

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 (separating isotopes B01D 59/00; crushing or disintegrating B02C; centrifuges or vortex apparatus for carrying out physical processes B04) [5]

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

1/00	Conditioning for facilitating separation by altering physical properties of the matter to be treated (pretreatment of ores in general C22B)	5/40 of trough type [2]
1/02	. Preparatory heating	5/42 of drum or lifting wheel type [2]
1/04	. by additives	5/44	. . . Application of particular media therefor [2]
1/06	. by varying ambient atmospheric pressure	5/46	. . using dry heavy media; Devices therefor [2]
		5/48	. by mechanical classifiers (sink-float separation aspects B03B 5/28) [2]
4/00	Separating by pneumatic tables or by pneumatic jigs (sink-float separation using dry heavy media B03B 5/46) [2]	5/50	. . Rake classifiers [2]
4/02	. using swinging or shaking tables [6]	5/52	. . Spiral classifiers [2]
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]	5/54	. . Drag classifiers [2]
4/06	. using fixed and inclined tables [6]	5/56	. . Drum classifiers [2]
		5/58	. . Bowl classifiers [2]
		5/60	. by non-mechanical classifiers, e.g. slime tanks (using shaken, pulsated or stirred beds as the principal means of separation B03B 5/02; hydraulic classifiers B03B 5/62; water impulse classifiers B03B 5/68) [2]
5/00	Washing granular, powdered or lumpy materials; Wet separating (separating by pneumatic tables or by pneumatic jigs B03B 4/00) [2]	5/62	. by hydraulic classifiers, e.g. of launder, tank, spiral or helical chute concentrator type [2]
5/02	. using shaken, pulsated or stirred beds as the principal means of separation (B03B 5/28, B03B 5/48 take precedence) [2]	5/64	. . of the free settling type [2]
5/04	. . on shaking tables (on vanners B03B 5/08) [2]	5/66	. . of the hindered settling type [2]
5/06	. . . Constructional details of shaking tables, e.g. riffling [2]	5/68	. by water impulse (shaking tables B03B 5/04; jigs B03B 5/10; hydraulic classifiers B03B 5/62) [2]
5/08	. . on vanners [2]	5/70	. . on tables or strakes [2]
5/10	. . on jigs [2]	5/72	. . . which are movable [2]
5/12	. . . using pulses generated mechanically in fluid [2]	5/74 Revolving tables [2]
5/14	. . . Plunger jigs [2]	7/00	Combinations of wet processes or apparatus with other processes or apparatus, e.g. for dressing ores or garbage
5/16	. . . Diaphragm jigs [2]	9/00	General arrangement of separating plant, e.g. flow sheets
5/18	. . . Moving-sieve jigs [2]	9/02	. specially adapted for oil-sand, oil-chalk, oil-shales, ozokerite, bitumen, or the like
5/20	. . . using pulses generated by air injection [2]	9/04	. specially adapted for furnace residues, smeltings, or foundry slags
5/22	. . . using pulses generated by liquid injection [2]	9/06	. specially adapted for refuse
5/24	. . . Constructional details of jigs, e.g. pulse control devices [2]	11/00	Feed or discharge devices integral with washing or wet-separating equipment (filling or emptying devices <u>per se</u> B65G 65/30)
5/26	. . in sluices [2]		
5/28	. by sink-float separation [2]		
5/30	. . using heavy liquids or suspensions [2]		
5/32	. . . using centrifugal force (centrifuges B04B; cyclones B04C) [2]		
5/34	. . . Applications of hydrocyclones [2]		
5/36	. . . Devices therefor, other than using centrifugal force (jigs B03B 5/10) [2]		
5/38 of conical receptacle type [2]		

13/00 Control arrangements specially adapted for wet-separating apparatus or for dressing plant, using physical effects (detecting, measuring, or analysing devices G01)

