

## B01D

**SEPARATION (separating solids from solids by wet methods [B03B](#), [B03D](#); by pneumatic jigs or tables [B03B](#); by other dry methods [B07](#); magnetic or electrostatic separation of solid materials from solid materials or fluids, separation by high-voltage electric fields [B03C](#); centrifuges, vortex apparatus [B04](#); presses per se for squeezing-out liquid from liquid-containing material [B30B 9/02](#); treatment of water [C02F](#), e.g. softening by ion-exchange [C02F 1/42](#); {arrangements of air intake cleaners in gas turbine plants [F02C 7/05](#)} ; arrangements or mounting of filters in air-conditioning, air-humidification or ventilation [F24F 13/28](#))**

### Definition statement

*This place covers:*

Processes and apparatus for evaporation, distillation, sublimation, crystallisation, solvent extraction, chromatography, sedimentation, filtration, dust precipitation, gas cleaning, absorption, adsorption, separation of isotopes.

Cold traps, cold baffles.

Treating liquids by displacement, adsorption, separation or degasification.

Treating gases or vapours by separation, recovering, chemical or biological purification of waste gases.

Separation using semi-permeable membranes, dialysis, osmosis, ultrafiltration.

Separation of suspended particles from liquids by sedimentation, flocculation, settling, filtration or other processes.

Separation of dispersed particles from gases or vapours, by filtration, gravity, inertia or centrifugal forces, or using liquid as separating agent.

Similar processes which are not concerned with, or limited to, separation.

### Relationships with other classification places

For apparatus used in drying or evaporation, [F26B](#) takes precedence over this subclass.

Separation of isotopes of the same chemical element is covered by group [B01D 59/00](#), whatever process or apparatus is employed; this group therefore takes precedence over other groups of class [B01](#).

### References

#### Limiting references

*This place does not cover:*

|  |   |
|--|---|
| Separating solids from solids by wet methods   | <a href="#">B03B</a> , <a href="#">B03D</a> |
| Separating solids from solids using liquids or using pneumatic jigs or tables  | <a href="#">B03B</a>                        |
| Magnetic or electrostatic separation of solid materials from solid materials or fluids, separation by high-voltage electric fields | <a href="#">B03C</a>                        |
| Flotation, differential sedimentation  | <a href="#">B03D</a>                        |
| Centrifuges  | <a href="#">B04B</a>                        |

|  |   |
|--|---|
| Vortex apparatus, e.g. cyclones  | <a href="#">B04C</a>                                  |
| Separating solids from solids by dry methods, e.g. sieving, screening, sifting or using gas currents | <a href="#">B07B</a>                                  |
| Presses per se for squeezing-out liquid from liquid-containing material                              | <a href="#">B30B 9/02</a>                             |
| Treatment of water   | <a href="#">C02F</a>                                  |
| Treatment of water softening by ion-exchange   | <a href="#">C02F 1/42</a>                             |
| Making single crystals   | <a href="#">C30B</a>                                  |
| Into single crystals   | <a href="#">C30B 23/00</a>                            |
| Manufacture of hollow fibres   | <a href="#">D01D 5/24</a> , <a href="#">D01F 1/08</a> |
| of air intake cleaners in gas turbine plants   | <a href="#">F02C 7/05</a>                             |
| Arrangements or mounting of filters in air-conditioning, air-humidification or ventilation           | <a href="#">F24F 13/28</a>                            |
| Separation of difficult-to-condense gases or air by liquefaction                                     | <a href="#">F25J 3/00</a>                             |
| Condensers   | <a href="#">F28B</a>                                  |

### **Application-oriented references**

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

|  |  |
|--|--|
| Treatment of milk by dialysis, reverse osmosis or ultrafiltration              | <a href="#">A23C 9/142</a>                             |
| Treatment of milk by electro dialysis  | <a href="#">A23C 9/144</a>                             |
| Suction cleaner filters  | <a href="#">A47L 9/10</a>                              |
| Artificial kidneys   | <a href="#">A61M 1/14</a>                              |
| Blood or infusion liquid filters   | <a href="#">A61M 5/165</a>                             |
| Filters for breathing-protection purposes                                      | <a href="#">A62B 23/00</a>                             |
| Screens or sieves per se   | <a href="#">B07B 1/00</a>                              |
| Extrusion filters  | <a href="#">B29C 47/68</a>                             |
| Filtering air for vehicles   | <a href="#">B60H 3/06</a>                              |
| Separating pneumatically-conveyed materials from propelling gas                | <a href="#">B65G 53/60</a>                             |
| Purification or separation of nitrogen   | <a href="#">C01B 21/04</a>                             |
| Treatment of water e.g. softening of water by ion-exchange                     | <a href="#">C02F</a> , <a href="#">C02F 1/42</a>       |
| Treatment of water by dialysis, osmosis or reverse osmosis                     | <a href="#">C02F 1/44</a>                              |
| Treatment of water by electro dialysis   | <a href="#">C02F 1/469</a>                             |
| Working-up unidentified gaseous mixtures obtained by cracking hydrocarbon oils | <a href="#">C10G 70/00</a>                             |
| Cleaning coal gas  | <a href="#">C10K</a>                                   |
| Working-up of natural gas, or synthetic natural gas                            | <a href="#">C10L 3/10</a>                              |
| Apparatus for enzymology or microbiology with dialysis means                   | <a href="#">C12M 1/12</a>                              |
| Production or purification of sugar juices, e.g. by osmosis                    | <b>C13D3/16</b>  |
| Extraction of sugar from molasses, e.g. by osmosis                             | <b>C13J1/08</b>  |
| Diaphragms for electrolysis  | <a href="#">C25B 13/00</a> , <a href="#">C25C 7/04</a> |
| Filtering spinning solution or melt  | <a href="#">D01D 1/10</a>                              |

|  |                             |
|--|-----------------------------|
| Exhaust or silencing apparatus for machines or engines having means for removing solid constituents of exhaust | <a href="#">F01N 3/02</a>   |
| Air cleaners for the intakes of gas-turbine or jet-propulsion plants   | <a href="#">F02C 7/05</a>   |
| Air cleaners for the intakes of combustion engines   | <a href="#">F02M 35/024</a> |
| Osmosis as energy source   | <a href="#">F03G 7/00</a>   |
| Air cleaners for the intakes of compressors  | <a href="#">F04B 39/16</a>  |
| Filtration of lubricants   | <a href="#">F16N 39/06</a>  |
| Filtering in air-conditioning  | <a href="#">F24F 3/16</a>   |
| Arrangement or mounting of filters in air-conditioning, air-humidification or ventilation                      | <a href="#">F24F 13/28</a>  |
| Investigating materials  | <a href="#">G01N 30/00</a>  |

### Special rules of classification

Group [B01D 59/00](#) (separation of isotopes) takes precedence over other groups of this subclass since it covers separation of isotopes of the same chemical element, whatever process or apparatus is employed.

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

|                     |   |
|---------------------|---|
| Filtration          | The separation of a fluid-solid mixture, involving passage of most of the fluid through a porous barrier which retains most of the solid particulates contained in the mixture; includes straining solids from fluids.  |
| Filter medium       | A porous barrier or porous arrangement of material, which lets a fluid pass while retaining most of the solids which were mixed with it.  |
| Filtering element   | A section of filter medium in addition to parts to which the medium is demountably or permanently fixed, including other sections of medium, end caps, peripheral frames or edge strips, but excluding housings.  |
| Filter housing      | The fluid-constraining impervious vessel, whether open or closed, which contains, or is adapted to contain one or more filtering elements or filter media.  |
| Filter chamber      | The space within a housing where filtering elements or filter media are located; partitions may divide a single housing into a plurality of chambers.   |
| Filtering apparatus | Filtering elements combined with housings, cleaning arrangements, motor or like parts, which are characteristic of the particular type of apparatus. Ancillary devices such as pumps or valves are considered part of a filtering apparatus when inside the apparatus. Ancillary devices performing similar or different unit operations such as comminutors, mixers or non-filtering separators, whether or not inside the apparatus, are not considered part of a filtering apparatus. The term does not extend to apparatus, e.g. washing machines, of which the filter forms only a part. |

## B01D 1/00

Evaporating ({evaporation in general, e.g. of liquids for gas phase reactions [B01B 1/005](#)}; removal of incrustation [B08B](#); preparation of starch [C08B 30/00](#); sugar industry [C13](#); prevention of incrustation [C23F](#); drying solid materials or objects by evaporating liquids therefrom [F26](#))

### Definition statement

*This place covers:*

This group covers document where evaporation of a mixture is used for separation of components of said mixture.

Document concerning specific application should not be classified in this group.

Means for contacting gas and liquid for the specific purpose of concentration by evaporation

This group does not cover :

Evaporation and concentration with attendant crystallisation is not classified in this group.

### Relationships with other classification places

Concentrating by evaporation of liquid containing solids in solution or suspension and treating or recovering the concentrate are classified in [B01D 21/00](#) and [F26](#)

Recovery of heat in the vapours evolved is classify in [B01D 5/006](#)

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Distillation   | <a href="#">B01D 3/00</a>  |
| Evaporation without separation                                     | <a href="#">B01B 1/00</a>  |
| evaporation in general, e.g. of liquids for gas phase reactions    | <a href="#">B01B 1/005</a> |
| removal of incrustation  | <a href="#">B08B</a>       |
| preparation of starch  | <a href="#">C08B 30/00</a> |
| sugar industry   | <a href="#">C13</a>        |
| prevention of incrustation   | <a href="#">C23F</a>       |
| drying solid materials or objects by evaporating liquids therefrom | <a href="#">F26</a>        |

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                         |                            |
|-------------------------|----------------------------|
| food evaporation        | <a href="#">A23C 1/12</a>  |
| juices evaporation      | <a href="#">A23L 2/10</a>  |
| soups concentration     | <a href="#">A23L 23/10</a> |
| removal of incrustation | <a href="#">B08B</a>       |
| Water evaporation       | <a href="#">C02F 1/02</a>  |
| preparation of starch   | <a href="#">C08B 30/00</a> |

|  |                            |
|--|----------------------------|
| In sugar industry  | <a href="#">C13B</a>       |
| Preventing incrustation  | <a href="#">C23F</a>       |
| spent liquor concentration   | <a href="#">D21C 11/10</a> |
| Drying solid materials or objects by evpoarating liquids therefrom | <a href="#">F26B</a>       |
| heat exchanger construction  | <a href="#">F28D 9/00</a>  |

## B01D 1/0017

{Use of electrical or wave energy ([B01D 1/0029](#) takes precedence)}

### References

#### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|                   |                      |
|-------------------|----------------------|
| Microwave devices | <a href="#">H05B</a> |
|-------------------|----------------------|

## B01D 1/0035

{Solar energy (for treatment of water [C02F 1/14](#))}

### References

#### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|       |                           |
|-------|---------------------------|
| Water | <a href="#">C02F 1/14</a> |
|-------|---------------------------|

## B01D 1/065

{by film evaporating}

### Definition statement

*This place covers:*

Evaporators with vertical tubes by film evaporating , e.g. documents describing a falling-film evaporator.

This subgroup does not cover the following:

Rising-film and wiped-film evaporators

Liquid being maintained as a film on a support by centrifugal force

Film supported on a travelling surface for evaporation

### References

#### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|                                |                            |
|--------------------------------|----------------------------|
| Gas and liquid contact in film | <a href="#">B01D 53/00</a> |
| Boilers, e.g.                  | <a href="#">F22B</a>       |

|  |                            |
|--|----------------------------|
| Machines or apparatus for drying materials in loose, plastic or fluidised form | <a href="#">F26B 17/00</a> |
| Heat exchanger   | <a href="#">F28D</a>       |

## B01D 1/18

to obtain dry solids ([B01D 1/24](#) takes precedence)

### Definition statement

*This place covers:*

This class is for classifying documents where the feed is a liquid mixture and after treatment a stream of vapour is obtained as well as some solid(s).

### References

#### Limiting references

*This place does not cover:*

|                                  |                           |
|----------------------------------|---------------------------|
| Evaporating to obtain dry solids | <a href="#">B01D 1/24</a> |
|----------------------------------|---------------------------|

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|              |                           |
|--------------|---------------------------|
| Granulation  | <a href="#">B01J 2/00</a> |
| Solid drying | <a href="#">F26B</a>      |

## B01D 1/20

Sprayers (in general [B05B](#))

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                            |                           |
|----------------------------|---------------------------|
| Distillation in spray form | <a href="#">B01D 3/00</a> |
| Sprayers                   | <a href="#">B05B</a>      |

## B01D 1/24

to obtain dry solids

### Definition statement

*This place covers:*

This group is for classifying documents where the feed is a liquid mixture and after treatment a stream of vapour is obtained as well as some solid(s).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|              |                           |
|--------------|---------------------------|
| Granulation  | <a href="#">B01J 2/00</a> |
| Solid drying | <a href="#">F26B</a>      |

## B01D 1/28

### with vapour compression

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Distillation using compressed vapour as source of heat | <a href="#">B01D 3/00</a>  |
| Water  | <a href="#">C02F 1/041</a> |
| Compressor   | <a href="#">F01D</a>       |

## B01D 3/00

Distillation or related exchange processes in which liquids are contacted with gaseous media, e.g. stripping (evaporation in general, e.g. of liquids for gas phase reactions [B01B 1/005](#)); gas chromatography [B01D 15/08](#); destructive distillation [C10B](#); preparation of alcoholic beverages by distillation [C12G 3/12](#))

### Definition statement

*This place covers:*

This group concerns distillation in general. Specific application should be classified in the relevant group.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Gas chromatography                                 | <a href="#">B01D 15/08</a> |
| Evaporation of liquids for gas phase reactions     | <a href="#">B01B 1/005</a> |
| Destructive distillation (pyrolysis)               | <a href="#">C10B</a>       |
| Preparation of alcoholic beverages by distillation | <a href="#">C12G 3/12</a>  |

### Special rules of classification

Packing elements are classified in [B01J 19/30](#), [B01J 19/32](#) and corresponding Indexing Codes.

Documents with a simple reference to distillation as possible separation means or step should not be classified in [B01D 3/00](#).

**B01D 3/001**

**{Processes specially adapted for distillation or rectification of fermented solutions}**

**Definition statement**

*This place covers:*

In [B01D 3/001](#) are classified the documents dealing with alcohol batch distillation.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|  |                           |
|--|---------------------------|
| More general alcohol distillation processes        | <a href="#">C12F</a>      |
| Preparation of alcoholic beverages by distillation | <a href="#">C12G 3/12</a> |

**B01D 3/002**

**{by continuous methods}**

**Definition statement**

*This place covers:*

In [B01D 3/001](#) are classified the documents dealing with alcohol continuous distillation.

**B01D 3/003**

**{Rectification of spirit}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|  |                           |
|--|---------------------------|
| Preparation of alcoholic beverages other than wine by distillation | <a href="#">C12G 3/12</a> |
|--|---------------------------|

**B01D 3/008**

**{Liquid distribution}**

**Special rules of classification**

Liquid feeder/distributor for all kind of columns (absorption) should be classified here.

**B01D 3/009**

**{in combination with chemical reactions}**

**Definition statement**

*This place covers:*

The chemical reaction is inside the distillation vessel.



This subgroup does not cover:

The chemical reaction only for assisting in the separation by distillation of a pre-existing

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                           |
|--|---------------------------|
| Distillation using compresses vapour as source of heat                         | <a href="#">B01D 3/00</a> |
| Purification, separation of hydrocarbons                                       | <a href="#">C07C 7/00</a> |
| Destructive distillation of carbonaceous materials for production of gas, coke | <a href="#">C10B 1/00</a> |
| Working up tar, pitch, asphalt by chemical means                               | <a href="#">C10C 3/02</a> |

## B01D 3/085

{using a rotary evaporator}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Distillation using compresses vapour as source of heat                                   | <a href="#">B01D 3/00</a>  |
| Laboratory apparatus   | <a href="#">B01L 3/00</a>  |
| Machines or apparatus for drying solid materials with movements which is non-progressive | <a href="#">F26B 11/00</a> |

## B01D 3/14

Fractional distillation {or use of a fractionation or rectification column}

## Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "Fractionation", "rectification" and "distillation"

## B01D 3/40

Extractive distillation

## References

### Limiting references

This place does not cover:

|                         |                           |
|-------------------------|---------------------------|
| Azeotropic distillation | <a href="#">B01D 3/36</a> |
|-------------------------|---------------------------|

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|            |                            |
|------------|----------------------------|
| Extraction | <a href="#">B01D 11/00</a> |
|------------|----------------------------|

**B01D 5/00**

**Condensation of vapours; Recovering volatile solvents by condensation**  
(**B01D 8/00** takes precedence; condensers **F28B**)

**References****Limiting references**

*This place does not cover:*

|            |                      |
|------------|----------------------|
| condensers | <a href="#">F28B</a> |
|------------|----------------------|

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                             |                             |
|-----------------------------|-----------------------------|
| Distillation                | <a href="#">B01D 3/00</a>   |
| Condensation from gases     | <a href="#">B01D 53/002</a> |
| Water condensation from air | <a href="#">E03B 3/28</a>   |
| Heat exchanger construction | <a href="#">F28D 9/00</a>   |

**B01D 5/0003**

**{by using heat-exchange surfaces for indirect contact between gases or vapours and the cooling medium}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                             |                           |
|-----------------------------|---------------------------|
| Heat exchanger construction | <a href="#">F28D 9/00</a> |
|-----------------------------|---------------------------|

**B01D 7/00**

**Sublimation** (**B01D 8/00** takes precedence; freeze-drying **F26**)

**Definition statement**

*This place covers:*

Sublimation or antisublimation in general for separation.

**References****Limiting references**

*This place does not cover:*

|                          |                           |
|--------------------------|---------------------------|
| Cold traps; cold baffles | <a href="#">B01D 8/00</a> |
| Freeze-drying            | <a href="#">F26</a>       |

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|                      |                           |
|----------------------|---------------------------|
| Distillation         | <a href="#">B01D 3/00</a> |
| Cryogenic separation | <a href="#">F25J</a>      |
| Drying solids        | <a href="#">F26B 3/00</a> |

**Special rules of classification**

Specific application should be classified in the relevant groups.

**B01D 8/00**

**Cold traps; Cold baffles (pumps for evacuating by condensing or freezing  
[F04B 37/08](#))**

**Definition statement**

*This place covers:*

Only documents for separation should be classified in this group.

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Pumps for evacuating by condensing or freezing | <a href="#">F04B 37/08</a> |
| Cryogenic separation                           | <a href="#">F25J</a>       |

**B01D 9/00**

**Crystallisation (crystallisation directly from the vapour phase [B01D 7/02](#);  
making single crystals [C30B](#) {; crystallisation as part of the Bayer process also  
classified in [C01F 7/14](#)})**

**Relationships with other classification places**

Making single crystals: [C30B](#)

**References****Limiting references**

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Crystallisation directly from the vapour phase  | <a href="#">B01D 7/02</a>   |
| Dairy products, e.g. milk, butter, cheese; milk or cheese substitutes:<br>Concentration by freezing out the water   | <a href="#">A23C 1/06</a>   |
| Preservation of foods or foodstuffs, in general, e.g. pasteurising,<br>sterilising, specially adapted for foods or foodstuff: fractionated<br>crystallisation | <a href="#">A23L 3/405</a>  |
| Medicinal preparations characterised by special physical form:<br>Agglomerates; Granulates; Microbeadlets : Processes   | <a href="#">A61K 9/1682</a> |
| Crystallisation as part of the Bayer process is also classified in  | <a href="#">C01F 7/14</a>   |

|   |                             |
|---|-----------------------------|
| Treatment of water, waste water or sewage by freezing   | <a href="#">C02F 1/22</a>   |
| Purification/separation of acyclic or carbocyclic compounds by crystallisation  | <a href="#">C07C 7/14</a>   |
| Production of sucrose; apparatus specially adapted therefor:<br>Crystallisation; Crystallising apparatus; Separating crystals from mother liquors | <a href="#">C13B 30/00</a>  |
| Investigating or analyzing materials by crystallisation   | <a href="#">G01N 25/147</a> |

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|   |                                |
|---|--------------------------------|
| Processes leading to the formation of precipitates  | <a href="#">B01D 2009/0086</a> |
| Preservation of foods or foodstuffs, in general, e.g. pasteurising, sterilising, specially adapted for foods or foodstuff: by drying or kilning | <a href="#">A23L 3/40</a>      |

### Special rules of classification

No documents should be classified in [B01D 9/02](#) as virtually all crystallisation processes are conducted using solutions of the target compound. Use [B01D 9/04](#) if solvent is removed for concentration of solutions.

## B01D 11/00

### Solvent extraction

#### References

##### Limiting references

This place does not cover:

|   |                             |
|---|-----------------------------|
| Separation of isotopes by solvent extraction  | <a href="#">B01D 59/24</a>  |
| Tea extraction  | <a href="#">A23F 3/16</a>   |
| Coffee: reducing alkaloid content by extraction of the beans with selective solvents other than water or aqueous bean extracts, including supercritical gases | <a href="#">A23F 5/206</a>  |
| Coffee: reducing alkaloid content by extraction of the beans with water, aqueous solutions without organic or inorganic solvents, or aqueous coffee extract   | <a href="#">A23F 5/208</a>  |
| Extraction of coffee; Coffee extracts   | <a href="#">A23F 5/24</a>   |
| Foods or foodstuffs; their preparation or treatment: natural spices obtained by solvent extraction  | <a href="#">A23L 27/11</a>  |
| Foods or foodstuffs; their preparation or treatment : plant extracts  | <a href="#">A23L 33/105</a> |
| Cosmetic or similar toilet preparations containing material of vegetable origin, e.g. plant extracts  | <a href="#">A61K 8/97</a>   |
| Preparation of oxyacids of phosphorus involving liquid-liquid extraction  | <a href="#">C01B 25/46</a>  |
| Treatment of water, waste water or sewage by extraction   | <a href="#">C02F 1/26</a>   |
| Purification/separation of acyclic or carbocyclic compounds by extraction   | <a href="#">C07C 7/10</a>   |

|   |                              |
|---|------------------------------|
| Separation/purification of compounds having hydroxy or O-metal groups bound to a carbon atom not belonging to a six-membered aromatic ring by liquid-liquid treatment | <a href="#">C07C 29/86</a>   |
| Working-up pitch, asphalt, bitumen by selective extraction  | <a href="#">C10C 3/08</a>    |
| Production of liquid hydrocarbon mixtures from oil-shale, oil-sand, or non-melting solid carbonaceous or similar materials, e.g. wood, coal, by extraction            | <a href="#">C10G 1/04</a>    |
| Refining of hydrocarbon oils in the absence of hydrogen, by extraction with selective solvents  | <a href="#">C10G 21/00</a>   |
| Working-up used lubricants to recover useful products using extraction processes; apparatus therefor  | <a href="#">C10M 175/005</a> |
| Production of fats/fatty oils by extraction   | <a href="#">C11B 1/10</a>    |
| Recovery/refining of essential oils/perfumes by solvent extraction  | <a href="#">C11B 9/025</a>   |
| Extraction of hop using carbon dioxide  | <a href="#">C12C 3/10</a>    |
| Extraction of metal compounds from ores or concentrates by wet processes  | <a href="#">C22B 3/00</a>    |
| Treating radioactively contaminated material by solvent extraction  | <a href="#">G21F 9/125</a>   |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |                              |
|--|------------------------------|
| Medicinal preparations containing material or reaction products thereof with undetermined constitution   | <a href="#">A61K 35/00</a>   |
| Medicinal preparations of undetermined constitution containing material from algae, lichens, fungi or plants, or derivatives thereof, e.g. traditional herbal medicines    | <a href="#">A61K 36/00</a>   |
| Processes of utilising sub-atmospheric or super-atmospheric pressure to effect chemical or physical change of matter; processes carried out under supercritical conditions | <a href="#">B01J 3/008</a>   |
| Cleaning using liquid gasses or supercritical fluids   | <a href="#">B08B 7/0021</a>  |
| Cleaning electronic devices, e.g. semiconductors   | <a href="#">C11D 11/0047</a> |
| Preparing specimens for investigation: purifying, cleaning   | <a href="#">G01N 1/34</a>    |
| Heating using microwaves   | <a href="#">H05B 6/64</a>    |

## **B01D 12/00**

**Displacing liquid, e.g. from wet solids or from dispersions of liquids or from solids in liquids, by means of another liquid**

### **Relationships with other classification places**

Displacing liquid normally aims at drying the solids and in this case should not be classified here, but rather in [F26B 5/005](#) (see below).

