact therewith is referred to as an "encapsulation";
- "integrated circuit" is a device where all components, e.g. diodes, *or* resistors, are built up on a common substrate and form the device including interconnections between the components;

- "assembly" of a device is the building up of the device from its **component constructional units and includes** *constructional units; the term covers* the provision of fillings in containers.

~~3.~~4. In this subclass, both the process or apparatus for the manufacture or treatment of a device and the device itself are classified, whenever both of these are described sufficiently to be of interest.

~~4. Attention is drawn to Note (3) after the title of section C, which Note indicates to which version of the periodic table of chemical elements the IPC refers. In this subclass, the Periodic System used is the 8 group system indicated by Roman numerals in the Periodic Table thereunder.~~

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

H01L 21/301	covered by	H01L 21/30
H01L 21/328	covered by	H01L 29/66075
H01L 21/329	covered by	H01L 29/66083
H01L 21/33	covered by	H01L 29/66227
H01L 21/331	covered by	H01L 29/66234
H01L 21/332	covered by	H01L 29/66363
H01L 21/334	covered by	H01L 29/66075
H01L 21/335	covered by	H01L 29/66409
H01L 21/336	covered by	H01L 29/66477
H01L 21/337	covered by	H01L 29/66893
H01L 21/338	covered by	H01L 29/66848
H01L 21/339	covered by	H01L 29/66946
H01L 21/36-H01L 21/368	covered by	H01L 21/02107
H01L 21/58	covered by	H01L 24/80
H01L 21/66	covered by	H01L 22/00
H01L21/8242	covered by	H01L 27/108
H01L21/8244	covered by	H01L 27/11
H01L21/8246	covered by	H01L 27/112
H01L 21/98	covered by	H01L 25/50
H01L 29/38	covered by	H01L 29/04-H01L 29/365
H01L 29/96	covered by	H01L 29/68-H01L 29/945
H01L51/30	covered by	H01L 51/0032
H01L51/40	covered by	H01L 51/0001
H01L51/46	covered by	H01L 51/0032
H01L51/48	covered by	H01L 51/0001
H01L51/54	covered by	H01L 51/0032

2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}

Project: RP11760 (H02M)**H02M**

APPARATUS FOR CONVERSION BETWEEN AC AND AC, BETWEEN AC AND DC, OR BETWEEN DC AND DC, AND FOR USE WITH MAINS OR SIMILAR POWER SUPPLY SYSTEMS; CONVERSION OF DC OR AC INPUT POWER INTO SURGE OUTPUT POWER; CONTROL OR REGULATION THEREOF (transformers [H01F](#); dynamo-electric converters [H02K 47/00](#); controlling transformers, reactors or choke coils, control or regulation of electric motors, generators or dynamo-electric converters [H02P](#))

NOTES

1. This subclass covers only circuits or apparatus for the conversion of electric power, or arrangements for control or regulation of such circuits or apparatus. The electrotechnical elements employed are dealt within the appropriate subclasses, e.g. inductors, transformers [H01F](#), capacitors, electrolytic rectifiers [H01G](#), mercury rectifying or other discharge tubes [H01J](#), semiconductor devices [H01L](#), [H10](#) impedance networks or resonant circuit not primarily concerned with the transfer of electric power [H03H](#).
2. In this subclass, the following term is used with the meaning indicated:
 - "conversion", in respect of an electric variable, e.g. voltage or current, means the change of one or more of the parameters of the variable, e.g. amplitude, frequency, phase, polarity.

WARNINGS

1.

The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

H02M 9/00	covered by	H03K 3/53
H02M 9/02	covered by	H03K 3/53
H02M 9/04	covered by	H03K 3/53
H02M 9/06	covered by	H03K 3/53

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11760 (H02N)**H02N****ELECTRIC MACHINES NOT OTHERWISE PROVIDED FOR**NOTES1. This subclass covers:

- electrostatic generators, motors, clutches, or holding devices;
- other non-dynamo-electric generators or motors;
- holding or levitation devices using magnetic attraction or repulsion;
- arrangements for starting, regulating, braking, or otherwise controlling such machines unless in conjoint operation with a second machine.

2. Specific provision for generators, motors, or other means for converting between electric and other forms of energy also exists in other subclasses, e.g. in *class [H10](#) and* subclasses [H01L](#), [H01M](#), [H02K](#), [H04R](#).

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11760 (H10)**N H10****SEMICONDUCTOR DEVICES; ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR**

Project: RP11761 (B06B)

- U B06B 1/00 **Methods or apparatus for generating mechanical vibrations of infrasonic, sonic, or ultrasonic frequency**
- U B06B 1/02
B06B 1/06
B06B 1/08
- making use of electrical energy ([B06B 1/18](#), [B06B 1/20](#) take precedence)
 - operating with piezo-electric effect or with electrostriction (~~piezo-electric or electrostrictive devices per se H01L 41/00~~*piezo-electric or electrostrictive devices per se H10N 30/00*)
 - operating with magnetostriction (~~magnetostrictive devices per se H01L 41/00~~*magnetostrictive devices per se H10N 30/00*)

Project: RP11761 (B23Q)

- B23Q 1/00 **Members which are comprised in the general build-up of a form of machine, particularly relatively large fixed members ([B23Q 37/00](#) takes precedence {; positioning supports for measuring arrangements [G01B 5/0004](#); motorised alignment for optical elements [G02B 7/005](#); handling of mask or wafer [G03F 7/70691](#); adjusting or compensating devices for optical apparatuses [G12B 5/00](#); ~~piezoelectric or electrostrictive positioners H01L 41/09~~; *piezoelectric or electrostrictive positioners H10N 30/20*)**

Project: RP11761 (B60H)

- U B60H 1/00 **Heating, cooling or ventilating {[HVAC]} devices (heating, cooling or ventilating devices providing other air treatment, the other treatment being relevant, [B60H 3/00](#); ventilating solely by opening windows, doors, roof parts, or the like [B60J](#); heating or ventilating devices for vehicle seats [B60N 2/56](#); vehicle window or windscreen cleaners using air, e.g. defrosters, [B60S 1/54](#))**
- NOTE
In this group and its subgroups, as well as in patent documents, the following abbreviation is used:
- HVAC Heating, Ventilating and Air Conditioning
- B60H 1/00478
• {Air-conditioning devices using the Peltier effect (for air-conditioning in general [F24F 5/0042](#); for refrigeration [F25B 21/02](#); ~~electric devices exhibiting the Peltier effect H01L 35/00~~; *electric devices exhibiting the Peltier effect H10N 10/00*)}

Project: RP11761 in addition to RP11760 (B81B)

- B81B **MICROSTRUCTURAL DEVICES OR SYSTEMS, e.g. MICROMECHANICAL DEVICES (~~piezo-electric, electrostrictive or magnetostrictive elements per se H01L 41/00~~*piezo-electric, electrostrictive or magnetostrictive elements per se H10N 30/00*)**

NOTES

1. This subclass does not cover:
 - purely electrical or electronic devices per se which are covered by section [H](#), e.g. subclass [H01L](#) *or class H10*;
 - purely optical devices per se which are covered by subclasses [G02B](#) or [G02F](#);
 - essentially two-dimensional structures, e.g. layered products which are covered by subclass [B32B](#);
 - chemical or biological structures per se which are covered by section [C](#);

- structures in atomic scale produced by manipulation of single atoms or molecules, which are covered by group [B82B 1/00](#).
2. Devices or systems classified in this subclass are also classified in appropriate subclasses providing for their structural or functional features, if such features are of interest.
3. Attention is drawn to the following places:
- | | |
|----------------------------|---|
| A61K 9/50 | Microcapsules for medicinal preparations |
| B25J 7/00 | Micromanipulators |
| G02B 21/32 | Micromanipulators combined with microscopes |
| G11B 5/127 | Magnetic heads |
| H01P 3/08 | Waveguide microstrips. |
4. In this subclass, local "residual" subgroups, e.g. [B81B 7/0077](#), are used with the following purpose:
- When classifying a document which does not fit in any of a set of subgroups with the same dot-level, the document should be classified in the residual group, if present, and not in the group at the hierarchical level one dot above.

In the example, the document shall be classified in [B81B 7/0077](#) and not in [B81B 7/0032](#) as [B81B 7/0077](#) is "residual" to [B81B 7/0035-B81B 7/0074](#)

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Project: RP11761 (B81B)

- U B81B 3/00** **Devices comprising flexible or deformable elements, e.g. comprising elastic tongues or membranes ([B81B 5/00](#) takes precedence)**
- U B81B 3/0018 · {Structures acting upon the moving or flexible element for transforming energy into mechanical movement or *vice versa*, i.e. actuators, sensors, generators}
- B81B 3/0021 · · {Transducers for transforming electrical into mechanical energy or *vice versa* (dynamo-electric machines [H02K 99/00](#); electrostatic machines [H02N 1/00](#); ~~piezo-electric devices [H01L 41/00](#)~~; *piezo-electric devices [H10N 30/00](#)*)}

Project: RP11761 (B81C)

B81C **PROCESSES OR APPARATUS SPECIALLY ADAPTED FOR THE MANUFACTURE OR TREATMENT OF MICROSTRUCTURAL DEVICES OR SYSTEMS (making microcapsules or microballoons [B01J 13/02](#); ~~processes or apparatus peculiar to the manufacture or treatment of piezo-electric, electrostrictive or magnetostrictive element per se [H01L 41/22](#)~~; *processes or apparatus peculiar to the manufacture or treatment of piezo-electric, electrostrictive or magnetostrictive element per se [H10N 30/01](#)*)**

NOTES

1. This subclass does not cover:
- processes or apparatus for the manufacture or treatment of purely electrical or electronic devices, which are covered by section [H](#), e.g. group [H01L 21/00](#);
 - processes or apparatus involving the manipulation of single atoms or molecules, which are covered by group [B82B 3/00](#).
2. In this subclass, local "residual" subgroups, e.g. [B81C 1/00126](#), are used with the following purpose.
- When classifying a document which does not fit in any of a set of subgroups with the same dot-level, the document should be classified in the residual group, if present, and not in the group at the hierarchical level one dot above.

In the example, the document shall be classified in [B81C 1/00126](#) and not in [B81C 1/00023](#) as [B81C 1/00126](#) is "residual" to [B81C 1/00031](#)-[B81C 1/00119](#)

Project: RP11761 (E05B)

- U E05B 47/00 **Operating or controlling locks or other fastening devices by electric or magnetic means (electric permutation locks [E05B 49/00](#))**
- U E05B 47/0001 · {with electric actuators; Constructional features thereof (for vehicles [E05B 81/04](#))}
- E05B 47/0011 · · {with piezo-electric actuators (~~piezo-electric devices per se H01L 41/00~~*piezo-electric devices per se H10N 30/00*)}

Project: RP11761 (F02D)

- U F02D 41/00 **Electrical control of supply of combustible mixture or its constituents ([F02D 43/00](#) takes precedence {; control of engine starters [F02N 11/08](#), electrical control of engine ignition timing [F02P 5/145](#))**
- U F02D 41/20 · Output circuits, e.g. for controlling currents in command coils
- F02D 41/2096 · · {for controlling piezo-electric injectors (~~drive and control circuit for piezo-electric devices in general H01L 41/042~~*drive and control circuit for piezo-electric devices in general H10N 30/802*)}

Project: RP11761 (F16F)

- U F16F 15/00 **Suppression of vibrations in systems ({damping of non-rotary systems using inertia effect [F16F 7/10](#); prevention or isolation of vibrations in machine tools [B23Q 11/0032](#); suppression of driveline vibrations in hybrid vehicle transmissions [B60W 30/20](#)}; vehicle seat suspension devices [B60N 2/50](#); {methods or devices for protecting against, or damping of, acoustic waves, e.g. sound [G10K 11/16](#)}); Means or arrangements for avoiding or reducing out-of-balance forces, e.g. due to motion ({vibration absorbing or balancing means for aircraft propellers [B64C 11/008](#), for rotorcraft rotors [B64C 27/001](#)}; testing static and dynamic balance of machines or structures [G01M 1/00](#))**
- F16F 15/005 · {using electro- or magnetostrictive actuation means (generating of mechanical vibrations operating with electrostriction [B06B 1/06](#), with magnetostriction [B06B 1/08](#); vehicle suspension arrangements characterised by use of piezo-electric elements [B60G 17/01941](#); ~~piezo-electric, electrostrictive and magnetostrictive devices per se H01L 41/00~~; *piezo-electric, electrostrictive and magnetostrictive devices per se H10N 30/00*)}

Project: RP11761 (G01L)

- U G01L 1/00 **Measuring force or stress, in general (measuring force due to impact [G01L 5/00](#))**
- U G01L 1/12 · by measuring variations in the magnetic properties of materials resulting from the application of stress
- G01L 1/125 · · {by using magnetostrictive means (~~magnetostrictive sensors H01L 41/425~~*magnetostrictive sensors H10N 35/101*)}
- U G01L 3/00 **Measuring torque, work, mechanical power, or mechanical efficiency, in general**
- U G01L 3/02 · Rotary-transmission dynamometers
- U G01L 3/04 · · wherein the torque-transmitting element comprises a torsionally-flexible shaft
- U G01L 3/10 · · · involving electric or magnetic means for indicating
- U G01L 3/101 · · · · {involving magnetic or electromagnetic means}

- G01L 3/102 {involving magnetostrictive means (~~magnetostrictive sensors H01L 41/125~~ *magnetostrictive sensors H10N 35/101*)}

Project: RP11761 (G01N)

- U G01N 25/00 Investigating or analyzing materials by the use of thermal means (G01N 3/00 - G01N 23/00 take precedence)**
- U G01N 25/20 . by investigating the development of heat, i.e. calorimetry, e.g. by measuring specific heat, by measuring thermal conductivity (calorimeters *per se* G01K)
- U G01N 25/48 . . on solution, sorption, or a chemical reaction not involving combustion or catalytic oxidation
- U G01N 25/4806 . . . {Details not adapted to a particular type of sample}
- U G01N 25/4813 {concerning the measuring means}
- G01N 25/482 {concerning the temperature responsive elements (measuring temperature or quantity of heat, thermally-sensitive elements G01K; ~~thermoelectric devices H01L 35/00, H01L 37/00~~; *thermoelectric devices H10N 10/00, H10N 15/00*)}

Project: RP11761 (G01R)

- U G01R 33/00 Arrangements or instruments for measuring magnetic variables**
- G01R 33/0052 . {Manufacturing aspects; Manufacturing of single devices, i.e. of semiconductor magnetic sensor chips (~~devices based on galvano-magnetic effect or the like H01L 43/12~~ *devices based on galvano-magnetic effect or the like H10N 50/85*)}

Project: RP11761 (G21D)

- U G21D 7/00 Arrangements for direct production of electric energy from fusion or fission reactions (obtaining electric energy from radioactive sources G21H 1/00)**
- G21D 7/04 . using thermoelectric elements {or thermoionic converters} (structural combination of fuel element with thermoelectric element {or with thermoionic converters} G21C 3/40 {, G21H 1/10}; ~~thermoelectric elements per se H01L 35/00, H01L 37/00~~; *thermoelectric elements per se H10N 10/00, H10N 15/00*)

Project: RP11761 (H01C)

H01C 7/00

Non-adjustable resistors formed as one or more layers or coatings; Non-adjustable resistors made from powdered conducting material or powdered semi-conducting material with or without insulating material (consisting of loose powdered or granular material [H01C 8/00](#) {; {measuring deformation in a solid state using the change in resistance formed by printed-circuit technique [G01B 7/20](#); insulating materials [H01B 3/00](#); passive thin-film or thick-film semiconductor or solid state devices [H01L 27/00](#); resistors without a potential-jump or surface barrier specially adapted for integrated circuits, details thereof, multistep manufacturing processes therefor [H01L 28/20](#)}; resistors with a potential-jump barrier or surface barrier, e.g. field effect resistors [H01L 29/00](#); semiconductor devices sensitive to electromagnetic or corpuscular radiation, e.g. photoresistors, [H01L 31/00](#) {; ~~devices using superconductivity H01L 39/00; devices using galvanomagnetic or similar magnetic effects, e.g. magnetic-field-controlled resistors, H01L 43/00; solid state devices for rectifying, amplifying, oscillating or switching without a potential-jump barrier or surface barrier H01L 45/00; bulk negative resistance effect devices H01L 47/00; {ohmic resistance heating [H05B 3/00](#); printed circuits [H05K](#)}; ~~devices using galvanomagnetic or similar magnetic effects, e.g. magnetic-field-controlled resistors, H10N 50/00; devices using superconductivity H10N 60/00; solid state devices for rectifying, amplifying, oscillating or switching without a potential-jump barrier or surface barrier H10N 70/00; bulk negative resistance effect devices H10N 80/00)~~~~

Project: RP11761 (H01F)

H01F

MAGNETS; INDUCTANCES; TRANSFORMERS; SELECTION OF MATERIALS FOR THEIR MAGNETIC PROPERTIES (ceramics based on ferrites [C04B 35/26](#); alloys [C22C](#) {; {construction of loading coils [H01B](#)} ; ~~thermomagnetic devices H01L 37/00~~; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers [H04R](#); ~~thermomagnetic devices H10N 15/00~~)

NOTE

In this subclass, inductances and transformers are regarded as being "for power supply" if they are intended for this purpose even in systems operating at frequencies above 60 cycles/sec.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

U H01F 1/00

Magnets or magnetic bodies characterised by the magnetic materials therefor; Selection of materials for their magnetic properties

NOTES

1. Attention is drawn to Note (3) after the title of section [C](#), which Note indicates to which version of the periodic table of chemical elements the IPC refers. In this group, the Periodic System used is the 8 group system indicated by Roman numerals in the Periodic Table thereunder.
2. {Group [H01F 1/0036](#) takes precedence over groups [H01F 1/09](#), [H01F 1/11](#), [H01F 1/20](#), [H01F 1/33](#) and [H01F 1/36](#)}

- H01F 1/0036 · {showing low dimensional magnetism, i.e. spin rearrangements due to a restriction of dimensions, e.g. showing giant magnetoresistivity, ([H01F 1/153](#), [H01F 1/42](#) and [H01F 10/00](#) take precedence; magnetoresistive sensors [G01D 5/16](#), [G01R 33/06](#); magnetoresistive recording [G11B 5/39](#); ~~magnetic-field-controlled resistors H01L 43/08~~; *magnetic-field-controlled resistors H10N 50/10*)}
- U H01F 1/01 · of inorganic materials ([H01F 1/44](#) takes precedence)
- H01F 1/40 · · of magnetic semiconductor materials, e.g. CdCr₂S₄ (~~devices using galvanomagnetic or similar effects H01L 43/00~~ *devices using galvanomagnetic or similar effects H10N 50/00*)
- U H01F 6/00 Superconducting magnets; Superconducting coils {(magnetic resonance assemblies using superconducting coil systems [G01R 33/3815](#))}**
- H01F 6/003 · {Methods and means for discharging superconductive storage (superconducting alloys [C22C](#); static memories with superconducting elements [G11C 11/44](#); superconducting circuit breakers with contacts [H01H 33/004](#); ~~superconducting material H01L 39/00~~; ~~power cryotrons H01L 39/20~~; superconducting switches for low power [H03K 17/92](#); *superconducting material H10N 60/00*; *power cryotrons H10N 60/355*)}

Project: RP11761 (H01H)

- U H01H 33/00 High-tension or heavy-current switches with arc-extinguishing or arc-preventing means**
- U H01H 33/002 · {Very heavy-current switches ([H01H 33/02](#) - [H01H 33/98](#) take precedence)}
- H01H 33/004 · · {making use of superconducting contacts (~~power cryotrons H01L 39/20~~; current limitation using superconducting elements [H02H 9/023](#); *power cryotrons H10N 60/355*)}

Project: RP11761 (H01L)

- U H01L 23/48 · Arrangements for conducting electric current to or from the solid state body in operation, e.g. leads, terminal arrangements {; Selection of materials therefor}
- NOTE**
Arrangements for connecting or disconnecting semiconductor or other solid state bodies, or methods related thereto, other than those arrangements or methods covered by the following subgroups, are covered by [H01L 24/00](#)
- U H01L 23/488 · · consisting of soldered {or bonded} constructions {(bump connectors [H01L 24/01](#))}
- U H01L 23/498 · · · Leads, {i.e. metallisations or lead-frames} on insulating substrates, {e.g. chip carriers (shape of the substrate [H01L 23/13](#))}
- U H01L 23/49866 · · · · {characterised by the materials (materials of the substrates [H01L 23/14](#), of the lead-frames [H01L 23/49579](#))}
- H01L 23/49877 · · · · · {Carbon, e.g. fullerenes (~~superconducting fullerenes H01L 39/123~~ *superconducting fullerenes H10N 60/853*)}
- U H01L 23/52 · Arrangements for conducting electric current within the device in operation from one component to another {, i.e. interconnections, e.g. wires, lead frames (optical interconnections [G02B 6/00](#))}
- U H01L 23/522 · · including external interconnections consisting of a multilayer structure of conductive and insulating layers inseparably formed on the semiconductor body
- U H01L 23/532 · · · characterised by the materials
- U H01L 23/53204 · · · · {Conductive materials}

- H01L 23/53276 · · · · {containing carbon, e.g. fullerenes (~~superconducting fullerenes H01L 39/123~~superconducting fullerenes H10N 60/853)}
- H01L 27/01 · comprising only passive thin-film or thick-film elements formed on a common insulating substrate {(passive two-terminal components without a potential-jump or surface barrier for integrated circuits, details thereof and multistep manufacturing processes therefor [H01L 28/00](#))}
- NOTE**
In groups H01L 27/01 -- H01L 27/26, in the absence of an indication to the contrary, classification is made in the last appropriate place.
- D H01L 27/16 · including thermoelectric components with or without a junction of dissimilar materials; including thermomagnetic components (using the Peltier effect only for cooling of semiconductor or other solid state devices H01L 23/38)
<administratively transferred to [H10N 19/00](#)>
- D H01L 27/18 · including components exhibiting superconductivity
<administratively transferred to [H10N 69/00](#)>
- D H01L 27/20 · including piezo-electric components; including electrostrictive components; including magnetostrictive components
<administratively transferred to [H10N 39/00](#)>
- D H01L 27/26 · including bulk negative resistance effect components
<administratively transferred to [H10N 89/00](#)>
- D H01L 27/265 · · {Gunn effect devices}
<administratively transferred to [H10N 89/02](#)>

Project: RP11761 in addition to RP11801 (H01L)

- H01L 29/00** Semiconductor devices adapted for rectifying, amplifying, oscillating or switching, or capacitors or resistors with at least one potential-jump barrier or surface barrier, e.g. PN junction depletion layer or carrier concentration layer; Details of semiconductor bodies or of electrodes thereof {; {Multistep manufacturing processes therefor}{[H01L 31/00](#) - [H01L 47/00](#)[H01L 33/00](#), [H01L 51/05](#)[H10K 10/00](#), [H10N](#) take precedence; ~~processes or apparatus adapted for the manufacture or treatment thereof or of parts thereof H01L 21/00~~; details other than of semiconductor bodies or of electrodes thereof [H01L 23/00](#); devices consisting of a plurality of solid state components formed in or on a common substrate [H01L 27/00](#) {; {passive two-terminal components without a potential-jump or surface barrier for integrated circuits, details thereof and multistep manufacturing processes therefor [H01L 28/00](#) ~~resistors in general H01C;~~ } ~~resistors in general H01C~~; capacitors in general [H01G](#), {e.g. ceramic barrier-layer capacitors [H01G 4/1272](#)}}
- NOTE**
In this main group, classification is made both in groups [H01L 29/02](#) - [H01L 29/51](#) and in groups [H01L 29/66](#) - [H01L 29/94](#) if both of these sets of groups are relevant.

Project: RP11761 (H01L)

- D H01L 35/00 **Thermoelectric devices comprising a junction of dissimilar materials, i.e. exhibiting Seebeck or Peltier effect with or without other thermoelectric effects or thermomagnetic effects; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof; Details thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00)**
<administratively transferred to [H10N 10/00](#)>
- D H01L 35/02 · Details
<administratively transferred to [H10N 10/80](#)>
- D H01L 35/04 · · Structural details of the junction; Connections of leads
<administratively transferred to [H10N 10/81](#)>
- D H01L 35/06 · · · detachable, e.g. using a spring
<administratively transferred to [H10N 10/813](#)>
- D H01L 35/08 · · · non-detachable, e.g. cemented, sintered, soldered {, e.g. thin films}
<administratively transferred to [H10N 10/817](#)>
- D H01L 35/10 · · · Connections of leads
<administratively transferred to [H10N 10/82](#)>
- D H01L 35/12 · Selection of the material for the legs of the junction
<administratively transferred to [H10N 10/85](#)>
- D H01L 35/14 · · using inorganic compositions
<administratively transferred to [H10N 10/851](#)>
- D H01L 35/16 · · · comprising tellurium or selenium or sulfur
<administratively transferred to [H10N 10/852](#)>
- D H01L 35/18 · · · comprising arsenic or antimony or bismuth (H01L 35/16 takes precedence), {e.g. $A_{III}B_V$ compounds}
<administratively transferred to [H10N 10/853](#)>
- D H01L 35/20 · · · comprising metals only (H01L 35/16, H01L 35/18 take precedence)
<administratively transferred to [H10N 10/854](#)>
- D H01L 35/22 · · · comprising compounds containing boron, carbon, oxygen or nitrogen {or germanium or silicon, e.g. superconductors}
<administratively transferred to [H10N 10/855](#)>
- D H01L 35/225 · · · · {Superconducting materials}
<administratively transferred to [H10N 10/8552](#)>
- D H01L 35/24 · · using organic compositions
<administratively transferred to [H10N 10/856](#)>
- D H01L 35/26 · · using compositions changing continuously or discontinuously inside the material
<administratively transferred to [H10N 10/857](#)>
- D H01L 35/28 · operating with Peltier or Seebeck effect only
<administratively transferred to [H10N 10/10](#)>
- D H01L 35/30 · · characterised by the heat-exchanging means at the junction
<administratively transferred to [H10N 10/13](#)>

- D H01L 35/32
- characterised by the structure or configuration of the cell or thermocouple forming the device (including details about housing, insulation, geometry or module)
- <administratively transferred to [H10N 10/17](#)>
- D H01L 35/325
- • • {Cascades of thermocouples}
- <administratively transferred to [H10N 19/101](#)>
- D H01L 35/34
- Processes or apparatus specially adapted for peculiar to the manufacture or treatment of these devices or of parts thereof
- <administratively transferred to [H10N 10/01](#)>
- D H01L 37/00**
- ~~Thermoelectric devices without a junction of dissimilar materials; Thermomagnetic devices, e.g. using Nernst-Ettinghausen effect; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00)~~**
- <administratively transferred to [H10N 15/00](#)>**
- D H01L 37/02
- using thermal change of dielectric constant, e.g. working above and below Curie point (, e.g. pyroelectric devices)
- <administratively transferred to [H10N 15/10](#)>
- D H01L 37/025
- • {Selection of materials}
- <administratively transferred to [H10N 15/15](#)>
- D H01L 37/04
- using thermal change of magnetic permeability, e.g. working above and below the Curie point (, e.g. pyromagnetic devices)
- <administratively transferred to [H10N 15/20](#)>
- D H01L 39/00**
- ~~Devices using superconductivity; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00; {light detection G01J, G02F 2/00; application to memories G11C 11/44, G11C 15/00, G11C 19/32}; superconducting conductors cables or transmission lines H01B 12/00; {microwaves H01P 7/00, H01P 11/00}; superconductive coils or windings H01F; amplifiers using superconductivity H03F 19/00; {impulse generators and logic circuits H03K 3/38, H03K 17/92, H03K 19/195; lasers H01S 3/00, H01S 5/00}~~**
- NOTE
- In this group, in the absence of an indication to the contrary, an invention is classified in the last appropriate place
- <administratively transferred to [H10N 60/00](#)>**
- D H01L 39/005
- {Alleged superconductivity}
- <administratively transferred to [H10N 60/99](#)>
- D H01L 39/02
- Details
- <administratively transferred to [H10N 60/80](#)>
- D H01L 39/025
- • {for Josephson devices}
- <administratively transferred to [H10N 60/805](#)>
- D H01L 39/04
- • Containers; Mountings
- <administratively transferred to [H10N 60/81](#)>
- D H01L 39/045
- • • {for Josephson devices}
- <administratively transferred to [H10N 60/815](#)>

- D H01L 39/06
- characterised by the current path
<administratively transferred to [H10N 60/82](#)>
- D H01L 39/08
- characterised by the shape of the element
<administratively transferred to [H10N 60/83](#)>
- D H01L 39/10
- characterised by the means for switching {between superconductive and normal states}
<administratively transferred to [H10N 60/84](#)>
- D H01L 39/12
- characterised by the material
<administratively transferred to [H10N 60/85](#)>
- D H01L 39/121
- • {Organic materials}
<administratively transferred to [H10N 60/851](#)>
- D H01L 39/123
- • • {Fullerene superconductors, e.g. soccerball-shaped allotrope of carbon, e.g. C₆₀, C₉₄ (fullerenes in general C07C 13/00)}
<administratively transferred to [H10N 60/853](#)>
- D H01L 39/125
- • • {Ceramic materials}
<administratively transferred to [H10N 60/855](#)>
- D H01L 39/126
- • • • {comprising copper oxide}
<administratively transferred to [H10N 60/857](#)>
- D H01L 39/128
- • • • • {Multi-layered structures, e.g. super lattices}
<administratively transferred to [H10N 60/858](#)>
- D H01L 39/14
- Permanent superconductor devices
<administratively transferred to [H10N 60/20](#)>
- D H01L 39/141
- {comprising metal borides, e.g. MgB₂}
<administratively transferred to [H10N 60/202](#)>
- D H01L 39/143
- {comprising high Tc ceramic materials}
<administratively transferred to [H10N 60/203](#)>
- D H01L 39/145
- • {Three or more electrode devices (H01L 39/228 takes precedence)}
<administratively transferred to [H10N 60/205](#)>
- D H01L 39/146
- • • {Field effect devices}
<administratively transferred to [H10N 60/207](#)>
- D H01L 39/148
- • {Abrikosov vortex devices}
<administratively transferred to [H10N 60/208](#)>
- D H01L 39/16
- Devices switchable between superconductive and normal states {, e.g. switches, current limiters (circuits for current limitation using superconductor elements H02H 9/023)}
<administratively transferred to [H10N 60/30](#)>
- D H01L 39/18
- • Cryotrons
<administratively transferred to [H10N 60/35](#)>
- D H01L 39/20
- • • Power cryotrons
<administratively transferred to [H10N 60/355](#)>
- D H01L 39/22
- Devices comprising a junction of dissimilar materials, e.g. Josephson-effect devices
<administratively transferred to [H10N 60/10](#)>

