

Glossary of

Terms associated with refractory materials —

Part 1: General and manufacturing

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Committees responsible for this British Standard

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- British Cement Association
- British Ceramic Research Ltd.
- British Coal Corporation
- British Steel Industry
- Department of Trade and Industry (Minerals and Metals Division)
- Refractories Association of Great Britain
- Society of Glass Technology

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Foreword

This Part of BS 3446 has been prepared under the direction of the Refractory Products Standards Policy Committee. Together with Parts 2 and 3 it forms a revision of BS 3446:1962, which is withdrawn. Much of the work in preparing BS 3446 was conducted under a joint BSI/DTI¹⁾ Consultancy Scheme.

BS 3446 is published in three Parts:

- *Part 1: General and manufacturing* (sections 1 to 6);
- *Part 2: Applications in the coke, glass, cement and other non-metallurgical industries* (sections 7 and 8);
- *Part 3: Applications in the metallurgical industries* (section 9).

Terms are listed alphabetically within each section. Each term has an individual number consisting of five digits in two parts, the first of two digits, the second of three. The first two digits represent the number of the section and subsection (in the case of sections 1, 2 and 4, the second digit is 0 as these sections have no divisions into subsections). The last three digits represent the place that the term occupies within the section or subsection.

Alternative terms are given below the preferred term. These terms are not individually numbered, but are included in the index with a reference to the preferred term. Terms of more than one word, e.g. “ceramic bond”, are written in a direct style, not as “bond, ceramic”.

Italicized words indicate terms that are defined elsewhere in this Part of BS 3446. The definitions presented in this Part of BS 3446 give the general meaning of terms, and should not be interpreted as being legally binding.

NOTE The titles of the publications referred to in this Part of BS 3446 are listed on the inside back cover.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 56, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ Department of Trade and Industry.

Section 1. General terms

No.	Term	Definition
10 001	abrasion	Surface wear caused by the mechanical action of solids. (See <i>corrosion</i> and <i>erosion</i> .)
10 002	attrition	<i>Particle size</i> reduction by a process depending mainly on impact and/or a rubbing action.
10 003	batch	A quantity of material passing through a manufacturing process, which can be clearly identified at all stages of manufacture.
10 004	batch composition	The blend of materials proportioned in a definite manner. (See <i>mix</i> .)
10 005	binder	A substance added to a non-plastic granular material to give it <i>workability</i> and <i>green strength</i> and/or <i>dry strength</i> .
10 006	calcination	Heat treatment intended to produce mineralogical or chemical changes in certain raw materials.
10 007	ceramic bond	The vitreous or crystalline material formed, on <i>firing</i> , in the interstices of a ceramic <i>body</i> and giving cohesion and mechanical strength to the fired product.
10 008	chamotte	Refractory <i>clay</i> that has been specifically fired for use as a <i>non-plastic material</i> . (See <i>grog</i> .)
10 009	clinker	Fused, partially fused or sintered material. (See <i>sintering</i> .)
10 010	coarse	The large <i>particle size</i> fraction in a <i>batch</i> . (See <i>finer</i> .)
10 011	conversion	A change in the crystalline structure of a material which is not immediately reversible, resulting from heat treatment. (See <i>inversion</i> .) NOTE The term is often applied to silica.
10 012	corrosion	Material loss caused by chemical reaction. (See <i>abrasion</i> and <i>erosion</i> .)
10 013	crazing	A network of surface <i>cracks</i> .
10 014	devitrification	The formation of crystals in a vitreous material.
10 015	dilatancy	The property of a fluid, e.g. a ceramic <i>slurry</i> , which when stirred becomes less fluid than when allowed to stand. (See <i>thixotropy</i> .)
10 016	dross	Scum formed on liquid metal.
10 017	dry strength	The mechanical strength of a dried but unfired material. (See <i>green strength</i> .)
10 018	dusting	Spontaneous falling to a powder. (See <i>inversion</i> .)
10 019	erosion	Surface wear caused by the mechanical action of a fluid, whether containing solid materials or not. (See <i>abrasion</i> and <i>corrosion</i> .)
10 020	exfoliation	The property possessed by certain materials, e.g. <i>vermiculites</i> and hydro-biotites, of expanding permanently in a direction parallel to a particular axis when submitted to sudden heating, forming a laminar <i>texture</i> . (See <i>intumescence</i> .)
10 021	finer	The small <i>particle size</i> fraction in a <i>batch</i> . (See <i>coarse</i> .)
10 022	flashing	Dark areas found on the surface of fired refractory bricks.
10 023	flux (metallurgical)	A material that, when present in or added to a <i>refractory material</i> (even in very small amounts) appreciably lowers the temperature of formation of a liquid phase.

