BRITISH STANDARD

BS 3533:1981

CONFIRMED
DECEMBER 2007

Glossary of

Thermal insulation terms

UDC 536.2:001.4

Cooperating organizations

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This British Standard, having been prepared under the direction of the Refrigeration, Heating and Air Conditioning Standards Committee, was published under the authority of the Executive Board and comes into effect on 27 February 1981

First published August 1962
First revision February 1981

The following BSI references relate to the work on this standard:
Committee reference RHE/9
Draft for comment 79/74975 DC

ISBN 0 580 11833 9

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

Foreword

BS 3533 was first issued in 1962. The standard originated as a result of work on the preparation of British Standards for the properties, methods of test and applications of thermal insulating materials in general; it was recognized that the nomenclature employed required definition in order to avoid misrepresentation.

In the present revision the text has been brought up to date with technical developments and takes into account the need for harmony with other standard glossaries in related fields published since 1962. It also takes account of current work being undertaken by the International Organization for Standardization (ISO).

This glossary is intended to explain terms used in the insulation industry rather than to provide a full list of relevant scientific definitions. For this reason the term "description" is considered more appropriate than "definition" as normally used in British Standard glossaries. The descriptions are however compatible with the scientific definitions given in BS 874 and other British Standards publications. Where it has been considered to be helpful, the descriptions have been elaborated by explanatory notes, references and symbols.

Where units are indicated (in parentheses at the end of appropriate definitions), these are given in terms of the Système International d'Unités (abbreviated to "SI units"). For details see PD 5686.

The glossary has been divided somewhat arbitrarily into four sections dealing respectively with physical properties, insulating materials, descriptive terms, and fittings and accessory materials. In view of the relative infrequency of associated terms, items in the four sections have been tabulated in alphabetical order and an index has been provided for ease of reference.

Preferred terms are printed in bold type, and non-preferred terms in non-bold type. Terms considered undesirable because their use could lead to confusion are followed by the word "deprecated" in italics.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, 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.

References

The titles of the publications referred to in this standard are listed on the inside back cover.

Section 1. Physical properties

NOTE For more detailed definitions of a number of the terms relating to thermal properties, see BS 874.

No.	Term	Description
101	**absorptivity**	The ratio of the amount of radiation absorbed by a surface to the amount falling on the surface. It can refer to radiation of any wavelength but commonly refers to solar radiation.
102	**air permeability**	The fluid permeability of a material where air is the given fluid. See 113.
103	**bulk density**	The mass per unit volume of the insulating material (kg/m^3).
104	**compressibility**	The relation between deformation and applied mechanical pressure on a material.
105	**compressive strength crushing strength**	The capacity of a material to withstand mechanical pressure up to the point of fracture. NOTE For materials that do not fail by shattering, the compressive strength may be deduced arbitrarily from a load/deformation curve.
106	**convection coefficient** (f_c)	The quantity of heat transferred by convection in unit time to or from unit area of surface, divided by the temperature difference between the surface and the surrounding air or other fluid [$W/(m^2\ K)$].
107	**covering capacity (dry)**	The area covered to unit thickness by unit mass of material as supplied, when it has been applied and dried to constant mass in accordance with BS 2972 (m^2 per tonne at unit thickness).
108	**creep**	Progressive permanent deformation of a material under load.
109	**dimensional change (expansion or shrinkage)**	The increase or decrease in a characteristic dimension, which may be measured in linear, superficial or volumetric units.
110	**emissivity** (E)	The ratio of the thermal radiation from unit area of a surface to the radiation from unit area of a full emitter ("black body") at the same temperature.
111	**equivalent thermal conductivity**	The thermal conductivity assigned to a hypothetical uniform material of the same dimensions as a particular composite insulation that would give the same rate of heat flow under identical conditions.
112	**flexural strength modulus of rupture cross-breaking strength**	The capacity of a material to withstand bending up to the point of fracture.
113	**fluid permeability**	The property of a material that determines the rate at which a given fluid passes through it under the influence of unit pressure gradient. See 102.
114	**mean free path**	The average distance travelled by a gas molecule between successive collisions with other molecules.
115	**nominal thickness designated thickness**	Manufactured thickness within agreed tolerances.