- D H01L 39/221
 - • {Single electron tunnelling devices}
 - <administratively transferred to [H10N 60/11](#)>
- D H01L 39/223
 - • {Josephson-effect devices}
 - <administratively transferred to [H10N 60/12](#)>
- D H01L 39/225
 - • • {comprising high-Tc ceramic materials}
 - <administratively transferred to [H10N 60/124](#)>
- D H01L 39/226
 - • • {comprising metal borides, e.g. MgB₂}
 - <administratively transferred to [H10N 60/126](#)>
- D H01L 39/228
 - • {three or more electrode devices, e.g. transistor-like structures}
 - <administratively transferred to [H10N 60/128](#)>
- D H01L 39/24
 - Processes or apparatus peculiar to the manufacture or treatment of devices provided for in H01L 39/00 or of parts thereof
 - <administratively transferred to [H10N 60/01](#)>
- D H01L 39/2403
 - • {Processes peculiar to the manufacture or treatment of composite superconductor filaments (comprising copper oxide H01L 39/2419)}
 - <administratively transferred to [H10N 60/0128](#)>
- D H01L 39/2406
 - • {of devices comprising Nb or an alloy of Nb with one or more of the elements of group 4, e.g. Ti, Zr, Hf}
 - <administratively transferred to [H10N 60/0156](#)>
- D H01L 39/2409
 - • {of devices comprising an intermetallic compound of type A-15, e.g. Nb₃Sn}
 - <administratively transferred to [H10N 60/0184](#)>
- D H01L 39/2412
 - • {of devices comprising molybdenum chalcogenides}
 - <administratively transferred to [H10N 60/0212](#)>
- D H01L 39/2416
 - • {of devices comprising nitrides or carbonitrides}
 - <administratively transferred to [H10N 60/0241](#)>
- D H01L 39/2419
 - • {the superconducting material comprising copper oxide}
 - <administratively transferred to [H10N 60/0268](#)>
- D H01L 39/2422
 - • • {Processes for depositing or forming superconductor layers}
 - <administratively transferred to [H10N 60/0296](#)>
- D H01L 39/2425
 - • • • {from a solution}
 - <administratively transferred to [H10N 60/0324](#)>
- D H01L 39/2429
 - • • • {from a suspension or slurry, e.g. screen printing; doctor blade casting}
 - <administratively transferred to [H10N 60/0352](#)>
- D H01L 39/2432
 - • • • {by evaporation independent of heat source, e.g. MBE}
 - <administratively transferred to [H10N 60/0381](#)>
- D H01L 39/2435
 - • • • {by sputtering}
 - <administratively transferred to [H10N 60/0408](#)>
- D H01L 39/2438
 - • • • {by chemical vapour deposition [CVD]}
 - <administratively transferred to [H10N 60/0436](#)>
- D H01L 39/2441
 - • • • • {by metalloorganic chemical vapour deposition [MOCVD]}
 - <administratively transferred to [H10N 60/0464](#)>
- D H01L 39/2445
 - • • • {by thermal spraying, e.g. plasma deposition}
 - <administratively transferred to [H10N 60/0492](#)>

- D H01L 39/2448 {Pulsed laser deposition, e.g. laser sputtering; laser ablation}
<administratively transferred to [H10N 60/0521](#)>
- D H01L 39/2451 {Precursor deposition followed by after-treatment, e.g. oxidation}
<administratively transferred to [H10N 60/0548](#)>
- D H01L 39/2454 {characterised by the substrate}
<administratively transferred to [H10N 60/0576](#)>
- D H01L 39/2458 {Monocrystalline substrates, e.g. epitaxial growth}
<administratively transferred to [H10N 60/0604](#)>
- D H01L 39/2461 {Intermediate layers, e.g. for growth control}
<administratively transferred to [H10N 60/0632](#)>
- D H01L 39/2464 . . . {After-treatment, e.g. patterning}
<administratively transferred to [H10N 60/0661](#)>
- D H01L 39/2467 {Etching}
<administratively transferred to [H10N 60/0688](#)>
- D H01L 39/247 {Passivation}
<administratively transferred to [H10N 60/0716](#)>
- D H01L 39/2474 . . . {Manufacture or deposition of contacts or electrodes}
<administratively transferred to [H10N 60/0744](#)>
- D H01L 39/2477 . . . {Processes including the use of precursors}
<administratively transferred to [H10N 60/0772](#)>
- D H01L 39/248 . . . {Processes peculiar to the manufacture or treatment of filaments or composite wires}
<administratively transferred to [H10N 60/0801](#)>
- D H01L 39/2483 . . . {Introducing flux pinning centres}
<administratively transferred to [H10N 60/0828](#)>
- D H01L 39/2487 . . {of devices comprising metal borides, e.g. MgB_2 }
<administratively transferred to [H10N 60/0856](#)>
- D H01L 39/249 . . {Treatment of superconductive layers by irradiation, e.g. ion-beam, electron-beam, laser beam, X-rays (irradiation devices G21K, H01J)}
<administratively transferred to [H10N 60/0884](#)>
- D H01L 39/2493 . . {for Josephson devices}
<administratively transferred to [H10N 60/0912](#)>
- D H01L 39/2496 . . . {comprising high-Tc ceramic materials}
<administratively transferred to [H10N 60/0941](#)>

D H01L 41/00 ~~Piezo-electric devices in general; Electrostrictive devices in general; Magnetostrictive devices in general; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof (devices consisting of a plurality of solid-state components formed in or on a common substrate H01L 27/00)~~

WARNING

Groups H01L 41/23-H01L 41/47 are incomplete pending reclassification of documents from group H01L 41/22.

Groups H01L 41/23-H01L 41/47 and H01L 41/22 should be considered in order to perform a complete search.

<administratively transferred to [H10N 30/00](#)>

- D H01L 41/02
 - Details
 - <administratively transferred to [H10N 30/80](#)>
- D H01L 41/04
 - of piezo-electric or electrostrictive devices
 - <administratively transferred to [H10N 30/80](#)>
- D H01L 41/042
 - • {Drive or control circuitry or methods for piezo-electric or electrostrictive devices not otherwise provided for}
 - <administratively transferred to [H10N 30/802](#)>
- D H01L 41/044
 - • • {for piezoelectric transformers (conversion of DC or AC power H02M; for operating discharge lamps H05B 41/282)}
 - <administratively transferred to [H10N 30/804](#)>
- D H01L 41/047
 - • • Electrodes {or electrical connection arrangements}
 - <administratively transferred to [H10N 30/87](#)>
- D H01L 41/0471
 - • • • {Individual layer electrodes of multilayer piezo-electric or electrostrictive devices, e.g. internal electrodes}
 - <administratively transferred to [H10N 30/871](#)>
- D H01L 41/0472
 - • • • {Connection electrodes of multilayer piezo-electric or electrostrictive devices, e.g. external electrodes}
 - <administratively transferred to [H10N 30/872](#)>
- D H01L 41/0474
 - • • • • {embedded within piezo-electric or electrostrictive material, e.g. via connections}
 - <administratively transferred to [H10N 30/874](#)>
- D H01L 41/0475
 - • • • • {Further connection or lead arrangements, e.g. flexible wiring boards, terminal pins}
 - <administratively transferred to [H10N 30/875](#)>
- D H01L 41/0477
 - • • • • {Conductive materials (in general H01B 1/00)}
 - <administratively transferred to [H10N 30/877](#)>
- D H01L 41/0478
 - • • • • • {the principal material being non-metallic, e.g. oxide or carbon based}
 - <administratively transferred to [H10N 30/878](#)>
- D H01L 41/053
 - • • Mounts, supports, enclosures or casings
 - <administratively transferred to [H10N 30/88](#)>
- D H01L 41/0533
 - • • • • {Further insulation means against electrical, physical or chemical damage, e.g. protective coatings}
 - <administratively transferred to [H10N 30/883](#)>
- D H01L 41/0536
 - • • • • {Mechanical prestressing means, e.g. springs (in general F16F 1/00)}
 - <administratively transferred to [H10N 30/886](#)>
- D H01L 41/06
 - • of magnetostrictive devices
 - <administratively transferred to [H10N 35/80](#)>
- D H01L 41/08
 - Piezo-electric or electrostrictive devices
 - <administratively transferred to [H10N 30/00](#)>
- D H01L 41/0805
 - • {based on piezo-electric or electrostrictive films or coatings}
 - <administratively transferred to [H10N 30/1051](#)>
- D H01L 41/081
 - • • {characterised by the underlying base, e.g. substrates}
 - <administratively transferred to [H10N 30/10513](#)>
- D H01L 41/0815
 - • • • • {Intermediate layers, e.g. barrier, adhesion or growth control buffer layers}
 - <administratively transferred to [H10N 30/10516](#)>

- D H01L 41/082 . . {based on piezo-electric or electrostrictive fibres}
<administratively transferred to [H10N 30/1061](#)>
- D H01L 41/0825 . . {with electrical and mechanical input and output, e.g. having combined actuator and sensor parts}
<administratively transferred to [H10N 30/1071](#)>
- D H01L 41/083 . . having a stacked or multilayer structure
<administratively transferred to [H10N 30/50](#)>
- D H01L 41/0831 . . . {with non-rectangular cross-section in stacking direction, e.g. polygonal, trapezoidal}
<administratively transferred to [H10N 30/501](#)>
- D H01L 41/0833 . . . {with non-rectangular cross-section orthogonal to the stacking direction, e.g. polygonal, circular}
<administratively transferred to [H10N 30/503](#)>
- D H01L 41/0835 {Annular cross-section}
<administratively transferred to [H10N 30/505](#)>
- D H01L 41/0836 . . . {of cylindrical shape with stacking in radial direction, e.g. coaxial or spiral type rolls}
<administratively transferred to [H10N 30/506](#)>
- D H01L 41/0838 . . . {adapted for alleviating internal stress, e.g. cracking control layers ("Sollbruchstellen")}
<administratively transferred to [H10N 30/508](#)>
- D H01L 41/087 . . formed as coaxial cables
<administratively transferred to [H10N 30/60](#)>
- D H01L 41/09 . . with electrical input and mechanical output {, e.g. actuators, vibrators (in frequency selective networks H03H 9/00)}
<administratively transferred to [H10N 30/20](#)>
- D H01L 41/0906 . . . {using longitudinal or thickness displacement combined with bending, shear or torsion displacement}
<administratively transferred to [H10N 30/202](#)>
- D H01L 41/0913 {with polygonal or rectangular shape}
<administratively transferred to [H10N 30/2023](#)>
- D H01L 41/092 {with cylindrical or annular shape}
<administratively transferred to [H10N 30/2027](#)>
- D H01L 41/0926 . . . {using bending displacement, e.g. unimorph, bimorph or multimorph cantilever or membrane benders}
<administratively transferred to [H10N 30/204](#)>
- D H01L 41/0933 {Beam type}
<administratively transferred to [H10N 30/2041](#)>
- D H01L 41/094 {Cantilevers, i.e. having one fixed end}
<administratively transferred to [H10N 30/2042](#)>
- D H01L 41/0946 {connected at their free ends, e.g. parallelogram type}
<administratively transferred to [H10N 30/2043](#)>
- D H01L 41/0953 {with multiple segments mechanically connected in series, e.g. zig-zag type}
<administratively transferred to [H10N 30/2044](#)>

- D H01L 41/096 {adapted for in-plane bending displacement}
<administratively transferred to [H10N 30/2045](#)>
- D H01L 41/0966 {adapted for multi-directional bending displacement}
<administratively transferred to [H10N 30/2046](#)>
- D H01L 41/0973 {Membrane type}
<administratively transferred to [H10N 30/2047](#)>
- D H01L 41/098 {with non-planar shape}
<administratively transferred to [H10N 30/2048](#)>
- D H01L 41/0986 . . . {using longitudinal or thickness displacement only, e.g. d33 or d31 type devices}
<administratively transferred to [H10N 30/206](#)>
- D H01L 41/0993 . . . {using shear or torsion displacement, e.g. d15 type devices}
<administratively transferred to [H10N 30/208](#)>
- D H01L 41/107 . . with electrical input and electrical output {, e.g. transformers}
<administratively transferred to [H10N 30/40](#)>
- D H01L 41/113 . . with mechanical input and electrical output {, e.g. generators, sensors}
<administratively transferred to [H10N 30/30](#)>
- D H01L 41/1132 . . . {Sensors}
<administratively transferred to [H10N 30/302](#)>
- D H01L 41/1134 . . . {Beam type}
<administratively transferred to [H10N 30/304](#)>
- D H01L 41/1136 {Cantilevers}
<administratively transferred to [H10N 30/306](#)>
- D H01L 41/1138 . . . {Membrane type}
<administratively transferred to [H10N 30/308](#)>
- D H01L 41/12 . . Magnetostrictive devices
<administratively transferred to [H10N 35/00](#)>
- D H01L 41/125 . . {with mechanical input and electrical output, e.g. generators, sensors}
<administratively transferred to [H10N 35/101](#)>
- D H01L 41/16 . . Selection of materials
<administratively transferred to [H10N 30/85](#)>
- D H01L 41/18 . . for piezo-electric or electrostrictive devices {, e.g. bulk piezo-electric crystals}
<administratively transferred to [H10N 30/85](#)>
- D H01L 41/183 . . . {Composite materials, e.g. having 1-3 or 2-2 type connectivity}
<administratively transferred to [H10N 30/852](#)>
- D H01L 41/187 . . . Ceramic compositions {, i.e. synthetic inorganic polycrystalline compounds incl. epitaxial, quasi-crystalline materials}
<administratively transferred to [H10N 30/853](#)>
- D H01L 41/1871 {Alkaline earth metal based oxides, e.g. barium titanates}
<administratively transferred to [H10N 30/8536](#)>
- D H01L 41/1873 {Alkali metal based oxides, e.g. lithium, sodium or potassium niobates}
<administratively transferred to [H10N 30/8542](#)>

- D H01L 41/1875 {Lead based oxides}
<administratively transferred to [H10N 30/8548](#)>
- D H01L 41/1876 {Lead zirconate titanate based}
<administratively transferred to [H10N 30/8554](#)>
- D H01L 41/1878 {Bismuth based oxides}
<administratively transferred to [H10N 30/8561](#)>
- D H01L 41/193 . . . Macromolecular compositions {, e.g. piezo-electric polymers}
<administratively transferred to [H10N 30/857](#)>
- D H01L 41/20 . . for magnetostrictive devices
<administratively transferred to [H10N 35/85](#)>
- D H01L 41/22 . Processes or apparatus specially adapted for the assembly, manufacture or treatment of piezo-electric or electrostrictive devices or of parts thereof
<administratively transferred to [H10N 30/01](#)>
- D H01L 41/23 . . Forming enclosures or casings
<administratively transferred to [H10N 30/02](#)>
- D H01L 41/25 . . Assembling devices that include piezo-electric or electrostrictive parts
<administratively transferred to [H10N 30/03](#)>
- D H01L 41/253 . . Treating devices or parts thereof to modify a piezo-electric or electrostrictive property, e.g. polarisation characteristics, vibration characteristics or mode tuning
<administratively transferred to [H10N 30/04](#)>
- D H01L 41/257 . . . by polarising
<administratively transferred to [H10N 30/045](#)>
- D H01L 41/27 . . Manufacturing multilayered piezo-electric or electrostrictive devices or parts thereof, e.g. by stacking piezo-electric bodies and electrodes
<administratively transferred to [H10N 30/05](#)>
- D H01L 41/273 . . . by integrally sintering piezo-electric or electrostrictive bodies and electrodes
<administratively transferred to [H10N 30/053](#)>
- D H01L 41/277 . . . by stacking bulk piezo-electric or electrostrictive bodies and electrodes
<administratively transferred to [H10N 30/057](#)>
- D H01L 41/29 . . Forming electrodes, leads or terminal arrangements
<administratively transferred to [H10N 30/06](#)>
- D H01L 41/293 . . . Connection electrodes of multilayered piezo-electric or electrostrictive parts
NOTE
Integral individual layer electrode and connection electrode are classified in both H01L 41/293 and H01L 41/297
<administratively transferred to [H10N 30/063](#)>
- D H01L 41/297 . . . Individual layer electrodes of multilayered piezo-electric or electrostrictive parts
NOTE
Integral individual layer electrode and connection electrode are classified in both H01L 41/293 and H01L 41/297
<administratively transferred to [H10N 30/067](#)>

- D H01L 41/31
 - • Applying piezo-electric or electrostrictive parts or bodies onto an electrical element or another base
 - <administratively transferred to [H10N 30/07](#)>
- D H01L 41/311
 - • • Mounting of piezo-electric or electrostrictive parts together with semiconductor elements, or other circuit elements, on a common substrate
 - <administratively transferred to [H10N 30/071](#)>
- D H01L 41/312
 - • • by laminating or bonding of piezo-electric or electrostrictive bodies
 - <administratively transferred to [H10N 30/072](#)>
- D H01L 41/313
 - • • • by metal fusing or with adhesives
 - <administratively transferred to [H10N 30/073](#)>
- D H01L 41/314
 - • • by depositing piezo-electric or electrostrictive layers, e.g. aerosol or screen printing
 - <administratively transferred to [H10N 30/074](#)>
- D H01L 41/316
 - • • • by vapour phase deposition
 - <administratively transferred to [H10N 30/076](#)>
- D H01L 41/317
 - • • • by liquid phase deposition
 - <administratively transferred to [H10N 30/077](#)>
- D H01L 41/318
 - • • • • by sol-gel deposition
 - <administratively transferred to [H10N 30/078](#)>
- D H01L 41/319
 - • • • using intermediate layers, e.g. for growth control
 - <administratively transferred to [H10N 30/079](#)>
- D H01L 41/33
 - • Shaping or machining of piezo-electric or electrostrictive bodies
 - <administratively transferred to [H10N 30/08](#)>
- D H01L 41/331
 - • • by coating or depositing using masks, e.g. lift-off
 - <administratively transferred to [H10N 30/081](#)>
- D H01L 41/332
 - • • by etching, e.g. lithography
 - <administratively transferred to [H10N 30/082](#)>
- D H01L 41/333
 - • • by moulding or extrusion
 - <administratively transferred to [H10N 30/084](#)>
- D H01L 41/335
 - • • by machining
 - <administratively transferred to [H10N 30/085](#)>
- D H01L 41/337
 - • • • by polishing or grinding
 - <administratively transferred to [H10N 30/086](#)>
- D H01L 41/338
 - • • • by cutting or dicing
 - <administratively transferred to [H10N 30/088](#)>
- D H01L 41/339
 - • • • by punching
 - <administratively transferred to [H10N 30/089](#)>
- D H01L 41/35
 - • Forming piezo-electric or electrostrictive materials
 - <administratively transferred to [H10N 30/09](#)>
- D H01L 41/37
 - • • Composite materials
 - <administratively transferred to [H10N 30/092](#)>
- D H01L 41/39
 - • • Inorganic materials
 - <administratively transferred to [H10N 30/093](#)>

- D H01L 41/41 by melting
<administratively transferred to [H10N 30/095](#)>
- D H01L 41/43 by sintering
<administratively transferred to [H10N 30/097](#)>
- D H01L 41/45 . . . Organic materials
<administratively transferred to [H10N 30/098](#)>
- D H01L 41/47 . Processes or apparatus specially adapted for the assembly, manufacture or treatment of magnetostrictive devices or of parts thereof
<administratively transferred to [H10N 35/01](#)>
- D H01L 43/00 ~~Devices using galvano-magnetic or similar magnetic effects; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00)~~**
<administratively transferred to [H10N 50/00](#)>
- D H01L 43/02 . Details
<administratively transferred to [H10N 50/80](#)>
- D H01L 43/04 . . of Hall-effect devices
<administratively transferred to [H10N 52/80](#)>
- D H01L 43/06 . Hall-effect devices
<administratively transferred to [H10N 52/00](#)>
- D H01L 43/065 . . {Semiconductor Hall-effect devices}
<administratively transferred to [H10N 52/101](#)>
- D H01L 43/08 . Magnetic-field-controlled resistors
<administratively transferred to [H10N 50/10](#)>
- D H01L 43/10 . Selection of materials
<administratively transferred to [H10N 50/85](#)>
- D H01L 43/12 . Processes or apparatus specially adapted for the manufacture or treatment of these devices or of parts thereof
<administratively transferred to [H10N 50/01](#)>
- D H01L 43/14 . . for Hall-effect devices
<administratively transferred to [H10N 52/01](#)>
- D H01L 45/00 ~~Solid state devices adapted for rectifying, amplifying, oscillating or switching without a potential-jump barrier or surface barrier, e.g. dielectric triodes; Ovshinsky-effect devices; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00; devices using superconductivity H01L 39/00; piezo-electric devices H01L 41/00; bulk negative resistance effect devices H01L 47/00; {memories G11C 11/34; G11C 13/0002; amplifying circuits H03F 11/00; pulse generation H03K 3/02; electronic switching circuits H03K 17/00; logic circuits H03K 19/00})~~**
<administratively transferred to [H10N 70/00](#)>
- D H01L 45/005 . {Charge density wave transport devices}
<administratively transferred to [H10N 70/151](#)>
- D H01L 45/02 . Solid state travelling-wave devices
<administratively transferred to [H10N 70/10](#)>

- D H01L 45/04 · {Bistable or multistable switching devices, e.g. for resistance switching non-volatile memory}
<administratively transferred to [H10N 70/20](#)>
- D H01L 45/06 · · {based on solid-state phase change, e.g. between amorphous and crystalline phases, Ovshinsky effect}
<administratively transferred to [H10N 70/231](#)>
- D H01L 45/065 · · · {between different crystalline phases, e.g. cubic and hexagonal}
<administratively transferred to [H10N 70/235](#)>
- D H01L 45/08 · · {based on migration or redistribution of ionic species, e.g. anions, vacancies}
<administratively transferred to [H10N 70/24](#)>
- D H01L 45/085 · · · {the species being metal cations, e.g. programmable metallization cells}
<administratively transferred to [H10N 70/245](#)>
- D H01L 45/10 · · {based on bulk electronic defects, e.g. trapping of electrons}
<administratively transferred to [H10N 70/25](#)>
- D H01L 45/12 · · {Details}
<administratively transferred to [H10N 70/801](#)>
- D H01L 45/1206 · · · {Three or more terminal devices, e.g. transistor like devices}
<administratively transferred to [H10N 70/253](#)>
- D H01L 45/1213 · · · {Radiation or particle beam assisted switching devices, e.g. optically controlled devices}
<administratively transferred to [H10N 70/257](#)>
- D H01L 45/122 · · · {Device geometry}
<administratively transferred to [H10N 70/821](#)>
- D H01L 45/1226 · · · · {adapted for essentially horizontal current flow, e.g. bridge type devices}
<administratively transferred to [H10N 70/823](#)>
- D H01L 45/1233 · · · · {adapted for essentially vertical current flow, e.g. sandwich or pillar type devices}
<administratively transferred to [H10N 70/826](#)>
- D H01L 45/124 · · · · · {on sidewalls of dielectric structures, e.g. mesa or cup type devices}
<administratively transferred to [H10N 70/8265](#)>
- D H01L 45/1246 · · · · · {Further means within the switching material region to limit current flow, e.g. constrictions}
<administratively transferred to [H10N 70/828](#)>
- D H01L 45/1253 · · · {Electrodes}
<administratively transferred to [H10N 70/841](#)>
- D H01L 45/126 · · · · {adapted for resistive heating}
<administratively transferred to [H10N 70/8413](#)>
- D H01L 45/1266 · · · · {adapted for supplying ionic species}
<administratively transferred to [H10N 70/8416](#)>
- D H01L 45/1273 · · · · {adapted for electric field or current focusing, e.g. tip-shaped}
<administratively transferred to [H10N 70/8418](#)>
- D H01L 45/128 · · · {Thermal details}
<administratively transferred to [H10N 70/861](#)>

- D H01L 45/1286 {Heating or cooling means other than resistive heating electrodes, e.g. heater in parallel}
<administratively transferred to [H10N 70/8613](#)>
- D H01L 45/1293 {Thermal insulation means}
<administratively transferred to [H10N 70/8616](#)>
- D H01L 45/14 . . {Selection of switching materials}
<administratively transferred to [H10N 70/881](#)>
- D H01L 45/141 . . . {Compounds of sulfur, selenium or tellurium, e.g. chalcogenides}
<administratively transferred to [H10N 70/882](#)>
- D H01L 45/142 {Sulfides, e.g. CuS}
<administratively transferred to [H10N 70/8822](#)>
- D H01L 45/143 {Selenides, e.g. GeSe}
<administratively transferred to [H10N 70/8825](#)>
- D H01L 45/144 {Tellurides, e.g. GeSbTe}
<administratively transferred to [H10N 70/8828](#)>
- D H01L 45/145 . . . {Oxides or nitrides}
<administratively transferred to [H10N 70/883](#)>
- D H01L 45/146 {Binary metal oxides, e.g. TaOx}
<administratively transferred to [H10N 70/8833](#)>
- D H01L 45/147 {Complex metal oxides, e.g. perovskites, spinels}
<administratively transferred to [H10N 70/8836](#)>
- D H01L 45/148 . . . {Other compounds of groups 13-15, e.g. elemental or compound semiconductors}
<administratively transferred to [H10N 70/884](#)>
- D H01L 45/149 {Carbon or carbides}
<administratively transferred to [H10N 70/8845](#)>
- D H01L 45/16 . . {Manufacturing}
<administratively transferred to [H10N 70/011](#)>
- D H01L 45/1608 . . . {Formation of the switching material, e.g. layer deposition}
<administratively transferred to [H10N 70/021](#)>
- D H01L 45/1616 {by chemical vapor deposition, e.g. MOCVD, ALD}
<administratively transferred to [H10N 70/023](#)>
- D H01L 45/1625 {by physical vapor deposition, e.g. sputtering}
<administratively transferred to [H10N 70/026](#)>
- D H01L 45/1633 {by conversion of electrode material, e.g. oxidation}
<administratively transferred to [H10N 70/028](#)>
- D H01L 45/1641 . . . {Modification of the switching material, e.g. post-treatment, doping}
<administratively transferred to [H10N 70/041](#)>
- D H01L 45/165 {by implantation}
<administratively transferred to [H10N 70/043](#)>
- D H01L 45/1658 {by diffusion, e.g. photo-dissolution}
<administratively transferred to [H10N 70/046](#)>

- D H01L 45/1666 . . . {Patterning of the switching material}
<administratively transferred to [H10N 70/061](#)>
- D H01L 45/1675 {by etching of pre-deposited switching material layers, e.g. lithography}
<administratively transferred to [H10N 70/063](#)>
- D H01L 45/1683 {by filling of openings, e.g. damascene method}
<administratively transferred to [H10N 70/066](#)>
- D H01L 45/1691 {Patterning process specially adapted for achieving sub-lithographic dimensions, e.g. using spacers}
<administratively transferred to [H10N 70/068](#)>
- D H01L 47/00** **Bulk negative resistance effect devices, e.g. Gunn-effect devices; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof (devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00)**
<administratively transferred to [H10N 80/00](#)>
- D H01L 47/005 . {Processes or apparatus peculiar to the manufacture or treatment of these devices or of parts thereof (not peculiar thereto H01L 21/00)}
<administratively transferred to [H10N 80/01](#)>
- D H01L 47/02 . Gunn-effect devices (or transferred electron devices)
<administratively transferred to [H10N 80/10](#)>
- D H01L 47/023 . . {controlled by electromagnetic radiation}
<administratively transferred to [H10N 80/103](#)>
- D H01L 47/026 . . {Gunn diodes (H01L 47/02 takes precedence)}
<administratively transferred to [H10N 80/107](#)>
- D H01L 49/00** **Solid state devices not provided for in groups H01L 27/00 – H01L 47/00 and H01L 51/00 and not provided for in any other subclass; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof**
<administratively transferred to [H10N 99/00](#)>
- D H01L 49/003 . {Devices using Mott metal-insulator transition, e.g. field effect transistors}
<administratively transferred to [H10N 99/03](#)>
- D H01L 49/006 . {Quantum devices, e.g. Quantum Interference Devices, Metal Single Electron Transistor (using semiconductors in the active part H01L 29/00)}
<administratively transferred to [H10N 99/05](#)>
- D H01L 49/02 . Thin-film or thick-film devices
<administratively transferred to [H10N 97/00](#)>

Project: RP11761 (H02H)

- U H02H 9/00** **Emergency protective circuit arrangements for limiting excess current or voltage without disconnection (structural association of protective devices with specific machines or apparatus, see the relevant subclass for the machine or apparatus)**
- U H02H 9/04 . responsive to excess voltage (lightning arrestors [H01C 7/12](#), [H01C 8/04](#), [H01G 9/18](#), [H01T](#))
- H02H 9/044 . . {Physical layout, materials not provided for elsewhere (varistors [H01C 7/12](#); [Ovshinsky devices H01L 45/00](#); spark-gaps [H01T](#); [Ovshinsky devices H10N 70/00](#))}

Project: RP11761 (H02N)

- H02N 2/00 Electric machines in general using piezo-electric effect, electrostriction or magnetostriction (generating mechanical vibrations in general [B06B](#); ~~piezo-electric, electrostrictive or magnetostrictive devices in general H01L 41/00~~; *piezo-electric, electrostrictive or magnetostrictive devices in general H10N 30/00*)
- U H02N 15/00 Holding or levitation devices using magnetic attraction or repulsion, not otherwise provided for (electric or magnetic devices for holding work on machine tools [B23Q 3/15](#) {; monorail vehicle propulsion or suspension [B60L 13/00](#)}; sliding or levitation devices for railway systems [B61B 13/08](#); material handling devices associated with conveyors incorporating devices with electrostatic or magnetic grippers [B65G 47/92](#); separating thin or filamentary articles from piles using magnetic force [B65H 3/16](#); delivering thin or filamentary articles from magnetic holders by air blast or suction [B65H 29/24](#); bearings using magnetic or electric supporting means [F16C 32/04](#); relieving bearing loads using magnetic means [F16C 39/06](#); magnets [H01F 7/00](#); dynamo-electric clutches or brakes [H02K 49/00](#) {; electric furnaces with simultaneous levitation and heating [H05B 6/32](#)})
- H02N 15/04
 - Repulsion by the Meissner effect (~~superconductors or hyperconductors in general H01L 39/00~~*superconductors or hyperconductors in general H10N 60/00*)

Project: RP11761 in addition to RP11801 (H02S)

- H02S GENERATION OF ELECTRIC POWER BY CONVERSION OF INFRARED RADIATION, VISIBLE LIGHT OR ULTRAVIOLET LIGHT, e.g. USING PHOTOVOLTAIC [PV] MODULES (obtaining electrical energy from radioactive sources [G21H 1/12](#); light sensitive inorganic semiconductor devices [H01L 31/00](#); ~~thermoelectric devices H01L 35/00~~; ~~pyroelectric devices H01L 37/00~~; ~~light sensitive organic semiconductor devices H01L 51/42~~; *light sensitive organic semiconductor devices H10K 30/00*; *thermoelectric devices H10N 10/00*; *pyroelectric devices H10N 15/00*)

Project: RP11761 (H02S)

- U H02S 10/00 PV power plants; Combinations of PV energy systems with other systems for the generation of electric power
- H02S 10/30
 - Thermophotovoltaic systems (photovoltaic cells specially adapted for conversion or sensing of infra-red [IR] radiation [H01L 31/00](#); ~~thermoelectric devices H01L 35/00~~; *thermoelectric devices H10N 10/00*)

Project: RP11761 (H03B)

- U H03B 5/00 Generation of oscillations using amplifier with regenerative feedback from output to input ([H03B 9/00](#), [H03B 15/00](#) take precedence)
- U H03B 5/30
 - with frequency-determining element being electromechanical resonator
- H03B 5/32
 - being a piezo-electric resonator (~~selection of piezo-electric material H01L 41/00~~*selection of piezo-electric material H10N 30/00*)
- H03B 5/40
 - being a magnetostrictive resonator ([H03B 5/42](#) takes precedence; selection of magneto-strictive material {[H01F 1/00](#)}-; ~~H01L 41/00~~; *H10N 30/00*)
- U H03B 15/00 Generation of oscillations using galvano-magnetic devices, e.g. Hall-effect devices, or using superconductivity effects
- H03B 15/003
 - {using superconductivity effects (~~devices using superconductivity H01L 39/00~~*devices using superconductivity H10N 60/00*)}

Project: RP11761 (H03F)

U H03F 3/00 Amplifiers with only discharge tubes or only semiconductor devices as amplifying elements

NOTE

Groups [H03F 3/20](#) - [H03F 3/72](#) take precedence over groups [H03F 3/02](#) - [H03F 3/189](#).

