

## ECLA EUROPEAN CLASSIFICATION

### C02F

#### TREATMENT OF WATER, WASTE WATER, SEWAGE, OR SLUDGE

(separation in general B01D; special arrangements on waterborne vessels of installations for treating water, waste water or sewage, e.g. for producing fresh water, B63J; adding materials to water to prevent corrosion C23F; treating radioactively-contaminated liquids G21F9/04; regeneration of reactants for recirculation into processes, see the relevant places for the processes)

[N: **WARNING**

[C2012.03]

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

[C02F9/02](#) to [C02F9/14](#) covered by [C02F9/00](#) and subgroup

]

**Note**

[N0408] When classifying in this subclass, classification is also made in group [B01D15/08](#) insofar as subject matter of general interest relating to chromatography is concerned.

### C02F1/00

**Treatment of water, waste water, or sewage** ([C02F3/00](#) to [C02F9/00](#) take precedence)

#### C02F1/00D

- . [N: Processes for the treatment of water whereby the filtration technique is of importance ([C02F1/44](#) takes precedence; construction of filters in general [B01D24/00](#) to [B01D41/00](#))] [C1110]

#### C02F1/00D2

- . . [N: using small portable filters for producing potable water, e.g. personal travel or emergency equipment, survival kits, combat gear ([C02F1/00D4](#) takes precedence)] [C0406]

#### C02F1/00D4

- . . [N: using household-type filters for producing potable water, e.g. pitchers, bottles, faucet mounted devices ([C02F9/00B](#) takes precedence)] [C1110]

#### C02F1/00D6

- . . [N: using large scale industrial sized filters] [N1110]

#### C02F1/00M

- . [N: Systems or processes based on supernatural or anthroposophic principles, cosmic or terrestrial radiation, geomancy or rhabdomancy]

#### C02F1/00R

- . [N: Water distributors either inside a treatment tank or directing the water to several treatment tanks; Water treatment plants incorporating these distributors, with or without chemical or biological tanks (for settling tanks [B01D21/24](#))]

#### C02F1/00T

- . [N: Control or steering systems not provided for elsewhere in subclass C02F]

#### C02F1/02

- . by heating (methods of steam generation [F22B](#); preheating boiler feed-water or accumulating preheated boiler feed-water [F22D](#))

#### C02F1/02C

- . . [N: Thermal hydrolysis]

#### C02F1/04

- . . by distillation or evaporation

#### C02F1/04C

- . . . [N: by means of vapour compression]

#### C02F1/04E

- . . . [N: Prevention of deposits]

#### C02F1/04G

- . . . [N: Details]

#### C02F1/04K

- . . . [N: for obtaining ultra-pure water]

- C02F1/04M . . . [N: under vacuum produced by a barometric column]
- C02F1/04P . . . [N: using eolic energy]
- C02F1/04Z . . . [N: Purification of waste water by evaporation]
- C02F1/06 . . . Flash evaporation
- C02F1/08 . . . Thin film evaporation
- C02F1/10 . . . by direct contact with a particulate solid or with a fluid, as a heat transfer medium
- C02F1/12 . . . . Spray evaporation
- C02F1/14 . . . using solar energy
- C02F1/16 . . . using waste heat from other processes
- C02F1/18 . . . Transportable devices to obtain potable water
  
- C02F1/20 . by degassing, i.e. liberation of dissolved gases ([degasification of liquids in general B01D19/00](#); [arrangement of degassing apparatus in boiler feed supply F22D](#))
- C02F1/22 . by freezing
- C02F1/24 . by flotation ([C02F1/465](#) takes precedence)
- C02F1/26 . by extraction
- C02F1/26C . . [N: Desalination]
  
- C02F1/28 . by sorption ([using ion-exchange C02F1/42](#); [sorbent compositions B01J](#))
- C02F1/28B . . [N: using inorganic sorbents]
- C02F1/28D . . [N: using coal, charred products, or inorganic mixtures containing them]
- C02F1/28F . . [N: using synthetic organic sorbents]
- C02F1/28H . . [N: using natural organic sorbents or derivatives thereof]
- C02F1/28L . . [N: using composite sorbents, e.g. coated, impregnated, multi-layered]
  