No.	Term	Definition
10 024	grading	The grain-size distribution of a <i>mix</i> .
10 025	green green state <i>non-preferred</i>	Shaped but unfired (as applied to ceramic materials).
10 026	green strength	The mechanical strength of a <i>green</i> ceramic product.
10 027	grog	Firebrick or other calcined or fused materials (unused or used) for incorporation in a <i>batch</i> as a <i>non-plastic material</i> .
10 028	hot face refractory materials	The <i>refractory materials</i> comprising the inner or <i>working lining</i> .
10 029	intumescence	The property possessed by certain materials, e.g. perlites, of expanding permanently during suitable heat treatment, and forming a vesicular <i>texture</i> . (See <i>exfoliation</i> .)
10 030	inversion	A generally rapid and immediately reversible change in the crystalline form of a material resulting from a change in temperature (See <i>conversion</i> .)
10 031	inversion point	The temperature at which a crystalline <i>inversion</i> takes place.
10 032	iron spot	A dark coloured spot formed from particles of iron or its compounds that are present in a brick.
10 033	lamination	Directional faults in <i>texture</i> that may be formed during shaping of clayware or other <i>refractory materials</i> .
10 034	matrix ground mass <i>non-preferred</i>	In a polycrystalline and especially heterogeneous mass, e.g. igneous minerals and <i>refractory materials</i> , the material between large crystals or grains of the major component(s), which bonds them together. It may itself be crystalline or vitreous.
10 035	mineralizer	A substance which in small quantities encourages, during <i>firing</i> , the formation and/or crystallization of certain compounds.
10 036	mix	The <i>batch</i> after it has been mixed. (See <i>batch composition</i> .)
10 037	moisture content	A term that can be broadly subdivided as follows. a) Chemically-combined moisture content. The mass of water retained in a material after it has been dried to constant mass at 100 °C. b) Critical moisture content. The average mass of water contained within a test piece when the <i>constant rate period</i> is at an end. c) Equilibrium moisture content. The limiting mass of water remaining to which any given material can be dried under specific conditions of air temperature and humidity. d) Free moisture content. The mass of water in excess of the chemically-combined moisture.
10 038	monolithic	Jointless, e.g. as applied to linings that are moulded, rammed or cast in situ.
10 039	non-plastic material	A material with no inherent <i>plasticity</i> or <i>dry strength</i> .
10 040	partial vitrification	Transformation by heat treatment of a substance or mixture into a product containing a moderate proportion of vitreous phase, giving the material a lower apparent <i>porosity</i> . (See <i>sintering</i> and <i>vitrification</i> .)
10 041	plasticity	The property of a material, and especially of <i>clay</i> , that allows it to be shaped without cracking and to retain its new form.

No.	Term	Definition
10 042	pore	Small void in the <i>texture</i> of a product.
10 043	refractory material refractory, refractory product, <i>both non-preferred</i>	A non-metallic material or product (but not excluding those containing a proportion of metal) having heat-resisting properties, usually measured by classes in <i>pyrometric cone equivalent</i> and selected according to the operating temperature and the level of protection required.
10 044	rheology	The science of the deformation and flow of materials.
10 045	rheopexy	A property of certain materials to exhibit <i>dilatancy</i> under small shearing <i>stress</i> followed by <i>thixotropy</i> under greater <i>stress</i> .
10 046	shelling peeling, flaking, <i>both non-preferred</i>	The loss of part of the surface of a <i>refractory material</i> as a consequence of cracking behind the hot face. (See <i>spalling</i> .)
10 047	shot	A non-fibrous component of <i>ceramic fibre</i> products.
10 048	sintering	The bonding of powdered and/or granular materials by solid state reactions at a temperature lower than that required for the formation of a liquid phase. (See <i>partial vitrification</i> and <i>vitrification</i> .)
10 049	slag (1)	A non-metallic material formed during the treatment or purification of a metal.
10 050	slag (2)	A non-metallic material resulting from chemical reaction between a <i>refractory material</i> and materials in contact with it. (See <i>dross</i> .)
10 051	slip	Generally a stable suspension of <i>clay</i> in water with or without the inclusion of other materials; this term can also denote other stable suspensions, e.g. of <i>alumina</i> . (See <i>slurry</i> .)
10 052	slurry	A concentrated suspension (containing some relatively coarse material) in water. (See <i>slip</i> .)
10 053	solid solution	A crystalline phase, the composition of which can, within limits, be varied without the appearance of an additional phase. Many solid solutions occur naturally and are important in various areas of the technology of <i>refractory materials</i> .
10 054	spalling	The fracture and physical loss of pieces of a <i>refractory material</i> .
10 055	structure	Crystalline or atomic arrangement. (See <i>texture</i> .) NOTE The term "structure" is generally used in combination with another word to define the type, e.g. micro-structure, atomic structure, crystal structure.
10 056	texture	A relationship existing between the various shapes, sizes and orientations of <i>pores</i> and grains in a <i>refractory material</i> .
10 057	thixotropy	A property of certain materials to become less fluid when allowed to stand and more fluid when stirred.
10 058	vitrification	The transformation by heat treatment of a substance or mixture into a product containing a large proportion of vitreous phase, giving the material a low apparent porosity and permeability. (See <i>partial vitrification</i> and <i>sintering</i> .)
10 059	vitriify	To effect <i>vitrification</i> .
10 060	warpage	The degree of bending, twisting or distortion which may occur during manufacture of a refractory brick, shape or block.

