

# SIM WELDER™

## Welding Glossary

---

<i>Actual throat thickness</i>	The perpendicular distance between two lines, each parallel to a line joining the outer toes, one being tangent at the weld face and the other being through the furthestmost point of fusion penetration.
<i>Air-arc cutting</i>	Thermal cutting using an arc for melting the metal and a stream of air to remove the molten metal to enable a cut to be made.
<i>All-weld test piece</i>	A block of metal consisting of one or more beads or runs fused together for test purposes. It may or may not include portions of parent metal.
<i>All-weld test specimen</i>	A test specimen that is composed wholly of weld metal over the portion to be tested.
<i>Arc blow</i>	A lengthening or deflection of a DC welding arc caused by the interaction of magnetic fields set up in the work and arc or cables.
<i>Arc fan</i>	The fan-shaped flame associated with the atomic-hydrogen arc.
<i>Arc voltage</i>	The voltage between electrodes or between an electrode and the work, measured at a point as near as practical to the work.
<i>Atomic-hydrogen welding</i>	Arc welding in which molecular hydrogen, passing through an arc between two tungsten or other suitable electrodes, is changed to its atomic form and then re-combines to supply the heat for welding.
<i>Backfire</i>	Retrogression of the flame into the blowpipe neck or body with rapid self extinction.
<i>Backing bar</i>	A piece of metal or other material placed at a root (Temporary backing)(These terms are applied only to the welding of pipes or tubes.)
<i>Blowhole</i>	A cavity generally over 1.6 mm in diameter, formed by entrapped gas during solidification of molten metal.
<i>Blowpipe</i>	A device for mixing and burning gases to produce a flame for welding, brazing, bronze welding, cutting, heating, and similar operations.
<i>Burn back</i>	Fusing of the electrode wire to the current contact tube by sudden lengthening of the arc in any form of automatic or semi-automatic metal-arc welding using a bare electrode.
<i>Burn off rate</i>	The linear rate of consumption of a consumable electrode.
<i>Carbon-arc</i>	Arc welding using a carbon electrode or electrodes.

*welding*

<i>Chain intermittent weld</i>	An intermittent weld on each side of a joint (usually fillet welds in T and lap joints) arranged so that the welds lie opposite to one another along the joint.
<i>CO2 flux welding</i>	Metal-arc welding in which a flux-coated or flux containing electrode is deposited under a shield of carbon dioxide.
<i>CO2 welding</i>	Metal-arc welding in which a bare wire electrode is used, the arc and molten pool being shielded with carbon dioxide.
<i>Concave fillet weld</i>	A fillet weld in which the weld face is concave (curved inwards).
<i>Cone</i>	The more luminous part of a flame, which is adjacent to the nozzle orifice.
<i>Continuous weld</i>	A weld extending along the entire length of a joint.
<i>Convex fillet weld</i>	A fillet weld in which the weld face is convex (bulbous).
<i>Coupon plate</i>	A test piece made by adding plates to the end of a joint to give an extension of the weld for test purposes. (Note: this term is usually used in the shipbuilding industry.)
<i>Crack</i>	A longitudinal discontinuity produced by fracture. Cracks may be longitudinal, transverse, edge, crater, centre line, fusion zone underhead, weld metal, or parent metal.
<i>Crater pipe</i>	A depression due to shrinkage at the end of a run where the source of heat was removed.
<i>Cruciform testpiece</i>	A flat plate to which two other flat plates or two bars are welded at right angles and on the same axis.
<i>Cutting electrode</i>	An electrode with a covering that aids the production of such an arc that molten metal is blown away to produce a groove or cut in the work.
<i>Cutting oxygen</i>	Oxygen used at a pressure suitable for cutting.
<i>De-seaming</i>	The removal of the surface defects from ingots, blooms, billets, and slabs by means of a manual thermal cutting.
<i>Dip transfer</i>	A method of metal-arc welding in which fused particles of the electrode wire in contact with the molten pool are detached from the electrode in rapid succession by the short circuit current, which develops every time the wire touches the molten pool.
<i>Drag</i>	The projected distance between the two ends of a dragline.
<i>Drag lines</i>	Serrations left on the face of a cut made by thermal cutting.
<i>Electron-beam cutting</i>	Thermal cutting in vacuum by melting and vaporizing a narrow section of the metal by the impact of a focused beam of electrons.
<i>Excess penetration bead</i>	Excessive metal protruding through the root of a fusion weld made from one side only.
<i>Feather</i>	The carbon-rich zone, visible in a flame, extending around and beyond the cone when there is an excess of carbonaceous gas.
<i>Fillet weld</i>	A fusion weld, other than a butt, edge or fusion spot weld, which is approximately triangular in transverse cross-section.
<i>Flame cutting</i>	Oxygen cutting in which the appropriate part of the material to be cut is raised to

