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Glossary of terms used in the gas industry

Co-operating organizations

The Gas Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government department and scientific and industrial organizations:

- Gas Council*
- Heating and Ventilating Contractors' Association
- Institution of Gas Engineers*
- Liquefied Petroleum Gas Industry Technical Committee*
- Ministry of Power*
- Society of British Gas Industries*

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Department of Education and Science
- Institution of Heating and Ventilating Engineers

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Foreword

This standard makes reference to the following British Standards:

- BS 526, *Definitions of the calorific value of fuels.*
- BS 1016, *Methods for the analysis and testing of coal and coke.*
- BS 1016-13, *Tests special to coke.*
- BS 1250, *Domestic appliances burning town gas.*
- BS 1250-1, *General requirements.*
- BS 1293 & BS 2074, *Methods for the size analysis of coal and coke.*
- BS 1523, *Glossary of terms used in automatic controlling and regulating systems.*
- BS 1584, *Glossary of terms used in refrigeration.*
- BS 1846, *Glossary of terms relating to solid fuel burning equipment.*
- BS 1846-1, *Domestic appliances.*
- BS 1963, *Pressure operated relay valves for use with town gas.*
- BS 2869, *Oil fuels.*
- BS 3142, *Manufactured solid smokeless fuels for household use.*
- BS 3323, *Glossary of coal terms.*
- BS 3446, *Glossary of terms relating to the manufacture and use of refractor materials.*
- BS 3552, *Glossary of terms used in coal preparation.*

This glossary was first published in 1944 at the request of the Institution of Gas Engineers, was revised in 1961 in order to incorporate new terms and modified definitions which had been adopted in the intervening period and has now been further revised and extended by the addition of terms previously included in BS Codes of Practice. While every effort has been made to formulate the definitions in line with present day technical usage, these should not be given the status of British Standard specifications.

The glossary deals primarily with technical terms special to the gas industry and as far as possible its scope has been limited to terms having a definite and important significance in the practice of the gas industry. Subsidiary descriptive terms and terms which, though commonly used in the gas industry, have the same meaning there as in their ordinary usage, have been excluded from the glossary, with a few exceptions where inaccurate use of such terms might lead to misunderstanding. However, it is important to avoid confusion when designating gas appliance parts and a standard nomenclature for these is desirable, even though the terms may be in common usage and their definitions obvious. For this purpose Appendix A has been added to the glossary to accommodate these terms, which should be regarded and used henceforward as standard nomenclature.

Terms which may be regarded as colloquial and words used only in relatively restricted areas of the country have generally been avoided. It has been considered unnecessary to include terms and definitions relating to various patented processes, e.g. Dstrigas, Lurgi, Otto, Vetrocoke, as these terms have unique reference to the particular process concerned. In view of the increasing use of petroleum feedstocks, of liquefied petroleum gases and of natural gas, relevant definitions have been adjusted, where necessary, so as to be generally applicable.

Where terms are used with somewhat different meanings in different branches of the gas industry appropriate definitions are given in the corresponding sections of the glossary. In those cases where different designs for the same type of plant or apparatus exist, the definitions have been made sufficiently general to cover all such variations.

In each section of the glossary, terms are arranged in order of increasing specialization; that is, general terms occur before terms relating to specialized features.

In many cases, several terms correspond to each definition; those which it is considered should be used preferentially are shown in heavy type; those less favoured are printed in light italic type and those which it is hoped will lapse into disuse are marked *deprecated*. For gas appliance parts the preferred term should always be used where alternatives still appear.

For convenience of reference, each definition has been assigned a number divided into three groups, indicating the number of the section, the sub-section and the definition within that sub-section. For example, 11305 indicates the fifth definition in Sub-section 3 of Section 11.

Where a substantial group of terms has already been defined in relation to other industries, reference has been included to the relevant BS Glossary in order to avoid unnecessary duplication.

It is hoped that the form of all the definitions is such as to allow for changes in design and techniques, but it is accepted that British Standards require periodical review to take account of modern developments. For this reason, suggestions for the improvement of this glossary will be welcomed for consideration when it becomes necessary to review it in the future.

A revision of this glossary, in course of preparation, will be divided into the following six Parts corresponding to the fields in which the terms are used:

- *Part 1: General;*
- *Part 2: Natural gas production;*
- *Part 3: Carbonization and gasification;*
- *Part 4: Transmission, distribution and storage;*
- *Part 5: Measurement and regulation;*
- *Part 6: Combustion and utilization.*

Part 6, published in January 1980, includes terms taken, from various sections of this edition of this British Standard.

It is recommended that the user ascertain

- a) whether the definition of any term in this current edition has been superseded by a term in Part 6:1980; and
- b) whether there is any term in Part 6:1980 that is both additional and relevant to any of the sections in this current edition.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 94 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.

Section 1. General

No.	Term	Definition
1001	British thermal unit Btu	1 Btu = 1055.06 J = 252 cal ^a .
1002	therm	The statutory heat unit by which gas is sold in the United Kingdom at present. 1 therm = 100 000 British thermal units.
1003	calorific value <i>heat of combustion,</i> deprecated	The amount of heat liberated by the complete combustion, under specified conditions, of unit volume of a gas or unit weight of a solid or liquid. In the United Kingdom at present, calorific value is normally expressed in Btu/ft³ (gas) or Btu/lb (solid or liquid). Convenient SI units are megajoules per cubic metre (MJ/m³) or megajoules per kilogramme (MJ/kg). A distinction is made between: 1) Gross calorific value, in the determination of which the water produced by the combustion of the fuel is assumed to be completely condensed and its latent heat released, and 2) Net calorific value, in the determination of which the water produced by the combustion of the fuel is assumed to remain as a vapour. NOTE For fuller definitions of gross and net calorific value, see BS 526^b.
1004	official calorific value of town gas	The gross calorific value of gas supplied under the terms of the Gas Act as determined by an official gas examiner.
1005	declared calorific value	The gross calorific value of gas supplied under the terms of the Gas Act declared by a gas undertaker as the basis of charge to the gas consumer.
1006	recording calorimeter	An instrument which provides a continuous record of the calorific value of gas.
1007	standard reference conditions s.r.c	The volume of a gas at a temperature of 60 °F, and a pressure of 30 inches of mercury, saturated with water vapour (60 °F and 30 inHg sat.). (Gas Act 1948, Clause 74-(1). NOTE This is designated as s.r.c. in order to avoid confusion with 0 °C, 760 mmHg, dry, the conditions of standard temperature and pressure (s.t.p.).
1008	uncorrected volume	A volume of gas as measured, without correction to standard conditions of temperature, pressure and humidity.
1009	corrected volume	A volume of gas corrected to standard reference conditions.
1010	tabular number	A multiplying factor for determining the corrected volume (1009).
1011	gas volume factor	The reciprocal of the tabular number (1010), used as multiplying factor in measurements of calorific value.
1012	supplementary gas volume factor	A multiplying factor used in gas calorimetry to correct for the increased volume when gas, partially saturated with water vapour at standard temperature and pressure, becomes fully saturated.
1013	percentage volume correction	The supplementary gas volume factor (1012), expressed as a percentage addition.

^a See BS 350, "Conversion factors and tables", for a more detailed definition.

^b BS 526, "Definitions of the calorific value of fuels".

Section 2. Raw Materials

Sub-section 21. Coal

Relevant terms and definitions will be found in BS 3323 and BS 3552^a.

Sub-section 22. Natural gas

No.	Term	Definition
2201	natural gas (NG)	Gas, consisting mainly of methane, occurring naturally in underground accumulations.
2202	liquefied natural gas (LNG)	Natural gas liquefied by refrigeration.
2203	mine drainage gas	Gas, consisting mainly of methane, extracted in coal mining operations.

