

Glossary of

Electrotechnical, power, telecommunication, electronics, lighting and colour terms —

Part 2: Terms particular to power
engineering —

Group 10: Industrial electroheating
terminology

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- Association of Consulting Engineers
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- Electricity Supply Industry in England and Wales
- Electronic Engineering Association
- Institute of Physics
- Institution of Electrical Engineers
- Ministry of Defence
- Power Generation Association (BEAMA Ltd.)
- Radio and Electronics Technical Press
- Telecommunication Engineering and Manufacturing Association (TEMA)

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Foreword

This Group of Part 2 of BS 4727, prepared under the direction of the General Electrotechnical Engineering Standards Committee, contains terms and definitions relating to industrial electroheating. The text of this Part of BS 4727 is identical with the English text of Chapter 841, first edition, 1983, of the International Electrotechnical Vocabulary, published by the International Electrotechnical Commission (IEC). The following errors should be noted:

- a) In 210 1215, the note should read “The bottom is formed by separate sections, shaped for example like orange segments, petals or clam shells”.
- b) In 210 1268, “Balance gas” should read “Balanced gas”.

BS 4727 combines into one glossary the subjects previously covered by BS 204 “*Glossary of terms used in telecommunications (including radio) and electronics*”, BS 205 “*Glossary of terms used in electrical engineering*”, BS 233 “*Glossary of terms used in illumination and photometry*” and BS 1611 “*Glossary of colour terms used in science and industry*”. These four glossaries have now been withdrawn.

The glossary is divided into four main Parts, each of which is further subdivided into Groups. Each Group will comprise the terms and definitions used in a particular branch of electrical engineering and will be issued individually as soon as it is completed. This arrangement makes it possible to add new Groups or revise existing Groups at any time without affecting the remainder of the glossary.

The four main Parts of the glossary are as follows.

- *Part 1: Terms common to power, telecommunications and electronics;*
- *Part 2: Terms particular to power engineering;*
- *Part 3: Terms particular to telecommunications and electronics;*
- *Part 4: Terms particular to lighting and colour.*

Fundamental and general terms common to power, telecommunications and electronics respectively form the first two Groups of Part 1. General terms particular to Part 2 and Part 3 similarly form the first Groups of their respective Parts. The specialist Groups contain only the terms and definitions relating to their subject.

As far as has been practicable all terms and definitions established in current usage and falling within the scope of this glossary have been included. Experience has shown that it is rarely possible to replace, or even to modify, a well established term no matter what the logical or aesthetic shortcomings of that term may be. Current usage has therefore been accepted as the authority for terms and their meanings except where there has been a very good reason for doing otherwise, e.g. where terms have been considered to be fundamentally wrong, ambiguous, superfluous or in need of standardization. Where two or more synonymous terms are in use, those which are deprecated are omitted from the body of the text but are entered in the alphabetical index with a cross-reference to the standard term. In cases where it was felt that the time was not yet right to deprecate a synonym, preferred terms are given first and other terms are printed in less prominent type to indicate the intention to deprecate them in the course of time. Where synonyms are considered of equal value they are shown in the same type.

Where terms are used with somewhat different meanings in different branches of electrical engineering, appropriate definitions are given in the Groups of the glossary corresponding to these branches. Such a definition, when taken out of the context of its Group, should always be quoted with a preamble indicating its proper context.

It is to be noted that the given definition of a term represents the generally accepted meaning of that term. Under no circumstances should it be regarded as taking the place of a specification.

An effort has been made to arrange the terms in a logical order proceeding from the general to the specific and from the whole to the part and placing allied terms in proximity. Each term has assigned to it a Part number (one digit) and a Group number of two digits followed by a space and four digits, the first digit of which represents the section, the second digit the subsection and the last two digits the place within the subsection. The International Electrotechnical Vocabulary employs a different numbering system and for convenience the IEV number is given in parentheses after the BS number for each term.

A general view of the arrangement of the Group in the glossary can be obtained from the guide to the glossary. An alphabetical index of the terms of the Group is provided at the end to facilitate reference to particular terms. For simplicity, only the last four digits of a term's number are quoted in the index. It is recommended that the user of any Group of the glossary should consider the Group in association with the Groups covering general or fundamental terms within the Part, for Parts 2 and 3, and also together with Groups 01 and 02 of Part 1.