{This Note corresponds to IPC Note (1) relating to [H03F 3/02](#) - [H03F 3/189](#).}

H03F 3/54

- Amplifiers using transit-time effect in tubes or semiconductor devices (parametric amplifiers [H03F 7/00](#); ~~solid state travelling-wave devices H01L 45/02~~; *solid state travelling-wave devices H10N 70/10*)

Project: RP11761 (H03H)

H03H 9/00 Networks comprising electromechanical or electro-acoustic devices; Electromechanical resonators (making single crystals [C30B](#); selection of materials thereof [H01L](#); ~~piezo-electric, electrostrictive or magnetostrictive devices per se H01L 41/00~~; electromechanical transducers [H04R](#); *piezo-electric, electrostrictive or magnetostrictive devices per se H10N 30/00*)

Project: RP11761 (H04R)

H04R 15/00 Magnetostrictive transducers (~~magnetostrictive elements in general H01L 41/00~~ *magnetostrictive elements in general H10N 30/00*)

H04R 17/00 Piezo-electric transducers; Electrostrictive transducers (~~piezo-electric or electrostrictive elements in general H01L 41/00; details of piezo-electric or electrostrictive motors, generators or positioners {H01L 41/00}~~ *piezo-electric or electrostrictive elements in general H10N 30/00; details of piezo-electric or electrostrictive motors, generators or positioners {H10N 30/00}*)

Project: RP11761 (H10N)

N H10N ***ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR***

N H10N 10/00 - H10N 19/00 ***Thermoelectric or thermomagnetic devices***

N H10N 10/00 ***Thermoelectric devices comprising a junction of dissimilar materials, i.e. devices exhibiting Seebeck or Peltier effects (integrated devices or assemblies of multiple devices H10N 19/00)***

N H10N 10/01 • *Manufacture or treatment*

N H10N 10/10 • *operating with only the Peltier or Seebeck effects*

N H10N 10/13 • • *characterised by the heat-exchanging means at the junction*

N H10N 10/17 • • *characterised by the structure or configuration of the cell or thermocouple forming the device*

N H10N 10/80 • *Constructional details*

N H10N 10/81 • • *Structural details of the junction*

N H10N 10/813 • • • *the junction being separable, e.g. using a spring*

N H10N 10/817 • • • *the junction being non-separable, e.g. being cemented, sintered or soldered*

N H10N 10/82 • • *Connection of interconnections*

N H10N 10/85 • • *Thermoelectric active materials*

N H10N 10/851 • • • *comprising inorganic compositions*

N H10N 10/852 • • • • *comprising tellurium, selenium or sulfur*

- N H10N 10/853 comprising arsenic, antimony or bismuth ([H10N 10/852](#) takes precedence)
- N H10N 10/854 comprising only metals ([H10N 10/852](#), [H10N 10/853](#) take precedence)
- Q H10N 10/855 comprising compounds containing boron, carbon, oxygen or nitrogen
WARNING
 Group [H10N 10/855](#) is impacted by reclassification into group [H10N 10/8556](#).
 Groups [H10N 10/855](#) and [H10N 10/8556](#) should be considered in order to perform a complete search.
- N H10N 10/8552 {the compounds being superconducting}
- N H10N 10/8556 {comprising compounds containing germanium or silicon}
WARNING
 Group [H10N 10/8556](#) is incomplete pending reclassification of documents from group [H10N 10/855](#).
 Groups [H10N 10/855](#) and [H10N 10/8556](#) should be considered in order to perform a complete search.
- N H10N 10/856 comprising organic compositions
- N H10N 10/857 comprising compositions changing continuously or discontinuously inside the material
- N H10N 15/00** **Thermoelectric devices without a junction of dissimilar materials; Thermomagnetic devices, e.g. using the Nernst-Ettingshausen effect (integrated devices or assemblies of multiple devices [H10N 19/00](#))**
- N H10N 15/10 . Thermoelectric devices using thermal change of the dielectric constant, e.g. working above and below the Curie point
- N H10N 15/15 . {Selection of materials}
- N H10N 15/20 . Thermomagnetic devices using thermal change of the magnetic permeability, e.g. working above and below the Curie point
- N H10N 19/00** **Integrated devices, or assemblies of multiple devices, comprising at least one thermoelectric or thermomagnetic element covered by groups [H10N 10/00](#) - [H10N 15/00](#)**
WARNING
 Group [H10N 19/00](#) is incomplete pending reclassification of documents from groups [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#). All groups listed in this Warning should be considered in order to perform a complete search.
- N H10N 19/101 . {Multiple thermocouples connected in a cascade arrangement}
- N H10N 30/00 - H10N 39/00** **Piezoelectric, electrostrictive or magnetostrictive devices**
- Q H10N 30/00** **Piezoelectric or electrostrictive devices (integrated devices or assemblies of multiple devices [H10N 39/00](#))**
WARNING
 Group [H10N 30/00](#) is impacted by reclassification into group [H10N 35/00](#). Groups [H10N 30/00](#) and [H10N 35/00](#) should be considered in order to perform a complete search.
- N H10N 30/01 . Manufacture or treatment
- N H10N 30/02 . Forming enclosures or casings
- N H10N 30/03 . Assembling devices that include piezoelectric or electrostrictive parts

- N H10N 30/04 • • *Treatments to modify a piezoelectric or electrostrictive property, e.g. polarisation characteristics, vibration characteristics or mode tuning*
- N H10N 30/045 • • • *by polarising*
- N H10N 30/05 • • *Manufacture of multilayered piezoelectric or electrostrictive devices, or parts thereof, e.g. by stacking piezoelectric bodies and electrodes*
- N H10N 30/053 • • • *by integrally sintering piezoelectric or electrostrictive bodies and electrodes*
- N H10N 30/057 • • • *by stacking bulk piezoelectric or electrostrictive bodies and electrodes*
- N H10N 30/06 • • *Forming electrodes or interconnections, e.g. leads or terminals*
- N H10N 30/063 • • • *Forming interconnections, e.g. connection electrodes of multilayered piezoelectric or electrostrictive parts*
- N H10N 30/067 • • • *Forming single-layered electrodes of multilayered piezoelectric or electrostrictive parts*
- N H10N 30/07 • • *Forming of piezoelectric or electrostrictive parts or bodies on an electrical element or another base*
- N H10N 30/071 • • • *Mounting of piezoelectric or electrostrictive parts together with semiconductor elements, or other circuit elements, on a common substrate*
- N H10N 30/072 • • • *by laminating or bonding of piezoelectric or electrostrictive bodies*
- N H10N 30/073 • • • • *by fusion of metals or by adhesives*
- N H10N 30/074 • • • *by depositing piezoelectric or electrostrictive layers, e.g. aerosol or screen printing*
- N H10N 30/076 • • • • *by vapour phase deposition*
- N H10N 30/077 • • • • *by liquid phase deposition*
- N H10N 30/078 • • • • • *by sol-gel deposition*
- N H10N 30/079 • • • • *using intermediate layers, e.g. for growth control*
- N H10N 30/08 • • *Shaping or machining of piezoelectric or electrostrictive bodies*
- N H10N 30/081 • • • *by coating or depositing using masks, e.g. lift-off*
- N H10N 30/082 • • • *by etching, e.g. lithography*
- N H10N 30/084 • • • *by moulding or extrusion*
- N H10N 30/085 • • • *by machining*
- N H10N 30/086 • • • • *by polishing or grinding*
- N H10N 30/088 • • • • *by cutting or dicing*
- N H10N 30/089 • • • • *by punching*
- N H10N 30/09 • • *Forming piezoelectric or electrostrictive materials*
- N H10N 30/092 • • • *Forming composite materials*
- N H10N 30/093 • • • *Forming inorganic materials*
- N H10N 30/095 • • • • *by melting*
- N H10N 30/097 • • • • *by sintering*
- N H10N 30/098 • • • *Forming organic materials*
- N H10N 30/1051 • *{based on piezoelectric or electrostrictive films or coatings}*
- N H10N 30/10513 • • *{characterised by the underlying bases, e.g. substrates}*
- N H10N 30/10516 • • • *{Intermediate layers, e.g. barrier, adhesion or growth control buffer layers}*
- N H10N 30/1061 • *{based on piezoelectric or electrostrictive fibres}*
- N H10N 30/1071 • *{with electrical and mechanical input and output, e.g. having combined actuator and sensor parts}*
- N H10N 30/20 • *with electrical input and mechanical output, e.g. functioning as actuators or vibrators*

- N H10N 30/202 • • {using longitudinal or thickness displacement combined with bending, shear or torsion displacement}
- N H10N 30/2023 • • • {having polygonal or rectangular shape}
- N H10N 30/2027 • • • {having cylindrical or annular shape}
- N H10N 30/204 • • {using bending displacement, e.g. unimorph, bimorph or multimorph cantilever or membrane benders}
- N H10N 30/2041 • • • {Beam type}
- N H10N 30/2042 • • • • {Cantilevers, i.e. having one fixed end}
- N H10N 30/2043 • • • • • {connected at their free ends, e.g. parallelogram type}
- N H10N 30/2044 • • • • • {having multiple segments mechanically connected in series, e.g. zig-zag type}
- N H10N 30/2045 • • • • • {adapted for in-plane bending displacement}
- N H10N 30/2046 • • • • • {adapted for multi-directional bending displacement}
- N H10N 30/2047 • • • {Membrane type}
- N H10N 30/2048 • • • • {having non-planar shape}
- N H10N 30/206 • • {using only longitudinal or thickness displacement, e.g. d_{33} or d_{31} type devices}
- N H10N 30/208 • • {using shear or torsion displacement, e.g. d_{15} type devices}
- N H10N 30/30 • with mechanical input and electrical output, e.g. functioning as generators or sensors
- N H10N 30/302 • • {Sensors}
- N H10N 30/304 • • {Beam type}
- N H10N 30/306 • • • {Cantilevers}
- N H10N 30/308 • • {Membrane type}
- N H10N 30/40 • with electrical input and electrical output, e.g. functioning as transformers
- N H10N 30/50 • having a stacked or multilayer structure
- N H10N 30/501 • • {with non-rectangular cross-section in stacking direction, e.g. polygonal, trapezoidal}
- N H10N 30/503 • • {with non-rectangular cross-section orthogonal to the stacking direction, e.g. polygonal, circular}
- N H10N 30/505 • • • {Annular cross-section}
- N H10N 30/506 • • {of cylindrical shape with stacking in radial direction, e.g. coaxial or spiral type rolls}
- N H10N 30/508 • • {adapted for alleviating internal stress, e.g. cracking control layers}
- N H10N 30/60 • having a coaxial cable structure
- Q H10N 30/80 • Constructional details

WARNING

Group [H10N 30/80](#) is impacted by reclassification into group [H10N 35/80](#). Groups [H10N 30/80](#) and [H10N 35/80](#) should be considered in order to perform a complete search.

- N H10N 30/802 • • {Drive or control circuitry or methods for piezoelectric or electrostrictive devices not otherwise provided for}
- N H10N 30/804 • • • {for piezoelectric transformers (conversion of DC or AC power [H02M](#); for operating discharge lamps [H05B 41/282](#))}
- Q H10N 30/85 • • Piezoelectric or electrostrictive active materials

WARNING

Group [H10N 30/85](#) is impacted by reclassification into group [H10N 35/85](#).

Groups [H10N 30/85](#) and [H10N 35/85](#) should be considered in order to perform a complete search.

- N [H10N 30/852](#) . . . {Composite materials, e.g. having 1-3 or 2-2 type connectivity}
- N [H10N 30/853](#) . . . Ceramic compositions
- N [H10N 30/8536](#) {Alkaline earth metal based oxides, e.g. barium titanates}
- N [H10N 30/8542](#) {Alkali metal based oxides, e.g. lithium, sodium or potassium niobates}
- N [H10N 30/8548](#) {Lead based oxides}
- N [H10N 30/8554](#) {Lead zirconium titanate based}
- N [H10N 30/8561](#) {Bismuth based oxides}
- N [H10N 30/857](#) . . . Macromolecular compositions
- N [H10N 30/87](#) . . Electrodes or interconnections, e.g. leads or terminals
- N [H10N 30/871](#) . . . {Single-layered electrodes of multilayer piezoelectric or electrostrictive devices, e.g. internal electrodes}
- N [H10N 30/872](#) . . . {Connection electrodes of multilayer piezoelectric or electrostrictive devices, e.g. external electrodes}
- N [H10N 30/874](#) {embedded within piezoelectric or electrostrictive material, e.g. via connections}
- N [H10N 30/875](#) . . . {Further connection or lead arrangements, e.g. flexible wiring boards, terminal pins}
- N [H10N 30/877](#) . . . {Conductive materials (in general [H01B 1/00](#))}
- N [H10N 30/878](#) {the principal material being non-metallic, e.g. oxide or carbon based}
- N [H10N 30/88](#) . . Mounts; Supports; Enclosures; Casings
- N [H10N 30/883](#) . . . {Further insulation means against electrical, physical or chemical damage, e.g. protective coatings}
- N [H10N 30/886](#) . . . {Mechanical prestressing means, e.g. springs (springs in general [F16F 1/00](#))}

N [H10N 35/00](#) **Magnetostrictive devices (integrated devices or assemblies of multiple devices [H10N 39/00](#))**

WARNING

Group [H10N 35/00](#) is incomplete pending reclassification of documents from group [H10N 30/00](#).

Groups [H10N 30/00](#) and [H10N 35/00](#) should be considered in order to perform a complete search.

- N [H10N 35/01](#) . . Manufacture or treatment
- N [H10N 35/101](#) . . {with mechanical input and electrical output, e.g. generators, sensors}
- N [H10N 35/80](#) . . Constructional details

WARNING

Group [H10N 35/80](#) is incomplete pending reclassification of documents from group [H10N 30/80](#).

Groups [H10N 30/80](#) and [H10N 35/80](#) should be considered in order to perform a complete search.

- N [H10N 35/85](#) . . Magnetostrictive active materials

WARNING

Group [H10N 35/85](#) is incomplete pending reclassification of documents from group [H10N 30/85](#).

Groups [H10N 30/85](#) and [H10N 35/85](#) should be considered in order to perform a complete search.

N H10N 39/00 ***Integrated devices, or assemblies of multiple devices, comprising at least one piezoelectric, electrostrictive or magnetostrictive element covered by groups [H10N 30/00](#) – [H10N 35/00](#)***

WARNING

Group [H10N 39/00](#) is incomplete pending reclassification of documents from groups [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#). All groups listed in this Warning should be considered in order to perform a complete search.

N H10N 50/00 - H10N 59/00 ***Galvanomagnetic or similar magnetic-effect devices***

Q H10N 50/00 ***Galvanomagnetic devices (Hall-effect devices [H10N 52/00](#); integrated devices or assemblies of multiple devices [H10N 59/00](#))***

WARNING

Group [H10N 50/00](#) is impacted by reclassification into group [H10N 50/20](#). Groups [H10N 50/00](#) and [H10N 50/20](#) should be considered in order to perform a complete search.

N H10N 50/01 • Manufacture or treatment

N H10N 50/10 • Magnetoresistive devices

N H10N 50/20 • Spin-polarised current-controlled devices (magnetoresistive devices [H10N 50/10](#))

WARNING

Group [H10N 50/20](#) is incomplete pending reclassification of documents from group [H10N 50/00](#). Groups [H10N 50/00](#) and [H10N 50/20](#) should be considered in order to perform a complete search.

N H10N 50/80 • Constructional details

Q H10N 50/85 • • Magnetic active materials

WARNING

Group [H10N 50/85](#) is impacted by reclassification into group [H10N 52/85](#). Groups [H10N 50/85](#) and [H10N 52/85](#) should be considered in order to perform a complete search.

N H10N 52/00 ***Hall-effect devices (integrated devices or assemblies of multiple devices [H10N 59/00](#))***

N H10N 52/01 • Manufacture or treatment

N H10N 52/101 • {Semiconductor Hall-effect devices}

N H10N 52/80 • Constructional details

N H10N 52/85 • • Magnetic active materials

WARNING

Group [H10N 52/85](#) is incomplete pending reclassification of documents from group [H10N 50/85](#). Groups [H10N 50/85](#) and [H10N 52/85](#) should be considered in order to perform a complete search.

Q H10N 59/00 **Integrated devices, or assemblies of multiple devices, comprising at least one galvanomagnetic or Hall-effect element covered by groups [H10N 50/00](#) - [H10N 52/00](#) (MRAM devices [H10B 61/00](#))**

WARNING

Group [H10N 59/00](#) is incomplete pending reclassification of documents from groups [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#). Group [H10N 59/00](#) is also impacted by reclassification into group [H10B 61/00](#). All groups listed in this Warning should be considered in order to perform a complete search.

N H10N 60/00 - H10N 69/00

Superconducting devices

N H10N 60/00

Superconducting devices (integrated devices or assemblies of multiple devices [H10N 69/00](#))

N H10N 60/01

• Manufacture or treatment

N H10N 60/0128

• {of composite superconductor filaments (comprising copper oxide [H10N 60/0268](#))}

N H10N 60/0156

• {of devices comprising Nb or an alloy of Nb with one or more of the elements of group 4, e.g. Ti, Zr, Hf}

N H10N 60/0184

• {of devices comprising intermetallic compounds of type A-15, e.g. Nb₃Sn}

N H10N 60/0212

• {of devices comprising molybdenum chalcogenides}

N H10N 60/0241

• {of devices comprising nitrides or carbonitrides}

N H10N 60/0268

• {of devices comprising copper oxide}

N H10N 60/0296

• . . {Processes for depositing or forming superconductor layers}

N H10N 60/0324

• . . . {from a solution}

N H10N 60/0352

• . . . {from a suspension or slurry, e.g. screen printing; doctor blade casting}

N H10N 60/0381

• . . . {by evaporation independent of heat source, e.g. MBE}

N H10N 60/0408

• . . . {by sputtering}

N H10N 60/0436

• . . . {by chemical vapour deposition [CVD]}

N H10N 60/0464

• {by metalloorganic chemical vapour deposition [MOCVD]}

N H10N 60/0492

• {by thermal spraying, e.g. plasma deposition}

N H10N 60/0521

• {by pulsed laser deposition, e.g. laser sputtering; laser ablation}

N H10N 60/0548

• {by precursor deposition followed by after-treatment, e.g. oxidation}

N H10N 60/0576

• {characterised by the substrate}

N H10N 60/0604

• {Monocrystalline substrates, e.g. epitaxial growth}

N H10N 60/0632

• {Intermediate layers, e.g. for growth control}

N H10N 60/0661

• . . . {After-treatment, e.g. patterning}

N H10N 60/0688

• {Etching}

N H10N 60/0716

• {Passivation}

N H10N 60/0744

• . . . {Manufacture or deposition of contacts or electrodes}

N H10N 60/0772

• . . . {Processes including the use of precursors}

N H10N 60/0801

• . . . {Processes peculiar to the manufacture or treatment of filaments or composite wires}

N H10N 60/0828

• . . . {Introducing flux pinning centres}

N H10N 60/0856

• . {of devices comprising metal borides, e.g. MgB₂}

N H10N 60/0884

• . {Treatment of superconductor layers by irradiation, e.g. ion-beam, electron-beam, laser beam, X-rays (irradiation devices [G21K](#), [H01J](#))}

- N H10N 60/0912 · · {of Josephson-effect devices}
- N H10N 60/0941 · · · {comprising high- T_c ceramic materials}
- N H10N 60/10 · Junction-based devices
- N H10N 60/11 · · {Single electron tunnelling devices}
- N H10N 60/12 · · Josephson-effect devices
- N H10N 60/124 · · · {comprising high- T_c ceramic materials}
- N H10N 60/126 · · · {comprising metal borides, e.g. MgB_2 }
- N H10N 60/128 · · {having three or more electrodes, e.g. transistor-like structures}
- N H10N 60/20 · Permanent superconducting devices
- N H10N 60/202 · · {comprising metal borides, e.g. MgB_2 }
- N H10N 60/203 · · {comprising high- T_c ceramic materials}
- N H10N 60/205 · · {having three or more electrodes, e.g. transistor-like structures ([H10N 60/128](#) takes precedence)}
- N H10N 60/207 · · · {Field effect devices}
- N H10N 60/208 · · {based on Abrikosov vortices}
- N H10N 60/30 · Devices switchable between superconducting and normal states
- N H10N 60/35 · · Cryotrons
- N H10N 60/355 · · · Power cryotrons
- N H10N 60/80 · Constructional details
- N H10N 60/805 · · {for Josephson-effect devices}
- N H10N 60/81 · · Containers; Mountings
- N H10N 60/815 · · · {for Josephson-effect devices}
- N H10N 60/82 · · Current path
- N H10N 60/83 · · Element shape
- N H10N 60/84 · · Switching means for devices switchable between superconducting and normal states
- N H10N 60/85 · · Superconducting active materials
- N H10N 60/851 · · · {Organic materials}
- N H10N 60/853 · · · · {Fullerene superconductors, e.g. soccerball-shaped allotrope of carbon, e.g. C_{60} , C_{94} (fullerenes in general [C07C 13/00](#))}
- N H10N 60/855 · · · {Ceramic materials}
- N H10N 60/857 · · · · {comprising copper oxide}
- N H10N 60/858 · · · · · {Multi-layered structures, e.g. superlattices}
- N H10N 60/99 · {Alleged superconductivity}

N H10N 69/00 ***Integrated devices, or assemblies of multiple devices, comprising at least one superconducting element covered by group [H10N 60/00](#)***

WARNING

Group [H10N 69/00](#) is incomplete pending reclassification of documents from groups [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#). All groups listed in this Warning should be considered in order to perform a complete search.

N H10N 70/00 - H10N 79/00 **Other electric solid-state devices**

N H10N 70/00 ***Solid-state devices without a potential-jump barrier or surface barrier, and specially adapted for rectifying, amplifying, oscillating or switching (integrated devices or assemblies of multiple devices [H10N 79/00](#))***

- N H10N 70/011 · {Manufacture or treatment of multistable switching devices}
- N H10N 70/021 · · {Formation of the switching material, e.g. layer deposition}
- N H10N 70/023 · · · {by chemical vapor deposition, e.g. MOCVD, ALD}
- N H10N 70/026 · · · {by physical vapor deposition, e.g. sputtering}
- N H10N 70/028 · · · {by conversion of electrode material, e.g. oxidation}
- N H10N 70/041 · · {Modification of the switching material, e.g. post-treatment, doping}
- N H10N 70/043 · · · {by implantation}
- N H10N 70/046 · · · {by diffusion, e.g. photo-dissolution}
- N H10N 70/061 · · {Patterning of the switching material}
- N H10N 70/063 · · · {by etching of pre-deposited switching material layers, e.g. lithography}
- N H10N 70/066 · · · {by filling of openings, e.g. damascene method}
- N H10N 70/068 · · · {by processes specially adapted for achieving sub-lithographic dimensions, e.g. using spacers}
- N H10N 70/10 · Solid-state travelling-wave devices
- N H10N 70/151 · {Charge density wave transport devices}
- N H10N 70/20 · Multistable switching devices, e.g. memristors
- N H10N 70/231 · · {based on solid-state phase change, e.g. between amorphous and crystalline phases, Ovshinsky effect}
- N H10N 70/235 · · · {between different crystalline phases, e.g. cubic and hexagonal}
- N H10N 70/24 · · {based on migration or redistribution of ionic species, e.g. anions, vacancies}
- N H10N 70/245 · · · {the species being metal cations, e.g. programmable metallization cells}
- N H10N 70/25 · · {based on bulk electronic defects, e.g. trapping of electrons}
- N H10N 70/253 · · {having three or more terminals, e.g. transistor-like devices}
- N H10N 70/257 · · {based on radiation or particle beam assisted switching, e.g. optically controlled devices}
- N H10N 70/801 · {Constructional details of multistable switching devices}
- N H10N 70/821 · · {Device geometry}
- N H10N 70/823 · · · {adapted for essentially horizontal current flow, e.g. bridge type devices}
- N H10N 70/826 · · · {adapted for essentially vertical current flow, e.g. sandwich or pillar type devices}
- N H10N 70/8265 · · · · {on sidewalls of dielectric structures, e.g. mesa or cup type devices}
- N H10N 70/828 · · · {Current flow limiting means within the switching material region, e.g. constrictions}
- N H10N 70/841 · · {Electrodes}
- N H10N 70/8413 · · · {adapted for resistive heating}
- N H10N 70/8416 · · · {adapted for supplying ionic species}
- N H10N 70/8418 · · · {adapted for focusing electric field or current, e.g. tip-shaped}
- N H10N 70/861 · · {Thermal details}
- N H10N 70/8613 · · · {Heating or cooling means other than resistive heating electrodes, e.g. heater in parallel}
- N H10N 70/8616 · · · {Thermal insulation means}
- N H10N 70/881 · · {Switching materials}
- N H10N 70/882 · · · {Compounds of sulfur, selenium or tellurium, e.g. chalcogenides}
- N H10N 70/8822 · · · · {Sulfides, e.g. CuS}
- N H10N 70/8825 · · · · {Selenides, e.g. GeSe}
- N H10N 70/8828 · · · · {Tellurides, e.g. GeSbTe}

- N H10N 70/883 · · · {Oxides or nitrides}
- N H10N 70/8833 · · · · {Binary metal oxides, e.g. TaO_x}
- N H10N 70/8836 · · · · {Complex metal oxides, e.g. perovskites, spinels}
- N H10N 70/884 · · · {Other compounds of groups 13-15, e.g. elemental or compound semiconductors}
- N H10N 70/8845 · · · · {Carbon or carbides}
- N H10N 79/00** **Integrated devices, or assemblies of multiple devices, comprising at least one solid-state element covered by group [H10N 70/00](#) (ReRAM devices [H10B 63/00](#); PCRAM devices [H10B 63/10](#))**
- WARNING
Group [H10N 79/00](#) is incomplete pending reclassification of documents from groups [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#), [H01L 25/18](#) and [H10B 63/00](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10N 80/00** **Bulk negative-resistance effect devices (integrated devices or assemblies of multiple devices [H10N 89/00](#))**
- N H10N 80/01 · {Manufacture or treatment}
- N H10N 80/10 · Gunn-effect devices
- N H10N 80/103 · · {controlled by electromagnetic radiation}
- N H10N 80/107 · · {Gunn diodes}
- N H10N 89/00** **Integrated devices, or assemblies of multiple devices, comprising at least one bulk negative resistance effect element covered by group [H10N 80/00](#)**
- WARNING
Group [H10N 89/00](#) is incomplete pending reclassification of documents from groups [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10N 89/02 · {Gunn-effect devices}
- N H10N 97/00** **Electric solid-state thin-film or thick-film devices, not otherwise provided for**
- N H10N 99/00** **Subject matter not provided for in other groups of this subclass**
- N H10N 99/03 · {Devices using Mott metal-insulator transition, e.g. field effect transistors}
- N H10N 99/05 · {Quantum devices, e.g. quantum interference devices, metal single electron transistors}

Project: RP11766 (H01L)

- U H01L 21/70 · Manufacture or treatment of devices consisting of a plurality of solid state components formed in or on a common substrate or of parts thereof; Manufacture of integrated circuit devices or of parts thereof ({multistep manufacturing processes of assemblies consisting of a plurality of individual semiconductor or other solid state devices [H01L 25/00](#); } manufacture of assemblies consisting of preformed electrical components [H05K 3/00](#), [H05K 13/00](#))

- H01L 21/77
- • Manufacture or treatment of devices consisting of a plurality of solid state components or integrated circuits formed in, or on, a common substrate (~~electrically programmable read-only memories or multistep manufacturing processes therefor H01L 27/115~~*electrically programmable read-only memories or multistep manufacturing processes therefor H10B 69/00*)
- NOTE**
- Integration processes for the manufacture of devices of the type classified in ~~H01L 27/14-~~, ~~H01L 27/15~~, ~~H01L 27/32~~*H10N 19/00, H10N 39/00, H10N 59/00, H10N 79/00, H10N 89/00, H10K 19/00, H10K 39/00, H10K 59/00 and H10K 65/00* are not classified in this group and its sub-groups. Instead, as they are peculiar to said devices, they are classified together with the devices Multistep processes for manufacturing memory structures in general using field effect technology are covered by ~~H01L 27/1052~~*H10B 99/00*; Multistep processes for manufacturing dynamic random access memory structures are covered by ~~H01L 27/10844~~*H10B 12/01*; Multistep processes for manufacturing static random access memory structures are covered by ~~H01L 27/11~~*H10B 10/00*; Multistep processes for manufacturing read-only memory structures are covered by ~~H01L 27/112~~*H10B 20/00*; Multistep processes for manufacturing electrically programmable read-only memory structures are covered by ~~H01L 27/115~~*H10B 69/00*
- U H01L 21/78
- • • with subsequent division of the substrate into plural individual devices (cutting to change the surface-physical characteristics or shape of semiconductor bodies [H01L 21/304](#))
- U H01L 21/82
- • • • to produce devices, e.g. integrated circuits, each consisting of a plurality of components
- U H01L 21/822
- • • • • the substrate being a semiconductor, using silicon technology ([H01L 21/8258](#) takes precedence)
- U H01L 21/8222
- • • • • • Bipolar technology
- D H01L 21/8229
- • • • • • Memory structures
 - <administratively transferred to [H10B 99/00](#)>
- U H01L 21/8232
- • • • • • Field-effect technology
- U H01L 21/8234
- • • • • • MIS technology {, i.e. integration processes of field effect transistors of the conductor-insulator-semiconductor type}
- D H01L 21/8239
- • • • • • Memory structures
 - <administratively transferred to [H10B 99/00](#)>

Project: RP11766 in addition to RP11801 (H01L)

H01L 27/00 Devices consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate (details thereof [H01L 23/00](#), [H01L 29/00](#) - ~~H01L 51/00~~*H10K 10/00*; assemblies consisting of a plurality of individual solid state devices [H01L 25/00](#))

NOTE

1. In this group, ~~with the exception of groups the~~ ~~H01L 27/115 - H01L 27/11597~~, ~~the~~ last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.