- C02F1/30 . by irradiation
- C02F1/30B . . [N: with microwaves] [N9411]
- C02F1/30E . . [N: with electrons] [N0304]
- C02F1/30G . . [N: with X-rays or gamma radiation] [N1112]
  
- [N: **WARNING** [N1112]  
Not complete pending the completion of a reclassification, see also [C02F1/30](#)  
]
- C02F1/32 . . with ultra-violet light
- C02F1/32D . . . [N: Irradiation devices or lamp constructions] [N9901]
  
- C02F1/34 . with mechanical oscillations
- C02F1/36 . . ultrasonic vibrations
  
- C02F1/38 . by centrifugal separation
- C02F1/38B . . [N: by centrifuging suspensions ([centrifuges B04B](#))]
  
- C02F1/40 . Devices for separating or removing fatty or oily substances or similar floating material ([cleaning or keeping clear the surface of open water from oil or like materials](#))

[E02B15/04](#); devices in sewers for separating liquid or solid substances from sewage  
[E03F5/14](#), e.g. for use in drains leading to the sewer [E03F5/16](#))

- C02F1/42 . by ion-exchange (ion-exchange in general [B01J](#))
- [N: **Note**  
 When classifying in group [C02F1/42](#), details of ion-exchangers can be further indexed by using ICO indexing codes chosen from [M02F1/42B](#) to [M02F1/42F](#)  
 ]
- C02F1/44 . by dialysis, osmosis or reverse osmosis [N: (general membrane separation processes [B01D61/00](#), membrane modules [B01D63/00](#), electrodialysis [C02F1/469D](#), combination of membrane modules and bioreactors [C02F3/12N9](#))] [C1201]
- C02F1/44B . . [N: by reverse osmosis]
- C02F1/44C . . [N: by nanofiltration] [N1112]
- C02F1/44D . . [N: by ultrafiltration or microfiltration] [C1112]
- C02F1/44F . . [N: by forward osmosis] [N1110]
- C02F1/44H . . [N: by membrane distillation (distillation and evaporation without the use of membranes [C02F1/04](#))] [N1202]
- C02F1/44P . . [N: by pervaporation] [N1112]
- C02F1/46 . by electrochemical methods
- C02F1/46C . . [N: for prevention or elimination of deposits]
- C02F1/46E . . [N: for desalination of seawater or brackish water]
- C02F1/46H . . [N: for producing oligodynamic substances to disinfect the water]
- C02F1/46J . . [N: using electrical discharges] [N0304]
- C02F1/46I . . by electrolysis [N0012]
- C02F1/461B . . . [N: Devices therefor; Their operating or servicing] [N0012]
- C02F1/461B2 . . . . [N: Electrodes] [N0012]
- [N: **Note** [C1112]  
 When classifying in group [C02F1/461B2](#), details of devices for electrolysis can be further indexed by using ICO indexing codes chosen from [M02F1/461B2D](#) to [M02F1/461B2L2B2](#)  
 ]
- C02F1/461B2B . . . . . [N: Electrodes in particulate form or with conductive and/or non conductive particules between them] [N0012]
- C02F1/461B4 . . . . [N: Galvanic cells] [N0012]
- C02F1/461B6 . . . . [N: for producing "ionised" acidic or basic water] [N0012]
- [N: **Note**  
 When classifying in group [C02F1/461B6](#), details relating to the production of "ionised" acidic or basic water using electrolysis devices can be further indexed by using ICO indexing codes chosen from [M02F1/461B6B](#) to [M02F1/461B6F](#)  
 ]
- C02F1/463 . . . by electrocoagulation [N0012]
- C02F1/465 . . . by electroflotation
- C02F1/467 . . . by electrochemical disinfection; [N: by electrooxydation or by electroreduction] [N0012]

- C02F1/467B . . . . [N: by electrooxydation] [N0012]
- C02F1/467B2 . . . . . [N: with halogen or compound of halogens, e.g. chlorine, bromine] [N0012] [C1107]
- C02F1/467D . . . . [N: by electroreduction] [N0012]
- C02F1/467D2 . . . . . [N: of metals] [N0012]
- C02F1/469 . . by electrochemical separation, e.g. by electro-osmosis, electrodialysis, electrophoresis
- C02F1/469B . . . [N: Capacitive deionisation] [N0310]
- C02F1/469D . . . [N: electrodialysis] [N1112]
- C02F1/469D2 . . . . [N: electrodeionisation] [N1112]
- C02F1/469F . . . [N: electrophoresis] [N1112]
- C02F1/469H . . . [N: electro-osmosis] [N1112]
  
