

**CPC****COOPERATIVE PATENT CLASSIFICATION****G03F**

**PHOTOMECHANICAL PRODUCTION OF TEXTURED OR PATTERNED SURFACES, e.g. FOR PRINTING, FOR PROCESSING OF SEMICONDUCTOR DEVICES ; MATERIALS THEREFOR ; ORIGINALS THEREFOR ; APPARATUS SPECIALLY ADAPTED THEREFOR ;** ( phototypographic composing devices [B41B](#) ; photosensitive materials or processes for photographic purposes [G03C](#) ; electrophotography, sensitive layers or processes therefor [G03G](#) )

**NOTE**

In this subclass, the following terms or expressions are used with the meanings indicated :

- "photosensitive" means not only sensitive to electro-magnetic radiation but also to corpuscular radiation;
- "photosensitive compositions" covers photosensitive substances, e.g. quinonediazides, and, if applicable, binders or additives;
- "photosensitive materials" covers the photosensitive compositions, e.g. photoresists, the bases carrying them and, if applicable, auxiliary layers.

**WARNING**

The following IPC groups are not used in the CPC system. Subject matter covered by these groups is classified in the following CPC groups :

[G03F 3/08](#) covered by [H04N 1/46](#)  
[G03F 7/207](#) " [G03F 7/20](#)  
[G03F 7/23](#) " [G03F 7/22](#)  
[G03F 9/02](#) " [G03F 9/00](#)

**Guidance heading:****G03F 1/00**

**Originals for photomechanical production of textured or patterned surfaces, e.g., masks, photo-masks, reticles ; Mask blanks or pellicles therefor ; Containers specially adapted therefor ; Preparation thereof**

**NOTE**

In this main group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place

**WARNING**

Groups [G03F 1/02](#) - [G03F 1/16](#) are no longer used for classification of new documents as from January, 1, 2012. The backfile is being progressively transferred to new groups as follows : - [G03F 1/02](#) : [G03F 1/88](#) - [G03F 1/04](#) : [G03F 1/90](#) - [G03F 1/06](#) : [G03F 1/92](#) - [G03F 1/08](#) - [G03F 1/16](#) : [G03F 1/20](#) - [G03F 1/86](#)

**G03F 1/0007**

. { using an elastic substrate or involving an optical distortion, e.g. for printing on non

flat surfaces }

- G03F 1/0015 . { by drawing, writing, e.g. on a photosensitive surface, or by engraving, e.g. using a stylus; using a typewriter; using chemical copy sheet }
- G03F 1/0023 .. { the masking pattern being obtained by the application of an ink, e.g. by traditional printing, by ink jet printing, by using a typewriter, or by the selective application of a powder, e.g. a toner }
- G03F 1/003 .. { the masking pattern being obtained by thermal means, e.g. by laser ablation ( thermal transfer from a ribbon, e.g. [G03F 1/0023](#) ) }
- G03F 1/0038 .. { using chemical means, e.g. chemical camera copying }
- G03F 1/0046 . { Phase shift masks }
- G03F 1/0053 .. { Hybrid phase shift masks, i.e. combining plural types of phase-shifting pattern in a single common pattern }

#### **NOTE**

- in this group the term "hybrid" is meant to involve the combination of plural types of phase-shifting pattern in a single common pattern; a mere structural, e.g. geometrical, association of masks with separate patterns is not considered hybrid;  
 - hybrid masks combining a binary pattern with a phase-shifting pattern are only classified in the group corresponding to the phase-shifting aspect, the binary pattern being considered a trivial feature in this context

- G03F 1/0061 .. { Alternating phase shift masks, i.e. Levenson-Shibuya type }
- G03F 1/0069 ... { Auxiliary patterns or specific arrangements of the phase-shifting elements to avoid phase-conflicts, i.e. phase-shifter layout strategies for alternating masks }
- G03F 1/0076 .. { Masks with semi-transparent phase shifters, i.e. attenuated phase-shifting masks }
- G03F 1/0084 .. { Masks where at least part of the patterns comprise no opaque or semi-opaque pattern elements, i.e. phase-edge masks }
- G03F 1/0092 . { Auxiliary processes relating to originals, e.g. repair, washing or inspection }
- G03F 1/02 . by photographic processes for production of originals simulating relief
- G03F 1/04 . by montage processes
- G03F 1/06 . from printing surfaces, { e.g. using a heat or pressure sensitive foil, by pulling an impression, e.g. on a photosensitive sheet }
- G03F 1/08 . Originals having inorganic imaging layers, e.g. chrome masks ( [G03F 1/12](#) takes precedence; { X-Ray absorbers [G03F 1/148](#) } )
- G03F 1/10 . by exposing and washing out pigmented or coloured organic layers ; by colouring macromolecular patterns

- G03F 1/103 . . { the masking pattern being obtained by modification of the polymeric pattern by energetic means, e.g. by carbonisation or by ion implantation }
- G03F 1/106 . . { the masking means, e.g. the dye or pigment being incorporated into the photosensitive material }
- G03F 1/12 . by exposing silver-halide-containing photosensitive materials or diazo-type materials
- G03F 1/14 . Originals characterised by structural details, e.g. supports, cover layers, pellicle rings
- G03F 1/142 . . { Pellicles, pellicle rings or continuous protective layers }
- G03F 1/144 . . { Auxiliary patterns; Corrected patterns, e.g. proximity correction, grey level masks ( [G03F 1/0046](#) , [G03F 1/146](#) , [G03F 9/00](#) take precedence ) }
- G03F 1/146 . . { Originals for X-Ray exposures, X-Ray masks }
- G03F 1/148 . . . { X-Ray absorbers }
- G03F 1/16 . Originals having apertures, e.g. for corpuscular lithography
- G03F 1/20 . Masks or mask blanks for imaging by charged particle beam [CPB] radiation, e.g. by electron beam ; Preparation thereof
- G03F 1/22 . Masks or mask blanks for imaging by radiation of 100nm or shorter wavelength, e.g. X-ray masks, extreme ultra-violet [EUV] masks ; Preparation thereof
- G03F 1/24 . . Reflection masks ; Preparation thereof
- G03F 1/26 . Phase shift masks [PSM] ; PSM blanks ; Preparation thereof
- G03F 1/28 . . with three or more diverse phases on the same PSM ; Preparation thereof
- G03F 1/29 . . Rim PSM or outrigger PSM ; Preparation thereof
- G03F 1/30 . . Alternating PSM, e.g. Levenson-Shibuya PSM ; Preparation thereof
- G03F 1/32 . . Attenuating PSM [att-PSM], e.g. halftone PSM or PSM having semi-transparent phase shift portion, ; Preparation thereof
- G03F 1/34 . . Phase-edge PSM, e.g. chromeless PSM ; Preparation thereof
- G03F 1/36 . Masks having proximity correction features ; Preparation thereof, e.g. optical proximity correction [OPC] design processes
- G03F 1/38 . Masks having auxiliary features, e.g. special coatings or marks for alignment or testing ; Preparation thereof
- G03F 1/40 . . Electrostatic discharge [ESD] related features, e.g. antistatic coatings or a conductive metal layer around the periphery of the mask substrate
- G03F 1/42 . . Alignment or registration features, e.g. alignment marks on the mask substrate
- G03F 1/44 . . Testing or measuring features, e.g. grid patterns, focus monitors, sawtooth scales or notched scales
- G03F 1/46 . . Antireflective coatings
- G03F 1/48 . . Protective coatings
- G03F 1/50 . Mask blanks not covered by [G03F 1/20](#) - [G03F 1/34](#) ; Preparation thereof
- G03F 1/52 . Reflectors
- G03F 1/54 . Absorbers, e.g. of opaque material