## References

### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Drying solid materials or objects by dipping them into or mixing them with a chemical liquid, e.g. organic; chemical, e.g. organic, dewatering aid | <a href="#">F26B 5/005</a> |
|--|----------------------------|

## B01D 15/00

**Separating processes involving the treatment of liquids with solid sorbents (using liquid sorbents [B01D 11/00](#); ion exchange processes or materials, sorbent materials in general [B01J](#), e.g. sorbents for chromatography [B01J 20/281](#); for investigating or analysing materials [G01N 30/00](#)); Apparatus therefor**

### Definition statement

*This place covers:*

- Separating processes and apparatus for treating liquids involving non-selective adsorption with solid sorbents.
- Separating processes and apparatus for treating liquids involving moving solid sorbents.
- Separation processes and apparatus for treating liquids using selective adsorption, e.g. chromatography.
- Processes for separation by chromatography involving ion exchange materials and apparatus therefor.

## References

### Limiting references

*This place does not cover:*

|  |   |
|--|---|
| Separating processes involving the treatment of liquids with liquid sorbents | <a href="#">B01D 11/00</a>  |
| Preparative gas chromatography   | <a href="#">B01D 53/02</a>  |
| Separation of isotopes of the same chemical element                          | <a href="#">B01D 59/00</a>  |
| Sorbent materials  | <a href="#">B01J 20/00</a> -<br><a href="#">B01J 20/28097</a><br>; <a href="#">B01J 20/30</a> -<br><a href="#">B01J 20/3491</a> |
| Sorbents used as stationary phases or packings for chromatography            | <a href="#">B01J 20/281</a> -<br><a href="#">B01J 20/292</a>  |
| Ion-exchange processes or materials  | <a href="#">B01J 39/00</a> - <a href="#">B01J 49/90</a>   |
| Ion-exchange materials used for chromatographic processes                    | <a href="#">B01J 39/26</a> , <a href="#">B01J 41/20</a> ,<br><a href="#">B01J 45/00</a>   |
| Treatment processes of water by sorption                                     | <a href="#">C02F 1/28</a> - <a href="#">C02F 1/288</a>  |
| Treatment of water by ion-exchange   | <a href="#">C02F 1/42</a>   |
| Investigative or analytical chromatography                                   | <a href="#">G01N 30/00</a>  |

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|   |  |
|---|--|
| Modifying dairy products by dialysis, osmosis, filtration or ion-exchange   | <a href="#">A23C 9/14</a>                              |
| Treating blood or products derived there from   | <a href="#">A61K 35/14</a> , <a href="#">A61M 1/36</a> |
| Medicinal preparations of undetermined constitution containing material from algae, lichens, fungi or plants, or derivatives thereof, e.g. traditional herbal medicines | <a href="#">A61K 36/00</a>                             |
| Separation of optically active compounds  | <a href="#">C07B 57/00</a>                             |
| Purification of hydrocarbons by adsorption  | <a href="#">C07C 7/12</a>                              |
| Extraction, separation or purification of peptides by chromatography  | <a href="#">C07K 1/16</a>                              |
| Refining hydrocarbon oils with solid sorbents   | <a href="#">C10G 25/00</a>                             |
| Working-up of used lubricants with the use of adsorbents  | <a href="#">C10M 175/0008</a>                          |
| Refining fats or fatty oils by adsorption   | <a href="#">C11B 3/10</a>                              |
| Purification of alcoholic beverages with ion-exchange or adsorption materials   | <a href="#">C12H 1/04</a>                              |
| Separating or purifying microorganisms or enzymes   | <a href="#">C12N 9/00</a>                              |
| Processes for the isolation, preparation or purification of DNA or RNA  | <a href="#">C12N 15/10</a>                             |
| Purification of sugar juices using adsorption agents  | <a href="#">C13B 20/12</a>                             |
| Treating radioactively contaminated liquids by adsorption   | <a href="#">G21F 9/12</a>                              |

### Special rules of classification

- [B01D 15/00](#) or [B01D 15/02](#) are to be used for classifying non selective adsorption processes or apparatus other than chromatography involving the removal of a particular component from a liquid, e.g. removal of heavy metals such as mercury, sulphur containing compounds, PCB's from e.g. a hydrocarbon feedstock, a solvent, a caustic solution.
- Separation or purification processes by chromatography are classified in [B01D 15/26](#) and subgroups according to the separation mechanism.
- Specific features related to chromatography processes or apparatus are classified in [B01D 15/10](#) and subgroups.
- The IPC group **B01D15/04** is not used in the CPC classification scheme. Subject-matter covered by this group is classified in [B01J 39/00](#) - [B01J 49/90](#).
- In order that group [B01D 15/08](#) may provide a basis for a complete search with respect to chromatography in general, all subject matter of general interest is classified in this group even if it is classified primarily in the application-oriented groups, for example dairy products [A23C 9/148](#), treatment of blood, e.g. [A61M 1/36](#), optically active organic compounds [C07B 57/00](#) or peptides [C07K 1/16](#) (See Informative references).
- Other secondary non invention related information concerning chromatography can be classified with symbols [B01D 15/08-B01D 15/428](#).
- Moreover, combination of these Indexing Code symbols should also be used when classifying documents relating to chromatographic processes involving several different type of interactions. For example, a multistep chromatographic process involving hydrophobic interaction chromatography followed by ion exchange chromatography should be classified in ([B01D 15/327](#),[B01D 15/361](#)). A process using affinity chromatography followed by chromatography with an anion exchanger should be classified in ([B01D 15/3804](#),[B01D 15/363](#)).

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

|                            |  |
|----------------------------|--|
| Adsorption                 | Separation process which involves the transfer and resulting equilibrium distribution of one or more solutes between a fluid phase and adsorbing particles.  |
| Sorbent                    | A material which separates a constituent from a fluid mixture containing such constituents. The action in most instances is that of selective retention (i.e. the sorbent removes only the part of the fluid mixture for which it has the greatest affinity). The retained constituent cannot be removed by shaking, brushing or similar mechanical action, but generally can be removed by heating, pressure reduction, or use of a stripping or denuding fluid.  |
| Chromatography             | A process in which a liquid is flowed along a linear path comprising a sorbent, with which the liquid competes in affinity for a constituent of the liquid. The constituent is sorbed from the moving liquid by the relatively immobile sorbent and re-dissolved by a later passing portion of the liquid until an equilibrium of the sorbing-dissolving step is set up causing the constituent to concentrate in a specific volume of the sorbent and to move along the path of the liquid at a rate slower than such liquid. |
| Adsorption chromatography: | Separation is based mainly on the differences between the adsorption affinities of the sample components for the surface of an active solid.   |
| Partition chromatography   | Separation is based mainly on differences between the solubilities of the sample components in the stationary phase (gas chromatography) or on differences between the solubilities of the components in the mobile and stationary phases (liquid chromatography).   |
| Exclusion chromatography   | Separation is based mainly on exclusion effects, such as differences in molecular size ( size- exclusion chromatography) and/or shape or charge.   |
| Affinity chromatography    | The particular variant of chromatography in which the unique biological specificity of the analyte and ligand interaction is utilised in the separation.   |
| Bonded phase               | A stationary phase which is covalently bonded to the support particles or to the inside wall of the column tubing.   |

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

|      |  |
|------|--|
| HPLC | High performance liquid chromatography, sometimes also referred to as high pressure liquid chromatography. |
|------|--|



## B01D 17/00

**Separation of liquids, not provided for elsewhere, e.g. by thermal diffusion (devices for separating or removing fatty or oily substances or similar floating material from water, waste water, or sewage [C02F 1/40](#); cleaning or keeping clear the surface of open water from oil or like materials [E02B 15/04](#); arrangements for separating lubricants from refrigerants [F25B 43/02](#))**

### Definition statement

*This place covers:*

Documents concerning separation of liquids not provided elsewhere should be given a group in [B01D 17/00](#). In case of specific application, the document should be given a group in the relevant field only.

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Liquid solid separation                 | <a href="#">B01D 21/00</a> |
| Filtration                              | <a href="#">B01D 37/00</a> |
| Blood treatment                         | <a href="#">A61M</a>       |
| For cyclones                            | <a href="#">B04C</a>       |
| Waste water treatment                   | <a href="#">C02F 1/40</a>  |
| Petrol separation                       | <a href="#">C10G 33/00</a> |
| For cleaning open water from oil        | <a href="#">E02B 15/04</a> |
| Fat separation                          | <a href="#">E03F 5/14</a>  |
| Drilling or well fluid separation       | <a href="#">E21B</a>       |
| Separating lubricants from refrigerants | <a href="#">F25B 43/02</a> |
| Drying solid                            | <a href="#">F26B 3/00</a>  |

### Special rules of classification

In the case of a document in the specific field of water treatment, the document should be given a the classification symbol [B01D 17/00](#).

The wording of the title of the group could allow classification of documents for separation of miscible liquids. In practice only documents with separation of emulsion is classified in this group. Separation of miscible liquids should be classified in the relevant group(s) e.g. evaporation ([B01D 1/00](#)), distillation ([B01D 3/00](#)), permeation ([B01D 61/00](#)), filtration ([B01D 39/00](#)).

This group used combination of classes. This has been abandoned but reclassification is currently done.

If the phase to be separated comprises also solids (liquid-liquid-solid stream) and the separation step separates the three phases in three streams, then it should be classified in the relevant group in [B01D 21/00](#).

**B01D 17/0205****{by gas bubbles or moving solids}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|           |                      |
|-----------|----------------------|
| Flotation | <a href="#">B03D</a> |
|-----------|----------------------|

**B01D 17/0217****{by centrifugal force}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|          |                      |
|----------|----------------------|
| Cyclones | <a href="#">B04C</a> |
|----------|----------------------|

**B01D 17/045****{with coalescers}****Definition statement***This place covers:*

Devices (or processes) with some grid for increasing coalescing of phases. The grid can have lipophilic or lipophobic composition.

**B01D 17/047****{with separation aids}****Definition statement***This place covers:*

Addition of a chemical agent to promote the separation of the phases.

**B01D 17/048****{by changing the state of aggregation}****Definition statement***This place covers:*

Documents describing inversion of phases (O/W to W/O and reciprocally) should be classified in this group

## B01D 17/06

### Separation of liquids from each other by electricity

#### References

##### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|                                      |                      |
|--------------------------------------|----------------------|
| Magnetic or electrostatic separation | <a href="#">B03C</a> |
| Microwave devices                    | <a href="#">H05B</a> |

## B01D 19/00

### Degasification of liquids

#### Definition statement

*This place covers:*

Documents involving degassing of a liquid should be given a group in this field. The constituent that is removed from the liquid is initially present in the liquid as a gas, e.g. air, oxygen, nitrogen, carbon dioxide, etc.

Degassing includes defoaming ([B01D 19/02](#)) and also stripping a gas from a liquid that was used in absorption of a gas from another gas ([B01D 19/00](#)).

Vaporising a liquid mixed in another liquid and then removing the vaporised liquid (now a gas) is not removing a constituent initially present as a gas from a liquid.

Degassing is [B01D 19/00](#) and separation by evaporation is [B01D 1/00](#)

#### References

##### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|                 |                            |
|-----------------|----------------------------|
| Filtration      | <a href="#">B01D 37/00</a> |
| Blood treatment | <a href="#">A61M</a>       |
| Cyclones        | <a href="#">B04C</a>       |
| Ink degassing   | <a href="#">B41J 2/19</a>  |

#### Special rules of classification

In practice, all documents about degassing of ink(s) are classified only in [B41J 2/19](#).

## B01D 19/0036

### {Flash degasification (the other groups take precedence)}

#### Definition statement

*This place covers:*

Documents involving degassing by vacuum should be given this group.

The other groups in [B01D 19/00](#) take precedence

**B01D 19/0057**

{the centrifugal movement being caused by a vortex, e.g. using a cyclone, or by a tangential inlet}

**Definition statement**

*This place covers:*

Degasification of liquids by modifying the liquid flow in vessels in which the centrifugal movement is caused by a vortex

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|          |                      |
|----------|----------------------|
| Cyclones | <a href="#">B04C</a> |
|----------|----------------------|

**B01D 19/0063**

{Regulation, control including valves and floats (for construction and details of valves [F16K](#))}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                          |                      |
|--------------------------|----------------------|
| For detail of valves see | <a href="#">F16K</a> |
|--------------------------|----------------------|

**B01D 19/0084**

{using an electric current}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                          |                      |
|--------------------------|----------------------|
| Electrostatic separation | <a href="#">B03C</a> |
| Microwave devices        | <a href="#">H05B</a> |

**B01D 19/0089**

{using a magnetic field (magnetic separation in general [B03C 1/00](#))}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                                      |                           |
|--------------------------------------|---------------------------|
| Magnetic or electrostatic separation | <a href="#">B03C</a>      |
| Magnetic separation in general       | <a href="#">B03C 1/00</a> |

|                   |                      |
|-------------------|----------------------|
| Microwave devices | <a href="#">H05B</a> |
|-------------------|----------------------|

## B01D 19/0094

{by using a vortex, cavitation}

### Definition statement

*This place covers:*

Degasification of liquids by a method not covered by groups [B01D 19/0005](#) - [B01D 19/0042](#) and using a vortex

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                    |                           |
|--------------------|---------------------------|
| Cyclones           | <a href="#">B04C</a>      |
| Ultrasonic devices | <a href="#">B06B 3/00</a> |

## B01D 19/02

Foam dispersion or prevention (during boiling [B01B 1/02](#); during fermentation [C12](#))

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|   |   |
|---|---|
| Foam dispersion or prevention during boiling without separation | <a href="#">B01B 1/02</a>                   |
| Foam dispersion or prevention during fermentation               | <a href="#">C12C</a> , <a href="#">C12G</a> |

## B01D 21/00

Separation of suspended solid particles from liquids by sedimentation ({separation of ores or the like by sedimentation [B03B 5/48](#) - [B03B 5/60](#)} ; differential sedimentation [B03D 3/00](#); {purification of water, waste water, sewage or sludge [C02F](#), e.g.} devices for separating or removing fatty or oily substances or similar floating material from water, waste water or sewage [C02F 1/40](#))

### Definition statement

*This place covers:*

- Devices for the separation of suspended solid particles from liquids by sedimentation in general, i.e., if the application of the device is subordinate.
- Devices for specific applications if there is a strong emphasis on the structural details of the device or if parts of the device are of general interest in the field of sedimentation. For example, a sedimentation device for waste water treatment, also classified in [C02F](#), which discloses e.g. certain details of the scraper, should also be classified in [B01D 21/00](#).

## Relationships with other classification places

Documents which are primordially directed to the fields of waste water treatment ([C02F](#)), sewers ([E03F](#)) or other technical fields relating to the application of the apparatuses should only be classified in [B01D 21/00](#) if the device disclosed therein shows structural details of general interest in [B01D 21/00](#). Documents disclosing the mere presence of a sedimentation device, e.g. as a schematic block in a process flow diagram, as a schematic drawing after a sand filter etc., should not be classified in [B01D 21/00](#). Instead, an appropriate index from the indexing scheme corresponding to [B01D 21/00](#) should be assigned.

Documents disclosing a device relating to the technical the fields of the separation with centrifuges ([B04B](#)), the separation with free vortices, e.g. cyclones ([B04C](#)), the electric and magnetic separation ([B03C](#)), the filtration ([B01D 23/00](#) - [B01D 41/00](#)), the flotation ([B03D 1/00](#)) or the differential sedimentation ([B03D 3/00](#)) should only be classified in [B01D 21/00](#) if the general aspects of the disclosed device relate to [B01D 21/00](#) and if it is deemed unjustified to assign a classification symbol in the respective other fields. This is normally the case if the disclosure lacks sufficient structural details to justify a classification in the above referred technical fields be assigned or because the feature relates to a side aspect. Examples for side aspects are the rough pre-filtration of the liquid to be clarified by sedimentation, the mere presence of a magnetic separator at an outlet of the sedimentation tank, or the introduction of gas bubbles in a limited region of the sedimentation device, e.g. close to the discharge opening for the clarified liquid.

## References

### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Separation of liquids by sedimentation or centrifugal forces   | <a href="#">B01D 17/00</a> |
| Washing granular materials; Separating solids from solids by wet methods e.g. sink-float separation: separating the fractions of a mixture of solids with a liquid having a density in between the fractions | <a href="#">B03B</a>       |
| Magnetic or electrostatic separation devices   | <a href="#">B03C</a>       |
| Flotation devices (also reactor-separator types)   | <a href="#">B03D 1/00</a>  |
| Differential sedimentation: separating a mixture into its fractions by making use of a difference in sedimentation velocity, e.g. density gradient centrifugation  | <a href="#">B03D 3/00</a>  |
| Centrifuges and structural details thereof   | <a href="#">B04B</a>       |
| Cyclones and structural details thereof  | <a href="#">B04C</a>       |
| Treatment of water, waste water, sewage, or sludge when no structural details of general interest are disclosed.   | <a href="#">C02F</a>       |

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |  |
|--|--|
| Filters making use of electricity or magnetism | <a href="#">B01D 35/05</a>                                   |
| Treating manure                                | <a href="#">A01C 3/00</a>                                    |
| Devices used for fish ponds                    | <a href="#">A01K 61/00</a> and<br><a href="#">A01K 63/00</a> |
| Treatment of water for aquaria                 | <a href="#">A01K 63/04</a>                                   |
| Processing slaughtering residues               | <a href="#">A22B 5/00</a>                                    |
| Clarifying non-alcoholic beverages             | <a href="#">A23L 2/70</a>                                    |

|  |                              |
|--|------------------------------|
| Sedimentation devices for dental use   | <a href="#">A61C 17/046</a>  |
| Sedimentation devices for medical purposes, body liquids   | <a href="#">A61M 1/3693</a>  |
| Chemical or physical processes   | <a href="#">B01J</a>         |
| Paint sludge treatment   | <a href="#">B05B 14/462</a>  |
| Methods or apparatus specially adapted for transmitting mechanical vibrations  | <a href="#">B06B 3/00</a>    |
| Removing chips from sawing machines  | <a href="#">B23D 59/00</a>   |
| Removing chips from machine tools  | <a href="#">B23Q 11/00</a>   |
| Ink filters for printers   | <a href="#">B41J 2/17563</a> |
| Barges for collection of pollution from open water   | <a href="#">B63B 35/32</a>   |
| Fluidising means for discharging large containers  | <a href="#">B65D 88/72</a>   |
| Treatment of water, waste water, sewage, or sludge when structural details of general interest are disclosed.                        | <a href="#">C02F</a>         |
| Refining hydrocarbon oils by centrifugation  | <a href="#">C10G 31/10</a>   |
| Working-up lubricants  | <a href="#">C10M 175/00</a>  |
| Clarifying alcoholic beverages   | <a href="#">C12H 1/06</a>    |
| Apparatus for microbiology   | <a href="#">C12M 1/00</a>    |
| Cleaning or keeping clear the surface of open water; Apparatus therefore   | <a href="#">E02B 15/00</a>   |
| Kitchen sinks  | <a href="#">E03C 1/00</a>    |
| Stormwater treatment   | <a href="#">E03F 5/00</a>    |
| Other installations or implements for operating sewer systems (cleaning, emptying, maintenance)                                      | <a href="#">E03F 7/00</a>    |
| Sludge tanker  | <a href="#">E03F 7/10</a>    |
| Working-up Building material   | <a href="#">E04G 21/00</a>   |
| Treatment of water for swimming pools  | <a href="#">E04H 4/1209</a>  |
| Sedimentation devices used in drilling boreholes   | <a href="#">E21B 21/00</a>   |
| Separation of well effluents   | <a href="#">E21B 43/34</a>   |
| Measuring volume flow, mass flow or liquid level (e.g. indicating or measuring liquid level <a href="#">G01F 23/00</a> )             | <a href="#">G01F</a>         |
| Investigating and analysing materials by determining their chemical or physical properties (e.g. density <a href="#">G01N 9/00</a> ) | <a href="#">G01N</a>         |
| Control of non-electrical variables  | <a href="#">G05D</a>         |

### Special rules of classification

In the absence of an indication to the contrary, classification is made for each technical feature shown in the document.

## B01D 23/00

{Gravity filters (with moving filtering elements [B01D 33/0035](#))}

### Definition statement

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

### Special rules of classification

- The group [B01D 23/00](#) is no more valid for classification.

The group [B01D 24/00](#) was introduced in March 1989. This group includes subject matter of [B01D 23/00](#), [B01D 25/06](#), [B01D 25/10](#), [B01D 29/0027](#), [B01D 33/0032](#) and [B01D 33/0054](#)

- Documents from the backlog of the group [B01D 23/00](#), and the subgroups

[B01D 25/06](#), [B01D 25/10](#), [B01D 29/0027](#), [B01D 33/0032](#) and [B01D 33/0054](#) are in the process of being revised and also systematically transferred to [B01D 24/00](#)

- The combination classes of the type [B01D 23/14-B01D 23/24](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set), e.g. ([B01D 23/14](#), [B01D 23/24](#)).

## B01D 24/00

**Filters comprising loose filtering material, i.e. filtering material without any binder between the individual particles or fibres thereof ([B01D 27/02](#) takes precedence)**

### Definition statement

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

### References

#### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| With cartridges made from a mass of loose materials   | <a href="#">B01D 27/02</a> |
| Gas Filters   | <a href="#">B01D 46/00</a> |
| Separation of gases or vapours  | <a href="#">B01D 53/00</a> |
| Chemical or physical processes  | <a href="#">B01J</a>       |
| Treatment of water, waste water, sewage, or sludge only when no mechanical filtration is involved | <a href="#">C02F</a>       |

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Gravity filters  | <a href="#">B01D 23/00</a> |
| Filters with loose, granular or fibrous filtering elements, formed by clamping together several filtering elements | <a href="#">B01D 25/06</a> |



|  |                              |
|--|------------------------------|
| Filters in which the suspended particles form the filtering medium, formed by clamping together several filtering elements                     | <a href="#">B01D 25/10</a>   |
| Filters with loose, granular or fibrous filtering elements with filtering elements stationary during filtration                                | <a href="#">B01D 29/0027</a> |
| Filters with loose, granular or fibrous filtering elements with filtering elements moving during the filtering operation (with drums)          | <a href="#">B01D 33/0032</a> |
| Filters with loose, granular or fibrous filtering elements with filtering elements moving during the filtering operation (with plane surfaces) | <a href="#">B01D 33/0054</a> |

### Special rules of classification

- The group [B01D 24/00](#) was introduced in March 1989. This group includes subject matter of [B01D 23/00](#), [B01D 25/06](#), [B01D 25/10](#), [B01D 29/0027](#),

[B01D 33/0032](#) and [B01D 33/0054](#)

- Documents from the backlog of the group [B01D 23/00](#), and the subgroups

[B01D 25/06](#), [B01D 25/10](#), [B01D 29/0027](#), [B01D 33/0032](#) and [B01D 33/0054](#) are in the process of being revised and also systematically transferred to [B01D 24/00](#)

- The combination classes of the type [B01D 24/14](#)+ [B01D 24/42](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets (C-set), e.g. ([B01D 24/14](#), [B01D 24/42](#)).

