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British Standard Glossary of Coal preparation terms

Glossaire des termes de préparation du charbon

Begriffe der Kohleaufbereitung

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Foreword

This British Standard glossary has been prepared under the direction of the Solid Fuels Standards Committee. It is a revision and extension of BS 3552 : 1962 which is withdrawn.

In this edition, clauses 3 to 9 retain numbering identical with the terms in clauses 3 to 9 of ISO/DIS 1213/1 of Technical Committee ISO/TC 27, Solid mineral fuels, of the International Organization for Standardization (ISO). In addition, terms proposed in the draft addendum 1 to ISO/DIS 1213/1 have been included as clauses 10 and 11 of this standard. It is expected that this standard will be reviewed upon publication of ISO 1213/1 and addendum 1 and that the ISO text will be implemented in the new

edition of this standard as a dual numbered British Standard.

The glossary is almost entirely confined to those terms special to, and in general use in, the coal preparation industry; it therefore does not include terms that may be expected to be included in a general dictionary. In some cases, where two or more terms have the same meaning, one is preferred and is printed in bold type; the other(s) is printed in ordinary type and, if deprecated, it is so marked. When used in another definition, a preferred defined term is shown in italics the first time that it occurs in that definition.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

British Standard Glossary of Coal preparation terms

1. Scope

This British Standard glossary defines terms special to, and in general use in, the coal preparation industry. It is divided into clauses and takes into account the distinction between processes or operations and the methods or machines for carrying them out.

2. Additional terms

Additional terms, particularly those relating to automatic control, that are also in general use may be found by reference to the publications listed in appendix A.

3. General

3.1 General coal preparation terms

No.	Term	Definition
31 01	coal preparation	Collectively, physical and mechanical processes applied to coal to make it suitable for a particular use.
31 02	run of mine; r.o.m. coal	Coal produced by mining operations, before <i>screening</i> , <i>crushing</i> or preparation.
31 03	raw coal	Coal which has received no preparation other than possibly <i>screening</i> or <i>crushing</i> .
31 04	raw coal feed	<i>Raw coal</i> supplied to a plant or machine, in which it undergoes some form of preparation.
31 05	coal cleaning	The treatment of coal to lower the mineral matter content (ash).
31 06	cleaned coal; clean coal	Coal produced by a cleaning process (wet or dry).
31 07	middlings	A product of <i>coal preparation</i> which by reason of its ash content is intermediate between coal and <i>discard</i> . NOTE. It follows therefore that the relative density of middlings is intermediate between those of coal and discard. Middlings may be reprocessed.
31 08	true middlings; bone	Comparatively high ash content particles so nearly homogeneous that their quality cannot readily be improved by <i>crushing</i> and re-cleaning.
31 09	false middlings; interbanded middlings	<i>Middlings</i> in which the particles consist of bands of coal and shale, and from which the coal may be liberated by <i>crushing</i> .
31 10	refuse	Waste material in the <i>raw coal</i> which the cleaning process removes. (See also 31 12.)
31 11	reject	The material extracted from the <i>feed</i> during cleaning, for retreatment or discarded.
31 12	discard; dirt; stone	The material extracted from the <i>raw coal</i> and finally discarded.

No.	Term	Definition
31 13	recirculation	The operation in which the whole or part of a product from a process is returned to the <i>feed</i> to the process, e.g. the return of the crushed <i>overflow</i> from a <i>screen</i> to the screen feed for rescreening.
31 14	'foreign coal'	Coal received at a preparation plant from a colliery other than that to which the plant is attached.
31 15	imported coal	Coal coming from a foreign country, or other state within the country.
31 16	low-grade coal	Combustible material which has only limited use owing to undesirable characteristics (e.g. ash content or size).
31 17	segregation	Partial separation of a previously mixed material into its constituents, occurring as a result of differences in either particle size or relative density.