~~2. When classifying in this group, subject matter relating to electrically programmable read-only memories is classified in group H01L 27/115, irrespective of the last place priority rule.~~

Project: RP11766 (H01L)

- U H01L 27/02 · including semiconductor components specially adapted for rectifying, oscillating, amplifying or switching and having at least one potential-jump barrier or surface barrier; including integrated passive circuit elements with at least one potential-jump barrier or surface barrier
- U H01L 27/04 · · the substrate being a semiconductor body
- C H01L 27/10 · · · including a plurality of individual components in a repetitive configuration
- WARNING**
Group H01L 27/10 is impacted by reclassification into group H10B 99/10. Groups H01L 27/10 and H10B 99/10 should be considered in order to perform a complete search.
- C H01L 27/101 · · · · {including resistors or capacitors only}
- WARNING**
Group H01L 27/101 is impacted by reclassification into group H10B 99/14. Groups H01L 27/101 and H10B 99/14 should be considered in order to perform a complete search.
- C H01L 27/102 · · · · including bipolar components
- WARNING**
Group H01L 27/102 is impacted by reclassification into group H10B 99/00. Groups H01L 27/102 and H10B 99/00 should be considered in order to perform a complete search.
- C H01L 27/1021 · · · · · {including diodes only}
- WARNING**
Group H01L 27/1021 is impacted by reclassification into group H10B 99/16. Groups H01L 27/1021 and H10B 99/16 should be considered in order to perform a complete search.
- C H01L 27/1022 · · · · · {including bipolar transistors}
- WARNING**
Group H01L 27/1022 is impacted by reclassification into group H10B 99/00. Groups H01L 27/1022 and H10B 99/00 should be considered in order to perform a complete search.
- D H01L 27/1023 · · · · · {Bipolar dynamic random access memory structures}
 <administratively transferred to [H10B 12/10](#)>
- D H01L 27/1024 · · · · · {Arrays of single bipolar transistors only, e.g. read only memory structures}
 <administratively transferred to [H10B 20/10](#)>
- D H01L 27/1025 · · · · · {Static bipolar memory cell structures}
 <administratively transferred to [H10B 10/10](#)>
- D H01L 27/1026 · · · · · {Bipolar electrically programmable memory structures (using fuses H01L 23/525)}
 <administratively transferred to [H10B 69/00](#)>

- C H01L 27/1027 {Thyristors}
- WARNING**
Group H01L 27/1027 is impacted by reclassification into groups H10B 10/10, H10B 12/10, H10B 20/10, H10B 69/00 and H10B 99/20. All groups listed in this Warning should be considered in order to perform a complete search.
- C H01L 27/1028 {Double base diodes}
- WARNING**
Group H01L 27/1028 is impacted by reclassification into groups H10B 10/10, H10B 12/10, H10B 20/10, H10B 69/00 and H10B 99/20. All groups listed in this Warning should be considered in order to perform a complete search.
- C H01L 27/105 including field-effect components
- NOTE**
 In this group and its subgroups classification is made in any appropriate place
- WARNING**
Group H01L 27/105 is impacted by reclassification into group H10B 99/22. Groups H01L 27/105 and H10B 99/22 should be considered in order to perform a complete search.
- D H01L 27/1052 {Memory structures and multistep manufacturing processes therefor not provided for in groups H01L 27/1055 - H01L 27/112}
- <administratively transferred to [H10B 99/00](#)>
- D H01L 27/108 Dynamic random access memory structures
- <administratively transferred to [H10B 12/00](#)>
- D H01L 27/10802 {comprising floating-body transistors, e.g. floating-body cells}
- <administratively transferred to [H10B 12/20](#)>
- D H01L 27/10805 {with one-transistor one-capacitor memory cells}
- <administratively transferred to [H10B 12/30](#)>
- D H01L 27/10808 {the storage electrode stacked over transistor}
- <administratively transferred to [H10B 12/31](#)>
- D H01L 27/10811 {with bit line higher than capacitor}
- <administratively transferred to [H10B 12/312](#)>
- D H01L 27/10814 {with capacitor higher than bit line level}
- <administratively transferred to [H10B 12/315](#)>
- D H01L 27/10817 {the storage electrode having multiple wings}
- <administratively transferred to [H10B 12/318](#)>
- D H01L 27/1082 {the capacitor extending under transfer transistor area}
- <administratively transferred to [H10B 12/33](#)>
- D H01L 27/10823 {the transistor having a trench structure in the substrate}
- <administratively transferred to [H10B 12/34](#)>
- D H01L 27/10826 {the transistor being of the FinFET type}
- <administratively transferred to [H10B 12/36](#)>

- D H01L 27/10829 {the capacitor being in a substrate trench}
<administratively transferred to [H10B 12/37](#)>
- D H01L 27/10832 {the capacitor extending under or around transfer transistor area}
<administratively transferred to [H10B 12/373](#)>
- D H01L 27/10835 {having storage electrode extension stacked over transistor}
<administratively transferred to [H10B 12/377](#)>
- D H01L 27/10838 {the capacitor and the transistor being in one trench}
<administratively transferred to [H10B 12/39](#)>
- D H01L 27/10841 {the transistor being vertical}
<administratively transferred to [H10B 12/395](#)>
- D H01L 27/10844 {Multistep manufacturing methods}
<administratively transferred to [H10B 12/01](#)>
- D H01L 27/10847 {for structures comprising one transistor one capacitor memory cells}
<administratively transferred to [H10B 12/02](#)>
- D H01L 27/1085 {with at least one step of making the capacitor or connections thereto}
<administratively transferred to [H10B 12/03](#)>
- D H01L 27/10852 {the capacitor extending over the access transistor}
<administratively transferred to [H10B 12/033](#)>
- D H01L 27/10855 {with at least one step of making a connection between transistor and capacitor, e.g. plug}
<administratively transferred to [H10B 12/0335](#)>
- D H01L 27/10858 {the capacitor extending under the access transistor area}
<administratively transferred to [H10B 12/036](#)>
- D H01L 27/10861 {the capacitor being in a substrate trench}
<administratively transferred to [H10B 12/038](#)>
- D H01L 27/10864 {in combination with a vertical transistor}
<administratively transferred to [H10B 12/0383](#)>
- D H01L 27/10867 {with at least one step of making a connection between transistor and capacitor, e.g. buried strap}
<administratively transferred to [H10B 12/0385](#)>
- D H01L 27/1087 {with at least one step of making the trench}
<administratively transferred to [H10B 12/0387](#)>
- D H01L 27/10873 {with at least one step of making the transistor}
<administratively transferred to [H10B 12/05](#)>
- D H01L 27/10876 {the transistor having a trench structure in the substrate (vertical transistor in combination with a capacitor formed in a substrate trench H01L 27/10864)}
<administratively transferred to [H10B 12/053](#)>
- D H01L 27/10879 {the transistor being of the FinFET type}
<administratively transferred to [H10B 12/056](#)>
- D H01L 27/10882 {with at least one step of making a data line}
<administratively transferred to [H10B 12/48](#)>

- D H01L 27/10885 {with at least one step of making a bit line}
<administratively transferred to [H10B 12/482](#)>
- D H01L 27/10888 {with at least one step of making a bit line contact}
<administratively transferred to [H10B 12/485](#)>
- D H01L 27/10891 {with at least one step of making a word line}
<administratively transferred to [H10B 12/488](#)>
- D H01L 27/10894 {with simultaneous manufacture of periphery and memory cells}
<administratively transferred to [H10B 12/09](#)>
- D H01L 27/10897 {Peripheral structures}
<administratively transferred to [H10B 12/50](#)>
- D H01L 27/11 Static random access memory structures
<administratively transferred to [H10B 10/00](#)>
- D H01L 27/1104 {the load element being a MOSFET transistor}
<administratively transferred to [H10B 10/12](#)>
- D H01L 27/1108 {the load element being a thin film transistor}
<administratively transferred to [H10B 10/125](#)>
- D H01L 27/1112 {the load element being a resistor (resistors for integrated circuits H01L 28/20, H01L 29/8605)}
<administratively transferred to [H10B 10/15](#)>
- D H01L 27/1116 {Peripheral circuit region}
<administratively transferred to [H10B 10/18](#)>
- D H01L 27/112 Read-only memory structures {[ROM] and multistep manufacturing processes therefor}
<administratively transferred to [H10B 20/00](#)>
- D H01L 27/11206 {Programmable ROM [PROM], e.g. memory cells comprising a transistor and a fuse or an antifuse}
<administratively transferred to [H10B 20/20](#)>
- D H01L 27/11213 {ROM only}
<administratively transferred to [H10B 20/27](#)>
- D H01L 27/1122 {with source and drain on the same level, e.g. lateral transistors}
<administratively transferred to [H10B 20/30](#)>
- D H01L 27/11226 {Source or drain contact programmed}
<administratively transferred to [H10B 20/34](#)>
- D H01L 27/11233 {Gate programmed, e.g. different gate material or no gate}
<administratively transferred to [H10B 20/36](#)>
- D H01L 27/1124 {Gate contact programmed}
<administratively transferred to [H10B 20/363](#)>
- D H01L 27/11246 {Gate dielectric programmed, e.g. different thickness}
<administratively transferred to [H10B 20/367](#)>
- D H01L 27/11253 {Doping programmed, e.g. mask ROM}
<administratively transferred to [H10B 20/38](#)>
- D H01L 27/1126 {Entire channel doping programmed}
<administratively transferred to [H10B 20/383](#)>

- D H01L 27/11266 {Source or drain doping programmed}
<administratively transferred to [H10B 20/387](#)>
- D H01L 27/11273 {with source and drain on different levels, e.g. vertical channel}
<administratively transferred to [H10B 20/40](#)>
- D H01L 27/1128 {with transistors on different levels, e.g. 3D-ROM}
<administratively transferred to [H10B 20/50](#)>
- D H01L 27/11286 {Peripheral circuit regions}
<administratively transferred to [H10B 20/60](#)>
- D H01L 27/11293 {of memory structures of the ROM-only type}
<administratively transferred to [H10B 20/65](#)>
- D H01L 27/115 Electrically programmable read-only memories; Multistep manufacturing processes therefor
<administratively transferred to [H10B 69/00](#)>
- D H01L 27/11502 with ferroelectric memory capacitors
<administratively transferred to [H10B 53/00](#)>
- D H01L 27/11504 characterised by the top-view layout
<administratively transferred to [H10B 53/10](#)>
- D H01L 27/11507 characterised by the memory core region
<administratively transferred to [H10B 53/30](#)>
- D H01L 27/11509 characterised by the peripheral circuit region
<administratively transferred to [H10B 53/40](#)>
- D H01L 27/11512 characterised by the boundary region between the core and peripheral circuit regions
<administratively transferred to [H10B 53/50](#)>
- D H01L 27/11514 characterised by the three-dimensional arrangements, e.g. with cells on different height levels
<administratively transferred to [H10B 53/20](#)>
- D H01L 27/11517 with floating gate
<administratively transferred to [H10B 41/00](#)>
- D H01L 27/11519 characterised by the top-view layout
<administratively transferred to [H10B 41/10](#)>
- D H01L 27/11521 characterised by the memory core region (three-dimensional arrangements H01L 27/11551)
<administratively transferred to [H10B 41/30](#)>
- D H01L 27/11524 with cell select transistors, e.g. NAND
<administratively transferred to [H10B 41/35](#)>
- D H01L 27/11526 characterised by the peripheral circuit region
<administratively transferred to [H10B 41/40](#)>
- D H01L 27/11529 of memory regions comprising cell select transistors, e.g. NAND
<administratively transferred to [H10B 41/41](#)>
- D H01L 27/11531 Simultaneous manufacturing of periphery and memory cells
<administratively transferred to [H10B 41/42](#)>
- D H01L 27/11534 including only one type of peripheral transistor
<administratively transferred to [H10B 41/43](#)>

- D H01L 27/11536 with a control gate layer also being used as part of the peripheral transistor
<administratively transferred to [H10B 41/44](#)>
- D H01L 27/11539 with an inter-gate dielectric layer also being used as part of the peripheral transistor
<administratively transferred to [H10B 41/46](#)>
- D H01L 27/11541 with a floating-gate layer also being used as part of the peripheral transistor
<administratively transferred to [H10B 41/47](#)>
- D H01L 27/11543 with a tunnel dielectric layer also being used as part of the peripheral transistor
<administratively transferred to [H10B 41/48](#)>
- D H01L 27/11546 including different types of peripheral transistor
<administratively transferred to [H10B 41/49](#)>
- D H01L 27/11548 characterised by the boundary region between the core and peripheral circuit regions
<administratively transferred to [H10B 41/50](#)>
- D H01L 27/11551 characterised by three-dimensional arrangements, e.g. with cells on different height levels
<administratively transferred to [H10B 41/20](#)>
- D H01L 27/11553 with source and drain on different levels, e.g. with sloping channels
<administratively transferred to [H10B 41/23](#)>
- D H01L 27/11556 the channels comprising vertical portions, e.g. U-shaped channels
<administratively transferred to [H10B 41/27](#)>
- D H01L 27/11558 the control gate being a doped region, e.g. single-poly memory cells
<administratively transferred to [H10B 41/60](#)>
- D H01L 27/1156 the floating gate being an electrode shared by two or more components
<administratively transferred to [H10B 41/70](#)>
- D H01L 27/11563 with charge-trapping gate insulators, e.g. MNOS or NROM
<administratively transferred to [H10B 43/00](#)>
- D H01L 27/11565 characterised by the top-view layout
<administratively transferred to [H10B 43/10](#)>
- D H01L 27/11568 characterised by the memory core region (three-dimensional arrangements H01L 27/11578)
<administratively transferred to [H10B 43/30](#)>
- D H01L 27/1157 with cell select transistors, e.g. NAND
<administratively transferred to [H10B 43/35](#)>
- D H01L 27/11573 characterised by the peripheral circuit region
<administratively transferred to [H10B 43/40](#)>
- D H01L 27/11575 characterised by the boundary region between the core and peripheral circuit regions
<administratively transferred to [H10B 43/50](#)>

- D H01L 27/11578 characterised by three-dimensional arrangements, e.g. with cells on different height levels
<administratively transferred to [H10B 43/20](#)>
- D H01L 27/1158 with source and drain on different levels, e.g. with sloping channels
<administratively transferred to [H10B 43/23](#)>
- D H01L 27/11582 the channels comprising vertical portions, e.g. U-shaped channels
<administratively transferred to [H10B 43/27](#)>
- D H01L 27/11585 with the gate electrodes comprising a layer used for its ferroelectric memory properties, e.g. metal-ferroelectric-semiconductor [MFS] or metal-ferroelectric-metal-insulator-semiconductor [MFMS]
<administratively transferred to [H10B 51/00](#)>
- D H01L 27/11587 characterised by the top-view layout
<administratively transferred to [H10B 51/10](#)>
- D H01L 27/1159 characterised by the memory core region
<administratively transferred to [H10B 51/30](#)>
- D H01L 27/11592 characterised by the peripheral circuit region
<administratively transferred to [H10B 51/40](#)>
- D H01L 27/11595 characterised by the boundary region between core and peripheral circuit regions
<administratively transferred to [H10B 51/50](#)>
- D H01L 27/11597 characterised by three-dimensional arrangements, e.g. cells on different height levels
<administratively transferred to [H10B 51/20](#)>

Project: RP11766 (H10B)

- N H10B ELECTRONIC MEMORY DEVICES**
- N H10B 10/00 - H10B 12/00 Volatile memory devices**
- N H10B 10/00 Static random access memory [SRAM] devices**
- N H10B 10/10 . SRAM devices comprising bipolar components
WARNING
Group [H10B 10/10](#) is incomplete pending reclassification of documents from groups [H01L 27/1027](#), [H01L 27/1028](#) and [H10B 99/00](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10B 10/12 . {comprising a MOSFET load element}
- N H10B 10/125 . . {the MOSFET being a thin film transistor [TFT]}
- N H10B 10/15 . {comprising a resistor load element}
- N H10B 10/18 . {Peripheral circuit regions}
- N H10B 12/00 Dynamic random access memory [DRAM] devices**
- N H10B 12/01 . {Manufacture or treatment}
- N H10B 12/02 . . {for one transistor one-capacitor [1T-1C] memory cells}
- N H10B 12/03 . . . {Making the capacitor or connections thereto}
- N H10B 12/033 {the capacitor extending over the transistor}

- N H10B 12/0335 {Making a connection between the transistor and the capacitor, e.g. plug}
- N H10B 12/036 {the capacitor extending under the transistor}
- N H10B 12/038 {the capacitor being in a trench in the substrate}
- N H10B 12/0383 {wherein the transistor is vertical}
- N H10B 12/0385 {Making a connection between the transistor and the capacitor, e.g. buried strap}
- N H10B 12/0387 {Making the trench}
- N H10B 12/05 . . . {Making the transistor}
- N H10B 12/053 {the transistor being at least partially in a trench in the substrate (vertical transistor in combination with a capacitor formed in a substrate trench [H10B 12/0383](#))}
- N H10B 12/056 {the transistor being a FinFET}
- N H10B 12/09 . . {with simultaneous manufacture of the peripheral circuit region and memory cells}
- N H10B 12/10 . DRAM devices comprising bipolar components
WARNING
Group [H10B 12/10](#) is incomplete pending reclassification of documents from groups [H01L 27/1027](#), [H01L 27/1028](#) and [H10B 99/00](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10B 12/20 . {DRAM devices comprising floating-body transistors, e.g. floating-body cells}
- N H10B 12/30 . {DRAM devices comprising one-transistor - one-capacitor [1T-1C] memory cells}
- N H10B 12/31 . . {having a storage electrode stacked over the transistor}
- N H10B 12/312 . . . {with a bit line higher than the capacitor}
- N H10B 12/315 . . . {with the capacitor higher than a bit line}
- N H10B 12/318 . . . {the storage electrode having multiple segments}
- N H10B 12/33 . . {the capacitor extending under the transistor}
- N H10B 12/34 . . {the transistor being at least partially in a trench in the substrate}
- N H10B 12/36 . . {the transistor being a FinFET}
- N H10B 12/37 . . {the capacitor being at least partially in a trench in the substrate}
- N H10B 12/373 . . . {the capacitor extending under or around the transistor}
- N H10B 12/377 . . . {having a storage electrode extension located over the transistor}
- N H10B 12/39 . . {the capacitor and the transistor being in a same trench}
- N H10B 12/395 . . . {the transistor being vertical}
- N H10B 12/48 . . {Data lines or contacts therefor}
- N H10B 12/482 . . . {Bit lines}
- N H10B 12/485 . . . {Bit line contacts}
- N H10B 12/488 . . . {Word lines}
- N H10B 12/50 . {Peripheral circuit region structures}
- N H10B 20/00 - H10B 69/00** **Non-volatile memory devices**
- N H10B 20/00** **Read-only memory [ROM] devices**

- N H10B 20/10
- ROM devices comprising bipolar components
- WARNING
Group [H10B 20/10](#) is incomplete pending reclassification of documents from groups [H01L 27/1027](#), [H01L 27/1028](#) and [H10B 99/00](#). All groups listed in this Warning should be considered in order to perform a complete search.
- Q H10B 20/20
- Programmable ROM [PROM] devices comprising field-effect components ([H10B 20/10](#) takes precedence)
- WARNING
Group [H10B 20/20](#) is impacted by reclassification into group [H10B 20/25](#). Groups [H10B 20/20](#) and [H10B 20/25](#) should be considered in order to perform a complete search.
- N H10B 20/25
- • One-time programmable ROM [OTPROM] devices, e.g. using electrically-fusible links
- WARNING
Group [H10B 20/25](#) is incomplete pending reclassification of documents from group [H10B 20/20](#). Groups [H10B 20/20](#) and [H10B 20/25](#) should be considered in order to perform a complete search.
- N H10B 20/27
- {ROM only}
- N H10B 20/30
- • {having the source region and the drain region on the same level, e.g. lateral transistors}
- N H10B 20/34
- • • {Source electrode or drain electrode programmed}
- N H10B 20/36
- • • {Gate programmed, e.g. different gate material or no gate}
- N H10B 20/363
- • • • {Gate conductor programmed}
- N H10B 20/367
- • • • {Gate dielectric programmed, e.g. different thickness}
- N H10B 20/38
- • • {Doping programmed, e.g. mask ROM}
- N H10B 20/383
- • • • {Channel doping programmed}
- N H10B 20/387
- • • • {Source region or drain region doping programmed}
- N H10B 20/40
- • {having the source region and drain region on different levels, e.g. vertical channel}
- N H10B 20/50
- • {having transistors on different levels, e.g. 3D ROM}
- N H10B 20/60
- {Peripheral circuit regions}
- N H10B 20/65
- • {of memory structures of the ROM only type}
- N H10B 41/00**
- Electrically erasable-and-programmable ROM [EEPROM] devices comprising floating gates**
- N H10B 41/10
- characterised by the top-view layout
- N H10B 41/20
- characterised by three-dimensional arrangements, e.g. with cells on different height levels
- N H10B 41/23
- • with source and drain on different levels, e.g. with sloping channels
- N H10B 41/27
- • • the channels comprising vertical portions, e.g. U-shaped channels
- N H10B 41/30
- characterised by the memory core region
- N H10B 41/35
- • with a cell select transistor, e.g. NAND
- N H10B 41/40
- characterised by the peripheral circuit region
- N H10B 41/41
- • of a memory region comprising a cell select transistor, e.g. NAND
- N H10B 41/42
- • Simultaneous manufacture of periphery and memory cells

- N H10B 41/43 · · · comprising only one type of peripheral transistor
- N H10B 41/44 · · · · with a control gate layer also being used as part of the peripheral transistor
- N H10B 41/46 · · · · with an inter-gate dielectric layer also being used as part of the peripheral transistor
- N H10B 41/47 · · · · with a floating-gate layer also being used as part of the peripheral transistor
- N H10B 41/48 · · · · with a tunnel dielectric layer also being used as part of the peripheral transistor
- N H10B 41/49 · · · comprising different types of peripheral transistor
- N H10B 41/50 · characterised by the boundary region between the core region and the peripheral circuit region
- N H10B 41/60 · the control gate being a doped region, e.g. single-poly memory cell
- N H10B 41/70 · the floating gate being an electrode shared by two or more components
- N H10B 43/00 *EEPROM devices comprising charge-trapping gate insulators***
- N H10B 43/10 · characterised by the top-view layout
- N H10B 43/20 · characterised by three-dimensional arrangements, e.g. with cells on different height levels
- N H10B 43/23 · · with source and drain on different levels, e.g. with sloping channels
- N H10B 43/27 · · · the channels comprising vertical portions, e.g. U-shaped channels
- N H10B 43/30 · characterised by the memory core region
- N H10B 43/35 · · with cell select transistors, e.g. NAND
- N H10B 43/40 · characterised by the peripheral circuit region
- N H10B 43/50 · characterised by the boundary region between the core and peripheral circuit regions
- N H10B 51/00 *Ferroelectric RAM [FeRAM] devices comprising ferroelectric memory transistors***
- N H10B 51/10 · characterised by the top-view layout
- N H10B 51/20 · characterised by the three-dimensional arrangements, e.g. with cells on different height levels
- N H10B 51/30 · characterised by the memory core region
- N H10B 51/40 · characterised by the peripheral circuit region
- N H10B 51/50 · characterised by the boundary region between the core and peripheral circuit regions
- N H10B 53/00 *Ferroelectric RAM [FeRAM] devices comprising ferroelectric memory capacitors***
- N H10B 53/10 · characterised by the top-view layout
- N H10B 53/20 · characterised by the three-dimensional arrangements, e.g. with cells on different height levels
- N H10B 53/30 · characterised by the memory core region
- N H10B 53/40 · characterised by the peripheral circuit region
- N H10B 53/50 · characterised by the boundary region between the core and peripheral circuit regions
- N H10B 61/00 *Magnetic memory devices, e.g. magnetoresistive RAM [MRAM] devices***
- WARNING
Group [H10B 61/00](#) is incomplete pending reclassification of documents from group [H10N 59/00](#).

Groups [H10N 59/00](#) and [H10B 61/00](#) should be considered in order to perform a complete search.

- N H10B 61/10 · {comprising components having two electrodes, e.g. diodes or MIM elements}
- N H10B 61/20 · {comprising components having three or more electrodes, e.g. transistors}
- N H10B 61/22 · · {of the field-effect transistor [FET] type}

Q H10B 63/00 Resistance change memory devices, e.g. resistive RAM [ReRAM] devices

WARNING

Group [H10B 63/00](#) is impacted by reclassification into groups [H10B 63/10](#) and [H10N 79/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- N H10B 63/10 · Phase change RAM [PCRAM, PRAM] devices

WARNING

Group [H10B 63/10](#) is incomplete pending reclassification of documents from group [H10B 63/00](#).

Groups [H10B 63/00](#) and [H10B 63/10](#) should be considered in order to perform a complete search.

- N H10B 63/20 · {comprising selection components having two electrodes, e.g. diodes}
- N H10B 63/22 · · {of the metal-insulator-metal type}
- N H10B 63/24 · · {of the Ovonic threshold switching type}
- N H10B 63/30 · {comprising selection components having three or more electrodes, e.g. transistors}
- N H10B 63/32 · · {of the bipolar type}
- N H10B 63/34 · · {of the vertical channel field-effect transistor type}
- N H10B 63/80 · {Arrangements comprising multiple bistable or multi-stable switching components of the same type on a plane parallel to the substrate, e.g. cross-point arrays}
- N H10B 63/82 · · {the switching components having a common active material layer}
- N H10B 63/84 · · {arranged in a direction perpendicular to the substrate, e.g. 3D cell arrays}
- N H10B 63/845 · · · {the switching components being connected to a common vertical conductor}

N H10B 69/00 Erasable-and-programmable ROM [EPROM] devices not provided for in groups [H10B 41/00](#) - [H10B 63/00](#), e.g. ultraviolet erasable-and-programmable ROM [UVEPROM] devices

WARNING

Group [H10B 69/00](#) is incomplete pending reclassification of documents from groups [H01L 27/1027](#) and [H01L 27/1028](#).

Groups [H01L 27/1027](#), [H01L 27/1028](#) and [H10B 69/00](#) should be considered in order to perform a complete search.

N H10B 80/00 Assemblies of multiple devices comprising at least one memory device covered by this subclass

WARNING

Group [H10B 80/00](#) is incomplete pending reclassification of documents from groups [H01L 25/065](#), [H01L 25/0652](#), [H01L 25/0655](#), [H01L 25/0657](#) and [H01L 25/18](#).

All groups listed in this Warning should be considered in order to perform a complete search.

Q H10B 99/00**Subject matter not provided for in other groups of this subclass****WARNING**

Group [H10B 99/00](#) is incomplete pending reclassification of documents from groups [H01L 27/102](#) and [H01L 27/1022](#).

Group [H10B 99/00](#) is also impacted by reclassification into groups [H10B 10/10](#), [H10B 12/10](#) and [H10B 20/10](#).

All groups listed in this Warning should be considered in order to perform a complete search.

N H10B 99/10

- {Memory cells having a cross-point geometry}

WARNING

Group [H10B 99/10](#) is incomplete pending reclassification of documents from group [H01L 27/10](#).

Groups [H01L 27/10](#) and [H10B 99/10](#) should be considered in order to perform a complete search.

N H10B 99/14

- {comprising memory cells that only have passive resistors or passive capacitors}

WARNING

Group [H10B 99/14](#) is incomplete pending reclassification of documents from group [H01L 27/101](#).

Groups [H01L 27/101](#) and [H10B 99/14](#) should be considered in order to perform a complete search.

N H10B 99/16

- {comprising memory cells having diodes}

WARNING

Group [H10B 99/16](#) is incomplete pending reclassification of documents from group [H01L 27/1021](#).

Groups [H01L 27/1021](#) and [H10B 99/16](#) should be considered in order to perform a complete search.

N H10B 99/20

- {comprising memory cells having thyristors}

WARNING

Group [H10B 99/20](#) is incomplete pending reclassification of documents from groups [H01L 27/1027](#) and [H01L 27/1028](#).

Groups [H01L 27/1027](#), [H01L 27/1028](#) and [H10B 99/20](#) should be considered in order to perform a complete search.

N H10B 99/22

- {including field-effect components}

WARNING

Group [H10B 99/22](#) is incomplete pending reclassification of documents from group [H01L 27/105](#).

Groups [H01L 27/105](#) and [H10B 99/22](#) should be considered in order to perform a complete search.