Sub-section 23. Petroleum derivatives

(Raw materials and products of the gas industry)

2301	refinery gas	Gas produced during the refining and processing of petroleum and petroleum products, consisting mainly of C ₁ to C ₄ hydrocarbons with variable amounts of free hydrogen, nitrogen and possibly hydrogen sulphide.
2302	tail gas	Refinery gas which is not required for further processing in the refinery.
2303	liquefied petroleum gas (LPG)	Light hydrocarbon material, gaseous at normal temperatures and pressures, but capable of being kept in the liquid state by pressure to facilitate storage, transport and handling.
2304	commercial butane	A liquefied petroleum gas consisting predominantly of butanes and/or butylenes (C ₄ hydrocarbons).
2305	commercial propane	A liquefied petroleum gas consisting predominantly of propane and/or propylene (C ₃ hydrocarbons).
2306	light petroleum feedstock (LPF) (see Note 2) <i>primary flash distillate (PFD)</i> , deprecated <i>light distillate spirit (LDS)</i> , deprecated <i>virgin naphtha (VN)</i> , deprecated <i>light gasworks feedstock (LGF)</i> , deprecated <i>light distillate feedstock (LDF)</i> , deprecated	Petroleum distillates of low flash-point having properties which render them unsuitable for use as motor spirit. NOTE 1 The petroleum distillates defined above are normally supplied free from hydrocarbons which are gaseous at normal temperatures and pressures. NOTE 2 Preference has been given to this term because it is an accurate general description of the various closely related materials for which the <i>deprecated</i> terms have been loosely used in the past. Also the abbreviation LPF is readily distinguishable in speech from LPG (2303). NOTE 3 The abbreviations of these terms should only be used if there is no danger of confusion, e.g. in the petroleum industry the term "light distillate fuel" is used which has the same abbreviation as the <i>deprecated term light distillate feedstock</i> .
2307	gas oil	Middle fraction of petroleum distillate used for enriching water gas, for washing benzole from coal gas, and for burning in certain heating installations ^b .
2308	straight run	Produced by distillation without cracking or alteration of the structure of the constituent hydrocarbons.
2309	feedstock	Material introduced into a plant for processing and capable of being converted into the required gas.
2310	light oil	Hydrocarbon oil as defined by Customs and Excise Act 1952, S195(1).
2311	heavy oil	Hydrocarbon oil other than light oil (2310).

^a BS 3323, "Glossary of coal terms".

BS 3552, "Glossary of terms used in coal preparation"

^b Information about oil fuels is given in BS 2869, "Oil fuels".

Sub-section 24. Properties of feedstocks

No.	Term	Definition
2401	carbon-hydrogen ratio	The relative proportion by weight of carbon and hydrogen in a hydrocarbon feedstock.
2402	total sulphur content	The sulphur content by weight of a hydrocarbon feedstock.
2403	reactive sulphur	That portion of the total sulphur content of a light hydrocarbon feedstock which is removed by passing the vapours of the feedstock, together with hydrogen, through a bed of zinc oxide catalyst at 400 °C.
2404	unreactive sulphur	That portion of the total sulphur content which is not removed by passing the vapours of the light hydrocarbon feedstock, together with the hydrogen, through a bed of zinc oxide catalyst at 400 °C.

Sub-section 25. Storage of feedstocks

2501	LPG pressure storage	The storage of LPG, at ambient temperature, at its vapour pressure corresponding to that temperature.
2502	LPG low-temperature storage LPG refrigerated storage	The storage of LPG at a reduced temperature whereby its vapour pressure is substantially reduced.
2503	fixed-roof tank	A conventional tank in which vapour can exist above the liquid. It is normally gas pressurized to prevent air ingress.
2504	floating-roof tank	A tank used for storing volatile petroleum products. The tank roof floats on the liquid and thereby prevents the accumulation of air/vapour mixtures.
2505	fixed ullage points	Fixed dip pipes into an LPG tank used to indicate the maximum permitted filling levels.
2506	excess-flow valve	A valve which shuts automatically if the flow through it exceeds a specified design rating, e.g. in the event of a pipeline fracturing.
2507	bund	Earthwork or wall surrounding a storage tank (or tanks) in order to retain the contents of at least one tank in the event of fracture.
2508	spillbay	A bay excavated in order to collect liquid or vapour away from LPG tank installations in the event of spillage.
2509	kerb	A low wall designed to contain small volumes of spillage or to direct spillage to a spillbay.
2510	firebreak walls firewalls	Walls situated between LPG storage tanks which are designed to minimize the effect of heat radiation to other tanks in the event of one tank catching fire.
2511	thermal relief valve	A relief valve which allows release of liquid from a shut off pipeline in the event of thermal expansion of the liquid.
2512	double block and bleed	A device used to ensure the isolation of a vessel or a section of a pipeline and consisting of two valves with a valved vent between them.
2513	back-pressure valve	A restrictor valve which maintains liquid pressure in the pipeline and equipment upstream of the back-pressure valve, thus preventing vapour formation.
2514	let down valve	A valve through which LPG is expanded in order to cause refrigeration.
2515	refrigeration compressor	A compressor used to withdraw and compress the vapour which is evolved after the liquid is expanded through the let-down valve.

No.	Term	Definition
2516	holding compressor	A compressor used to withdraw and compress boil-off gases caused by heat inleakage into a low temperature storage tank. It is normally stopped and started by a pressure switch or similar device so that the tank is maintained at an approximately constant pressure.
2517	foam laterals	Pipes which are fitted to a storage tank into which fire-fighting foam can be injected so that the tank's contents are blanketed.
2518	drenchers	Water sprays used for cooling storage tanks in the event of a fire.
2519	autorefrigeration	The cooling of LPG due to vapour release caused by its storage pressure being rapidly reduced.

Section 3. Carbonization

Sub-section 31. General

No.	Term	Definition
3101	carbonization	Decomposition of solid carbonaceous substances, usually coal, into gaseous, liquid and solid products by heating under controlled conditions substantially out of contact with air.
3102	volatile therms per ton	1) The total heat in therms (on the gross calorific value basis) produced by the combustion of the volatile products (gas, tar and benzole) from the carbonization of 1 ton of coal. 2) The potential heat in therms (on the gross calorific value basis) in the form of gas recoverable from 1 ton of semi-coke or coke on heating under specified conditions (see BS 1016-13 ^a).
3103	high temperature^b	A qualifying expression applied to such terms as carbonization, gas, coke and tar to indicate that the products are typical of a process in which the solid residue of the carbonizing process has attained a maximum temperature of the order of 900 °C or above.
3104	medium temperature^b	A qualifying expression applied to such terms as carbonization, gas, coke and tar to indicate that the products are typical of a process in which the solid residue of the carbonizing process has attained a maximum temperature between the normal limits of high temperature and low temperature practice.
3105	low temperature^b	A qualifying expression applied to such terms as carbonization, gas, coke and tar to indicate that the products are typical of a process in which the solid residue of the carbonizing process has attained a maximum temperature not exceeding about 600 °C.
3106	static intermittent^c	A qualifying term applied to carbonization, or to carbonizing vessels, indicating that the coal after being charged into the vessel is left undisturbed until the carbonization is complete, when the coke is withdrawn from the carbonizing zone and a fresh coal charge introduced.
3107	continuous^c	A qualifying term applied to carbonization, or to carbonizing vessels, indicating that the coke is withdrawn from, and the coal introduced into, the retort continuously.

^a BS 1016, "Methods for the analysis and testing of coal and coke", Part 13, "Tests special to coke".

^b These terms are used to show a general relationship, and the temperatures given in the explanations of these terms are indicative and not definitive.

^c The terms *intermittent retort* and *continuous retort* are often applied to coke and tar to indicate the system of carbonization by which they have been produced.

No.	Term	Definition
3108	gross carbonizing time	The time between the introduction of consecutive charges of coal into an intermittent carbonizing vessel in regular operation.
3109	net carbonizing time	The time between charging coal into and discharging the resulting coke from an intermittent carbonizing vessel in regular operation.
3110	plastic layer	The layer of material in a plastic condition between coal and coke, produced in a charge of coal undergoing carbonization.
3111	coking pressure <i>swelling pressure,</i> deprecated	The pressure exerted on the walls of a retort, chamber or oven by coal undergoing carbonization.