No.	Term	Description
116	**packing density**	The bulk density of loose-fill insulating material after application.
117	**permanent set**	The deformation of a material that remains after removal of the deforming stress.
118	**porosity (apparent)**	The volume of open pores in a material expressed as a percentage of the total volume of the material.
119	**porosity (true)**	The combined volume of open and closed pores in a material, expressed as a percentage of the total volume of the material.
120	**radiation coefficient** (f_r)	The net quantity of heat radiated per unit time from unit area of a surface divided by the temperature difference between the radiating surface and the surroundings with which it is exchanging radiation [W/(m^2 K)].
121	**radiation constant** (σ) **Stefan's constant**	The constant of proportionality of the Stefan-Boltzman equation relating the radiation loss per unit area of the surface to the fourth power of the absolute temperature of a body. $\sigma = 5.67 \times 10^{-8}$ [W/(m^2 K^4)].
122	**reflectivity** (r)	The ratio of the amount of thermal radiation reflected from a surface to the amount that falls on the surface.
123	**resilience**	The ability of a material to recover or partly recover its original dimensions after deformation.
124	**shape factor**	A quantity derived from surface area divided by thickness, used in calculating heat transfer by thermal conduction and varying with the geometry of the insulation (m).
125	**surface coefficient** (f)	Thermal transmission per unit area to or from a surface in contact with air or other fluid, due to convection, conduction and radiation, divided by the difference between the temperature of the surface and the effective ambient temperature in "steady state" conditions [W/(m2 K)]. NOTE 1 The value of the surface coefficient depends on many factors, such as the movement of air or other fluid, the roughness and emissivity of the surface and the temperature and nature of the surroundings. NOTE 2 The term "effective ambient temperature" is used to indicate that the actual measured temperature may need to be corrected for factors such as atmospheric humidity, solar radiation and wind velocity before comparable results can be obtained.
126	**surface resistance** (1/f)	The reciprocal of surface coefficient (see 125).
127	**tensile strength**	The capacity of a material to withstand tension up to the point of fracture.
128	**thermal capacity**	The quantity of heat required to raise the temperature of a given structure or quantity of material by 1 K.
129	**thermal capacity per unit mass** (c) **specific heat capacity**	The quantity of heat required to raise the temperature of unit mass by 1 K [J/(kg K)].
130	**thermal capacity per unit volume**	Thermal capacity per unit mass multiplied by bulk density [J/(m^3 K)].

No.	Term	Description
131	**thermal conductance** (C)	The thermal transmission through unit area of a slab of material, or of a structure, divided by the temperature difference between the hot and cold faces in "steady state" conditions [W/(m^2 K)]. NOTE 1 When the hot face and the cold face are not equal in area, e.g. the internal and external surfaces of insulation on a box or pipe, it is necessary to state the position at which the area is measured. NOTE 2 Thermal conductance depends upon the actual thickness of the material or structure, whereas thermal conductivity refers to unit thickness of the material.
132	**thermal conductivity** (λ)	The thermal transmission through unit area of a slab of a uniform material of unit thickness when unit difference of temperature is established between its faces [W/(m K)]. NOTE 1 Thermal conductivity was formerly given the symbol k. NOTE 2 W/(m K) is a simplification of W m/[m^2 K)].
133	**thermal diffusivity** (α)	Thermal conductivity divided by thermal capacity per unit volume (m^2/s).
134	**thermal resistance** (R)	The reciprocal of thermal conductance.
135	**thermal resistivity** (1/λ)	The reciprocal of thermal conductivity.
136	**thermal transmission** (q) **heat flux**	The quantity of heat flowing in unit time (W).
137	**thermal transmittance** (U) **overall heat transfer coefficient**	The thermal transmission through unit area of a given structure divided by the difference between the effective ambient temperatures on either side of the structure in "steady state" conditions [W/(m^2 K)]. NOTE 1 If the structure is not a simple slab, it is necessary to state where the area is measured. NOTE 2 "Transmittance" differs from "conductance" because the temperature difference is measured between different positions. For conductance the temperature difference is that between the faces; for transmittance it is that between the effective ambient temperatures on either side of the structure. Thus the thermal transmittance (U) of a structure involves both the thermal conductance and the surface coefficient of the structure. NOTE 3 The term "effective ambient temperature" is used to indicate that the actual measured temperature may need to be corrected for factors such as atmospheric humidity, solar radiation and wind velocity before comparable results can be obtained. The U-value is normally referred to a particular combination of these factors.
138	**total thermal resistance** (1/U)	The sum of the surface resistances and the thermal resistance of the structure itself.
139	**U-value**	A conventionally used value of thermal transmittance of a structure related to design conditions. NOTE For calculation of standardized U-values, reference should be made to Building Research Establishment Digest no. 108.
140	**vapour permeance**	The property of a material that determines the rate at which vapour passes through it under the influence of unit partial water vapour pressure difference across the specimen [g/(s MN)]. NOTE For water vapour permeance conversion factors see BS 2972.
141	**vapour permeability**	The vapour permeance of a material per unit thickness [g m/(s MN)]. See also BS 3177.
142	**vapour resistance**	The reciprocal of vapour permeance (see 140).
143	**vapour resistivity**	The reciprocal of vapour permeability (see 141).