Project: RP11801 (B41M)**B41M 3/00**

Printing processes to produce particular kinds of printed work, e.g. patterns (~~special designs or pictures per se B44F~~; {printing apparatus or machines of special type or for particular purposes [B41F 17/00](#); ~~manufacturing organic semiconductor devices using printing techniques [H01L 51/0004](#)~~}; ~~special designs or pictures per se B44F~~; manufacturing printed circuits using printing techniques [H05K 3/12](#) {; ~~manufacturing organic semiconductor devices using printing techniques [H10K 71/13](#)~~})

Project: RP11801 (H01L)

- U H01L 21/00 Processes or apparatus adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof**
- U H01L 21/02 · Manufacture or treatment of semiconductor devices or of parts thereof
- U H01L 21/02104 · · {Forming layers (deposition in general [C23C](#); crystal growth in general [C30B](#))}
- WARNING
Groups [H01L 21/02104](#) – [H01L 21/02694](#) are incomplete pending reclassification of documents from groups [H01L 21/06](#), [H01L 21/16](#), and [H01L 21/20](#).
Groups [H01L 21/02104](#) – [H01L 21/02694](#), [H01L 21/06](#), [H01L 21/20](#), and [H01L 21/16](#) should be considered in order to perform a complete search.
- U H01L 21/02365 · · · {Forming inorganic semiconducting materials on a substrate (for light-sensitive devices [H01L 31/00](#))}
- WARNINGS
1. Group [H01L 21/02365](#) is incomplete pending reclassification of documents from groups [H01L 21/06](#), [H01L 21/16](#) and [H01L 21/20](#). Groups [H01L 21/06](#), [H01L 21/16](#), and [H01L 21/20](#) should be considered in order to perform a complete search.
2. Groups [H01L 21/02365](#) - [H01L 21/02694](#) are incomplete pending reclassification of documents from groups [H01L 21/2018](#), [H01L 21/2022](#), [H01L 21/2026](#), [H01L 21/203](#), [H01L 21/2033](#), [H01L 21/2036](#), [H01L 21/205](#), [H01L 21/2053](#), [H01L 21/2056](#), [H01L 21/208](#) and [H01L 21/2085](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- U H01L 21/02518 · · · · {Deposited layers}
- U H01L 21/02587 · · · · · {Structure}
- U H01L 21/0259 · · · · · · {Microstructure}
- H01L 21/02601 · · · · · · · {Nanoparticles (~~fullerenes H01L 51/0046~~fullerenes [H10K 85/211](#))}
- H01L 21/02606 · · · · · · · {Nanotubes (~~carbon nanotubes H01L 51/0048~~carbon nanotubes [H10K 85/211](#))}
- H01L 21/64 · Manufacture or treatment of solid state devices other than semiconductor devices, or of parts thereof, not peculiar to a single device provided for in groups [H01L 31/00](#) - ~~H01L 51/00~~[H10K 99/00](#)
- H01L 23/00 Details of semiconductor or other solid state devices ([H01L 25/00](#) takes precedence {; structural arrangements for testing or measuring during manufacture or treatment, or for reliability measurements [H01L 22/00](#); arrangements for connecting or disconnecting semiconductor or solid-state bodies, or methods related thereto [H01L 24/00](#); finger print sensors [G06V 40/12](#))}**
- NOTE
This group does not cover:
- details of semiconductor bodies or of electrodes of devices provided for in group [H01L 29/00](#), which details are covered by that group;
 - details peculiar to devices provided for in a single main group of groups [H01L 31/00](#)–, [H01L 33/00](#), ~~H01L 51/00~~[H10K 30/00](#), [H10K 50/00](#), [H10K 59/00](#), [H10K 71/00](#), [H10K 85/00](#), [H10K 99/00](#), [H10N 10/00](#), [H10N 30/00](#), [H10N 35/00](#), [H10N 50/00](#), [H10N 52/00](#), [H10N 60/00](#), which details are covered by those groups.

H01L 24/00

{Arrangements for connecting or disconnecting semiconductor or solid-state bodies; Methods or apparatus related thereto}

NOTES

1. This group does not cover:

- details of semiconductor bodies or of electrodes of devices provided for in group [H01L 29/00](#), which details are covered by that group;
- details peculiar to devices provided for in a single main group of groups [H01L 31/00](#)-, [H01L 33/00](#), ~~[H01L 51/00](#)~~[H10K 30/00](#), [H10K 50/00](#), [H10K 59/00](#), [H10K 71/00](#), [H10K 85/00](#), [H10K 99/00](#), [H10N 10/00](#), [H10N 30/00](#), [H10N 35/00](#), [H10N 50/00](#), [H10N 52/00](#), [H10N 60/00](#), which details are covered by those groups.
- printed circuits, which are covered by groups [H05K 1/00](#) - [H05K 1/189](#);
- apparatus or manufacturing processes for printed circuits, which are covered by groups [H05K 3/00](#) - [H05K 3/4685](#);
- manufacture or treatment of parts, which are covered by group [H01L 21/48](#) and subgroups except [H01L 21/4885](#) - [H01L 21/4896](#);
- assemblies of semiconductor devices, which are covered by groups [H01L 21/50](#) - [H01L 21/568](#);
- applying interconnections to be used for carrying current between separate components within a device, which is covered by group [H01L 21/768](#) and subgroups;
- containers or seals, which are covered by groups [H01L 23/02](#) - [H01L 23/10](#);
- mountings, which are covered by groups [H01L 23/12](#) - [H01L 23/15](#) and subgroups;
- arrangements for cooling, heating, ventilating or temperature compensation, which are covered by groups [H01L 23/34](#) - [H01L 23/4735](#);
- arrangements for conducting electric current, which are covered by groups [H01L 23/48](#) - [H01L 23/50](#), and by groups [H01L 23/52](#) - [H01L 23/5389](#);
- structural electrical arrangements, which are covered by groups ~~[H01L 24/80](#)~~ [H01L 23/58](#) - [H01L 23/66](#);
- assemblies of semiconductor or other solid state devices, which are covered by groups [H01L 25/00](#) - [H01L 25/18](#).

2. In this group the following indexing codes are used : [H01L 24/00](#), [H01L 2224/00](#), [H01L 2924/00](#), and subgroups thereof

Project: RP11801 in addition to RP11766 (H01L)

H01L 27/00

Devices consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate (details thereof [H01L 23/00](#), [H01L 29/00](#) - ~~[H01L 51/00](#)~~[H10K 10/00](#); assemblies consisting of a plurality of individual solid state devices [H01L 25/00](#))

NOTE

1. In this group, ~~with the exception of groups *the* [H01L 27/115](#) - [H01L 27/11597](#),~~ the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.

~~2. When classifying in this group, subject matter relating to electrically programmable read-only memories is classified in group [H01L 27/115](#), irrespective of the last place priority rule.~~

Project: RP11801 (H01L)

D H01L 27/28

- ~~including components using organic materials as the active part, or using a combination of organic materials with other materials as the active part~~
- <administratively transferred to [H10K 19/00](#)>

- D H01L 27/281 . . {Integrated circuits having a three-dimensional layout}
<administratively transferred to [H10K 19/201](#)>
- D H01L 27/283 . . {comprising components of the field-effect type}
<administratively transferred to [H10K 19/10](#)>
- D H01L 27/285 . . {Integrated circuits with a common active layer, e.g. cross point devices}
<administratively transferred to [H10K 19/202](#)>
- D H01L 27/286 . . {with an active region comprising an inorganic semiconductor}
<administratively transferred to [H10K 19/20](#)>
- D H01L 27/288 . . {Combination of organic light sensitive components with organic light emitting components, e.g. optocoupler}
<administratively transferred to [H10K 65/00](#)>
- D H01L 27/30 . . with components specially adapted for sensing infra-red radiation, light, electromagnetic radiation of shorter wavelength, or corpuscular radiation; with components specially adapted for either the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation {{combination of organic light sensitive components with organic light emitting components, e.g. optocoupler H01L 27/288}}
<administratively transferred to [H10K 39/00](#)>
- D H01L 27/301 . . . {Energy conversion devices}
<administratively transferred to [H10K 39/10](#)>
- D H01L 27/302 {comprising multiple junctions, e.g. tandem cells}
<administratively transferred to [H10K 30/57](#)>
- D H01L 27/304 {in form of a fiber or a tube, e.g. photovoltaic fibers}
<administratively transferred to [H10K 30/53](#)>
- D H01L 27/305 . . . {Devices controlled by radiation}
<administratively transferred to [H10K 39/30](#)>
- D H01L 27/307 {Imager structures}
<administratively transferred to [H10K 39/32](#)>
- D H01L 27/308 {Devices specially adapted for detecting X-ray radiation (measuring X-radiation G01T 1/00)}
<administratively transferred to [H10K 39/36](#)>
- D H01L 27/32 . . with components specially adapted for light emission, e.g. flat-panel displays using organic light-emitting diodes [OLED] {{combination of organic light sensitive components with organic light emitting components, e.g. optocoupler H01L 27/288}}
<administratively transferred to [H10K 59/00](#)>
- D H01L 27/3202 . . . {OLEDs electrically connected in parallel}
<administratively transferred to [H10K 59/84](#)>
- D H01L 27/3204 . . . {OLEDs electrically connected in series}
<administratively transferred to [H10K 59/86](#)>
- D H01L 27/3206 . . . {Multi-colour light emission}
<administratively transferred to [H10K 59/30](#)>
- D H01L 27/3209 {using stacked OLED}
<administratively transferred to [H10K 59/32](#)>
- D H01L 27/3211 {using RGB sub-pixels}
<administratively transferred to [H10K 59/35](#)>

- D H01L 27/3213 {using more than three sub-pixels, e.g. RGBW}
<administratively transferred to [H10K 59/351](#)>
- D H01L 27/3216 {the areas of RGB sub-pixels being different}
<administratively transferred to [H10K 59/352](#)>
- D H01L 27/3218 {characterised by the geometrical arrangement of the RGB sub-pixels}
<administratively transferred to [H10K 59/353](#)>
- D H01L 27/322 {using colour filters or colour changing media [CCM]}
<administratively transferred to [H10K 59/38](#)>
- D H01L 27/3223 . . . {combined with dummy elements, i.e. non-functional features}
<administratively transferred to [H10K 59/88](#)>
- D H01L 27/3225 . . . {OLED integrated with another component (H01L 27/3223 takes precedence)}
<administratively transferred to [H10K 59/00](#)>
- D H01L 27/3227 {the other component being a light sensitive element, e.g. inorganic solar cell, inorganic photodiode (H01L 27/288 takes precedence)}
<administratively transferred to [H10K 59/60](#)>
- D H01L 27/323 {the other component being a touch screen}
<administratively transferred to [H10K 59/40](#)>
- D H01L 27/3232 {the other component being a light modulating element, e.g. electrochromic element, photochromic element, liquid crystal element}
<administratively transferred to [H10K 59/50](#)>
- D H01L 27/3234 {the other component being an imager structure (H01L 27/146 takes precedence)}
<administratively transferred to [H10K 59/65](#)>
- D H01L 27/3237 . . . {Displays not provided for in group H01L 27/3241 and subgroups, e.g. segment-type displays}
<administratively transferred to [H10K 59/10](#)>
- D H01L 27/3239 {Light emitting logos}
<administratively transferred to [H10K 59/221](#)>
- D H01L 27/3241 . . . {Matrix-type displays}
<administratively transferred to [H10K 59/10](#)>
- D H01L 27/3244 {Active matrix displays}
<administratively transferred to [H10K 59/12](#)>
- D H01L 27/3246 {Pixel defining structures, e.g. banks}
<administratively transferred to [H10K 59/122](#)>
- D H01L 27/3248 {Connection of the pixel electrode to the TFT}
<administratively transferred to [H10K 59/123](#)>
- D H01L 27/3251 {Double substrate, i.e. with OLED and TFT on different substrates}
<administratively transferred to [H10K 59/127](#)>
- D H01L 27/3253 {Electrical connection of the two substrates}
<administratively transferred to [H10K 59/1275](#)>
- D H01L 27/3255 {Chiplets}
<administratively transferred to [H10K 59/129](#)>

- D H01L 27/3258 {Insulating layers formed between TFT elements and OLED elements}
<administratively transferred to [H10K 59/124](#)>
- D H01L 27/326 {special geometry or disposition of pixel elements}
<administratively transferred to [H10K 59/121](#)>
- D H01L 27/3262 {of TFT}
<administratively transferred to [H10K 59/1213](#)>
- D H01L 27/3265 {of capacitor}
<administratively transferred to [H10K 59/1216](#)>
- D H01L 27/3267 {Dual display, i.e. having two independent displays}
<administratively transferred to [H10K 59/128](#)>
- D H01L 27/3269 {Including photosensors to control luminance}
<administratively transferred to [H10K 59/13](#)>
- D H01L 27/3272 {Shielding, e.g. of TFT}
<administratively transferred to [H10K 59/126](#)>
- D H01L 27/3274 {including organic thin film transistors [OTFT]}
<administratively transferred to [H10K 59/125](#)>
- D H01L 27/3276 {Wiring lines}
<administratively transferred to [H10K 59/131](#)>
- D H01L 27/3279 {comprising structures specially adapted for lowering the resistance}
<administratively transferred to [H10K 59/1315](#)>
- D H01L 27/3281 {Passive matrix displays}
<administratively transferred to [H10K 59/17](#)>
- D H01L 27/3283 {including banks or shadow masks}
<administratively transferred to [H10K 59/173](#)>
- D H01L 27/3286 {Dual display, i.e. having two independent displays}
<administratively transferred to [H10K 59/176](#)>
- D H01L 27/3288 {Wiring lines}
<administratively transferred to [H10K 59/179](#)>
- D H01L 27/329 {comprising structures specially adapted for lowering the resistance}
<administratively transferred to [H10K 59/1795](#)>
- D H01L 27/3293 {Filed displays}
<administratively transferred to [H10K 59/18](#)>

Project: RP11801 in addition to RP11761 (H01L)

H01L 29/00

Semiconductor devices adapted for rectifying, amplifying, oscillating or switching, or capacitors or resistors with at least one potential-jump barrier or surface barrier, e.g. PN junction depletion layer or carrier concentration layer; Details of semiconductor bodies or of electrodes thereof {; {Multistep manufacturing processes therefor}(H01L 31/00 - H01L 47/00 H01L 33/00, H01L 51/05 H10K 10/00, H10N take precedence; ~~processes or apparatus adapted for the manufacture or treatment thereof or of parts thereof H01L 21/00~~; details other than of semiconductor bodies or of electrodes thereof H01L 23/00; devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00 {; {passive two-terminal components without a potential-jump or surface barrier for integrated circuits, details thereof and multistep manufacturing processes therefor H01L 28/00 *resistors in general H01C*; } ~~resistors in general H01C~~; capacitors in general H01G, {e.g. ceramic barrier-layer capacitors H01G 4/1272}}

NOTE

In this main group, classification is made both in groups [H01L 29/02](#) - [H01L 29/51](#) and in groups [H01L 29/66](#) - [H01L 29/94](#) if both of these sets of groups are relevant.

Project: RP11801 (H01L)

- U H01L 29/02 • Semiconductor bodies {; Multistep manufacturing processes therefor}
- U H01L 29/06 • • characterised by their shape; characterised by the shapes, relative sizes, or dispositions of the semiconductor regions {; characterised by the concentration or distribution of impurities within semiconductor regions}
- U H01L 29/0657 • • • {characterised by the shape of the body}
- U H01L 29/0665 • • • • {the shape of the body defining a nanostructure (nanotechnology per se B82B)}
- H01L 29/0669 • • • • • {Nanowires or nanotubes (~~carbon nanotubes as material of solid-state device active part H01L 51/0048~~*carbon nanotubes as material of solid-state device active part H10K 85/211*)}
- U H01L 29/12 • • characterised by the materials of which they are formed
- H01L 29/24 • • • including, apart from doping materials or other impurities, only semiconductor materials not provided for in groups [H01L 29/16](#), [H01L 29/18](#), [H01L 29/20](#), [H01L 29/22](#) (~~including organic materials H01L 51/00~~*including organic materials H10K 99/00*)
- U H01L 29/40 • Electrodes {; Multistep manufacturing processes therefor}
- U H01L 29/41 • • characterised by their shape, relative sizes or dispositions
- H01L 29/413 • • • {Nanosized electrodes, e.g. nanowire electrodes comprising one or a plurality of nanowires (~~transparent electrodes comprising carbon nanotubes H01L 51/444, nanotechnology per se B82B~~; nanosized carbon materials, e.g. carbon nanotubes, per se C01B 32/15; *transparent electrodes comprising carbon nano-tubes H10K 30/821, nanotechnology per se B82B*)}

- H01L 31/00** Semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation and specially adapted either for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof (~~H01L 51/42~~[H10K 30/00](#) takes precedence; devices consisting of a plurality of solid state components formed in, or on, a common substrate, other than combinations of radiation-sensitive components with one or more electric light sources, [H01L 27/00](#))
- U H01L 31/02 · Details
- H01L 31/0203 · · Containers; Encapsulations {, e.g. encapsulation of photodiodes} (for photovoltaic devices [H01L 31/048](#); ~~for organic photosensitive devices H01L 51/44~~; ~~for organic photosensitive devices H10K 30/80~~)
- U H01L 31/0248 · characterised by their semiconductor bodies
- U H01L 31/0352 · · characterised by their shape or by the shapes, relative sizes or disposition of the semiconductor regions
- U H01L 31/035209 · · · {comprising a quantum structures}
- H01L 31/035227 · · · · {the quantum structure being quantum wires, or nanorods (~~carbon nanotubes H01L 51/0048~~~~carbon nanotubes H10K 85/211~~)}
- D H01L 51/00** ~~Solid state devices using organic materials as the active part, or using a combination of organic materials with other materials as the active part; Processes or apparatus specially adapted for the manufacture or treatment of such devices, or of parts thereof (devices consisting of a plurality of components formed in or on a common substrate H01L 27/28; thermoelectric devices using organic material H01L 35/00, H01L 37/00; piezoelectric, electrostrictive or magnetostrictive elements using organic material H01L 41/00)~~
- ~~<administratively transferred to [H10K 99/00](#)>~~
- D H01L 51/0001 · {Processes specially adapted for the manufacture or treatment of devices or of parts thereof (multistep processes H01L 51/0098, H01L 51/05, H01L 51/42, H01L 51/50)}
- ~~<administratively transferred to [H10K 71/00](#)>~~
- D H01L 51/0002 · · {Deposition of organic semiconductor materials on a substrate}
- ~~<administratively transferred to [H10K 71/10](#)>~~
- D H01L 51/0003 · · · {using liquid deposition, e.g. spin coating}
- ~~<administratively transferred to [H10K 71/12](#)>~~
- D H01L 51/0004 · · · · {using printing techniques, e.g. ink-jet printing, screen printing}
- ~~<administratively transferred to [H10K 71/13](#)>~~
- D H01L 51/0005 · · · · · {ink-jet printing}
- ~~<administratively transferred to [H10K 71/135](#)>~~
- D H01L 51/0006 · · · · {Electrolytic deposition using an external electrical current, e.g. in-situ electropolymerisation}
- ~~<administratively transferred to [H10K 71/125](#)>~~
- D H01L 51/0007 · · · · · {characterised by the solvent}
- ~~<administratively transferred to [H10K 71/15](#)>~~
- D H01L 51/0008 · · · {using physical deposition, e.g. sublimation, sputtering}
- ~~<administratively transferred to [H10K 71/16](#)>~~

- D H01L 51/0009 {using laser ablation}
<administratively transferred to [H10K 71/162](#)>
- D H01L 51/001 {Vacuum deposition}
<administratively transferred to [H10K 71/164](#)>
- D H01L 51/0011 {selective deposition, e.g. using a mask}
<administratively transferred to [H10K 71/166](#)>
- D H01L 51/0012 {special provisions for the orientation or alignment of the layer to be deposited}
<administratively transferred to [H10K 71/191](#)>
- D H01L 51/0013 {using non liquid printing techniques, e.g. thermal transfer printing from a donor sheet}
<administratively transferred to [H10K 71/18](#)>
- D H01L 51/0014 {for changing the shape of the device layer, e.g. patterning}
<administratively transferred to [H10K 71/20](#)>
- D H01L 51/0015 {by selective transformation of an existing layer}
<administratively transferred to [H10K 71/211](#)>
- D H01L 51/0016 {lift off techniques}
<administratively transferred to [H10K 71/221](#)>
- D H01L 51/0017 {etching of an existing layer}
<administratively transferred to [H10K 71/231](#)>
- D H01L 51/0018 {using photolithographic techniques}
<administratively transferred to [H10K 71/233](#)>
- D H01L 51/0019 {using printing techniques, e.g. applying the etch liquid using an ink jet printer}
<administratively transferred to [H10K 71/236](#)>
- D H01L 51/002 {Making n- or p-doped regions}
<administratively transferred to [H10K 71/30](#)>
- D H01L 51/0021 {Formation of conductors}
<administratively transferred to [H10K 71/60](#)>
- D H01L 51/0022 {using printing techniques, e.g. ink jet printing}
<administratively transferred to [H10K 71/611](#)>
- D H01L 51/0023 {Patterning of conductive layers}
<administratively transferred to [H10K 71/621](#)>
- D H01L 51/0024 {for forming devices by joining two substrates together, e.g. lamination technique}
<administratively transferred to [H10K 71/50](#)>
- D H01L 51/0025 {Purification process of the organic semiconductor material}
<administratively transferred to [H10K 71/311](#)>
- D H01L 51/0026 {Thermal treatment of the active layer, e.g. annealing}
<administratively transferred to [H10K 71/40](#)>
- D H01L 51/0027 {using coherent electromagnetic radiation, e.g. laser annealing}
<administratively transferred to [H10K 71/421](#)>

- D H01L 51/0028 . . . {Thermal treatment in the presence of solvent vapors, e.g. solvent annealing}
<administratively transferred to [H10K 71/441](#)>
- D H01L 51/0029 . . {Special provisions for controlling the atmosphere during processing (H01L 51/0026 takes precedence)}
<administratively transferred to [H10K 71/811](#)>
- D H01L 51/003 . . {using a temporary substrate}
<administratively transferred to [H10K 71/80](#)>
- D H01L 51/0031 . . {Testing, e.g. accelerated lifetime tests of photoelectric devices}
<administratively transferred to [H10K 71/70](#)>
- D H01L 51/0032 . {Selection of organic semiconducting materials, e.g. organic light sensitive or organic light emitting materials}

NOTE

This group only covers the selection of organic materials for their electrical or other properties insofar as they are specific for their use in devices covered by the group H01L 51/00.

For the materials per se, see the relevant subclasses.

Attention is drawn to the following places:

- organic materials in general C07C, C07D, C07F, C08L;
- organic materials as electrical conductors H01B 1/12;
- organic materials as electrical insulators H01B 3/18

<administratively transferred to [H10K 85/00](#)>

- D H01L 51/0034 . . {Organic polymers or oligomers (organic macromolecular compounds or compositions per se C08)}
<administratively transferred to [H10K 85/10](#)>
- D H01L 51/0035 . . . {comprising aromatic, heteroaromatic, or aryllic chains, e.g. polyaniline (per se C08G 73/026), polyphenylene (per se C08G 61/10), polyphenylene vinylene (per se C08G 61/02)}
<administratively transferred to [H10K 85/111](#)>
- D H01L 51/0036 . . . {Heteroaromatic compounds comprising sulfur or selenium, e.g. polythiophene (per se C08G 61/126)}
<administratively transferred to [H10K 85/113](#)>
- D H01L 51/0037 . . . {Polyethylene dioxythiophene [PEDOT] and derivatives}
<administratively transferred to [H10K 85/1135](#)>
- D H01L 51/0038 . . . {Poly-phenylenevinylene and derivatives (per se C08G 61/10)}
<administratively transferred to [H10K 85/114](#)>
- D H01L 51/0039 . . . {Polyfluorene and derivatives}
<administratively transferred to [H10K 85/115](#)>
- D H01L 51/004 . . . {comprising aliphatic or olefinic chains, e.g. poly N-vinylcarbazol, PVC, PTFE}
<administratively transferred to [H10K 85/141](#)>
- D H01L 51/0041 . . . {Poly acetylene (per se C08G 61/04, C08F 38/02, C08F 138/02, C08F 238/02) or derivatives}
<administratively transferred to [H10K 85/143](#)>
- D H01L 51/0042 . . . {poly N-vinylcarbazol and derivatives}
<administratively transferred to [H10K 85/146](#)>

- D H01L 51/0043 . . . {Copolymers}
<administratively transferred to [H10K 85/151](#)>
- D H01L 51/0044 . . . {Ladder-type polymers}
<administratively transferred to [H10K 85/154](#)>
- D H01L 51/0045 . . {Carbon-containing materials, e.g. carbon nanotubes, fullerenes (per se C01B 32/15)}
<administratively transferred to [H10K 85/20](#)>
- D H01L 51/0046 . . . {Fullerenes, e.g. C₆₀, C₇₀}
<administratively transferred to [H10K 85/211](#)>
- D H01L 51/0047 {comprising substituents, e.g. PCBM}
<administratively transferred to [H10K 85/215](#)>
- D H01L 51/0048 . . . {Carbon nanotubes}
<administratively transferred to [H10K 85/221](#)>
- D H01L 51/0049 {comprising substituents}
<administratively transferred to [H10K 85/225](#)>
- D H01L 51/005 . . {Macromolecular systems with low molecular weight, e.g. cyanine dyes, coumarine dyes, tetrathiafulvalene (H01L 51/0045, H01L 51/0077, H01L 51/0093, H01L 51/0094 take precedence)}
<administratively transferred to [H10K 85/60](#)>
- D H01L 51/0051 . . . {Charge transfer complexes}
<administratively transferred to [H10K 85/611](#)>
- D H01L 51/0052 . . . {Polycyclic condensed aromatic hydrocarbons, e.g. anthracene}
<administratively transferred to [H10K 85/615](#)>
- D H01L 51/0053 {Aromatic anhydride or imide compounds, e.g. perylene tetra-carboxylic dianhydride, perylene tetracarboxylic diimide}
<administratively transferred to [H10K 85/621](#)>
- D H01L 51/0054 {containing four rings, e.g. pyrene}
<administratively transferred to [H10K 85/622](#)>
- D H01L 51/0055 {containing five rings, e.g. pentacene}
<administratively transferred to [H10K 85/623](#)>
- D H01L 51/0056 {containing six or more rings}
<administratively transferred to [H10K 85/624](#)>
- D H01L 51/0057 {containing at least one aromatic ring having 7 or more carbon atoms, e.g. azulene}
<administratively transferred to [H10K 85/625](#)>
- D H01L 51/0058 {containing more than one polycyclic condensed aromatic rings, e.g. bis-anthracene}
<administratively transferred to [H10K 85/626](#)>
- D H01L 51/0059 . . . {Amine compounds having at least two aryl rest on at least one amine-nitrogen atom, e.g. triphenylamine (per se C07C 211/00)}
<administratively transferred to [H10K 85/631](#)>
- D H01L 51/006 {comprising polycyclic condensed aromatic hydrocarbons as substituents on the nitrogen atom}
<administratively transferred to [H10K 85/633](#)>

- D H01L 51/0061 {comprising heteroaromatic hydrocarbons as substituents on the nitrogen atom}
<administratively transferred to [H10K 85/636](#)>
- D H01L 51/0062 . . . {aromatic compounds comprising a hetero atom, e.g.: N,P,S}
<administratively transferred to [H10K 85/649](#)>
- D H01L 51/0064 {Cyanine Dyes}
<administratively transferred to [H10K 85/652](#)>
- D H01L 51/0065 {comprising only oxygen as heteroatom}
<administratively transferred to [H10K 85/653](#)>
- D H01L 51/0067 {comprising only nitrogen as heteroatom (H01L 51/0064 takes precedence)}
<administratively transferred to [H10K 85/654](#)>
- D H01L 51/0068 {comprising only sulfur as heteroatom}
<administratively transferred to [H10K 85/655](#)>
- D H01L 51/0069 {comprising two or more different heteroatoms per ring, e.g. S and N (H01L 51/0064 takes precedence)}
<administratively transferred to [H10K 85/656](#)>
- D H01L 51/007 {Oxadiazole compounds}
<administratively transferred to [H10K 85/6565](#)>
- D H01L 51/0071 {Polycyclic condensed heteroaromatic hydrocarbons}
<administratively transferred to [H10K 85/657](#)>
- D H01L 51/0072 {comprising only nitrogen in the heteroaromatic polycondensed ringsystem, e.g. phenanthroline, carbazole}
<administratively transferred to [H10K 85/6572](#)>
- D H01L 51/0073 {comprising only oxygen in the heteroaromatic polycondensed ringsystem, e.g. cumarine dyes}
<administratively transferred to [H10K 85/6574](#)>
- D H01L 51/0074 {comprising only sulfur in the heteroaromatic polycondensed ringsystem, e.g. benzothiophene}
<administratively transferred to [H10K 85/6576](#)>
- D H01L 51/0075 . . {Langmuir Blodgett films (per se B05D 1/202)}
<administratively transferred to [H10K 85/701](#)>
- D H01L 51/0076 . . {Liquid crystalline materials (per se C09K 19/00)}
<administratively transferred to [H10K 85/731](#)>
- D H01L 51/0077 . . {Coordination compounds, e.g. porphyrin}
<administratively transferred to [H10K 85/30](#)>
- D H01L 51/0078 . . . {Phthalocyanine (per se C09B 47/04)}
<administratively transferred to [H10K 85/311](#)>
- D H01L 51/0079 . . . {Metal complexes comprising a IIIB-metal (B, Al, Ga, In or Tl), e.g. Tris (8-hydroxyquinoline) gallium (Gaq3)}
<administratively transferred to [H10K 85/321](#)>
- D H01L 51/008 {comprising boron}
<administratively transferred to [H10K 85/322](#)>
- D H01L 51/0081 {comprising aluminium, e.g. Alq3}
<administratively transferred to [H10K 85/324](#)>

- D H01L 51/0082 {comprising gallium}
<administratively transferred to [H10K 85/326](#)>
- D H01L 51/0083 . . . {Metal complexes comprising an iron-series metal, e.g. Fe, Co, Ni}
<administratively transferred to [H10K 85/331](#)>
- D H01L 51/0084 . . . {Transition metal complexes, e.g. Ru(II)polypyridine complexes}
<administratively transferred to [H10K 85/341](#)>
- D H01L 51/0085 {comprising Iridium}
<administratively transferred to [H10K 85/342](#)>
- D H01L 51/0086 {comprising Ruthenium}
<administratively transferred to [H10K 85/344](#)>
- D H01L 51/0087 {comprising platinum}
<administratively transferred to [H10K 85/346](#)>
- D H01L 51/0088 {comprising osmium}
<administratively transferred to [H10K 85/348](#)>
- D H01L 51/0089 . . . {Metal complexes comprising Lanthanides or Actinides, e.g. Eu}
<administratively transferred to [H10K 85/351](#)>
- D H01L 51/009 . . . {Polynuclear complexes, i.e. complexes having two or more metal centers}
<administratively transferred to [H10K 85/361](#)>
- D H01L 51/0091 . . . {Metal complexes comprising a IB-metal (Cu, Ag, Au)}
<administratively transferred to [H10K 85/371](#)>
- D H01L 51/0092 . . . {Metal complexes comprising a IIB-metal (Zn, Cd, Hg)}
<administratively transferred to [H10K 85/381](#)>
- D H01L 51/0093 . . {Biomolecules or bio-macromolecules, e.g. proteins, ATP, chlorophyll, beta-carotene, lipids, enzymes}
<administratively transferred to [H10K 85/761](#)>
- D H01L 51/0094 . . {Silicon-containing organic semiconductors}
<administratively transferred to [H10K 85/40](#)>
- D H01L 51/0095 . . {Starburst compounds}
<administratively transferred to [H10K 85/791](#)>
- D H01L 51/0096 . {Substrates}
<administratively transferred to [H10K 77/10](#)>
- D H01L 51/0097 . . {flexible substrates}
<administratively transferred to [H10K 77/111](#)>
- D H01L 51/0098 . {Molecular electronic devices (molecular computers G06F 15/80; molecular memories G11C 11/00, G11C 13/02)}
<administratively transferred to [H10K 30/671](#)>
- D H01L 51/05 . specially adapted for rectifying, amplifying, oscillating or switching, or capacitors or resistors with at least one potential-jump barrier or surface barrier (multistep processes for their manufacture)
<administratively transferred to [H10K 10/00](#)>
- D H01L 51/0504 . . {the devices being controllable only by the electric current supplied or the electric potential applied, to an electrode which does not carry the current to be rectified, amplified or switched, e.g. three-terminal devices}
<administratively transferred to [H10K 10/00](#)>