Sub-section 32. Charging and discharging

3201	charging	Introducing coal into a carbonizing vessel.
3202	coke pad breeze pad	A small quantity of coke or breeze which is dropped on to the bottom door of an intermittent vertical chamber before the coal charge is introduced so that the charge will lie in the heated space of the chamber.
3203	smokeless charging	Charging carbonizing vessels of the intermittent type where special means are provided for reducing the amount of fumes released into the atmosphere round the charging car or hopper.
3204	levelling	Flattening the top of a fresh coal charge in a coke oven.
3205	charging cycle	The same as gross carbonizing time (3108) but generally referred to by a phrase such as 8-hour work or 12-hour work.
3206	discharging <i>pushing,</i> deprecated <i>drawing,</i> deprecated	1) Removing hot coke from horizontal retorts, intermittent retorts, chambers and coke ovens. <i>Drawing</i> was originally applied to manual raking of coke from horizontal retorts, but it is sometimes applied to discharging retorts by mechanical means which may, in fact, involve pushing out the coke. <i>Pushing</i> is applied only to discharging coke from horizontal retorts and coke ovens. 2) Discharging also applies to removing cool coke from the coke chamber under a continuous vertical retort.

Sub-section 33. Heating

3301	fuel consumption	The amount of fuel used for carbonizing a unit weight of coal. When the fuel is coke the fuel consumption is generally stated as "hundredweights of coke per ton of coal" or as a percentage of the weight of the coal. If the fuel is coal gas, the fuel consumption may be stated as "therms per ton of coal" or "Btu per lb of coal" (in S.I. units as MJ/Mg, kJ/kg or J/kg). In precise usage, it is also stated whether the coke and coal are measured on the dry or wet basis, and whether the calorific value of the gas is "gross" or "net".
3302	single-stage combustion	A system of heating a carbonizing vessel in which the whole of the heating gas and the air for combustion meet at one point in each separate heating flue.
3303	multi-stage combustion	A system of heating carbonizing vessels in which the heating gas and the air for combustion meet at two or more points in each separate heating flue.
3304	recirculation	Mixing part of the products of combustion from the heating system of a carbonizing vessel with the gases at the hottest point of the heating system. This is normally done by making use of the injection effect of the combustion gas and air and/or of convection.

No.	Term	Definition
3305	drying-out	The first stage in the operation of heating up a setting from cold to working temperature, during which moisture is removed from new brickwork and jointing material by passing hot waste gases and air through the setting flues.
3306	warming-up	Continuation of the drying-out stage, during which the lowest flue temperature in the setting is raised, at a controlled rate, to about 400 °C.
3307	lighting-up	A stage in the operation of heating-up a setting which follows warming-up, and during which the point of combustion is transferred from the producers or other positions outside the setting to the combustion ports or nostrils in the setting.
3308	semi-gaseous firing	A stage during the lighting-up period when poor quality producer gas is going forward to the settings.
3309	heating-up	A term frequently used for the whole of the operation of heating a setting between the drying-out stage and the gaseous firing stage. It, therefore, covers the operations separately described under warming-up (3306), lighting-up (3307) and semi-gaseous firing (3308).
3310	gaseous firing	A stage during the lighting-up period when combustion is occurring at the ports or nostrils as a result of the mixing of good quality producer gas and secondary air.
3311	soaking period	The final stage in the heating-up of a setting or battery during which all parts of the brickwork attain steady temperature conditions.
3312	standing-off	Stopping the production of gas in a retort or section of retorts by ceasing to charge coal, leaving the retort full of coke and shut off from the collecting main. At the same time the heat input is reduced so that the heating flue temperatures are kept at about 1 200 °C.
3313	carbonizing temperature	The temperature maintained in the combustion flues of a setting or battery during carbonization of coal.
3314	working temperature	
3314	scurfing temperature	The temperature (generally from 1 000 °C to 1 200 °C) maintained in the heating flues during scurfing.
3315	shutting down to cold	Emptying retorts and stopping the supply of heat to a setting so that it gradually cools to ambient temperature.
3316	shutting down temporarily	Stopping gasmaking in a bench or section of retorts usually by emptying the retorts and maintaining the scurfing temperature in the heating flues.

Sub-section 34. Carbonizing conditions

3401	controlled carbonization <i>burning off</i> , deprecated	Carbonizing coal until a desired low volatile content is left in the coke.
3402	cracking	Thermal decomposition of volatile products of carbonization.
3403	cracking space free space	The heated space above the charge in a carbonizing vessel, where cracking occurs.
3404	retort carbon scurf scale <i>graphite</i> , deprecated	A layer of carbon formed on the inner surfaces of high temperature carbonizing vessels by decomposition of hydrocarbons during carbonization. It is periodically removed by allowing air to pass over the carbon on the hot retort or oven surfaces. This operation is termed scurfing or scaling .

No.	Term	Definition
3405	steaming	Passing steam through hot coke in a carbonizing vessel to produce water-gas.
3406	pull suction vacuum	A pressure below atmospheric in pipes and apparatus, especially those on the inlet side of exhausters. Pull is particularly applied to the pressure below atmospheric prevailing in the heating and waste gas flues of a retort or chamber setting or oven battery.
3407	draught	A pressure below atmospheric at the base of a chimney or in a waste gas flue.
3408	level gauge	Balanced conditions in a pipe or apparatus, where the gas pressure is either equal to atmospheric pressure or fluctuating slightly above and below atmospheric pressure.

Sub-section 35. Coke handling and preparation

3501	cooling quenching	Reducing the temperature of coke from that at which it leaves the carbonizing chamber to a temperature below the ignition point. Quenching generally implies that water is the coolant (wet quenching), while cooling generally implies some other coolant, such as steam or waste gases (dry cooling).
3502	screening	Separating smaller pieces of coke from larger by shaking or rolling the coke over a surface having holes of appropriate size.
3503	sizing <i>grading</i> , deprecated	Sorting coke into fractions containing pieces with linear dimensions between predetermined upper and lower limits, by a series of screenings.
3504	scalping	Preliminary screening to remove oversize coke.
3505	grizzly	A rugged screen for rough sizing at a comparatively large size [e.g. more than 1½ in (38 mm)], consisting of fixed or moving bars, disks or shaped tumblers or rollers.
3506	cutting breaking	Reducing large coke to smaller pieces.
3507	debreezing	Removal of coke dust and breeze from graded material immediately before bagging or bulk loading.

Sub-section 36. Carbonizing plant

3601	retort	1) A continuous carbonization vessel of any capacity. 2) A static carbonization vessel, generally having a capacity up to about 1 ton (1 Mg) of coal.
3602	horizontal vertical inclined	Qualifying terms applied to a carbonizing vessel, indicating the direction of its longest dimension.
3603	intermittent vertical chamber	A static carbonizing vessel generally having a capacity of between 1 and 5 tons (1 and 5 Mg) of coal.
3604	coke oven	A static carbonizing vessel, generally having a capacity of between 5 and 20 tons (5 and 20 Mg) of coal.
3605	waste-heat oven	A coke oven, heated by burning rich gas, in which hot gases leaving the heating flues are not used for pre-heating the combustion air but are discharged directly to the chimney or are used for steam raising.
3606	regenerative oven	A coke oven having regenerators in which the products of combustion leaving the heating flues transfer their heat to the air for combustion and, in a compound oven, to the lean heating gas, before the air or gas enters the heating flues of the oven.

No.	Term	Definition
3607	vertical-flue oven	A coke oven with vertical heating flues.
3608	horizontal-flue oven	A coke oven with horizontal heating flues.
3609	gas gun oven	A vertical-flue coke oven in which the rich gas used for heating the oven is supplied to the heating flues from a duct (gas gun) situated in the brickwork between the top of the regenerator and the base of the heating flues.
3610	underjet oven	A vertical-flue coke oven in which the rich gas used for heating the oven is supplied to each of the heating flues by separate vertical ducts from a metal pipe situated in a cellar beneath the battery.
3611	twin-flue oven hairpin-flue oven	A vertical-flue regenerative coke oven in which the heating gases ascend and descend alternate heating flues in the same wall.
3612	cross-over flue oven	A vertical-flue regenerative coke oven in which the heating gases ascend all the heating flues in one wall, cross the top of the oven, and descend all the flues in the next wall.
3613	compound oven combination oven	An oven which can be heated by burning fuel gases of high and/or low calorific value.
3614	setting <i>bed</i>	A group of carbonizing vessels in a bench (3615) which may be brought to the carbonizing temperature independently of other similar groups in the same bench.
3615	bench <i>range</i> <i>section</i>	A series of settings or retorts between two end buttress walls.
3616	battery	A series of horizontal ovens bounded by buttress walls and/or division walls.
Sub-section 37. Setting details		
3701	buttress wall <i>pinion wall</i> <i>end wall</i>	An outside wall built at each end of a bench or battery, specially designed to aid in resisting the thrust of the brickwork during heating-up.
3702	division wall	A party wall which separates one bed of retorts or chambers or battery of ovens from the next.
3703	buckstays <i>buckstaves</i>	The principal members of the steel bracing of a bench or battery.
3704	recuperator^a	An apparatus for transferring heat from one gas to another, the heat passing continuously in the same direction through a refractory or metal wall separating the two gases.
3705	regenerator^a	An apparatus for effecting the transference of heat from one gas to another, the heat being absorbed from the hotter gas by a mass of refractory or metallic filling during one period and given up by the filling to the colder gas during the subsequent period.
3706	chequer filling chequerwork	The firebrick filling of a regenerator in which rows of solid refractory bricks cross one another at right angles in alternate courses arranged so that gas passages are formed between the bricks.
3707	block filling	A form of regenerator packing comprising refractory blocks which have gas passages formed in them during manufacture or are of such a shape as to form gas passages when the blocks are packed together.