3.2 Cleaning characteristics

32 01	washability	The amenability of a coal to improvement in quality by cleaning.
32 02	float-and-sink analysis	The division of a sample into relative density fractions with defined limits, the proportions of the fractions being expressed as percentages of the total sample, commonly with an indication of the ash percentage (and other characteristics, if required) of each fraction.
32 03	washability curve	Any curve obtained from the results of a <i>float-and-sink analysis</i> permitting the theoretical yield of <i>floats</i> or <i>sinks</i> to be read off. There are four main types of <i>washability curve</i> : (a) the <i>characteristic ash curve</i> ; (b) the <i>cumulative floats curve</i> ; (c) the <i>cumulative sinks curve</i> ; (d) the <i>densimetric</i> (relative density) <i>curve</i> .
32 04	characteristic ash curve	The curve obtained from the results of a <i>float-and-sink analysis</i> showing, for any mass percentage of <i>floats</i> (or <i>sinks</i>) the ash percentage of the highest density (or lowest density) fraction passing into these floats (or sinks), the mass percentage being plotted on the ordinate (vertical axis) and the ash percentage on the abscissa (horizontal axis).
32 05	cumulative curve	Any curve expressing the results of combining successive relative density fractions or size fractions.
32 06	cumulative floats curve	The curve obtained from the results of a <i>float-and-sink analysis</i> by plotting the cumulative mass percentage of <i>floats</i> at each relative density against the cumulative ash of the total floats at that density.
32 07	cumulative sinks curve	The curve obtained from the results of a <i>float-and-sink analysis</i> by plotting the cumulative mass percentage of <i>sinks</i> at each relative density against the cumulative ash of the total sinks at that density.
32 08	densimetric curve; relative density curve	The curve obtained from the results of a <i>float-and-sink analysis</i> by plotting the cumulative mass percentage of <i>floats</i> or <i>sinks</i> against the relative density.
32 09	near-density curve; difficulty curve	The curve obtained from the results of a <i>float-and-sink analysis</i> , or from the densimetric curve, by plotting the mass percentage within the limits ± 0.1 of a given relative density against that relative density.
32 10	performance curve	Any curve used to show the relationship between properties of coal and results of a specific treatment.
32 11	actual performance curve	A <i>performance curve</i> showing the results actually obtained from a coal preparation treatment.

No.	Term	Definition
32 12	probable performance curve	A <i>performance curve</i> showing the expected results of a coal preparation treatment.
32 13	M-curve; Mayer curve	A <i>cumulative curve</i> used in the first instance to express the <i>washability</i> of a coal, plotted on a vectorial diagram in which the projection of the vector on the ordinate (vertical axis) represents the percentage of the product (coal) and the direction of the vector represents the percentage of a particular constituent of the product.
32 14	ash/relative density curve	The curve obtained from the <i>float-and-sink analysis</i> by plotting the ash percentage of successive fractions against the mean relative density of the fraction.
3.3 Capacity and throughput		
33 01	nominal capacity	A notional figure expressed in mass per hour used in the title of a flowsheet and in the general descriptions of a plant, applying to the plant as a whole and to the specific project under consideration.
33 02	operational capacities	Figures given on a flowsheet to indicate quantities per unit time passing various points in the plant, taking account of fluctuations in the rate of supply and composition (as to size and impurity content).
33 03	design capacity	The rate of feed, defined by limits expressing the extent and duration of load variations, at which specific items of plant subject to a performance guarantee shall operate continuously and give the guaranteed results on a particular quality of <i>feed</i> .
33 04	peak design capacity	A rate of feed in excess of the <i>design capacity</i> which specific items of plant will accept for short periods without necessarily fulfilling the performance guarantees given in respect of them.
33 05	mechanical maximum capacity	The highest rate of feed at which specific items of equipment, not subject to performance guarantees, will function on the type and quality of <i>feed</i> for which they are supplied.
33 06	feed	Material for treatment supplied to an appliance or plant.
33 07	basic flowsheet	A block diagram of the various stages in the treatment of the <i>raw coal</i> .
33 08	process flowsheet	A <i>basic flowsheet</i> indicating the main operational steps within the plant, the movement of the various materials between the steps and the final products obtained, and often also the average mass flow at various points in the plant.
33 09	equipment flowsheet	A diagram indicating, preferably by symbols, the units of plant used in the various operational steps carried out within a coal preparation plant.
33 10	materials flowsheet	A flowsheet principally concerned with solid materials.
33 11	liquids flowsheet	A flowsheet to indicate the flow of liquids throughout a series of operations.
33 12	weighted flowsheet; capacity flowsheet	A <i>materials flowsheet</i> used in the design of a plant, including statements of the maximum mass flow per hour at principal points in the plant. The total mass flow of products from an operation is usually greater than the mass flow of the <i>feed</i> to that operation.

