

## SECTION B — PERFORMING OPERATIONS; TRANSPORTING

### B03 SEPARATION OF SOLID MATERIALS USING LIQUIDS OR USING PNEUMATIC TABLES OR JIGS; MAGNETIC OR ELECTROSTATIC SEPARATION OF SOLID MATERIALS FROM SOLID MATERIALS OR FLUIDS; SEPARATION BY HIGH-VOLTAGE ELECTRIC FIELDS

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

#### Subclass index

PRETREATMENT.....	1/00
WASHING, WET SEPARATING, SEPARATING BY PNEUMATIC JIGS; FEEDING AND DISCHARGING PRODUCTS TREATED THEREBY.....	4/00, 5/00, 11/00
COMBINATIONS OF PROCESSES OR APPARATUS.....	7/00
ARRANGEMENTS OF PLANT.....	9/00
CONTROL BY PHYSICAL EFFECTS.....	13/00

<b>1/00</b>	<b>Conditioning for facilitating separation by altering physical properties of the matter to be treated</b> (pretreatment of ores in general C22B) [1, 2006.01]	5/24	• • • Constructional details of jigs, e.g. pulse control devices [2, 2006.01]
1/02	• Preparatory heating [1, 2006.01]	5/26	• • in sluices [2, 2006.01]
1/04	• by additives [1, 2006.01]	5/28	• by sink-float separation [2, 2006.01]
1/06	• by varying ambient atmospheric pressure [1, 2006.01]	5/30	• • using heavy liquids or suspensions [2, 2006.01]
		5/32	• • • using centrifugal force (centrifuges B04B; cyclones B04C) [2, 2006.01]
<b>4/00</b>	<b>Separating by pneumatic tables or by pneumatic jigs</b> (sink-float separation using dry heavy media B03B 5/46) [2, 2006.01]	5/34	• • • • Applications of hydrocyclones [2, 2006.01]
4/02	• using swinging or shaking tables [6, 2006.01]	5/36	• • • Devices therefor, other than using centrifugal force (jigs B03B 5/10) [2, 2006.01]
4/04	• using rotary tables or tables formed by travelling belts (separating solids from solids using gas currents and revolving drums B07B 4/06) [6, 2006.01]	5/38	• • • • of conical receptacle type [2, 2006.01]
4/06	• using fixed and inclined tables [6, 2006.01]	5/40	• • • • of trough type [2, 2006.01]
		5/42	• • • • of drum or lifting wheel type [2, 2006.01]
<b>5/00</b>	<b>Washing granular, powdered or lumpy materials; Wet separating</b> (separating by pneumatic tables or by pneumatic jigs B03B 4/00) [2, 2006.01]	5/44	• • • Application of particular media therefor [2, 2006.01]
5/02	• using shaken, pulsated or stirred beds as the principal means of separation (B03B 5/28, B03B 5/48 take precedence) [2, 2006.01]	5/46	• • using dry heavy media; Devices therefor [2, 2006.01]
5/04	• • on shaking tables (on vanners B03B 5/08) [2, 2006.01]	5/48	• by mechanical classifiers (sink-float separation aspects B03B 5/28) [2, 2006.01]
5/06	• • • Constructional details of shaking tables, e.g. riffing [2, 2006.01]	5/50	• • Rake classifiers [2, 2006.01]
5/08	• • on vanners [2, 2006.01]	5/52	• • Spiral classifiers [2, 2006.01]
5/10	• • on jigs [2, 2006.01]	5/54	• • Drag classifiers [2, 2006.01]
5/12	• • • using pulses generated mechanically in fluid [2, 2006.01]	5/56	• • Drum classifiers [2, 2006.01]
5/14	• • • • Plunger jigs [2, 2006.01]	5/58	• • Bowl classifiers [2, 2006.01]
5/16	• • • • Diaphragm jigs [2, 2006.01]	5/60	• by non-mechanical classifiers, e.g. slime tanks (using shaken, pulsated or stirred beds as the principal means of separation B03B 5/02; hydraulic classifiers B03B 5/62) [2, 2006.01]
5/18	• • • • Moving-sieve jigs [2, 2006.01]	5/62	• by hydraulic classifiers, e.g. of launder, tank, spiral or helical chute concentrator type [2, 2006.01]
5/20	• • • using pulses generated by air injection [2, 2006.01]	5/64	• • of the free settling type [2, 2006.01]
5/22	• • • using pulses generated by liquid injection [2, 2006.01]	5/66	• • of the hindered settling type [2, 2006.01]
		5/68	• by water impulse (shaking tables B03B 5/04; jigs B03B 5/10; hydraulic classifiers B03B 5/62) [2, 2006.01]
		5/70	• • on tables or strakes [2, 2006.01]