^a It is incorrect to refer to a *recuperator* as a *regenerator*, though this is sometimes done in respect of recuperators used with retort settings (3614).

No.	Term	Definition
3708	combustion chamber	Part of the heating system of a carbonizing vessel in which all or most of the heat required for carbonization is generated by combustion of gas and air.
3709	port <i>nostril</i>	An opening in a wall or block of refractory material in a setting through which heating gas, combustion air or waste gas passes.
3710	gas nozzle	A brick in the form of a nozzle at the bottom of a vertical flue, the cross sectional area of which controls the amount of rich gas passing from the gas gun to the heating flue.
3711	heating flue	A duct along the outside of the walls of a carbonizing vessel in which heating gas is burnt or through which hot products of combustion pass in order to heat the coal in the carbonizing vessel. A series of such heating flues along one wall of a carbonizing vessel is a heating wall .
3712	sole flue	A heating flue or waste gas flue lying longitudinally beneath an oven or regenerator.
3713	side flue	A waste gas flue lying along the side of a coke oven battery and conveying waste gases from the outlets of the regenerators to the chimney.
3714	air slide	A movable metal plate at an air inlet to a producer or setting, for controlling the amount of air entering.
3715	damper	A movable plate of metal and/or refractory brick placed in a heating gas, air or waste gas flue for controlling the flow of gas or air.
3716	retort welding	Repairing carbonizing vessels by fusing powdered refractory material into holes or cracks with a blow-pipe flame.
3717	airborne sealing	Repairing carbonizing vessels by blowing a refractory powder into the closed, empty vessel so that it fills cracks and small holes and is fused in place by the heat of the walls.
3718	spraying	Repairing carbonizing vessels by spraying a wet powdered refractory into holes and cracks, where it is fused in place by the heat of the walls.
Sub-section 38. Bench fittings		
3801	mouthpiece	1) A metal surround attached to the end of a horizontal retort through which coal is charged into, or coke is discharged from, the retort. 2) A metal or concrete surround attached to the top of a continuous vertical, retort, through which coal is introduced into the retort.
3802	self-sealing door	A lid covering an opening in a carbonizing vessel and held by pressure against a metal frame so designed that a practically gas-tight seal is obtained without using sealing media.
3803	eccentric lever	A device fitted to a self-sealing door to press it against its frame.
3804	clay-luted door	A door, sealed with plastic fireclay, at the end of a coke oven.
3805	flash plate	A cast iron plate covering the brickwork at the end of a coke oven and forming the jambs of the oven door.
3806	gas offtake pipe ascension pipe	A pipe attached to a carbonizing vessel, or to the mouthpiece, to convey gas away.

No.	Term	Definition
3807	bridge pipe arch pipe H-pipe	A short pipe or hollow casting, connecting the gas offtake pipe to the hydraulic or collecting main.
3808	ascension pipe valve hydraulic valve	A valve at the junction of the gas offtake pipe and the collecting main for isolating a carbonizing vessel from the collecting main by means of a hydraulic seal.
3809	collecting main	A main which receives the gaseous products from a number of carbonizing vessels.
3810	hydraulic main	A type of collecting main which contains ammoniacal liquor maintained at a predetermined depth. Gas from a retort, chamber or oven enters the main through an extension of the bridge pipe (dip). In a wet main, the end of the dip is at such a depth below the surface of the liquor as to allow the gas from the retort to pass into the hydraulic main during gas making but to seal the gas offtake when the retort is empty. In a dry main, the end of the dip is above the surface of the liquor and the gas offtake is sealed by an anti-dip when the retort is to be isolated.
3811	anti-dip hydraulic valve	A device which enables a retort to be isolated from the hydraulic or collecting main but gives free passage to the gas during gas making.
3812	scrubber standpipe descension pipe	A vertical gas collecting main linked by gas offtake pipes to a number of retorts. It incorporates a liquor spray for cooling the gas and a disk-type valve for each gas offtake.
3813	offtake main suction main	A main through which gas travels to the by-product plant after it has left the collecting main and passed through the retort house or collecting main governor.
3814	foul main	A pipe through which gas flows from collecting or hydraulic mains to a condenser.
3815	double collecting main system	Two collecting mains, one along each-side of a coke oven battery, taking off the gas from each end of the ovens through gas offtake pipes and connected into the offtake main by means of a bridge main.
3816	bridge main	A main which conveys gas from the two collecting mains of a double collecting main system to a common offtake main.
3817	Beimann main	A main which, in a coke oven battery having a single collecting main, connects the ends of the ovens remote from the collecting main through offtake pipes. It is used to pass gas from ovens producing gas freely, through the tops of ovens producing little gas, back to the collecting main.
3818	blow-off pipe <i>relief pipe</i> <i>purge</i> <i>purge pipe</i> <i>bleeder</i> , deprecated	A pipe attached to a gas main by which gas normally conveyed by the main can be discharged to the atmosphere.
3819	seal	In general, any device other than a cock or valve used for preventing the passage of gas. In its most common form it employs water, liquor or tar as the sealing medium. Fine materials such as sand may also be used.
3820	seal pot	A common form of sealing device, embodying a pipe dipping into water, liquor or tar, used for draining condensate from pipes and apparatus containing gas without the gas escaping to the atmosphere.

No.	Term	Definition
3821	tar tower	A device used to drain tar from a hydraulic main without altering the liquor level.
3822	auxiliary coal hopper <i>feed hopper</i> <i>coal-feed hopper</i> <i>coal box</i>	A gas-tight metal container connected to the upper end of a continuous vertical retort. The container is filled periodically with coal which passes into the top of the retort as coke and is removed at the lower end of the retort by the extractor.
3823	coal valve	A gas-tight valve at the top of an auxiliary coal hopper immediately under the outlet of the coal storage hopper. It is periodically opened to allow the auxiliary coal hopper to be filled with coal.
3824	coal-indicating gear	A device fitted to an auxiliary coal hopper to indicate the level of the coal.
3825	top casting	The cast iron or cast refractory terminal piece fitted to the top of the refractory retort brickwork of a continuous vertical retort. On it are mounted the gas offtake pipe, rodding holes and auxiliary coal hopper [cf. mouthpiece (3801)].
3826	offtake curtain plate division plate coal deflecting plate	A vertical plate (sometimes removable or adjustable in length) hanging vertically across the mouthpiece of a continuous vertical retort to keep the gas outlet clear of incoming coal.
3827	rodding hole	A hole, closed by a removable plug, swivel flap or rodding ball, through which a rod can be inserted into the coal in order to correct the travel of the coal through the retort.
3828	rodding ball	A heavy iron ball which serves as a closure to the rodding hole. It is perforated with a hole through which a rod can be passed into the coal in the retort when the ball is rotated on its seating.
3829	seating casting	The casting attached to the supporting structure of a continuous vertical retort bench on which the refractory retort brickwork sits.
3830	extractor casting extractor box	The metal section of a continuous vertical retort immediately below the seating casting which provides a mounting for the coke extractor.
3831	coke extractor	A mechanical device for removing coke from a vertical retort at a controlled rate.
3832	auxiliary coke hopper <i>coke chamber</i>	The metal section of a continuous vertical retort immediately below the extractor, which stores the coke extracted from the retort between the discharges.