- D H01L 51/0508 . . . {Field-effect devices, e.g. TFTs}
<administratively transferred to [H10K 10/46](#)>
- D H01L 51/0512 . . . {insulated gate field effect transistors}
<administratively transferred to [H10K 10/462](#)>
- D H01L 51/0516 . . . {characterised by the gate dielectric}
<administratively transferred to [H10K 10/468](#)>
- D H01L 51/052 . . . {the gate dielectric comprising only organic materials}
<administratively transferred to [H10K 10/471](#)>
- D H01L 51/0525 . . . {the gate dielectric comprising only inorganic materials}
<administratively transferred to [H10K 10/472](#)>
- D H01L 51/0529 . . . {the gate dielectric having a multilayered structure}
<administratively transferred to [H10K 10/474](#)>
- D H01L 51/0533 . . . {Combinations of organic and inorganic layers}
<administratively transferred to [H10K 10/476](#)>
- D H01L 51/0537 . . . {the gate dielectric comprising composite materials, e.g. TiO₂ particles in a polymer matrix}
<administratively transferred to [H10K 10/478](#)>
- D H01L 51/0541 . . . {Lateral single gate single channel transistors with non-inverted structure, i.e. the organic semiconductor layer is formed before the gate electrode}
<administratively transferred to [H10K 10/464](#)>
- D H01L 51/0545 . . . {Lateral single gate single channel transistors with inverted structure, i.e. the organic semiconductor layer is formed after the gate electrode}
<administratively transferred to [H10K 10/466](#)>
- D H01L 51/055 . . . {characterised by the gate conductor}
<administratively transferred to [H10K 10/481](#)>
- D H01L 51/0554 . . . {the transistor having two or more gate electrodes}
<administratively transferred to [H10K 10/482](#)>
- D H01L 51/0558 . . . {characterised by the channel of the transistor}
<administratively transferred to [H10K 10/484](#)>
- D H01L 51/0562 . . . {the channel comprising two or more active layers, e.g. forming pn-hetero junction}
<administratively transferred to [H10K 10/486](#)>
- D H01L 51/0566 . . . {the channel comprising a composite layer, e.g. a mixture of donor and acceptor moieties, forming pn-bulk hetero junction}
<administratively transferred to [H10K 10/488](#)>
- D H01L 51/057 . . . {having a vertical structure, e.g. vertical carbon nanotube field-effect transistors [CNT-FETs]}
<administratively transferred to [H10K 10/491](#)>
- D H01L 51/0575 . . . {the devices being controllable only by variation of the electric current supplied or the electric potential applied, to one or more of the electrodes carrying the current to be rectified, amplified, oscillated or switched, e.g. two-terminal devices}
<administratively transferred to [H10K 10/20](#)>
- D H01L 51/0579 . . . {Schottky diodes}
<administratively transferred to [H10K 10/23](#)>

- D H01L 51/0583 . . . {comprising an organic/organic junction, e.g. hetero-junction}
<administratively transferred to [H10K 10/26](#)>
- D H01L 51/0587 . . . {comprising an organic/inorganic hetero-junction, e.g. hetero-junction}
<administratively transferred to [H10K 10/29](#)>
- D H01L 51/0591 . . . {Bi-stable switching devices}
<administratively transferred to [H10K 10/50](#)>
- D H01L 51/0595 . . . {molecular electronic devices (molecular computers G06F 15/80; molecular memories G11C 11/00, G11C 13/02)}
<administratively transferred to [H10K 10/701](#)>
- D H01L 51/10 . . Details of devices
<administratively transferred to [H10K 10/80](#)>
- D H01L 51/102 . . . {Electrodes}
<administratively transferred to [H10K 10/82](#)>
- D H01L 51/105 {Ohmic contacts, e.g. source and drain electrodes}
<administratively transferred to [H10K 10/84](#)>
- D H01L 51/107 . . . {Passivation, containers, encapsulations}
<administratively transferred to [H10K 10/88](#)>
- D H01L 51/42 . specially adapted for sensing infra-red radiation, light, electro-magnetic radiation of shorter wavelength or corpuscular radiation and adapted for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation {using organic materials as the active part, or using a combination of organic materials with other material as the active part; Multistep processes for their manufacture}
<administratively transferred to [H10K 30/00](#)>
- D H01L 51/4206 . . {Metal-organic semiconductor-metal devices}
<administratively transferred to [H10K 30/451](#)>
- D H01L 51/4213 . . {Comprising organic semiconductor-inorganic semiconductor hetero-junctions (H01L 51/4253 takes precedence)}
<administratively transferred to [H10K 30/10](#)>
- D H01L 51/422 . . . {Majority carrier devices using sensitisation of widebandgap semiconductors, e.g. TiO₂ (photoelectrochemical devices with a liquid or solid electrolyte H01G 9/20)}
<administratively transferred to [H10K 30/15](#)>
- D H01L 51/4226 {the wideband gap semiconductor comprising titanium oxide, e.g. TiO₂}
<administratively transferred to [H10K 30/151](#)>
- D H01L 51/4233 {the wideband gap semiconductor comprising zinc oxide, e.g. ZnO}
<administratively transferred to [H10K 30/152](#)>
- D H01L 51/424 . . {comprising organic semiconductor-organic semiconductor hetero-junctions (H01L 51/4253 takes precedence)}
<administratively transferred to [H10K 30/20](#)>
- D H01L 51/4246 . . . {comprising multi-junctions, e.g. double hetero-junctions}
<administratively transferred to [H10K 30/211](#)>
- D H01L 51/4253 . . {comprising bulk hetero-junctions, e.g. interpenetrating networks}
<administratively transferred to [H10K 30/30](#)>
- D H01L 51/426 . . . {comprising inorganic nanostructures, e.g. CdSe nanoparticles}
<administratively transferred to [H10K 30/35](#)>

- D H01L 51/4266 {the inorganic nanostructures being nanotubes or nanowires, e.g. CdTe nanotubes in P3HT}
<administratively transferred to [H10K 30/352](#)>
- D H01L 51/4273 . . . {comprising blocking layers, e.g. exciton blocking layers}
<administratively transferred to [H10K 30/353](#)>
- D H01L 51/428 . . {light sensitive field effect devices}
<administratively transferred to [H10K 30/65](#)>
- D H01L 51/4286 . . {Devices having a m-i-s structure}
<administratively transferred to [H10K 30/354](#)>
- D H01L 51/4293 . . {Devices having a p-i-n structure}
<administratively transferred to [H10K 30/40](#)>
- D H01L 51/44 . . Details of devices
<administratively transferred to [H10K 30/80](#)>
- D H01L 51/441 . . . {Electrodes}
<administratively transferred to [H10K 30/81](#)>
- D H01L 51/442 {transparent electrodes, e.g. ITO, TCO}
<administratively transferred to [H10K 30/82](#)>
- D H01L 51/444 {comprising carbon nanotubes}
<administratively transferred to [H10K 30/821](#)>
- D H01L 51/445 {comprising arrangements for extracting the current from the cell, e.g. metal finger grid systems to reduce the serial resistance of transparent electrodes}
<administratively transferred to [H10K 30/83](#)>
- D H01L 51/447 . . . {Light trapping means}
<administratively transferred to [H10K 30/87](#)>
- D H01L 51/448 . . . {Passivation, containers, encapsulations}
<administratively transferred to [H10K 30/88](#)>
- D H01L 51/50 . specially adapted for light emission, e.g. organic light emitting diodes [OLED] or polymer light emitting devices [PLED] (organic semiconductor lasers H01S 5/36 {; circuit arrangements for OLED or PLED H05B 45/60; control arrangements for organic electroluminescent displays G09G 3/3208})
<administratively transferred to [H10K 50/00](#)>
- D H01L 51/5004 . . {characterised by the interrelation between parameters of constituting active layers, e.g. HOMO-LUMO relation}
<administratively transferred to [H10K 50/11](#) and [H10K 2101/40](#) ADD>
- D H01L 51/5008 . . {Intermediate layers comprising a mixture of materials of the adjoining active layers}
<administratively transferred to [H10K 30/865](#)>
- D H01L 51/5012 . . {Electroluminescent [EL] layer}
<administratively transferred to [H10K 50/11](#)>
- D H01L 51/5016 . . . {Triplet emission}
<administratively transferred to [H10K 50/11](#) and [H10K 2101/10](#) ADD>
- D H01L 51/502 . . . {comprising active inorganic nanostructures, e.g. luminescent quantum dots}
<administratively transferred to [H10K 50/115](#)>

- D H01L 51/5024 . . . {having a host comprising an emissive dopant and further additive materials, e.g. for improving the dispersability, for improving the stabilisation, for assisting energy transfer}
<administratively transferred to [H10K 50/12](#)>
- D H01L 51/5028 {for assisting energy transfer, e.g. sensitization}
<administratively transferred to [H10K 50/121](#)>
- D H01L 51/5032 . . . {Light emitting electrochemical cells [LEC], i.e. with mobile ions in the active layer}
<administratively transferred to [H10K 50/135](#)>
- D H01L 51/5036 . . . {Multi-colour light emission, e.g. colour tuning, polymer blend, stack of electroluminescent layers}
<administratively transferred to [H10K 50/125](#)>
- D H01L 51/504 {Stack of electroluminescent layers}
<administratively transferred to [H10K 50/13](#)>
- D H01L 51/5044 {with spacer layers between the emissive layers}
<administratively transferred to [H10K 50/131](#)>
- D H01L 51/5048 . . {Carrier transporting layer}
<administratively transferred to [H10K 50/14](#)>
- D H01L 51/5056 . . . {Hole transporting layer}
<administratively transferred to [H10K 50/15](#)>
- D H01L 51/506 {comprising a dopant}
<administratively transferred to [H10K 50/155](#)>
- D H01L 51/5064 {having a multilayered structure}
<administratively transferred to [H10K 50/156](#)>
- D H01L 51/5068 {arranged between the light emitting layer and the cathode}
<administratively transferred to [H10K 50/157](#)>
- D H01L 51/5072 . . . {Electron transporting layer}
<administratively transferred to [H10K 50/16](#)>
- D H01L 51/5076 {comprising a dopant}
<administratively transferred to [H10K 50/165](#)>
- D H01L 51/508 {having a multilayered structure}
<administratively transferred to [H10K 50/166](#)>
- D H01L 51/5084 {arranged between the light emitting layer and the anode}
<administratively transferred to [H10K 50/167](#)>
- D H01L 51/5088 . . {Carrier injection layer}
<administratively transferred to [H10K 50/17](#)>
- D H01L 51/5092 . . . {Electron injection layer}
<administratively transferred to [H10K 50/171](#)>
- D H01L 51/5096 . . {Carrier blocking layer}
<administratively transferred to [H10K 50/18](#)>
- D H01L 51/52 . . Details of devices
<administratively transferred to [H10K 50/80](#)>
- D H01L 51/5203 . . . {Electrodes}
<administratively transferred to [H10K 50/805](#)>

- D H01L 51/5206 {Anodes, i.e. with high work-function material}
<administratively transferred to [H10K 50/81](#)>
- D H01L 51/5209 {characterised by the shape}
<administratively transferred to [H10K 50/813](#)>
- D H01L 51/5212 {combined with auxiliary electrode, e.g. ITO layer combined with metal lines}
<administratively transferred to [H10K 50/814](#)>
- D H01L 51/5215 {composed of transparent multilayers}
<administratively transferred to [H10K 50/816](#)>
- D H01L 51/5218 {Reflective anodes, e.g. ITO combined with thick metallic layer}
<administratively transferred to [H10K 50/818](#)>
- D H01L 51/5221 {Cathodes, i.e. with low work-function material}
<administratively transferred to [H10K 50/82](#)>
- D H01L 51/5225 {characterised by the shape}
<administratively transferred to [H10K 50/822](#)>
- D H01L 51/5228 {combined with auxiliary electrodes}
<administratively transferred to [H10K 50/824](#)>
- D H01L 51/5231 {composed of opaque multilayers}
<administratively transferred to [H10K 50/826](#)>
- D H01L 51/5234 {Transparent, e.g. including thin metal film}
<administratively transferred to [H10K 50/828](#)>
- D H01L 51/5237 . . . {Passivation; Containers; Encapsulation, e.g. against humidity}
<administratively transferred to [H10K 50/84](#)>
- D H01L 51/524 {Sealing arrangements having a self-supporting structure, e.g. containers}
<administratively transferred to [H10K 50/841](#)>
- D H01L 51/5243 {the sealing arrangements being made of metallic material}
<administratively transferred to [H10K 50/8423](#)>
- D H01L 51/5246 {characterised by the peripheral sealing arrangements, e.g. adhesives, sealants}
<administratively transferred to [H10K 50/8426](#)>
- D H01L 51/525 {Vertical spacers, e.g. arranged between the sealing arrangement and the OLED}
<administratively transferred to [H10K 50/8428](#)>
- D H01L 51/5253 {Protective coatings}
<administratively transferred to [H10K 50/844](#)>
- D H01L 51/5256 {having repetitive multilayer structures}
<administratively transferred to [H10K 50/8445](#)>
- D H01L 51/5259 {including getter material or desiccant}
<administratively transferred to [H10K 50/846](#)>
- D H01L 51/5262 . . . {Arrangements for extracting light from the device}
<administratively transferred to [H10K 50/85](#)>
- D H01L 51/5265 {comprising a resonant cavity structure, e.g. Bragg reflector pair}
<administratively transferred to [H10K 50/852](#)>

- D H01L 51/5268 . . . {Scattering means}
<administratively transferred to [H10K 50/854](#)>
- D H01L 51/5271 . . . {Reflective means}
<administratively transferred to [H10K 50/856](#)>
- D H01L 51/5275 . . . {Refractive means, e.g. lens}
<administratively transferred to [H10K 50/858](#)>
- D H01L 51/5278 . . . {comprising a repetitive electroluminescent unit between one set of electrodes}
<administratively transferred to [H10K 50/19](#)>
- D H01L 51/5281 . . . {Arrangements for contrast improvement, e.g. preventing reflection of ambient light}
<administratively transferred to [H10K 50/86](#)>
- D H01L 51/5284 . . . {comprising a light absorbing layer, e.g. black layer}
<administratively transferred to [H10K 50/865](#)>
- D H01L 51/5287 . . . {OLED having a fiber structure}
<administratively transferred to [H10K 50/182](#)>
- D H01L 51/529 . . . {Arrangements for heating or cooling}
<administratively transferred to [H10K 50/87](#)>
- D H01L 51/5293 . . . {Arrangements for polarized light emission (H01L 51/5281 takes precedence)}
<administratively transferred to [H10K 50/868](#)>
- D H01L 51/5296 . . . {Light emitting organic transistors}
<administratively transferred to [H10K 50/30](#)>
- D H01L 51/56 . . Processes or apparatus specially adapted for the manufacture or treatment of such devices or of parts thereof
<administratively transferred to [H10K 71/00](#)>
- U H01L 2225/00 Details relating to assemblies covered by the group [H01L 25/00](#) but not provided for in its subgroups**
- H01L 2225/03 . All the devices being of a type provided for in the same subgroup of groups [H01L 27/00](#) - ~~H01L 51/00~~ [H01L 33/648](#) and [H10K 99/00](#)
- D H01L 2227/00 Indexing scheme for devices consisting of a plurality of semiconductor or other solid state components formed in or on a common substrate covered by group H01L 27/00**
- D H01L 2227/32 . Devices including an organic light emitting device [OLED], e.g. OLED display
<administratively transferred to [H10K 59/10](#) INV>
- D H01L 2227/323 . . Multistep processes for AMOLED
<administratively transferred to [H10K 59/1201](#) INV>
- D H01L 2227/326 . . Use of temporary substrate, e.g. for manufacturing of OLED displays having an inorganic driving circuit
<administratively transferred to [H10K 71/80](#) INV and [H10K 59/1201](#) INV>
- D H01L 2251/00 Indexing scheme relating to organic semiconductor devices covered by group H01L 51/00**
- D H01L 2251/10 . Processes specially adapted for the manufacture or treatment of organic semiconductor devices
<administratively transferred to [H10K 71/00](#)>

- D H01L 2251/105
- • Patterning of a layer by embossing, e.g. to form trenches in an insulating layer
 - <administratively transferred to [H10K 71/821](#)>
- D H01L 2251/30
- Materials
 - <administratively transferred to [H10K 2102/00](#) ADD>
- D H01L 2251/301
- • Inorganic materials
 - <administratively transferred to [H10K 2102/00](#) ADD>
- D H01L 2251/303
- • • Oxides, e.g. metal oxides
 - <administratively transferred to [H10K 2102/00](#) ADD>
- D H01L 2251/305
- • • • Transparent conductive oxides [TCO]
 - <administratively transferred to [H10K 2102/101](#) ADD>
- D H01L 2251/306
- • • • • composed of tin oxides, e.g. F-doped SnO₂
 - <administratively transferred to [H10K 2102/102](#) ADD>
- D H01L 2251/308
- • • • • composed of indium oxides, e.g. ITO
 - <administratively transferred to [H10K 2102/103](#) ADD>
- D H01L 2251/50
- Organic light-emitting devices
 - <administratively transferred to [H10K 2102/301](#) ADD>
- D H01L 2251/53
- • Structure
 - <administratively transferred to [H10K 2102/302](#) ADD>
- D H01L 2251/5307
- • • specially adapted for controlling the direction of light emission
 - <administratively transferred to [H10K 2102/3023](#) ADD>
- D H01L 2251/5315
- • • • Top-emission
 - <administratively transferred to [H10K 2102/3026](#) ADD>
- D H01L 2251/5323
- • • • • Two-side emission, i.e. TOLED
 - <administratively transferred to [H10K 2102/3031](#) ADD>
- D H01L 2251/533
- • • • • End-face emission
 - <administratively transferred to [H10K 2102/3035](#) ADD>
- D H01L 2251/5338
- • • Flexible OLED
 - <administratively transferred to [H10K 2102/311](#) ADD>
- D H01L 2251/5346
- • • Graded composition
 - <administratively transferred to [H10K 2101/80](#) ADD>
- D H01L 2251/5353
- • • Inverted OLED
 - <administratively transferred to [H10K 2102/321](#) ADD>
- D H01L 2251/5361
- • • OLED lamp
- D H01L 2251/5369
- • • Nanoparticles used in whatever layer except emissive layer, e.g. in packaging
 - <administratively transferred to [H10K 2102/331](#) ADD>
- D H01L 2251/5376
- • • Combination of fluorescent and phosphorescent emission
 - <administratively transferred to [H10K 2101/27](#) ADD>
- D H01L 2251/5384
- • • Multiple hosts in the emissive layer
 - <administratively transferred to [H10K 2101/90](#) ADD>
- D H01L 2251/5392
- • • Short-circuit prevention
 - <administratively transferred to [H10K 2102/341](#) ADD>

- D H01L 2251/55 . . characterised by parameters
<administratively transferred to [H10K 2101/00](#) ADD>
- D H01L 2251/552 . . . HOMO-LUMO-EF
<administratively transferred to [H10K 2101/30](#) ADD>
- D H01L 2251/554 . . . Oxidation-reduction potential
<administratively transferred to [H10K 2101/50](#) ADD>
- D H01L 2251/556 . . . Temperature
<administratively transferred to [H10K 2102/361](#) ADD>
- D H01L 2251/558 . . . Thickness
<administratively transferred to [H10K 2102/351](#) ADD>
- D H01L 2251/56 . . Processes specially adapted for the manufacture or treatment of OLED
<administratively transferred to [H10K 71/00](#)>
- D H01L 2251/562 . . . Aging
<administratively transferred to [H10K 71/831](#)>
- D H01L 2251/564 . . . Application of alternating current
<administratively transferred to [H10K 71/841](#)>
- D H01L 2251/566 . . . Division of substrate, e.g. for manufacturing of OLED displays
<administratively transferred to [H10K 71/851](#)>
- D H01L 2251/568 . . . Repairing
<administratively transferred to [H10K 71/861](#)>

Project: RP11801 (H01M)**H01M 14/00**

Electrochemical current or voltage generators not provided for in groups [H01M 6/00](#) - [H01M 12/00](#); Manufacture thereof

NOTE

This group does not cover solar cells, photocells, photoelectrochemical cells or photovoltaic cells, which are covered by the following groups:

- semiconductor devices sensitive to light and adapted for the conversion of the energy of such radiation into electrical energy are covered by group [H01L 31/00](#);
- solid-state devices using organic materials as active part specially adapted for sensing light and adapted for the conversion of the energy of such radiation into electrical energy are covered by group ~~H01L 51/42~~ [H10K 30/00](#);
- electrolytic light-sensitive devices, e.g. dye-sensitised solar cells, are covered by group [H01G 9/20](#);
- photovoltaic modules structurally associated with energy storage means, e.g. batteries, are covered by group [H02S 40/38](#).

Project: RP11801 in addition to RP11761 (H02S)**H02S**

GENERATION OF ELECTRIC POWER BY CONVERSION OF INFRARED RADIATION, VISIBLE LIGHT OR ULTRAVIOLET LIGHT, e.g. USING PHOTOVOLTAIC [PV] MODULES (obtaining electrical energy from radioactive sources [G21H 1/12](#); light sensitive inorganic semiconductor devices [H01L 31/00](#); thermoelectric devices ~~H01L 35/00~~; pyroelectric devices ~~H01L 37/00~~; light sensitive organic semiconductor devices ~~H01L 51/42~~; light sensitive organic semiconductor devices [H10K 30/00](#); thermoelectric devices [H10N 10/00](#); pyroelectric devices [H10N 15/00](#))

Project: RP11801 (H02S)

H02S 30/00

Structural details of PV modules other than those related to light conversion (semiconductor device aspects of modules of electrolytic light sensitive devices [H01G 9/20](#), of inorganic PV modules [H01L 31/00](#), of organic PV modules [H01L 51/42](#)[H10K 30/00](#))

Project: RP11801 (H10K)

N H10K

ORGANIC ELECTRIC SOLID-STATE DEVICESNOTES

1. This subclass covers:

- individual organic electric solid-state devices, i.e. electric solid-state devices comprising organic material in the active part;
- integrated devices, or assemblies of multiple devices, comprising such elements.

2. This subclass does not cover:

- organic electronic memory devices, which are covered by subclass [H10B](#);
- organic thermoelectric, piezoelectric, electrostrictive or magnetostrictive devices, which are covered by subclass [H10N](#);
- organic resistors without a potential-jump barrier or surface barrier and not specially adapted for integrated devices, which are covered by subclass [H01C](#);
- organic capacitors without a potential-jump barrier or surface barrier and not specially adapted for integrated devices, which are covered by subclass [H01G](#).

3. In this subclass, it is desirable to add the indexing codes of groups [H10K 2101/00](#) - [H10K 2102/00](#).

N H10K 10/00 -
H10K 19/00

Organic devices specially adapted for rectifying, amplifying, oscillating or switching

Q H10K 10/00

Organic devices specially adapted for rectifying, amplifying, oscillating or switching; Organic capacitors or resistors having a potential-jump barrier or a surface barrier (integrated devices or assemblies of multiple devices [H10K 19/00](#))

WARNING

Group [H10K 10/00](#) is impacted by reclassification into groups [H10K 10/10](#), [H10K 10/40](#) and [H10K 10/43](#).

All groups listed in this Warning should be considered in order to perform a complete search.

N H10K 10/10

- Organic capacitors or resistors comprising a potential-jump barrier or surface barrier

WARNING

Group [H10K 10/10](#) is incomplete pending reclassification of documents from group [H10K 10/00](#).

Groups [H10K 10/00](#) and [H10K 10/10](#) should be considered in order to perform a complete search.

N H10K 10/20

- Organic diodes

N H10K 10/23

- • Schottky diodes

N H10K 10/26

- • Diodes comprising organic-organic junctions

N H10K 10/29

- • Diodes comprising organic-inorganic heterojunctions

- N H10K 10/40
- Organic transistors
- WARNING
Groups [H10K 10/40](#) and [H10K 10/43](#) are incomplete pending reclassification of documents from group [H10K 10/00](#).
Groups [H10K 10/00](#), [H10K 10/40](#) and [H10K 10/43](#) should be considered in order to perform a complete search.
- N H10K 10/43
- • Bipolar transistors, e.g. organic bipolar junction transistors [OBJT]
- N H10K 10/46
- • Field-effect transistors, e.g. organic thin-film transistors [OTFT] ([H10K 10/43](#) takes precedence)
- N H10K 10/462
- • • {Insulated gate field-effect transistors [IGFETs]}
- N H10K 10/464
- • • • {Lateral top-gate IGFETs comprising only a single gate}
- N H10K 10/466
- • • • {Lateral bottom-gate IGFETs comprising only a single gate}
- N H10K 10/468
- • • • {characterised by the gate dielectrics}
- N H10K 10/471
- • • • • {the gate dielectric comprising only organic materials}
- N H10K 10/472
- • • • • {the gate dielectric comprising only inorganic materials}
- N H10K 10/474
- • • • • {the gate dielectric comprising a multilayered structure}
- N H10K 10/476
- • • • • • {comprising at least one organic layer and at least one inorganic layer}
- N H10K 10/478
- • • • • {the gate dielectric comprising a layer of composite material comprising interpenetrating or embedded materials, e.g. TiO₂ particles in a polymer matrix}
- N H10K 10/481
- • • • {characterised by the gate conductors}
- N H10K 10/482
- • • • • {the IGFET comprising multiple separately-addressable gate electrodes}
- N H10K 10/484
- • • • {characterised by the channel regions}
- N H10K 10/486
- • • • • {the channel region comprising two or more active layers, e.g. forming pn heterojunctions}
- N H10K 10/488
- • • • • {the channel region comprising a layer of composite material having interpenetrating or embedded materials, e.g. a mixture of donor and acceptor moieties, that form a bulk heterojunction}
- N H10K 10/491
- • • • {Vertical transistors, e.g. vertical carbon nanotube field effect transistors [CNT-FETs]}
- N H10K 10/50
- Bistable switching devices
- N H10K 10/701
- {Organic molecular electronic devices}
- Q H10K 10/80
- Constructional details
- WARNING
Group [H10K 10/80](#) is impacted by reclassification into group [H10K 77/00](#).
Groups [H10K 10/80](#) and [H10K 77/00](#) should be considered in order to perform a complete search.
- Q H10K 10/82
- • Electrodes
- WARNING
Group [H10K 10/82](#) is impacted by reclassification into group [H10K 10/86](#).
Groups [H10K 10/82](#) and [H10K 10/86](#) should be considered in order to perform a complete search.
- N H10K 10/84
- • • Ohmic electrodes, e.g. source or drain electrodes

- N H10K 10/86
- • • Schottky electrodes
- WARNING
Group [H10K 10/86](#) is incomplete pending reclassification of documents from group [H10K 10/82](#).
Groups [H10K 10/82](#) and [H10K 10/86](#) should be considered in order to perform a complete search.
- N H10K 10/88
- • Passivation; Containers; Encapsulations
- Q H10K 19/00
- Integrated devices, or assemblies of multiple devices, comprising at least one organic element specially adapted for rectifying, amplifying, oscillating or switching, covered by group [H10K 10/00](#)**
- WARNING
Group [H10K 19/00](#) is incomplete pending reclassification of documents from groups [H01L 25/04](#) and [H01L 25/18](#).
Group [H10K 19/00](#) is also impacted by reclassification into group [H10K 19/80](#).
Groups [H10K 19/00](#) and [H10K 19/80](#) should be considered in order to perform a complete search.
- N H10K 19/10
- comprising field-effect transistors
- N H10K 19/20
- comprising components having an active region that includes an inorganic semiconductor
- Q H10K 19/201
- {Integrated devices having a three-dimensional layout, e.g. 3D ICs}
- WARNING
Group [H10K 19/201](#) is impacted by reclassification into groups [H10K 39/401](#) and [H10K 59/751](#).
Groups [H10K 19/201](#), [H10K 39/401](#) and [H10K 59/751](#) should be considered in order to perform a complete search.
- Q H10K 19/202
- {Integrated devices comprising a common active layer}
- WARNING
Group [H10K 19/202](#) is impacted by reclassification into groups [H10K 39/501](#) and [H10K 59/771](#).
Groups [H10K 19/202](#), [H10K 39/501](#) and [H10K 59/771](#) should be considered in order to perform a complete search.
- N H10K 19/80
- Interconnections, e.g. terminals
- WARNING
Group [H10K 19/80](#) is incomplete pending reclassification of documents from group [H10K 19/00](#).
Groups [H10K 19/00](#) and [H10K 19/80](#) should be considered in order to perform a complete search.
- N H10K 19/901
- {Assemblies of multiple devices comprising at least one organic element specially adapted for rectifying, amplifying, oscillating or switching}
- N H10K 30/00 -
H10K 39/00
- Q H10K 30/00
- Organic radiation-sensitive devices**
- Organic devices sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation (integrated devices or assemblies of multiple devices [H10K 39/00](#), [H10K 65/00](#); electrolytic light-sensitive devices [H01G 9/20](#))**
- NOTE
This group covers organic semiconductor devices sensitive to radiation insofar as these devices are specially adapted for either:

- the conversion of the radiation energy into electrical energy; or
- the control of electrical energy by such radiation.

WARNING

Group [H10K 30/00](#) is impacted by reclassification into groups [H10K 30/50](#), [H10K 30/53](#) and [H10K 30/60](#).

Groups [H10K 30/00](#), [H10K 30/50](#), [H10K 30/53](#) and [H10K 30/60](#) should be considered in order to perform a complete search.

Q H10K 30/10

- comprising heterojunctions between organic semiconductors and inorganic semiconductors

WARNING

Group [H10K 30/10](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).