Section 2. Raw materials and minerals

No.	Term	Definition
20 001	alumina	Aluminium oxide, Al_2O_3 . It exists in several crystalline forms, the principal being gamma-alumina and alpha-alumina. NOTE So-called beta-alumina contains a small amount of alkali metal oxide. (See <i>corundum</i> .)
20 002	anatase	Crystalline form of <i>titania</i> . (See <i>brookite</i> and <i>rutile</i> .)
20 003	andalusite	One of three minerals having the same composition, $\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$, but different crystalline forms. (See <i>kyanite</i> and <i>sillimanite</i> .) NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 004	asbestos	A group of the naturally, occurring hydrated crystalline silicates which can be separated into fine fibres.
20 005	baddeleyite	A mineral mainly composed of <i>zirconia</i> .
20 006	ball clay	A highly plastic secondary <i>kaolinitic clay</i> .
20 007	bauxite (1)	A residual deposit containing principally one or more hydrates of <i>alumina</i> ; it may also contain <i>clay</i> minerals and hydrated iron oxide. (See <i>diaspore</i> , <i>gibbsite</i> and <i>boehmite</i> .)
20 008	bauxite (2)	Loose term for the oxide <i>refractory material</i> obtained on calcination.
20 009	bentonite	A highly plastic montmorillonitic <i>clay</i> , essentially derived from volcanic ash.
20 010	beryl	The mineral form of beryllium alumino-silicate, $3\text{BeO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2$.
20 011	beryllia	Beryllium oxide, BeO .
20 012	boehmite	One of the monohydrates of <i>alumina</i> , $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$. (See <i>bauxite</i> and <i>diaspore</i> .)
20 013	breunerite	A magnesium iron carbonate.
20 014	brookite	A crystalline form of <i>titania</i> . (See <i>anatase</i> and <i>rutile</i> .)
20 015	brucite	Hydrated magnesium oxide.
20 016	calcite	A crystalline form of calcium carbonate, CaCO_3 .
20 017	chalk	A soft, relatively pure <i>limestone</i> , consisting of fine grained calcium carbonate.
20 018	china clay kaolin <i>non-preferred</i>	A primary or secondary <i>clay</i> consisting of comparatively coarsely-crystalline <i>kaolinite</i> ; it is not very plastic and is white-firing. Distinction is made between china-clay rock, which contains the debris of the parent material, and china clay which is refined from the china-clay rock.
20 019	chrome ore	An ore containing a major proportion of chrome-bearing <i>spinel</i> s.
20 020	clay	A natural material composed essentially of <i>clay minerals</i> but also likely to contain free <i>silica</i> and other impurities. (See <i>sand</i> .) NOTE Clay has a <i>particle size</i> less than 1/256 mm.
20 021	clay minerals	Hydrated alumino-silicates; the product of weathering. Some types contain other elements, e.g. magnesium, potassium, iron. When mixed with water, clay minerals become plastic, and they harden on drying. (See <i>kaolinite</i> , <i>illite</i> and <i>montmorillonite</i> .)

No.	Term	Definition
20 022	cordierite	A natural or artificial magnesium aluminosilicate. Cordierites containing manganese or iron also exist. NOTE The term is also commonly used for a rock containing a major proportion of this mineral.
20 023	corundum	Alpha-alumina, Al_2O_3 ; the form of <i>alumina</i> stable at temperatures above about 1 000 °C.
20 024	cristobalite	One of the polymorphic forms of crystalline <i>silica</i> . (See <i>quartz</i> and <i>tridymite</i> .)
20 025	diaspore	One of the monohydrates of <i>alumina</i> . (See <i>bauxite</i> and <i>boehmite</i> .) NOTE The term is also commonly used for a rock containing a major proportion of this mineral.
20 026	diatomaceous earth kieselguhr, diatomite, <i>both non-preferred</i>	Siliceous sedimentary material containing a high proportion of diatoms.
20 027	dolomite	The double carbonate of calcium and magnesium, $\text{CaCO}_3\cdot\text{MgCO}_3$. NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 028	fayalite	Iron (II) orthosilicate, $2\text{FeO}\cdot\text{SiO}_2$.
20 029	feldspar felspar <i>non-preferred</i>	A group of minerals composed of aluminosilicates of the alkalis and alkaline earths.
20 030	fireclay	A <i>clay</i> which is resistant to high temperatures, containing mainly kaolinitic <i>clay minerals</i> , free <i>silica</i> and only a small proportion of other impurities. (See <i>fireclay mineral</i> .)
20 031	fireclay mineral	A <i>clay mineral</i> of the kaolinitic group, the principal constituent of <i>fireclay</i> .
20 032	flake graphite	A lamellar form of <i>graphite</i> found in certain metamorphic rocks.
20 033	flint	A variety of <i>quartz</i> , found as nodules and nodular bands in <i>chalk</i> and as residual pebbles.
20 034	flint clay	A very hard compact kaolinitic material, showing conchoidal fracture, and virtually non-plastic.
20 035	forsterite	Magnesium orthosilicate, $2\text{MgO}\cdot\text{SiO}_2$. (See <i>olivine</i> .)
20 036	ganister	A <i>silica</i> rock formed by deposition of dissolved <i>silica</i> in the siliceous seat-earth of coal seams. NOTE Colloquially, the term is understood to be a highly siliceous patching and <i>ramming</i> material.
20 037	gibbsite hydrargillite <i>non-preferred</i>	A trihydrate of <i>alumina</i> , $\text{Al}_2\text{O}_3\cdot 3\text{H}_2\text{O}$. (See <i>bauxite</i> .) NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 038	graphite	An allotropic crystalline form of carbon.
20 039	gypsum	Calcium sulphate dihydrate, $\text{CaSO}_4\cdot 2\text{H}_2\text{O}$, the mineral from which <i>Plaster-of-Paris</i> is made.
20 040	halloysite	A <i>clay mineral</i> of the kaolinite group.
20 041	illite	One of the <i>clay minerals</i> .
20 042	ilmenite	Iron (II) titanate, $\text{FeO}\cdot\text{TiO}_2$.
20 043	kaolinite	A <i>clay mineral</i> of the kaolinite group; the principal constituent of <i>china clay</i> .