Sub-section 39. Machines and auxiliaries

3901	charging machine stoking machine	A machine for charging horizontal retorts with coal. The same machine may embody a device for removing the coke from the retort (pusher-charger, charger-discharger, projector-discharger). The two operations of removing the coke from the retort and of introducing the fresh coal charge may be carried out simultaneously.
3902	charging car <i>charging larry, deprecated</i>	A car which runs along the top of a bench of intermittent vertical chambers or of a coke-oven battery and conveys coal from the storage hopper to the chamber or oven to be charged. The coal is discharged from the car into the chamber or oven mechanically or by gravity.
3903	pusher ram	A machine used to discharge coke from a horizontal retort or coke oven.

No.	Term	Definition
3904	hot-coke car hot-coke skip	A car which transports coke away from a carbonizing plant. In intermittent carbonization, the coke car receives incandescent coke from the carbonizing chamber and transports it to the quenching tower or dry cooling plant.
3905	coke wharf	An inclined surface onto which coke is discharged immediately after wet quenching and where it is allowed to dry and cool.
3906	reversing gear change-over gear	A mechanism used with regenerators which operates at regular intervals and moves the valves controlling the direction of flow of heating gas, combustion air or waste gas. The time which elapses between successive operations of the reversing gear is termed the reversal period .
3907	liquor-circulating system liquor-flushing system	An arrangement of pumps, pipes and sprays enabling hot ammoniacal liquor to be sprayed into gas during its passage along the gas offtake pipes and collecting main.
3908	waste-heat boiler	A steam-raising boiler utilizing the sensible heat contained in the waste gases from a carbonizing plant. Producer gas and additional air may be added to the waste gases at the inlet to the boiler to increase the steam output of the boiler. This is known as augmentation .
3909	pusher side ram side machine side	The side of a coke oven battery along which the pusher operates.
3910	coke side	The side of a coke oven battery from which the hot coke is discharged.
3911	coke-side bench pusher-side bench	Permanent platforms along the coke side and pusher side of a coke oven battery just below the oven sole to give access to the ends of the ovens.
3912	coke guide	A contrivance movable along the coke-side bench which guides hot coke into the hot-coke car, during coke oven discharging.
3913	door machine	A machine movable along the coke-side bench for removing and replacing the oven doors. On the pusher side the door removing mechanism is usually incorporated in the pusher.
3914	luting machine	A trolley, carrying platforms and movable along the coke-side or pusher-side benches, to give access for sealing clayluted doors.
3915	decarbonizing gear	An apparatus used with rich-gas-fired regenerative coke ovens, which enables air to be admitted during part of the reversal, period to those rich gas burners from which the gas is shut off, in order to burn off carbon deposits.
3916	service bunker <i>servicing bin</i>	A bunker at one end of a coke oven battery in which prepared coal is stored to ensure a regular supply to the ovens and from which the charging car is filled before charging an oven.

Section 4. Gasification

Sub-section 41. General

No.	Term	Definition
4101	refinery	Any premises approved by the Commissioners (of Customs and Excise) for the treatment of hydrocarbon oil. A gasworks or part of a gasworks may be scheduled as a refinery for the purpose of the Customs and Excise Act 1952, S195(1).
4102	gasification	1) Conversion of solid or liquid fuels to gaseous fuels by reaction with a gas such as steam, air or oxygen. 2) Conversion of liquid fuels to gaseous fuels by thermal or catalytic means.
4103	complete gasification	Conversion of solid to gaseous fuel without leaving a combustible solid residue.
4104	continuous process	A process in which the required products are formed continuously under operating conditions.
4105	cyclic process	A process in which the required products are formed only during a specific part of each cycle of operations.
4106	recycle process <i>recycling</i>	A process in which some of the products are returned to the reactor.
4107	slagging process	A process in which the temperature is high enough to fuse the solid residue, which is then run off as slag. Fluxes may be added to facilitate fusion.
4108	gasifier	A vessel in which the gasification process is carried out.
4109	reactor <i>generator</i> <i>reformer</i>	Any vessel in which chemical reactions in the gas manufacturing process take place, either under pressure or in the presence of a catalyst, or both.
4110	hydrogenation	A process in which hydrogen reacts with one or more substances to yield a product or products containing a higher proportion of hydrogen.
4111	de-alkylation	A hydrogenation reaction in which the alkyl side chain of an aromatic compound are removed from the aromatic nucleus.
4112	hydrogenation gas <i>recycle hydrogen</i> <i>recycle gas</i> , deprecated	Gas from a reforming plant stream which contains a substantial amount of hydrogen and which is used for pretreatment of feedstocks by hydrodesulphurization.
4113	cracking^a	Thermal decomposition of hydrocarbons.
4114	reforming^a	Causing a hydrocarbon to react with steam to produce a combustible gas.
4115	tubular reforming	Reforming which takes place in externally treated tubes.
4116	autothermic reforming	Reforming where the heat of reaction is supplied by the addition of air or oxygen-enriched air to the reactants. The air so added is called autothermic air .
4117	shift conversion water-gas shift CO conversion	A process whereby carbon monoxide and steam are catalytically converted to carbon dioxide and hydrogen.
4118	space velocity	The ratio of the volume of reactants entering a reaction zone to the volume of the reaction zone per unit time.
4119	free space	That space in a reactor and associated vessels of a gasification plant which is not occupied by the catalyst or chequer brickwork.

^a Where catalysts are used in the process this is indicated.

No.	Term	Definition
4120	steam/oil ratio	The weight ratio of steam to feedstock admitted upstream of the catalyst bed.
4121	blast main air main	A pipe which conveys air under pressure to a cyclic gasification plant or producer.
4122	time controlled cyclic operation	A cyclic gasification process in which the phase changes of the cycle are controlled on a time basis.
4123	temperature controlled cyclic operation	A cyclic gasification process in which the phase changes of the cycle are controlled by temperature.
4124	lock hopper	A chamber enabling solids to be charged into or discharged from a pressurized gasifier without loss of pressure within the gasifier.
4125	lock gas	The combustible gas which has been allowed to enter a hopper from the gasifier.

Sub-section 42. Producer gas plant

4201	producer	An apparatus for gasifying solid fuels in a continuous supply of air usually with the addition of steam.
4202	slag bath gasifier	A gasifier in which both the reactions take place in a bath of molten slag. In a twin shaft slag bath gasifier the endothermic and exothermic reactions are carried out in separate compartments.
4203	suspension gasifier	A gasifier in which particles of solid fuel are gasified in steam and air or oxygen in suspension in the reaction gases.
4204	fluidized gasifier	A gasifier in which a bed of solid fuel particles is maintained in a state of continuous agitation by the upward passage of the gaseous reactants through it.
4205	static producer	A producer from which ash is removed manually.
4206	mechanical producer	A producer with a mechanical grate and sometimes with a mechanical device for periodically replenishing the producer with fuel.
4207	pressurized producer	A producer to which the primary air is supplied at a pressure above atmospheric.
4208	step grate	An inclined grate consisting of horizontal plates arranged stepwise.
4209	mechanical grate	A power-operated grate which ejects the clinker and ash from the base of a producer or generator and so eliminates hand clinkering.
4210	inner seal	A water seal preventing leakage of gas between the mechanical grate and the steam and air conduit at the base of a generator or producer.
4211	outer seal	A water seal preventing leakage of gas between the mechanical grate and the wall of a generator or producer.
4212	dry seal	An alternative to a water seal for preventing leakage of gas round the base of a generator or producer fitted with a mechanical grate, by extending the wall of the generator to enclose the grate completely.
4213	ash pocket	A gas-tight chamber connected to the base of a dry-sealed generator to receive ashes discharged by the mechanical grate.