In this glossary parentheses () enclose words or phrases that are not part of the term of definition and can be omitted without affecting the meaning.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 30 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.

Guide to the glossary

Part 1 Terms common to power, telecommunications and electronics

- Group 01 Fundamental terminology
- Group 02 Electrical and magnetic devices terminology
- Group 03 Relay terminology
- Group 04 Measurement terminology
- Group 05 Semiconductor terminology
- Group 06 Electronic tube terminology
- Group 07 Magnetism terminology
- Group 08 Piezo-electric device terminology
- Group 09 Radio interference terminology
- Group Radiological terminology^a
- Group Integrated electronic circuit terminology^a

Titles to any further groups will be added in due course.

Part 2 Terms particular to power engineering

- Group 01 General power terminology
- Group 02 Static converter terminology
- Group 03 Rotating machinery terminology
- Group 04 Transformer terminology
- Group 05 Voltage fluctuation terminology
- Group 06 Switchgear and controlgear terminology (including fuse terminology)
- Group 07 Tariffs terminology
- Group 08 Power cable terminology
- Group 09 Transducer terminology
- Group 10 Industrial electroheating terminology**
- Group Power systems terminology^a
- Group Systems operation terminology^a
- Group Traction terminology^a

Titles to any further groups will be added in due course.

Part 3 Terms particular to telecommunications and electronics

- Group 01 General telecommunication and electronics terminology
- Group 02 Telephony terminology
- Group 03 Telegraphy, including facsimile, terminology
- Group 04 Broadcasting, radio and television terminology
- Group 05 Propagation and media terminology
- Group 06 Radio location and navigation terminology
- Group 07 Radiocommunication terminology
- Group 08 Electro-acoustics terminology^a
- Group 09 Waveguide terminology
- Group 10 Recording and reproduction of sound and video terminology
- Group 11 Space radio communications terminology

Titles to any further groups will be added in due course.

Part 4 Terms particular to lighting and colour

- Group 01 Radiation and photometry terminology
- Group 02 Vision and colour terminology
- Group 03 Lighting technology terminology

^a Not yet published, as at March 1985.

210 1 Terms common to several methods of heating

210 11 (841-01) General terms

No.	Term	Definition
210 1101 (841-01-01)	electroheat	The branch of science and technology dealing with the transformation of electrical energy into thermal energy for useful purposes.
210 1102 (841-01-02)	electrothermal	Qualifies all techniques related to electroheat, or all devices which function in accordance with its principles.
210 1103 (841-01-03)	electroheat technology	The technique relating to the generation and application of heat in all fields of electric heating.
210 1104 (841-01-04)	industrial electroheat	Electroheat applied by industry.
210 1105 (841-01-05)	electroheat equipment	An appliance or assembly of technological devices for converting electrical energy into thermal energy.
210 1106 (841-01-06)	electroheat installation	An installation composed of an electroheat equipment and the electrical and mechanical equipment needed for its operation and use.
210 1107 (841-01-07)	electric heating	The deliberate production of heat by electrical phenomena.
210 1108 (841-01-08)	direct electric heating	An electric heating process in which the current passes through the material to be heated.
210 1109 (841-01-09)	indirect electric heating	An electric heating process in which the heat generated is transferred to the material to be heated.
210 1110 (841-01-10)	electric surface heating	The heat generated in the surface layer of a body to be heated by electrical means in order to raise or maintain its temperature.
210 1111 (841-01-11)	through heating	The heating of a workpiece throughout to a temperature as uniform as possible.
210 1112 (841-01-12)	localized heating	The heating of a confined area of a body.
210 1113 (841-01-13)	stored heat	The heat which is put into a material of high specific heat and/or high latent heat primarily for later utilization.
210 1114 (841-01-14)	useful heat	The quantity of heat which is usable during the total heating.
210 1115 (841-01-15)	recuperative heat	The quantity of heat which is not usable during the total heating process and which can be recuperated.
210 1116 (841-01-16)	thermal losses	The quantity of heat lost during the heating process, being the difference between the total heat input and useful heat.
210 1117 (841-01-17)	thermal insulation	The material used to reduce heat transfer between two media.
210 1118 (841-01-18)	working temperature	The temperature which is required for treatment of the charge material.