Groups [H10K 30/10](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

Q H10K 30/15

- • Sensitised wide-bandgap semiconductor devices, e.g. dye-sensitised TiO₂ (photo-electrochemical devices comprising a liquid electrolyte or a solid electrolyte [H01G 9/20](#))

WARNING

Group [H10K 30/15](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).

Groups [H10K 30/15](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

Q H10K 30/151

- • • {the wide bandgap semiconductor comprising titanium oxide, e.g. TiO₂}

WARNING

Group [H10K 30/151](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).

Groups [H10K 30/151](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

Q H10K 30/152

- • • {the wide bandgap semiconductor comprising zinc oxide, e.g. ZnO}

WARNING

Group [H10K 30/152](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).

Groups [H10K 30/152](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

Q H10K 30/20

- comprising organic-organic junctions, e.g. donor-acceptor junctions

WARNING

Group [H10K 30/20](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).

Groups [H10K 30/20](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

Q H10K 30/211

- • {comprising multiple junctions, e.g. double heterojunctions}

WARNING

Group [H10K 30/211](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).

Groups [H10K 30/211](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

- Q H10K 30/30
- comprising bulk heterojunctions, e.g. interpenetrating networks of donor and acceptor material domains
- WARNING
Group [H10K 30/30](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/30](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.
- Q H10K 30/35
- • comprising inorganic nanostructures, e.g. CdSe nanoparticles
- WARNING
Group [H10K 30/35](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/35](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.
- Q H10K 30/352
- • • {the inorganic nanostructures being nanotubes or nanowires, e.g. CdTe nanotubes in P3HT polymer}
- WARNING
Group [H10K 30/352](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/352](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.
- Q H10K 30/353
- • {comprising blocking layers, e.g. exciton blocking layers}
- WARNING
Group [H10K 30/353](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/353](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.
- Q H10K 30/354
- {comprising a metal-insulator-semiconductor [m-i-s] structure}
- WARNING
Group [H10K 30/354](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/354](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.
- Q H10K 30/40
- comprising a p-i-n structure, e.g. having a perovskite absorber between p-type and n-type charge transport layers
- WARNING
Group [H10K 30/40](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/40](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.
- Q H10K 30/451
- {comprising a metal-semiconductor-metal [m-s-m] structure}
- WARNING
Group [H10K 30/451](#) is impacted by reclassification into groups [H10K 30/50](#) and [H10K 30/53](#).
Groups [H10K 30/451](#), [H10K 30/50](#) and [H10K 30/53](#) should be considered in order to perform a complete search.

- N H10K 30/50
- Photovoltaic [PV] devices
- WARNING
Groups [H10K 30/50](#) and [H10K 30/53](#) are incomplete pending reclassification of documents from groups [H10K 30/00](#), [H10K 30/10](#), [H10K 30/15](#), [H10K 30/151](#), [H10K 30/152](#), [H10K 30/20](#), [H10K 30/211](#), [H10K 30/30](#), [H10K 30/35](#), [H10K 30/352](#), [H10K 30/353](#), [H10K 30/354](#), [H10K 30/40](#) and [H10K 30/451](#). All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 30/53
- • in the form of fibres or tubes, e.g. photovoltaic fibres
- N H10K 30/57
- • comprising multiple junctions, e.g. tandem PV cells
- N H10K 30/60
- in which radiation controls flow of current through the devices, e.g. photoresistors
- WARNING
Group [H10K 30/60](#) is incomplete pending reclassification of documents from group [H10K 30/00](#). Groups [H10K 30/00](#) and [H10K 30/60](#) should be considered in order to perform a complete search.
- N H10K 30/65
- • Light-sensitive field-effect devices, e.g. phototransistors
- Q H10K 30/671
- {Organic radiation-sensitive molecular electronic devices}
- WARNING
Group [H10K 30/671](#) is impacted by reclassification into group [H10K 50/401](#). Groups [H10K 30/671](#) and [H10K 50/401](#) should be considered in order to perform a complete search.
- Q H10K 30/80
- Constructional details
- WARNING
Group [H10K 30/80](#) is impacted by reclassification into groups [H10K 30/84](#) - [H10K 30/86](#), [H10K 30/89](#) and [H10K 77/00](#). All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 30/81
- • Electrodes
- N H10K 30/82
- • • Transparent electrodes, e.g. indium tin oxide [ITO] electrodes
- N H10K 30/821
- • • • {comprising carbon nanotubes}
- N H10K 30/83
- • • • comprising arrangements for extracting the current from the cell, e.g. metal finger grid systems to reduce the serial resistance of transparent electrodes
- N H10K 30/84
- • Layers having high charge carrier mobility
- WARNING
Groups [H10K 30/84](#) - [H10K 30/86](#) are incomplete pending reclassification of documents from group [H10K 30/80](#). All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 30/85
- • • Layers having high electron mobility, e.g. electron-transporting layers or hole-blocking layers
- N H10K 30/86
- • • Layers having high hole mobility, e.g. hole-transporting layers or electron-blocking layers
- N H10K 30/865
- • {Intermediate layers comprising a mixture of materials of the adjoining active layers}
- N H10K 30/87
- • Light-trapping means

- N H10K 30/88
- • Passivation; Containers; Encapsulations
- N H10K 30/89
- • Terminals, e.g. bond pads
- WARNING
Group [H10K 30/89](#) is incomplete pending reclassification of documents from group [H10K 30/80](#).
Groups [H10K 30/80](#) and [H10K 30/89](#) should be considered in order to perform a complete search.
- N H10K 39/00
- Integrated devices, or assemblies of multiple devices, comprising at least one organic radiation-sensitive element covered by group [H10K 30/00](#)**
- NOTE
This group only covers devices that are sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation.
- Q H10K 39/10
- Organic photovoltaic [PV] modules; Arrays of single organic PV cells
- WARNING
Group [H10K 39/10](#) is incomplete pending reclassification of documents from groups [H01L 25/04](#), [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#).
Group [H10K 39/10](#) is also impacted by reclassification into groups [H10K 39/12](#), [H10K 39/15](#) and [H10K 39/18](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 39/12
- • Electrical configurations of PV cells, e.g. series connections or parallel connections
- WARNING
Group [H10K 39/12](#) is incomplete pending reclassification of documents from group [H10K 39/10](#).
Groups [H10K 39/10](#) and [H10K 39/12](#) should be considered in order to perform a complete search.
- N H10K 39/15
- • comprising both organic PV cells and inorganic PV cells
- WARNING
Group [H10K 39/15](#) is incomplete pending reclassification of documents from group [H10K 39/10](#).
Groups [H10K 39/10](#) and [H10K 39/15](#) should be considered in order to perform a complete search.
- N H10K 39/18
- • Interconnections, e.g. terminals
- WARNING
Group [H10K 39/18](#) is incomplete pending reclassification of documents from group [H10K 39/10](#).
Groups [H10K 39/10](#) and [H10K 39/18](#) should be considered in order to perform a complete search.
- Q H10K 39/30
- Devices controlled by radiation
- WARNING
Group [H10K 39/30](#) is impacted by reclassification into group [H10K 39/38](#).
Groups [H10K 39/30](#) and [H10K 39/38](#) should be considered in order to perform a complete search.
- N H10K 39/32
- • Organic image sensors

- N H10K 39/34
- • • *integrated with organic light-emitting diodes [OLED]*
- WARNING
Group [H10K 39/34](#) is incomplete pending reclassification of documents from group [H10K 59/65](#).
Groups [H10K 59/65](#) and [H10K 39/34](#) should be considered in order to perform a complete search.
- N H10K 39/36
- • *Devices specially adapted for detecting X-ray radiation*
- N H10K 39/38
- • *Interconnections, e.g. terminals*
- WARNING
Group [H10K 39/38](#) is incomplete pending reclassification of documents from group [H10K 39/30](#).
Groups [H10K 39/30](#) and [H10K 39/38](#) should be considered in order to perform a complete search.
- N H10K 39/401
- *{Integrated devices having a three-dimensional layout, e.g. 3D ICs}*
- WARNING
Group [H10K 39/401](#) is incomplete pending reclassification of documents from group [H10K 19/201](#).
Groups [H10K 19/201](#) and [H10K 39/401](#) should be considered in order to perform a complete search.
- N H10K 39/501
- *{Integrated devices comprising a common active layer}*
- WARNING
Group [H10K 39/501](#) is incomplete pending reclassification of documents from group [H10K 19/202](#).
Groups [H10K 19/202](#) and [H10K 39/501](#) should be considered in order to perform a complete search.
- Q H10K 39/601
- *{Assemblies of multiple devices comprising at least one organic radiation-sensitive element}*
- WARNING
Group [H10K 39/601](#) is impacted by reclassification into group [H10K 39/621](#).
Groups [H10K 39/601](#) and [H10K 39/621](#) should be considered in order to perform a complete search.
- N H10K 39/621
- • *{comprising only organic radiation-sensitive elements}*
- WARNING
Group [H10K 39/621](#) is incomplete pending reclassification of documents from group [H10K 39/601](#).
Groups [H10K 39/601](#) and [H10K 39/621](#) should be considered in order to perform a complete search.
- N H10K 50/00 -
H10K 65/00
- Q H10K 50/00
- Organic light-emitting devices**
- Organic light-emitting devices (integrated devices or assemblies of multiple devices [H10K 59/00](#), [H10K 65/00](#); organic semiconductor lasers [H01S 5/36](#))**
- WARNING
Group [H10K 50/00](#) is impacted by reclassification into group [H10K 50/10](#).
Groups [H10K 50/00](#) and [H10K 50/10](#) should be considered in order to perform a complete search.

- N H10K 50/10
- OLEDs or polymer light-emitting diodes [PLED]
- WARNING
Group [H10K 50/10](#) is incomplete pending reclassification of documents from group [H10K 50/00](#).
Groups [H10K 50/00](#) and [H10K 50/10](#) should be considered in order to perform a complete search.
- N H10K 50/11
- • characterised by the electroluminescent [EL] layers
- N H10K 50/115
- • • comprising active inorganic nanostructures, e.g. luminescent quantum dots
- N H10K 50/12
- • • comprising dopants
- N H10K 50/121
- • • • {for assisting energy transfer, e.g. sensitization}
- N H10K 50/125
- • • specially adapted for multicolour light emission, e.g. for emitting white light
- N H10K 50/13
- • • • comprising stacked EL layers within one EL unit
- N H10K 50/131
- • • • • {with spacer layers between the electroluminescent layers}
- N H10K 50/135
- • • comprising mobile ions
- N H10K 50/14
- • Carrier transporting layers
- N H10K 50/15
- • • Hole transporting layers
- N H10K 50/155
- • • • comprising dopants
- N H10K 50/156
- • • • {comprising a multilayered structure}
- N H10K 50/157
- • • • {between the light-emitting layer and the cathode}
- N H10K 50/16
- • • Electron transporting layers
- N H10K 50/165
- • • • comprising dopants
- N H10K 50/166
- • • • {comprising a multilayered structure}
- N H10K 50/167
- • • • {between the light-emitting layer and the anode}
- Q H10K 50/17
- • Carrier injection layers
- WARNING
Group [H10K 50/17](#) is impacted by reclassification into group [H10K 50/171](#).
Groups [H10K 50/17](#) and [H10K 50/171](#) should be considered in order to perform a complete search.
- N H10K 50/171
- • • {Electron injection layers}
- WARNING
Group [H10K 50/171](#) is incomplete pending reclassification of documents from group [H10K 50/17](#).
Groups [H10K 50/17](#) and [H10K 50/171](#) should be considered in order to perform a complete search.
- Q H10K 50/18
- • Carrier blocking layers
- WARNING
Group [H10K 50/18](#) is impacted by reclassification into group [H10K 50/181](#).
Groups [H10K 50/18](#) and [H10K 50/181](#) should be considered in order to perform a complete search.
- N H10K 50/181
- • • {Electron blocking layers}
- WARNING
Group [H10K 50/181](#) is incomplete pending reclassification of documents from group [H10K 50/18](#).
Groups [H10K 50/18](#) and [H10K 50/181](#) should be considered in order to perform a complete search.
- N H10K 50/182
- • {OLED comprising a fiber structure}

- N H10K 50/19 • Tandem OLEDs
- N H10K 50/30 • Organic light-emitting transistors
- N H10K 50/401 • {Organic light-emitting molecular electronic devices}
- WARNING
Group [H10K 50/401](#) is incomplete pending reclassification of documents from group [H10K 30/671](#).
Groups [H10K 30/671](#) and [H10K 50/401](#) should be considered in order to perform a complete search.
- Q H10K 50/80 • Constructional details
- WARNING
Group [H10K 50/80](#) is impacted by reclassification into groups [H10K 50/88](#), [H10K 59/80](#) and [H10K 77/00](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- Q H10K 50/805 • Electrodes
- WARNING
Group [H10K 50/805](#) is impacted by reclassification into group [H10K 59/805](#).
Groups [H10K 50/805](#) and [H10K 59/805](#) should be considered in order to perform a complete search.
- Q H10K 50/81 • • Anodes
- WARNING
Group [H10K 50/81](#) is impacted by reclassification into groups [H10K 50/816](#) and [H10K 59/8051](#).
Groups [H10K 50/81](#), [H10K 50/816](#) and [H10K 59/8051](#) should be considered in order to perform a complete search.
- Q H10K 50/813 • • • characterised by their shape
- WARNING
Group [H10K 50/813](#) is impacted by reclassification into group [H10K 59/80515](#).
Groups [H10K 50/813](#) and [H10K 59/80515](#) should be considered in order to perform a complete search.
- Q H10K 50/814 • • • combined with auxiliary electrodes, e.g. ITO layer combined with metal lines
- WARNING
Group [H10K 50/814](#) is impacted by reclassification into group [H10K 59/80516](#).
Groups [H10K 50/814](#) and [H10K 59/80516](#) should be considered in order to perform a complete search.
- Q H10K 50/816 • • • Multilayers, e.g. transparent multilayers
- WARNING
Group [H10K 50/816](#) is incomplete pending reclassification of documents from group [H10K 50/81](#).
Group [H10K 50/816](#) is also impacted by reclassification into group [H10K 59/80517](#).
Groups [H10K 50/81](#), [H10K 50/816](#) and [H10K 59/80517](#) should be considered in order to perform a complete search.

- Q H10K 50/818 Reflective anodes, e.g. ITO combined with thick metallic layers
WARNING
 Group [H10K 50/818](#) is impacted by reclassification into group [H10K 59/80518](#).
 Groups [H10K 50/818](#) and [H10K 59/80518](#) should be considered in order to perform a complete search.
- Q H10K 50/82 . . . Cathodes
WARNING
 Group [H10K 50/82](#) is impacted by reclassification into group [H10K 50/826](#) and [H10K 59/8052](#).
 Groups [H10K 50/82](#), [H10K 50/826](#) and [H10K 59/8052](#) should be considered in order to perform a complete search.
- Q H10K 50/822 characterised by their shape
WARNING
 Group [H10K 50/822](#) is impacted by reclassification into group [H10K 59/80521](#).
 Groups [H10K 50/822](#) and [H10K 59/80521](#) should be considered in order to perform a complete search.
- Q H10K 50/824 combined with auxiliary electrodes
WARNING
 Group [H10K 50/824](#) is impacted by reclassification into group [H10K 59/80522](#).
 Groups [H10K 50/824](#) and [H10K 59/80522](#) should be considered in order to perform a complete search.
- Q H10K 50/826 Multilayers, e.g. opaque multilayers
WARNING
 Group [H10K 50/826](#) is incomplete pending reclassification of documents from group [H10K 50/82](#).
 Group [H10K 50/826](#) is also impacted by reclassification into group [H10K 59/80523](#).
 Groups [H10K 50/82](#), [H10K 50/826](#) and [H10K 59/80523](#) should be considered in order to perform a complete search.
- Q H10K 50/828 Transparent cathodes, e.g. comprising thin metal layers
WARNING
 Group [H10K 50/828](#) is impacted by reclassification into group [H10K 59/80524](#).
 Groups [H10K 50/828](#) and [H10K 59/80524](#) should be considered in order to perform a complete search.
- Q H10K 50/84 . . Passivation; Containers; Encapsulations
WARNING
 Group [H10K 50/84](#) is impacted by reclassification into group [H10K 59/87](#).
 Groups [H10K 50/84](#) and [H10K 59/87](#) should be considered in order to perform a complete search.
- Q H10K 50/841 . . . {Self-supporting sealing arrangements}
WARNING
 Group [H10K 50/841](#) is impacted by reclassification into groups [H10K 50/842](#), [H10K 59/871](#) and [H10K 59/872](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- N H10K 50/842
- • • Containers
- WARNING
Group [H10K 50/842](#) is incomplete pending reclassification of documents from group [H10K 50/841](#).
Groups [H10K 50/841](#) and [H10K 50/842](#) should be considered in order to perform a complete search.
- Q H10K 50/8423
- • • • {Metallic sealing arrangements}
- WARNING
Group [H10K 50/8423](#) is impacted by reclassification into group [H10K 59/8721](#).
Groups [H10K 50/8423](#) and [H10K 59/8721](#) should be considered in order to perform a complete search.
- Q H10K 50/8426
- • • • {Peripheral sealing arrangements, e.g. adhesives, sealants}
- WARNING
Group [H10K 50/8426](#) is impacted by reclassification into group [H10K 59/8722](#).
Groups [H10K 50/8426](#) and [H10K 59/8722](#) should be considered in order to perform a complete search.
- Q H10K 50/8428
- • • • {Vertical spacers, e.g. arranged between the sealing arrangement and the OLED}
- WARNING
Group [H10K 50/8428](#) is impacted by reclassification into group [H10K 59/8723](#).
Groups [H10K 50/8428](#) and [H10K 59/8723](#) should be considered in order to perform a complete search.
- Q H10K 50/844
- • • Encapsulations
- WARNING
Group [H10K 50/844](#) is impacted by reclassification into group [H10K 59/873](#).
Groups [H10K 50/844](#) and [H10K 59/873](#) should be considered in order to perform a complete search.
- Q H10K 50/8445
- • • • {multilayered coatings having a repetitive structure, e.g. having multiple organic-inorganic bilayers}
- WARNING
Group [H10K 50/8445](#) is impacted by reclassification into group [H10K 59/8731](#).
Groups [H10K 50/8445](#) and [H10K 59/8731](#) should be considered in order to perform a complete search.
- Q H10K 50/846
- • • {comprising getter material or desiccants}
- WARNING
Group [H10K 50/846](#) is impacted by reclassification into group [H10K 59/874](#).
Groups [H10K 50/846](#) and [H10K 59/874](#) should be considered in order to perform a complete search.
- Q H10K 50/85
- • Arrangements for extracting light from the devices
- WARNING
Group [H10K 50/85](#) is impacted by reclassification into group [H10K 59/875](#).

Groups [H10K 50/85](#) and [H10K 59/875](#) should be considered in order to perform a complete search.

- Q [H10K 50/852](#) . . . comprising a resonant cavity structure, e.g. Bragg reflector pair
WARNING
Group [H10K 50/852](#) is impacted by reclassification into group [H10K 59/876](#). Groups [H10K 50/852](#) and [H10K 59/876](#) should be considered in order to perform a complete search.
- Q [H10K 50/854](#) . . . comprising scattering means
WARNING
Group [H10K 50/854](#) is impacted by reclassification into group [H10K 59/877](#). Groups [H10K 50/854](#) and [H10K 59/877](#) should be considered in order to perform a complete search.
- Q [H10K 50/856](#) . . . comprising reflective means
WARNING
Group [H10K 50/856](#) is impacted by reclassification into group [H10K 59/878](#). Groups [H10K 50/856](#) and [H10K 59/878](#) should be considered in order to perform a complete search.
- Q [H10K 50/858](#) . . . comprising refractive means, e.g. lenses
WARNING
Group [H10K 50/858](#) is impacted by reclassification into group [H10K 59/879](#). Groups [H10K 50/858](#) and [H10K 59/879](#) should be considered in order to perform a complete search.
- Q [H10K 50/86](#) . . Arrangements for improving contrast, e.g. preventing reflection of ambient light
WARNING
Group [H10K 50/86](#) is impacted by reclassification into group [H10K 59/8791](#). Groups [H10K 50/86](#) and [H10K 59/8791](#) should be considered in order to perform a complete search.
- Q [H10K 50/865](#) . . . {comprising light absorbing layers, e.g. light-blocking layers}
WARNING
Group [H10K 50/865](#) is impacted by reclassification into group [H10K 59/8792](#). Groups [H10K 50/865](#) and [H10K 59/8792](#) should be considered in order to perform a complete search.
- Q [H10K 50/868](#) . . {Arrangements for polarized light emission ([H10K 50/86](#) takes precedence)}
WARNING
Group [H10K 50/868](#) is impacted by reclassification into group [H10K 59/8793](#). Groups [H10K 50/868](#) and [H10K 59/8793](#) should be considered in order to perform a complete search.
- Q [H10K 50/87](#) . . Arrangements for heating or cooling
WARNING
Group [H10K 50/87](#) is impacted by reclassification into group [H10K 59/8794](#). Groups [H10K 50/87](#) and [H10K 59/8794](#) should be considered in order to perform a complete search.

- N H10K 50/88
- • Terminals, e.g. bond pads
- WARNING
Group [H10K 50/88](#) is incomplete pending reclassification of documents from group [H10K 50/80](#).
Groups [H10K 50/80](#) and [H10K 50/88](#) should be considered in order to perform a complete search.
- Q H10K 59/00
- Integrated devices, or assemblies of multiple devices, comprising at least one organic light-emitting element covered by group [H10K 50/00](#)**
- WARNING
Group [H10K 59/00](#) is impacted by reclassification into groups [H10K 59/70](#) and [H10K 59/80 - H10K 59/88](#).
Groups [H10K 59/00](#), [H10K 59/70](#) and [H10K 59/80 - H10K 59/88](#) should be considered in order to perform a complete search.
- Q H10K 59/10
- OLED displays
- WARNING
Group [H10K 59/10](#) is impacted by reclassification into group [H10K 59/19](#).
Groups [H10K 59/10](#) and [H10K 59/19](#) should be considered in order to perform a complete search.
- Q H10K 59/12
- • Active-matrix OLED [AMOLED] displays
- WARNING
Group [H10K 59/12](#) is impacted by reclassification into groups [H10K 59/131](#) and [H10K 59/1315](#).
Groups [H10K 59/12](#), [H10K 59/131](#) and [H10K 59/1315](#) should be considered in order to perform a complete search.
- N H10K 59/1201
- • • {Manufacture or treatment}
- N H10K 59/121
- • • characterised by the geometry or disposition of pixel elements
- N H10K 59/1213
- • • • {the pixel elements being TFTs}
- N H10K 59/1216
- • • • {the pixel elements being capacitors}
- N H10K 59/122
- • • Pixel-defining structures or layers, e.g. banks
- N H10K 59/123
- • • Connection of the pixel electrodes to the thin film transistors [TFT]
- N H10K 59/124
- • • Insulating layers formed between TFT elements and OLED elements
- N H10K 59/125
- • • including organic TFTs [OTFT]
- N H10K 59/126
- • • Shielding, e.g. light-blocking means over the TFTs
- N H10K 59/127
- • • comprising two substrates, e.g. display comprising OLED array and TFT driving circuitry on different substrates
- N H10K 59/1275
- • • • {Electrical connections of the two substrates}
- N H10K 59/128
- • • comprising two independent displays, e.g. for emitting information from two major sides of the display
- N H10K 59/129
- • • Chiplets
- N H10K 59/13
- • • comprising photosensors that control luminance
- N H10K 59/131
- • • Interconnections, e.g. wiring lines or terminals
- WARNING
Group [H10K 59/131](#) is incomplete pending reclassification of documents from group [H10K 59/12](#).
Groups [H10K 59/12](#) and [H10K 59/131](#) should be considered in order to perform a complete search.

- N H10K 59/1315
- • • {comprising structures specially adapted for lowering the resistance}
- WARNING
Group [H10K 59/1315](#) is incomplete pending reclassification of documents from group [H10K 59/12](#).
Groups [H10K 59/12](#) and [H10K 59/1315](#) should be considered in order to perform a complete search.
- Q H10K 59/17
- • Passive-matrix OLED displays
- WARNING
Group [H10K 59/17](#) is impacted by reclassification into groups [H10K 59/179](#) and [H10K 59/1795](#).
Groups [H10K 59/17](#), [H10K 59/179](#) and [H10K 59/1795](#) should be considered in order to perform a complete search.
- N H10K 59/173
- • • comprising banks or shadow masks
- N H10K 59/176
- • • comprising two independent displays, e.g. for emitting information from two major sides of the display
- N H10K 59/179
- • • Interconnections, e.g. wiring lines or terminals
- WARNING
Group [H10K 59/179](#) is incomplete pending reclassification of documents from group [H10K 59/17](#).
Groups [H10K 59/17](#) and [H10K 59/179](#) should be considered in order to perform a complete search.
- N H10K 59/1795
- • • {comprising structures specially adapted for lowering the resistance}
- WARNING
Group [H10K 59/1795](#) is incomplete pending reclassification of documents from group [H10K 59/17](#).
Groups [H10K 59/17](#) and [H10K 59/1795](#) should be considered in order to perform a complete search.
- N H10K 59/18
- • Tiled displays
- N H10K 59/19
- • Segment displays
- WARNING
Group [H10K 59/19](#) is incomplete pending reclassification of documents from group [H10K 59/10](#).
Groups [H10K 59/10](#) and [H10K 59/19](#) should be considered in order to perform a complete search.
- N H10K 59/221
- • {Static displays, e.g. displaying permanent logos}
- N H10K 59/30
- • Devices specially adapted for multicolour light emission
- N H10K 59/32
- • Stacked devices having two or more layers, each emitting at different wavelengths
- N H10K 59/35
- • comprising red-green-blue [RGB] subpixels
- N H10K 59/351
- • • {comprising more than three subpixels, e.g. red-green-blue-white [RGBW]}
- N H10K 59/352
- • • {the areas of the RGB subpixels being different}
- N H10K 59/353
- • • {characterised by the geometrical arrangement of the RGB subpixels}
- N H10K 59/38
- • comprising colour filters or colour changing media [CCM]
- N H10K 59/40
- OLEDs integrated with touch screens
- N H10K 59/50
- OLEDs integrated with light modulating elements, e.g. with electrochromic elements, photochromic elements or liquid crystal elements

- N H10K 59/60
- OLEDs integrated with inorganic light-sensitive elements, e.g. with inorganic solar cells or inorganic photodiodes
- Q H10K 59/65
- • OLEDs integrated with inorganic image sensors
- WARNING
Group [H10K 59/65](#) is impacted by reclassification into group [H10K 39/34](#). Groups [H10K 59/65](#) and [H10K 39/34](#) should be considered in order to perform a complete search.
- N H10K 59/70
- OLEDs integrated with inorganic light-emitting elements, e.g. with inorganic electroluminescent elements
- WARNING
Group [H10K 59/70](#) is incomplete pending reclassification of documents from group [H10K 59/00](#). Groups [H10K 59/00](#) and [H10K 59/70](#) should be considered in order to perform a complete search.
- N H10K 59/751
- {Integrated devices having a three-dimensional layout, e.g. 3D ICs}
- WARNING
Group [H10K 59/751](#) is incomplete pending reclassification of documents from group [H10K 19/201](#). Groups [H10K 19/201](#) and [H10K 59/751](#) should be considered in order to perform a complete search.
- N H10K 59/771
- {Integrated devices comprising a common active layer}
- WARNING
Group [H10K 59/771](#) is incomplete pending reclassification of documents from group [H10K 19/202](#). Groups [H10K 19/202](#) and [H10K 59/771](#) should be considered in order to perform a complete search.
- N H10K 59/80
- Constructional details
- WARNING
Group [H10K 59/80](#) is incomplete pending reclassification of documents from groups [H10K 50/80](#) and [H10K 59/00](#). Groups [H10K 50/80](#), [H10K 59/00](#) and [H10K 59/80](#) should be considered in order to perform a complete search.
- N H10K 59/805
- • {Electrodes}
- WARNING
Group [H10K 59/805](#) is incomplete pending reclassification of documents from groups [H10K 50/805](#) and [H10K 59/00](#). Groups [H10K 50/805](#), [H10K 59/00](#) and [H10K 59/805](#) should be considered in order to perform a complete search.
- N H10K 59/8051
- • • {Anodes}
- WARNING
Group [H10K 59/8051](#) is incomplete pending reclassification of documents from groups [H10K 50/81](#) and [H10K 59/00](#). Groups [H10K 50/81](#), [H10K 59/00](#) and [H10K 59/8051](#) should be considered in order to perform a complete search.

- N H10K 59/80515 . . . {characterised by their shape}
WARNING
Group [H10K 59/80515](#) is incomplete pending reclassification of documents from groups [H10K 50/813](#) and [H10K 59/00](#).
Groups [H10K 50/813](#), [H10K 59/00](#) and [H10K 59/80515](#) should be considered in order to perform a complete search.
- N H10K 59/80516 . . . {combined with auxiliary electrodes, e.g. ITO layer combined with metal lines}
WARNING
Group [H10K 59/80516](#) is incomplete pending reclassification of documents from groups [H10K 50/814](#) and [H10K 59/00](#).
Groups [H10K 50/814](#), [H10K 59/00](#) and [H10K 59/80516](#) should be considered in order to perform a complete search.
- N H10K 59/80517 . . . {Multilayers, e.g. transparent multilayers}
WARNING
Group [H10K 59/80517](#) is incomplete pending reclassification of documents from groups [H10K 50/816](#) and [H10K 59/00](#).
Groups [H10K 50/816](#), [H10K 59/00](#) and [H10K 59/80517](#) should be considered in order to perform a complete search.
- N H10K 59/80518 . . . {Reflective anodes, e.g. ITO combined with thick metallic layers}
WARNING
Group [H10K 59/80518](#) is incomplete pending reclassification of documents from groups [H10K 50/818](#) and [H10K 59/00](#).
Groups [H10K 50/818](#), [H10K 59/00](#) and [H10K 59/80518](#) should be considered in order to perform a complete search.
- N H10K 59/8052 . . . {Cathodes}
WARNING
Group [H10K 59/8052](#) is incomplete pending reclassification of documents from groups [H10K 50/82](#) and [H10K 59/00](#).
Groups [H10K 50/82](#), [H10K 59/00](#) and [H10K 59/8052](#) should be considered in order to perform a complete search.
- N H10K 59/80521 . . . {characterised by their shape}
WARNING
Group [H10K 59/80521](#) is incomplete pending reclassification of documents from groups [H10K 50/822](#) and [H10K 59/00](#).
Groups [H10K 50/822](#), [H10K 59/00](#) and [H10K 59/80521](#) should be considered in order to perform a complete search.
- N H10K 59/80522 . . . {combined with auxiliary electrodes}
WARNING
Group [H10K 59/80522](#) is incomplete pending reclassification of documents from groups [H10K 50/824](#) and [H10K 59/00](#).
Groups [H10K 50/824](#), [H10K 59/00](#) and [H10K 59/80522](#) should be considered in order to perform a complete search.
- N H10K 59/80523 . . . {Multilayers, e.g. opaque multilayers}
WARNING
Group [H10K 59/80523](#) is incomplete pending reclassification of documents from groups [H10K 50/826](#) and [H10K 59/00](#).