No.	Term	Definition
4214	generator boiler <i>annular boiler</i>	A steam boiler enclosing the wall of a generator or producer and preventing adhesion of clinker to the wall.
4215	blast saturation temperature BST	Temperature at which the air blast is saturated with water vapour, i.e. the dewpoint of the air blast (used as a method of expressing the ratio of steam to air in the blast).
Sub-section 43. Cyclic gasification plan		
4301	blow	The period during which air is passed through the generator of a water-gas plant to raise the temperature of the incandescent fuel or through the combustion space of an oil-gasification plant to raise the temperature of the catalyst in the reactor.
4302	run make phase	The phase of the cycle of a cyclic gasification process in which the process reactants produce the make gas.
4303	oiling period	The phase of the cycle of a cyclic gasification process during which the process hydrocarbon oil or gases are admitted to the reactor.
4304	waste gases	Gaseous products issuing through the main stack valve during a blow.
4305	blow gases	Gaseous products leaving a generator during a blow.
4306	blast purge air purge	The short period at the start of the blow when the stack valve remains closed while the free spaces of the plant are swept clear of make gas by blow gases.
4307	steam purge	1) The short period at the start of the run when the stack valve remains open until the free spaces of the plant are swept clear of blast products by make gas. 2) The short period at the end of the run during which the base of the generator is cleared of combustible gas by steam.
4308	interlock	A device which prevents unwanted or dangerous combinations of valve movements.
4309	wash-box	An enclosed water-seal at the outlet of a cyclic gas-making plant to prevent product gas returning from the relief holder.
4310	automatic operator	A device which automatically controls the operation of the various valves on the plant.
4311	relief holder	A gasholder on the outlet of a wash-box which accommodates fluctuations in gas pressure and rate of gas production caused by the cyclic operation of the plant.
4312	creeper valve	A valve in a secondary air main which opens gradually during the blow to govern the supply of secondary air according to the changing composition of the blow gases.

No.	Term	Definition
Sub-section 44. Water-gas plant		
4401	water-gas plant	An installation in which solid fuels are gasified in air and/or oxygen, and steam, the air or oxygen and the steam being introduced in alternate periods of operation and the gases produced in each period being removed separately (blue water-gas plant). Provision is often made for raising the calorific value of the water gas by carburetting with hydrocarbon oils (carburetted water-gas plant).
4402	carburettor	A chamber between a generator and superheater, sometimes filled with chequerwork. The chequerwork or brickwork is kept hot and oil is sprayed in during part of the run. The oil is vaporized and cracked to gaseous hydrocarbons which mix with the water-gas and raise its calorific value. The operation is termed carburetting the gas. "Carburetting" also applies to other methods of enriching gases, such as cold carburetting.
4403	superheater	A chamber connected to the outlet of a carburettor filled with chequerwork, in which the thermal decomposition of oil vapours, begun in the carburettor, is continued. The temperature of the chequerwork is maintained at that required for efficient decomposition.
4404	up-run	Part of the run during which steam is supplied to the bottom of the generator and passes upwards through the fuel.
4405	down-run	Part of the run during which steam is supplied to the top of the generator and passes downwards through the fuel.
4406	back-run	A modified down-run in which steam is supplied to the top of the superheater and is preheated to a high temperature by passing backwards through the hot chequerwork in the superheater and carburettor before reaching the generator.
4407	back-run reforming	A process in which light petroleum feedstock or liquefied petroleum gas is cracked in the presence of steam during the back-run period.
4408	reversed air blast down blast	A method of operation during the blow in a carburetted water-gas plant when carburetting with heavy oils. Air is admitted at the top of the superheater and, on its way to the generator, burns off carbon deposits from the chequerwork.
4409	gas-reversing valves	Two interconnected valves which operate simultaneously to reverse the direction of gas-making in a generator.
4410	steam curtain steam cushion	A jet of steam at the inlet of a waste-heat boiler to prevent water-gas entering the boiler during the run.

No.	Term	Definition
4411	hydrocarbon enrichment value (HEV)	A term used in connection with the assessment of gas-making results, to indicate the contribution to the total calorific value of the gas which is provided by the hydrocarbon gases (see <i>J. Inst. F.</i>, 8, 1935, 200). It is represented by the formula: $\text{HEV} = 10^{-5} V [Q - 318 (1 - N/100)]$ where HEV = the hydrocarbon enrichment value in therms per unit measure. V = the corrected volume of purified gas as made, measured in cubic feet per ton of coal or, in the case of carburetted water-gas, per gal of oil. Q = the gross calorific value of gas (as determined in accordance with the Gas Examiners' General Directions, 1956). 318 represents the calorific value of hydrogen or carbon monoxide. N = percentage of inerts, i.e. carbon dioxide, oxygen and nitrogen, in the purified gas. In SI units: $\text{HEV} = V[Q - 11.85(1 - N/100)]$ where HEV = the hydrocarbon enrichment value in megajoules per unit measure. V = the corrected volume of purified gas as made, measured in cubic metres per megagramme of coal or, in the case of carburetted water-gas, per cubic decimetre of oil. Q = the gross calorific value of gas (in MJ/m³) at s.r.c. 11.85 represents the calorific value of hydrogen or carbon monoxide. N = percentage of inerts in the purified gas.
4412	charging period	1) The period between two consecutive fuel replacements in a hand-charged generator. 2) The time taken to run a charge of fuel into an automatic generator.
4413	water-gas generator	The chamber of a water-gas plant in which solid fuel is gasified alternately by steam and air.
4414	self-clinkering generator	A generator from which clinker and ashes are removed mechanically.
4415	back-run gas main	A pipe conveying back-run gas from the base of a generator to a wash-box.
4416	down-run gas main	A pipe conveying down-run gas from the base of a generator to the top of a carburettor.
4417	primary air <i>air blast</i>	Air Supplied to a generator or producer for gasification of solid fuels.

No.	Term	Definition
4418	secondary air	Air supplied for the combustion of blow gases.
4419	tertiary air	Air supplied at the top of the superheater of a carburetted water-gas plant or at the bottom of the recuperator of a blue water-gas plant in order to liberate any potential heat in the waste gases before they go to the waste-heat boiler.

Sub-section 45. Cyclic oil gasification plant

4501	regenerative cyclic process	A cyclic process in which the flow of make gases is in the opposite direction to the flow of combustion gases thus enabling heat recovery to take place.
4502	non-regenerative cyclic process	A cyclic gasification process in which the flow of make gases and combustion gases is in the same direction.
4503	steam regenerator	A chamber on a regenerative type plant between the reactor and the main stack valve filled with chequerwork in which steam is preheated and oil is sprayed during the run.
4504	air regenerator	A chamber on a regenerative type plant between the reactor and the wash box filled with chequerwork in which air is preheated during the blow.
4505	steam preheater	A chamber on a non-regenerative type plant before the reactor and filled with chequerwork in which steam is preheated and oil is sprayed during the run.
4506	catalyst bed	The mass of catalyst in the reactor.
4507	steam/carbon ratio	The ratio of the quantities of steam to carbon content in the feedstock used in the reforming reaction, expressed as moles of steam per gram atom of carbon.
4508	steam/feedstock ratio	The weight ratio of the quantities of steam to feedstock used in the reforming reaction (often incorrectly called steam/carbon ratio).

Sub-section 46. Oil-based continuous gasification plant

4601	tubular reforming furnace	A furnace containing externally heated tubes through which the reactants for reforming pass.
4602	reformer tubes	Tubes containing catalyst which are located in the furnace and through which the reactants are passed.
4603	partial oxidation	A process in which a hydrocarbon is caused to react with air and/or oxygen, and steam to produce a combustible gas.
4604	pigtail	Piping, either flexible or with expansion loops, which carries either the reactants to, or the products from, each reformer tube.
4605	rich gas reactor	A reaction vessel containing catalyst which promotes a reaction between a mixture of steam and light hydrocarbons to produce a methane-rich gas.
4606	reforming efficiency	The ratio of therms (joules in S.I. units) of reformed gas produced, to the therms (joules) of process and heating feedstock used, expressed as a percentage.
4607	conversion performance <i>conversion efficiency,</i> deprecated	The ratio of therms (joules in S.I. units) of reformed gas produced to the therms (joules) of process feedstock only, expressed as a percentage.
4608	vent stack	A stack through which "off-specification" gas can be vented until such time as it has so changed as to be suitable for passing to the distribution system.