Section 2. Insulating materials

No.	Term	Description
201	**aluminium foil**	Thin sheets of rolled aluminium (0.15 mm thick and under).
202	**aluminium silicate fibre**	Filaments or fibres produced from a melt of alumina and silica.
203	**animal hair**	Natural fibre obtained from the coats of animals (see also *wool,* 276).
204	**asbestos**	The generic name for those silicate minerals that cleave naturally into fibres, the three important forms being chrysotile (white asbestos), crocidolite (blue asbestos) and amosite.
205	**asbestos insulating board**	A board containing a large percentage (by mass) of asbestos fibre, normally bonded with an inorganic bonding agent substantially insoluble in water.
206	**asbestos millboard**	Board based on a mix that consists mainly of asbestos fibre and a binder (frequently organic). Fillers may be included.
207	**asbestos paper**	Paper-like material of which the main constituent is asbestos fibre.
208	**blowing wool**	Granulated wool (see 230) for application by blowing.
209	**calcium silicate insulation**	Hydrated calcium silicate with added reinforcing fibres.
210	**cellular asbestos paper**	Sheet insulation formed by combining alternate sheets of flat with corrugated asbestos paper, and securing the adjacent sheets together at their points of contact by means of an adhesive.
211	**cellular glass** foamed glass	A lightweight expanded glass with small cells, preferably non-intercommunicating, produced by a foaming process.
212	**cellular plastics** expanded plastics foamed plastics	A generic term for plastics material of which the density is reduced by the presence of numerous small cavities (cells), interconnecting or not, dispersed throughout the mass. NOTE See BS 1755 for individual definitions.
213	**cellular rubber**	A generic term for vulcanized rubber containing numerous thin-walled cells filled with air or other gas. The walls of the cells may be vulcanized to the soft rubber stage or completely to the hard rubber (ebonite) stage.
214	**ceramic fibre**	Fibrous material, loose or fabricated into convenient forms, mainly intended for use at appropriate elevated temperatures. The fibres may consist of silica (SiO_2) or of an appropriate metal silicate, e.g. alumino-silicate. Alternatively, they may be formed synthetically from appropriate refractory metal oxides, e.g. alumina, zirconia.
215	**compressed straw slab**	Natural straw compressed and bonded with its own resin.
216	**corkboard**	Preformed material composed of granulated cork bonded by heating under pressure, with or without added adhesive.
217	**diatomaceous brick**	A fired insulating brick composed mainly of diatomite