- C02F1/48 . with magnetic or electric fields ([C02F1/46](#) takes precedence)
- C02F1/48A . . [N: using permanent magnets] [C1110]
- C02F1/48A2 . . . [N: located on the outer wall of the treatment device, i.e. not in contact with the liquid to be treated, e.g. detachable] [N1110]
- C02F1/48E . . [N: using electromagnets] [N1110]
  
- [N: **WARNING**  
[N1110] Not complete pending the completion of a reclassification, see also [C02F1/48](#) and [C02F1/48C](#)  
]
- C02F1/48E2 . . . [N: located on the outer wall of the treatment device, i.e. not in contact with the liquid to be treated, e.g. detachable] [N1110]
  
- [N: **WARNING**  
[N1110] Not complete pending the completion of a reclassification, see also [C02F1/48](#)  
]
- C02F1/48F . . [N: using high frequency electromagnetic fields, e.g. pulsed electromagnetic fields] [N1110]
  
- [N: **WARNING**  
[N1110] Not complete pending the completion of a reclassification, see also [C02F1/48](#)  
]
- C02F1/48K . . [N: for separation of magnetic materials, e.g. magnetic flocculation]
  
- C02F1/50 . by addition or application of a germicide or by oligodynamic treatment ([N: [C02F1/46H](#), [C02F1/467](#), [C02F1/76](#) take precedence]) [C0310]
- C02F1/50B . . [N: by oligodynamic treatment]
  
- C02F1/52 . by flocculation or precipitation of suspended impurities [N: ([C02F1/463](#) takes precedence)] [C0012]
- C02F1/52A . . [N: Regulation methods for flocculation or precipitation]
- C02F1/52C . . [N: Processes for facilitating the dissolution of solid flocculants in water]
- C02F1/52F . . [N: using inorganic agents]
- C02F1/52F2 . . . [N: using basic salts, e.g. of aluminium and iron]
- C02F1/52F3 . . . [N: using magnesium compounds and phosphoric acid for removing ammonia]

- C02F1/52H . . [N: using natural chemical compounds]
- C02F1/52K . . [N: using specific organic precipitants]
- C02F1/52P . . [N: Installations for water purification using chemical agents]
- C02F1/52R . . [N: Processes or devices for preparing lime water]
- C02F1/54 . . using organic material
- C02F1/54P . . . [N: Phosphorus compounds]
- C02F1/54S . . . [N: Silicon compounds]
- C02F1/54T . . . [N: Tensides]
- C02F1/56 . . . Macromolecular compounds
  
- C02F1/58 . . by removing specified dissolved compounds (using ion-exchange [C02F1/42](#); softening water [C02F5/00](#))
- C02F1/58F . . [N: by removing fluoride or fluorine compounds]
- C02F1/58N . . [N: by removing ammoniacal nitrogen (for biological methods [C02F3/00](#))]
- C02F1/60 . . Silicon compounds [N: ([C02F1/58F](#) takes precedence)]
- C02F1/62 . . Heavy metal compounds
- C02F1/64 . . . of iron or manganese
- C02F1/64C . . . . [N: Devices for iron precipitation and treatment by air]
  
- C02F1/66 . . by neutralisation; pH adjustment (for degassing [C02F1/20](#); using ion-exchange [C02F1/42](#); for flocculation or precipitation of suspended impurities [C02F1/52](#); for removing dissolved compounds [C02F1/58](#))
  
- C02F1/68 . . by addition of specified substances, e.g. trace elements, for ameliorating potable water (medicinal water [A61K](#))
- C02F1/68C . . [N: by addition of solid materials for removing an oily layer on water]
- C02F1/68D . . [N: by addition of chemical compounds for dispersing an oily layer on water]
- C02F1/68K . . [N: by addition of complex-forming compounds]
- C02F1/68P . . [N: Devices for dosing the additives]
- C02F1/68P2 . . . [N: Devices for dosing liquid additives]
- C02F1/68P4 . . . [N: Devices for dosing solid compounds]
- C02F1/68P6 . . . [N: Devices in which the water progressively dissolves a solid compound]
  
