

Common Oxy-Fuel Industry Terms

A

ACETYLENE – Gas composed of two parts of carbon and two parts of hydrogen. When burned in the atmosphere of oxygen, it produces one of the highest flame temperatures obtainable.

ACETYLENE CYLINDER – All acetylene cylinders are fitted with fusible plugs. These are designed to vent the cylinder contents in the event of an unsafe condition arising in the cylinder that could be due to any number of reasons, such as overheating from either incorrect operating techniques, faulty equipment, or in conjunction with excessive temperature.

ACETYLENE REGULATOR – A device used to reduce cylinder pressure to torch pressure and to keep the pressure constant. They are *NEVER* to be used as oxygen regulators.

ALLOY – metallurgy mixture of metals: a substance that is a mixture of two or more metals, or of a metal with a nonmetallic material

ANNEALING – Softening metals by heat treating. This most commonly consists of heating the metals up to a critical temperature and then cooling them slowly.

ANSI – Abbreviation for “*American National Standards Institute.*”

AWS – Abbreviation for “*American Welding Society.*”

AXIS OF WELD – (See **WELD AXIS**)

B

BACKHAND WELDING – A welding technique in which the welding torch is directed opposite to the progress of welding.

BEAD – A type of weld composed of one or more string or weave beads deposited on an unbroken surface.

BEVEL – An angular edge preparation. For successful welding, the edges of the parts to be joined with a butt joint often require a beveled edge to allow adequate deposition and penetration of the weld. While the strength requirements of the joint dictate the actual joint design required, butt welding of material 3/8 inch or more thick often requires some sort of edge preparation before welding.

BLOWPIPE – Another term used for torch. (See **CUTTING TORCH** or **WELDING TORCH**)

BOND – To join (metals) by applying heat, sometimes with pressure and sometimes with an intermediate or filler metal having a high melting point.

BRAZE WELDING – A welding process variation in which a filler metal, having a liquidus above 840° F (450° C) and below the solidus of the basemetal is used. Unlike brazing, in braze welding the filler metal is not distributed in the joint by capillary action.

BRAZING – A group of welding processes that produces coalescence of materials by heating them to the brazing temperature in the presence of a filler metal having a liquidus above 840° F (450° C) and below the solidus of the base metal. The filler metal is distributed between the closely fitted surfaces of the joint by capillary action.

BUILDUP – Refers to the order in which the beads of a multiple-pass weld are deposited in the joint.

BURNED METAL – Term occasionally applied to the metal which has been combined with oxygen so that some of the carbon changed into carbon dioxide and some of the iron into iron oxide.

BURNING – A nonstandard term for **OXYGEN CUTTING**.

BUTT JOINT – A joint consisting of two parts of material that are placed squarely together rather than overlapping or interlocking.

C

CAPILLARY ACTION – A phenomenon in which a liquid's surface rises, falls, or becomes distorted in shape where it is in contact with a solid. It is caused by the difference between the relative attraction of the molecules of the liquid for each other and for those of the solid.

CARBON – An element which, when combined with iron, forms various kinds of steel. In steel, it is the changing carbon content which changes the physical properties of the steel. Carbon is also used in a solid form as an electrode for arc welding and as a mold to hold metal.

CARBONIZING FLAME – An oxyacetylene flame in which there is an excess of acetylene. Also called excess acetylene or **REDUCING FLAME**.

CARBURIZING FLAME – A nonstandard term for **REDUCING FLAME**.

CASE HARDENING – Adding of carbon to the surface of a mild steel object and heat treating to produce a hard surface.

CASTINGS – Metallic forms that are produced by pouring molten metal into a shaped container (mold).

CGA – Abbreviation for "*Compressed Gas Association*."

CONCAVE FILLET WELD – A weld that has a concave face (may result in cracking).

CONE – The conical part of an oxy-fuel flame next to the orifice of the tip.

CONTINUOUS WELD – A weld that extends continuously from one end of the joint to the other. Where the joint is essentially circular, it extends completely around the joint.

CONVEX FILLET WELD – A fillet weld having a convex face (a good weld with no undercutting).

CORNER JOINT – A joint between two members located approximately at right angles to each other to form an "L."

CRACKING – Action of opening a valve slightly and then closing the valve immediately.

CROWN – Curve or convex surface of finished weld face.

CUTTING TORCH – A device used in gas cutting for controlling the gases used for preheating and the oxygen used for cutting the metal.

CYLINDER – (See **GAS CYLINDER**)

D

DOT – Abbreviation for "*Department of Transportation*."

E

EDGE JOINT – A joint between the edges of two or more parallel or nearly parallel members.