No.	Term	Description
218	**diatomite** kieselguhr diatomaceous earth moler earth *(deprecated)*	Cellular siliceous particles of microscopic size, composed of the skeletons of diatoms.
219	**eel grass**	The dried grass-like leaves of the sea plant *Zostera marina*.
220	**exfoliated vermiculite**	A lightweight granular material formed by expanding the multileaf structure of the micaceous mineral vermiculite
221	**expanded ebonite** expanded hard rubber	Cellular rubber made from masticated raw rubber, in which the cells are non-intercommunicating and in which vulcanization has been carried to the ebonite stage.
222	**expanded perlite**	A cellular particulate product made by expanding perlitic volcanic rock by heat.
223	**felt**	A semi-rigid or flexible sheet consisting of closely interlaced fibres with or without the addition of binders or adhesives.
224	**flocculent gypsum**	Loose gypsum processed to produce a flocculent material.
225	**foamed slag aggregate**	Furnace slag treated to produce lightweight aggregate (see 243).
226	**foamed slag concrete**	Insulating concrete [see 236 a)] with foamed slag as the aggregate.
227	**foamed-in-situ plastics**	Cellular plastics produced in situ and foamed by physical or chemical means.
228	**glass fibre** glass wool	Mineral fibre produced from molten glass.
229	**granulated cork**	Cork untreated except for grinding or milling.
230	**granulated wool**	See pelleted mineral wool (253).
231	**hollow brick** **hollow block**	A building brick (or block) containing one or more cavities or penetrating holes.
232	**hollow glass blocks** glass bricks	Hollow translucent glass units, usually having various patterns moulded on the internal or external surface or on both.
233	**insulating board**	A generic term for sheet insulating material generally made from felted wood or mineral fibre.
234	**insulating brick** high porosity brick	A brick that contains a high volume ratio of air cells to solid matrix.
235	**insulating castable refractory**	Insulating concrete [see 236 a)] containing a suitably graded insulating refractory aggregate.
236	**insulating concrete** lightweight concrete aerated concrete autoclaved aerated concrete cellular concrete foamed cement foamed concrete	a) Concrete containing a substantial percentage by volume of lightweight aggregate. b) Concrete made cellular by aeration or foaming. May be cured by autoclaving.
237	**insulating plaster**	See *premixed lightweight plaster* (259).

No.	Term	Description
238	**insulating plasterboard**	Gypsum plasterboard (see BS 1230) with one or both faces veneered with a polished metal foil.
239	**insulating rope**	a) A loosely braided sleeve of mineral fibre yarn packed with mineral fibre. b) A twisted rope of man-made mineral fibre.
240	**kapok**	A silky fibre obtained from the seed pods of certain tropical silk-cotton trees.
241	**lamella products**	Mineral wool products in which the predominant orientation of the fibres has been arranged to be perpendicular to the faces.
242	**latex foam rubber** foamed rubber	Cellular rubber made directly from liquid latex and in which the cells are either wholly or partly intercommunicating.
243	**lightweight aggregate**	Porous or cellular granules, used with a bonding agent or as a loose fill.
244	**loose wool**	Mineral wool without a bonding agent, although a fibre dressing may be applied to minimize fibre fly and irritation.
245	**magnesia**	Insulating material containing about 85 % by mass of light basic magnesium carbonate, the balance being substantially of reinforcing fibres.
246	**magnesium carbonate (basic)**	A powder insulant composed of finely divided, light basic magnesium carbonate without additive.
247	**man-made fibres**	Fibres manufactured by man as distinct from those that occur naturally.
248	**man-made mineral fibres**	Fibres manufactured from glass, rock or other minerals, or from readily-melted slags. The term includes metallic oxide fibres made by chemical processes.
249	**millboard, engineers' millboard, organic**	A tough flexible board made from cellulosic fibre.
250	**mineral fibre**	A generic term for all non-metallic inorganic fibres.
251	**mineral wool**	A generic term for mineral fibres of a woolly consistency, normally made from molten glass, rock or slag.
252	**paper felt**	Thin sheet comprising compressed cellulosic fibre, usually with the addition of size or starch.
253	**pelleted mineral wool** granulated wool	Mineral wool shredded or chopped into granules or nodules.
254	**perforated brick**	A building brick with multiple holes, usually in the direction of one of the short axes.
255	**perlite plaster**	Premixed lightweight plaster (see 259) with expanded perlite (see 222) as the aggregate.
256	**plastic composition** thermal insulating cement (USA)	Insulating material in loose, dry form, prepared for application as a paste or dough by mixing with water, usually on site, and normally setting under the influence of heat applied to the internal surface.
257	**plastic composition, self-setting**	Plastic composition that will set without the application of heat.