No.	Term	Definition
20 044	kyanite	One of three minerals having the same composition, $\text{Al}_2\text{O}_3\cdot\text{SiO}_2$, but different crystalline forms. (See <i>andalusite</i> and <i>sillimanite</i> .) NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 045	lime	Calcium oxide, CaO . (See <i>chalk</i> and <i>limestone</i> .)
20 046	limestone	A rock consisting of calcium carbonate, CaCO_3 . (See <i>calcite</i> , <i>chalk</i> and <i>lime</i> .)
20 047	magnesia	Magnesium oxide, MgO . (See <i>periclase</i> .)
20 048	magnesite	The mineral magnesium carbonate, MgCO_3 . NOTE This term has been erroneously used to refer to <i>magnesia refractory materials</i> .
20 049	magnetite	Ferrous <i>spinel</i> $\text{FeO}\cdot\text{Fe}_2\text{O}_3$; a constituent of many iron ores and <i>chrome ores</i> .
20 050	mica	A group of hydrated silicate minerals which are laminar and non-plastic.
20 051	monticellite	An orthosilicate of calcium and magnesium, $\text{CaO}\cdot\text{MgO}\cdot\text{SiO}_2$.
20 052	montmorillonite	One of the <i>clay minerals</i> ; the principal constituent of <i>bentonite</i> .
20 053	mullite	A rarely occurring silicate of <i>alumina</i> having the theoretical formula $3\text{Al}_2\text{O}_3\cdot 2\text{SiO}_2$. In practice it is synthetically formed to be used as a raw material in the refractories industry.
20 054	olivine	<i>Forsterite</i> with some <i>fayalite</i> in solid solution. NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 055	periclase	Crystalline magnesium oxide, MgO . NOTE The term is sometimes used to describe high purity dead-burned <i>magnesia</i> .
20 056	perlite	A variety of <i>rhyolite</i> that can be expanded by <i>intumescence</i> .
20 057	picrochromite	<i>Magnesia chrome spinel</i> , $\text{MgO}\cdot\text{Cr}_2\text{O}_3$.
20 058	Plaster-of-Paris	Calcium sulphate hemi-hydrate, $\text{CaSO}_4\cdot\frac{1}{2}\text{H}_2\text{O}$. It is made by heating <i>gypsum</i> , to which it reverts when mixed with water.
20 059	plumbago	Naturally occurring impure <i>graphite</i> . In practice, a synthetic <i>refractory material</i> containing this <i>graphite</i> and a substantial quantity of <i>clay</i> .
20 060	pot clay (1)	A <i>fireclay</i> which is particularly suitable for use in the manufacture of glass-melting pots or steel-melting crucibles.
20 061	pot clay (2)	A blend of this <i>clay</i> with <i>grog</i> .
20 062	pyrophyllite	A hydrated alumino-silicate, $\text{Al}_2\text{O}_3\cdot 4\text{SiO}_2\cdot\text{H}_2\text{O}$. NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 063	quartz	One of the polymorphic forms of crystalline <i>silica</i> . (See <i>cristobalite</i> and <i>tridymite</i> .)
20 064	quartzite	A rock formed by transformation of a siliceous-bonded <i>sandstone</i> by in situ growth of the grains at the expense of the siliceous cement. There are two types of quartzite, one in which the grains are cemented together (cemented quartzite), and one in which no cementing material remains (uncemented quartzite).

No.	Term	Definition
20 065	rhyolite	An acidic volcanic rock, mainly glassy but also containing sporadic crystals of <i>quartz</i> and orthoclase. (See <i>perlite</i> .)
20 066	rutile	A crystalline form of <i>titania</i> . (See <i>anatase</i> and <i>brookite</i> .)
20 067	sand	Detrital siliceous material of small grain size. NOTE Particle size limits are 1/16 mm to 2 mm.
20 068	sandstone	A sedimentary rock composed of grains of <i>silica</i> bonded by a cementing agent, which may be siliceous, calcareous or argillaceous.
20 069	sea-water magnesia	<i>Magnesia</i> obtained by chemical precipitation from sea-water or brine. NOTE Most of the <i>magnesia</i> needed for the production of basic <i>refractory materials</i> in Britain is derived from the sea.
20 070	serpentine	A hydrated magnesium silicate, $3\text{MgO} \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$. NOTE The term is also commonly used for a rock containing a major proportion of this mineral.
20 071	silcrete	A surface deposit of crypto-crystalline <i>quartzite</i> particularly that found in South Africa.
20 072	silica	Silicon dioxide, SiO_2 . (See <i>cristobalite</i> , <i>flint</i> , <i>quartz</i> and <i>tridymite</i> .) NOTE Colloquially, silica rock is called stone.
20 073	silicon carbide	The synthetic compound SiC .
20 074	sillimanite	One of three minerals having the same composition, $\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$, but different crystalline forms. (See <i>andalusite</i> and <i>kyanite</i> .) NOTE This term is also commonly used for a rock containing a major proportion of this mineral.
20 075	soapstone	An impure type of <i>steatite</i> .
20 076	spinel (1)	Magnesium aluminate, $\text{MgO} \cdot \text{Al}_2\text{O}_3$.
20 077	spinel (2)	Any mineral having the same crystalline structure as magnesium aluminate and having the general formula $R''\text{O} \cdot R'''\text{O}_3$, where R'' and R''' are divalent and trivalent metals respectively.
20 078	steatite	Compact <i>talc</i> .
20 079	talc	A hydrated magnesium silicate, $3\text{MgO} \cdot 4\text{SiO}_2 \cdot \text{H}_2\text{O}$. (See <i>steatite</i> and <i>soapstone</i> .)
20 080	thoria	Thorium dioxide, ThO_2 .
20 081	titania	Titanium dioxide, TiO_2 . (See <i>anatase</i> , <i>brookite</i> and <i>rutile</i> .)
20 082	topaz	Aluminium fluorosilicate, $\text{Al}_2\text{SiO}_4(\text{OH}, \text{F})_2$.
20 083	tridymite	One of the polymorphic forms of crystalline <i>silica</i> . (See <i>cristobalite</i> and <i>quartz</i> .)
20 084	vermiculite	A group name for certain biotite <i>micas</i> which, when rapidly heated to 800 °C to 950 °C, exfoliate as the combined water is expelled. The exfoliated product is used to make insulating bricks and <i>castables</i> .
20 085	wollastonite	Calcium metasilicate, $\text{CaO} \cdot \text{SiO}_2$.
20 086	zircon (1)	Zirconium orthosilicate, $\text{ZrO}_2 \cdot \text{SiO}_2$.
20 087	zircon (2)	A deposit containing a major proportion of this mineral.
20 088	zirconia	Zirconium (IV) oxide, ZrO_2 .
20 089	zirkite	A rock mainly composed of a mixture of <i>baddeleyite</i> and <i>zircon</i> .