- G03F 1/56 . . Organic absorbers, e.g. of photo-resist
- G03F 1/58 . . having two or more different absorber layers, e.g. stacked multilayer absorber
- G03F 1/60 . Substrates
- G03F 1/62 . Pellicles, e.g. pellicle assemblies, e.g. having membrane on support frame ; Preparation thereof
- G03F 1/64 . . characterised by the frames, e.g. structure or material, including bonding means therefor
- G03F 1/66 . Containers specially adapted for masks, mask blanks or pellicles ; Preparation thereof
- G03F 1/68 . Preparation processes not covered by groups [G03F 1/20](#) - [G03F 1/50](#)
- G03F 1/70 . . Adapting basic layout or design of masks to lithographic process requirement, e.g., second iteration correction of mask patterns for imaging
- G03F 1/72 . . Repair or correction of mask defects
- G03F 1/74 . . . by charged particle beam [CPB], e.g. focused ion beam
- G03F 1/76 . . Patterning of masks by imaging
- G03F 1/78 . . . by charged particle beam [CPB], e.g. electron beam patterning of masks
- G03F 1/80 . . Etching
- G03F 1/82 . . Auxiliary processes, e.g. cleaning or inspecting
- G03F 1/84 . . . Inspecting
- G03F 1/86 . . . . by charged particle beam [CPB]
- G03F 1/88 . prepared by photographic processes for production of originals simulating relief
- G03F 1/90 . prepared by montage processes
- G03F 1/92 . prepared from printing surfaces
- G03F 3/00** **Colour separation ; Correction of tonal value** ( [photographic copying apparatus in general G03B](#) )
- G03F 3/02 . by retouching
- G03F 3/04 . by photographic means
- G03F 3/06 . . by masking
- G03F 3/10 . Checking the colour or tonal value of separation negatives or positives
- G03F 3/101 . . { Colour or tonal value checking by non-photographic means or by means other than using non-impact printing methods or duplicating or marking methods covered by [B41M 5/00](#) }
- G03F 3/102 . . { Lamination or delamination method or apparatus for colour proofing systems }
- G03F 3/103 . . { using tonable photoresist or photopolymerisable systems }
- G03F 3/105 . . { using electro photographic materials }
- G03F 3/106 . . { using non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, other than silicon containing compounds }
- G03F 3/107 . . { using silver halide photosensitive materials }

- G03F 3/108 . . { using a non-impact printing method, e.g. ink jet, using duplicating or marking methods covered by [B41M 5/00](#) , e.g. by ablation or by thermographic means }
- G03F 5/00 Screening processes ; Screens therefor { ( plates or light sensitive layers with incorporated screen [G03F 7/004](#) ) }**
- G03F 5/02 . by projection methods ( [cameras G03B](#) )
- G03F 5/04 . . changing the screen effect
- G03F 5/06 . . changing the diaphragm effect
- G03F 5/08 . . using line screens
- G03F 5/10 . . using cross-line screens
- G03F 5/12 . . using other screens, e.g. granulated screen
- G03F 5/14 . by contact methods
- G03F 5/16 . . using grey half-tone screens
- G03F 5/18 . . using colour half-tone screens
- G03F 5/20 . using screens for gravure printing
- G03F 5/22 . combining several screens ; Elimination of moirè
- G03F 5/24 . by multiple exposure, e.g. combined processes for line photo and screen
- G03F 7/00 Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, e.g. printing surfaces ; Materials therefor, e.g. comprising photoresists ; Apparatus specially adapted therefor ( using photoresist structures for special production processes, see the relevant places, e.g. [B44C](#) , [H01L](#) , e.g. [H01L 21/00](#) , [H05K](#) )**
- G03F 7/0002 . { Lithographic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping }
- G03F 7/0005 . { Production of optical devices or components in so far as characterised by the lithographic processes or materials used therefor }
- G03F 7/0007 . . { Filters, e.g. additive colour filters; Components for display devices }
- G03F 7/001 . . { Phase modulating patterns, e.g. refractive index patterns }
- G03F 7/0012 . { Processes making use of the tackiness of the photolithographic materials, e.g. for mounting; Packaging for photolithographic material; Packages obtained by processing photolithographic materials }
- G03F 7/0015 . { Production of aperture devices, microporous systems or stamps }
- G03F 7/0017 . { for the production of embossing, cutting or similar devices; for the production of casting means }
- G03F 7/002 . { using materials containing microcapsules; Preparing or processing such materials, e.g. by pressure; Devices or apparatus specially designed therefor }
- G03F 7/0022 . . { Devices or apparatus }