No.	Term	Definition
210 1119 (841-01-19)	operating temperature	The temperature at which an electroheat equipment operates.
210 1120 (841-01-20)	maximum continuous operating temperature	The highest temperature at which an electroheat equipment can be operated continuously.
210 1121 (841-01-21)	rated temperature	The temperature normally used for which the furnace or electroheating equipment is designed.
210 1122 (841-01-22)	stand-by losses; standing losses	The power consumed by electroheating equipment to maintain the rated temperature at the steady state only.
210 1123 (841-01-23)	Joule effect	The phenomenon in which a current produces heat in a material at a rate proportional to the resistivity of the material and to the square of the current density.
210 1124 (841-01-24)	skin effect	The phenomenon in which the r.m.s. density of a time-varying current is greater nearer the surface of a conductor than in its interior.
210 1125 (841-01-25)	pinch effect	The phenomenon of contraction, with increasing current, of the current-carrying cross-section of a fluid.
210 1126 (841-01-26)	mains frequency	The frequency of the a.c. public supply; usually 50 Hz or 60 Hz.
210 1127 (841-01-27)	low frequency^a	A frequency lower than or equal to 60 Hz.
210 1128 (841-01-28)	medium frequency^a	A frequency higher than 60 Hz and lower than or equal to 10 kHz.
210 1129 (841-01-29)	high frequency^a	A frequency higher than 10 kHz and lower than or equal to 300 MHz.
210 1130 (841-01-30)	hyperfrequency^a	A frequency higher than 300 MHz and lower than or equal to 300 GHz.
210 1131 (841-01-31)	efficiency of an electroheat installation	The ratio of the energy transformed into useful heat to the total electrical energy supplied to produce this useful heat.
210 1132 (841-01-32)	heat capacity	The quantity of heat which may be absorbed by a body.
210 1133 (841-01-33)	specific heat capacity	The quantity of heat in joules necessary to raise the temperature of 1 kilogram of substance through 1 kelvin.
210 1134 (841-01-34)	molar reaction heat	The quantity of heat which is evolved per mole during a chemical reaction.
210 1135 (841-01-35)	molar reduction heat	The quantity of heat per mole which it is necessary to add during a chemical reaction.
210 1136 (841-01-36)	latent heat	The quantity of heat involved to change the state or structure of a substance when at constant temperature and pressure.
210 1137 (841-01-37)	freezing-point; solidification point	The temperature at which a chemically pure substance changes from liquid to solid state at a given pressure.

^a This frequency classification applies for use of electroheat equipment.

No.	Term	Definition
210 1138 (841-01-38)	melting-point	The temperature at which a chemically pure substance changes from solid to liquid state by application of heat at a given pressure.
210 1139 (841-01-39)	triple point	The temperature at which the solid, liquid and gas phases of a chemically pure substance may co-exist in equilibrium.
210 1140 (841-01-40)	dew-point	The temperature at which the water vapour contained in a gas or a gas mixture at a given constant pressure is just sufficient to permit its saturation.
210 1141 (841-01-41)	Curie-point	<i>Of a magnetic substance.</i> The temperature below which a substance is ferromagnetic or ferrimagnetic and above which it is paramagnetic.
210 1142 (841-01-42)	heat transmission	A phenomenon of natural or forced heat transfer by conduction, convection and/or radiation from one temperature level to a lower temperature level.
210 1143 (841-01-43)	thermal conduction	A mode of heat transmission within a body or between bodies in contact resulting from the interaction between adjacent molecules.
210 1144 (841-01-44)	thermal conductivity	In a steady state, the quantity of heat which is transmitted by conduction through a body per unit area, per unit time, per unit thickness for a temperature difference of 1 kelvin. Symbol: λ
210 1145 (841-01-45)	thermal diffusivity	The quotient of the thermal conductivity of a body by the product of its specific heat capacity and its specific mass. Symbol: α
210 1146 (841-01-46)	thermal convection	A mode of heat transmission in which the heat transfer results from the interchange of a part of a fluid with another part at a different temperature.
210 1147 (841-01-47)	thermal natural convection	A mode of thermal convection in which the movement of the fluid is caused by its density difference.
210 1148 (841-01-48)	thermal forced convection	A mode of heat transmission by thermal convection, in which the movement of the fluid is produced and accelerated with the help of external mechanical means, for example a fan.
210 1149 (841-01-49)	convection coefficient	The quantity of heat which is exchanged between the unit surface area of a solid body and a contacting fluid, in unit time, for a temperature difference of 1 kelvin. Symbol: α
210 1150 (841-01-50)	radiation	The emission or transfer of energy in the form of electromagnetic waves or particles.
210 1151 (841-01-51)	electromagnetic spectrum	The ordered sequence of wavelengths, frequencies or quanta of energy which exists in an electromagnetic radiation.
210 1152 (841-01-52)	transmission	<i>Of radiation.</i> The passage of radiation through a medium without change of frequency of the monochromatic components of which the radiation is composed.