Section 3. Manufacture

31 000 Preparation and shaping

No.	Term	Definition
31 001	aeration pad	A mechanism for discharging fine material from a storage hopper.
31 002	ageing souring <i>non-preferred</i>	A process in which the <i>plasticity</i> of a <i>body</i> is increased by storing the moist <i>body</i> in a heap or in a pit. (See <i>tempering</i> .)
31 003	air-ramming	Placing monolithic <i>refractory materials</i> by means of a pneumatic <i>rammer</i> .
31 004	air-separator	Equipment for the size classification of fine powders by means of an air current.
31 005	auger	An <i>extrusion</i> machine operated by means of a rotating screw. (See <i>pug</i> .)
31 006	ball mill	A machine for fine grinding, generally comprising a cylinder or truncated <i>cone</i> containing pebbles, or metal or ceramic balls or cylinders, turning about a horizontal or slightly inclined axis. Types of <i>ball mill</i> include the following: a) vibration mill; b) gravity-discharge ball mill; c) pebble mill; d) air-swept ball mill; e) tube-mill.
31 007	balling	The tendency of some ceramic materials or <i>batches</i> , when moist, to aggregate into small balls when being mixed in a machine.
31 008	bleached	The pale appearance of some <i>silica</i> bricks after <i>firing</i> .
31 009	blending	Mixing of different materials or of particles of different sizes.
31 010	blinding	An obstruction to the apertures of a <i>screen</i> , preventing the passage of particles. Especially with <i>screens</i> having a fine mesh size.
31 011	body	The condition of a <i>batch composition</i> with respect to its suitability for shaping or moulding. Qualified by terms such as long, short, lean, fat.
31 012	box feeder	A container, which may be closed or open, together with a mechanism for the controlled delivery of material to the next stage of the process.
31 013	charger box	A small hopper located above the table of a press but below the feed hopper, for the filling of the <i>mould</i> cavity.
31 014	cheese wire	The metal band or wire used in the wire-cutting of bricks and other <i>bodies</i> .
31 015	closed circuit system	An arrangement of <i>crushing</i> , <i>grinding</i> and separating machines which enables fine material to be removed and classified at various stages of the process and the <i>coarse</i> oversize material to be returned to the feed.
31 016	closed fraction	A controlled distribution of particles between an upper and lower <i>particle size</i> .
31 017	clot clod, blank, <i>both non-preferred</i>	A roughly shaped <i>body</i> ready for final shaping, <i>calcination</i> or <i>firing</i> .

No.	Term	Definition
31 018	clot mould	A <i>mould</i> employed for the re-pressing and shaping of a <i>clot</i> .
31 019	colloid mill	A machine for the production of colloidal suspensions, emulsions and solid dispersions.
31 020	cone crusher	A crusher comprising a <i>cone</i> housed in, and rotating concentrically with, a similarly-shaped casing. (See <i>gyratory crusher</i> .)
31 021	crushing	Reduction by mechanical pressure of the size of material originally in the form of large lumps. (See <i>grinding</i> .)
31 022	crushing rolls	A crusher with rolls which usually rotate in opposite directions, often at different speeds.
31 023	curing	The process by which a <i>bond</i> is developed in a <i>refractory material</i> , under moist conditions, through the setting of hydraulic cement.
31 024	cutter	Device at the outlet of the mouthpiece of a <i>pug</i> or <i>auger</i> for cutting off <i>clots</i> or finishing shapes.
	cutting-off table <i>non-preferred</i>	
31 025	daylight	The vertical distance between the upper and lower platens of a press.
31 026	de-airing	The removal of entrapped air from a <i>body</i> by means of <i>compaction</i> under a partial vacuum.
31 027	deflocculation	The dispersion of a <i>clay slip</i> by the addition of a small amount of a suitable electrolyte, e.g. sodium silicate and/or sodium carbonate.
31 028	die	A metal plate attached to the upper and lower platens of a press which enters the <i>mould</i> (box) and through which pressure is transmitted to the brick <i>batch</i> .
31 029	disintegrator	A <i>mill</i> comprising a rotor turning in a casing, both rotor and casing being fitted with fixed hammers. (See <i>hammer mill</i> .)
31 030	dobie	A roughly shaped lump of <i>refractory material</i> in either the <i>green</i> or fired state.
31 031	double acting	The mechanical movement of a press which allows the load to be applied in two stages.
31 032	draw down	The pulling of a filament from a liquid phase.
31 033	drive	The prime mover of a conveyor belt.
31 034	dry pan	An <i>edge-runner mill</i> , generally with a perforated bottom, used for the dry <i>grinding</i> or mixing of materials. (See <i>wet pan</i> .)
	dry edge-runner mill <i>non-preferred</i>	
31 035	dump truck	A small mechanized vehicle used for transporting material.
31 036	edge-runner mill	A <i>mill</i> having a fixed or revolving pan with <i>mullers</i> and with a solid or perforated bottom. (See <i>dry pan</i> and <i>wet pan</i> .)
	pan mill <i>non-preferred</i>	
31 037	extrusion	A shaping process in which a plastic <i>body</i> is forced through a <i>die</i> .
31 038	fabric	The <i>texture</i> of a <i>refractory material</i> .