### B01D 24/005

{Filters being divided into a plurality of cells or compartments ([B01D 24/004](#) takes precedence)}

#### References

##### Limiting references

*This place does not cover:*

|                                      |                             |
|--------------------------------------|-----------------------------|
| Arranged concentrically or coaxially | <a href="#">B01D 24/004</a> |
|--------------------------------------|-----------------------------|

### B01D 24/04

the filtering material being clamped between pervious fixed walls ([B01D 24/10](#), [B01D 24/20](#) take precedence)

#### References

##### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| The filtering material being held in a closed container | <a href="#">B01D 24/10</a> |
| The filtering material being held in an open container  | <a href="#">B01D 24/20</a> |

**B01D 24/12**

Downward filtration, the filtering material being supported by pervious surfaces ([B01D 24/18](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Combined upward and downward filtration | <a href="#">B01D 24/18</a> |
|---|----------------------------|

**B01D 24/14**

Downward filtration, the container having distribution or collection headers or pervious conduits ([B01D 24/18](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Combined upward and downward filtration | <a href="#">B01D 24/18</a> |
|---|----------------------------|

**B01D 24/16**

Upward filtration ([B01D 24/18](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Combined upward and downward filtration | <a href="#">B01D 24/18</a> |
|---|----------------------------|

**B01D 24/405**

{Special treatment of the feed stream before contacting the filtering material, e.g. cutting ([B01D 35/24](#), [B01D 37/02](#), [B01D 37/03](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Providing loose granular material to scratch the filters clean                     | <a href="#">B01D 35/24</a> |
| Precoating the filter medium; Addition of filter aids to the liquid being filtered | <a href="#">B01D 37/02</a> |
| Using flocculating agents  | <a href="#">B01D 37/03</a> |

**B01D 24/46**

Regenerating the filtering material in the filter ([B01D 24/44](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|                             |                            |
|-----------------------------|----------------------------|
| For discharging filter cake | <a href="#">B01D 24/44</a> |
|-----------------------------|----------------------------|

**B01D 24/4605**

{by scrapers, brushes, nozzles or the like placed on the cake-side of the stationary filtering material and only contacting the external layer ([B01D 24/4631](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|                          |                              |
|--------------------------|------------------------------|
| Counter-current flushing | <a href="#">B01D 24/4631</a> |
|--------------------------|------------------------------|

**B01D 24/4668**

{by moving the filtering element ([B01D 24/4605](#) and [B01D 24/4631](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|   |                              |
|---|------------------------------|
| By scrapers, brushes, nozzles or the like placed on the cake-side of the stationary filtering material and only contacting the external layer | <a href="#">B01D 24/4605</a> |
| Counter-current flushing  | <a href="#">B01D 24/4631</a> |

**B01D 24/4846**

{Retarding cake deposition on the filter during the filtration period, e.g. using stirrers ([B01D 24/407](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|                               |                             |
|-------------------------------|-----------------------------|
| Provoking a tangential stream | <a href="#">B01D 24/407</a> |
|-------------------------------|-----------------------------|

## B01D 24/4876

{in which the filtering elements are moved between filtering operations; particular measures for removing or replacing the filtering elements ([B01D 24/46](#), [B01D 24/4807](#) take precedence)}

### References

#### Limiting references

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Regenerating the filtering material in the filter             | <a href="#">B01D 24/46</a>   |
| Handling the filter cake for purposes other than regenerating | <a href="#">B01D 24/4807</a> |

## B01D 25/00

Filters formed by clamping together several filtering elements or parts of such elements (disc filters [B01D 29/39](#))

### Definition statement

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

### References

#### Limiting references

*This place does not cover:*

|   |   |
|---|---|
| Disc filters  | <a href="#">B01D 29/39</a>  |
| Edge filtering elements, i.e. using impervious surfaces.  | <a href="#">B01D 29/44</a> , <a href="#">B01D 29/46</a> ,<br><a href="#">B01D 29/48</a> |
| Gas Filters   | <a href="#">B01D 46/00</a>  |
| Separation of gases or vapours  | <a href="#">B01D 53/00</a>  |
| Chemical or physical processes  | <a href="#">B01J</a>  |
| Treatment of water, waste water, sewage, or sludge only when no mechanical filtration is involved | <a href="#">C02F</a>  |

### Special rules of classification

- The groups [B01D 25/16](#), [B01D 25/18](#) and [B01D 25/20](#) are no longer used for classification. New patent documents are continuously being reclassified to groups [B01D 29/44](#), [B01D 29/46](#), [B01D 29/48](#).
- The groups [B01D 25/04](#), [B01D 25/08](#), [B01D 25/121](#), [B01D 25/122](#), [B01D 25/124](#), [B01D 25/125](#), [B01D 25/14](#) are no longer used for classification. The backlog of those groups are being continuously reclassified to groups and subgroups of [B01D 25/00](#), [B01D 29/00](#)
- The combination classes of the type [B01D 25/127](#)+ [B01D 25/19](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set) e.g. ([B01D 25/127](#), [B01D 25/19](#)).

**B01D 25/001**

{Making filtering elements (not provided for elsewhere; see also [B01D 24/001](#), [B01D 27/005](#), [B01D 29/012](#), [B01D 29/111](#), [B01D 33/0093](#))}

**References****Limiting references**

*This place does not cover:*

|                           |                              |
|---------------------------|------------------------------|
| Making filter elements    | <a href="#">B01D 24/001</a>  |
| Making filter elements    | <a href="#">B01D 27/005</a>  |
| Making filtering elements | <a href="#">B01D 29/012</a>  |
| Making filtering elements | <a href="#">B01D 29/111</a>  |
| Making filter elements    | <a href="#">B01D 33/0093</a> |

**B01D 25/002**

{Clamping devices ([B01D 25/12](#) and subgroups take precedence)}

**References****Limiting references**

*This place does not cover:*

|                |                            |
|----------------|----------------------------|
| Filter presses | <a href="#">B01D 25/12</a> |
|----------------|----------------------------|

**B01D 25/127**

with one or more movable filter bands arranged to be clamped between the press plates or between a plate and a frame during filtration, e.g. zigzag endless filter bands ([B01D 25/172](#), [B01D 25/176](#), [B01D 25/19](#) take precedence)

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Plate spreading means                                    | <a href="#">B01D 25/172</a> |
| Attaching the filter elements to the filter press plates | <a href="#">B01D 25/176</a> |
| Clamping means for closing the filter press              | <a href="#">B01D 25/19</a>  |

**B01D 25/21**

Plate and frame presses ([B01D 25/172](#), [B01D 25/176](#), [B01D 25/19](#) take precedence)

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Plate spreading means                                    | <a href="#">B01D 25/172</a> |
| Attaching the filter elements to the filter press plates | <a href="#">B01D 25/176</a> |
| Clamping means for closing the filter press              | <a href="#">B01D 25/19</a>  |

**B01D 25/307**

{with internal recirculation through the filtering element ([B01D 37/02](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Precoating the filter medium; Addition of filter aids to the liquid being filtered | <a href="#">B01D 37/02</a> |
|--|----------------------------|

**B01D 25/34**

by moving, {e.g. rotating,} the filter elements {([B01D 25/172](#), [B01D 25/19](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Plate spreading means                       | <a href="#">B01D 25/172</a> |
| Clamping means for closing the filter press | <a href="#">B01D 25/19</a>  |

**B01D 25/343**

{Particular measures for replacing or isolating one or more filtering elements; Transport systems for the filtering apparatus ([B01D 25/28](#), [B01D 25/32](#), [B01D 25/346](#), [B01D 25/36](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Leaching or washing filter cakes in the filter | <a href="#">B01D 25/28</a> |
|--|----------------------------|

|                         |                             |
|-------------------------|-----------------------------|
| Removal of filter cakes | <a href="#">B01D 25/32</a>  |
| By vibration            | <a href="#">B01D 25/346</a> |
| By centrifugal force    | <a href="#">B01D 25/36</a>  |

## B01D 27/00

### Cartridge filters of the throw-away type

#### Definition statement

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

#### References

##### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Gas Filters   | <a href="#">B01D 46/00</a> |
| Separation of gases or vapours  | <a href="#">B01D 53/00</a> |
| Chemical or physical processes  | <a href="#">B01J</a>       |
| Treatment of water, waste water, sewage, or sludge only when no mechanical filtration is involved | <a href="#">C02F</a>       |

#### Special rules of classification

- The combination classes of the type [B01D 27/08](#)+ [B01D 27/10](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set)e.g. ([B01D 27/08](#), [B01D 27/10](#)).

## B01D 29/00

**Other filters with filtering elements stationary during filtration, e.g. pressure or suction filters, or filtering elements therefor {([B01D 24/00](#), [B01D 25/00](#) and [B01D 27/00](#) take precedence)}**

#### Definition statement

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

#### References

##### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Filters comprising loose filtering material  | <a href="#">B01D 24/00</a> |
| Filters formed by clamping together several filtering elements or parts of such elements | <a href="#">B01D 25/00</a> |
| Cartridge filters of the throw-away type   | <a href="#">B01D 27/00</a> |

|   |   |
|---|---|
| Gas Filters   | <a href="#">B01D 46/00</a>                              |
| Separation of gases or vapours                                    | <a href="#">B01D 53/00</a>                              |
| Membranes   | <a href="#">B01D 63/00</a> - <a href="#">B01D 71/00</a> |
| Filters or strainers for coffee or tea makers                     | <a href="#">A47J 31/06</a>                              |
| Deep fat fryers with means for filtering the frying liquid        | <a href="#">A47J 37/1223</a>                            |
| Filters for washing or rinsing machines for crockery or tableware | <a href="#">A47L 15/4202</a>                            |
| Filters for dental appliances                                     | <a href="#">A61C 17/046</a>                             |
| Filter for medical purposes, body liquids                         | <a href="#">A61M 1/0056</a>                             |
| Chemical or physical processes                                    | <a href="#">B01J</a>                                    |
| Filters for laboratory use  | <a href="#">B01L</a>                                    |
| Paint filters   | <a href="#">B05B 15/00</a>                              |
| Separating solids from solids by sieving, screening               | <a href="#">B07B</a>                                    |
| Filters for extrusion molding                                     | <a href="#">B29C 47/68</a>                              |
| Ink filters for printers  | <a href="#">B41J 2/17563</a>                            |
| Treatment of water, waste water, sewage, or sludge                | <a href="#">C02F</a>                                    |
| Filters for molten metals   | <a href="#">C22B 9/023</a>                              |
| Filters for washing machines (laundrying)                         | <a href="#">D06F 39/10</a>                              |
| Filters in sewerage structures                                    | <a href="#">E03F 5/00</a>                               |
| Filters used in drilling boreholes                                | <a href="#">E21B 21/00</a>                              |
| Filters for refrigeration machines , plants or systems            | <a href="#">F25B 43/003</a>                             |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Filters with filtering elements stationary during filtration (The documents from the backlog of the subgroups of group <a href="#">B01D 29/0002</a> are in the process of being systematically transferred to the other subgroups of group <a href="#">B01D 29/00</a> ) | <a href="#">B01D 29/0002</a> |
| Filters for aquaria   | <a href="#">A01K 63/045</a>  |
| Filters for machine tools   | <a href="#">B23Q 11/1069</a> |
| Filters for swimming pools  | <a href="#">E04H 4/1209</a>  |
| Filters for oil used for lubricating machines   | <a href="#">F01M 11/03</a>   |
| Filters for liquid fuel used in combustion engines  | <a href="#">F02M 37/22</a>   |

### **Special rules of classification**

- Group and subgroups of [B01D 29/0002](#) are no longer used for the classification of new documents
- The combination classes of the type [B01D 29/111](#)+ [B01D 29/21](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set), e.g. ([B01D 29/111](#), [B01D 29/21](#)).



**B01D 29/071**

{with curved filtering elements ([B01D 29/072](#), [B01D 29/073](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|                             |                             |
|-----------------------------|-----------------------------|
| Ring shaped                 | <a href="#">B01D 29/072</a> |
| With wound filtering sheets | <a href="#">B01D 29/073</a> |

**B01D 29/09**

with filtering bands, e.g. movable between filtering operations {([B01D 25/121](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| With bandshaped filtering elements intermittently entrained between the press plates, the lateral sides of the elements being clamped between two successive plates or between a plate and a successive frame during the filtration period. | <a href="#">B01D 25/121</a> |
|---|-----------------------------|

**B01D 29/114**

{arranged for inward flow filtration ([B01D 29/15](#), [B01D 29/33](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|                                |                            |
|--------------------------------|----------------------------|
| Arranged for inward filtration | <a href="#">B01D 29/15</a> |
| Arranged for inward filtration | <a href="#">B01D 29/33</a> |

**B01D 29/117**

{arranged for outward flow filtration ([B01D 29/23](#), [B01D 29/35](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|                                 |                            |
|---------------------------------|----------------------------|
| Arranged for outward filtration | <a href="#">B01D 29/23</a> |
| Arranged for outward filtration | <a href="#">B01D 29/35</a> |

**B01D 29/50**

with multiple filtering elements, characterised by their mutual disposition  
([B01D 29/39](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| With hollow discs side by side on, or around , one or more tubes | <a href="#">B01D 29/39</a> |
|--|----------------------------|

**B01D 29/76**

Handling the filter cake in the filter for purposes other than for regenerating  
([B01D 29/94](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|                                 |                            |
|---------------------------------|----------------------------|
| For discharging the filter cake | <a href="#">B01D 29/94</a> |
|---------------------------------|----------------------------|

**B01D 29/828**

{using screws ([B01D 29/6476](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                              |
|--|------------------------------|
| With a rotary movement with respect to the filtering element | <a href="#">B01D 29/6476</a> |
|--|------------------------------|

**B01D 29/86**

Retarding cake deposition on the filter during the filtration period, e.g. using  
stirrers {([B01D 29/908](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|                               |                             |
|-------------------------------|-----------------------------|
| Provoking a tangential stream | <a href="#">B01D 29/908</a> |
|-------------------------------|-----------------------------|

**B01D 29/885**

{with internal recirculation through the filtering element ([B01D 37/02](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Precoating the filter medium ; addition of filter aids to the liquid being filtered | <a href="#">B01D 37/02</a> |
|---|----------------------------|

**B01D 29/904**

{directing the mixture to be filtered on the filtering element in a manner to clean the filter continuously ([B01D 29/115](#), [B01D 29/118](#), [B01D 29/17](#), [B01D 29/25](#), [B01D 29/336](#), [B01D 29/356](#), [B01D 29/902](#), [B01D 29/908](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Open-ended, the arrival of the mixture to be filtered and the discharge of the concentrated mixture are situated on both opposite sides of the filtering element | <a href="#">B01D 29/115</a> |
| Open-ended   | <a href="#">B01D 29/118</a> |
| Open-ended, the arrival of the mixture to be filtered and the discharge of the concentrated mixture are situated on both opposite sides of the filtering element | <a href="#">B01D 29/17</a>  |
| Open-ended, the arrival of the mixture to be filtered and the discharge of the concentrated mixture are situated on both opposite sides of the filtering element | <a href="#">B01D 29/25</a>  |
| Open-ended, the arrival of the mixture to be filtered and the discharge of the concentrated mixture are situated on both opposite sides of the filtering element | <a href="#">B01D 29/336</a> |
| Open-ended, the arrival of the mixture to be filtered and the discharge of the concentrated mixture are situated on both opposite sides of the filtering element | <a href="#">B01D 29/356</a> |
| Containing liquid displacement elements or cores   | <a href="#">B01D 29/902</a> |
| Provoking a tangential stream  | <a href="#">B01D 29/908</a> |

**B01D 29/906**

{Special treatment of the feed stream before contacting the filtering element, e.g. cutting ([B01D 35/24](#), [B01D 37/02](#), [B01D 37/03](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Providing loose granular material to scratch the filters clean                     | <a href="#">B01D 35/24</a> |
| Precoating the filter medium; Addition of filter aids to the liquid being filtered | <a href="#">B01D 37/02</a> |
| Using flocculating agents  | <a href="#">B01D 37/03</a> |

**B01D 29/96**

in which the filtering elements are moved between filtering operations; Particular measures for removing or replacing the filtering elements; Transport systems for filters ([B01D 29/09](#), [B01D 29/70](#) take precedence)

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| With filtering bands, e.g. movable between filtering operations | <a href="#">B01D 29/09</a> |
| By forces created by movement of the filter element             | <a href="#">B01D 29/70</a> |

**B01D 33/00**

Filters with filtering elements which move during the filtering operation (filters comprising loose filtering material moving or fluidised during filtration [B01D 24/28](#) - [B01D 24/36](#); centrifuges [B04B](#))

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|   |   |
|---|---|
| Filters comprising loose filtering material moving or fluidised during filtration | <a href="#">B01D 24/28</a> - <a href="#">B01D 24/36</a> |
| Gas Filters   | <a href="#">B01D 46/00</a>                              |
| Separation of gases or vapours  | <a href="#">B01D 53/00</a>                              |
| Membranes   | <a href="#">B01D 63/00</a> - <a href="#">B01D 71/00</a> |

|   |                              |
|---|------------------------------|
| Deep fat fryers with means for filtering the frying liquid        | <a href="#">A47J 37/1223</a> |
| Filters for washing or rinsing machines for crockery or tableware | <a href="#">A47L 15/4202</a> |
| Filters for dental appliances                                     | <a href="#">A61C 17/046</a>  |
| Filter for medical purposes, body liquids                         | <a href="#">A61M 1/0056</a>  |
| Chemical or physical processes                                    | <a href="#">B01J</a>         |
| Filters for laboratory use  | <a href="#">B01L</a>         |
| Centrifuges   | <a href="#">B04B</a>         |
| Paint filters   | <a href="#">B05B 15/00</a>   |
| Filters for extrusion molding                                     | <a href="#">B29C 47/68</a>   |
| Treatment of water, waste water, sewage, or sludge                | <a href="#">C02F</a>         |
| Filters for molten metals   | <a href="#">C22B 9/023</a>   |
| Filters for washing machines (Laundering)                         | <a href="#">D06F 39/10</a>   |
| Filters used in drilling boreholes                                | <a href="#">E21B 21/00</a>   |
| Filters for refrigeration machines , plants or systems            | <a href="#">F25B 43/003</a>  |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Filters with filtering elements stationary during filtration (The documents from the backlog of the subgroups of group <a href="#">B01D 33/0003</a> are in the process of being systematically transferred to the other subgroups of group <a href="#">B01D 33/00</a> ) | <a href="#">B01D 33/0003</a> |
| Filters with tipping buckets or trays   | <a href="#">B01D 35/08</a>   |
| Filters for aquaria   | <a href="#">A01K 63/045</a>  |
| Separating solids from solids by sieving, screening   | <a href="#">B07B</a>         |
| Filters for machine tools   | <a href="#">B23Q 11/1069</a> |
| Purification of the paper pulp suspension by mechanical means; Apparatus therefor.  | <a href="#">D21D 5/00</a>    |
| Filters for swimming pools  | <a href="#">E04H 4/1209</a>  |

### **Special rules of classification**

- Group and subgroups of [B01D 33/0003](#) are no longer used for the classification of new documents
- The combination classes of the type [B01D 33/073](#)+ [B01D 33/39](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set), e.g. ([B01D 33/073](#), [B01D 33/39](#)).

**B01D 33/01**

with translationally moving filtering elements, e.g. pistons  
([B01D 33/04](#) - [B01D 33/327](#) take precedence)

**References****Limiting references**

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| with filtering bands or the likes supported on cylinders which are impervious for filtering | <a href="#">B01D 33/04</a>  |
| Tipping buckets, trays or like sections   | <a href="#">B01D 33/327</a> |

**B01D 33/06**

with rotary cylindrical filtering surfaces, e.g. hollow drums ([B01D 33/044](#) takes precedence {; rotating drums for paper-making [D21B](#)})

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| With filtering bands or the like supported on cylinders which are pervious for filtering | <a href="#">B01D 33/044</a> |
|--|-----------------------------|

**B01D 33/29**

the movement of the filter elements being a combination of movements  
([B01D 33/19](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| The table surface being divided in successively tilted sectors or cells | <a href="#">B01D 33/19</a> |
|---|----------------------------|

**B01D 33/35**

with multiple filtering elements characterised by their mutual disposition  
([B01D 33/042](#) , [B01D 33/21](#) take precedence)

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Whereby the filtration and squeezing-out take place between at least two filtering bands | <a href="#">B01D 33/042</a> |
| With hollow filtering discs transversely mounted on a hollow rotary shaft                | <a href="#">B01D 33/21</a>  |

**B01D 33/46**

by scrapers, brushes {nozzles} or the like acting on the cake-side of the filtering element {(B01D 33/503 takes precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| The backwash arms, shoes acting on the cake side | <a href="#">B01D 33/503</a> |
|--|-----------------------------|

**B01D 33/58**

Handling the filter cake in the filter for purposes other than for regenerating (B01D 33/76 takes precedence){the filter cake remaining on the filtering element}

**References****Limiting references**

*This place does not cover:*

|                                 |                            |
|---------------------------------|----------------------------|
| For discharging the filter cake | <a href="#">B01D 33/76</a> |
|---------------------------------|----------------------------|

**B01D 33/70**

having feed or discharge devices (B01D 33/82 takes precedence)

**References****Limiting references**

*This place does not cover:*

|                                 |                            |
|---------------------------------|----------------------------|
| Means for pressure distribution | <a href="#">B01D 33/82</a> |
|---------------------------------|----------------------------|

**B01D 33/725**

{Special treatment of the feed stream before contacting the filtering element, e.g. cutting (B01D 35/24, B01D 37/02, B01D 37/03 take precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Providing loose granular material to scratch the filters clean                     | <a href="#">B01D 35/24</a> |
| Precoating the filter medium; Addition of filter aids to the liquid being filtered | <a href="#">B01D 37/02</a> |
| Using flocculating agents  | <a href="#">B01D 37/03</a> |

**B01D 33/803**

{in which the filtering elements are moved between filtering operations ([B01D 33/52](#) takes precedence); Particular measures for removing or replacing the filtering elements; Transport systems for filters}

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| By forces created by movement of the filter element | <a href="#">B01D 33/52</a> |
|---|----------------------------|

**B01D 35/00**

**Other filtering devices; Auxiliary devices for filtration; Filter housing constructions**

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|   |   |
|---|---|
| Gas Filters   | <a href="#">B01D 46/00</a>                              |
| Separation of gases or vapours  | <a href="#">B01D 53/00</a>                              |
| Membranes   | <a href="#">B01D 63/00</a> - <a href="#">B01D 71/00</a> |
| Filters or strainers for coffee or tea makers   | <a href="#">A47J 31/06</a>                              |
| Deep fat fryers with means for filtering the frying liquid  | <a href="#">A47J 37/1223</a>                            |
| Filters for washing or rinsing machines for crockery or tableware                                 | <a href="#">A47L 15/4202</a>                            |
| Filters for dental appliances   | <a href="#">A61C 17/046</a>                             |
| Filter for medical purposes, body liquids   | <a href="#">A61M 1/0056</a>                             |
| Chemical or physical processes  | <a href="#">B01J</a>                                    |
| Filters for laboratory use  | <a href="#">B01L</a>                                    |
| Paint filters   | <a href="#">B05B 15/00</a>                              |
| Separating solids from solids by sieving, screening   | <a href="#">B07B</a>                                    |
| Filters for extrusion molding   | <a href="#">B29C 47/68</a>                              |
| Ink filters for printers  | <a href="#">B41J 2/17563</a>                            |
| Treatment of water, waste water, sewage, or sludge only when no mechanical filtration is involved | <a href="#">C02F</a>                                    |
| Filters for molten metals   | <a href="#">C22B 9/023</a>                              |
| Filters for washing machines (laundering)   | <a href="#">D06F 39/10</a>                              |
| Filters in sewerage structures  | <a href="#">E03F 5/00</a>                               |



|  |                             |
|--|-----------------------------|
| Filters used in drilling boreholes                     | <a href="#">E21B 21/00</a>  |
| Filtering elements installed in valves                 | <a href="#">F16K</a>        |
| Filters for refrigeration machines , plants or systems | <a href="#">F25B 43/003</a> |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                             |
|---|-----------------------------|
| Filters for aquaria                                 | <a href="#">A01K 63/045</a> |
| Magnetic separation of solid materials from liquids | <a href="#">B03C 5/00</a>   |
| Filters for liquid fuel with pumps                  | <a href="#">F02M 37/14</a>  |
| Filters for liquid fuel with heating means          | <a href="#">F02M 37/223</a> |

### **Special rules of classification**

- [B01D 35/08](#) is no longer used for the classification of new documents, documents are classified in [B01D 33/327](#)
- The combination classes of the type [B01D 35/147](#)+B01D35/30 are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set), e.g. ([B01D 35/147](#), [B01D 35/30](#)).