- C02F1/70 . . by reduction [N: ([C02F1/467D](#) takes precedence)] [C0012]
- C02F1/70C . . [N: Reduction by metals]
  
- C02F1/72 . . by oxidation [N: ([C02F1/467B](#) takes precedence)] [C0012]
- C02F1/72C . . [N: Oxidation by peroxides]
- C02F1/72K . . [N: by catalytic oxidation]
- C02F1/72S . . [N: using pure oxygen or oxygen rich gas] [N0304]
- C02F1/74 . . with air (aeration of stretches of water [C02F7/00](#))
- C02F1/76 . . with halogens or compounds of halogens [N: ([C02F1/467B2](#) takes precedence)] [C0012]
- C02F1/76E . . . [N: Devices for the addition of such compounds in gaseous form]
- C02F1/76G . . . [N: by means of halogens other than chlorine or of halogenated compounds containing halogen other than chlorine]

- C02F1/78 . . with ozone [N: ([C02F1/467B](#) takes precedence)] [C0012]
  
- C02F3/00** **Biological treatment of water, waste water, or sewage** [N: ([C02F1/00R](#) takes precedence)]
  
- C02F3/00E . [N: Combined electrochemical biological processes (aeration by electrolytically produced oxygen bubbles [C02F3/20C](#))] [N1112]
  
- C02F3/00R . [N: Regulation methods for biological treatment]
  
- C02F3/02 . Aerobic processes
- C02F3/02C . . [N: Biological purification using sources of oxygen other than air, oxygen or ozone]
- C02F3/04 . . using trickle filters
- C02F3/04C . . . [N: Devices for distributing water over trickle filters]
- C02F3/04E . . . [N: Soil filtration]
- C02F3/06 . . using submerged filters
- C02F3/08 . . using moving contact bodies [C1109]
- C02F3/08B . . . [N: Rotating biological contactors] [N1109]
- C02F3/08D . . . [N: Fluidized beds] [N1109]
- C02F3/08D2 . . . . [N: Floating beds with contact bodies having a lower density than water] [N1109]
  
- C02F3/10 . . Packings; Fillings; Grids ([packing elements in general](#) [B01J19/30](#), [B01J19/32](#))
- C02F3/10B . . . [N: Arranged-type packing, e.g. stacks, arrays]
- C02F3/10C . . . [N: Permeable membranes]
- C02F3/10E . . . [N: Textile-type packing]
- C02F3/10G . . . [N: Granular carriers] [N1111]
- C02F3/10K . . . [N: Characterized by the chemical composition] [N1111]
- C02F3/10K2 . . . . [N: Carbonaceous materials] [N1111]
- C02F3/10K4 . . . . [N: Inorganic materials, e.g. sand, silicates] [N1111]
- C02F3/10K6 . . . . [N: Immobilising gels, polymers or the like] [N1201]
- C02F3/10S . . . [N: Characterized by the shape ([C02F3/10G](#) takes precedence)] [N1111]
  
- C02F3/12 . . Activated sludge processes
- C02F3/12A . . . [N: Particular type of activated sludge processes] [N1112]
- C02F3/12A2 . . . . [N: Multistep treatment] [N1112]
- C02F3/12A4 . . . . [N: Combinations of activated sludge treatment with precipitation, flocculation, coagulation and separation of phosphates] [N1112]
- C02F3/12A6 . . . . [N: comprising treatment of the recirculated sludge] [N1112]
- C02F3/12A8 . . . . [N: comprising an absorbent material suspended in the mixed liquor] [N1112]
- C02F3/12A9 . . . . [N: Treatments of toxic sewage] [N1112]
- C02F3/12N . . . [N: Particular type of activated sludge installations] [N1112]
- C02F3/12N2 . . . . [N: Small compact installations for use in homes, apartment blocks, hotels or the like] [N1112]
- C02F3/12N2B . . . . . [N: comprising circular tanks with elements, e.g. decanters, aeration basins, in the form of segments, crowns or sectors] [N1112]
- C02F3/12N4 . . . . [N: Cylindrical tanks with horizontal axis] [N1112]