No.	Term	Description
258	**plastics**	A material that contains a high polymer as an essential ingredient and that at some stage in its processing into finished products can be shaped by flow. NOTE 1 Elastomeric materials that are also shaped by flow are not considered as plastics. NOTE 2 In the United Kingdom and some other countries the singular as well as the plural form of the noun is "plastics" (see BS 1755). This differentiates it from the adjective "plastic".
259	**premixed lightweight plaster**	Gypsum plaster containing a substantial percentage of lightweight aggregate (see BS 1191-2).
260	**refractory insulating brick**	A fired insulating brick that will withstand high temperatures, generally over 1 100 °C.
261	**regranulated cork**	Corkboard off-cuts and waste, ground or milled.
262	**rock wool**	Mineral wool produced from naturally occurring igneous rock.
263	**silica aerogel**	Silica powder in the form of porous particles, the pores having dimensions comparable with the mean free path of the molecules of air at atmospheric pressure.
264	**silica fibre**	Mineral fibre consisting essentially of silica (SiO_2).
265	**slag wool**	Mineral wool produced from molten furnace slag.
266	**softboard**	Board made from lightly bonded wood or mineral fibre. (See 274.)
267	**sponge plastics**	Cellular plastics, generally flexible, having a substantially open cell structure.
268	**sponge rubber**	Flexible cellular rubber, made from masticated raw rubber, in which the cells are either wholly or partly intercommunicating.
269	**sprayed asbestos**	Sprayed insulation produced by projecting specially prepared asbestos fibre simultaneously with a fine liquid spray.
270	**sprayed man-made mineral fibres**	Sprayed insulation produced by projecting specially prepared man-made mineral fibres simultaneously with a fine liquid spray.
271	**synthetic fibres**	Man-made fibres (see 247) built up from chemical elements or compounds, in contrast to those made from fibre-forming materials that occur naturally.
272	**vermiculite concrete**	Insulating concrete [see 236 a)] with exfoliated vermiculite as the aggregate.
273	**vermiculite plaster**	Premixed lightweight plaster (see 259) with exfoliated vermiculite as the aggregate.
274	**wood fibre board**	Wood fibre, compressed and bonded or felted (see 276).
275	**wood wool slab**	Wood wool compressed and bonded with an inorganic cementing agent.
276	**wool**	A generic name used loosely for a random mass of any type of fibre.

Section 3. Descriptive terms

No.	Term	Description
301	**air space insulation**	Insulation afforded by an air space between surfaces. The air space is generally enclosed and sometimes subdivided.
302	**backing insulation**	Insulating material shielded from excessive temperature and/or abrasive conditions by a more resistant protective material, for example insulating brick protected by firebrick and not exposed to furnace conditions (cf. hot-face insulation, 313).
303	**batt**	A discrete portion of mat in the form of rectangular pieces, generally between 1 m and 3 m long, and usually supplied flat or folded.
304	**blown insulation**	Loose-fill insulation (see 318) applied by blowing.
305	**composite insulation**	Multilayer insulation (see 322) in which layers have different characteristics.
306	**double glazing**	A form of glazing that incorporates two panes of glass separated by substantially stationary air or other gas. (See *multiple glazing,* 323.)
307	**expansion joint**	An arrangement in an insulation system to minimize the risk of cracking due to thermal movement.
308	**fibrous insulation**	Insulation constructed from fibres, naturally occurring or manufactured, that incorporate single or composite filaments generally circular in cross section and of length considerably greater than the diameter.
309	**flexible insulation**	A material that tends to conform to the shape of the surface against which it is laid, or is so designed as to alter its manufactured shape to accommodate bends and angles.
310	**linear metre** **metre run**	A length of 1 m measured along the centre longitudinal axis of a pipe.
311	**grooved slab** **slotted slab**	A slab with a deep saw-cut channel of triangular cross section, so that it can be applied to a curved surface without fracturing the exposed face.
312	**high-vacuum insulation**	Insulation consisting of a sealed space from which the air has been removed to give a pressure less than 0.13 Pa, the surfaces facing the space being normally highly polished. NOTE The unit of pressure formerly used in high vacuum technology was the torr. 1 torr = 133 Pa. 1 Pa = 1 N/m^2.
313	**hot-face insulation**	Insulation that is exposed to the highest temperature of a system; in furnace insulation, normally the layer that has at least one surface exposed to the full furnace temperature (see also 302).
314	**insulating jacket**	A flexible construction of insulating material, totally enclosed in fabric, film, paper or thin metal, that is designed to fit individual vessel sizes and may or may not be stabbed (see 438) or quilted (see 431).
315	**lagging** (*deprecated*)	Obsolete term for *thermal insulation* (342).