### **B01D 35/02**

Filters adapted for location in special places, e.g. pipe-lines, pumps, stop-cocks, ([B01D 35/05](#) takes precedence; {water pipe system filters [E03B 3/18](#), [E03B 7/07](#); dirt catchers in sewers [E03F](#); filters or strainers for pipe-lines in general [B08B](#), [E03F](#); object or dirt catching devices in sinks or the like [E03C 1/26](#); suction strainers or filters for pumps [F04B 53/005](#), [F04D 29/70](#)})

### **References**

#### **Limiting references**

This place does not cover:

|                  |                            |
|------------------|----------------------------|
| Floating filters | <a href="#">B01D 35/05</a> |
|------------------|----------------------------|

### **B01D 35/027**

rigidly mounted in or on tanks or reservoirs ([B01D 35/04](#) takes precedence)

### **References**

#### **Limiting references**

This place does not cover:

|                           |                            |
|---------------------------|----------------------------|
| Plug, tap or cock filters | <a href="#">B01D 35/04</a> |
|---------------------------|----------------------------|

**B01D 35/22**

Directing the mixture to be filtered on to the filters in a manner to clean the filters {(B01D 29/904 takes precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Directing the mixture to be filtered on the filtering element in a manner to clean the filter continuously | <a href="#">B01D 29/904</a> |
|--|-----------------------------|

**B01D 35/301**

{Constructions of two or more housings (B01D 35/12 takes precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Devices for taking out of action one or more units of multi-unit filters | <a href="#">B01D 35/12</a> |
|--|----------------------------|

**B01D 35/34**

open-topped (B01D 35/31 takes precedence)

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Including arrangements for environmental protection | <a href="#">B01D 35/31</a> |
|---|----------------------------|

**B01D 36/00**

Filter circuits or combinations of filters with other separating devices

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|                                |   |
|--------------------------------|---|
| Gas Filters                    | <a href="#">B01D 46/00</a>                              |
| Separation of gases or vapours | <a href="#">B01D 53/00</a>                              |
| Membranes                      | <a href="#">B01D 63/00</a> - <a href="#">B01D 71/00</a> |

|   |                              |
|---|------------------------------|
| Filters or strainers for coffee or tea makers                     | <a href="#">A47J 31/06</a>   |
| Deep fat fryers with means for filtering the frying liquid        | <a href="#">A47J 37/1223</a> |
| Filters for washing or rinsing machines for crockery or tableware | <a href="#">A47L 15/4202</a> |
| Filters for dental appliances                                     | <a href="#">A61C 17/046</a>  |
| Filter for medical purposes, body liquids                         | <a href="#">A61M 1/0056</a>  |
| Chemical or physical processes                                    | <a href="#">B01J</a>         |
| Paint filters   | <a href="#">B05B 15/00</a>   |
| Separating solids from solids by sieving, screening               | <a href="#">B07B</a>         |
| Filters for extrusion molding                                     | <a href="#">B29C 47/68</a>   |
| Ink filters for printers  | <a href="#">B41J 2/17563</a> |
| Treatment of water, waste water, sewage, or sludge                | <a href="#">C02F</a>         |
| Filters for molten metals   | <a href="#">C22B 9/023</a>   |
| Filters for washing machines (laundry)                            | <a href="#">D06F 39/10</a>   |
| Filters for sewerage structures                                   | <a href="#">E03F 5/00</a>    |
| Filters used in drilling boreholes                                | <a href="#">E21B 21/00</a>   |
| Filters for refrigeration machines , plants or systems            | <a href="#">F25B 43/003</a>  |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                             |
|---|-----------------------------|
| Liquid fuel filters with water separation means | <a href="#">F02M 37/221</a> |
|---|-----------------------------|

### **Special rules of classification**

- The combination classes of the type [B01D 36/001](#)+ [B01D 36/04](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set), e.g. ([B01D 36/001](#), [B01D 36/04](#)).

### **B01D 36/003**

{Filters in combination with devices for the removal of liquids ([B01D 35/185](#) takes precedence)}

### **References**

#### **Limiting references**

This place does not cover:

|                               |                             |
|-------------------------------|-----------------------------|
| Comprising a vapourizing unit | <a href="#">B01D 35/185</a> |
|-------------------------------|-----------------------------|

**B01D 36/02**

**Combinations of filters of different kinds ([B01D 29/50](#), [B01D 33/35](#) take precedence)**

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| With multiple filtering elements, characterized by their mutual disposition | <a href="#">B01D 29/50</a> |
| With multiple filtering elements, characterized by their mutual disposition | <a href="#">B01D 33/35</a> |

**B01D 37/00**

**Processes of filtration (processes specially adapted for filtering gases [B01D 46/00](#))**

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|   |   |
|---|---|
| Gas Filters   | <a href="#">B01D 46/00</a>                              |
| Separation of gases or vapours                                    | <a href="#">B01D 53/00</a>                              |
| Membranes   | <a href="#">B01D 63/00</a> - <a href="#">B01D 71/00</a> |
| Filters or strainers for coffee or tea makers                     | <a href="#">A47J 31/06</a>                              |
| Deep fat fryers with means for filtering the frying liquid        | <a href="#">A47J 37/1223</a>                            |
| Filters for washing or rinsing machines for crockery or tableware | <a href="#">A47L 15/4202</a>                            |
| Filters for dental use  | <a href="#">A61C 17/046</a>                             |
| Filter for medical purposes, body liquids                         | <a href="#">A61M 1/0056</a>                             |
| Chemical or physical processes                                    | <a href="#">B01J</a>                                    |
| Paint filters   | <a href="#">B05B 15/00</a>                              |
| Separating solids from solids by sieving, screening               | <a href="#">B07B</a>                                    |
| Filters for extrusion molding                                     | <a href="#">B29C 47/68</a>                              |
| Ink filters for printers  | <a href="#">B41J 2/17563</a>                            |
| Treatment of water, waste water, sewage, or sludge                | <a href="#">C02F</a>                                    |
| Filters for molten metals   | <a href="#">C22B 9/023</a>                              |
| Filters for washing machines (laundry)                            | <a href="#">D06F 39/10</a>                              |
| Filters for sewerage structures                                   | <a href="#">E03F 5/00</a>                               |
| Filters used in drilling boreholes                                | <a href="#">E21B 21/00</a>                              |

|  |                             |
|--|-----------------------------|
| Filters for refrigeration machines , plants or systems | <a href="#">F25B 43/003</a> |
|--|-----------------------------|

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                                      |                               |
|--------------------------------------|-------------------------------|
| Treatment of oil (motor oil systems) | <a href="#">C10M 175/0091</a> |
|--------------------------------------|-------------------------------|

### Special rules of classification

- The combination classes of the type [B01D 37/02](#)+ [B01D 37/04](#) are no longer used from October 1, 2011 onwards. Documents are classified as Combination-sets(C-set), e.g. ([B01D 37/02](#), [B01D 37/04](#)).

## B01D 39/00

### Filtering material for liquid or gaseous fluids

#### Definition statement

*This place covers:*

Mainly materials for mechanical filtration, however materials with additives e.g. adsorbents are also included. Also composite filtering materials with combined activity (mechanical filtration, adsorption, antimicrobial action etc. are also under the present group.

## B01D 39/08

### Filter cloth, i.e. woven, knitted or interlaced material (metallic [B01D 39/10](#))

#### References

##### Limiting references

*This place does not cover:*

|                   |   |
|-------------------|---|
| Metallic material | <a href="#">B01D 39/10</a> , <a href="#">B01D 39/12</a> |
|-------------------|---|

## B01D 39/14

### Other self-supporting filtering material {; Other filtering material (non-woven fabrics in general [D04H 3/00](#))}

#### Definition statement

*This place covers:*

This subgroup covers non-woven, foamy, porous films and bonded particulate filter materials.

#### References

##### Limiting references

*This place does not cover:*

|                                  |   |
|----------------------------------|---|
| Loose filtering material         | <a href="#">B01D 39/02</a>                              |
| Filter cloths                    | <a href="#">B01D 39/08</a>                              |
| Metallic screens, expanded films | <a href="#">B01D 39/10</a> , <a href="#">B01D 39/12</a> |

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|                              |                           |
|------------------------------|---------------------------|
| Non-woven fabrics in general | <a href="#">D04H 3/00</a> |
|------------------------------|---------------------------|

**B01D 39/1607**

{the material being fibrous ([B01D 39/18](#) takes precedence)}

**References****Limiting references**

This place does not cover:

|                             |                            |
|-----------------------------|----------------------------|
| Fibrous cellulosic material | <a href="#">B01D 39/18</a> |
|-----------------------------|----------------------------|

**B01D 39/18**

the material being cellulose or derivatives thereof ({cork or peat [B01D 39/1646](#)}; making filter paper [D21F 11/14](#))

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|                                  |                              |
|----------------------------------|------------------------------|
| Cork or peat particulate filters | <a href="#">B01D 39/1646</a> |
| Making filter paper              | <a href="#">D21F 11/14</a>   |

**B01D 39/20**

of inorganic material, e.g. asbestos paper, metallic filtering material of non-woven wires (porous ceramic material {[C04B 38/00](#)}; sintering metals [C22C 1/04](#); {making porous sintered metal bodies [B22F 3/10](#), honeycomb filters [B01D 46/2418](#), materials used for filtering exhaust gases of an internal combustion engine [F01N 3/022](#), ceramic honeycomb structures [C04B 38/0006](#)})

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Honeycomb filters   | <a href="#">B01D 46/2418</a> |
| Making porous sintered bodies   | <a href="#">B22F 3/10</a>    |
| Ceramic honeycomb structure   | <a href="#">C04B 38/0006</a> |
| Honeycomb filters used for filtering exhaust gases of an internal combustion engine | <a href="#">F01N 3/022</a>   |

**B01D 39/2055**

{Carbonaceous material (solid sorbent compositions comprising free carbon [B01J 20/20](#))}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                            |
|---|----------------------------|
| Solid sorbent compositions comprising free carbon | <a href="#">B01J 20/20</a> |
|---|----------------------------|

**Special rules of classification**

- Reclassification of the documents of this subgroup into its subgroups [B01D 39/2058](#), [B01D 39/2062](#) and [B01D 39/2065](#) is pending

**B01D 41/00**

Regeneration of the filtering material or filter elements outside the filter for liquid or gaseous fluids

**References****Limiting references**

This place does not cover:

|                                       |  |
|---------------------------------------|--|
| Regeneration of liquid filters under: | <a href="#">B01D 24/00</a> , <a href="#">B01D 25/00</a> ,<br><a href="#">B01D 29/00</a> , <a href="#">B01D 33/00</a> |
| Regeneration of gas filters under:    | <a href="#">B01D 46/00</a>   |

**B01D 43/00**

Separating particles from liquids, or liquids from solids, otherwise than by sedimentation or filtration (flotation processes [B03D 1/00](#); drying solid materials or objects [F26B](#))

**References****Limiting references**

This place does not cover:

|                                  |   |
|----------------------------------|---|
| Separation of immiscible liquids | <a href="#">B01D 17/00</a>                              |
| Sedimentation or flotation       | <a href="#">B01D 21/00</a> , <a href="#">B03D 1/00</a>  |
| Liquid filtration                | <a href="#">B01D 24/00</a> - <a href="#">B01D 33/00</a> |
| Gas filtration                   | <a href="#">B01D 46/00</a>                              |

## B01D 45/00

**Separating dispersed particles from gases or vapours by gravity, inertia, or centrifugal forces**

### Definition statement

*This place covers:*

- Separators used for filtering particles out of a gas or vapour.
- Only mechanical separation is taking place, no reaction, no absorption or adsorption is involved

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|             |                      |
|-------------|----------------------|
| Centrifuges | <a href="#">B04B</a> |
| Cyclones    | <a href="#">B04C</a> |

## B01D 45/04

**by utilising inertia ([B01D 45/12](#) takes precedence)**

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Separating dispersed particles by centrifugal forces | <a href="#">B01D 45/12</a> |
|--|----------------------------|

## B01D 46/00

**Filters {, i.e. particle separators} or filtering processes specially modified for separating dispersed particles from gases or vapours (filtering elements [B01D 23/00](#) - [B01D 35/00](#); filtering material [B01D 39/00](#); their regeneration outside the filters [B01D 41/00](#))**

### Definition statement

*This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

### References

#### Limiting references

*This place does not cover:*

|  |   |
|--|---|
| Liquid filters   | <a href="#">B01D 24/00</a> - <a href="#">B01D 29/00</a> , <a href="#">B01D 33/00</a> - <a href="#">B01D 37/00</a> |
| Filter materials   | <a href="#">B01D 39/00</a>  |
| Separating particles using centrifugal forces or inertia | <a href="#">B01D 45/00</a>  |



|   |   |
|---|---|
| Separation of gases or vapours                      | <a href="#">B01D 53/00</a>                              |
| Membranes   | <a href="#">B01D 63/00</a> - <a href="#">B01D 71/00</a> |
| Sterilisation of air                                | <a href="#">A61L 9/00</a>                               |
| Chemical or physical processes                      | <a href="#">B01J</a>                                    |
| Filters for laboratory use                          | <a href="#">B01L</a>                                    |
| Magnetic filters                                    | <a href="#">B03C 1/00</a>                               |
| Electrostatic filters                               | <a href="#">B03C 3/00</a>                               |
| Centrifuges   | <a href="#">B04B</a>                                    |
| Cyclones  | <a href="#">B04C</a>                                    |
| Separating solids from solids by sieving, screening | <a href="#">B07B</a>                                    |
| Ceramic honeycomb structures per se                 | <a href="#">C04B 38/0006</a>                            |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Suction cleaners having filters                         | <a href="#">A47L8/10</a>     |
| Sterilization of air by filtration                      | <a href="#">A61L 9/16</a>    |
| Air conditioning systems for vehicles including filters | <a href="#">B60H 3/06</a>    |
| Exhaust filters for internal combustion engines         | <a href="#">F01N 3/021</a>   |
| Intake systems for internal combustion engines          | <a href="#">F02M 35/024</a>  |
| Filters for kitchen                                     | <a href="#">F24C 15/2035</a> |
| Air conditioning systems comprising filters             | <a href="#">F24F 3/1603</a>  |

## **B01D 46/0005**

{Mounting of filtering elements within casings, housings or frames  
([B01D 46/2422](#) takes precedence)}

### **References**

#### **Limiting references**

This place does not cover:

|                              |                              |
|------------------------------|------------------------------|
| Mounting of honeycomb bodies | <a href="#">B01D 46/2422</a> |
|------------------------------|------------------------------|

## **B01D 46/0046**

{provoking a tangential stream ([B01D 46/0045](#) takes precedence)}

### **References**

#### **Limiting references**

This place does not cover:

|  |                              |
|--|------------------------------|
| Flow guiding by feed devices using vanes | <a href="#">B01D 46/0045</a> |
|--|------------------------------|

**B01D 46/0052**

{with filtering elements moving during filtering operation ([B01D 46/22](#), [B01D 46/32](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Filters having travelling belts                   | <a href="#">B01D 46/22</a> |
| Loose filtering material moving during filtration | <a href="#">B01D 46/32</a> |

**B01D 46/0057**

{Regenerating the filter material in the filter ([B01D 46/04](#), [B01D 46/48](#) take precedence)}

**References****Limiting references**

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Cleaning filters outside the filter housing | <a href="#">B01D 41/00</a> |
| Cleaning filters of flexible material       | <a href="#">B01D 46/04</a> |
| Removing dust from a filter housing         | <a href="#">B01D 46/48</a> |

**B01D 46/528**

{using wound sheets ([B01D 46/527](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Particle separators using folded material comprising flutes in wound arrangement | <a href="#">B01D 46/527</a> |
|--|-----------------------------|

**B01D 50/00**

**Combinations of devices for separating particles from gases or vapours**

**Definition statement**

*This place covers:*

- Separators used for filtering particles out of a gas or vapour.
- Only mechanical separation or filtration perhaps in combination with a liquid as separating agent is taking place, no reaction, no absorption or adsorption is involved

## B01D 51/00

Auxiliary pretreatment of gases or vapours to be cleaned (preventing dust fires [A62C](#); pretreatment specially adapted for magnetic or electrostatic separation [B03C](#))

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|   |                      |
|---|----------------------|
| Preventing dust fires   | <a href="#">A62C</a> |
| Pretreatment specially adapted for magnetic or electrostatic separation | <a href="#">B03C</a> |

### Special rules of classification

These groups are, if possible, to be combined with groups from [B01D 53/00](#) or symbols from [B01D 53/00](#), [B01D 2251/00](#), [B01D 2256/00](#), [B01D 2257/00](#) and [B01D 2259/00](#) (multiple classification)

## B01D 53/00

Separation of gases or vapours; Recovering vapours of volatile solvents from gases; Chemical or biological purification of waste gases, e.g. engine exhaust gases, smoke, fumes, flue gases, aerosols, (recovery of volatile solvents by condensation [B01D 5/00](#); sublimation [B01D 7/00](#); cold traps, cold baffles [B01D 8/00](#); working-up undefined gaseous mixtures obtained by cracking hydrocarbon oils [C10G 70/00](#); cleaning coal gas [C10K](#); working-up of natural gas, or synthetic natural gas, [C10L 3/10](#); separation of difficult-to-condense gases or air by liquefaction [F25J](#); for investigating materials [G01N 30/00](#))

### Definition statement

*This place covers:*

Catalytic treatment of gases in [B01D 53/00](#) is only for waste gases, i.e. catalytic treatment or synthesis of other gases such as commercially relevant gases (e.g. synthesis or natural gas) is not classified in [B01D 53/00](#).

### Relationships with other classification places

Cleaning coal gas: [C10K](#)

Separation of difficult-to-condense gases or air by liquefaction: [F25J](#)

### References

#### Limiting references

*This place does not cover:*

|  |  |
|--|--|
| Catalytic treatment of exhaust gases from engine exhaust gases (a waste gas) | <a href="#">B01D 53/94</a> -<br><a href="#">B01D 53/9495</a> |
|--|--|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                             |
|---|-----------------------------|
| Recovery of volatile solvents by condensation                               | <a href="#">B01D 5/00</a>   |
| Sublimation   | <a href="#">B01D 7/00</a>   |
| Cold traps  | <a href="#">B01D 8/00</a>   |
| Working-up undefined gaseous mixtures obtained by cracking hydrocarbon oils | <a href="#">C10G 70/00</a>  |
| Working-up of natural gas, or synthetic natural gas                         | <a href="#">C10L 3/10</a>   |
| Drying air in air conditioning systems                                      | <a href="#">F24F 3/1423</a> |
| Investigating materials   | <a href="#">G01N 30/00</a>  |

**Special rules of classification**

[B01D 53/00](#) - [B01D 53/326](#) are generally applied for all gases except for waste gases. Waste gases are mainly dealt with in [B01D 53/34](#) - [B01D 53/96](#). In cases where no appropriate treatment concept can be found for waste gases, the groups

[B01D 53/00](#) - [B01D 53/326](#) can be given (ex: [B01D 53/002](#) or [B01D 53/32](#)).

**B01D 53/002**

{by condensation}

**Relationships with other classification places**

- [B05D 5/00](#)

Condensation of vapours; recovering volatile solvents by condensation

- [F25J](#)

Separation of difficult-to-condense gases or air by liquefaction

**References****Limiting references**

This place does not cover:

|   |                             |
|---|-----------------------------|
| Cryogenic condensation only for carbon dioxide (CO <sub>2</sub> ) | <a href="#">B01D 53/002</a> |
| Condensation of water vapour                                      | <a href="#">B01D 53/265</a> |
| Solidifying carbon dioxide  | <a href="#">C01B 32/55</a>  |
| Other gas mixtures  | <a href="#">F25J 1/00</a>   |

**B01D 53/007**

{by irradiation}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |   |
|---|---|
| Disinfection, sterilisation or deodorisation of air | <a href="#">A61L 9/18</a> - <a href="#">A61L 9/22</a> |
|---|---|

### Special rules of classification

This group (and corresponding additional information symbols) is often given for waste gases, too.

Symbols [B01D 2259/80](#) - [B01D 2259/816](#) are to be applied where possible.

Concepts applying photo-catalytic treatment should be given the symbol [B01D 2255/804](#).

### B01D 53/02

by adsorption, e.g. preparative gas chromatography {(solid sorbent compositions [B01J 20/00](#), preparation of inorganic compounds or elements [C01](#))}

### Definition statement

*This place covers:*

Only specific solid adsorbent materials, i.e. not for documents covering general aspects of adsorption.

### Relationships with other classification places

|  |                            |
|--|----------------------------|
| Solid sorbent compositions.                    | <a href="#">B01J 20/00</a> |
| Preparation of inorganic compounds or elements | <a href="#">C01</a>        |

### Special rules of classification

Symbols [B01D 2253/00](#) and [B01D 2257/00](#) are to be applied where appropriate.

Documents from other technical fields in which adsorption is mentioned as one of many possible applications or a minor aspect. For such cases, [B01D 53/02](#) should be given.

### B01D 53/04

with stationary adsorbents {([B01D 53/025](#) takes precedence)}

### Definition statement

*This place covers:*

General adsorption process aspects.

This group is often used for (general) regeneration aspects and new combinations of known adsorbents for specific gases.

### References

#### Limiting references

*This place does not cover:*

|   |   |
|---|---|
| Takes precedence  | <a href="#">B01D 53/025</a>   |
| Documents from other technical fields in which adsorption is mentioned as one of many possible applications or a minor aspect | <a href="#">B01D 53/04</a>  |
| Controlling processes and pressure & temperature swing adsorption processes   | <a href="#">B01D 53/0454</a> ,<br><a href="#">B01D 53/047-</a><br><a href="#">B01D 53/053</a> |

**Special rules of classification**

Symbols to be applied where possible: [B01D 2253/00](#); [B01D 2256/00](#); [B01D 2257/00](#); [B01D 2259/40083](#) - [B01D 2259/4583](#).

**B01D 53/0407****{Constructional details of adsorbing systems}****Definition statement**

*This place covers:*

Apparatus (mechanical) related concepts (as opposed to process related inventions classified in [B01D 53/04](#)).

**Special rules of classification**

Symbols to be applied where possible: [B01D 2253/00](#); [B01D 2256/00](#); [B01D 2257/00](#); [B01D 2259/45](#) - [B01D 2259/4583](#).

**B01D 53/0431****{Beds with radial gas flow}****Definition statement**

*This place covers:*

Concepts with an annular bed in form of a hollow cylinder.

**B01D 53/0438****{Cooling or heating systems}****Definition statement**

*This place covers:*

Mainly regeneration systems.

**Special rules of classification**

Very relevant symbols to be applied where possible: [B01D 2259/40083](#) - [B01D 2259/40098](#).

**B01D 53/0446****{Means for feeding or distributing gases}****Definition statement**

*This place covers:*

Concepts focussed on ducts, manifolds, flow dividers, pumps, valves, etc.

**Special rules of classification**

Symbols for (specific) valves: [B01D 2259/40003](#) and [B01D 2259/40005](#).

**B01D 53/0454**

{Controlling adsorption (controlling temperature swing adsorption [B01D 53/0462](#), controlling pressure swing adsorption [B01D 53/047](#))}

**References****Limiting references**

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Documents relating to temperature swing adsorption (TSA) | <a href="#">B01D 53/0462</a> |
| Documents relating to pressure swing adsorption (PSA)    | <a href="#">B01D 53/047</a>  |

**B01D 53/047****Pressure swing adsorption****Definition statement**

*This place covers:*

PSA processes characterised by a sequences of cycle steps

**Special rules of classification**

Symbols to be allocated: [B01D 2259/40007](#) - [B01D 2259/4148](#) ; [B01D 2253/00](#); [B01D 2256/00](#); [B01D 2257/00](#); [B01D 2259/45](#) - [B01D 2259/4583](#);

Documents from other technical fields in which PSA is mentioned as one of many possible applications or a minor aspect. For such cases, [B01D 53/047](#) should be given.

**B01D 53/0473**

{Rapid pressure swing adsorption}

**Definition statement**

*This place covers:*

RPSA processes characterised by a sequences of cycle steps

**Special rules of classification**

Symbols to be allocated: [B01D 2259/40007](#) - [B01D 2259/4148](#) ; [B01D 2253/00](#); [B01D 2256/00](#); [B01D 2257/00](#); [B01D 2259/45](#) - [B01D 2259/4583](#);

Documents from other technical fields in which RPSA is mentioned as one of many possible applications or a minor aspect. For such cases, [B01D 53/0473](#) should be given.