No.	Term	Definition
4609	hydrodesulphurization	A process in which sulphur compounds are hydrogenated over a catalyst to H ₂ S and the H ₂ S then removed. The reactions are carried out in the vapour phase and at elevated temperatures.
4610	degasser	Equipment used for removing gases from condensate which has been recovered from a process gas stream, in order that the condensate may be re-used in the process.
Sub-section 47. Instrumentation and control		
4701	automatic controller	A device in which a signal from the sensing element is compared with a signal representing the set value and which operates in such a way as to reduce the deviation. This it does by providing a control signal dependent on the deviation, for transmission to the correcting unit which adjusts the value of the correcting condition. NOTE The two functions of the automatic controller, namely to determine the deviation and to generate the control signal dependent on the deviation, are in many controllers carried out by two separate parts of the controller, the comparing element and the controlling element respectively.
4702	sensing element detecting element	The element which responds directly to the value of the controlled condition.
4703	measuring element	The element which responds to the signal from the sensing element and gives the measured value of the controlled condition.
4704	measuring unit	A unit comprising those elements (sensing element and measuring element) which give the measured value of the controlled condition.
4705	signal	The physical quantity or change in physical quantity by which one element of a control system influences another.
4706	set value <i>index value</i>	The value of the controlled condition to which the automatic control mechanism is set. NOTE 1 In process control the set value may be adjusted to a specified value or it may be varied by an external agent. NOTE 2 Desired value and set value are not always the same [see offset (4709)].
4707	deviation (θ)	The difference between the measured value of the controlled condition and the set value. A positive (+) sign is given to the deviation when the measured value of the controlled condition is greater than the set value; a negative (–) sign when it is less.
4708	proportional band	That range of values of deviation corresponding to the full operating range of output signal of the controlling unit resulting from proportional action only. The proportional band can be expressed as a percentage of the range of values of the controlled condition which the measuring unit of the controller is designed to measure.
4709	offset	Sustained deviation due to an inherent characteristic of proportional controller action.
4710	cascade control system	A control system in which the controller alters the set value of one or more other controllers.
4711	transducer	A device for transforming one kind of energy (e.g. mechanical or thermal) into another (e.g. hydraulic or electrical) so that a signal may be used for indication, control or transmission.
4712	automatic trip system	An automatic system which interrupts operations and brings plant or equipment to a safe condition in the event of certain conditions deviating beyond the prescribed limits.

4713	valve positioner	A signal amplifying device which can be fitted to a control valve to obtain increased sensitivity of valve operation.
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Section 5. Refractories

Relevant terms and definitions will be found in BS 3446^a.

^a BS 3446, "Glossary of terms relating to the manufacture and use of refractory materials".

Section 6. Gas purification

Sub-section 61. General

No.	Term	Definition
6101	wet purification	Removing moisture, tar and ammonia from raw gas.
6102	dry purification	Removing gaseous impurities from gas by passing it through particulate solids, e.g. removing hydrogen sulphide by iron oxide.
6103	liquid purification	The removal of specific constituents from gas by means of liquid reagents.
6104	naphthalene extraction	Removing naphthalene from gas by absorption in oil.
6105	dehydration	Removing water vapour from gas to lower its dew-point and minimize condensation in mains.

Sub-section 62. Gas cooling

6201	primary condenser <i>primary cooler</i>	Apparatus for condensing tar and water from raw gas and for cooling gas to a temperature suitable for the first process to which it is to be subjected.
6202	secondary condenser <i>secondary cooler</i> <i>final cooler</i>	Apparatus for cooling partially-treated gas to a temperature suitable for subsequent processes.
6203	indirect condenser <i>indirect cooler</i>	Apparatus for cooling hot gas, heat being transferred from the gas to the liquid cooling medium through a metal wall.
6204	direct condenser <i>direct cooler</i>	Apparatus for cooling hot gas, the cooling medium being brought into direct contact with the gas to be cooled.
6205	atmospheric condenser	Apparatus for cooling gas, the heat of the gas being transferred to the atmosphere through a metal wall which is commonly sprayed with cold water.
6206	virgin liquor	Aqueous condensate produced by cooling crude coal gas.
6207	flushing liquor	Hot ammoniacal liquor sprayed into the gas in gas off-takes and collecting mains to cool it and precipitate solid particles and heavy tar.
6208	flushing tank decantation tank	A tank to which surplus flushing liquor and condensed tar are returned from a collecting main. The flushing liquor is separated from the tar in the tank and is returned to the sprays in the gas off-takes and collecting main.
6209	acid gas condensate	The condensate derived from the cooling of saturated gases, containing carbon dioxide or hydrogen sulphide.
6210	knock-out pot	A vessel fitted in a gas stream in locations where the gas has been cooled below its dewpoint. The vessel acts as a receiver for condensate and removes water droplets.
6211	demister	A means by which the fine droplets of condensed or entrained liquid are removed from a saturated gas stream.
6212	air-fin cooler	A type of cooler in which air is blown or drawn over banks of finned tubes which carry the gas or liquid to be cooled.

Sub-section 63. Tar removal

No.	Term	Definition
6301	electrostatic precipitation electro-detarring	A method of removing suspended tar, tar fog or dust from gas by imparting to the particles an electric charge which causes them to be deposited on the oppositely charged electrode of the apparatus.
6302	impingement	A method of removing suspended tar particles from gas by dividing the gas into numerous small streams and causing the particles to impinge on a surface from which the tar is collected. A typical example of the method is the Pelouze and Audouin tar extractor (P & A).
6303	centrifugal separation	Removing suspended tar particles from a gas by making it flow spirally at high velocity in a suitable apparatus. The tar particles are thrown by centrifugal force to the periphery of the apparatus, from which they are collected.
6304	bubble-type separation	Removing suspended tar particles from gas by dividing it into numerous small streams which bubble through a liquid (usually ammoniacal liquor). A typical example of the method is the Livesey washer.
6305	tar fog	A suspension of very small particles of tar in a gas, the particles being too small to be removed readily from the gas by the action of gravity alone.

Sub-section 64. Ammonia removal

6401	direct ammonia recovery	Removal of ammonia from hot raw coal gas by first removing suspended tar without cooling the gas and then passing the raw gas into sulphuric acid.
6402	indirect ammonia recovery	Removal of ammonia from coal gas by first cooling the gas almost to atmospheric temperature and then removing the residual ammonia by washing the gas with soft or softened cold water or cold dilute ammoniacal liquor.
6403	semi-direct ammonia recovery	A process similar to indirect ammonia recovery (6402) in which the residual ammonia is removed by washing, often after reheating, with sulphuric acid.
6404	gas washing gas scrubbing	Removing soluble constituents and suspended particles from a gas by bringing it into intimate contact with a suitable liquid.

Sub-section 65. Dry purification

6501	primary purifiers	A set of gas purifier boxes or towers for removing most of the hydrogen sulphide.
6502	secondary purifiers	A set of gas purifier boxes or towers for removing hydrogen sulphide which has not been removed in the primary purifiers or has been introduced by an intermediate process.
6503	purifier box	An iron, steel or concrete box, generally rectangular, containing iron oxide, usually in superimposed layers on grids or removable perforated trays (purifier tray), through which gas flows.
6504	catch box catch tower	A purifier box through which gas passes after leaving the main dry purification plant to remove any remaining hydrogen sulphide.
6505	clean box	A purifier box from which gas free from hydrogen sulphide is passing.

No.	Term	Definition
6506	dirty box	A purifier box from which gas containing hydrogen sulphide is passing.
6507	purifier tray	An open topped container (shape according to the type of purifier) with grids in the base, also sometimes in a mid-position; contains oxide for use in tower purifiers.
6508	tower purifier	Apparatus for dry purification of gas, consisting of a tower containing superimposed removable trays filled with iron oxide, through which the gas flows.
6509	stocking tower	An additional tower attached to a group of purifier towers, intended to contain trays of spent oxide after removal from a tower on stream; to permit exclusion of air if firing is likely to occur.
6510	stocking frame	Similar to a stocking tower except that the sides are clad only in light gauge sheets of non-gas-tight construction; provided to contain trays of new or revived oxide prior to replacing trays of spent oxide.
6511	backward rotation	A method of operating purifiers. The sequence of the boxes is changed by making the last box in a set become the first box, the order of the other boxes remaining the same. For example, for a set of four boxes the full sequence is as follows: 1, 2, 3, 4, 4, 1, 2, 3, 3, 4, 1, 2, 2, 3, 4, 1.
6512	forward rotation	A method of operating purifiers. The sequence of the boxes is changed by making the first box in a set become the last box, the order of the other boxes remaining the same. For example, for a set of four boxes the full sequence is as follows: 1, 2, 3, 4, 2, 3, 4, 1, 3, 4, 1, 2, 4, 1, 2, 3.
6513	rapid rotation of boxes	The scheme of rotation of boxes at frequent intervals as a means of obtaining more even temperature distribution throughout the system.
6514	fouling	Accumulation of sulphur and other impurities from gas in a purifying material.
6515	revivification	Re-converting fouled oxide for further purification of gas, usually by oxidizing in air.
6516	revivification in situ	Revivifying fouled oxide by adding air to the unpurified gas passed through the purified box.
6517	oxide	A purification material, traditionally used in a dry purification, basically hydrated iron oxide, occurring naturally as in bog ore or as a commercially "prepared" material.
6518	bog ore	Naturally occurring forms of hydrated iron oxide deposited on peat or other fibrous matter, particularly suitable for extracting hydrogen sulphide from gas.
6519	spent oxide	Fouled iron oxide unsuitable for revivification.
6520	wet lute	A purifier cover seal consisting of a trough containing water into which the edges of the cover dip.