C02F3/12N6	. . . .	[N: Oxidation ditches] [N1112]
C02F3/12N8	. . . .	[N: Sequencing batch reactors (SBR)] [N1112]
C02F3/12N9	. . . .	[N: Membrane bioreactor systems] [N1112]
C02F3/12N9B	. . . . .	[N: Submerged membrane bioreactors] [N1112]
C02F3/12V	. . . .	[N: Provisions for mixing or aeration of the mixed liquor] [N1112]
C02F3/12V2	. . . .	[N: Mixing devices] [N1112]
C02F3/12V4	. . . .	[N: Aeration by saturation under super-atmospheric pressure] [N1112]
C02F3/12V6	. . . .	[N: "Venturi" aeration means] [N1112]
C02F3/14	. . . .	using surface aeration
C02F3/14B	. . . .	[N: Protection against aerosols]
C02F3/16	. . . .	the aerator having a vertical axis
C02F3/16B	. . . . .	[N: using vertical aeration channels]
C02F3/18	. . . .	the aerator having a horizontal axis
C02F3/20	. . . .	using diffusers
C02F3/20B	. . . .	[N: Perforated, resilient plastic diffusers, e.g. membranes, sheets, foils, tubes, hoses]
C02F3/20C	. . . .	[N: Aeration by electrolytically produced oxygen bubbles]
C02F3/20D	. . . .	[N: Swing diffusers]
C02F3/20E	. . . .	[N: Moving, e.g. rotary, diffusers; Stationary diffusers with moving, e.g. rotary, distributors]
C02F3/20E2	. . . . .	[N: with helical screw impellers]
C02F3/20E3	. . . . .	[N: with axial thrust propellers]
C02F3/20F	. . . .	[N: Membrane aeration ( <a href="#">C02F3/20B</a> takes precedence)]
C02F3/22	. . . .	using circulation pipes
C02F3/22C	. . . .	[N: using "air-lift"]
C02F3/22D	. . . .	[N: "Deep shaft" processes]
C02F3/24	. . . .	using free-fall aeration or spraying
C02F3/26	. . . .	using pure oxygen or oxygen-rich gas
C02F3/28	. . . .	Anaerobic digestion processes
C02F3/28C	. . . .	[N: Anaerobic processes using solid supports for micro-organisms]
C02F3/28G	. . . .	[N: using anaerobic contact processes] [N1109]
C02F3/28H	. . . .	[N: using anaerobic sequencing batch reactors] [N1109]
C02F3/28J	. . . .	[N: using anaerobic filters] [N1109]
C02F3/28L	. . . .	[N: using fluidized bed reactors] [N1109]
C02F3/28M	. . . .	[N: using anaerobic baffled reactors] [N1109]
C02F3/28N	. . . .	[N: using upflow anaerobic sludge blanket (UASB) reactors] [N1109]
C02F3/28P	. . . .	[N: using anaerobic membrane bioreactors] [N1109]
C02F3/28S	. . . .	[N: including two or more steps] [N1109]
C02F3/28T	. . . .	[N: Particular arrangements for anaerobic reactors] [N1109]
C02F3/28T2	. . . .	[N: with internal draft tube circulation] [N1109]
C02F3/28T4	. . . .	[N: comprising septic tanks combined with a filter] [N1109]
C02F3/28T6	. . . .	[N: Two story combinations of the Imhoff tank type] [N1109]