G03F 7/0025	...	{ characterised by means for coating the developer }
G03F 7/0027	...	{ characterised by pressure means }
G03F 7/003	...	{ characterised by storage means for the light sensitive material, e.g. cartridges }
G03F 7/0032	...	{ characterised by heat providing or glossing means }
G03F 7/0035	.	{ Multiple processes, e.g. applying a further resist layer on an already in a previously step, processed pattern or textured surface }
G03F 7/0037	.	{ Production of three-dimensional images }
G03F 7/004	.	Photosensitive materials ( <a href="#">G03F 7/12</a> , <a href="#">G03F 7/14</a> take precedence )
G03F 7/0041	..	{ providing an etching agent upon exposure ( <a href="#">G03F 7/075</a> takes precedence; photolytic halogen compounds <a href="#">G03F 7/0295</a> ) }
G03F 7/0042	..	{ with inorganic or organometallic light-sensitive compounds not otherwise provided for, e.g. inorganic resists ( <a href="#">G03F 7/075</a> takes precedence ) }
G03F 7/0043	...	{ Chalcogenides; Silicon, germanium, arsenic or derivatives thereof; Metals, oxides or alloys thereof ( <a href="#">G03F 7/0044</a> takes precedence ) }
G03F 7/0044	...	{ involving an interaction between the metallic and non-metallic component, e.g. photodope systems }
G03F 7/0045	..	{ with organic non-macromolecular light-sensitive compounds not otherwise provided for, e.g. dissolution inhibitors }
G03F 7/0046	..	{ with perfluoro compounds, e.g. for dry lithography ( <a href="#">G03F 7/0048</a> takes precedence ) }
G03F 7/0047	..	{ characterised by additives for obtaining a metallic or ceramic pattern, e.g. by firing }
G03F 7/0048	..	{ characterised by the solvents or agents facilitating spreading, e.g. tensio-active agents }
G03F 7/008	..	Azides ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/0085	...	{ characterised by the non-macromolecular additives }
G03F 7/012	...	Macromolecular azides ; Macromolecular additives, e.g. binders { ( <a href="#">G03F 7/0085</a> takes precedence ) }
G03F 7/0125	....	{ characterised by the polymeric binder or the macromolecular additives other than the macromolecular azides }
G03F 7/016	..	Diazonium salts or compounds ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/0163	...	{ Non ionic diazonium compounds, e.g. diazosulphonates; Precursors thereof, e.g. triazenes }
G03F 7/0166	...	{ characterised by the non-macromolecular additives }
G03F 7/021	...	Macromolecular diazonium compounds ; Macromolecular additives, e.g. binders { <a href="#">G03F 7/0166</a> takes precedence }
G03F 7/0212	....	{ characterised by the polymeric binder or the macromolecular additives other than the diazo resins or the polymeric diazonium compounds }
G03F 7/0215	.....	{ Natural gums; Proteins, e.g. gelatins; Macromolecular carbohydrates, e.g. cellulose; Polyvinyl alcohol and derivatives thereof, e.g. polyvinylacetals }
G03F 7/0217	.....	{ Polyurethanes; Epoxy resins }
G03F 7/022	..	Quinonediazides ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/0223	...	Iminoquinonediazides ; Para-quinonediazides]

G03F 7/0226	...	{ characterised by the non-macromolecular additives }
G03F 7/023	...	Macromolecular quinonediazides ; Macromolecular additives, e.g. binders { ( <a href="#">G03F 7/0226</a> takes precedence ) }
G03F 7/0233	....	{ characterised by the polymeric binders or the macromolecular additives other than the macromolecular quinonediazides }
G03F 7/0236	.....	{ Condensation products of carbonyl compounds and phenolic compounds, e.g. novolak resins }
G03F 7/025	..	Non-macromolecular photopolymerisable compounds having carbon-to-carbon triple bonds, e.g. acetylenic compounds ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/027	..	Non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, e.g. ethylenic compounds ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/0275	...	{ with dithiol or polysulfide compounds }
G03F 7/028	...	with photosensitivity-increasing substances, e.g. photoinitiators
G03F 7/0285	....	{ Silver salts, e.g. a latent silver salt image }
G03F 7/029	....	Inorganic compounds ; Onium compounds ; Organic compounds having hetero atoms other than oxygen, nitrogen or sulfur
G03F 7/0295	.....	{ Photolytic halogen compounds }
G03F 7/031	....	Organic compounds not covered by group <a href="#">G03F 7/029</a>
G03F 7/032	...	with binders
G03F 7/0325	....	{ the binders being polysaccharides, e.g. cellulose }
G03F 7/033	....	the binders being polymers obtained by reactions only involving carbon-to-carbon unsaturated bonds, e.g. vinyl polymers
G03F 7/035	...	the binders being polyurethanes
G03F 7/037	...	the binders being polyamides or polyimides
G03F 7/038	..	Macromolecular compounds which are rendered insoluble or differentially wettable ( <a href="#">G03F 7/075</a> takes precedence; macromolecular azides <a href="#">G03F 7/012</a> ; macromolecular diazonium compounds <a href="#">G03F 7/021</a> )
G03F 7/0381	...	{ using a combination of a phenolic resin and a polyoxyethylene resin }
G03F 7/0382	...	{ the macromolecular compound being present in a chemically amplified negative photoresist composition }
G03F 7/0384	...	{ with ethylenic or acetylenic bands in the main chain of the photopolymer }
G03F 7/0385	...	{ using epoxydised novolak resin }
G03F 7/0387	...	{ Polyamides or polyimides }
G03F 7/0388	...	{ with ethylenic or acetylenic bands in the side chains of the photopolymer }
G03F 7/039	..	Macromolecular compounds which are photodegradable, e.g. positive electron resists ( <a href="#">G03F 7/075</a> takes precedence; macromolecular quinonediazides <a href="#">G03F 7/023</a> )
G03F 7/0392	...	{ the macromolecular compound being present in a chemically amplified positive photoresist composition }
G03F 7/0395	....	{ the macromolecular compound having a backbone with alicyclic moieties }
G03F 7/0397	.....	{ the alicyclic moiety being in a side chain }
G03F 7/04	..	Chromates ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/06	..	Silver salts ( <a href="#">G03F 7/075</a> takes precedence )
G03F 7/063	...	{ Additives or means to improve the lithographic properties; Processing solutions characterised by such additives; Treatment after development or transfer, e.g. finishing, washing; Correction or deletion fluids }
G03F 7/066	....	{ Organic derivatives of bivalent sulfur, e.g. onium derivatives }