No.	Term	Definition
210 1153 (841-01-53)	reflection	<i>Of radiation.</i> The return of radiation by a surface without change of frequency of the monochromatic components of which the radiation is composed.
210 1154 (841-01-54)	absorption	<i>Of radiation.</i> The transformation of radiant energy to a different form of energy by interaction with the material.
210 1155 (841-01-55)	diffusion	<i>Of radiation.</i> The change of the spatial distribution of a beam of radiation when it is dispersed in many directions by a surface or by a medium, without change of frequency of the monochromatic components of which the radiation is composed.
210 1156 (841-01-56)	radiant energy	The energy emitted, transferred or received in the form of radiation.
210 1157 (841-01-57)	radiant flux	The power emitted, transferred or received in the form of radiation
210 1158 (841-01-58)	radiant transfer	<i>At a point of a surface.</i> The quotient of the radiant flux leaving an element of the surface containing the point, by the area of that element.
210 1159 (841-01-59)	radiant intensity	<i>In a given direction.</i> The quotient of the radiant flux emitted by the source, in an infinitesimal solid angle containing the given direction, by that solid angle.
210 1160 (841-01-60)	radiance	The quotient of the radiant flux leaving, arriving at or passing through an element of surface at a point and propagated in direction defined by an elementary cone containing a given direction, by the product of the solid angle of the cone and the area of the orthogonal projection of the element of surface on a plane perpendicular to the given direction.
210 1161 (841-01-61)	irradiance	<i>At a point of a surface.</i> The quotient of the radiant flux incident on an element of the surface containing the point, by the area of that element.
210 1162 (841-01-62)	complete radiator; black body	A thermal radiator which absorbs completely all electromagnetic incident radiation, whatever the wavelength, the direction of incidence or the polarization.
210 1163 (841-01-63)	emissivity	<i>Of a thermal radiator.</i> The ratio of the thermal radiant transfer of the radiator to that of a complete radiator at the same temperature.
210 1164 (841-01-64)	combined heat transmission	A mode of heat transmission in which the propagation of heat takes place simultaneously by conduction, convection and radiation, or by two of these phenomena.
210 1165 (841-01-65)	heat transmission coefficient	The quantity of heat which passes per unit of area and time through a partition of constant thickness from a fluid to another having a temperature difference of 1 kelvin. Symbol: k