**B01D 53/0476**

{Vacuum pressure swing adsorption}

**Definition statement**

*This place covers:*

VPSA processes characterised by a sequences of cycle steps.

**Special rules of classification**

Symbols to be allocated: [B01D 2259/40007](#) - [B01D 2259/4148](#) ; [B01D 2253/00](#); [B01D 2256/00](#); [B01D 2257/00](#); [B01D 2259/45](#) - [B01D 2259/4583](#);

Documents from other technical fields in which VPSA is mentioned as one of many possible applications or a minor aspect. For such cases, [B01D 53/0476](#) should be given.

**B01D 53/053**

**with storage or buffer vessel**

**Special rules of classification**

Symbols to be allocated: [B01D 2259/40007](#) - [B01D 2259/4148](#) ; [B01D 2253/00](#); [B01D 2256/00](#); [B01D 2257/00](#); [B01D 2259/45](#) - [B01D 2259/4583](#);

**B01D 53/06**

**with moving adsorbents, e.g. rotating beds {([B01D 53/025](#) takes precedence)}**

**Definition statement**

*This place covers:*

Moving (e.g. rotating or oscillating) adsorbent structures or units, e.g. rotating beds.

**References****Limiting references**

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Separation of gases or vapours with wetted absorbents | <a href="#">B01D 53/025</a> |
|---|-----------------------------|

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|  |                             |
|--|-----------------------------|
| Drying air in air conditioning systems | <a href="#">F24F 3/1423</a> |
|--|-----------------------------|

**Special rules of classification**

Systems for drying air by solid bed adsorption (classified in [B01D 53/261](#)) are also classified in this group where possible.

**B01D 53/08**

**according to the "moving bed" method**

**Definition statement**

*This place covers:*

Concepts where adsorbent particles travel (mainly by gravity) through a reactor and are often, after regeneration, reintroduced.



## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

In the patent documents the following expressions/words "Fließbett, Wanderbett" (German) ,"fluidized bed" and "moving bed" are often used as synonyms.

## B01D 53/10

### with dispersed adsorbents

#### Definition statement

*This place covers:*

Concepts where (loose) adsorbent particles are dispersed into a gas stream for a short residence (contact) time.

#### References

##### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Concepts with loose particles being held for a longer residence time in a fluidized state | <a href="#">B01D 53/12</a> |
|---|----------------------------|

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|

## B01D 53/12

### according to the "fluidised technique"

#### Definition statement

*This place covers:*

Concepts with loose particles being held for a longer residence time in a fluidized state.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|

## B01D 53/14

### by absorption

#### Definition statement

*This place covers:*

Concepts using liquid physical and chemical solvents

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                           |
|--|---------------------------|
| Treatment of gaseous fuels, natural gas or synthetic natural gas | <a href="#">C10L 3/10</a> |
|--|---------------------------|

### Special rules of classification

Symbols to be allocated where appropriate [B01D 2252/00](#)

Documents from other technical fields in which absorption is mentioned as one of many possible applications or a minor aspect. For such cases, [B01D 53/14](#) should be given.

## B01D 53/1493

{Selection of liquid materials for use as absorbents}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                           |
|--|---------------------------|
| Acyclic or carboxylic compounds                                  | <a href="#">C07C</a>      |
| Treatment of gaseous fuels, natural gas or synthetic natural gas | <a href="#">C10L 3/10</a> |

### Special rules of classification

Symbols [B01D 2252/00](#) are to be used in combination with this group.

## B01D 53/18

Absorbing units; Liquid distributors therefor ([B01D 3/16](#), [B01D 3/26](#), [B01D 3/30](#) take precedence; packing elements [B01J 19/30](#), [B01J 19/32](#))

### Definition statement

*This place covers:*

Apparatus (mechanical) aspects of absorption columns or units.

## References

### Limiting references

*This place does not cover:*

|                       |  |
|-----------------------|--|
| Fractionating columns | <a href="#">B01D 3/16</a> , <a href="#">B01D 3/26</a> ,<br><a href="#">B01D 3/30</a> |
|-----------------------|--|

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                  |   |
|------------------|---|
| Packing elements | <a href="#">B01J 19/30</a> , <a href="#">B01J 19/32</a> |
|------------------|---|

## B01D 53/22

by diffusion (manufacturing semi-permeable membranes [B01D 67/00](#); form, structure or properties of semi-permeable membranes [B01D 69/00](#); material for semi-permeable membranes [B01D 71/00](#))

### Definition statement

*This place covers:*

The groups [B01D 53/22](#) - [B01D 53/229](#) cover gas separation concepts using membranes.

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| Apparatus and accessories in general for separation processes using semipermeable membranes | <a href="#">B01D 63/00</a> , <a href="#">B01D 65/00</a> |
| Manufacturing semipermeable membranes   | <a href="#">B01D 67/00</a>                              |
| Form, structure or properties of semi-permeable membranes                                   | <a href="#">B01D 69/00</a>                              |
| Material for semipermeable membranes  | <a href="#">B01D 71/00</a>                              |

## B01D 53/24

by centrifugal force (centrifuges [B04B](#); cyclones [B04C](#))

### References

#### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Centrifugal separation of particles or aerosols from a gas stream | <a href="#">B01D 45/00</a> |
|---|----------------------------|

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Separating dispersed particles or aerosols from gases or vapours | <a href="#">B01D 45/00</a> |
| Centrifuges  | <a href="#">B04B</a>       |
| Apparatus using free vortex flow, e.g. cyclones                  | <a href="#">B04C</a>       |

## B01D 53/26

Drying gases or vapours

### Definition statement

*This place covers:*

Concepts for removing water vapour from a gas.

## References

### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|  |                           |
|--|---------------------------|
| Dehumidification in air conditioning systems | <a href="#">F24F 3/14</a> |
|--|---------------------------|

## B01D 53/261

{by adsorption}

### Definition statement

*This place covers:*

Use of solid sorbents as drying agents.

## References

### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|  |                           |
|--|---------------------------|
| Dehumidification in air conditioning systems | <a href="#">F24F 3/14</a> |
|--|---------------------------|

### Special rules of classification

For apparatus related features, documents are often classified in [B01D 53/0407](#) - [B01D 53/0446](#), [B01D 53/06](#), [B01D 53/0407](#) - [B01D 53/0446](#), [B01D 53/06](#)

## B01D 53/263

{by absorption}

### Definition statement

*This place covers:*

Gas drying concepts using a liquid drying agent (solvent).

## References

### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

|  |                           |
|--|---------------------------|
| Dehumidification in air conditioning systems | <a href="#">F24F 3/14</a> |
|--|---------------------------|

### Special rules of classification

Symbols [B01D 2252/00](#) are to be used where possible.

**B01D 53/265****{by refrigeration (condensation)}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| Condensation of vapours                   | <a href="#">B01D 5/00</a>                   |
| Collecting potable water from air         | <a href="#">E03B 3/28</a>                   |
| Steam or vapour condensers                | <a href="#">F28B</a>                        |
| Heat exchange and heat transfer apparatus | <a href="#">F28D</a> , <a href="#">F28F</a> |

**B01D 53/268****{by diffusion}****Definition statement***This place covers:*

Gas drying concepts using membranes.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|  |   |
|--|---|
| Separation of gases by diffusion   | <a href="#">B01D 53/22</a>                              |
| Apparatus and accessoirs in general for separation processes using semipermeable membranes | <a href="#">B01D 63/00</a> , <a href="#">B01D 65/00</a> |
| Manufacturing semipermeable membranes  | <a href="#">B01D 67/00</a>                              |
| Form, structure or properties of semi-permeable membranes                                  | <a href="#">B01D 69/00</a>                              |
| Material for semipermeable membranes   | <a href="#">B01D 71/00</a>                              |

**B01D 53/28****Selection of materials for use as drying agents****Special rules of classification**[B01D 2252/00](#); [B01D 2253/00](#);

**B01D 53/30**

**Controlling by gas-analysis apparatus (regulating non electrical variables in general [G05D](#))**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |  |
|---|--|
| Investigating or analysing materials by determining their chemical or physical properties | <a href="#">G01N</a>   |
| Controlling or regulating systems or variables  | <a href="#">G05B</a> , <a href="#">G05D</a> , <a href="#">G05F</a> |

**B01D 53/32**

**by electrical effects other than those provided for in group [B01D 61/00](#)**

**Definition statement**

*This place covers:*

Concepts using electric discharge or corona discharge, e.g. a plasma treatment.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|  |                      |
|--|----------------------|
| Separation by high-voltage electrical fields | <a href="#">B03C</a> |
|--|----------------------|

**Special rules of classification**

All documents using an electrical plasma are classified her. The corresponding symbol for those documents is [B01D 2259/818](#).

Symbols [B01D 2259/80](#) - [B01D 2259/818](#) are to be applied where appropriate.

**B01D 53/323**

**{by electrostatic effects or by high-voltage electric fields}**

**Definition statement**

*This place covers:*

Concepts using electric fields where no discharge takes place.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|  |                      |
|--|----------------------|
| Separation by high-voltage electrical fields | <a href="#">B03C</a> |
|--|----------------------|

**Special rules of classification**

Symbols [B01D 2259/80](#) - [B01D 2259/818](#) are to be applied where appropriate.

**B01D 53/326**

{in electrochemical cells}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                      |
|---|----------------------|
| Electrolytic or electrophoretic processes for the production of (.e.g. gaseous) compounds | <a href="#">C25B</a> |
|---|----------------------|

**B01D 53/34**

Chemical or biological purification of waste gases

**Special rules of classification**

The treatment of waste gases is divided into chemical concepts ([B01D 53/34](#) - [B01D 53/83](#)), biological concepts ([B01D 53/84](#), [B01D 53/85](#)) and catalytic concepts ([B01D 53/86](#) - [B01D 53/90](#)).

Exhaust (waste) gases from internal combustion engines are classified in [B01D 53/92](#) (non catalytic) and in [B01D 53/94](#) - [B01D 53/9495](#) (catalytic).

**B01D 53/343**

{Heat recovery}

**Special rules of classification**

Symbols [B01D 2259/65](#) - [B01D 2259/657](#) are to be applied where appropriate.

**B01D 53/346**

{Controlling the process}

**Definition statement**

*This place covers:*

Controlling concepts for chemical and biological waste gas treatments.

**References****Limiting references**

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Controlling catalytic processes                                | <a href="#">B01D 53/8696</a> |
| Controlling catalytic processes involving engine exhaust gases | <a href="#">B01D 53/9495</a> |

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |  |
|--|--|
| Controlling or regulating systems or variables | <a href="#">G05B</a> , <a href="#">G05D</a> , <a href="#">G05F</a> |
|--|--|

**Special rules of classification**

This group should, if possible, be allocated in combination with another group and/or additional information symbol specifying the chemical or biological waste gas treatment concept.

**B01D 53/38****Removing components of undefined structure****References****Limiting references**

This place does not cover:

|                      |  |
|----------------------|--|
| Catalytic treatments | <a href="#">B01D 53/8678</a> -<br><a href="#">B01D 53/8687</a> |
|----------------------|--|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|

**Special rules of classification**

This group should, if sensible, be allocated in combination with another group selected from [B01D 53/74](#) - [B01D 53/83](#) and/or symbol selected notably from [B01D 2258/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators

**B01D 53/40****Acidic components ([B01D 53/44](#) takes precedence)****References****Limiting references**

This place does not cover:

|                      |  |
|----------------------|--|
| Organic components   | <a href="#">B01D 53/44</a>                                     |
| Catalytic treatments | <a href="#">B01D 53/8678</a> -<br><a href="#">B01D 53/8687</a> |

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|



**Special rules of classification**

This group should, if sensible, be allocated in combination with another group selected from [B01D 53/74](#) - [B01D 53/83](#) and/or symbols selected notably from [B01D 2258/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators

**B01D 53/42**

**Basic components ([B01D 53/44](#) takes precedence)**

**References****Limiting references**

*This place does not cover:*

|                      |  |
|----------------------|--|
| Organic components   | <a href="#">B01D 53/44</a>                                     |
| Catalytic treatments | <a href="#">B01D 53/8678</a> -<br><a href="#">B01D 53/8687</a> |

**Special rules of classification**

This group should, if sensible, be allocated in combination with another group selected from [B01D 53/74](#) - [B01D 53/83](#) and/or symbols selected notably from [B01D 2258/00](#).

**B01D 53/44**

**Organic components**

**References****Limiting references**

*This place does not cover:*

|                      |  |
|----------------------|--|
| Catalytic treatments | <a href="#">B01D 53/8678</a> -<br><a href="#">B01D 53/8687</a> |
|----------------------|--|

**Special rules of classification**

This group should, if sensible, be allocated in combination with another group selected from [B01D 53/74](#) - [B01D 53/83](#) and/or symbol selected notably from [B01D 2258/00](#).

**B01D 53/46**

**Removing components of defined structure**

**References****Limiting references**

*This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8671</a> |
|----------------------|------------------------------|

**B01D 53/48****Sulfur compounds****References****Limiting references***This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8603</a> |
|----------------------|------------------------------|

**B01D 53/485****{containing only one sulfur compound other than sulfur oxides or hydrogen sulfide}****References****Limiting references***This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8606</a> |
|----------------------|------------------------------|

**B01D 53/50****Sulfur oxides ([B01D 53/60](#) takes precedence)****References****Limiting references***This place does not cover:*

|  |                              |
|--|------------------------------|
| Removing sulfur dioxide or sulfur trioxide from gases other than waste gases by absorption with solvents | <a href="#">B01D 53/1481</a> |
| Simultaneously removing sulphur oxides and nitrogen oxides   | <a href="#">B01D 53/60</a>   |
| Corresponding group for catalytic treatments   | <a href="#">B01D 53/8609</a> |

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides | <a href="#">C01B 17/04</a> |
|--|----------------------------|

**B01D 53/501**

{by treating the gases with a solution or a suspension of an alkali or earth-alkali or ammonium compound}

**References****Limiting references**

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Removing sulfur dioxide or sulfur trioxide from gases other than waste gases by absorption with solvents | <a href="#">B01D 53/1481</a> |
|--|------------------------------|

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a> |
|---|----------------------------|

**B01D 53/502**

{characterised by a specific solution or suspension}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                              |
|---|------------------------------|
| Removing sulfur dioxide or sulfur trioxide by absorption with solvents    | <a href="#">B01D 53/1481</a> |
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a>   |

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbol selected notably from [B01D 2251/00](#).

**B01D 53/504**

{characterised by a specific device}

**Definition statement**

*This place covers:*

Constructional (mechanical) concepts related to desulfurization.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Separating dispersed particles from gases, air or vapours | <a href="#">B01D 47/00</a> |
| Absorbing units, liquid distributors therefore            | <a href="#">B01D 53/18</a> |

|                              |                      |
|------------------------------|----------------------|
| Spraying apparatus, nozzles. | <a href="#">B05B</a> |
|------------------------------|----------------------|

### Special rules of classification

Examples for concepts in this group are scrubbers, sprayers, contactors

## B01D 53/505

{in a spray drying process}

### Definition statement

*This place covers:*

Inter alia concepts involving semi-solid reagents such as slurries.

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a> |
|---|----------------------------|

## B01D 53/507

{by treating the gases with other liquids}

### References

#### Limiting references

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Removing sulfur dioxide or sulfur trioxide from gases other than waste gases by absorption with solvents | <a href="#">B01D 53/1481</a> |
|--|------------------------------|

### Special rules of classification

This group should, if sensible, be allocated in combination with symbols selected notably from [B01D 2251/00](#) and from [B01D 2252/00](#)

## B01D 53/508

{by treating the gases with solids}

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Solid gas separation processes in general | <a href="#">B01D 53/81</a> |
|---|----------------------------|

### Special rules of classification

This group should, if sensible, be allocated in combination with symbols selected notably from [B01D 2251/00](#) and [B01D 2253/00](#).

**B01D 53/52****Hydrogen sulfide****References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Removing hydrogen sulfide from gases other than waste gases by absorption with solvents | <a href="#">B01D 53/1468</a> |
| Corresponding group for catalytic treatments  | <a href="#">B01D 53/8612</a> |

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides | <a href="#">C01B 17/04</a> |
|--|----------------------------|

**Special rules of classification**

Treatment concepts with regenerable solvents are also classified in [B01D 53/1468](#) (even waste gases).

This group should, if sensible, be allocated in combination with symbol selected notably from [B01D 2251/00](#).

**B01D 53/523****{Mixtures of hydrogen sulfide and sulfur oxides}****References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Corresponding group for catalytic treatments: | <a href="#">B01D 53/8615</a> |
|---|------------------------------|

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides | <a href="#">C01B 17/04</a> |
| Arrangement or devices for treating smokes or fumes liquids            | <a href="#">F23J 15/00</a> |

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbol selected notably from [B01D 2251/00](#).

**B01D 53/526****{Mixtures of hydrogen sulfide and carbon dioxide}****References****Limiting references***This place does not cover:*

|  |                                |
|--|--------------------------------|
| Removing hydrogen sulfide and carbon dioxide from gases other than waste gases by absorption with solvents | <a href="#">B01D 53/1462</a> . |
| Corresponding group for catalytic treatments   | <a href="#">B01D 53/8618</a>   |

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides | <a href="#">C01B 17/04</a> |
|--|----------------------------|

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbols selected notably from [B01D 2251/00](#) - [B01D 2251/90](#)

**B01D 53/54****Nitrogen compounds****References****Limiting references***This place does not cover:*

|  |                              |
|--|------------------------------|
| Corresponding group for catalytic treatments | <a href="#">B01D 53/8621</a> |
|--|------------------------------|

**B01D 53/56****Nitrogen oxides ([B01D 53/60](#) takes precedence)****References****Limiting references***This place does not cover:*

|  |                              |
|--|------------------------------|
| Simultaneously removing sulphur oxides and nitrogen oxides | <a href="#">B01D 53/60</a>   |
| Corresponding group for catalytic treatments               | <a href="#">B01D 53/8625</a> |

**B01D 53/565****{by treating the gases with solids}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Solid gas separation processes in general | <a href="#">B01D 53/81</a> |
|---|----------------------------|

**B01D 53/58****Ammonia****References****Limiting references***This place does not cover:*

|  |                              |
|--|------------------------------|
| Corresponding group for catalytic treatments | <a href="#">B01D 53/8634</a> |
|--|------------------------------|

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |                             |
|---|-----------------------------|
| Separation of ammonia by absorption or condensation | <a href="#">C01C 1/0458</a> |
| Separation of ammonia from gases or vapours         | <a href="#">C01C 1/12</a>   |

**B01D 53/60****Simultaneously removing sulfur oxides and nitrogen oxides****References****Limiting references***This place does not cover:*

|  |                              |
|--|------------------------------|
| Corresponding group for catalytic treatments | <a href="#">B01D 53/8637</a> |
|--|------------------------------|

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| General processes for purification of waste gases           | <a href="#">B01D 53/77</a> , <a href="#">B01D 53/80</a> ,<br><a href="#">B01D 53/88</a> |
| Arrangement or devices for treating smokes or fumes liquids | <a href="#">F23J 15/00</a>  |

## B01D 53/62

### Carbon oxides

#### References

##### *Limiting references*

*This place does not cover:*

|                                       |                             |
|---------------------------------------|-----------------------------|
| Catalytic removal of carbon monoxide: | <a href="#">B01D 53/864</a> |
|---------------------------------------|-----------------------------|

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Solidifying carbon dioxide                                     | <a href="#">C01B 32/55</a> |
| Arrangement or devices for treating smokes or fumes liquids    | <a href="#">F23J 15/00</a> |
| Separation of carbon dioxide by liquefaction or solidification | <a href="#">F25J</a>       |

#### Special rules of classification

Treatment concepts with regenerable solvents are also classified in [B01D 53/1475](#) (even for waste gases).

This group should, if sensible, be allocated in combination with symbol selected notably from [B01D 2251/00](#), [B01D 2252/00](#) and [B01D 2258/00](#).

Frequent examples are concepts resulting in carbonate salt precipitation.

Carbon monoxide is also classified here. This is specified by symbol [B01D 2257/502](#).

Note that carbon dioxide in a mixture with hydrogen sulfide is (also) classified in [B01D 53/526](#).

## B01D 53/64

### Heavy metals or compounds thereof, e.g. mercury

#### References

##### *Limiting references*

*This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8665</a> |
|----------------------|------------------------------|

#### Special rules of classification

Mercury is to be specified by [B01D 2257/602](#).



**B01D 53/66****Ozone****References****Limiting references**

*This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8675</a> |
|----------------------|------------------------------|

**B01D 53/68****Halogens or halogen compounds****References****Limiting references**

*This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8659</a> |
|----------------------|------------------------------|

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                              |
|---|------------------------------|
| Exhaust treatment in chemical vapour deposition processes | <a href="#">C23C 16/4412</a> |
|---|------------------------------|

**Special rules of classification**

Halogens to be removed can further be specified in [B01D 2257/00](#).

**B01D 53/685**

**{by treating the gases with solids}**

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbols selected notably from [B01D 2251/00](#) and [B01D 2253/00](#).

**B01D 53/70****Organic halogen compounds****References****Limiting references**

*This place does not cover:*

|                      |                              |
|----------------------|------------------------------|
| Catalytic treatments | <a href="#">B01D 53/8662</a> |
|----------------------|------------------------------|

## B01D 53/72

Organic compounds not provided for in groups [B01D 53/48](#) - [B01D 53/70](#), e.g. hydrocarbons

### Special rules of classification

This group should, if sensible, be allocated in combination with another group or symbol specifying the component to be removed and/or the treatment concept.

## B01D 53/73

After-treatment of removed components

### Special rules of classification

This group should, if sensible, be allocated in combination with another group or symbol specifying the component to be removed and/or the treatment concept.

## B01D 53/74

General processes for purification of waste gases; Apparatus or devices specially adapted therefor ([B01D 53/92](#) takes precedence)

### References

#### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Chemical or biological purification of engine exhaust gases | <a href="#">B01D 53/92</a> |
|---|----------------------------|

### Special rules of classification

This group should, if sensible, be allocated in combination with another group or symbol specifying the component to be removed and/or the treatment concept.

## B01D 53/75

Multi-step processes

### Definition statement

*This place covers:*

Processes comprising a sequence of different treatment steps. The individual steps as such do not represent the inventive concept.

### References

#### Limiting references

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| A catalytic treatment with more than one catalytic step | <a href="#">B01D 53/869</a> |
|---|-----------------------------|

### Special rules of classification

Sequence of steps may comprise a (one single) catalytic step.

This group should, if sensible, be allocated in combination with another group or symbol specifying the component to be removed and/or the treatment concept (e.g. [B01D 53/00](#)).

## B01D 53/77

### Liquid phase processes

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbol specifying the component to be removed and/or the reactants used.

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/78

### with gas-liquid contact

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbol specifying the component to be removed and/or the reactants used.

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/79

### Injecting reactants

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbol specifying the component to be removed and/or the reactants used [B01D 2251/00](#) and [B01D 2252/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/80

### Semi-solid phase processes, i.e. by using slurries

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes using washing liquids | <a href="#">F23J 15/04</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbols specifying the component to be removed or the reactants used [B01D 2251/00](#), [B01D 2253/00](#), [B01D 2252/00](#), [B01D 2257/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/81

### Solid phase processes

#### Relationships with other classification places

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbol specifying the component to be removed or the reactants used [B01D 2251/00](#), [B01D 2253/00](#), [B01D 2252/00](#), [B01D 2257/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/82

### with stationary reactants

#### Relationships with other classification places

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbol specifying the component to be removed or the reactants used [B01D 2251/00](#), [B01D 2253/00](#), [B01D 2252/00](#), [B01D 2257/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/83

### with moving reactants

#### Relationships with other classification places

|   |                            |
|---|----------------------------|
| Arrangement or devices for treating smokes or fumes | <a href="#">F23J 15/00</a> |
|---|----------------------------|

#### Special rules of classification

This group should, if sensible, be allocated in combination with symbol specifying the component to be removed and/or the reactants used [B01D 2251/00](#), [B01D 2253/00](#), [B01D 2252/00](#), [B01D 2257/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators

## B01D 53/84

### Biological processes

#### Definition statement

*This place covers:*

All biological concepts except those using solid bed reactors.