No.	Term	Definition
6521	dry lute	A purifier cover seal consisting of a strip of compressible material attached near the edge of the underside of the cover and gripped between the cover and the top of the box by suitable fastenings.
6522	purifier grid	A grating built up from closely placed wooden slats or metal bars and used for supporting iron oxide in purifier boxes. There are various forms of grid, the flat grid and the hurdle grid being the most common.
6523	lightening grid	An intermediate grid composed of widely-spaced wooden slats, used to reduce the weight on the main purifier grid.
6524	centre valve	A composite gas valve containing in one casing all the valves necessary for a set of purifier boxes.
6525	preheater	Apparatus for heating gas immediately before or during some stage in dry purification.
6526	humidifier	Apparatus for admitting steam or atomized water to gas immediately before or during some stage in dry purification.
6527	R ratio	A ratio used in designing oxide boxes, equal to the volume of gas to be purified per hour divided by the volume of oxide in a box, both in cubic feet (or cubic metres).

Sub-section 66. Liquid purification

6601	feed gas	The gas which is supplied to the liquid purification system to enable one or more constituents of the gas to be removed.
6602	sour gas	A gas containing acid gases, e.g. hydrogen sulphide, carbon dioxide, hydrogen cyanide, which is normally fed to a liquid purification system.
6603	stripped gas	A stream of gas leaving a purification system having had one or more constituents removed or partially removed in that system.
6604	acid gas	The effluent gas from the regenerator of a liquid purification system containing mainly acid gas constituents.
6605	absorber	A vessel in which one or more of the constituents of the feed gas are absorbed or partially absorbed by liquid reagent.
6606	regenerator <i>stripper</i> , deprecated	A vessel in which the gaseous constituents absorbed by the liquid reagent are removed from that reagent by means of heat, air, steam or other carrier gas.
6607	reboiler	A heat exchanger by means of which heat is imparted to the liquid reagent to enable the removal of the absorbed constituents from the liquid reagent to take place.
6608	flash vessel let down vessel	A vessel in which the liquid reagent leaving an absorber is depressurized, thus enabling the dissolved gases to be released.
6609	oxidizer	A vessel into which air and oxygen is introduced to oxidize the liquid reagent being recirculated in the purification process.
6610	delay vessel	A holding vessel which allows the chemical reactions involved in the liquid purification process to proceed substantially to completion.
6611	packing	An inert material placed in the absorber or regenerator to provide adequate surface area for the contacting of liquids and gases.
6612	let down turbine	A machine which enables power to be recovered when reducing the pressure of the liquid reagent.

No.	Term	Definition
6613	lye	A term commonly applied to an alkaline liquid reagent.
6614	rich solution fat solution	A solution or lye in which the concentration of the absorbed constituent is high, i.e. after absorption.
6615	lean solution regenerated solution <i>stripped solution</i> , deprecated	The solution in which the concentration of the absorbed constituent is very low, i.e. after regeneration.
6616	oxygen carrier	A liquid reagent which is capable of taking up oxygen from an oxygen-containing gas and transferring the oxygen by chemical reaction.
6617	spray tower	A vessel in which a liquid reagent is brought into contact with the gas by means of fine sprays.
6618	static washer	Gas-washing apparatus in the form of a series of compartments each containing material presenting a large surface area. Each compartment has its own circulating pump for distributing the solvent over the filling material. The solvent flows by gravity from compartment to compartment usually counter-current to the gas flow.
6619	rotary washer	Gas-washing apparatus consisting of a horizontal series of adjacent cylindrical compartments with packings rotating on a central shaft. Gas passes successively through the compartments, flowing radially through the part of the filling above the solvent. The solvent overflows from one compartment to the next, usually counter-current to the gas.
6620	tower scrubber	Gas-washing apparatus in the form of a circular or rectangular tower, usually containing material presenting a large surface area. Solvent is distributed over the filling material from the top of the tower and is withdrawn at the bottom, whilst gas enters at the bottom of the tower and passes counter-current to the descending stream of solvent.
6621	centrifugal washer	Gas-washing apparatus consisting of a vertical series of compartments, solvent being sprayed in each compartment by a device mounted on a central vertical shaft rotating at high speed. Solvent enters at the top, overflows successively through the series of compartments and leaves at the bottom of the apparatus, while gas enters at the bottom, ascends through the solvent spray in each compartment and leaves at the top of the apparatus.
6622	flooding rate	The rate of circulation of solution down a packed column at which the interstices in the packing are just filled with liquid and gas flow ceases.
6623	driving force	The difference in concentration of the gaseous constituent being absorbed or desorbed between the gas in equilibrium with the liquid phase.

Section 7. Products

Sub-section 71. Gas

No.	Term	Definition
7101	town gas	Combustible gas normally supplied to the public by a utility undertaking in accordance with statutory requirements (see Appendix B).
7102	coal gas	Combustible gas produced by carbonizing coal and sometimes called “straight” coal gas to distinguish it from mixtures to which water-gas or other combustible gas has been added.
7103	coke-oven gas	Coal gas produced in a coke oven.
7104	oil gas	Combustible gas produced by cracking oil in the presence or absence of a catalyst. The oil is generally of mineral origin.
7105	bottled gas	Liquefied petroleum gases sold in pressure containers.
7106	butane-air propane-air	Commercial butane or propane mixed with air and supplied as town gas or as a part of town gas.
7107	reformed gas	Combustible gas produced by a reforming process.
7108	unstripped gas benzolized gas	Gas from which benzole has not been removed.
7109	stripped gas debenzolized gas	Gas from which benzole has been removed.
7110	converted gas CO-reduced gas <i>detoxified gas</i> , deprecated	Combustible gas in which the carbon monoxide content has been substantially reduced.
7111	blue water-gas (BWG)	Gas consisting almost entirely of carbon monoxide and hydrogen in nearly equal proportions, produced by reaction of steam with coke at a temperature of about 1 000 °C.
7112	carburetted water-gas (CWG)	Blue water-gas to which gases of high calorific value obtained by thermal decomposition of oil have been added.
7113	producer gas <i>CO</i> , deprecated	Combustible gas produced by continuously gasifying solid fuel in a mixture of air and steam (or sometimes air alone).
7114	blast-furnace gas	Combustible gas produced by reactions in a blast-furnace.
7115	rich gas	Gas of relatively high calorific value consisting mainly of low boiling point hydrocarbons [cf. lean gas (7116)].
7116	lean gas	Gas of relatively low calorific value [cf. rich gas (7115)].
7117	lean gas	A mixture of combustible gases individually produced by two or more different processes.
7118	raw gas <i>green gas</i>	A mixture of permanent (mostly combustible) gases, vapours and tar fog evolved from coal.
7119	crude gas foul gas	A mixture of gases resulting from the removal of all or nearly all the tar and water vapour from raw gas by condensation.
7120	fuel gas heating gas	Gas supplied for heating process plant.
7121	underfiring gas	Gas supplied for heating coke ovens or retort settings.
7122	waste gas flue gas	Products of combustion, mainly carbon dioxide, water vapour and nitrogen, leaving the heating flues of a retort setting, coke oven or furnace.
7123	purging	Sweeping a gas from a main or installation with another gas. Gases used include air, waste, inert or combustible gases or steam.