- G03F 7/07 . . . used for diffusion transfer { ( [G03F 7/063](#) takes precedence ) }
- G03F 7/075 . . Silicon-containing compounds
- G03F 7/0751 . . . { used as adhesion-promoting additives or as means to improve adhesion }
- G03F 7/0752 . . . { in non photosensitive layers or as additives, e.g. for dry lithography }
- G03F 7/0754 . . . { Non-macromolecular compounds containing silicon-to-silicon bonds ( [G03F 7/0752](#) takes precedence ) }
- G03F 7/0755 . . . { Non-macromolecular compounds containing Si-O, Si-C or Si-N bonds ( [G03F 7/0752](#) takes precedence ) }
- G03F 7/0757 . . . { Macromolecular compounds containing Si-O, Si-C or Si-N bonds ( [G03F 7/0752](#) takes precedence ) }
- G03F 7/0758 . . . . { with silicon- containing groups in the side chains }
- G03F 7/085 . . Photosensitive compositions characterised by adhesion-promoting non-macromolecular additives ( [G03F 7/075](#) takes precedence )
- G03F 7/09 . . characterised by structural details, e.g. supports, auxiliary layers ( supports for printing plates in general [B41N](#) )
- G03F 7/091 . . . { characterised by antireflection means or light filtering or absorbing means, e.g. anti-halation, contrast enhancement }
- G03F 7/092 . . . { characterised by backside coating or layers, by lubricating-slip layers or means, by oxygen barrier layers or by stripping-release layers or means }
- G03F 7/093 . . . { characterised by antistatic means, e.g. for charge depletion }
- G03F 7/094 . . . { Multilayer resist systems, e.g. planarising layers }
- G03F 7/095 . . . having more than one photosensitive layer ( [G03F 7/075](#) takes precedence )
- G03F 7/0952 . . . . { comprising silver halide or silver salt based image forming systems, e.g. for camera speed exposure }
- G03F 7/0955 . . . . { one of the photosensitive systems comprising a non-macromolecular photopolymerisable compound having carbon-to-carbon double bonds, e.g. ethylenic compounds }
- G03F 7/0957 . . . . { with sensitive layers on both sides of the substrate }
- G03F 7/105 . . . having substances, e.g. indicators, for forming visible images
- G03F 7/11 . . . having cover layers or intermediate layers, e.g. subbing layers { ( [G03F 7/091](#) to [G03F 7/093](#) , [B41N 3/03](#) take precedence ) }
- G03F 7/115 . . . having supports or layers with means for obtaining a screen effect or for obtaining better contact in vacuum printing
- G03F 7/12 . Production of screen printing forms or similar printing forms, e.g. stencils
- G03F 7/14 . Production of collotype printing forms
- G03F 7/16 . Coating processes ; Apparatus therefor ( applying coatings to base materials in general [B05](#) ; applying photosensitive compositions to base for photographic purposes [G03C 1/74](#) )
- G03F 7/161 . . { using a previously coated surface, e.g. by stamping or by transfer lamination }
- G03F 7/162 . . { Coating on a rotating support, e.g. using a whirler or a spinner }
- G03F 7/164 . . { using electric, electrostatic or magnetic means; powder coating }
- G03F 7/165 . . { Monolayers, e.g. Langmuir-Blodgett }
- G03F 7/167 . . { from the gas phase, by plasma deposition ( [G03F 7/2035](#) takes precedence ) }
- G03F 7/168 . . { Finishing the coated layer, e.g. drying, baking, soaking }



- G03F 7/18           ..     Coating curved surfaces
- G03F 7/20           .     Exposure ; Apparatus therefor ( [photographic printing apparatus for making copies G03B 27/00](#) )
- G03F 7/2002        ..     { with visible light or UV light, through an original having an opaque pattern on a transparent support, e.g. film printing, projection printing; by reflection of visible or UV light from an original such as a printed image }
- G03F 7/2004        ...     { characterised by the use of a particular light source, e.g. fluorescent lamps or deep UV light }
- G03F 7/2006        ....    { using coherent light; using polarised light }
- G03F 7/2008        ...     { characterised by the reflectors, diffusers, light or heat filtering means or anti-reflective means used }
- G03F 7/201         ...     { characterised by an oblique exposure; characterised by the use of plural sources; characterised by the rotation of the optical device; characterised by a relative movement of the optical device, the light source, the sensitive system or the mask }
- G03F 7/2012        ...     { using liquid photohardening compositions, e.g. for the production of reliefs such as flexographic plates or stamps }
- G03F 7/2014        ...     { Contact or film exposure of light sensitive plates such as lithographic plates or circuit boards, e.g. in a vacuum frame }
- G03F 7/2016        ....    { Contact mask being integral part of the photosensitive element and subject to destructive removal during post-exposure processing }
- G03F 7/2018        .....   { Masking pattern obtained by selective application of an ink or a toner, e.g. ink jet printing }
- G03F 7/202         .....   { Masking pattern being obtained by thermal means, e.g. laser ablation }
- G03F 7/2022        ..     { Multi-step exposure, e.g. hybrid; backside exposure; blanket exposure, e.g. for image reversal; edge exposure, e.g. for edge bead removal; corrective exposure }
- G03F 7/2024        ...     { of the already developed image }
- G03F 7/2026        ...     { for the removal of unwanted material, e.g. image or background correction }
- G03F 7/2028        ....    { of an edge bead on wafers }
- G03F 7/203         ...     { comprising an imagewise exposure to electromagnetic radiation or corpuscular radiation }
- G03F 7/2032        ...     { Simultaneous exposure of the front side and the backside }
- G03F 7/2035        ..     { simultaneous coating and exposure; using a belt mask, e.g. endless }
- G03F 7/2037        ..     { Exposure with X-ray radiation or corpuscular radiation, through a mask with a pattern opaque to that radiation }
- G03F 7/2039        ...     { X-ray radiation }
- G03F 7/2041        ..     { in the presence of a fluid, e.g. immersion; using fluid cooling means }
- G03F 7/2043        ...     { with the production of a chemical active agent from a fluid, e.g. an etching agent; with material deposition from the fluid phase, e.g. contamination resists }
- G03F 7/2045        ..     { using originals with apertures, e.g. stencil exposure masks }
- G03F 7/2047        ...     { Exposure with radiation other than visible light or UV light, e.g. shadow printing, proximity printing }
- G03F 7/2049        ..     { using a cantilever }
- G03F 7/2051        ..     { Exposure without an original mask, e.g. using a programmed deflection of a point source, by scanning, by drawing with a light beam, using an addressed light or corpuscular source ( [G03F 7/70](#) takes precedence ) }
- G03F 7/2053        ...     { using a laser ( [ablative removal B41C](#) ) }