13/02 . using optical effects

13/04 . using electrical or electromagnetic effects

13/06 . using absorption or reflection of radioactive emanation

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**

1/005 . Pretreatment specially adapted for magnetic separation [6]

1/01 . . by addition of magnetic adjuvants [6]

1/015 . . by chemical treatment imparting magnetic properties to the material to be separated, e.g. roasting, reduction, oxidation [6]

1/02 . acting directly on the substance being separated [5]

1/021 . . Separation using Meissner effect, i.e. deflection of superconductive particles in a magnetic field [6]

1/023 . . Separation using Lorentz force, i.e. deflection of electrically charged particles in a magnetic field [6]

1/025 . . High gradient magnetic separators [5]

1/027 . . . with reciprocating canisters [6]

1/029 . . . with circulating matrix or matrix elements (matrix elements B03C 1/034) [6]

1/03 rotating, e.g. of the carousel type [5,6]

1/031 Component parts; Auxiliary operations [6]

1/032 Matrix cleaning systems [6]

1/033 characterised by the magnetic circuit [6]

1/034 characterised by the matrix elements [6]

1/035 . . Open gradient magnetic separators, i.e. separators in which the gap is unobstructed, characterised by the configuration of the gap [5]

1/0355 . . . using superconductive coils [6]

1/04 . . with the material carriers in the form of trays or with tables

1/06 . . . with magnets moving during operation

1/08 . . . with non-movable magnets

1/10 . . with cylindrical material carriers (B03C 1/247 takes precedence) [6]

1/12 . . . with magnets moving during operation; with movable pole pieces

1/14 . . . with non-movable magnets

1/16 . . with material carriers in the form of belts

1/18 . . . with magnets moving during operation

1/20 in the form of belts, e.g. cross-belt type

1/22 . . . with non-movable magnets

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]

1/24 . . . with material carried by travelling fields [5]

1/247 obtained by a rotating magnetic drum [6]

1/253 obtained by a linear motor [6]

1/26 . . with free falling material (B03C 1/035 takes precedence) [5]

1/28 . . Magnetic plugs and dipsticks

1/30 . . Combinations with other devices, not otherwise provided for

1/32 . acting on the medium containing the substance being separated, e.g. magneto-gravimetric-, magnetohydrostatic-, or magnetohydrodynamic separation [5]

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)

3/01 . Pretreatment of the gases prior to electrostatic precipitation

3/011 . . Prefiltering; Flow controlling [6]

3/013 . . Conditioning by chemical additives, e.g. with SO₃ [6]

3/014 . . Addition of water; Heat exchange, e.g. by condensation [6]

3/016 . . by acoustic or electromagnetic energy, e.g. ultra-violet light [6]

3/017 . Combinations of electrostatic separation with other processes, not otherwise provided for [6]

3/019 . Post-treatment of gases [6]

3/02 . Plant or installations having external electricity supply (electrode constructions B03C 3/40)

3/04 . . dry type

3/06 . . . characterised by presence of stationary tube electrodes

3/08 . . . characterised by presence of stationary flat electrodes arranged with their flat surfaces parallel to the gas stream

3/09 . . . characterised by presence of stationary flat electrodes arranged with their flat surfaces at right angles to the gas stream

3/10 . . . characterised by presence of electrodes moving during separating action

3/12 . . . characterised by separation of ionising and collecting stations

3/14 . . . characterised by the additional use of mechanical effects, e.g. gravity (B03C 3/32 takes precedence)

3/145 Inertia [6]

3/15 Centrifugal forces [6]

3/155 Filtration [6]

3/16 . . wet type

3/28 . Plant or installations without electricity supply, e.g. using electrets

3/30 . . in which electrostatic charge is generated by passage of the gases, i.e. tribo-electricity

3/32 . Transportable units, e.g. for cleaning room air (room air-conditioners having an electrostatic separating stage F24F)

