

**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

<b>1/00 Conditioning for facilitating separation by altering physical properties of the matter to be treated</b> (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]
<b>4/00 Separating by pneumatic tables or by pneumatic jigs</b> (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]
	5/56	. . Drum classifiers [2]
4/06 . using fixed and inclined tables [6]	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]
<b>5/00 Washing granular, powdered or lumpy materials; Wet separating</b> (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]	<b>7/00 Combinations of wet processes or apparatus with other processes or apparatus, e.g. for dressing ores or garbage</b>	
5/16 . . . . Diaphragm jigs [2]	<b>9/00 General arrangement of separating plant, e.g. flow sheets</b>	
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]	<b>11/00 Feed or discharge devices integral with washing or wet-separating equipment</b> (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 SO<sub>3</sub> [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	3/78	. . . by washing
3/36	. . . Controlling flow of gases or vapour	3/80	. . . by gas or solid particle blasting
3/38	. . . Particle charging or ionising stations, e.g. using electric discharge, radioactive radiation, flames (electrode constructions B03C 3/40; ionising gases H05H)	3/82	. . . Housings
3/40	. . . Electrode constructions	3/84	. . . Protective coatings
3/41	. . . . Ionising-electrodes	3/86	. . . Electrode-carrying means (B03C 3/40 takes precedence)
3/43	. . . . radioactive	3/88	. . . Cleaning-out collected particles
3/45	. . . . Collecting-electrodes	5/00	<b>Separating dispersed particles from liquids by electrostatic effect</b> (combined with centrifuges B04B 5/10) [2]
3/47	. . . . flat, e.g. plates, discs, gratings	5/02	. Separators
3/49	. . . . tubular	7/00	<b>Separating solids from solids by electrostatic effect</b>
3/51	. . . . Catch-space electrodes, e.g. slotted-box form	7/02	. Separators
3/53	. . . . Liquid, or liquid-film, electrodes	7/04	. . with material carriers in the form of trays, troughs, or tables
3/60	. . . . Use of special materials other than liquids	7/06	. . with cylindrical material carriers
3/62	. . . . ceramics	7/08	. . with material carriers in the form of belts
3/64	. . . . synthetic resins	7/10	. . with material falling in cascades
3/66	. . . Applications of electricity supply techniques	7/12	. . with material falling free
3/68	. . . Control systems therefor	9/00	<b>Electrostatic separation not provided for in any single one of the other main groups of this subclass</b>
3/70	. . . insulating in electric separators (B03C 3/53 takes precedence)	11/00	<b>Separation by high-voltage electrical fields, not provided for in other groups of this subclass [8]</b>
3/72	. . . Emergency control systems		
3/74	. . . Cleaning the electrodes		
3/76	. . . by using a mechanical vibrator, e.g. rapping gear		

**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	<b>Flotation</b> (conditioning for flotation, general arrangement of plant B03B)	1/12	. Agent recovery
1/001	. Flotation agents (conditioners B03B 1/00) [5]	1/14	. Flotation machines (devices for feeding measured quantities of reagents B01J 4/02; flotation apparatus for enzymology or microbiology C12M 1/09)
<b>Note</b>	In this group in the absence of an indication to the contrary, classification is made in the last appropriate place. [5]	1/16	. . with impellers; Subaeration machines
<b>Note</b>	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]	1/18	. . . without air supply
1/002	. . Inorganic compounds [5]	1/20	. . . with internal air pumps
1/004	. . Organic compounds [5]	1/22	. . . with external blowers
1/006	. . . Hydrocarbons [5]	1/24	. . pneumatic
1/008	. . . containing oxygen [5]	1/26	. . . Air lift machines
1/01	. . . containing nitrogen [5]	3/00	<b>Differential sedimentation</b>
1/012	. . . containing sulfur [5]	3/02	. Coagulation
1/014	. . . containing phosphorus [5]	3/04	. . assisted by vibrations
1/016	. . . Macromolecular compounds [5]	3/06	. Flocculation
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)		

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

101/00	<b>Specified effects produced by the flotation agents [5]</b>
101/02	. Collectors [5]
101/04	. Frothers [5]
101/06	. Depressants [5]
103/00	<b>Specified materials treated by the flotation agents [5]</b>
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]