ELONGATION – Percentage increase in the length of a specimen when stressed to its yield strength.

EROSION – A condition caused by dissolution of the base metal by molten filler metal resulting in a reduction in the thickness of the base metal.

F

FACE OF WELD – (See **WELD FACE**)

FILLER WIRE – A nonstandard term for **WELDING WIRE**.

FILLET – Weld metal in the internal vertex, or corner, of the angle formed by two pieces of metal, giving the joint additional strength to withstand unusual stress.

FILLET WELD – A weld of approximately triangular cross section joining two surfaces approximately at right angles to each other in a lap joint, T-joint or corner joint.

FILTER LENS – A colored glass used in goggles, helmets, and shields to exclude harmful light rays.

FLAME CUTTING – A nonstandard term for ***OXY-FUEL CUTTING***

FLAT POSITION – The welding position used to weld from the upper side of the joint; the face of the weld is approximately horizontal.

FLUX – A cleaning agent used to dissolve oxides, release trapped gases and slag, and to cleanse metals for welding, soldering, and brazing.

FORGING – Metallic shapes being derived by either hammering or squeezing the original piece of metal into the desired shape or thickness.

FOREHAND WELDING – A welding technique in which the flame is directed toward the progress of welding.

FUSION – A thorough and complete mixing between the two edges of the base metal to be joined or between the base metal and the filler metal added during welding.

G

GAS CYLINDER – A portable container used for transportation and storage of a compressed gas.

GAS POCKETS – Cavities in weld metal caused by entrapping gas (porosity).

GOUGING – The removal of a bevel or groove.

H

HEAT-AFFECTED ZONE – That portion of the base metal that has not been melted, but whose mechanical properties of microstructure has been altered by the heat of welding, cutting or heating.

HEAT CONDUCTIVITY – Speed and efficiency of heat energy movement through a substance.

HORIZONTAL POSITION – The position in which welding is performed on the upper side and approximately horizontal surface and against an approximately vertical surface.

HOSE – Flexible medium used to carry gases from the regulator to the torch. It is made of fabric and rubber or neoprene.

HYDROGEN – A gas formed of the single element hydrogen. It is considered one of the most active gases. When combined with oxygen, it forms a very clean flame.

I

INSIDE CORNER WELD – Two metals fused together; one metal is held 90 degrees to the other. The fusion is performed inside the vertex of the angle.

INTERMITTENT WELD – A weld in which the continuity is broken by recurring unweled spaces.

J

JOINT – The junction of members, or the edges of members, which are to be joined or have been joined.

JOINT PENETRATION – The depth a weld extends from its face into a joint, exclusive of reinforcement.

L

LAP JOINT – A joint between two overlapping members in parallel planes.

LAYER – A certain weld metal thickness made of one or more passes.

LEG OF A FILLET WELD – The distance from the root of the joint to the toe of the fillet weld.

LENS – (See *FILTER LENS*)

K

KINDLING TEMPERATURE – The temperature at which a substance will catch fire and continue to burn. Also call the “ignition point.”

M

MIXING CHAMBER – That part of the welding torch or cutting torch in which the fuel gas and oxygen are mixed.

N

NEUTRAL FLAME – An oxy-fuel gas flame in which the portion used is neither oxidizing nor reducing.

NFPA – Abbreviation for National Fire Protection Association.

NOZZLE – (See *TIP*)

O

ORIFICE – Opening through which gas flows. It is usually the final opening controlled by a valve.

OSHA – Abbreviation for “*Occupational Safety and Health Administration*.”

OUTSIDE CORNER WELD – Fusing two pieces of metal together with the fusion taking place on the underpart of the seam.

OVERHEAD POSITION – The position in which welding is performed from the underside of the joint.

OVERLAP – The protrusion of weld metal beyond the weld toe or weld root.

OXIDIZING – Combining oxygen with any other substance. For example, a metal is oxidized when the metal is burned, i.e., oxygen is combined with all the metal or parts of it.

OXIDIZING FLAME – An oxy-fuel gas flame having an oxidizing effect due to excess oxygen.

OXY-ACETYLENE CUTTING – (See *OXY-FUEL CUTTING*)

OXY-ACETYLENE WELDING – (See *OXY-FUEL WELDING*)

OXY-FUEL CUTTING – An oxy-fuel gas cutting process used to burn metals by means of the reaction oxygen with the base metal at elevated temperatures. The necessary temperature is maintained by gas flames resulting from the combustion of acetylene with oxygen.