No.	Term	Description
316	**lags**	Preformed rigid insulation for longitudinal application to cylinders larger than those for which pipe sections are available. There are three types as follows. a) *Plain lags.* Lags having rectangular cross section, for use on cylinders of such diameter that this shape conforms sufficiently closely to the surface. b) *Bevelled lags.* Lags similar to plain lags, but with one or more edges bevelled. c) *Radiused and bevelled lags.* Bevelled lags with faces curved to fit the surface of the cylinders (sometimes known as curved and bevelled lags).
317	**load-bearing structural insulating materials**	Insulating materials, in the form of bricks, blocks or other rigid shapes, that have good resistance to compression and will thus carry substantial superimposed loads without deformation.
318	**loose-fill insulation**	Material in the form of powder, granules, foamed, expanded or exfoliated aggregate or loose or pelleted fibres, used in the dry state as a filling for cavities, casings or jackets.
319	**mat** blanket	Flexible fibrous insulating material of low density that is bonded or unbonded, woven, felted, carded or needled. It is not enclosed but may be faced and is supplied in the form of rolls or batts. NOTE Ceramic fibre is not bonded. Mineral fibre is usually bonded.
320	**mattress**	A flexible construction comprising an insulating material faced on one side or both sides, or totally enclosed with fabric, film, paper, wire netting, expanded metal or similar covering attached mechanically to the insulating material.
321	**mitred joint**	A joint made by cutting (mitring) preformed pipe sections to fit around bends in a pipeline.
322	**multilayer insulation**	Insulation comprising more than one layer of insulating material.
323	**multiple glazing**	A form of glazing on the same principle as double glazing but incorporating three or more panes of glass.
324	**pipe sections**	Sections of insulating material in cylindrical form suitable for application to pipes.
325	**plumber's joint** balled-in joint	A pipe flange insulation of plastic composition so named because of its resemblance in shape to the wiped joint used in joining lead piping
326	**powder insulation** granular insulation	Loose-fill insulation in the form of a dry powder. When the particles are large enough to be clearly seen individually, the term "granular" is generally used instead of "powder", but no precise dividing line can be defined.
327	**preformed insulation**	Thermal insulating material fabricated in such a manner that at least one surface conforms to the shape of the surface to be covered and which, when handled, will maintain its shape without cracking, breaking, crumbling or permanent deformation.

No.	Term	Description
328	**quilt**	A flexible construction comprising an insulation material faced on one or both sides or totally enclosed with fabric, film or paper, quilted by means of staples or stitching at suitable centres. The term is sometimes used for a construction more properly described as a mattress (see 320).
329	**radiation barrier (thermal)**	Material, generally in sheet form, used to restrict the transmission of radiant heat.
330	**reflecting powder insulation**	Powder insulation (see 326) in which the powder contains one or more opacifying components having either low emissivity or high absorptivity, thus reducing the heat transfer by radiation.
331	**reflective insulation**	Insulation consisting of one or more surfaces of low emissivity.
332	**rigid insulation**	A material that substantially retains its manufactured shape.
333	**roll**	Mat supplied in the form of rolled cylindrical packages.
334	**sandwich panel**	A rigid construction comprising an insulating material faced on both sides with a sheet material.
335	**sheet insulation**	Substantially flat insulating material, in rigid or flexible form, the length and width of which are very much greater than the thickness. Sometimes applied loosely to slab insulation (see 337).
336	**shot**	Solid particles of fusible rock, slag or glass that have not been elongated during the manufacture of mineral fibres from a fused mass. Frequently such a particle forms one end of a mineral fibre.
337	**slab insulation** block insulation	Preformed insulation of rectangular cross section.
338	**slotted slab**	An alternative name for grooved slab (see 311).
339	**soaking heat**	Heat supplied to all parts of a material in such a way that a substantially uniform temperature ("soaking temperature") is attained throughout.
340	**soaking time**	The time during which a material is maintained at the selected soaking temperature.
341	**sprayed insulation**	An adherent coating of insulating material applied to a surface by spraying.
342	**thermal insulation**	a) A material or system that has the property of resisting the transfer of heat. b) The activity of applying thermal insulating materials.
343	**unbonded mat**	Loose wool supplied in roll form, usually with interleaving paper.
344	**vacuum insulation**	Insulation consisting of a sealed evacuated space, which may contain porous insulant.
345	**vacuum jacket**	An evacuated annular metal shell that may or may not contain porous insulant.