- G03F 7/2055 . . . . { for the production of printing plates; Exposure of liquid photohardening compositions }
- G03F 7/2057 . . . { using an addressed light valve, e.g. a liquid crystal device }
- G03F 7/2059 . . . { using a scanning corpuscular radiation beam, e.g. an electron beam }
- G03F 7/2061 . . . . { Electron scattering (proximity) correction or prevention methods }
- G03F 7/2063 . . . . { for the production of exposure masks or reticles }
- G03F 7/2065 . . . . { using corpuscular radiation other than electron beams }
- G03F 2007/2067 . . Apparatus for microlithography
- G03F 7/213 . . Exposing with the same light pattern different positions of the same surface at the same time { [G03F 7/70](#) takes precedence }
- G03F 7/22 . . Exposing sequentially with the same light pattern different positions of the same surface { [G03F 7/70](#) takes precedence }
- G03F 7/24 . . Curved surfaces { [G03F 7/70](#) takes precedence }
- G03F 7/26 . Processing photosensitive materials ; Apparatus therefor ( [G03F 7/12](#) to [G03F 7/24](#) take precedence )
- G03F 7/265 . . { Selective reaction with inorganic or organometallic reagents after image-wise exposure, e.g. silylation }
- G03F 7/28 . . for obtaining powder images ( [G03F 3/10](#) takes precedence )
- G03F 7/30 . . Imagewise removal using liquid means
- G03F 7/3007 . . . { combined with electrical means, e.g. force fields }
- G03F 7/3014 . . . { combined with ultrasonic means }
- G03F 7/3021 . . . { from a wafer supported on a rotating chuck }
- G03F 7/3028 . . . . { characterised by means for on-wafer monitoring of the processing }
- G03F 7/3035 . . . { from printing plates fixed on a cylinder or on a curved surface; from printing cylinders }
- G03F 7/3042 . . . { from printing plates transported horizontally through the processing stations }
- G03F 7/305 . . . . { characterised by the brushing or rubbing means }
- G03F 7/3057 . . . . { characterised by the processing units other than the developing unit, e.g. washing units }
- G03F 7/3064 . . . . { characterised by the transport means or means for confining the different units, e.g. to avoid the overflow }
- G03F 7/3071 . . . . { Process control means, e.g. for replenishing }
- G03F 7/3078 . . . . { Processing different kinds of plates, e.g. negative and positive plates, in the same machine }
- G03F 7/3085 . . . { from plates or webs transported vertically; from plates suspended or immersed vertically in the processing unit }
- G03F 7/3092 . . . { Recovery of material; Waste processing }
- G03F 7/32 . . . Liquid compositions therefor, e.g. developers
- G03F 7/322 . . . . { Aqueous alkaline compositions }
- G03F 7/325 . . . . { Non-aqueous compositions }
- G03F 7/327 . . . . . { Non-aqueous alkaline compositions, e.g. anhydrous quaternary ammonium salts }
- G03F 7/34 . . Imagewise removal by selective transfer, e.g. peeling away
- G03F 7/343 . . . { Lamination or delamination methods or apparatus for photolithographic photosensitive material }

- G03F 7/346 . . . { using photosensitive materials other than non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds }
- G03F 7/36 . . . Imagewise removal not covered by groups [G03F 7/30](#) to [G03F 7/34](#) , e.g. using gas streams, using plasma
- G03F 7/38 . . . Treatment before imagewise removal, e.g. prebaking { ( [G03F 7/265](#) takes precedence ) }
- G03F 7/40 . . . Treatment after imagewise removal, e.g. baking
- G03F 7/405 . . . { Treatment with inorganic or organometallic reagents after imagewise removal }
- G03F 7/42 . . . Stripping or agents therefor

**NOTE**

Stripping involving the use of a combination of means, e.g. plasma and radiation, is classified in group [G03F 7/42](#) only

- G03F 7/421 . . . { using biological means only, e.g. enzymes }
- G03F 7/422 . . . { using liquids only ( [G03F 7/421](#) takes precedence ) }
- G03F 7/423 . . . . { containing mineral acids or salts thereof, containing mineral oxidizing substances, e.g. peroxy compounds }
- G03F 7/425 . . . . { containing mineral alkaline compounds; containing organic basic compounds, e.g. quaternary ammonium compounds; containing heterocyclic basic compounds containing nitrogen }
- G03F 7/426 . . . . { containing organic halogen compounds; containing organic sulfonic acids or salts thereof; containing sulfoxides }
- G03F 7/427 . . . { using plasma means only }
- G03F 7/428 . . . { using ultrasonic means only }
- G03F 7/70 . { Exposure apparatus for microlithography }
- G03F 7/70008 . . { Production of exposure light, i.e. light sources }
- G03F 7/70016 . . . { by discharge lamps ( discharge lamps per se [H01J 61/00](#) ) }
- G03F 7/70025 . . . { by lasers ( lasers per se [H01S 3/00](#) ) }
- G03F 7/70033 . . . { by plasma EUV sources ( plasma EUV sources per se [H05G 2/00](#) ) }
- G03F 7/70041 . . . { by pulsed sources }
- G03F 7/7005 . . . { by multiple sources { ( addressable array sources specially adapted to produce patterns [G03F 7/70391](#) ) } }
- G03F 7/70058 . . { Mask illumination systems }
- G03F 7/70066 . . . { Size and form of the illuminated area in the mask plane, e.g. REMA }
- G03F 7/70075 . . . { Homogenization of illumination intensity in the mask plane, by using an integrator, e.g. fly's eye lenses, facet mirrors, glass rods, by using a diffusive optical element or by beam deflection }
- G03F 7/70083 . . . { Non-homogeneous intensity distribution in the mask plane }
- G03F 7/70091 . . . { Illumination settings, i.e. intensity distribution in the pupil plane, angular distribution in the field plane; On-axis or off-axis settings, e.g. annular, dipole, quadrupole; Partial coherence control, i.e. sigma or numerical aperture (NA) }
- G03F 7/701 . . . . { Off-axis setting using an aperture }
- G03F 7/70108 . . . . { Off-axis setting using a light-guiding element }
- G03F 7/70116 . . . . { Off-axis setting using a programmable means, e.g. LCD or DMD }
- G03F 7/70125 . . . { Use of illumination settings tailored to particular mask patterns ( details of

		setting means <a href="#">G03F 7/70091</a> ) }
<a href="#">G03F 7/70133</a>	...	{ Measurement of illumination distribution, in pupil plane or field plane }
<a href="#">G03F 7/70141</a>	...	{ Illumination system adjustment, alignment during assembly of illumination system ( alignment of mask with workpiece <a href="#">G03F 9/70</a> ) }
<a href="#">G03F 7/7015</a>	...	{ Details of optical elements }
<a href="#">G03F 7/70158</a>	....	{ Diffractive optical elements }
<a href="#">G03F 7/70166</a>	....	{ Capillary or channel elements, e.g. nested EUV mirrors }
<a href="#">G03F 7/70175</a>	....	{ Lamphouse reflector arrangements, i.e. collecting light from solid angle upstream of the light source }
<a href="#">G03F 7/70183</a>	....	{ Zoom systems }
<a href="#">G03F 7/70191</a>	...	{ Optical correction elements, filters or phase plates for controlling intensity, wavelength, polarization, phase or the like }