## B03B

- 5/72 • • • which are movable [2, 2006.01]
- 5/74 • • • • Revolving tables [2, 2006.01]
- 7/00 **Combinations of wet processes or apparatus with other processes or apparatus, e.g. for dressing ores or garbage [1, 2006.01]**
- 9/00 **General arrangement of separating plant, e.g. flow sheets [1, 2006.01]**
- 9/02 • specially adapted for oil-sand, oil-chalk, oil-shales, ozokerite, bitumen, or the like [1, 2006.01]
- 9/04 • specially adapted for furnace residues, smeltings, or foundry slags [1, 2006.01]
- 9/06 • specially adapted for refuse [1, 2006.01]

- 11/00 **Feed or discharge devices integral with washing or wet-separating equipment** (filling or emptying devices per se B65G 65/30) [1, 2006.01]
- 13/00 **Control arrangements specially adapted for wet-separating apparatus or for dressing plant, using physical effects** (detecting, measuring, or analysing devices G01) [1, 2006.01]
- 13/02 • using optical effects [1, 2006.01]
- 13/04 • using electrical or electromagnetic effects [1, 2006.01]
- 13/06 • using absorption or reflection of radioactive emanation [1, 2006.01]

## B03C MAGNETIC OR ELECTROSTATIC SEPARATION OF SOLID MATERIALS FROM SOLID MATERIALS OR FLUIDS; SEPARATION BY HIGH-VOLTAGE ELECTRIC FIELDS (filters making use of electricity or magnetism B01D 35/06; separating isotopes B01D 59/00; combinations of magnetic or electrostatic separation with separation of solids by other means B03B, B07B; separating sheets from piles B65H 3/00; magnets or magnet coils per se H01F) [5]

- 1/00 **Magnetic separation [1, 2006.01]**
- 1/005 • Pretreatment specially adapted for magnetic separation [6, 2006.01]
- 1/01 • • by addition of magnetic adjuvants [6, 2006.01]
- 1/015 • • by chemical treatment imparting magnetic properties to the material to be separated, e.g. roasting, reduction, oxidation [6, 2006.01]
- 1/02 • acting directly on the substance being separated [1, 5, 2006.01]
- 1/021 • • Separation using Meissner effect, i.e. deflection of superconductive particles in a magnetic field [6, 2006.01]
- 1/023 • • Separation using Lorentz force, i.e. deflection of electrically charged particles in a magnetic field [6, 2006.01]
- 1/025 • • High gradient magnetic separators [5, 2006.01]
- 1/027 • • • with reciprocating canisters [6, 2006.01]
- 1/029 • • • with circulating matrix or matrix elements (matrix elements B03C 1/034) [6, 2006.01]
- 1/03 • • • • rotating, e.g. of the carousel type [5, 6, 2006.01]
- 1/031 • • • Component parts; Auxiliary operations [6, 2006.01]
- 1/032 • • • • Matrix cleaning systems [6, 2006.01]
- 1/033 • • • • characterised by the magnetic circuit [6, 2006.01]
- 1/034 • • • • • characterised by the matrix elements [6, 2006.01]
- 1/035 • • Open gradient magnetic separators, i.e. separators in which the gap is unobstructed, characterised by the configuration of the gap [5, 2006.01]
- 1/0355 • • • using superconductive coils [6, 2006.01]
- 1/04 • • with the material carriers in the form of trays or with tables [1, 2006.01]
- 1/06 • • • with magnets moving during operation [1, 2006.01]
- 1/08 • • • with non-movable magnets [1, 2006.01]
- 1/10 • • with cylindrical material carriers (B03C 1/247 takes precedence) [1, 6, 2006.01]
- 1/12 • • • with magnets moving during operation; with movable pole pieces [1, 2006.01]
- 1/14 • • • with non-movable magnets [1, 2006.01]
- 1/16 • • with material carriers in the form of belts [1, 2006.01]