No.	Term	Description
346	**vacuum powder insulation**	Powder insulation enclosed in a sealed space from which the air has been evacuated.
347	**vacuum reflective insulation**	Insulation consisting of a number of reflecting surfaces separated by spacers of low thermal conductivity, the whole contained in a sealed space evacuated to a pressure below 0.13 Pa. NOTE The unit of pressure formerly used in high vacuum technology was the torr. 1 torr = 133 Pa. 1 Pa = N/m^2.
348	**vapour barrier**	A vapour check with water vapour permeance not exceeding 0.067 g/(s MN) when tested in accordance with BS 2972.
349	**vapour check**	Material used to restrict the transmission of vapour (generally water vapour). See also 140 to 143.
350	**wetted insulation**	Porous insulation applied to the interior of a container for liquefied gases; the contained liquid is in direct contact with the insulant and by evaporation fills the pores near the warm surface with vapour.

Section 4. Fittings and accessory materials

401	**anchor fittings**	See *securing attachments* (435).
402	**asphalt**	A mixture of bitumen with a substantial proportion of inert mineral matter.
403	**attachments**	See *securing attachments* (435).
404	**binding wire**	Light-gauge wire for binding insulating materials to pipes and similar structures; sometimes used loosely for lacing wire (see 424).
405	**bitumen**	A black or brown viscous liquid, or a solid; consisting essentially of hydrocarbons and their derivatives, that is substantially non-volatile, softens gradually when heated, and possesses waterproofing and adhesive qualities. It is obtained by refinery processes for mineral oil, and is also found as a natural deposit or as a component of naturally occurring asphalt, in which it is associated with mineral matter.
406	**bitumen emulsion**	A dispersion of bitumen in water, often containing mineral fibres and other inert fillers.
407	**bitumen, hot-applied**	Bitumen applied in a molten state.
408	**bitumen primer**	A low-viscosity bitumen preparation suitable for priming porous surfaces. Primers may be of either the emulsion or the cut-back type.
409	**brattice cloth**	A closely woven, coarse, heavy cloth normally made from twisted jute yarns.
410	**brine putty**	A mastic compound (see 425) used for insulation work at temperatures below ambient. It is usually of the petroleum jelly base with a filler of regranulated cork.

No.	Term	Description
411	**canvas**	A closely woven fabric of cotton, flax, hemp or jute characterized by strength and firmness.
412	**coal tar enamel**	A composition of specially processed coal tar pitch combined with an inert mineral filler that contains no bitumen, either of petroleum or natural origin.
413	**cut-back bitumen**	A solution of bitumen in an organic solvent, often containing mineral fibres and other inert fillers.
414	**expanded metal**	Metal network made by suitably stamping or cutting sheet metal and stretching it to form open diamond-shaped meshes.
415	**fabric wrapping**	A non-metallic flexible covering, normally a textile fabric, wrapped over the outer surface of insulation (see also 430).
416	**gilsonite**	A naturally occurring bitumen characterized by a relatively high melting point.
417	**glass cloth**	Fabric woven from continuous filament or staple glass fibre.
418	**glass tissue**	A random arrangement of glass fibres bonded together to form a membrane.
419	**hard-setting composition**	Clay-bound finishing material that is supplied in loose dry form, prepared for application by mixing with water, and dried by the application of heat.
420	**hardboard**	Highly compressed board of wood fibre used as a covering material for insulation on flat or curved surfaces. NOTE The term "hardboard" has also been applied to describe a stiff, thick paper, sometimes oiled, used for wrapping flexible insulation on cylindrical surfaces, but its use in this sense is deprecated. This material is more correctly described as "presspahn"; see BS 3203.
421	**haunching** **flaunching**	The construction of a sloping surface, for example to prevent the accumulation of moisture.
422	**hessian (open or close mesh)**	A loosely woven, coarse, plain cloth normally made from single-strand jute yarns.
423	**insulation sleeve**	A tube of material of low thermal conductivity passing through a structure to accommodate pipes, ducts, cables or similar fittings.
424	**lacing wire** **tie wire**	Light gauge wire, single or multistrand, used for lacing together adjacent edges of mattresses or of metal coverings, or for securing insulating material on substantially flat surfaces. NOTE The term is sometimes used loosely for binding wire (see 404).
425	**mastic compound**	a) Strictly a resinous gum extruded from a tree and used in the preparation of varnishes. b) Loosely, in current practice for the insulation trade, viscous organic plastics coating, filling or adhesive compounds or heavily filled bituminous (asphaltic) compounds.
426	**metal cleading** **cladding** **sheathing**	Sheet metal fitted as a protective finish over insulation. NOTE These terms have the same meaning but local usage may vary.