**NOTE**

Wavelength or polarisation control is further classified in groups [G03F 7/70566](#) , [G03F 7/70575](#)

<a href="#">G03F 7/702</a>	...	{ Reflective illumination, i.e. reflective optical elements other than folding mirrors }
<a href="#">G03F 7/70208</a>	...	{ Multiple illumination paths, e.g. radiation distribution device, multiplexer, demultiplexer for single or multiple projection systems }
<a href="#">G03F 7/70216</a>	..	{ Systems for imaging mask onto workpiece }
<a href="#">G03F 7/70225</a>	...	{ Catadioptric systems, i.e. documents describing optical design aspect details }

**NOTE**

Catadioptric systems are further classified in group [G02B 17/0892](#)

<a href="#">G03F 7/70233</a>	...	{ Optical aspects of catoptric systems }
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**NOTE**

Further aspects of catoptric systems are classified in group [G02B 17/06](#)

<a href="#">G03F 7/70241</a>	...	{ Optical aspects of refractive systems }
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**NOTE**

Further aspects of refractive systems are classified in group [G02B 13/143](#)

<a href="#">G03F 7/7025</a>	...	{ Size or form of projection system aperture }
<a href="#">G03F 7/70258</a>	...	{ Projection system adjustment, alignment during assembly of projection system ( alignment of mask with workpiece <a href="#">G03F 9/70</a> ) }
<a href="#">G03F 7/70266</a>	....	{ Adaptive optics, e.g. deformable optical elements for wavefront control }
<a href="#">G03F 7/70275</a>	...	{ Multiple projection paths, array of projection systems, microlens projection systems, tandem projection systems }
<a href="#">G03F 7/70283</a>	...	{ Masks or their effects on the imaging process, e.g. Fourier masks, greyscale masks, holographic masks, phase shift masks, phasemasks, lenticular masks, multiple masks, tilted masks, tandem masks ( masks per se <a href="#">G03F 1/14</a> ) }
<a href="#">G03F 7/70291</a>	....	{ Addressable masks }

- G03F 7/703 ... { Non-planar pattern area or non-planar masks }
- G03F 7/70308 ... { Optical correction elements, filters and phase plates for manipulating e.g. intensity, wavelength, polarization, phase, image shift ( filters per se [G02B 5/20](#) ) }

**NOTE**

Wavelength or polarisation control is further classified in groups [G03F 7/70566](#) , [G03F 7/70575](#)

- G03F 7/70316 ... { Details of optical elements, e.g. of Bragg reflectors or diffractive optical elements }

**NOTE**

1. Particular optical materials are further classified in group [G03F 7/70958](#) ; 2. Multilayer reflectors for X-ray or EUV lithography are further classified in group [G21K 1/062](#)

- G03F 7/70325 ... { Resolution enhancement techniques not otherwise provided for, e.g. darkfield imaging, interfering beams, spatial frequency multiplication, nearfield lens }
- G03F 7/70333 .... { Focus drilling, e.g. FLEX }
- G03F 7/70341 ... { Immersion ( chemical composition of immersion liquids [G03F 7/2041](#) ) }
- G03F 7/7035 ... { Proximity or contact printer }
- G03F 7/70358 ... { Scanning exposure, i.e. relative movement of patterned beam and workpiece during imaging }
- G03F 7/70366 .... { Rotary scanning }
- G03F 7/70375 .. { Imaging systems not otherwise provided for, e.g. multiphoton lithography; Imaging systems comprising means for converting one type of radiation into another type of radiation, systems comprising mask with photo-cathode }
- G03F 7/70383 ... { Direct write, i.e. pattern is written directly without the use of a mask by one or multiple beams ( "maskless" lithography using a programmable mask [G03F 7/70291](#) ) }
- G03F 7/70391 .... { Addressable array sources specially adapted to produce patterns, e.g. addressable LED arrays ( array sources for exposure apparatus comprising a mask [G03F 7/7005](#) ; illumination setting using programmable means in exposure apparatus comprising a mask [G03F 7/70116](#) ) }
- G03F 7/704 .... { Scanned exposure beam, e.g. raster-, rotary- and vector scanning ( mask projection exposure involving relative movement of patterned beam and workpiece during imaging [G03F 7/70358](#) ) }
- G03F 7/70408 ... { Interferometric lithography; Holographic lithography; Self-imaging lithography }
- G03F 7/70416 ... { Stereolithography, 3D printing, rapid prototyping }

**NOTE**

Apparatus for photolithographical production of three dimensional images are further classified in group [G03F 7/0037](#) and group [B29C 67/0051](#)

- G03F 7/70425 .. { Imaging strategies, e.g. for increasing throughput, printing product fields larger than the image field, compensating lithography- or non-lithography errors, e.g. proximity correction, mix-and-match, stitching, double patterning }
- G03F 7/70433 ... { Layout for increasing efficiency, for compensating imaging errors, e.g. layout of exposure fields, { ; Use of mask features for increasing efficiency, for