No.	Term	Definition
4. Sizing		
4.1 General		
41 01	sizing	Division of a material into products between <i>nominal size</i> limits.
41 02	classification	The separation of particles according to their size, density and shape by control of their settling rate through a fluid medium.
41 03	size analysis	The process or the result of the division of a sample into size fractions with defined limits, the proportions of the fractions being expressed as percentages of the total sample.
41 04	sieve analysis	The process or result of the division of a sample into size fractions by the use of test sieves.
41 05	mean size	The weighted average particle size of any sample, batch or consignment of particulate material, calculated according to a stated method. NOTE. Several methods for calculating mean size have been proposed giving results which vary widely for the same size distribution.
41 06	nominal size; limiting size	The limit or limits of particle size used to describe a product of a <i>sizing</i> operation.
41 07	oversize	Material in a product of size greater than the upper <i>nominal size</i> ; may be expressed as a percentage of the product.
41 08	undersize	Material in a product of size smaller than the lower <i>nominal size</i> ; may be expressed as a percentage of the product.
41 09	dust	Fine material removed dry from coal using air.
41 10	fines	Coal with a maximum particle size usually less than 4 mm, and with no lower limit. NOTE. The upper limit may vary widely. To avoid confusion the term should always be qualified by stating the <i>nominal size</i> .
41 11	smalls	Coal with a maximum particle size usually less than 25 mm, and with no lower limit. NOTE. The upper limit may vary widely. To avoid confusion the term should always be qualified by stating the <i>nominal size</i> .
4.2 Screening		
42 01	screen	(a) A device for carrying out the operation of <i>screening</i> . (b) A commonly used abbreviation for the <i>screen deck</i> or screening surface, e.g. woven wire section.
42 02	amplitude	The maximum displacement from the mean position in an oscillating motion. NOTE. In the case of a <i>screen</i> with a straight line motion or elliptical motion it is half of the total movement or half of the major axis of the ellipse. In the case of a circular motion it is the radius of the circle. (See also 42 03.)
42 03	stroke; throw	The distance between the extreme positions of an oscillating or vibration motion, i.e. the stroke is equal to twice the <i>amplitude</i> .
42 04	aperture size	The dimension or dimensions defining the opening in the <i>screen deck</i> , usually with a qualification as to the shape of aperture, e.g. 'round-hole', 'square-mesh', 'long-slot'.
42 05	screening	The separation of solid materials of different sizes by causing part to remain on a surface provided with apertures through which the remainder passes.

No.	Term	Definition
42 06	nominal screening size	A notional size at which it is intended to divide a <i>feed</i> by a <i>screening</i> operation.
42 07	dry screening	The <i>screening</i> of solid materials of different sizes without the aid of water.
42 08	wet screening	The <i>screening</i> of solid materials of different sizes with the aid of water, normally in the form of a spray.
42 09	probability screening	A method of <i>screening</i> which by making extended use of the probability of a particle passing through an aperture allows <i>sizing</i> at fine sizes to be performed with relatively large apertures.
42 10	de-sliming	The removal of <i>slimes</i> from coal or a mixture of coal and water, however accomplished.
42 11	finer removal	The removal of fine particles from a feed material, by either wet or dry methods, to facilitate treatment or utilisation of the remainder.
42 12	de-dusting	<i>Fines removal</i> by dry methods.
42 13	overflow (screen)	That portion of the <i>feed</i> discharged from the <i>screen deck</i> without having passed through the apertures.
42 14	undersize (overflow)	Particles in a screen <i>overflow</i> which are smaller than the nominal dimensions of the screen apertures.
42 15	underflow (screen)	That portion of the <i>feed</i> which has passed through the apertures in a <i>screen deck</i> .
42 16	oversize (underflow)	Particles in a screen <i>underflow</i> which are larger than the nominal dimensions of the screen apertures.
42 17	misplaced material (screening)	<i>Undersize</i> contained in the <i>overflow</i> , or <i>oversize</i> contained in the <i>underflow</i> .
42 18	near-mesh material; near-sized material	Material approximating in size to the aperture in the <i>screen deck</i> , usually within $\pm 25\%$ of that aperture size.
42 19	nominal area (screen)	The total area of the <i>screen deck</i> exposed to the flow of the material feed.
42 20	effective area (screen); working area, <i>deprecated</i>	The <i>nominal area</i> less any occupied by fixings or supports which obstruct the passage of material over or through the <i>screen deck</i> .
42 21	percentage open area	The ratio of the total area of the apertures to the total area of the wire cloth, perforated plate or wedge-wire panel. In the case of perforated plate the area of the unperforated margins is excluded.
42 22	sieve	(a) Generally, a <i>screen</i> of relatively small area. (b) Particularly, a screen used in the laboratory for test purposes.