No.	Term	Description
427	**muff cover**	A plain cylindrical cover, in one or more pieces, composed of preformed or flexible insulating material that spans over a flange to rest on the adjacent pipe insulation. It is assumed that this adjacent insulation projects above or is built up higher than the line of the flange.
428	**pipe box**	A horizontal or vertical casing packed with loose-fill insulation, enclosing a set of pipes.
429	**plastics coating** **plastics finish**	Plastics material applied in liquid form.
430	**plastics wrapping** **plastics covering**	Flexible plastics material, in the form of tape, sheet or plastics-impregnated cloth, applied as a wrapping to insulation.
431	**quilting**	The operation of securing together through the basic insulating material the fabrics or other coverings on the two faces, usually by means of stitching with continous thread or wire.
432	**roofing felt**	A sheet of matted fibres rendered substantially impervious to water by treatment with bitumen or pitch.
433	**rubber-modified bitumen**	A bitumen preparation containing raw or compounded rubber or a bitumen emulsion containing rubber latex and inert fillers.
434	**scrim cloth**	A generic term for plain cloth of open weave, characterized by its very light weight.
435	**securing attachments**	Anchor fittings fixed permanently to the surface to be insulated, by means of adhesives or by welding. Attachments for welding may be flat or angle cleats, pipe bosses, threaded pillar nuts, washers or nuts welded on edge, studs or various kinds, e.g. round, flat, split pins, fork studs, etc. Plastics attachments, e.g. nylon clips, normally are secured by suitable adhesive (subject to temperature limitations).
436	**securing bands** **non-corrodible bands**	Bands of metal (suitably treated as may be necessary to minimize corrosion), or of plastics material, used for securing insulation to pipes or other structures.
437	**self-setting cement**	Finishing material, based on Portland cement, that is supplied as a dry powder and, when mixed with water in suitable proportions, will set without the application of heat (see 419).
438	**stabbing**	An operation similar to quilting (see 431) except that the securing thread or wire is cut and secured at each point of fixing and is not continuous with other points.
439	**supports for insulation** (and associated cleading if appropriate)	Supports required to bear light insulation loading (as distinct from pipe and vessel supports). They may consist of metallic flat bars, rings, part rings, varying lengths of angle, or of studs; they may rest on the appropriate attachments or they may be located for ease of removal by being bolted, laced or clipped to the fixed attachments on the plant.
440	**valve box** **flange box**	A preformed rigid box, constructed of or lined with insulating material, shaped to enclose a flange or valve, and usually sectionally removable.

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Publications referred to

BS 874, *Methods for determining thermal insulating properties, with definitions of thermal insulating terms.*

BS 1191, *Gypsum building plasters.*

BS 1191-2, *Premixed lightweight plastics.*

BS 1230, *Gypsum plasterboard.*

BS 1755, *Glossary of terms used in the plastics industry.*

BS 2972, *Methods of test for inorganic thermal insulating materials.*

BS 3177, *Method for determining the permeability to water vapour of flexible sheet materials used for packaging.*

BS 3203, *Glossary of paper, stationery and allied terms.*

PD 5686, *The use of SI units*[1)].

[1)] Referred to in the foreword only.

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