- 1/18 • • • with magnets moving during operation [1, 2006.01]
- 1/20 • • • • in the form of belts, e.g. cross-belt type [1, 2006.01]
- 1/22 • • • with non-movable magnets [1, 2006.01]
- 1/23 • • with material carried by oscillating fields; with material carried by travelling fields, e.g. generated by stationary magnetic coils; Eddy-current separators, e.g. sliding ramp [5, 2006.01]
- 1/24 • • • with material carried by travelling fields [1, 5, 2006.01]
- 1/247 • • • • obtained by a rotating magnetic drum [6, 2006.01]
- 1/253 • • • • obtained by a linear motor [6, 2006.01]
- 1/26 • • with free falling material (B03C 1/035 takes precedence) [1, 5, 2006.01]
- 1/28 • • Magnetic plugs and dipsticks [1, 2006.01]
- 1/30 • • Combinations with other devices, not otherwise provided for [1, 2006.01]
- 1/32 • acting on the medium containing the substance being separated, e.g. magneto-gravimetric-, magnetohydrostatic-, or magnetohydrodynamic separation [5, 2006.01]
- 3/00 **Separating dispersed particles from gases or vapour, e.g. air, by electrostatic effect** (exhaust or silencing apparatus for machines or engines having means for removing solid constituents of exhaust, using electric or electrostatic separators F01N 3/01) [1, 2006.01]
- 3/01 • Pretreatment of the gases prior to electrostatic precipitation [1, 2006.01]
- 3/011 • • Prefiltering; Flow controlling [6, 2006.01]
- 3/013 • • Conditioning by chemical additives, e.g. with SO<sub>3</sub> [6, 2006.01]
- 3/014 • • Addition of water; Heat exchange, e.g. by condensation [6, 2006.01]
- 3/016 • • by acoustic or electromagnetic energy, e.g. ultra-violet light [6, 2006.01]
- 3/017 • Combinations of electrostatic separation with other processes, not otherwise provided for [6, 2006.01]
- 3/019 • Post-treatment of gases [6, 2006.01]
- 3/02 • Plant or installations having external electricity supply (electrode constructions B03C 3/40) [1, 2006.01]
- 3/04 • • dry type [1, 2006.01]

- 3/06 • • • characterised by presence of stationary tube electrodes [1, 2006.01]
- 3/08 • • • characterised by presence of stationary flat electrodes arranged with their flat surfaces parallel to the gas stream [1, 2006.01]
- 3/09 • • • characterised by presence of stationary flat electrodes arranged with their flat surfaces at right angles to the gas stream [1, 2006.01]
- 3/10 • • • characterised by presence of electrodes moving during separating action [1, 2006.01]
- 3/12 • • • characterised by separation of ionising and collecting stations [1, 2006.01]
- 3/14 • • • characterised by the additional use of mechanical effects, e.g. gravity (B03C 3/32 takes precedence) [1, 2006.01]
- 3/145 • • • • Inertia [6, 2006.01]
- 3/15 • • • • Centrifugal forces [6, 2006.01]
- 3/155 • • • • Filtration [6, 2006.01]
- 3/16 • • wet type [1, 2006.01]
- 3/28 • Plant or installations without electricity supply, e.g. using electrets [1, 2006.01]
- 3/30 • • in which electrostatic charge is generated by passage of the gases, i.e. tribo-electricity [1, 2006.01]
- 3/32 • Transportable units, e.g. for cleaning room air (room air-conditioners having an electrostatic separating stage F24F) [1, 2006.01]
- 3/34 • Constructional details or accessories or operation thereof [1, 2006.01]
- 3/36 • • Controlling flow of gases or vapour [1, 2006.01]
- 3/38 • • Particle charging or ionising stations, e.g. using electric discharge, radioactive radiation, flames (electrode constructions B03C 3/40; ionising gases H05H) [1, 2006.01]
- 3/40 • • Electrode constructions [1, 2006.01]
- 3/41 • • • Ionising-electrodes [1, 2006.01]
- 3/43 • • • • radioactive [1, 2006.01]
- 3/45 • • • Collecting-electrodes [1, 2006.01]
- 3/47 • • • • flat, e.g. plates, discs, gratings [1, 2006.01]
- 3/49 • • • • tubular [1, 2006.01]
- 3/51 • • • • Catch-space electrodes, e.g. slotted-box form [1, 2006.01]
- 3/53 • • • • Liquid, or liquid-film, electrodes [1, 2006.01]
- 3/60 • • • Use of special materials other than liquids [1, 2006.01]
- 3/62 • • • • ceramics [1, 2006.01]
- 3/64 • • • • synthetic resins [1, 2006.01]
- 3/66 • • Applications of electricity supply techniques [1, 2006.01]
- 3/68 • • • Control systems therefor [1, 2006.01]
- 3/70 • • • insulating in electric separators (B03C 3/53 takes precedence) [1, 2006.01]
- 3/72 • • Emergency control systems [1, 2006.01]
- 3/74 • • Cleaning the electrodes [1, 2006.01]
- 3/76 • • • by using a mechanical vibrator, e.g. rapping gear [1, 2006.01]
- 3/78 • • • by washing [1, 2006.01]
- 3/80 • • • by gas or solid particle blasting [1, 2006.01]
- 3/82 • • Housings [1, 2006.01]
- 3/84 • • • Protective coatings [1, 2006.01]
- 3/86 • • Electrode-carrying means (B03C 3/40 takes precedence) [1, 2006.01]
- 3/88 • • Cleaning-out collected particles [1, 2006.01]
- 5/00 **Separating dispersed particles from liquids by electrostatic effect** (combined with centrifuges B04B 5/10) [1, 2, 2006.01]
- 5/02 • Separators [1, 2006.01]
- 7/00 **Separating solids from solids by electrostatic effect** [1, 2006.01]
- 7/02 • Separators [1, 2006.01]
- 7/04 • • with material carriers in the form of trays, troughs, or tables [1, 2006.01]
- 7/06 • • with cylindrical material carriers [1, 2006.01]
- 7/08 • • with material carriers in the form of belts [1, 2006.01]
- 7/10 • • with material falling in cascades [1, 2006.01]
- 7/12 • • with material falling free [1, 2006.01]
- 9/00 **Electrostatic separation not provided for in any single one of the other main groups of this subclass** [1, 2006.01]
- 11/00 **Separation by high-voltage electrical fields, not provided for in other groups of this subclass** [2006.01]