OXY-FUEL WELDING – An oxy-fuel gas welding process that produces fused metals by heating them with a gas flame or flames obtained from the combustion of acetylene with oxygen. The process may be used with or without the application of pressure and with or without the use of a filler metal.

OXYGEN – A gas formed of the element oxygen. When oxygen very actively supports combustion it is called burning; when oxygen is slowly combined with a substance it is called oxidation.

OXYGEN CUTTING – A process of cutting ferrous metals by means of the chemical action of oxygen on elements in the base metal at elevated temperatures.

OXYGEN CYLINDER – (See ***GAS CYLINDER***)

OXYGEN HYDROGEN FLAME – The chemical combining of oxygen with the fuel gas hydrogen.

OXYGEN HOSE – (See ***HOSE***)

OXYGEN LP GAS FLAME – Chemical combining of oxygen with LP fuel gas (liquefied petroleum).

OXYGEN REGULATOR – A device used to reduce cylinder pressure to torch pressure and to keep the pressure constant. They are never to be used as fuel gas regulators.

P

PASS – (See ***WELD PASS***)

PENETRATION – A nonstandard term for ***JOINT PENETRATION***.

PWG WELD – A weld in a circular hole in one member of a joint fusing that member to another member.

POROSITY – Cavity type discontinuities formed by gas entrapment during solidification.

POSTHEATING – The application of heat to an assembly after welding, cutting or heating.

PRECOATING – Coating the base metal in the joint prior to soldering or brazing.

PREHEATING – The application of heat to the base metal immediately before welding or cutting.

PUDDLE – A nonstandard term for ***WELD POOL***.

R

REDUCING FLAME – A flame having a reducing effect due to excess fuel gas.

REINFORCEMENT WELD – (See ***WELD REINFORCEMENT***)

ROOT OF WELD – (See ***WELD ROOT***)

S

SLAG INCLUSION – Non-metallic solid material entrapped in the weld metal or between weld metal and base metal.

SOLDERING – A group of welding processes that by heating them to the soldering a filler metal having a liquidus not exceeding 840° F (450° C) and below the solidus of the base metals. The filler metal is distributed between the closely fitted surfaces of the joint by capillary action.

STRAIN – Reaction of an object to a stress.

STRESS – Load imposed on an object.

STRESS RELIEVING – Even heating of a structure to a temperature below the critical temperature followed by a slow, even cooling.

T

TACK WELD – A weld made to hold the parts of a weldment in proper alignment until the final welds are made.

T-JOINT – Joint formed by placing one metal against another at an angle of 90 degrees. The edge of one metal contacts the surface of the other metal.

TENSILE STRENGTH – The maximum load per unit of original cross-sectional area sustained by a material during the tension test.

THROAT OF A FILLET WELD – Distance from the weld root to the weld face.

TINNING – A nonstandard term for *PRECOATING*.

TIP – The end of the torch where the gas burns and creates a high temperature flame, it regulates and directs the flame.

TOE OF WELD – (See *WELD TOE*)

TORCH – (See *CUTTING TORCH* or *WELDING TORCH*)

U

UNDERCUT – A groove in the base metal adjacent to the weld toe or weld root and left unfilled by weld metal.

V

VERTICAL POSITION – The position of welding in which the weld axis is approximately vertical.

W

WELD AXIS – A line through the length of the weld, perpendicular to and at the geometric center of its cross section.

WELD BEAD – A weld deposit resulting from a pass.

WELD FACE – The exposed surface of the weld on the side from which welding was done.

WELDING – To join together pieces or parts of some material by heating, hammering or using other pressure.

WELDING ROD – Filler metal in wire or rod form, used in gas welding and brazing processes and in those arc welding processes in which the electrode does not provide the filler metal.

WELDING SEQUENCE – The order of making welds in a weldment.

WELDING TORCH – A device used in gas cutting for controlling the gases used for preheating and the oxygen used for cutting the metal.

WELDING WIRE – Metal wire that is melted and added to the welding puddle to produce the necessary increase in bead thickness.

WELDMENT – Assembly of component parts joined together by welding.

WELD METAL – Fused portion of base metal or fused portion of base metal and filler metal.

WELD PASS – A single progression of welding or surfacing along a joint or substrate. The result of a pass is a weld bead or layer.

WELD POOL – The localized volume of molten metal as a weld prior to its solidification as weld metal.

WELD REINFORCEMENT – Weld metal in excess of the quantity required to fill a joint.

WELD ROOT – The points, as shown in cross section, at which the back of the weld intersects the base metal.

WELD TOE – The junction of the weld face and the base metal.

Y

YIELD STRENGTH – Stress at which a specimen assumes a permanent set.