No.	Term	Definition
31 039	feeders	Machines for conveying granular solids. (See <i>box feeder</i> .) Types of <i>feeders</i> include the following: a) rotary; b) screw; c) weigh belt; d) apron; e) reciprocating; f) vibrating; g) oscillating.
31 040	flats	Hot floors on which brick shapes may be dried.
31 041	flatting	The action of rapping or jolting <i>leather-hard fireclay</i> bricks or shapes, which have been hand-made, onto a bench to help them dry without distortion.
31 042	flowered	The mottled appearance of some <i>silica</i> bricks after <i>firing</i> .
31 043	foaming	The formation of a vesicular <i>texture</i> by the development of gas bubbles in a <i>body</i> whilst it is in a fluid state.
31 044	friction press	A <i>screw press</i> operated by a friction disc.
31 045	fusion casting	A process of manufacture in which molten <i>refractory material</i> is poured into a <i>mould</i> .
31 046	gap grading	A distribution of particles made up of <i>closed fractions</i> having an appreciable difference between the size range covered by each <i>closed fraction</i> .
31 047	grinding	Reduction of the <i>particle size</i> of a material of granular form mainly by <i>abrasion</i> or <i>attrition</i> . (See <i>crushing</i> .)
31 048	gripper	A system of mechanically activated arms used for the removal of brick shapes from the press table.
31 049	grizzle	A <i>screen</i> consisting of parallel bars for separating large pieces or lumps.
31 050	gunning	The hot or cold application of a <i>refractory material</i> by means of a pneumatic gun.
31 051	gyratory crusher	A crusher comprising a <i>cone</i> housed in, and rotating eccentrically with, a similar shaped casing. (See <i>cone crusher</i> .)
31 052	hammer mill	A <i>mill</i> comprising a rotor turning in a casing, the rotor being fitted with movable hammers. (See <i>disintegrator</i> .)
31 053	hand moulding	The process of making blocks, usually those of large and/or intricate shape, by hand.
31 054	hydraulic press	A machine in which a <i>body</i> is shaped in a <i>mould</i> , pressure being applied hydraulically to the top mould-plate, and sometimes also to the bottom mould-plate.
31 055	idler	A free/loose pulley of a conveyor belt system.
31 056	impact mill	A <i>mill</i> in which a rotor projects the material against plates.
31 057	impact pressing	A process of forming in which the particles making up the <i>batch</i> are packed together by means of rapid vibrations.
31 058	impregnation	The action of filling the <i>open pores</i> of a refractory brick shape with a liquid, e.g. tar or pitch.
31 059	isostatic pressing	A process of forming a refractory shape by employing a fluid to apply an equal pressure over the entire surface of the shape. A flexible <i>mould</i> is used to contain the material.

No.	Term	Definition
31 060	jaw crusher	A crusher having two jaws, one or both actuated by reciprocating motion.
31 061	jet mill	A fluid energy system in which the solid material particles are pulverized. The fluid may be compressed air or superheated steam.
31 062	jigger	A vertical shaft, similar to a potter's wheel, having a cup-shaped wheel head to receive the <i>mould</i> . (See <i>jollying</i> .)
31 063	jolley	A device for carrying a <i>profile</i> so that it may be applied to the inside or outside of a <i>mould</i> . (See <i>jollying</i> .)
31 064	jollying	A process of shaping (of <i>clay</i> crucibles or saggars) in a <i>mould</i> made of plaster or metal, by means of a <i>profile</i> or a <i>jigger</i> .
31 065	jolt moulding	A moulding process in which a <i>mould</i> is subjected to a series of jolts with or without the application of top pressure.
31 066	knock-in mould	A <i>mould</i> , having a loose top <i>die</i> , employed for hand forming or light machine forming.
31 067	liner	The interchangeable plates which are attached to the vertical sides of a <i>mould</i> box.
31 068	mechanical press	A machine in which <i>bodies</i> are shaped in a <i>mould</i> , pressure being applied mechanically to the top mould-plate, and sometimes also to the bottom mould-plate.
31 069	melt blowing	The production of a refractory fibre from a molten liquid phase by the action of compressed air or steam.
31 070	melt spinning	The production of a refractory fibre from a molten liquid phase by a centrifugal action.
31 071	micro-pulverizer	A type of <i>hammer mill</i> .
31 072	mill	A machine for <i>grinding</i> and/or mixing.
31 073	mixer	A machine for preparing a <i>mix</i> by wet or dry methods. The most common types are as follows: a) batch-type mixer: a <i>mixer</i>, usually for semi-dry materials, operated by means of rotating arms; b) shaft mixer: a type of continuous, horizontal wet <i>mixer</i> comprising an open barrel and one or two shafts carrying blades or knives mounted helicoidally, and having means for adding water; c) pug mill: a <i>mixer</i> for a plastic <i>body</i> with a closed horizontal or vertical barrel containing one or two shafts carrying blades mounted helicoidally. (See <i>pug</i>.)
31 074	molasses	A product of the sugar industry, sometimes used as a <i>binder</i> for non-plastic or relatively <i>non-plastic materials</i> .
31 075	mould	An assembly of wooden, metal or other pieces that form a container which imparts, the required shape to a <i>body</i> .
31 076	moulding station	A location in the works where the bricks are formed.
31 077	muller	A roller, usually of metal, used in a mill for <i>grinding</i> , mixing or <i>tempering</i> .
31 078	muller mixer	A <i>wet pan</i> with the <i>mullers</i> suspended above the bottom.
31 079	needle reinforcement	The addition of carbon or stainless steel needles to a refractory <i>mix</i> , so as to achieve increased strength in the finished product.