4.3 Parts of screens

43 01	screen deck; screening surface	A surface provided with apertures of specified size for carrying out the operation of <i>screening</i> .
43 02	screen plate	A plate provided with apertures of specified size for use as a <i>screen deck</i> .
43 03	screen cloth; screen mesh	A mesh of wires woven in a consistent manner to form apertures.
43 04	wedge-wire deck; wedge-wire sieve	A <i>screen deck</i> comprising wires of wedge-shaped cross-section spaced from each other at a fixed dimension; the <i>underflow</i> thus passes through an aperture of increasing cross-section.

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No.	Term	Definition
43 05	rod deck	A <i>screen deck</i> consisting of loosely held parallel rods positioned at right angles to the flow of material over the screen. NOTE. This is normally used only on high speed <i>vibrating screens</i> .
43 06	relieving deck	A <i>screen plate</i> with large apertures mounted over the <i>screen deck</i> in order to reduce the load and wear thereon.
4.4 Screens according to purpose		
44 01	run of mine screen	A <i>screen</i> used for dividing <i>run of mine</i> coal into two or more sizes for further treatment or disposal; usually employed to remove the largest pieces for crushing and re-addition to the run of mine coal.
44 02	primary screen; raw coal screen	A <i>screen</i> used to divide coal (usually <i>raw coal</i>) into sizes more suitable for the subsequent cleaning of some or all of them.
44 03	de-watering screen	A <i>screen</i> used for the separation of water from solids.
44 04	de-sliming screen	A <i>screen</i> used for the removal of <i>slimes</i> from larger particles, usually with the aid of water sprays.
44 05	slurry screen	A <i>screen</i> to recover a granular product from <i>circulating water</i> in a coal preparation plant, usually after a preliminary concentration of the solids and with or without the use of water sprays.
44 06	rinsing screen; spray screen	A <i>screen</i> used for the removal by spraying of fine solids, especially <i>dense medium</i> solids present among or adhering to larger particles.
44 07	sizing screen(s); grading screen(s), <i>deprecated</i> ; classifying screen(s), <i>deprecated</i>	A <i>screen</i> or set of screens normally used for dividing a product (e.g. washed coal) into a range of sizes.
44 08	guard screen; oversize control screen; check screen, <i>deprecated</i>	A <i>screen</i> used to prevent the entry into a machine of coarse particles which might interfere with its operation.
44 09	undersize control screen; breakage screen, <i>deprecated</i>	A <i>screen</i> used for the removal of <i>undersize</i> from a product.
4.5 Screens according to principle of construction		
45 01	single-deck screen	A <i>screen</i> having one <i>screen deck</i> , not necessarily limited to one size or shape of aperture.
45 02	multi-deck screen	A <i>screen</i> with two or more superimposed <i>screen decks</i> mounted rigidly within a common frame.
45 03	jigging screen; shaking screen; reciprocating screen	A <i>screen</i> to which a combined horizontal and vertical motion is imparted, normally by a crankshaft and connecting rod, the <i>screen deck</i> being horizontal or inclined at a small angle.
45 04	resonance screen	A <i>screen</i> with a period of oscillation at or very close to the natural period of oscillation of the resilient mounting.
45 05	vibrating screen	A <i>screen</i> oscillated either by mechanical or electrical means. The <i>amplitude</i> of movement of the vibrating screen is smaller than that of the <i>jigging screen</i> and its speed of oscillation is higher.
45 06	trommel screen; revolving screen	A <i>screen</i> in which the <i>screen deck</i> is formed into a cylinder or frustum of a cone, mounted upon a horizontal or near horizontal rotating shaft or on revolving rollers.
45 07	roll screen	A <i>screen</i> consisting of a number of horizontal rotating shafts, fitting with elements arranged to provide screening apertures.