210 12 (841-10) Furnace technology and operation

No.	Term	Definition
210 1201 (841-10-01)	heating chamber	The heated enclosure of a furnace in which the heat treatment is carried out.
210 1202 (841-10-02)	arch	The roof of the heating chamber.
210 1203 (841-10-03)	suspended roof	A particular type of construction in which the roof of the heating chamber is suspended from the furnace casing.
210 1204 (841-10-04)	vestibule	An unheated chamber through which the charge passes prior to entry to the main furnace heating chamber.
210 1205 (841-10-05)	side walls	The lateral walls of the heating chamber.
210 1206 (841-10-06)	back wall	The back (end) wall of the furnace chamber.
210 1207 (841-10-07)	thermal insulation	The refractory materials, for example fibrous walls, having low heat conducting properties, placed between the furnace high temperature refractories and furnace casing.
210 1208 (841-10-08)	crucible	A container for the charge being made of refractory or electrical conducting materials, for example steel, copper or graphite.
210 1209 (841-10-09)	inspection hole; sight hole	An opening to allow observation of the charge materials within the furnace chamber.
210 1210 (841-10-10)	retort chamber	A completely enclosed chamber with a sealed lid (muffle) or, in the case of a continuous furnace, with gas seals at either end, which is located within the furnace chamber and through or into which is placed the charge materials.
210 1211 (841-10-11)	lock chamber	An enclosure at the entry or exit of a furnace chamber working under atmosphere or vacuum, being limited by two doors which open independently to avoid pollution by the ambient air.
210 1212 (841-10-12)	door counterbalance	A device for reducing the force necessary to raise door gear of the furnace by fitting counterbalance weights. NOTE The counterbalancing usually employs cast iron weight sections of shape and weight to satisfy requirements. Hydraulic or pneumatic counterbalancing systems may also be employed.
210 1213 (841-10-13)	charge	Total of materials or workpieces to be heated in a furnace or another type of electroheating appliance.
210 1214 (841-10-14)	charging basket	A basket which is used to introduce the charge into the heating chamber.
210 1215 (841-10-15)	drop-bottom charging basket	A basket with removable bottom which opens to drop the charge. NOTE The bottom is formed with sections which are distinguishing, for example orange peel, petal or clam shell.
210 1216 (841-10-16)	charging tray	An equipment to support and convey the charge into the furnace, withdrawn with the charge after processing.
210 1217 (841-10-17)	chute	An arrangement which allows charging or discharging by the material's own weight generally in the form of an open sloping channel.

No.	Term	Definition
210 1218 (841-10-18)	pusher	A mechanical device to push the charge and its carrier into and through the furnace chamber.
210 1219 (841-10-19)	hopper loading	Method of loading using a hopper to transport the charge to a tray, chute or opening of a furnace.
210 1220 (841-10-20)	pan charger	A charging equipment using a chain to which are attached pan-like containers.
210 1221 (841-10-21)	shaker conveyor	A charging system consisting of a horizontal or slightly sloping hearth subjected to a to-and-fro motion and quick return which moves the material forward by successive impulses.
210 1222 (841-10-22)	vibratory feed; vibratory conveyor	A charging system consisting of a horizontal or slightly sloping channel subjected to a vibration of small amplitude, which moves the material forward in a continuous manner.
210 1223 (841-10-23)	chain conveyor feed	A conveying device where the charge is moved by an endless chain with sprockets, which pulls the charge to or through the furnace chamber.
210 1224 (841-10-24)	skip monorails	A rail-guided charging device along which containers are continuously moved, so that each container may be tilted at the terminal point to discharge its contents.
210 1225 (841-10-25)	skip hoist	A charging device with chains or links which carries charged containers being continuously hoisted for tilting at the position required by the process.
210 1226 (841-10-26)	charging tundish	A device of conical shape to receive liquid metal to supply a continuous casting installation.
210 1227 (841-10-27)	launder	A refractory lined channel, generally of greater depth than width, to transport molten metal by gravity or electromagnetically.
210 1228 (841-10-28)	ladle	A refractory lined bucket for receiving and transporting molten metal.
210 1229 (841-10-29)	charging time	The time from beginning of providing free access for the entry of the charge to the closure of access in order to start processing.
210 1230 (841-10-30)	discontinuous furnace	A furnace in which loading and unloading are carried out in a discontinuous manner.
210 1231 (841-10-31)	bale out furnace	A furnace chamber from which liquid metal may be taken out by a hand ladle or automatic pouring device.
210 1232 (841-10-32)	batch furnace	A horizontal, rectangular or cylindrical furnace which handles individual charges and which may be heated and cooled with the charge or maintained at specific temperatures.
210 1233 (841-10-33)	pit furnace	A batch furnace, forming a pit, in which the charge is loaded from the top.
210 1234 (841-10-34)	bell furnace	A batch furnace in which the hearth is fixed and covered by a removable bell.