- C02F3/28T8 . . . [N: with biogas recycling] [N1109]
- C02F3/30 . Aerobic and anaerobic processes
- C02F3/30B . . [N: Aerobic and anaerobic treatment in the same reactor] [N0210]
- C02F3/30D . . [N: Nitrification and denitrification treatment ([C02F3/30F](#) takes precedence)] [N0210] [C1112]
- C02F3/30D2 . . . [N: characterised by the nitrification] [N1112]
- C02F3/30D4 . . . [N: characterised by the denitrification] [N1112]
- C02F3/30D4B . . . . [N: Denitrification of water in soil] [N1112]
- C02F3/30D6 . . . [N: characterised by direct conversion of nitrite to molecular nitrogen, e.g. by using the Anammox process] [N1202]
- C02F3/30F . . [N: Biological phosphorus removal] [N0210]
- C02F3/32 . characterised by the animals or plants used, e.g. algae
- C02F3/32A . . [N: use of algae] [N1111]
- C02F3/32A2 . . . [N: as symbiotic combination of algae and bacteria] [N1111]
- C02F3/32B . . [N: characterised by animals and plants]
- C02F3/34 . characterised by the micro-organisms used
- C02F3/34A . . [N: Consortia of bacteria] [N0310]
- C02F3/34B . . [N: characterised by the enzymes used]
- C02F3/34C . . [N: for digestion of grease, fat, oil]
- C02F3/34D . . [N: for digestion of mineral oil]
- C02F3/34E . . [N: for biological oxidation or reduction of sulfur compounds]
- C02F3/34F . . [N: Iron bacteria] [N0310]
- C02F3/34Y . . [N: Use of yeasts or fungi ([C02F3/32A](#) takes precedence)] [N1111]
- C02F3/34Z . . [N: characterised by the way or the form in which the microorganisms are added or dosed ] [N0310]
- C02F5/00** **Softening water; Preventing scale; Adding scale preventatives or scale removers to water, e.g. adding sequestering agents (softening using ion-exchange [C02F1/42](#))**
- C02F5/02 . Softening water by precipitation of the hardness
- C02F5/02C . . [N: Hot-water softening devices]
- C02F5/04 . . using phosphates ([C02F5/06](#) takes precedence)
- C02F5/06 . . using calcium compounds
- C02F5/08 . Treatment of water with complexing chemicals or other solubilising agents for softening, scale prevention or scale removal, e.g. adding sequestering agents
- C02F5/08C . . [N: Mineral agents]
- C02F5/08E . . [N: Condensed phosphates]
- C02F5/10 . . using organic substances
- C02F5/10B . . . [N: combined with inorganic substances]
- C02F5/12 . . . containing nitrogen ([C02F5/14](#) takes precedence)
- C02F5/12B . . . . [N: combined with inorganic substances]

- C02F5/14 . . . containing phosphorus
- C02F5/14B . . . . [N: combined with inorganic substances]

### **C02F7/00 Aeration of stretches of water**

### **C02F9/00 Multistage treatment of water, waste water, or sewage**

#### **Notes**

1. This group covers only those combined treating operations where the interest is directed to the relationship between the steps.
2. This group does not cover, for example, chemical treatment followed by settlement or biological treatment involving normal mechanical treatment.

- C02F9/00B . [N: Portable or detachable small-scale multistage treatment devices, e.g. point of use or laboratory water purification systems (single-stage processes in combination with filtration techniques [C02F1/00D2](#) or [C02F1/00D4](#))] [N1110]

### **C02F11/00 Treatment of sludge; Devices therefor**

- C02F11/00C . [N: Sludge treatment using liquids immiscible with water]
- C02F11/00D . [N: Sludge detoxification]
- C02F11/00E . [N: Electrochemical treatment, e.g. electro-oxidation or electro-osmosis] [N1202]
- C02F11/00F . [N: Sludge treatment by fixation or solidification]
- C02F11/02 . Biological treatment
- C02F11/04 . . Anaerobic treatment; Production of methane by such processes
- C02F11/06 . by oxidation (incinerators for burning waste liquors, e.g. sulfite liquor from paper-making plant [F23G7/04](#))
- C02F11/08 . . Wet air oxidation
- C02F11/08B . . . [N: using deep well reactors]
- C02F11/08D . . . [N: in the supercritical state]
- C02F11/10 . by pyrolysis
- C02F11/12 . by de-watering, drying, or thickening
- C02F11/12C . . [N: Processes for mechanical dehydration of sludge, e.g. by filters]
- C02F11/12C2 . . . using press filters ([C02F11/12C4](#) takes precedence) [N1105]
- C02F11/12C4 . . . using belt or band filters [N1105]
- C02F11/12C6 . . . using screw filters [N1105]
- C02F11/12C8 . . . using drum filters [N1105]
- C02F11/12C10 . . . by centrifugation [N1105]
- C02F11/12C12 . . . Batch processes [N1105]

- C02F11/14 . . with addition of chemical agents
- C02F11/16 . . using drying or composting beds
  
- C02F11/18 . by thermal conditioning (by pyrolysis [C02F11/10](#))
- C02F11/18C . . [N: by pasteurisation] [N0107]
- C02F11/20 . . by freezing