No.	Term	Definition
31 080	needling	A process for the bonding of refractory fibres into a blanket.
31 081	open circuit system	An arrangement of <i>crushing, grinding</i> and separating machines for preparing and classifying material on a continuous basis.
31 082	open fraction	A distribution of particles which has either an upper limit or a lower limit to the <i>particle size</i> .
31 083	overpressed	The application of excessive pressure, resulting in faulty, often laminated, material.
31 084	palette plate	A flat board or steel plate on which bricks may be placed after pressing or shaping.
31 085	pallet	A flat frame made from wood or steel on which brick shapes may be stacked for transportation.
31 086	pallet hoist	An elevator for lifting <i>pallet</i> loads of material.
31 087	phosphate bond	A chemical bond formed by the action of phosphoric acid or a phosphate on the <i>refractory material</i> .
31 088	pin beater mill	A type of <i>hammer mill</i> .
31 089	plastic making	A moulding process in which the water content of the material is sufficient for it to be extruded or moulded by hand or by machine.
31 090	press bay	An area of a brickworks containing pressing machines.
31 091	profile	A metal sheet for removing material from an article which is being shaped. (See <i>jolleying</i> .)
31 092	pug	An <i>extrusion</i> machine for consolidating wet <i>clay</i> into <i>clots</i> . The machine is operated by means of a series of knives, mounted on a shaft, the knives cutting and kneading the <i>clay</i> as it passes along the closed barrel. (See <i>auger</i> .)
31 093	rammer	Portable equipment, used for the shaping of semi-dry or plastic <i>bodies</i> by repeated impact.
31 094	ramming	Shaping with a <i>rammer</i> . (See <i>air-ramming</i> .)
31 095	relic process	The impregnation of an organic fibre with a metallic salt. The fibre is afterwards dried and then calcined in order to remove the organic matter and <i>sinter</i> the oxide remains as a method for producing <i>ceramic fibres</i> .
31 096	re-pressing	A process in which a <i>clot</i> is pressed to its final shape.
31 097	rod mill	A <i>mill</i> for <i>fine grinding</i> , in which metal rods are used as <i>grinding media</i> . (See <i>ball mill</i> .)
31 098	rotary (table) press	A press which provides a rotating table containing a number of <i>mould</i> cavities each of which can be moved in turn into a pressing position.
31 099	scalping	The removal of oversize particles, pieces or lumps by means of a coarse <i>screen</i> or <i>grizzle</i> .
31 100	screen	A wire mesh or perforated plate used for the industrial size classification of crushed or ground material. Types of <i>screen</i> include the following: a) rotary screen: a <i>screen</i> mounted on a drum turning on an axis slightly inclined to the horizontal; b) vibrating screen: a <i>screen</i> which is vibrated rapidly.
31 101	screen cloth	The mesh forming the <i>screen</i> , usually made from wire.
31 102	screen deck	One size of <i>screen</i> consisting of a frame and a <i>screen cloth</i> . <i>Screens</i> may be single-, double- or triple-decked.

No.	Term	Definition
31 103	screw press	A machine in which a <i>body</i> is shaped in a <i>mould</i> , pressure being applied to the top mould-plate by a thrust column that is forced downwards by a screw mechanism.
31 104	segregation	Partial re-separation of a previously-mixed <i>batch</i> of material into its constituents; this can occur either as a result of differences in <i>particle size</i> or in <i>density</i> . <i>Segregation</i> is liable to occur in storage bins, on conveyors and in <i>feeders</i> during the dry or semi-dry processing of ceramic materials.
31 105	semi-dry pressing	A high pressure shaping of a <i>body</i> containing various proportions of non-plastic constituents, but having a water content below that at which plastic making would be possible.
31 106	semi-plastic making stiff plastic making <i>non-preferred</i>	A moulding process in which the water content of the material being shaped is sufficient to permit a <i>clot</i> to be formed in a brick-making machine.
31 107	shuttle press	A press which provides a table having two <i>mould</i> cavities which can be moved alternately into a pressing position.
31 108	skin effect	The modified surface of a brick or shape caused by or during pressing, drying or <i>firing</i> .
31 109	slip casting	The process of shaping by pouring a <i>slip</i> into an absorbent <i>mould</i> .
31 110	slurry process	The preparation of a suspension which is then extruded as a filament, afterwards dried and then calcined to produce a polycrystalline filament suitable for use as a refractory fibre.
31 111	solution process	The preparation of an aqueous solution of a metal salt as a precursor to the formation of the oxide during the production of refractory fibres.
31 112	souring of magnesite	A stage in the preparation of <i>magnesia</i> (<i>magnesite</i>) brick/ <i>batch</i> involving the hydration of free <i>lime</i> or underburned material.
31 113	spray drying	The process of de-watering a suspension, e.g. a <i>slip</i> made of <i>clay</i> , by spraying the suspension into a heated chamber, the dried powder being removed from the bottom of the chamber.
31 114	steel-clad brick	A brick surrounded by metal plates to impart a greater resistance to <i>spalling</i> when in use.
31 115	steel-reinforced brick	A brick reinforced by a system of compartmenting with steel sheet so as to reduce <i>spalling</i> in use and to add strength.
31 116	strike	To skim off surplus material from the top of the <i>mould</i> .
31 117	sulphite lye	A by-product of the paper industry sometimes used as a <i>binder</i> for non-plastic and relatively <i>non-plastic material</i> .
31 118	swing press	A <i>screw press</i> operated by hand.
31 119	tamping	Shaping with a <i>tamping machine</i> .
31 120	tamping machine	Machine for shaping a <i>body</i> by means of a hammer which compresses the material by repeated blows on the top plate of a <i>mould</i> .
31 121	tempering (1)	The mechanical treatment of a wet <i>clay</i> or <i>body</i> to improve workability. (See <i>ageing</i> .)