No.	Term	Definition
45 08	bar screen	A stationary inclined <i>screen</i> , comprising longitudinal bars, spaced at intervals, on to which the material to be screened is fed at the upper end.
45 09	grizzly	A rugged <i>screen</i> for rough sizing at comparatively large size (e.g. 150 mm); it can comprise fixed or moving bars, discs, or shaped tumblers or rollers.
45 10	sieve bend	A device for the <i>sizing</i> of fine particles suspended in water by means of a stationary curved panel, commonly of wedge-wire, whereby the finer particles are removed with the bulk of the water in the <i>underflow</i> . (See also 62 02.)
4.6 Sizing in a current of air or water		
46 01	air classification	The process of <i>sizing</i> in a current of air.
46 02	classifier	A device which separates particles, according to their size, shape and density, by physical means other than <i>screening</i> .
46 03	cyclone classifier	A device for classification by centrifugal means of fine particles suspended in a fluid, whereby the coarser grains are discharged from the apex of the vessel, while the finer particles are removed with the bulk of the fluid at the overflow orifice.
5. Cleaning		
5.1 General		
51 01	upgrade	To increase the commercial value of a coal by appropriate treatment.
51 02	dry cleaning	The separation of impurities from coal by manual or mechanical methods which avoid the use of a liquid.
51 03	wet cleaning	The mechanical separation of impurities from coal by methods involving the use of a liquid.
51 04	washery	A coal preparation plant in which a cleaning process is carried out.
51 05	re-clean; re-wash	To retreat a product in the same or in another plant.
51 06	washery products	The final products from a <i>washery</i> .
51 07	reject elevator; refuse elevator, <i>deprecated</i>	An elevator for removing and draining the <i>reject</i> from a washing appliance.
51 08	middlings elevator	An elevator which removes material for further treatment or for disposal as an inferior product.
51 09	head tank	Any tank or vessel in the <i>water circuit</i> which is used to control the delivery pressure of the water to the washing units.
51 10	launder	A trough or channel along which flow liquids or a mixture of liquids and solids.
51 11	pump sump	A tank into which the <i>circulating water</i> gravitates and from which it is recirculated by means of a pump.
51 12	suspension	A mixture of solid particles and water or air in which the solid particles are completely and individually supported, normally by means of an upwardly moving current or with the assistance of mechanical agitation.
51 13	teeter (in); fluidized suspension (in)	The condition of a suspension of solids in an upward-moving current of water or air, whereby the support given to the particles reduces the internal friction between them to such an extent that the suspension acquires fluid or partially-fluid properties.

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No.	Term	Definition
51 14	water circuit	The complete system of pipelines, pumps, sumps, tanks, <i>launders</i> and accessories used for the circulation of water in a <i>washery</i> , including the water treatment plant.
51 15	closed water circuit	A <i>water circuit</i> designed so that the only water added is that necessary to replace the loss on the <i>washery products</i> and that due to atmospheric evaporation.
51 16	circulating water	The water in the <i>water circuit</i> .
51 17	make-up water	Water supplied to a plant to replace that lost from the circuit.
51 18	rinsing water; spray water	Water used to remove fine particles from larger sizes.
51 19	waste water; surplus water, <i>deprecated</i> ; bleed water, <i>deprecated</i>	Excess water allowed to run to waste from the <i>water circuit</i> . (See also 61 09.)
51 20	pit water; mine water	Water from underground workings or an open cut mine.
51 21	slimes	Extremely fine particles in suspension or present with larger particles.
51 22	slurry (coal preparation)	Fine particles concentrated in a portion of the <i>circulating water</i> and water-borne for treatment or disposal.
51 23	froth flotation	A process for cleaning fine coal in which the coal, with the aid of a reagent or reagents, becomes attached to air bubbles in a liquid medium and floats as a froth.
5.2 Dry cleaning		
52 01	hand cleaning	The removal by hand of impurities from coal, or coal from impurities.
52 02	hand selection	The selection by hand of pieces of coal with certain specific qualities according to surface appearance.
52 03	picking belt; picking table	A continuous conveyor (e.g. in the form of a rubber belt or of a steel apron, steel plate or link construction) on which <i>raw coal</i> is spread so that selected ingredients may be removed manually.
52 04	picking table, circular	An apparatus used for the same purpose as a <i>picking belt</i> and consisting of a flat horizontal rotating annular plate.
52 05	hand picker	A person employed either for <i>hand cleaning</i> or for <i>hand selection</i> .
52 06	pneumatic cleaning	Cleaning in an air current.
52 07	dry cleaning table	An apparatus in which <i>dry cleaning</i> is achieved by the application of air currents and agitation to a layer of <i>feed</i> of controlled depth on the table surface.
52 08	air jig	A machine in which the <i>feed</i> is stratified by means of pulsating currents of air and from which the stratified products are separately removed.
5.3 Jigging		
53 01	jig; washbox, <i>deprecated</i>	A machine in which the <i>feed</i> is stratified in water by means of a pulsating motion and from which the stratified products are separately removed, the pulsating motion usually being obtained by alternate upward and downward currents of water.