Groups [H10K 50/826](#), [H10K 59/00](#) and [H10K 59/80523](#) should be considered in order to perform a complete search.

- N H10K 59/80524 . . . {Transparent cathodes, e.g. comprising thin metal layers}

WARNING

Group [H10K 59/80524](#) is incomplete pending reclassification of documents from groups [H10K 50/828](#) and [H10K 59/00](#).

Groups [H10K 50/828](#), [H10K 59/00](#) and [H10K 59/80524](#) should be considered in order to perform a complete search.

- N H10K 59/82 . . Interconnections, e.g. terminals ([H10K 59/131](#), [H10K 59/179](#) take precedence)

WARNING

Group [H10K 59/82](#) is incomplete pending reclassification of documents from group [H10K 59/00](#).

Groups [H10K 59/00](#) and [H10K 59/82](#) should be considered in order to perform a complete search.

- N H10K 59/84 . . Parallel electrical configurations of multiple OLEDs

WARNING

Group [H10K 59/84](#) is incomplete pending reclassification of documents from group [H10K 59/00](#).

Groups [H10K 59/00](#) and [H10K 59/84](#) should be considered in order to perform a complete search.

- N H10K 59/86 . . Series electrical configurations of multiple OLEDs

WARNING

Group [H10K 59/86](#) is incomplete pending reclassification of documents from group [H10K 59/00](#).

Groups [H10K 59/00](#) and [H10K 59/86](#) should be considered in order to perform a complete search.

- N H10K 59/87 . . {Passivation; Containers; Encapsulations}

WARNING

Group [H10K 59/87](#) is incomplete pending reclassification of documents from groups [H10K 50/84](#) and [H10K 59/00](#).

Groups [H10K 50/84](#), [H10K 59/00](#) and [H10K 59/87](#) should be considered in order to perform a complete search.

- N H10K 59/871 . . . {Self-supporting sealing arrangements}

WARNING

Groups [H10K 59/871](#) and [H10K 59/872](#) are incomplete pending reclassification of documents from groups [H10K 50/841](#) and [H10K 59/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- N H10K 59/872 . . . {Containers}

- N H10K 59/8721 . . . {Metallic sealing arrangements}

WARNING

Group [H10K 59/8721](#) is incomplete pending reclassification of documents from groups [H10K 50/8423](#) and [H10K 59/00](#).

Groups [H10K 50/8423](#), [H10K 59/00](#) and [H10K 59/8721](#) should be considered in order to perform a complete search.

- N H10K 59/8722 . . . {Peripheral sealing arrangements, e.g. adhesives, sealants}
- WARNING
Group [H10K 59/8722](#) is incomplete pending reclassification of documents from groups [H10K 50/8426](#) and [H10K 59/00](#).
Groups [H10K 50/8426](#), [H10K 59/00](#) and [H10K 59/8722](#) should be considered in order to perform a complete search.
- N H10K 59/8723 . . . {Vertical spacers, e.g. arranged between the sealing arrangement and the OLED}
- WARNING
Group [H10K 59/8723](#) is incomplete pending reclassification of documents from groups [H10K 50/8428](#) and [H10K 59/00](#).
Groups [H10K 50/8428](#), [H10K 59/00](#) and [H10K 59/8723](#) should be considered in order to perform a complete search.
- N H10K 59/873 . . . {Encapsulations}
- WARNING
Group [H10K 59/873](#) is incomplete pending reclassification of documents from groups [H10K 50/844](#) and [H10K 59/00](#).
Groups [H10K 50/844](#), [H10K 59/00](#) and [H10K 59/873](#) should be considered in order to perform a complete search.
- N H10K 59/8731 . . . {multilayered coatings having a repetitive structure, e.g. having multiple organic-inorganic bilayers}
- WARNING
Group [H10K 59/8731](#) is incomplete pending reclassification of documents from groups [H10K 50/8445](#) and [H10K 59/00](#).
Groups [H10K 50/8445](#), [H10K 59/00](#) and [H10K 59/8731](#) should be considered in order to perform a complete search.
- N H10K 59/874 . . . {including getter material or desiccant}
- WARNING
Group [H10K 59/874](#) is incomplete pending reclassification of documents from groups [H10K 50/846](#) and [H10K 59/00](#).
Groups [H10K 50/846](#), [H10K 59/00](#) and [H10K 59/874](#) should be considered in order to perform a complete search.
- N H10K 59/875 . . {Arrangements for extracting light from the devices}
- WARNING
Group [H10K 59/875](#) is incomplete pending reclassification of documents from groups [H10K 50/85](#) and [H10K 59/00](#).
Groups [H10K 50/85](#), [H10K 59/00](#) and [H10K 59/875](#) should be considered in order to perform a complete search.
- N H10K 59/876 . . . {comprising a resonant cavity structure, e.g. Bragg reflector pair}
- WARNING
Group [H10K 59/876](#) is incomplete pending reclassification of documents from groups [H10K 50/852](#) and [H10K 59/00](#).
Groups [H10K 50/852](#), [H10K 59/00](#) and [H10K 59/876](#) should be considered in order to perform a complete search.
- N H10K 59/877 . . . {comprising scattering means}
- WARNING
Group [H10K 59/877](#) is incomplete pending reclassification of documents from groups [H10K 50/854](#) and [H10K 59/00](#).

Groups [H10K 50/854](#), [H10K 59/00](#) and [H10K 59/877](#) should be considered in order to perform a complete search.

- N H10K 59/878
- • {comprising reflective means}
- WARNING
Group [H10K 59/878](#) is incomplete pending reclassification of documents from groups [H10K 50/856](#) and [H10K 59/00](#).
Groups [H10K 50/856](#), [H10K 59/00](#) and [H10K 59/878](#) should be considered in order to perform a complete search.
- N H10K 59/879
- • {comprising refractive means, e.g. lenses}
- WARNING
Group [H10K 59/879](#) is incomplete pending reclassification of documents from groups [H10K 50/858](#) and [H10K 59/00](#).
Groups [H10K 50/858](#), [H10K 59/00](#) and [H10K 59/879](#) should be considered in order to perform a complete search.
- N H10K 59/8791
- • {Arrangements for improving contrast, e.g. preventing reflection of ambient light}
- WARNING
Group [H10K 59/8791](#) is incomplete pending reclassification of documents from groups [H10K 50/86](#) and [H10K 59/00](#).
Groups [H10K 50/86](#), [H10K 59/00](#) and [H10K 59/8791](#) should be considered in order to perform a complete search.
- N H10K 59/8792
- • {comprising light absorbing layers, e.g. black layers}
- WARNING
Group [H10K 59/8792](#) is incomplete pending reclassification of documents from groups [H10K 50/865](#) and [H10K 59/00](#).
Groups [H10K 50/865](#), [H10K 59/00](#) and [H10K 59/8792](#) should be considered in order to perform a complete search.
- N H10K 59/8793
- • {Arrangements for polarized light emission ([H10K 59/8791](#) takes precedence)}
- WARNING
Group [H10K 59/8793](#) is incomplete pending reclassification of documents from groups [H10K 50/868](#) and [H10K 59/00](#).
Groups [H10K 50/868](#), [H10K 59/00](#) and [H10K 59/8793](#) should be considered in order to perform a complete search.
- N H10K 59/8794
- • {Arrangements for heating and cooling}
- WARNING
Group [H10K 59/8794](#) is incomplete pending reclassification of documents from groups [H10K 50/87](#) and [H10K 59/00](#).
Groups [H10K 50/87](#), [H10K 59/00](#) and [H10K 59/8794](#) should be considered in order to perform a complete search.
- N H10K 59/88
- • Dummy elements, i.e. elements having non-functional features
- WARNING
Group [H10K 59/88](#) is incomplete pending reclassification of documents from group [H10K 59/00](#).
Groups [H10K 59/00](#) and [H10K 59/88](#) should be considered in order to perform a complete search.

- Q H10K 59/90
- Assemblies of multiple devices comprising at least one organic light-emitting element
- WARNING
Group [H10K 59/90](#) is incomplete pending reclassification of documents from groups [H01L 25/04](#), [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#) and [H01L 25/18](#).
Group [H10K 59/90](#) is also impacted by reclassification into group [H10K 59/95](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 59/95
- comprising only organic light-emitting elements
- WARNING
Group [H10K 59/95](#) is incomplete pending reclassification of documents from groups [H01L 25/04](#), [H01L 25/16](#), [H01L 25/162](#), [H01L 25/165](#), [H01L 25/167](#), [H01L 25/18](#) and [H10K 59/90](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 65/00
- Integrated devices, or assemblies of multiple devices, comprising at least one organic light-emitting element and at least one organic radiation-sensitive element, e.g. organic opto-couplers (organic image sensors integrated with organic light-emitting devices [H10K 39/34](#); OLED displays integrated with photosensors [H10K 59/13](#))**
- WARNING
Group [H10K 65/00](#) is incomplete pending reclassification of documents from groups [H01L 25/04](#) and [H01L 25/18](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 71/00 -
H10K 85/00
- Manufacture or treatment; Constructional details**
- Q H10K 71/00
- Manufacture or treatment specially adapted for the organic devices covered by this subclass**
- WARNING
Group [H10K 71/00](#) is impacted by reclassification into groups [H10K 71/40](#), [H10K 71/421](#) and [H10K 71/441](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 71/10
- Deposition of organic active material
- N H10K 71/12
- using liquid deposition, e.g. spin coating
- N H10K 71/125
- {using electrolytic deposition e.g. in-situ electropolymerisation}
- N H10K 71/13
- using printing techniques, e.g. ink-jet printing or screen printing
- N H10K 71/135
- {using ink-jet printing}
- N H10K 71/15
- characterised by the solvent used
- N H10K 71/16
- using physical vapour deposition [PVD], e.g. vacuum deposition or sputtering
- N H10K 71/162
- {using laser ablation}
- N H10K 71/164
- {using vacuum deposition}
- N H10K 71/166
- {using selective deposition, e.g. using a mask}
- N H10K 71/18
- using non-liquid printing techniques, e.g. thermal transfer printing from a donor sheet

- N H10K 71/191
 - • {characterised by provisions for the orientation or alignment of the layer to be deposited}
- N H10K 71/20
 - Changing the shape of the active layer in the devices, e.g. patterning
- N H10K 71/211
 - • {by selective transformation of an existing layer}
- N H10K 71/221
 - • {by lift-off techniques}
- N H10K 71/231
 - • {by etching of existing layers}
- N H10K 71/233
 - • • {by photolithographic etching}
- N H10K 71/236
 - • • {using printing techniques, e.g. applying the etch liquid using an ink jet printer}
- N H10K 71/30
 - Doping active layers, e.g. electron transporting layers
- N H10K 71/311
 - {Purifying organic semiconductor materials}
- N H10K 71/40
 - Thermal treatment, e.g. annealing in the presence of a solvent vapour

WARNING

Groups [H10K 71/40](#), [H10K 71/421](#) and [H10K 71/441](#) are incomplete pending reclassification of documents from group [H10K 71/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- N H10K 71/421
 - • {using coherent electromagnetic radiation, e.g. laser annealing}
- N H10K 71/441
 - • {in the presence of solvent vapors, e.g. solvent vapour annealing}
- N H10K 71/50
 - Forming devices by joining two substrates together, e.g. lamination techniques
- N H10K 71/60
 - Forming conductive regions or layers, e.g. electrodes
- N H10K 71/611
 - • {using printing deposition, e.g. ink jet printing}
- N H10K 71/621
 - {Providing a shape to conductive layers, e.g. patterning or selective deposition}
- N H10K 71/70
 - Testing, e.g. accelerated lifetime tests
- N H10K 71/80
 - using temporary substrates
- N H10K 71/811
 - {Controlling the atmosphere during processing ([H10K 71/40](#) takes precedence)}
- N H10K 71/821
 - {Patterning of a layer by embossing, e.g. stamping to form trenches in an insulating layer}
- N H10K 71/831
 - {Aging}
- N H10K 71/841
 - {Applying alternating current [AC] during manufacturing or treatment}
- N H10K 71/851
 - {Division of substrate}
- N H10K 71/861
 - {Repairing}

N H10K 77/00 **Constructional details of devices covered by this subclass and not covered by groups [H10K 10/80](#), [H10K 30/80](#), [H10K 50/80](#) or [H10K 59/80](#)**

WARNING

Group [H10K 77/00](#) is incomplete pending reclassification of documents from groups [H10K 10/80](#), [H10K 30/80](#), [H10K 50/80](#) and [H10K 99/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- N H10K 77/10
 - Substrates, e.g. flexible substrates
- N H10K 77/111
 - • {Flexible substrates}

Q H10K 85/00 **Organic materials used in the body or electrodes of devices covered by this subclass**

NOTE

This group only covers organic materials for their electrical or other properties, insofar as they are specially adapted for the devices covered by this subclass.

WARNING

Group [H10K 85/00](#) is impacted by reclassification into group [H10K 85/50](#). Groups [H10K 85/00](#) and [H10K 85/50](#) should be considered in order to perform a complete search.

- N H10K 85/10 · Organic polymers or oligomers
- N H10K 85/111 · · {comprising aromatic, heteroaromatic, or aryl chains, e.g. polyaniline, polyphenylene or polyphenylene vinylene}
- N H10K 85/113 · · · {Heteroaromatic compounds comprising sulfur or selenene, e.g. polythiophene}
- N H10K 85/1135 · · · · {Polyethylene dioxythiophene [PEDOT]; Derivatives thereof}
- N H10K 85/114 · · · {Poly-phenylenevinylene; Derivatives thereof}
- N H10K 85/115 · · · {Polyfluorene; Derivatives thereof}
- N H10K 85/141 · · {comprising aliphatic or olefinic chains, e.g. poly N-vinylcarbazol, PVC or PTFE}
- N H10K 85/143 · · · {Polyacetylene; Derivatives thereof}
- N H10K 85/146 · · · {poly N-vinylcarbazol; Derivatives thereof}
- N H10K 85/151 · · {Copolymers}
- N H10K 85/154 · · {Ladder-type polymers}
- N H10K 85/20 · Carbon compounds, e.g. carbon nanotubes or fullerenes
- N H10K 85/211 · · {Fullerenes, e.g. C₆₀}
- N H10K 85/215 · · · {comprising substituents, e.g. PCBM}
- N H10K 85/221 · · {Carbon nanotubes}
- N H10K 85/225 · · · {comprising substituents}
- N H10K 85/30 · Coordination compounds
- N H10K 85/311 · · {Phthalocyanine}
- N H10K 85/321 · · {Metal complexes comprising a group IIIA element, e.g. Tris (8-hydroxyquinoline) gallium [Gaq3]}
- Q H10K 85/322 · · · {comprising boron}

WARNING

Group [H10K 85/322](#) is impacted by reclassification into group [H10K 85/658](#). Groups [H10K 85/322](#) and [H10K 85/658](#) should be considered in order to perform a complete search.

- N H10K 85/324 · · · {comprising aluminium, e.g. Alq3}
- N H10K 85/326 · · · {comprising gallium}
- N H10K 85/331 · · {Metal complexes comprising an iron-series metal, e.g. Fe, Co, Ni}
- N H10K 85/341 · · {Transition metal complexes, e.g. Ru(II)polypyridine complexes ([H10K 85/331](#) takes precedence)}
- N H10K 85/342 · · · {comprising iridium}
- N H10K 85/344 · · · {comprising ruthenium}
- N H10K 85/346 · · · {comprising platinum}
- N H10K 85/348 · · · {comprising osmium}

- N H10K 85/351 . . {Metal complexes comprising lanthanides or actinides, e.g. comprising europium}
- N H10K 85/361 . . {Polynuclear complexes, i.e. complexes comprising two or more metal centers}
- N H10K 85/371 . . {Metal complexes comprising a group IB metal element, e.g. comprising copper, gold or silver}
- N H10K 85/381 . . {Metal complexes comprising a group IIB metal element, e.g. comprising cadmium, mercury or zinc}
- N H10K 85/40 . Organosilicon compounds, e.g. TIPS pentacene
- N H10K 85/50 . Organic perovskites; Hybrid organic-inorganic perovskites [HOIP], e.g. $\text{CH}_3\text{NH}_3\text{PbI}_3$
- WARNING**
 Group [H10K 85/50](#) is incomplete pending reclassification of documents from group [H10K 85/00](#).
 Groups [H10K 85/00](#) and [H10K 85/50](#) should be considered in order to perform a complete search.
- N H10K 85/60 . Organic compounds having low molecular weight ([H10K 85/10](#) - [H10K 85/50](#) take precedence)
- N H10K 85/611 . . {Charge transfer complexes}
- N H10K 85/615 . . {Polycyclic condensed aromatic hydrocarbons, e.g. anthracene}
- N H10K 85/621 . . . {Aromatic anhydride or imide compounds, e.g. perylene tetra-carboxylic dianhydride or perylene tetracarboxylic di-imide}
- N H10K 85/622 . . . {containing four rings, e.g. pyrene}
- N H10K 85/623 . . . {containing five rings, e.g. pentacene}
- N H10K 85/624 . . . {containing six or more rings}
- N H10K 85/625 . . . {containing at least one aromatic ring having 7 or more carbon atoms, e.g. azulene}
- N H10K 85/626 . . . {containing more than one polycyclic condensed aromatic rings, e.g. bis-anthracene}
- N H10K 85/631 . . {Amine compounds having at least two aryl rest on at least one amine-nitrogen atom, e.g. triphenylamine}
- N H10K 85/633 . . . {comprising polycyclic condensed aromatic hydrocarbons as substituents on the nitrogen atom}
- N H10K 85/636 . . . {comprising heteroaromatic hydrocarbons as substituents on the nitrogen atom}
- N H10K 85/649 . . {Aromatic compounds comprising a hetero atom}
- N H10K 85/652 . . . {Cyanine dyes}
- N H10K 85/653 . . . {comprising only oxygen as heteroatom}
- N H10K 85/654 . . . {comprising only nitrogen as heteroatom ([H10K 85/652](#) takes precedence)}
- N H10K 85/655 . . . {comprising only sulfur as heteroatom}
- N H10K 85/656 . . . {comprising two or more different heteroatoms per ring ([H10K 85/652](#) takes precedence)}
- N H10K 85/6565 {Oxadiazole compounds}
- N H10K 85/657 . . . {Polycyclic condensed heteroaromatic hydrocarbons}
- N H10K 85/6572 {comprising only nitrogen in the heteroaromatic polycondensed ring system, e.g. phenanthroline or carbazole}
- N H10K 85/6574 {comprising only oxygen in the heteroaromatic polycondensed ring system, e.g. cumarine dyes}

- N H10K 85/6576
- • • {comprising only sulfur in the heteroaromatic polycondensed ring system, e.g. benzothiophene}
- N H10K 85/658
- • {Organoboranes}
- WARNING
Group [H10K 85/658](#) is incomplete pending reclassification of documents from group [H10K 85/322](#).
Groups [H10K 85/322](#) and [H10K 85/658](#) should be considered in order to perform a complete search.
- N H10K 85/701
- {Langmuir Blodgett films}
- N H10K 85/731
- {Liquid crystalline materials}
- N H10K 85/761
- {Biomolecules or bio-macromolecules, e.g. proteins, chlorophyll, lipids or enzymes}
- N H10K 85/791
- {Starburst compounds}
- Q H10K 99/00**
- Subject matter not provided for in other groups of this subclass**
- WARNING
Group [H10K 99/00](#) is impacted by reclassification into group [H10K 77/00](#).
Groups [H10K 99/00](#) and [H10K 77/00](#) should be considered in order to perform a complete search.
- N H10K 2101/00 - H10K 2101/00**
- Indexing scheme associated with group [H10K 85/00](#), relating to properties of organic materials**
- Q H10K 2101/00**
- Properties of the organic materials covered by group [H10K 85/00](#)**
- WARNING
Group [H10K 2101/00](#) is impacted by reclassification into groups [H10K 2101/20](#) - [H10K 2101/25](#), [H10K 2101/60](#), [H10K 2101/70](#) and [H10K 2102/00](#).
All groups listed in this Warning should be considered in order to perform a complete search.
- N H10K 2101/10
- Triplet emission
- N H10K 2101/20
- Delayed fluorescence emission
- WARNING
Groups [H10K 2101/20](#) and [H10K 2101/25](#) are incomplete pending reclassification of documents from group [H10K 2101/00](#).
Groups [H10K 2101/00](#), [H10K 2101/20](#) and [H10K 2101/25](#) should be considered in order to perform a complete search.
- N H10K 2101/25
- • using exciplex
- N H10K 2101/27
- {Combination of fluorescent and phosphorescent emission}
- N H10K 2101/30
- Highest occupied molecular orbital [HOMO], lowest unoccupied molecular orbital [LUMO] or Fermi energy values
- N H10K 2101/40
- Interrelation of parameters between multiple constituent active layers or sublayers, e.g. HOMO values in adjacent layers
- N H10K 2101/50
- Oxidation-reduction potentials, e.g. excited state redox potentials
- N H10K 2101/60
- Up-conversion, e.g. by triplet-triplet annihilation
- WARNING
Group [H10K 2101/60](#) is incomplete pending reclassification of documents from group [H10K 2101/00](#).
Groups [H10K 2101/00](#) and [H10K 2101/60](#) should be considered in order to perform a complete search.

- N H10K 2101/70
- Down-conversion, e.g. by singlet fission
- WARNING
Group [H10K 2101/70](#) is incomplete pending reclassification of documents from group [H10K 2101/00](#).
Groups [H10K 2101/00](#) and [H10K 2101/70](#) should be considered in order to perform a complete search.
- N H10K 2101/80
- {Composition varying spatially, e.g. having a spatial gradient}
- N H10K 2101/90
- {Multiple hosts in the emissive layer}
- N H10K 2102/00 - H10K 2102/00
- Indexing scheme associated with groups [H10K 10/80](#), [H10K 30/80](#), [H10K 50/80](#), [H10K 59/80](#) and [H10K 77/00](#), relating to constructional details**
- N H10K 2102/00
- Constructional details relating to the organic devices covered by this subclass**
- WARNING
Group [H10K 2102/00](#) is incomplete pending reclassification of documents from group [H10K 2101/00](#).
Groups [H10K 2101/00](#) and [H10K 2102/00](#) should be considered in order to perform a complete search.
- N H10K 2102/10
- Transparent electrodes, e.g. using graphene
- N H10K 2102/101
- • {comprising transparent conductive oxides [TCO]}
- N H10K 2102/102
- • • {comprising tin oxides, e.g. fluorine-doped SnO₂}
- N H10K 2102/103
- • • {comprising indium oxides, e.g. ITO}
- N H10K 2102/20
- Metallic electrodes, e.g. using a stack of layers
- N H10K 2102/301
- {Details of OLEDs}
- N H10K 2102/302
- • {of OLED structures}
- N H10K 2102/3023
- • • {Direction of light emission}
- N H10K 2102/3026
- • • • {Top emission}
- N H10K 2102/3031
- • • • {Two-side emission, e.g. transparent OLEDs [TOLED]}
- N H10K 2102/3035
- • • • {Edge emission}
- N H10K 2102/311
- • {Flexible OLED}
- N H10K 2102/321
- • {Inverted OLED, i.e. having cathode between substrate and anode}
- N H10K 2102/331
- • {Nanoparticles used in non-emissive layers, e.g. in packaging layer}
- N H10K 2102/341
- • {Short-circuit prevention}
- N H10K 2102/351
- • {Thickness}
- N H10K 2102/361
- • {Temperature}

Project: RP11944 (H01L)

- M H01L 25/00
- Assemblies consisting of a plurality of individual semiconductor or other solid state devices {; Multistep manufacturing processes thereof} (devices consisting of a plurality of solid state components formed in or on a common substrate [H01L 27/00](#); photovoltaic modules or arrays of photovoltaic cells [H01L 31/042](#) {; panels or arrays of photo electrochemical cells [H01G 9/2068](#)})**

NOTE

{This group does not cover:

- • assemblies of electronic memory devices only, which are covered by [H10B 80/00](#);
- assemblies of organic devices only, which are covered by groups [H10K 19/00](#), [H10K 39/00](#), [H10K 59/00](#) or [H10K 65/00](#);

- *assemblies of electric solid-state devices only, which are covered by groups H10N 19/00, H10N 39/00, H10N 59/00, H10N 69/00, H10N 79/00 or H10N 89/00.*
- }
- M H01L 25/03
- all the devices being of a type provided for in the same subgroup of groups [H01L 27/00](#) - ~~H01L 51/00~~ [H01L 33/00](#), or in a single subclass of [H10K](#), [H10N](#), e.g. assemblies of rectifier diodes
- C H01L 25/04
- the devices not having separate containers
- WARNING**
Group H01L 25/04 is impacted by reclassification into groups [H10K 19/00](#), [H10K 39/10](#), [H10K 59/90](#), [H10K 59/95](#) and [H10K 65/00](#). All groups listed in this Warning should be considered in order to perform a complete search.
- D H01L 25/046
- {the devices being of a type provided for in group ~~H01L 51/00~~
 - <administratively transferred to [H10K 19/901](#)>
- D H01L 25/047
- {the devices being of a type provided for in group ~~H01L 51/42~~, e.g. photovoltaic modules based on organic solar cells}
 - <administratively transferred to [H10K 39/601](#)>
- D H01L 25/048
- {the devices being of a type provided for in group ~~H01L 51/50~~, e.g. assembly of organic light emitting devices}
 - <administratively transferred to [H10K 59/90](#)>
- C H01L 25/065
- the devices being of a type provided for in group [H01L 27/00](#)
- NOTE**
Group [H01L 25/0652](#) takes precedence over groups [H01L 25/0655](#) and [H01L 25/0657](#)
- WARNING**
Group H01L 25/065 is impacted by reclassification into group [H10B 80/00](#). Groups [H01L 25/065](#) and [H10B 80/00](#) should be considered in order to perform a complete search.
- C H01L 25/0652
- {the devices being arranged next and on each other, i.e. mixed assemblies}
- WARNING**
Group [H01L 25/0652](#) is impacted by reclassification into group [H10B 80/00](#). Groups [H01L 25/0652](#) and [H10B 80/00](#) should be considered in order to perform a complete search.
- C H01L 25/0655
- {the devices being arranged next to each other}
- WARNING**
Group [H01L 25/0655](#) is impacted by reclassification into group [H10B 80/00](#). Groups [H01L 25/0655](#) and [H10B 80/00](#) should be considered in order to perform a complete search.
- C H01L 25/0657
- {Stacked arrangements of devices}
- WARNING**
Group [H01L 25/0657](#) is impacted by reclassification into group [H10B 80/00](#).

Groups H01L 25/0657 and H10B 80/00 should be considered in order to perform a complete search.

- C H01L 25/16
 - the devices being of types provided for in two or more different main groups of groups [H01L 27/00](#) - [H01L 49/00](#) {and [H01L 33/00](#), or [H01L 51/00](#)}, in a single subclass of [H10K](#), [H10N](#), e.g. forming hybrid circuits ~~{(interconnections for hybrid circuits [H01L 23/5389](#))}~~

WARNING

Groups H01L 25/16, H01L 25/162, H01L 25/165 and H01L 25/167 are impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- C H01L 25/162
 - {the devices being mounted on two or more different substrates}
- C H01L 25/165
 - {Containers}
- C H01L 25/167
 - {comprising optoelectronic devices, e.g. LED, photodiodes}
- C H01L 25/18
 - the devices being of types provided for in two or more different subgroups of the same main group of groups [H01L 27/00](#) - [H01L 51/00](#) {[H01L 33/00](#), or in a single subclass of [H10K](#), [H10N](#) (comprising devices provided for in [H01L 27/144](#) and subgroups, see [H01L 27/144](#) and subgroups)}

WARNING

Group H01L 25/18 is impacted by reclassification into groups [H10B 80/00](#), [H10K 19/00](#), [H10K 39/10](#), [H10K 59/90](#), [H10K 59/95](#), [H10K 65/00](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

Project: RP11945 (H01L)

- D H01L 27/22
 - including components using galvano-magnetic effects, e.g. Hall effects; using similar magnetic field effects
 - <administratively transferred to [H10B 61/00](#) and [H10N 59/00](#)>
- D H01L 27/222
 - {Magnetic non-volatile memory structures, e.g. MRAM}
 - <administratively transferred to [H10B 61/00](#)>
- D H01L 27/224
 - • {comprising two-terminal components, e.g. diodes, MIM elements}
 - <administratively transferred to [H10B 61/10](#)>
- D H01L 27/226
 - • • {comprising multi-terminal components, e.g. transistors}
 - <administratively transferred to [H10B 61/20](#)>
- D H01L 27/228
 - • • • {of the field-effect transistor type}
 - <administratively transferred to [H10B 61/22](#)>
- D H01L 27/24
 - including solid-state components for rectifying, amplifying or switching without a potential-jump barrier or surface barrier, {e.g. resistance-switching non-volatile memory structures}
 - <administratively transferred to [H10B 63/00](#)>
- D H01L 27/2409
 - • {comprising two-terminal selection components, e.g. diodes}
 - <administratively transferred to [H10B 63/20](#)>
- D H01L 27/2418
 - • • {of the metal-insulator-metal type}
 - <administratively transferred to [H10B 63/22](#)>

- D H01L 27/2427 . . . {of the Ovonic threshold switching type}
<administratively transferred to [H10B 63/24](#)>
- D H01L 27/2436 . . {comprising multi-terminal selection components, e.g. transistors}
<administratively transferred to [H10B 63/30](#)>
- D H01L 27/2445 . . . {of the bipolar type}
<administratively transferred to [H10B 63/32](#)>
- D H01L 27/2454 . . . {of the vertical channel field-effect transistor type}
<administratively transferred to [H10B 63/34](#)>
- D H01L 27/2463 . . {Arrangements comprising multiple bistable or multistable switching components of the same type on a plane parallel to the substrate, e.g. cross-point arrays, details of the horizontal layout}
<administratively transferred to [H10B 63/80](#)>
- D H01L 27/2472 . . . {the switching components having a common active material layer}
<administratively transferred to [H10B 63/82](#)>
- D H01L 27/2481 . . . {arranged in a direction perpendicular to the substrate, e.g. 3D cell arrays, details of the vertical layout}
<administratively transferred to [H10B 63/84](#)>
- D H01L 27/249 {the switching components being connected to a common vertical conductor}
<administratively transferred to [H10B 63/845](#)>