#### References

##### Limiting references

*This place does not cover:*

|                                 |                            |
|---------------------------------|----------------------------|
| Concepts with solid bed reactor | <a href="#">B01D 53/85</a> |
|---------------------------------|----------------------------|

#### Special rules of classification

symbol for specific microorganisms [B01D 2251/95](#); symbol for bio-catalytic aspects (enzymes) [B01D 2255/804](#).

## B01D 53/85

### with gas-solid contact

#### Definition statement

*This place covers:*

Concepts with solid bed reactor.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |  |
|--|--|
| Solid bed reactors for water treatment | <a href="#">C02F 3/10</a> - <a href="#">C02F 3/103</a> |
|--|--|

#### Special rules of classification

Symbol for specific microorganisms [B01D 2251/95](#); Symbol for bio-catalytic aspects (enzymes) [B01D 2255/804](#).

## B01D 53/86

### Catalytic processes

#### References

##### *Limiting references*

*This place does not cover:*

|   |  |
|---|--|
| Catalytic concepts for engine exhaust gases | <a href="#">B01D 53/94</a> -<br><a href="#">B01D 53/9495</a> |
|---|--|

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> . |
|----------------------|---|

#### Special rules of classification

All groups [B01D 53/86](#) - [B01D 53/90](#) should, if sensible, be allocated in combination with symbols specifying the catalytic substances used [B01D 2255/00](#).

Concepts applying photo-catalytic treatment should be given the symbol [B01D 2255/804](#).

## B01D 53/8609

### {Sulfur oxides}

#### References

##### *Limiting references*

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Removing sulfur oxides and hydrogen sulfide:               | <a href="#">B01D 53/8603</a> |
| Simultaneously removing sulfur oxides and nitrogen oxides: | <a href="#">B01D 53/8637</a> |

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides. | <a href="#">C01B 17/04</a> |
|---|----------------------------|

## B01D 53/8612

### {Hydrogen sulfide}

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides. | <a href="#">C01B 17/04</a> |
|---|----------------------------|

**B01D 53/8615****{Mixtures of hydrogen sulfide and sulfur oxides}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides. | <a href="#">C01B 17/04</a> |
|---|----------------------------|

**B01D 53/8618****{Mixtures of hydrogen sulfide and carbon dioxides}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Production of sulfur from gaseous compounds including gaseous sulfides. | <a href="#">C01B 17/04</a> |
|---|----------------------------|

**B01D 53/8625****{Nitrogen oxides}****Definition statement***This place covers:*

Process related concepts (e.g. controlling) with known catalyst compositions.

**References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Simultaneously removing sulfur oxides and nitrogen oxides | <a href="#">B01D 53/8637</a> |
|---|------------------------------|

**Special rules of classification**This group can be combined with [B01D 53/8696](#) for controlling concepts.**B01D 53/8628****{Processes characterised by a specific catalyst}****References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Catalysts for engine exhaust gases (e.g. from cars) | <a href="#">B01D 53/9409</a> |
|---|------------------------------|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

**Special rules of classification**

Concepts classified here must further specify the catalytic substance in [B01D 2255/00](#).

**B01D 53/8634**

{Ammonia}

**References****Limiting references**

This place does not cover:

|   |                              |
|---|------------------------------|
| Catalysts for internal combustion engines (e.g. cars) | <a href="#">B01D 53/9436</a> |
|---|------------------------------|

**B01D 53/8646**

{Simultaneous elimination of the components ([B01D 53/8656](#) takes precedence)}

**Definition statement**

This place covers:

Process related concepts with known three-way-catalyst (TWC) compositions.

**References****Limiting references**

This place does not cover:

|   |  |
|---|--|
| Successive elimination of the components                  | <a href="#">B01D 53/8656</a>                                   |
| Three-way-catalysts for engine exhaust gases (e.g. cars): | <a href="#">B01D 53/9445</a> -<br><a href="#">B01D 53/9454</a> |

**Special rules of classification**

This group may be combined with [B01D 53/8696](#) for controlling concepts.

**B01D 53/865**

{characterised by a specific catalyst}

**References****Limiting references**

This place does not cover:

|  |  |
|--|--|
| Three-way-catalysts for engine exhaust gases (e.g. cars) | <a href="#">B01D 53/9445</a> -<br><a href="#">B01D 53/9454</a> |
|--|--|



**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

**Special rules of classification**

Concepts classified here must further specify the catalytic substance in [B01D 2255/00](#).

**B01D 53/8653**

{characterised by a specific device}

**Definition statement**

*This place covers:*

Apparatus (mechanics) related concepts with known catalytic substances.

**References****Limiting references**

*This place does not cover:*

|   |  |
|---|--|
| Three-way-catalysts for internal combustion engines (e.g. cars) | <a href="#">B01D 53/9445</a> -<br><a href="#">B01D 53/9454</a> |
|---|--|

**B01D 53/8656**

{Successive elimination of the components}

**Definition statement**

*This place covers:*

Concepts including the sequential removal of carbon monoxide or hydrocarbons and nitrogen oxides.

**References****Limiting references**

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Sequential removal for gases from internal combustion engines (e.g. cars): | <a href="#">B01D 53/9459</a> |
|--|------------------------------|

**B01D 53/8659**

{Removing halogens or halogen compounds}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Exhaust treatment in chemical vapour deposition processes | <a href="#">C23C 16/4412</a> |
|---|------------------------------|

**Special rules of classification**

Halogens to be removed can further be specified in [B01D 2257/00](#). Other symbols from [B01D 2255/00](#) and [B01D 2258/00](#) should be allocated where appropriate.

**B01D 53/8662**

{Organic halogen compounds}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Exhaust treatment in chemical vapour deposition processes | <a href="#">C23C 16/4412</a> |
|---|------------------------------|

**Special rules of classification**

Halogens to be removed can further be specified in [B01D 2257/00](#). Other symbols from [B01D 2255/00](#) and [B01D 2258/00](#) should be allocated where appropriate.

**B01D 53/8665**

{Removing heavy metals or compounds thereof, e.g. mercury}

**Special rules of classification**

Symbols from [B01D 2255/00](#), [B01D 2257/00](#) and [B01D 2258/00](#) should be allocated where appropriate.

**B01D 53/8668**

{Removing organic compounds not provided for in [B01D 53/8603](#) - [B01D 53/8665](#)}

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbol specifying the catalyst used and the component to be removed [B01D 2255/00](#), [B01D 2257/00](#).

**B01D 53/8671**

{Removing components of defined structure not provided for in [B01D 53/8603](#) - [B01D 53/8668](#)}

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbol specifying the catalyst used and the component to be removed [B01D 2255/00](#), [B01D 2257/00](#).

**B01D 53/8678**

{Removing components of undefined structure}

**Special rules of classification**

This group should, if sensible, be allocated in combination with symbol specifying the catalyst used [B01D 2255/00](#) and the origin of the waste gas [B01D 2258/00](#).

Examples of such gases are flue gases from power plants, blast furnaces or waste incinerators.

## B01D 53/869

**{Multiple step processes}**

### Definition statement

*This place covers:*

Sequential catalytic treatment of waste gases comprising two or more catalytic steps.

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| A multistep treatment comprising only one catalytic step | <a href="#">B01D 53/75</a> |
|--|----------------------------|

### Special rules of classification

Single treatment steps may be allocated the Indexing Code [B01D 53/00](#).

## B01D 53/8693

**{After-treatment of removed components}**

### Special rules of classification

Symbols for specifying the removed components should be allocated.

## B01D 53/8696

**{Controlling the catalytic process}**

### References

#### Limiting references

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Controlling catalytic processes involving internal combustion engines | <a href="#">B01D 53/9495</a> |
|---|------------------------------|

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |  |
|---|--|
| Investigating or analysing materials by determining their chemical or physical properties | <a href="#">G01N</a>   |
| Controlling or regulating systems or variables  | <a href="#">G05B</a> , <a href="#">G05D</a> , <a href="#">G05F</a> |

### Special rules of classification

This group should be allocated in combination with another group and/or symbol specifying the component to be removed.

## B01D 53/88

### Handling or mounting catalysts

#### Definition statement

*This place covers:*

Concepts related to mechanical appliances of catalytic material on structures or apparatus.

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

#### Special rules of classification

This group should be allocated in combination with symbol notably for specifying the catalyst [B01D 2255/00](#) and the component to be removed [B01D 2257/00](#).

A frequent example is the application of a photo-catalytic material ([B01D 2255/802](#)) onto a structure.

## B01D 53/885

### {Devices in general for catalytic purification of waste gases}

#### Relationships with other classification places

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

#### Special rules of classification

This group should be allocated in combination with symbol notably for specifying the catalyst [B01D 2255/00](#) and the component to be removed [B01D 2257/00](#).

A frequent example is the application of a photo-catalytic material ([B01D 2255/802](#)) onto a structure.

## B01D 53/90

### Injecting reactants

#### References

##### *Informative references*

*Attention is drawn to the following places, which may be of interest for search:*

|  |   |
|--|---|
| Exhaust treatment aspects for vehicles | <a href="#">F01N</a> , <a href="#">F02D</a> |
|--|---|

#### Special rules of classification

This group should be allocated in combination with symbol notably for specifying the reactant [B01D 2251/00](#), the catalyst [B01D 2255/00](#) and the component to be removed [B01D 2257/00](#).

A common example for an injected reactant is a liquid reducing agent such as ammonia.

## B01D 53/92

**of engine exhaust gases (exhaust {or silencing} apparatus {for internal combustion engines, machines or engines in general}, having means for purifying, {rendering innocuous} or otherwise treating exhaust gases [F01N 3/00](#))**

### Definition statement

*This place covers:*

The groups [B01D 53/92](#) - [B01D 53/927](#) cover all treatment concepts for engine exhaust gases except catalytic treatment

### References

#### Limiting references

*This place does not cover:*

|   |   |
|---|---|
| Catalytic treatment concepts for engine exhaust gases | <a href="#">B01D 53/94</a> - <a href="#">B01D 53/9495</a> |
|---|---|

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| Exhaust treatment aspects for vehicles  | <a href="#">F01N</a> , <a href="#">F02D</a> |
| Exhaust or silencing apparatus for internal combustion engines, machines or engines in general, having means for purifying, rendering innocuous or otherwise treating exhaust gases | <a href="#">F01N 3/00</a>                   |

### Special rules of classification

The groups [B01D 53/92](#) - [B01D 53/927](#) can be combined with other groups or symbol chosen from [B01D 53/00](#) - [B01D 53/96](#) to characterise the treatment concept.

## B01D 53/94

**by catalytic processes**

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Catalytic processes not involving engine exhaust gases | <a href="#">B01D 53/86</a> |
|--|----------------------------|

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |   |
|--|---|
| Catalysts in general                   | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
| Exhaust treatment aspects for vehicles | <a href="#">F01N</a> , <a href="#">F02D</a>             |

### Special rules of classification

All groups [B01D 53/94](#) - [B01D 53/9495](#) should, if sensible, be allocated in combination with symbol specifying the catalytic substances used [B01D 2255/00](#).

## B01D 53/9409

{Nitrogen oxides}

### Definition statement

*This place covers:*

Process related concepts (e.g. controlling) with known catalyst compositions.

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                                |                      |
|--------------------------------|----------------------|
| Controlling combustion engines | <a href="#">F02D</a> |
|--------------------------------|----------------------|

### Special rules of classification

This group can be combined with [B01D 53/9495](#) for controlling concepts.

## B01D 53/9413

{Processes characterised by a specific catalyst}

### References

#### Limiting references

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Removing nitrous oxides (N <sub>2</sub> O) | <a href="#">B01D 53/9427</a> |
|--|------------------------------|

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

### Special rules of classification

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).

## B01D 53/9418

{for removing nitrogen oxides by selective catalytic reduction [SCR] using a reducing agent in a lean exhaust gas}

### Definition statement

*This place covers:*

Concepts where the reducing agent is added under constant lean exhaust gas conditions.

## References

### Limiting references

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Adding reducing agent under alternating lean and rich exhaust gas conditions | <a href="#">B01D 53/9422</a> |
|--|------------------------------|

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

### Special rules of classification

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).

## B01D 53/9422

**{for removing nitrogen oxides by NO<sub>x</sub> storage or reduction by cyclic switching between lean and rich exhaust gases (LNT, NSC, NSR)}**

### Definition statement

*This place covers:*

Concepts where the reducing agent is added under alternating lean and rich exhaust gas conditions.

## References

### Limiting references

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Adding reducing agent under constant lean exhaust gas conditions | <a href="#">B01D 53/9418</a> |
|--|------------------------------|

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |   |
|--|---|
| Catalysts in general   | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
| Controlling exhaust gas conditions with means other than the combustion engine | <a href="#">F01N</a>                                    |
| Controlling combustion engines (e.g. lambda value)                             | <a href="#">F02D</a>                                    |

### Special rules of classification

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).

**B01D 53/9427****{for removing nitrous oxide}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

**Special rules of classification**Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).**B01D 53/9431****{Processes characterised by a specific device}****Definition statement***This place covers:*

Apparatus (mechanics) related concepts with known catalytic substances.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

|                                       |                      |
|---------------------------------------|----------------------|
| Exhaust treatment systems in vehicles | <a href="#">F01N</a> |
|---------------------------------------|----------------------|

**B01D 53/944****{Simultaneously removing carbon monoxide, hydrocarbons or carbon making use of oxidation catalysts (three-way-catalysts [TWC] [B01D 53/9445](#))}****Definition statement***This place covers:*

Oxidation catalysts (e.g. DOC) and filters coated with oxidation catalysts;

**References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Catalysts for gasoline engines (except lean burn engines) | <a href="#">B01D 53/9445</a> |
|---|------------------------------|

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|                           |   |
|---------------------------|---|
| Three-way-catalysts (TWC) | <a href="#">B01D 53/9445</a>                            |
| Catalysts in general      | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |



**Special rules of classification**

If applicable, this group should be given in combination with symbols chosen from [B01D 2255/902](#) and [B01D 2255/903](#).

Further Indexing Codes specifying the catalytic substance are to be allocated [B01D 2255/00](#), notably [B01D 2255/915](#).

**B01D 53/9445**

**{Simultaneously removing carbon monoxide, hydrocarbons or nitrogen oxides making use of three-way catalysts [TWC] or four-way-catalysts [FWC]}**

**Definition statement**

*This place covers:*

Process related concepts (e.g. controlling) with known catalyst compositions.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                                |                      |
|--------------------------------|----------------------|
| Controlling combustion engines | <a href="#">F02D</a> |
|--------------------------------|----------------------|

**Special rules of classification**

This group can be combined with [B01D 53/9495](#) for controlling concepts.

**B01D 53/945**

**{characterised by a specific catalyst}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

**Special rules of classification**

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).

**B01D 53/9454**

**{characterised by a specific device}**

**Definition statement**

*This place covers:*

Apparatus (mechanics) related concepts with known catalytic substances.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                                       |                      |
|---------------------------------------|----------------------|
| Exhaust treatment systems in vehicles | <a href="#">F01N</a> |
|---------------------------------------|----------------------|

## B01D 53/9459

{Removing one or more of nitrogen oxides, carbon monoxide, or hydrocarbons by multiple successive catalytic functions; systems with more than one different function, e.g. zone coated catalysts (layered catalysts with only one function [B01D 53/9413](#), [B01D 53/944](#) or [B01D 53/945](#))}

### Definition statement

*This place covers:*

Processes and apparatuses where the gas successively passes different catalysts (including zone-coated catalysts and wall-flow filters with different coatings on inlet and outlet channels)

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |  |
|--|--|
| Layered catalysts with only one function | <a href="#">B01D 53/9413</a> ,<br><a href="#">B01D 53/944</a> ,<br><a href="#">B01D 53/945</a> |
|--|--|

### Special rules of classification

Symbols to be allocated are notably selected from [B01D 2255/902](#), [B01D 2255/903](#), [B01D 2255/904](#) and [B01D 2255/9155](#)

## B01D 53/9463

{with catalysts positioned on one brick}

### Special rules of classification

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).

## B01D 53/9468

{in different layers}

### Definition statement

*This place covers:*

Wall-flow filters with different layers on the walls.

## References

### Limiting references

*This place does not cover:*

|  |  |
|--|--|
| Layered catalysts on flow through substrates are generally not regarded as having different successive functions | <a href="#">B01D 53/9413</a> ,<br><a href="#">B01D 53/944</a> ,<br><a href="#">B01D 53/945</a> |
|--|--|

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

## Special rules of classification

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#), notably [B01D 2255/902](#).

### B01D 53/9472

**{in different zones}**

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                      |   |
|----------------------|---|
| Catalysts in general | <a href="#">B01J 21/00</a> - <a href="#">B01J 38/00</a> |
|----------------------|---|

## Special rules of classification

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#), notably [B01D 2255/903](#).

### B01D 53/9477

**{with catalysts positioned on separate bricks, e.g. exhaust systems}**

## Definition statement

*This place covers:*

Exhaust systems where a specific sequence of catalytic functions is given, for example DOC-DPF or LNT-SCR. It also covers exhaust systems where the DPF is not coated.

## Special rules of classification

This group is also given if a specific order is indicated and the DPF has no catalytic function.

Symbols specifying the catalytic substance are to be allocated [B01D 2255/00](#).

## B01D 53/9495

{Controlling the catalytic process}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                      |
|--|----------------------|
| Controlling combustion engines (e.g. lambda value) | <a href="#">F02D</a> |
|--|----------------------|

### Special rules of classification

This group should be allocated in combination with another group and/or additional information symbols specifying the treatment concept [B01D 53/94](#) - [B01D 53/949](#).

## B01D 53/96

Regeneration, reactivation or recycling of reactants

### Special rules of classification

This group should, if sensible, be allocated in combination with another group or symbols specifying the reactant used [B01D 2251/00](#) or [B01D 2252/00](#), component to be removed [B01D 2257/00](#) or the treatment concept, e.g. [B01D 53/00](#).

## B01D 57/00

Separation, other than separation of solids, not fully covered by a single other group or subclass, e.g. [B03C](#)

### Definition statement

*This place covers:*

Any process for separation not fully covered by any of the other groups in [B01D](#) provided that it is not related to the separation of solid particles.

### References

#### Limiting references

*This place does not cover:*

|                                    |                            |
|------------------------------------|----------------------------|
| Separation by distillation         | <a href="#">B01D 3/00</a>  |
| Separation by extraction           | <a href="#">B01D 11/00</a> |
| Separation by sorption             | <a href="#">B01D 15/00</a> |
| Separation of liquids from liquids | <a href="#">B01D 17/00</a> |
| Degasification of liquids          | <a href="#">B01D 19/00</a> |
| Dead end filtration processes      | <a href="#">B01D 37/00</a> |
| Gas separation                     | <a href="#">B01D 53/00</a> |
| Membrane separation processes      | <a href="#">B01D 61/00</a> |

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |   |
|--|---|
| Electrodialysis and electro-osmosis  | <a href="#">B01D 61/42</a> - <a href="#">B01D 61/56</a> |
| Dielectrophoresis  | <a href="#">B03C 5/005</a>                              |
| Treatment of water, waste water, sewage, or sludge by electrochemical separation | <a href="#">C02F 1/469</a>                              |
| Preparation of peptides by electrophoresis                                       | <a href="#">C07K 1/26</a>                               |
| Electrophoretic production of compounds or non-metals                            | <a href="#">C25B 7/00</a>                               |
| Analysis processes using electrophoresis   | <a href="#">G01N 27/26</a>                              |

**Special rules of classification**

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant sub groups are given.

**B01D 57/02**

**by electrophoresis (treatment of water, waste water, sewage or sludge by electrophoresis [C02F 1/469](#); electrophoretic production of compounds or non-metals [C25B 7/00](#); investigating or analysing materials by using electrophoresis [G01N 27/26](#))**

**Definition statement**

*This place covers:*

[B01D 57/02](#) includes only processes involving migration of species due to an electrical potential in the absence of any kind of separation membrane. Otherwise the respective subgroups of [B01D 61/42](#) apply. The class is given for preparative purposes only (opposed to investigation or analysis purposes).

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Treatment of water, waste water, sewage or sludge by electrophoresis | <a href="#">C02F 1/469</a> |
| Electrophoretic production of compounds or non-metals                | <a href="#">C25B 7/00</a>  |
| Investigating or analysing materials by using electrophoresis        | <a href="#">G01N 27/26</a> |

**B01D 59/00**

**Separation of different isotopes of the same chemical element (preventing occurrence of critical conditions when producing fissile material [G21](#); shielding from radioactivity [G21F](#))**

**Definition statement**

*This place covers:*

The separation of isotopes of the SAME element. A starting compound comprising several isotopes of the same element is separated in at least two fractions wherein each fraction is enriched/depleted in

a least one of the isotopes in comparison with the starting material and with the other fraction(s). This implies that the difference in isotopes ratios is not only due to radioactive decay

### Relationships with other classification places

Preventing occurrence of critical conditions when producing fissile material [G21](#); shielding from radioactivity [G21F](#)

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| The preparation of nuclides, (e.g. for medical purposes) from other elements (e. g. preparation of <sup>99</sup> Tc from <sup>99</sup> Mo and their separation from the mother solution (when these are not separated from other isotopes of the same element (otherwise <a href="#">B01D 59/00</a> ). | <a href="#">G21G</a>       |
| Mass spectrometers.  | <a href="#">H01J 49/00</a> |

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                      |
|--|----------------------|
| Preventing occurrence of critical conditions when producing fissile material | <a href="#">G21</a>  |
| Shielding from radioactivity   | <a href="#">G21F</a> |

### Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "isotopes" and "nuclides"

## B01D 59/44

**Separation by mass spectrography (particle spectrometers or separator tubes [H01J 49/00](#))**

### Definition statement

*This place covers:*

Processes for separating isotopes by using mass spectrometers.

### References

#### Limiting references

*This place does not cover:*

|                    |                            |
|--------------------|----------------------------|
| Mass spectrometers | <a href="#">H01J 49/00</a> |
|--------------------|----------------------------|

## B01D 59/50

Separation involving two or more processes covered by different groups selected from groups [B01D 59/02](#), [B01D 59/10](#), [B01D 59/20](#), [B01D 59/22](#), [B01D 59/28](#), [B01D 59/34](#), [B01D 59/36](#), [B01D 59/38](#), [B01D 59/44](#)

### Special rules of classification

Document relating to isotopes separation using more than one process should get the class [B01D 59/50](#) and symbols (depending on the information disclosed) of each of separation process ([B01D 59/10](#), [B01D 59/20](#), [B01D 59/22](#), [B01D 59/28](#), [B01D 59/34](#), [B01D 59/36](#), [B01D 59/38](#), [B01D 59/44](#)).

## B01D 61/00

Processes of separation using semi-permeable membranes, e.g. dialysis, osmosis, ultrafiltration; Apparatus, accessories or auxiliary operations specially adapted therefor

### Definition statement

*This place covers:*

Processes for separation of liquid feed by means of a membrane in general which selectively allows passage of components from liquid feed mixtures including suspensions of particles, heterogeneous or homogeneous mixtures.

These types of membrane processes include:

- Pressure driven membrane separation processes as microfiltration, ultrafiltration, nanofiltration, reverse osmosis,
- Concentration gradient based membrane separation as forward osmosis, dialysis
- Membrane separation processes based on an electrical gradient such as electrodialysis, electro-osmosis and electro-ultrafiltration
- Thermally based separation processes (based on a gradient of the activities of a component) as pervaporation, membrane distillation
- Processes applying liquid separation membranes; either immobilised in a porous matrix or in suspension
- Sequences applying combinations of such membrane processes

For microfiltration processes only cross-flow processes, i.e. applying a tangential flow of the feed solution over the membrane) are considered.

### Relationships with other classification places

A close relationship exists between membrane microfiltration and the field of filtration ([B01D 25/00](#) - [B01D 35/00](#)).

Generally all cross-flow filtration applications (control of deposits on the filter) are regarded as falling into [B01D 61/00-B01D 61/58](#), while dead end filters (cake filtration) should be covered by the filtration groups.