**B03D FLOTATION; DIFFERENTIAL SEDIMENTATION** (in combination with other separation of solids B03B; sink-float separation B03B 5/28)

- 1/00 **Flotation** [1, 2006.01]
- 1/001 • Flotation agents [5, 2006.01]
- Note(s) [5]
  1. In this group, the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.
  2. In this group, it is desirable to add the appropriate indexing code(s) from each of groups B03D 101/00 or B03D 103/00.
- 1/002 • • Inorganic compounds [5, 2006.01]
- 1/004 • • Organic compounds [5, 2006.01]
- 1/006 • • • Hydrocarbons [5, 2006.01]
- 1/008 • • • containing oxygen [5, 2006.01]
- 1/01 • • • containing nitrogen [5, 2006.01]
- 1/012 • • • containing sulfur [5, 2006.01]
- 1/014 • • • containing phosphorus [5, 2006.01]
- 1/016 • • • Macromolecular compounds [5, 2006.01]
- 1/018 • • Mixtures of inorganic and organic compounds [5, 2006.01]
- 1/02 • Froth-flotation processes [1, 2006.01]
- 1/04 • • by varying ambient atmospheric pressure [1, 2006.01]
- 1/06 • • differential [1, 2006.01]
- 1/08 • Subsequent treatment of concentrated product [1, 2006.01]
- 1/10 • • Removing adhering liquid from separated materials [1, 2006.01]
- 1/12 • Agent recovery [1, 2006.01]
- 1/14 • Flotation machines (devices for feeding measured quantities of reagents B01J 4/02) [1, 2006.01]
- 1/16 • • with impellers; Subaeration machines [1, 2006.01]

**B03D**

- 1/18 • • • without air supply [1, 2006.01]
- 1/20 • • • with internal air pumps [1, 2006.01]
- 1/22 • • • with external blowers [1, 2006.01]
- 1/24 • • pneumatic [1, 2006.01]
- 1/26 • • • Air lift machines [1, 2006.01]
  
- 3/00 Differential sedimentation [1, 2006.01]**
- 3/02 • Coagulation [1, 2006.01]
- 3/04 • • assisted by vibrations [1, 2006.01]
- 3/06 • Flocculation [1, 2006.01]

**Indexing scheme associated with group B03D 1/001, relating to the effects produced and the materials treated. [5]**

- 101/00 Specified effects produced by the flotation agents [5, 2006.01]**
- 101/02 • Collectors [5, 2006.01]
- 101/04 • Frothers [5, 2006.01]
- 101/06 • Depressants [5, 2006.01]
  
- 103/00 Specified materials treated by the flotation agents [5, 2006.01]**
- 103/02 • Ores [5, 2006.01]
- 103/04 • • Non-sulfide ores [5, 2006.01]
- 103/06 • • • Phosphate ores [5, 2006.01]
- 103/08 • • • Coal ores [5, 2006.01]
- 103/10 • • • Potassium ores [5, 2006.01]