		compensating imaging errors ( circuit design per se <a href="#">G06F 17/5068</a> ; designing or making of mask <a href="#">G03F 1/14</a> ) } }
<a href="#">G03F 7/70441</a>	....	{ Optical proximity correction }
<a href="#">G03F 7/7045</a>	...	{ Hybrid exposure, i.e. combining different types of exposure, e.g. projection, proximity, direct write, interferometric, uv, x-ray, particle beam ( <a href="#">constructional details G03F 7/70991</a> ) }
<a href="#">G03F 7/70458</a>	...	{ Mix-and-match, i.e. multiple exposures of the same area using similar types of exposure, e.g. UV exposure }
<a href="#">G03F 7/70466</a>	...	{ Multiple exposures, e.g. combination of fine and coarse exposures, double patterning, multiple exposures for printing a single feature, mix-and-match ( <a href="#">stitching G03F 7/70475</a> ) }
<a href="#">G03F 7/70475</a>	...	{ Stitching, i.e. connecting image fields to produce a device field, the field occupied by a device such as a memory chip, processor chip, CCD, flat panel display }
<a href="#">G03F 7/70483</a>	..	{ Information management, control, testing, and wafer monitoring, e.g. pattern monitoring ( <a href="#">detection arrangements G03F 7/7085</a> ) }
<a href="#">G03F 7/70491</a>	...	{ Information management and control, including software }
<a href="#">G03F 7/705</a>	....	{ Modelling and simulation from physical phenomena up to complete wafer process or whole workflow in wafer fabrication }
<a href="#">G03F 7/70508</a>	....	{ Data handling, in all parts of the microlithographic apparatus, e.g. addressable masks }
<a href="#">G03F 7/70516</a>	....	{ Calibration of components of the microlithographic apparatus, e.g. light sources, addressable mask, detectors }
<a href="#">G03F 7/70525</a>	....	{ Controlling normal operating mode, e.g. matching different apparatus, remote control, prediction of failure }
<a href="#">G03F 7/70533</a>	....	{ Controlling abnormal operating mode, e.g. taking account of waiting time, decision to rework, rework flow }
<a href="#">G03F 7/70541</a>	....	{ Tagging, i.e. hardware or software tagging of features or components }
<a href="#">G03F 7/7055</a>	...	{ Exposure light control, in all parts of the microlithographic apparatus, e.g. pulse length control, light interruption }
<a href="#">G03F 7/70558</a>	....	{ Dose control, i.e. achievement of a desired dose ( <a href="#">determination of the required dose G03F 7/70625</a> ) }
<a href="#">G03F 7/70566</a>	....	{ Polarisation control }
<a href="#">G03F 7/70575</a>	....	{ Wavelength control, e.g. control of bandwidth, multiple wavelength, selection of wavelength, matching of optical components to wavelength }
<a href="#">G03F 7/70583</a>	....	{ Speckle reduction, e.g. coherence control, amplitude/wavefront splitting }
<a href="#">G03F 7/70591</a>	...	{ Testing optical components ( <a href="#">testing of optical mirrors G01M 11/005</a> ; <a href="#">testing of lenses G01M 11/02</a> ; <a href="#">stray light transmission G03F 7/70941</a> ) }
<a href="#">G03F 7/706</a>	....	{ Aberration measurement ( <a href="#">aberration measurement in general G01M 11/0242</a> ) }
<a href="#">G03F 7/70608</a>	...	{ Wafer resist monitoring, e.g. measuring thickness, reflectivity, effects of immersion liquid on resist }
<a href="#">G03F 7/70616</a>	...	{ Wafer pattern monitoring, i.e. measuring printed patterns or the aerial image at the wafer plane ( <a href="#">optical metrology tools per se G01B 11/02</a> and <a href="#">G01B 9/04</a> ) }
<a href="#">G03F 7/70625</a>	....	{ Pattern dimensions, e.g. line width, profile, sidewall angle, edge roughness }
<a href="#">G03F 7/70633</a>	....	{ Overlay ( <a href="#">alignment between mask and wafer prior to exposure G03F 9/70</a> ) }
<a href="#">G03F 7/70641</a>	....	{ Focus ( <a href="#">focus measurement prior to exposure G03F 9/7026</a> ) }



G03F 7/7065	....	{ Defect inspection ( defect inspection apparatus per se <a href="#">G06T 7/0004</a> , <a href="#">G01N 21/956</a> ) }
G03F 7/70658	....	{ Electrical }
G03F 7/70666	....	{ using aerial image ( aerial image measurement tools for mask inspection <a href="#">G03F 1/0092</a> ) }
G03F 7/70675	....	{ using latent image }
G03F 7/70683	....	{ using process control mark, i.e. specific mark designs }
G03F 7/70691	..	{ Handling of masks or wafers }
G03F 7/707	...	{ Chucks, e.g. chucking or un-chucking operations ( chucks for workpiece processing tools <a href="#">H01L 21/683</a> or <a href="#">H01L 21/687</a> depending on the type of chucking ) }
G03F 7/70708	....	{ being electrostatic; Electrostatically deformable vacuum chucks ( electrostatic chucks for workpiece processing tools <a href="#">H01L 21/6831</a> ) }
G03F 7/70716	...	{ Stages ( stages for workpiece processing tools <a href="#">H01L 21/682</a> ) }
G03F 7/70725	....	{ control }
G03F 7/70733	...	{ Handling masks and workpieces, e.g. exchange of workpiece or mask, transport of workpiece or mask }
G03F 7/70741	....	{ Handling masks outside exposure position, e.g. reticle libraries }

**NOTE**

Protective means, e.g. containers, for masks, blanks or pellicles, are further classified in group [G03F 1/66](#)

G03F 7/7075	....	{ Handling workpieces outside exposure position, e.g. SMIF box }
G03F 7/70758	...	{ Drive means, e.g. actuator, motor ( lens or mirror actuators <a href="#">G03F 7/70825</a> ) }
G03F 7/70766	...	{ Reaction force control means, e.g. countermass }
G03F 7/70775	...	{ Position control ( interferometers per se <a href="#">G01B 9/02</a> ; encoders per se <a href="#">G01D 5/00</a> ; alignment of mask with workpiece <a href="#">G03F 9/70</a> ) }
G03F 7/70783	...	{ Stress or warp of chucks, mask or workpiece, e.g. to compensate for imaging error }
G03F 7/70791	...	{ Large workpieces, e.g. in the shape of web or polygon }
G03F 7/708	..	{ Construction of apparatus, e.g. environment, hygiene aspects or materials }
G03F 7/70808	...	{ Construction details, e.g. housing, load-lock, seals, windows for passing light in- and out of apparatus ( load-lock chambers for workpiece processors in general <a href="#">H01L 21/67201</a> ) }
G03F 7/70816	....	{ Bearings ( fluid bearings per se <a href="#">F16C 32/06</a> ) }
G03F 7/70825	....	{ Mounting of individual elements, e.g. mounts, holders or supports ( mounts or supports for projection- and illumination system and stages on base-plate or ground <a href="#">G03F 7/70833</a> ; workpiece and mask holders <a href="#">G03F 7/707</a> ) }
G03F 7/70833	....	{ Mounting of optical systems, e.g. mounting of illumination system, projection system or stage systems on base-plate or ground ( mounting of individual elements of said systems <a href="#">G03F 7/70825</a> ) }
G03F 7/70841	....	{ Constructional issues related to vacuum environment }
G03F 7/7085	...	{ Detection arrangement, e.g. detectors of apparatus alignment possibly mounted on wafers, exposure dose, photo-cleaning flux, stray light, thermal load }
G03F 7/70858	...	{ Environment aspects, e.g. pressure of beam-path gas, temperature ( pollution aspects <a href="#">G03F 7/70916</a> ) }