### References

#### Limiting references

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Degasification of liquids by filtration (i.e. with membranes) | <a href="#">B01D 19/0031</a> |
|---|------------------------------|

|  |  |
|--|--|
| Dead end filtration processes and devices  | <a href="#">B01D 25/00</a> , <a href="#">B01D 27/00</a> ,<br><a href="#">B01D 29/00</a> , <a href="#">B01D 33/00</a> ,<br><a href="#">B01D 35/00</a> |
| Processes for separation of gases or vapour by means of membranes  | <a href="#">B01D 53/22</a>   |
| Electrophoresis for separation   | <a href="#">B01D 57/02</a> , <a href="#">C25B 7/00</a>   |
| Membrane modules for membrane separation   | <a href="#">B01D 63/00</a>   |
| Membrane cleaning or sterilisation   | <a href="#">B01D 65/02</a>   |
| Prevention of membrane fouling   | <a href="#">B01D 65/08</a>   |
| Membrane testing   | <a href="#">B01D 65/10</a>   |
| Bandages or dressings  | <a href="#">A61F 13/00</a>   |
| Galenical forms by sustained drug release by osmosis   | <a href="#">A61K 9/0004</a>  |
| Drug containing films, membranes or sheets   | <a href="#">A61K 9/7007</a>  |
| Methods or apparatus for sterilizing material using filtration   | <a href="#">A61L 2/022</a>   |
| Blood dialysis systems and blood oxygenation processes with membranes  | <a href="#">A61M 1/16</a>  |
| Filtering material out of the blood by passing it through a membrane, i.e. haemofiltration, diafiltration              | <a href="#">A61M 1/34</a>  |
| Feeding or removing reactants or products to or from the catalyst bed of a reactor through a membrane                  | <a href="#">B01J 8/009</a>   |
| Membrane reactors  | <a href="#">B01J 19/1893</a> ,<br><a href="#">B01J 19/2475</a>   |
| Separation of hydrogen by diffusion  | <a href="#">C01B 3/501</a>   |
| Preparation of oxygen by making use of membranes   | <a href="#">C01B 13/0251</a>   |
| Purification or separation of nitrogen by making use of membranes  | <a href="#">C01B 21/0438</a>   |
| Physical processing of noble gases by making use of membranes  | <a href="#">C01B 23/0042</a>   |
| Purification of acyclic or carboxylic compounds using membranes  | <a href="#">C07C 7/00</a>  |
| Working up of undefined normally gaseous mixtures using membranes  | <a href="#">C10G 70/045</a>  |
| Enzymology or microbiology with dialysis means   | <a href="#">C12M 1/12</a>  |
| Tissue, human, animal or plant cell or virus culture apparatus with ultrafiltration, inverse osmosis or dialysis means | <a href="#">C12M 3/06</a>  |
| Extracting or separation of nucleic acids from biological samples by membranes   | <a href="#">C12N 15/1017</a>   |
| Electrolysis   | <a href="#">C25B</a>   |
| Pressure retarded osmosis  | <a href="#">F03G 7/005</a>   |
| Osmotically driven micropumps  | <a href="#">F04B 19/006</a>  |
| Batteries comprising separators  | <a href="#">H01M 2/14</a>  |
| Fuel cells   | <a href="#">H01M 8/00</a>  |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Milk preparation by dialysis, reverse osmosis or ultrafiltration | <a href="#">A23C 9/142</a> |
| Milk preparation by electrodialysis                              | <a href="#">A23C 9/144</a> |



|  |                              |
|--|------------------------------|
| Cheese preparation by dialysis or ultrafiltration  | <a href="#">A23C 19/0285</a> |
| Concentration or drying of juices by membrane processes  | <a href="#">A23L 2/082</a>   |
| Clarifying or fining of non-alcoholic beverages using membranes  | <a href="#">A23L 2/74</a>    |
| Treatment of water, waste water, sewage, or sludge by means of by dialysis, osmosis or reverse osmosis | <a href="#">C02F 1/44</a>    |
| Treatment of water, waste water, sewage, or sludge by electrochemical separation                       | <a href="#">C02F 1/469</a>   |
| Multistage treatment of water, waste water, or sewage  | <a href="#">C02F 9/00</a>    |
| Multistage treatment of water with portable or detachable small-scale treatment devices                | <a href="#">C02F 9/005</a>   |
| Preparation of peptides by ultrafiltration or reverse osmosis  | <a href="#">C07K 1/34</a>    |
| Refining hydrocarbon oils by dialysis  | <a href="#">C10G 31/11</a>   |
| Dewatering or demulsification of hydrocarbon oils by filtration  | <a href="#">C10G 33/06</a>   |
| Working up used lubricants by ultrafiltration or osmosis   | <a href="#">C10M 175/06</a>  |
| Refining or fats or fatty oils including ultrafiltration or dialysis                                   | <a href="#">C11B 3/008</a>   |
| Preparation of other alcoholic beverages using membranes   | <a href="#">C12G 3/085</a>   |
| Removal of precipitate or added materials from alcoholic beverages by filtration                       | <a href="#">C12H 1/063</a>   |
| Purification of sugar juices using membranes   | <a href="#">C13B 20/165</a>  |
| Apparatus for feeding liquid fuel having water separation means as membranes                           | <a href="#">F02M 37/221</a>  |

### Special rules of classification

- Classification in multiple groups:

In case a specific application is addressed the respective application class/group takes precedence.

As long as no details on the membrane process or the apparatus for carrying out said process are disclosed, no groups from [B01D 61/00-B01D 61/58](#) are given in addition.

However if such details are given, the respective [B01D 61/00-B01D 61/58](#) group should be given in addition.

- Subgroup and main group:

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant sub groups are given.

- Classification of additional information:

The classification of additional information is obligatory and useful for retrieving documents.

Often, aspects of cleaning, maintenance or stable operation are disclosed in connection with the processes. These information is to be classified under CPC groups [B01D 65/02](#), [B01D 65/08](#) and the symbols under [B01D 2321/00](#).

The following groups relate to specific fields of application for the membrane processes falling into [B01D 61/00-B01D 61/58](#).

This does not exclude that also groups from [B01D 61/00-B01D 61/58](#) are given in addition.

As long as no details on the membrane process or the apparatus for carrying out said process are disclosed, no groups from [B01D 61/00-B01D 61/58](#) are given in addition.

However if such details are given, the respective [B01D 61/00-B01D 61/58](#) group should be given in addition.

- Further details of subgroups:

#### [B01D 61/022](#)

includes sequences of reverse osmosis (RO) steps, sequences of nanofiltration (NF) steps as well as mixed RO-NF sequences.

#### [B01D 61/04](#)

In cases when ultrafiltration/ microfiltration is only a prefiltration step for reverse osmosis or nanofiltration [B01D 61/04](#) applies.

#### [B01D 61/08](#), [B01D 61/18](#)

[B01D 61/08](#) and [B01D 61/18](#) apply in case a whole membrane plant structure suitable to carry out a membrane process is addressed. Includes also microfluidic devices. Membrane modules as such are in [B01D 63/00](#).

#### [B01D 61/10](#), [B01D 61/20](#)

[B01D 61/10](#) and [B01D 61/20](#) apply for specific parts of the membrane plant not being the membrane module (e.g. specific pumps, valves, heat exchangers etc.) and which are not relevant for the module alone, which is covered by [B01D 65/00](#).

#### [B01D 61/142](#)

includes sequences of ultrafiltration (UF) steps, sequences of microfiltration (MF) steps as well as mixed MF-UF sequences.

#### [B01D 61/147](#)

The group includes microfiltration processes only of the cross-flow type (i.e. no dead-end). Dead end filtration is covered by [B01D 25/00-B01D 35/00](#).

#### [B01D 61/58](#)

The group includes all combinations of different processes of any of the groups of [B01D 61/00](#) beside mixed RO-NF ([B01D 61/022](#)) or mixed UF-MF ([B01D 61/142](#)) processes.

#### [B01D 2311/00](#)

The groups under [B01D 2311/00](#) specify details to the membrane separation process and control (as controlled parameters or additional unit operations involved).

#### [B01D 2315/00](#)

The groups under [B01D 2315/00](#) specify details relating to the membrane module operation (e.g. batch processes or submerged operation).

#### [B01D 2317/00](#)

The groups under [B01D 2317/00](#) specify the membrane module arrangements within a plant or an apparatus (e.g. series/parallel connections).

#### [B01D 2319/00](#)

The groups under [B01D 2319/00](#) specify the membrane module arrangements within a single housing (e.g. series/parallel connections).

## B01D 63/00

### Apparatus in general for separation processes using semi-permeable membranes

#### Definition statement

*This place covers:*

Modules for membrane based separation processes. These modules could be suitable for both liquid ([B01D 61/00-B01D 61/58](#)) and/or gaseous ([B01D 53/22](#)) feed/ permeate streams.

The devices classified in this group provide details on the integration of a selective separation membrane into a technically applicable module concept as e.g.:

- a membrane plate with support structure, closed edges and permeate duct
- a spiral wound module with permeate core pipe
- a hollow fibre type module potted in tube sheets
- a rotating membrane disc mounted to a shaft
- tubular membrane module
- flat membrane module
- pleat-type membrane module,
- rotary, reciprocated or vibrated module

The technical concept may include membrane fixing or sealing means or certain feed or permeate side ducts or spaces.

#### Relationships with other classification places

The groups for apparatus specifically adapted for a certain membrane separation process classified in [B01D 61/08](#), [B01D 61/18](#), [B01D 61/28](#) and [B01D 61/46](#) concern a plant wide concept of design. This does not exclude that a specific module concept is disclosed in combination to this concept which is then classified in [B01D 63/00](#) in addition, if applicable.

If a document does not focus on the concept of incorporation of the membrane into the module but on membrane unrelated details (e.g. housing, end caps or locks), the relevant classification would be [B01D 65/00](#). This does not exclude that a specific module concept is disclosed in combination to this concept which is then classified in [B01D 63/00](#) in addition, if applicable.

A specific structure of the membrane as such (like the cross-sectional structure of a hollow fibre or a membrane with surface irregularities) is classified in the relevant [B01D 69/00](#) groups.

#### References

##### Limiting references

*This place does not cover:*

|  |  |
|--|--|
| Dead end filtration devices                                    | <a href="#">B01D 25/00</a> , <a href="#">B01D 27/00</a> ,<br><a href="#">B01D 29/00</a> , <a href="#">B01D 33/00</a> ,<br><a href="#">B01D 35/00</a> |
| Bandages or dressings  | <a href="#">A61F 13/00</a>   |
| Drug containing films, membranes or sheets                     | <a href="#">A61K 9/7007</a>  |
| Methods or apparatus for sterilizing material using filtration | <a href="#">A61L 2/022</a>   |

|   |  |
|---|--|
| Blood dialysis systems, blood oxygenation devices and blood filtration devices with do not focus on the design of the membrane module as such | <a href="#">A61M 1/16</a> , <a href="#">A61M 1/34</a>          |
| Membrane reactors   | <a href="#">B01J 19/1893</a> ,<br><a href="#">B01J 19/2475</a> |
| Enzymology or microbiology with dialysis means  | <a href="#">C12M 1/12</a>                                      |
| Tissue, human, animal or plant cell or virus culture apparatus with ultrafiltration, inverse osmosis or dialysis means                        | <a href="#">C12M 3/06</a>                                      |
| Honeycomb structures not relevant for membrane separation (silencers, catalysts etc.)   | <a href="#">F01N 3/0222</a> , <a href="#">B01J 35/04</a>       |
| Osmotically driven micropumps   | <a href="#">F04B 19/006</a>                                    |
| Batteries comprising separators   | <a href="#">H01M 2/14</a>                                      |
| Fuel cells  | <a href="#">H01M 8/00</a>                                      |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|  |   |
|--|---|
| Separation of gases or vapours by diffusion  | <a href="#">B01D 53/22</a>  |
| Drying gases or vapours by filtration  | <a href="#">B01D 53/266</a>                                       |
| Separation of different isotopes of the same chemical element by diffusion, solvent extraction         | <a href="#">B01D 59/12</a> , <a href="#">B01D 59/24</a>           |
| Processes of separation using semi-permeable membranes   | <a href="#">B01D 61/00</a>  |
| Membrane apparatus specifically adapted for a reverse osmosis or nanofiltration process                | <a href="#">B01D 61/08</a>  |
| Membrane apparatus specifically adapted for an ultrafiltration or microfiltration process              | <a href="#">B01D 61/18</a>  |
| Apparatus for dialysis   | <a href="#">B01D 61/28</a>  |
| Apparatus for electrodialysis  | <a href="#">B01D 61/46</a>  |
| Details of membrane modules not related to the membrane parts such as housing or locks                 | <a href="#">B01D 65/00</a>  |
| Membrane bonding or sealing  | <a href="#">B01D 65/003</a>                                       |
| Processes specially adapted for manufacturing semi-permeable membrane for separation processes         | <a href="#">B01D 67/00</a>  |
| Semi-permeable membranes for separation processes characterised by their form, structure               | <a href="#">B01D 69/00</a>  |
| Material of semi-permeable membrane for separation processes   | <a href="#">B01D 71/00</a>  |
| Honeycomb catalysts and wall flow filters  | <a href="#">B01D 2255/915</a> ,<br><a href="#">B01D 2255/9155</a> |
| Multiwell filters  | <a href="#">B01L 3/50255</a>                                      |
| Treatment of water, waste water, sewage, or sludge by means of by dialysis, osmosis or reverse osmosis | <a href="#">C02F 1/44</a>   |
| Treatment of water, waste water, sewage, or sludge by electrochemical separation                       | <a href="#">C02F 1/469</a>  |
| Membrane bioreactors   | <a href="#">C02F 3/1268</a>                                       |
| Mobile apparatus and plants, e.g. mounted on a vehicle   | <a href="#">C02F 2201/008</a>                                     |

|  |                             |
|--|-----------------------------|
| Apparatus for feeding liquid fuel having water separation means as membranes | <a href="#">F02M 37/221</a> |
| Humidifier for fuel cells  | <a href="#">H01M 8/04</a>   |

### Special rules of classification

- Classification of additional information

The classification of additional information is very desirable and useful for retrieving documents:

The groups under [B01D 2313/00](#) specify details to the membrane modules

groups codes under [B01D 2319/00](#) specify the membrane module arrangements within a single housing (e.g. series/parallel connections).

- Subgroup and main group

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant sub groups are given.

Membrane separation modules as such are to be classified in [B01D 63/00](#)- [B01D 63/16](#) only despite their field of application (e.g. though gas separation processes with membrane are classified in [B01D 53/22](#), the modules as such are to be classified in [B01D 63/00](#)- [B01D 63/16](#) only).

Usually all stand-alone types of modules are classified in [B01D 63/00](#) unless they are integral part of a specific device such as e.g. lab-on-a-chip, multi-well membrane filters, gas detectors, implantable dialysis means or degasification means in ink jet cartridges.

- Further details of subgroups

#### [B01D 63/00](#)

The group [B01D 63/00](#) is used for module concepts not falling in any of the groups.

#### [B01D 63/066](#)

applies for honeycomb structures with through-going channels, i.e. suitable for cross-flow. The structural similar exhaust gas filters (wall flow filters) and catalysts with channels closed at one end are not classified here. (cf. off-gas treatment groups [B01D 2255/915](#) and [B01D 2255/9155](#)). The subgroups of [B01D 69/04](#) do not apply for honeycomb structures.

#### [B01D 63/067](#)

covers tubular membranes bent/ pleated along its length dimension (e.g. u-shape) while the group [B01D 63/16](#) covers pleated flat membranes (often arranged in a closed circle).

#### [B01D 63/16](#)

The group [B01D 63/16](#) partly overlaps with the corresponding apparatus classes in [B01D 33/00](#) (filters with moving elements) , esp. [B01D 33/15](#). The documents are classified with respect to their intended application, i.e. if one of the applications falling under [B01D 61/00](#) is covered, [B01D 63/16](#) would apply.

The groups under [B01D 2315/02](#) and [B01D 2315/04](#) further specify membrane module arrangements falling under [B01D 63/16](#).

## B01D 65/00

### Accessories or auxiliary operations, in general, for separation processes or apparatus using semi-permeable membranes

#### Relationships with other classification places

All respective accessories and procedures applied for dead end filtration devices and process according to [B01D 25/00-B01D 35/00](#) are to be classified even if they are suitable to be used in connection with membrane devices and processes without modification. They have to be considered during search.

#### References

##### Limiting references

*This place does not cover:*

|   |  |
|---|--|
| Accessories and auxiliary operations of dead end filtration devices                               | <a href="#">B01D 25/00</a> , <a href="#">B01D 27/00</a> ,<br><a href="#">B01D 29/00</a> , <a href="#">B01D 33/00</a> ,<br><a href="#">B01D 35/00</a> |
| Accessories specifically adapted for a reverse osmosis or nanofiltration process                  | <a href="#">B01D 61/10</a>   |
| Accessories specifically adapted for an ultrafiltration or microfiltration process                | <a href="#">B01D 61/20</a>   |
| Accessories specifically for apparatus for dialysis   | <a href="#">B01D 61/30</a>   |
| Accessories specifically for apparatus for electro dialysis                                       | <a href="#">B01D 61/52</a>   |
| Regeneration of electro dialysis devices  | <a href="#">B01D 61/54</a>   |
| Membrane modules as such  | <a href="#">B01D 63/00</a>   |
| Accessories and auxiliary operations specifically for apparatus for blood dialysis and filtration | <a href="#">A61M 1/16</a> , <a href="#">A61M 1/34</a>  |
| Cleaning and fouling prevention in general  | <a href="#">B08B</a>   |
| Aerating systems for activated sludge systems   | <a href="#">C02F 3/00</a>  |
| Testing of material in general  | <a href="#">G01N</a>   |

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Sterilisation in general   | <a href="#">A61L 2/00</a>  |
| Sterilisation of dialysis devices  | <a href="#">A61M 1/168</a> |
| Water treatment processes by membrane technology                             | <a href="#">C02F 1/44</a>  |
| Investigating permeability, pore-volume, or surface area of porous materials | <a href="#">G01N 15/08</a> |

#### Special rules of classification

- Classification of additional information

The classification of additional information is obligatory and useful for retrieving documents:

For membrane cleaning processes [B01D 65/02](#) is given together with the relevant symbols under [B01D 2321/00](#) which specify details of membrane cleaning operations.

For measures for fouling prevention [B01D 65/08](#) is given together with the relevant symbols under [B01D 2321/00](#) which specify details of membrane fouling prevention operations.

- Subgroup and main group

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant subgroups are given.

- Further details of subgroups

[B01D 65/00](#), [B01D 65/003](#)

[B01D 65/00](#) and [B01D 65/003](#) are given together with the relevant groups under [B01D 2313/00](#) which specify details to the membrane modules and apparatus which might be of relevance.

[B01D 65/00](#): Accessories for modules and membrane plants which are not directly interrelated with a specific module type, e.g. end caps [B01D 65/00](#) or membrane sealing [B01D 65/003](#)

[B01D 65/006](#)

[B01D 65/006](#) applies for the storage of membrane modules while [B01D 67/0097](#) applies for the storage of membrane material only.

[B01D 65/02](#)

Membrane cleaning and sterilisation, i.e. actions taken or means specifically designed for treating the membrane in between cycles of steady filtration operation.

[B01D 65/02](#) , [B01D 65/08](#)

[B01D 65/02](#) and [B01D 65/08](#) are to be classified in combination with their relevant groups under [B01D 2321/00](#).

When aeration occurs during filtration operation [B01D 65/08](#) applies. When aeration takes place during cleaning cycles [B01D 65/02](#) applies. Combinations of both afford to give both groups.

The application of usual cross-flow conditions are not classified in [B01D 65/08](#)

If the process control is of relevance for either membrane cleaning or prevention of membrane fouling the respective control groups of [B01D 61/00](#) have to be given if applicable in combination with the relevant groups under [B01D 2311/00](#).

[B01D 65/04](#), [B01D 65/06](#)

Groups [B01D 65/04](#) and [B01D 65/06](#) are not used.

[B01D 65/08](#)

Prevention of membrane fouling, i.e. actions taken or means specifically designed for influencing the steady state operation conditions such that fouling is controlled (e.g. aeration during filtration or static mixers etc.).

[B01D 65/10](#)

Testing or membranes or membrane apparatus, i.e. devices and methods for determining integrity of membrane and/or the whole module or for determining characteristic parameters as retention, permeability etc.

## B01D 67/00

### Processes specially adapted for manufacturing semi-permeable membranes for separation processes or apparatus

#### Definition statement

*This place covers:*

Processes for the production of membranes for separation applications per se, i.e. including the production of the selective layer if applicable onto the support structure or self-supporting.

Semipermeable membranes comprise a continuous layer of material with or without pores capable for mass transfer of a certain species, solvent or gas.

Further process for after-treatment of a membrane are covered under [B01D 67/0081](#)

#### Relationships with other classification places

Production of hollow fibre membranes under [B01D 69/08](#).

Production of specific shapes of membranes in the relevant subgroups of [B01D 69/00](#).

Filter materials using woven or non-woven selective layers or loose particles for separation purposes are to be classified in [B01D 39/00](#).

All of the following fields have own classification schemes for manufacture:

Membrane electrodes specifically manufactured/ adapted for the application in fuel cells ([H01M 8/1018](#) and subgroups).

The production of ion exchange material films/ membranes ([C08J 5/22](#)).

Production of battery separators ([C08J 5/22](#), [H01M 2/14](#))

Double classification with [B01D 67/00](#) may occur if the structures produced are suitable to be used in membrane separation processes.

[C08](#) covers organic macromolecular compounds, their preparation or chemical working-up and compositions based thereon. Unless no details on the preparation of a separation membrane made of these components is described, [B01D 67/00](#) is not relevant.

#### References

##### Limiting references

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Form, structure or properties of membrane materials  | <a href="#">B01D 69/00</a>  |
| Hollow fibre membrane production   | <a href="#">B01D 69/08</a>  |
| Membrane material as such  | <a href="#">B01D 71/00</a>  |
| Surface coating to prevent activation of blood   | <a href="#">A61L 33/00</a>  |
| Production of catalysts by surface coating processes   | <a href="#">B01J 37/02</a>  |
| Shaping by stretching  | <a href="#">B29C 55/00</a>  |
| Surface treatment with plasma in general   | <a href="#">B29C 59/00</a>  |
| Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts by moulding material on a relative small portion (e.g. hollow fibre potting) of the preformed parts | <a href="#">B29C 70/845</a> |



|   |                            |
|---|----------------------------|
| Microstructural devices   | <a href="#">B81B</a>       |
| After-treatment of mortars, concrete, artificial stone or ceramics by coating or impregnating | <a href="#">C04B 41/45</a> |
| Manufacture of films of plastics  | <a href="#">C08J 5/18</a>  |
| Electroless plating in general  | <a href="#">C23C 18/16</a> |
| Aluminium anodisation in general  | <a href="#">C25D 11/04</a> |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |  |
|---|--|
| Manufacture of hollow fibre membranes   | <a href="#">B01D 69/08</a>                                     |
| Separate or in situ-formation of thin film membranes  | <a href="#">B01D 69/122</a> and<br><a href="#">B01D 69/125</a> |
| Micromachined membranes   | <a href="#">B81C 1/00158</a>                                   |
| Manufacture of shaped structures of ion- exchange resin films, membranes, or diaphragms               | <a href="#">C08J 5/22</a>                                      |
| Constructional details or processes of manufacture of separators, membranes, diaphragms for batteries | <a href="#">H01M 2/14</a>                                      |
| Membranes for fuel cells  | <a href="#">H01M 8/1018</a>                                    |

### **Special rules of classification**

Classification in multiple groups

If only the preparation of the support is defined in detail group [B01D 69/10](#) takes precedence.

Classification of additional information

If the membrane manufacturing process is defined for a specific material or group of materials the relevant groups under [B01D 71/00](#) have to be given in addition.

The classification of additional information is obligatory and useful for retrieving documents:

The groups under [B01D 2323/00](#) specify details to the membrane manufacturing methods

The respective groups under [B01D 61/00](#) if a membrane is specifically produced for a membrane process (as e.g. nanofiltration; [B01D 61/027](#)).

[B01D 69/02](#) in combination with the relevant groups under [B01D 2325/00](#) have to be used if the manufacturing process results in specific properties of the membrane product.