No.	Term	Definition
31 122	tempering (2)	A low temperature heat treatment of materials containing tar, pitch or resin.
31 123	tensioner	The mechanism which keeps a conveyor belt at the necessary tightness.
31 124	toggle press	A machine in which <i>bodies</i> are shaped in a <i>mould</i> , pressure being applied by a toggle mechanism to the top mould-plate and sometimes to the bottom mould-plate.
31 125	tote bin	A small transportable hopper or silo.
31 126	toughened	Used to describe a refractory brick shape which has been given improved mechanical properties, especially resulting from a low temperature heat treatment.
31 127	tower plant design	A plant design in which the hoppers and <i>screens</i> are so located that the material is moved through the system chiefly by the force of gravity.
31 128	tramp iron	Accidental metallic contamination during manufacture.
	tramp metal <i>non-preferred</i>	
31 129	trip hammer	A machine employing cams and/or friction wheels to apply repetitive blows to the <i>die</i> of a <i>mould</i> .
31 130	tube mill	A <i>ball mill</i> having a cylinder longer than usual, this usually being subdivided internally so that the material to be ground passes from one compartment to the next, the <i>grinding</i> media in successive compartments being appropriately smaller than in preceding compartments.
31 131	uprisings	Waste or scrap material which is recovered for use as <i>grog</i> .
31 132	vacuum forming	The process of producing boards or moulded shapes by converting fibres into a <i>slurry</i> and sucking them on to a gauze former.
31 133	vacuum pressing	A process of forming a brick shape with the <i>batch</i> held under a partial vacuum.
31 134	vacuum pug	A <i>pug</i> having an internal or external vacuum chamber in which <i>de-airing</i> of the <i>body</i> takes place.
31 135	vibrating poker	A poker used to compact refractory <i>castable</i> by vibration. The poker is inserted into a <i>mould</i> containing wet <i>castable</i> , the vibration is switched on and the <i>castable</i> is vibrated to remove air and compact the material.
31 136	vibrating table	A table used to compact refractory <i>castable</i> by vibration. The material containing wet <i>castable</i> is placed on the table, the vibration is switched on and the <i>castable</i> is vibrated to remove air and compact the material.
31 137	weathering	The alteration of raw materials by exposure to the weather.
31 138	wet pan	An <i>edge-runner mill</i> , generally with a solid bottom, in which materials are ground, mixed or tempered with water (or other liquids).
	wet edge-runner mill <i>non-preferred</i>	

32 000 Drying

32 001	chamber drier	A drier in which ware is placed in chambers and remains stationary during drying.
32 002	constant rate period	The time during which the rate of removal of moisture per unit of drying surface is constant.

No.	Term	Definition
32 003	continuous drier	A drier which may be direct or indirect, designed to move material continuously in a chamber or drying vessel. Types of <i>continuous drier</i> include the following: a) spray; b) tunnel; c) drum; d) rotary.
32 004	direct (convection) drier	A chamber in which heat transfer is obtained by direct contact between the ware being dried and the hot gases.
32 005	drying back	The reduction of the <i>moisture content</i> of a <i>batch</i> or <i>green</i> shape until it is in a condition suitable for further processing.
32 006	drying shrinkage	The reduction in the dimensions of a material as a result of drying.
32 007	falling rate period	The period during which the rate of drying is continually decreasing and is proportional to the free <i>moisture content</i> .
32 008	fluidized bed	A process whereby granular solids are maintained in a state of suspension to facilitate drying and/or <i>calcination</i> .
32 009	hack	An open setting of brick shapes for drying.
32 010	hot floor	A floor, heated from below by steam pipes or hot gases, on which the ware is placed to dry.
32 011	humidity drier	A type of drier in which the relative humidity and temperature of the drying agent (air) are controlled in order that surface evaporation can take place at a rate which will not damage the brick shape.
32 012	indirect drier	A chamber in which the heat for drying is transferred to the ware through an intermediate wall by means of conduction and contact, e.g. <i>hot floor</i> type.
32 013	intermittent-batch drier	A drier, which may be direct or indirect, designed to operate on a fixed volume of material in a given time cycle. Types of <i>intermittent-batch driers</i> include the following: a) loft; b) cabinet; c) compartment; d) chamber.
32 014	leather-hard	The condition of partially dried clayware. (See <i>white-hard</i> .)
32 015	passage drier	A chamber or oven with two or more parallel rail tracks used for the <i>batch</i> drying of brick shapes.
32 016	preheater	An oven which is employed to heat <i>green</i> brick shapes (of <i>silica</i>) to a temperature of 150 °C to 160 °C before transferring to the <i>kiln</i> .
32 017	rack drier	A <i>chamber drier</i> in which the ware is dried on racks.
32 018	spouted bed	A counter-current system of drying granular solids.
32 019	stillage	A small portable platform on which material may be handled, dried or stored inside the works. NOTE The term <i>pallet</i> is used to denote a similar platform used for transport.
32 020	tunnel drier	A horizontal <i>continuous drier</i> through which the ware is passed.
32 021	white-hard	The condition of clayware that has dried sufficiently for the surface to become lighter in colour. (See <i>leather-hard</i> .)