G03F 7/70866	....	{ of mask or workpiece }
G03F 7/70875	.....	{ Temperature }
G03F 7/70883	....	{ of optical system }
G03F 7/70891	.....	{ Temperature }
G03F 7/709	....	{ Vibration, e.g. vibration detection, compensation, suppression }
G03F 7/70908	...	{ Hygiene, e.g. preventing apparatus pollution, mitigating effect of pollution, removing pollutants from apparatus; electromagnetic and electrostatic-charge pollution }
G03F 7/70916	....	{ Pollution mitigation, i.e. mitigating effect of contamination or debris, e.g. foil traps }
G03F 7/70925	....	{ Cleaning, i.e. actively freeing apparatus from pollutants }
G03F 7/70933	....	{ Purge }
G03F 7/70941	....	{ Stray fields and charges, e.g. stray light, scattered light, flare, transmission loss }
G03F 7/7095	...	{ Materials, e.g. materials for housing, stage or other support having particular properties, e.g. weight, strength, conductivity, thermal expansion coefficient }
G03F 7/70958	....	{ Optical materials and coatings, e.g. with particular transmittance, reflectance ( details of optical elements <a href="#">G03F 7/70316</a> ) }
G03F 7/70966	.....	{ Birefringence }
G03F 7/70975	...	{ Assembly, maintenance, transport and storage of apparatus }
G03F 7/70983	...	{ Optical system protection, e.g. pellicles or removable covers for protection of mask }
G03F 7/70991	...	{ Connection with other apparatus, e.g. multiple exposure stations, particular arrangement of exposure apparatus and pre-exposure and/or post-exposure apparatus, shared apparatus, e.g. having shared radiation source, shared mask or workpiece stage, shared base-plate, utilities e.g. cable, pipe or wireless arrangements for data, power, fluids, vacuum ( apparatus for processing a workpiece in a plurality of work-stations including at least one lithography chamber <a href="#">H01L 21/67225</a> ) }

**G03F 9/00**

**Registration or positioning of originals, masks, frames, photographic sheets or textured or patterned surfaces, e.g. automatically** ( [G03F 7/22](#) takes precedence; preparation of photographic masks [G03F 1/00](#) ; within photographic printing apparatus for making copies [G03B 27/00](#) )

**WARNING**

Groups [G03F 9/70](#) - [G03F 9/00T26](#) are no longer used for classification of new documents as from January 1, 2012. The backfile is progressively being transferred to new groups as it follows: - [G03F 9/70](#) : [G03F 9/70](#) - [G03F 9/00T12](#) : [G03F 9/7003](#) - [G03F 9/00T14](#) : [G03F 9/7049](#) - [G03F 9/00T16](#) : [G03F 9/7065](#) - [G03F 9/00T18](#) : [G03F 9/7069](#) - [G03F 9/00T20](#) : [G03F 9/7073](#) - [G03F 9/00T22](#) : [G03F 9/7088](#) - [G03F 9/00T24](#) : [G03F 9/7092](#) - [G03F 9/00T26](#) : [G03F 9/7096](#)

G03F 2009/005	.	for microlithography
G03F 9/70	.	{ for microlithography ( measuring printed patterns for monitoring overlay <a href="#">G03F 7/70633</a> or focus <a href="#">G03F 7/70641</a> ; projection system adjustment <a href="#">G03F 7/70258</a> ; position control <a href="#">G03F 7/70775</a> ) }
G03F 9/7003	..	{ Alignment type or strategy, e.g. leveling, global alignment }

G03F 9/7007	...	{ Alignment other than original with workpiece }
G03F 9/7011	....	{ Pre-exposure scan; original with original holder alignment; Prealignment, i.e. workpiece with workpiece holder }
G03F 9/7015	....	{ Reference, i.e. alignment of original or workpiece with respect to a reference not on the original or workpiece }
G03F 9/7019	...	{ Calibration }
G03F 9/7023	...	{ Aligning or positioning in direction perpendicular to substrate surface }
G03F 9/7026	....	{ Focusing }
G03F 9/703	....	{ Gap setting, e.g. in proximity printer }
G03F 9/7034	....	{ Leveling }
G03F 9/7038	...	{ Alignment for proximity or contact printer ( <a href="#">proximity or contact printers per se G03F 7/7035</a> ) }
G03F 9/7042	...	{ Alignment for lithographic apparatus using patterning methods other than those involving the exposure to radiation, e.g. by stamping or imprinting ( <a href="#">non-exposure lithographic processes per se G03F 7/0002</a> ) }
G03F 9/7046	...	{ Strategy, e.g. mark, sensor or wavelength selection }
G03F 9/7049	..	{ Technique, e.g. interferometric }
G03F 9/7053	...	{ Non-optical, e.g. mechanical, capacitive, using an electron beam, acoustic or thermal waves }
G03F 9/7057	....	{ Gas flow, e.g. for focusing, leveling or gap setting }
G03F 9/7061	....	{ Scanning probe microscopy, e.g. AFM, scanning tunneling microscopy }
G03F 9/7065	..	{ Production of alignment light, e.g. light source, control of coherence, polarization, pulse length, wavelength }
G03F 9/7069	..	{ Alignment mark illumination, e.g. darkfield, dual focus }
G03F 9/7073	..	{ Alignment marks and their environment ( <a href="#">marks specific to masks G03F 1/42</a> ; <a href="#">marks specific to molds or stamps G03F 7/0002</a> ; <a href="#">overlay marks G03F 7/20T22</a> ; <a href="#">marks applied to semiconductor devices H01L 23/544</a> ) }
G03F 9/7076	...	{ Mark details, e.g. phase grating mark, temporary mark }
G03F 9/708	...	{ Mark formation }
G03F 9/7084	...	{ Position of mark on substrate: i.e. position in ( x, y, z ) of mark, e.g. buried or resist covered mark, mark on rearside, at the substrate edge, in the circuit area, latent image mark, marks in plural levels }
G03F 9/7088	..	{ Alignment mark detection, e.g. TTR, TTL, off-axis detection, array detector, video detection }
G03F 9/7092	..	{ Signal processing }
G03F 9/7096	..	{ Arrangement, mounting, housing, environment, cleaning or maintenance of apparatus }