Subgroup and main group

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant subgroups are given.

#### **Further details of subgroups**

[B01D 67/0006](#)

In cases of membrane formation by in situ interfacial polymerisation group [B01D 69/125](#) should be given in addition to the [B01D 67/0006](#).

[B01D 67/0079](#)

Group [B01D 67/0079](#) concerns membrane active layers comprising both organic and inorganic materials (as e.g. mixed matrix membranes in [B01D 69/148](#)). Structures e.g. comprising an inorganic support and an organic separation layer are also to be classified in [B01D 67/0079](#), however in addition in [B01D 69/10](#) (specific support) if applicable. In addition the materials of the individual layers should be given as groups under [B01D 71/00](#).

#### [B01D 67/0081](#)

The after treatment classes under [B01D 67/0081](#) apply if the membrane separation layer structure is basically maintained but modified in its properties (e.g. rendered hydrophilic or coated without closing the pores).

#### [B01D 67/0093](#)

If specific (e.g. charged) groups are added to the polymer solution before membrane formation [B01D 71/82](#) takes precedence before [B01D 67/0093](#).

Grafting supported by radiation or plasma is classified in [B01D 67/0093](#).

#### [B01D 67/0097](#)

Group [B01D 67/0097](#) applies for the storage of membrane material only while [B01D 65/006](#) applies for the storage of membrane modules.

#### [B01D 2323/42](#)

has to be used if details of the manufacturing apparatus are given (dies, roller arrangements, treatment chambers).

## **B01D 69/00**

**Semi-permeable membranes for separation processes or apparatus characterised by their form, structure or properties; Manufacturing processes specially adapted therefor**

### **Relationships with other classification places**

Production of membranes per se under [B01D 67/00](#).

Production of membrane modules under [B01D 63/00](#).

Filter materials using woven or non-woven selective layers or loose particles for separation purposes are to be classified under [B01D 39/00](#).

All of the following fields have own classification schemes for manufacture:

Membrane electrodes specifically manufactured/ adapted for the application in fuel cells ([H01M 8/1018](#) and subgroups).

The production of ion exchange material films/ membranes ([C08J 5/22](#)).

Production of battery separators ([C08J 5/22](#), [H01M 2/14](#))

Double classification with [B01D 67/00](#) may occur if the structures produced are suitable to be used in membrane separation processes and are relevant for any of the groups in [B01D 69/00](#).

## References

### Limiting references

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Membrane modules   | <a href="#">B01D 63/00</a>   |
| Production processes for membranes other than hollow fibre spinning  | <a href="#">B01D 67/00</a>   |
| Membrane material as such  | <a href="#">B01D 71/00</a>   |
| Surface coating to prevent activation of blood   | <a href="#">A61L 33/00</a>   |
| Diffusers made of flexible or rigid material   | <a href="#">B01F 3/04241</a> |
| Catalysts, in general, characterised by their form or physical properties in the form of membranes   | <a href="#">B01J 35/065</a>  |
| Production of catalysts by surface coating processes   | <a href="#">B01J 37/02</a>   |
| Shaping by stretching  | <a href="#">B29C 55/00</a>   |
| Surface treatment with plasma in general   | <a href="#">B29C 59/00</a>   |
| Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts by moulding material on a relative small portion (e.g. hollow fibre potting) of the preformed parts | <a href="#">B29C 70/845</a>  |
| Microstructural devices  | <a href="#">B81B</a>         |
| Tubular air diffusers  | <a href="#">C02F 3/201</a>   |
| After-treatment of mortars, concrete, artificial stone or ceramics by coating or impregnating  | <a href="#">C04B 41/45</a>   |
| Manufacture of films of plastics   | <a href="#">C08J 5/18</a>    |
| Electroless plating in general   | <a href="#">C23C 18/16</a>   |
| Aluminium anodisation in general   | <a href="#">C25D 11/04</a>   |
| Hoses and pipes made of rubber   | <a href="#">F16L 11/12</a>   |

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                              |
|---|------------------------------|
| Micromachined membranes   | <a href="#">B81C 1/00158</a> |
| Manufacture of shaped structures of ion- exchange resin films, membranes, or diaphragms               | <a href="#">C08J 5/22</a>    |
| Formation of filaments (e.g. electro-spinning)  | <a href="#">D01D 5/00</a>    |
| Manufacture of hollow fibres  | <a href="#">D01D 5/24</a>    |
| Manufacture of hollow fibres/ spinnerets therefore  | <a href="#">D01F 1/08</a>    |
| Constructional details or processes of manufacture of separators, membranes, diaphragms for batteries | <a href="#">H01M 2/14</a>    |
| Membranes for fuel cells  | <a href="#">H01M 8/1018</a>  |

### Special rules of classification

Classification of additional information

If the membrane manufacturing process is defined for a specific material or group of materials the relevant groups under [B01D 71/00](#) have to be given in addition. In case of multiple layers the material of each layer has to be specified by the respective groups under [B01D 71/00](#).

The classification of additional information is obligatory and useful for retrieving documents:

The symbol under [B01D 61/00](#) is to be used if a membrane is specifically produced for a certain membrane process (as e.g. nanofiltration; [B01D 61/027](#)).

Subgroup and main group

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant subgroups are given.

### **Further details of subgroups**

#### [B01D 69/02](#)

[B01D 69/02](#) in combination with the relevant groups under [B01D 2325/00](#) have to be used if the manufacturing process results in specific properties of the membrane product.

#### [B01D 69/04](#)

does not in any case apply for honeycomb structures/ monoliths with multiple channels. These kind of devices are rather classified in [B01D 63/066](#). If e.g. special cross-sectional shaped of the channels or surface undulations are present groups under [B01D 69/04](#) can be given in addition.

Specific forms of membranes for separation other than the materials as such.

#### [B01D 69/085](#), [B01D 69/087](#)

Spinning processes and spinnerets for hollow fibres

#### [B01D 69/10](#)

Specific membrane supports.

[B01D 69/10](#) is used for supports not bonded to the selective membrane layer, if only details of the support layer are defined or if the type of support is very unique (as e.g. membranes supported in the pores).

#### [B01D 69/12](#)

Composite membranes, i.e. comprising more than one layer, the layers being integrated.

used if support and selective membrane layer form a composite structure, in which both parts are relevant (e.g. by means of the type of bonding or membrane formation or relation of parameters of the support and the selective layer).

#### [B01D 69/122](#), [B01D 69/125](#)

groups [B01D 69/122](#) and [B01D 69/125](#) cover the manufacturing of ultra-thin (Thin film) membranes on a support and are given in addition to the relevant classes in [B01D 67/00](#).

#### [B01D 69/14](#)

Mixed matrix membranes, i.e. the separation layer comprises a heterogeneous mixture of at least two materials.

#### [B01D 69/141](#)

applies if the composition of the membrane solution is relevant for the coagulation process.

## B01D 71/00

**Semi-permeable membranes for separation processes or apparatus characterised by the material; Manufacturing processes specially adapted therefor**

### Definition statement

*This place covers:*

Membranes characterised by a specific material used for the separation layer and methods of preparation specifically adapted for the respective material (e.g. a specific polymer synthesis).

### Relationships with other classification places

Generally the production methods of membranes is covered under [B01D 67/00](#).

Production of specific shapes of membranes in the relevant sub groups of [B01D 69/00](#).

Gas separation membranes characterised by their material are additionally classified under [B01D 53/228](#).

Filter materials using woven or non-woven selective layers or loose particles for separation purposes are to be classified in [B01D 39/00](#).

All of the following fields have own classification schemes for manufacture:

Membrane electrodes specifically manufactured/ adapted for the application in fuel cells ([H01M 8/1018](#) and subgroups).

The production of ion exchange material films/ membranes ([C08J 5/22](#)).

Production of battery separators ([C08J 5/22](#), [H01M 2/14](#))

Double classification with groups of [B01D 67/00](#) may occur if the structures produced are suitable to be used in membrane separation processes.

[C08](#) covers organic macromolecular compounds, their preparation or chemical working-up and compositions based thereon. Unless no preparation of a separation membrane thereof is described, these classes are not relevant.

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Membrane production methods                          | <a href="#">B01D 67/00</a> |
| Form, structure or properties of membrane materials  | <a href="#">B01D 69/00</a> |
| Hollow fibre membrane production                     | <a href="#">B01D 69/08</a> |
| Surface coating to prevent activation of blood       | <a href="#">A61L 33/00</a> |
| Sorbents; zeolites, synthetic molecular sieves       | <a href="#">B01J 20/18</a> |
| Catalysts comprising molecular sieves; zeolites      | <a href="#">B01J 29/00</a> |
| Production of catalysts by surface coating processes | <a href="#">B01J 37/02</a> |
| Shaping by stretching                                | <a href="#">B29C 55/00</a> |
| Surface treatment with plasma in general             | <a href="#">B29C 59/00</a> |

|  |                             |
|--|-----------------------------|
| Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts by moulding material on a relative small portion (e.g. hollow fibre potting) of the preformed parts | <a href="#">B29C 70/845</a> |
| Microstructural devices  | <a href="#">B81B</a>        |
| Compounds having molecular sieve and base exchange properties  | <a href="#">C01B 39/00</a>  |
| After-treatment of mortars, concrete, artificial stone or ceramics by coating or impregnating  | <a href="#">C04B 41/45</a>  |
| Manufacture of films of plastics   | <a href="#">C08J 5/18</a>   |
| Electroless plating in general   | <a href="#">C23C 18/16</a>  |
| Aluminium anodisation in general   | <a href="#">C25D 11/04</a>  |

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                              |
|---|------------------------------|
| Micromachined membranes   | <a href="#">B81C 1/00158</a> |
| Characteristic membranes for the separation of hydrogen by diffusion                                  | <a href="#">C01B 3/503</a>   |
| Characteristic membranes for the preparation of oxygen by making use of membranes                     | <a href="#">C01B 13/0255</a> |
| Characteristic membranes for the purification or separation of nitrogen by making use of membranes    | <a href="#">C01B 21/0444</a> |
| Characteristic membranes for the physical processing of noble gases by making use of membranes        | <a href="#">C01B 23/0047</a> |
| Manufacture of shaped structures of ion- exchange resin films, membranes, or diaphragms               | <a href="#">C08J 5/22</a>    |
| Manufacture of hollow fibres  | <a href="#">D01D 5/24</a>    |
| Manufacture of hollow fibres/ spinnerets therefore  | <a href="#">D01F 1/08</a>    |
| Constructional details or processes of manufacture of separators, membranes, diaphragms for batteries | <a href="#">H01M 2/14</a>    |
| Membranes for fuel cells  | <a href="#">H01M 8/1018</a>  |

### **Special rules of classification**

Classification of additional information

If the membrane manufacturing process is defined for a specific material or group of materials the relevant groups under [B01D 71/00](#) have to be given in addition.

The classification of additional information is obligatory and useful for retrieving documents:

The group [B01D 69/02](#) in combination with the relevant groups under [B01D 2325/00](#) have to be used if the manufacturing process results in specific properties of the membrane product.

The respective groups under [B01D 61/00](#) is to be used if a membrane is specifically capable for a certain membrane process (as e.g. nanofiltration; [B01D 61/027](#)).

If a mixed matrix membrane is classified under [B01D 69/141](#) the material classification symbol of [B01D 71/00](#) of the continuous phase is to be given in addition if relevant.

For a blend of two polymers in the separation layer both relevant groups are given.

Support materials according to [B01D 69/10](#) are not classified under [B01D 71/00](#).

In general, the relevant subgroup is given and not the head group. If more than one subgroup of a single head group is relevant for a document, all these relevant subgroups are given.

### **Further details of subgroups**

#### [B01D 71/76](#)

The individual copolymers in [B01D 71/76](#) have to be classified with symbols under [B01D 71/00](#).

#### [B01D 71/78](#)

[B01D 71/78](#) is to be given if a polymer is grafted before membrane formation. Otherwise [B01D 67/0093](#) applies.

#### [B01D 71/82](#)

[B01D 71/82](#) is to be given if a polymer solution is treated before membrane formation by adding specific groups. Otherwise [B01D 67/0093](#) applies.

## **B01D 2201/00**

### **Details relating to filtering apparatus**

#### **Definition statement**

*This place covers:*

- Filters used for filtering particles out of a liquid.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

#### **References**

##### **Limiting references**

*This place does not cover:*

|  |                              |
|--|------------------------------|
| Casings, housings or mounting for filters specially adapted for separating dispersed particles from gases or vapours   | <a href="#">B01D 2265/00</a> |
| Multiple filter elements specially adapted for separating dispersed particles from gases or vapours  | <a href="#">B01D 2267/00</a> |
| Sealing for filters specially adapted for separating dispersed particles from gases or vapours   | <a href="#">B01D 2271/00</a> |
| Filter media structures for filters specially adapted for separating dispersed particles from gases or vapours   | <a href="#">B01D 2275/00</a> |
| Filters specially adapted for separating dispersed particles from gases or vapours characterised by the position of the filter in relation to the gas stream | <a href="#">B01D 2277/00</a> |
| Filters adapted for separating dispersed particles from gases or vapours specially modified for specific uses  | <a href="#">B01D 2279/00</a> |

## B01D 2221/00

### Applications of separation devices

#### Definition statement

*This place covers:*

This group relates to the application of the separation devices. It should be assigned if the application implicitly requires certain features (e.g. for separators installed in gullies, a shortcut between inlet and outlet for the fluid to be treated) and if it is deemed not necessary to assign a class corresponding to the technical field of application ([E03F](#) in the example before) or if a field of application is not reflected by a class (e.g. cleaning the polluted ambient air in cities).

#### Relationships with other classification places

If there exists a field of application, a invention information symbol in that field should be assigned rather than an symbol in the present group.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following places, which may be of interest for search (especially for mechanical features):

|   |  |
|---|--|
| Filters making use of electricity or magnetism                                | <a href="#">B01D 35/05</a>                                   |
| Treating manure   | <a href="#">A01C 3/00</a>                                    |
| Condensing atmospheric humidity   | <a href="#">A01G 15/00</a>                                   |
| Air conditioning for animal housing   | <a href="#">A01K 1/00</a>                                    |
| Devices used for fish ponds   | <a href="#">A01K 61/00</a> and<br><a href="#">A01K 63/00</a> |
| Treatment of water for aquaria  | <a href="#">A01K 63/04</a>                                   |
| Processing slaughtering residues  | <a href="#">A22B 5/00</a>                                    |
| Clarifying non-alcoholic beverages  | <a href="#">A23L 2/70</a>                                    |
| vacuum cleaners   | <a href="#">A47L 9/18</a>                                    |
| Sedimentation devices for dental use  | <a href="#">A61C 17/046</a>                                  |
| Sedimentation devices for medical purposes, body liquids                      | <a href="#">A61M 1/3693</a>                                  |
| Chemical or physical processes  | <a href="#">B01J</a>   |
| Separation of particles from gases and vapours by electrostatic effect        | <a href="#">B03C 3/00</a>                                    |
| Paint sludge treatment  | <a href="#">B05B 14/462</a>                                  |
| Details of spraying plants  | <a href="#">B05B 15/00</a>                                   |
| Spraying devices using ultrasonic energy                                      | <a href="#">B05B 17/06</a>                                   |
| Methods or apparatus specially adapted for transmitting mechanical vibrations | <a href="#">B06B 3/00</a>                                    |
| Preventing escape of fumes from the area where they are produced              | <a href="#">B08B 15/00</a>                                   |
| Removing chips from sawing machines   | <a href="#">B23D 59/00</a>                                   |
| Removing chips from machine tools   | <a href="#">B23Q 11/00</a>                                   |
| Removing dust for machines for working stones                                 | <a href="#">B28D 7/02</a>                                    |



|   |                              |
|---|------------------------------|
| Ink filters for printers  | <a href="#">B41J 2/17563</a> |
| Barges for collection of pollution from open water  | <a href="#">B63B 35/32</a>   |
| Fluidising means for discharging large containers   | <a href="#">B65D 88/72</a>   |
| Devices for separating the materials from propellant gas in material conveyors                                | <a href="#">B65G 53/62</a>   |
| Treatment of water, waste water, sewage, or sludge when structural details of general interest are disclosed. | <a href="#">C02F</a>         |
| Refining hydrocarbon oils by centrifugation   | <a href="#">C10G 31/10</a>   |
| Dust removal from combustible gases containing carbon monoxide  | <a href="#">C10K 1/02</a>    |
| Working-up lubricants   | <a href="#">C10M 175/00</a>  |
| Clarifying alcoholic beverages  | <a href="#">C12H 1/06</a>    |
| Apparatus for microbiology  | <a href="#">C12M 1/00</a>    |
| Dust arrester for blast furnaces  | <a href="#">C21B 7/22</a>    |
| Offtakes or separating apparatus for converter waste gases or dust in the manufacture of carbon-steel         | <a href="#">C21C 5/40</a>    |
| After treatment in chemical coating in semiconductor industry   | <a href="#">C23C 16/56</a>   |
| Details of domestic laundry driers  | <a href="#">D06F 58/00</a>   |
| Treatment of exhaust gases along roads  | <a href="#">E01C 1/005</a>   |
| Dispersing fog  | <b>E01H13/10</b>             |
| Cleaning or keeping clear the surface of open water; Apparatus therefore                                      | <a href="#">E02B 15/00</a>   |
| Obtaining drinking water from atmospheric humidity  | <a href="#">E03B 3/18</a>    |
| Kitchen sinks   | <a href="#">E03C 1/00</a>    |
| Other installations or implements for operating sewer systems (cleaning, emptying, maintenance)               | <a href="#">E03F 7/00</a>    |
| Sludge tanker   | <a href="#">E03F 7/10</a>    |
| Treatment of water for swimming pools   | <a href="#">E04H 4/1209</a>  |
| Sedimentation devices used in drilling boreholes  | <a href="#">E21B 21/00</a>   |
| Separation of well effluents  | <a href="#">E21B 43/34</a>   |
| Purifying air before leaving the crankcase  | <a href="#">F01M 13/04</a>   |
| Exhaust or silencing apparatus having means for purifying   | <a href="#">F01N 3/02</a>    |
| Exhaust or silencing apparatus for marine propulsion  | <a href="#">F01N 13/004</a>  |
| Combustion air cleaners   | <a href="#">F02M 35/02</a>   |
| Exhaust ducts   | <a href="#">F23J 11/00</a>   |
| Treating smoke and fumes using Washing fluids   | <a href="#">F23J 15/04</a>   |
| Removing cooking fumes  | <a href="#">F24C 15/20</a>   |
| Air conditioning  | <a href="#">F24F 3/00</a>    |
| Direct contact trickle coolers  | <a href="#">F28C 1/00</a>    |
| Removal of water droplets from fuel cell exhaust gases  | <a href="#">H01M 8/04156</a> |

## B01D 2239/00

### Aspects relating to filtering material for liquid or gaseous fluids

#### Definition statement

*This place covers:*

Details of filtering material as put forward under the corresponding maingroup [B01D 39/00](#)

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |  |
|---|--|
| Antibacterial additives                     | <a href="#">B01D 46/0028</a> ;<br><a href="#">B01D 2239/0442</a>   |
| Electret                                    | <a href="#">B01D 46/0032</a> ;<br><a href="#">B01D 2239/0435</a>   |
| Adsorbents                                  | <a href="#">B01D 46/0036</a> ;<br><a href="#">B01D 2239/0407</a>   |
| Fire retardant/Heat resistant properties    | <a href="#">B01D 46/0093</a> ;<br><a href="#">B01D 2239/0457</a>   |
| Nanofibers                                  | <a href="#">B01D 46/546</a> ;<br><a href="#">B01D 2239/025</a>   |
| More than one layers in the filter material | <a href="#">B01D 2275/10</a> ;<br><a href="#">B01D 2239/065</a>  |
| Wound layers                                | <a href="#">B01D 2275/105</a> ;<br><a href="#">B01D 2239/0695</a>  |
| Porosity, Pore size                         | <a href="#">B01D 2275/30</a><br>and subgroups;<br><a href="#">B01D 2239/1208</a> ,<br><a href="#">B01D 2239/1216</a> |

## B01D 2265/00

### Casings, housings or mounting for filters specially adapted for separating dispersed particles from gases or vapours

#### Definition statement

*This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

#### References

##### Limiting references

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |   |
|---|---|
| Filter materials                            | <a href="#">B01D 39/00</a> and <a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                   |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                   |
| Air bags                                    | <a href="#">B60R 21/16</a>                                  |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                  |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                 |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                 |

**B01D 2267/00**

**Multiple filter elements specially adapted for separating dispersed particles from gases or vapours**

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |   |
|---|---|
| Filter materials                            | <a href="#">B01D 39/00</a> and <a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                   |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                   |
| Air bags                                    | <a href="#">B60R 21/16</a>                                  |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                  |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                 |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                 |

**B01D 2271/00****Sealings for filters specially adapted for separating dispersed particles from gases or vapours****Definition statement***This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| Filter materials                            | <a href="#">B01D 39/00</a> and <a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                   |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                   |
| Air bags                                    | <a href="#">B60R 21/16</a>                                  |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                  |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                 |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                 |

**B01D 2273/00****Operation of filters specially adapted for separating dispersed particles from gases or vapours****Definition statement***This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references***This place does not cover:*

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |  |
|---|--|
| Filter materials                            | <a href="#">B01D 39/00</a> and<br><a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                      |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                      |
| Air bags                                    | <a href="#">B60R 21/16</a>                                     |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                     |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                    |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                    |

**B01D 2275/00****Filter media structures for filters specially adapted for separating dispersed particles from gases or vapours****Definition statement**

This place covers:

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

This place does not cover:

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |  |
|---|--|
| Filter materials                            | <a href="#">B01D 39/00</a> and<br><a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                      |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                      |
| Air bags                                    | <a href="#">B60R 21/16</a>                                     |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                     |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                    |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                    |

**B01D 2277/00**

**Filters specially adapted for separating dispersed particles from gases or vapours characterised by the position of the filter in relation to the gas stream**

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |   |
|---|---|
| Filter materials                            | <a href="#">B01D 39/00</a> and <a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                   |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                   |
| Air bags                                    | <a href="#">B60R 21/16</a>                                  |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                  |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                 |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                 |

**B01D 2279/00**

**Filters adapted for separating dispersed particles from gases or vapours specially modified for specific uses**

**Definition statement**

*This place covers:*

- Filters used for filtering particles out of a gas.
- Only mechanical filtering is taking place, no reaction, no absorption or adsorption is involved

**References****Limiting references**

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Details for filters specially adapted for separating dispersed particles from liquids | <a href="#">B01D 2201/00</a> |
|---|------------------------------|

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |  |
|---|--|
| Filter materials                            | <a href="#">B01D 39/00</a> and<br><a href="#">B01D 2239/00</a> |
| Filtration in suction cleaners              | <a href="#">A47L 9/10</a>                                      |
| Filtration in sterilisation                 | <a href="#">A61L 9/00</a>                                      |
| Air bags                                    | <a href="#">B60R 21/16</a>                                     |
| Filtration of exhaust gases from IC engines | <a href="#">F01N 3/021</a>                                     |
| Filtration of intake air for IC engines     | <a href="#">F02M 35/024</a>                                    |
| Filtration in air conditioning              | <a href="#">F24F 3/1603</a>                                    |

**B01D 2311/00**

Details relating to membrane separation process operations and control

**Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

**B01D 2313/00**

Details relating to membrane modules or apparatus

**Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

**B01D 2315/00**

Details relating to the membrane module operation

**Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

**B01D 2317/00**

Membrane module arrangements within a plant or an apparatus (membrane assemblies within one housing [B01D 2319/00](#))

**Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

## **B01D 2319/00**

**Membrane assemblies within one housing (module or elements arrangements within a plant or an apparatus [B01D 2317/00](#))**

### **Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

## **B01D 2321/00**

**Details relating to membrane cleaning, regeneration, sterilization or to the prevention of fouling**

### **Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

## **B01D 2323/00**

**Details relating to membrane preparation**

### **Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).

## **B01D 2325/00**

**Details relating to properties of membranes**

### **Special rules of classification**

These subgroups describes additional information and has to be used in accordance with the Rules for subgroups [B01D 61/00](#) - [B01D 71/00](#).