- 3/34 . . . Constructional details or accessories or operation thereof
- 3/36 . . . Controlling flow of gases or vapour
- 3/38 . . . Particle charging or ionising stations, e.g. using electric discharge, radioactive radiation, flames (electrode constructions B03C 3/40; ionising gases H05H)
- 3/40 . . . Electrode constructions
- 3/41 Ionising-electrodes
- 3/43 radioactive
- 3/45 Collecting-electrodes
- 3/47 flat, e.g. plates, discs, gratings
- 3/49 tubular
- 3/51 Catch-space electrodes, e.g. slotted-box form
- 3/53 Liquid, or liquid-film, electrodes
- 3/60 Use of special materials other than liquids
- 3/62 ceramics
- 3/64 synthetic resins
- 3/66 . . . Applications of electricity supply techniques
- 3/68 Control systems therefor
- 3/70 insulating in electric separators (B03C 3/53 takes precedence)
- 3/72 . . . Emergency control systems
- 3/74 . . . Cleaning the electrodes
- 3/76 by using a mechanical vibrator, e.g. rapping gear
- 3/78 by washing
- 3/80 by gas or solid particle blasting
- 3/82 . . . Housings
- 3/84 Protective coatings
- 3/86 . . . Electrode-carrying means (B03C 3/40 takes precedence)
- 3/88 . . . Cleaning-out collected particles
- 5/00 **Separating dispersed particles from liquids by electrostatic effect** (combined with centrifuges B04B 5/10) [2]
 - 5/02 . Separators
- 7/00 **Separating solids from solids by electrostatic effect**
 - 7/02 . Separators
 - 7/04 . . with material carriers in the form of trays, troughs, or tables
 - 7/06 . . with cylindrical material carriers
 - 7/08 . . with material carriers in the form of belts
 - 7/10 . . with material falling in cascades
 - 7/12 . . with material falling free
- 9/00 **Electrostatic separation not provided for in any single one of the other main groups of this subclass**
- 11/00 **Separation by high-voltage electrical fields, not provided for in other groups of this subclass** [8]

B03D FLOTATION; DIFFERENTIAL SEDIMENTATION (sedimentation in general B01D 21/00; in combination with other separation of solids B03B; sink-float separation B03B 5/28; detergents, soaps C11D)

- 1/00 **Flotation** (conditioning for flotation, general arrangement of plant B03B)
- 1/001 . Flotation agents (conditioners B03B 1/00) [5]

Note

In this group in the absence of an indication to the contrary, classification is made in the last appropriate place. [5]

Note

In this group, it is desirable to add the appropriate indexing code(s) from each of groups B03D 101/00 or B03D 103/00. [5]

- 1/002 . . . Inorganic compounds [5]
- 1/004 . . . Organic compounds [5]
- 1/006 Hydrocarbons [5]
- 1/008 containing oxygen [5]
- 1/01 containing nitrogen [5]
- 1/012 containing sulfur [5]
- 1/014 containing phosphorus [5]
- 1/016 Macromolecular compounds [5]
- 1/018 . . . Mixtures of inorganic and organic compounds [5]
- 1/02 . Froth-flotation processes
- 1/04 . . by varying ambient atmospheric pressure
- 1/06 . . differential
- 1/08 . Subsequent treatment of concentrated product (froth dispersion B01D 19/02)
- 1/10 . . Removing adhering liquid from separated materials (processes or devices capable of general use B01D)

- 1/12 . Agent recovery
- 1/14 . Flotation machines (devices for feeding measured quantities of reagents B01J 4/02; flotation apparatus for enzymology or microbiology C12M 1/09)
- 1/16 . . with impellers; Subaeration machines
- 1/18 . . . without air supply
- 1/20 . . . with internal air pumps
- 1/22 . . . with external blowers
- 1/24 . . pneumatic
- 1/26 . . . Air lift machines
- 3/00 **Differential sedimentation**
- 3/02 . Coagulation
- 3/04 . . assisted by vibrations
- 3/06 . Flocculation

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