	ignition temperature by an oxy-fuel gas flame.
<i>Flame snap-out</i>	Retrogression of the flame beyond the blowpipe body into the hose, with possible subsequent explosion.
<i>Flame washing</i>	A method of surface shaping and dressing of metal by flame cutting using a nozzle designed to produce a suitably shaped cutting oxygen stream.
<i>Flashback arrestor</i>	A safety device fitted in the oxygen and fuel gas system to prevent any flashback reaching the gas supplies.
<i>Floating head</i>	A blowpipe holder on a flame-cutting machine, which through a suitable linkage, is designed to follow the contour of the surface of the plate, thereby enabling the correct nozzle-to-workpiece distance to be maintained.
<i>Free bend test</i>	A bend test made without using a former.
<i>Fusion penetration</i>	In fusion welding, the depth to which the parent metal has been fused.
<i>Fusion zone</i>	The part of the parent metal that is melted into the weld metal.
<i>Gas economiser</i>	An auxiliary device designed for temporarily cutting off the supply of gas to the welding equipment except the supply to a pilot jet where fitted.
<i>Gas envelope</i>	The gas surrounding the inner cone of an oxy-gas flame.
<i>Gas pore</i>	A cavity generally under 1.6 mm in diameter, formed by entrapped gas during solidification of molten metal.
<i>Gas regulator</i>	A device for attachment to a gas cylinder or pipeline for reducing and regulating the gas pressure to the working pressure required.
<i>GMAW (Gas metal arc welding)</i>	Also known as MIG (Metal inert gas) common and is also referred to as short circuit transfer. Welding using continuously fed consumable electrode & shielding gas.
<i>GTAW (Gas tungsten arc welding)</i>	Also known as TIG (Tungsten inert gas) Welding using a tungsten electrode & shielding gas where the filler metal is added using a welding rod.
<i>Guided bend test</i>	A bend test made by bending the specimen around a specified former.
<i>Heat affected zone</i>	The part of the parent metal that is metallurgically affected by the heat of welding or thermal cutting but not melted. (Also known as the zone of thermal disturbance).
<i>Hose protector</i>	A small non-return valve fitted to the blowpipe end of a hose to resist the retrogressive force of a flashback.
<i>Included angle</i>	The angle between the planes of the fusion faces of parts to be welded.
<i>Inclusion</i>	Slag or other foreign matter entrapped during welding. The defect is usually more irregular in shape than a gas pore.
<i>Incomplete root penetration</i>	Failure of weld metal to extend into the root of a joint.
<i>Incompletely filled groove</i>	A continuous or intermittent channel in the surface of a weld, running along its length, due to insufficient weld metal. The channel may be along the centre or along one or both edges of the weld.

<i>Intermittent weld</i>	A series of welds at intervals along a joint.
<i>Kerf</i>	The void left after metal has been removed by thermal cutting.
<i>Lack of fusion</i>	Lack of union in a weld between weld metal and parent metal, parent metal and parent metal or between weld metal and weld metal.
<i>Leg</i>	The width of a fusion face in a fillet weld.
<i>Metal-arc cutting</i>	Thermal cutting by melting using the heat of an arc between a metal electrode and the metal to be cut.
<i>Metal-arc welding</i>	Arc welding using a consumable electrode.
<i>Metal transfer</i>	The transfer of metal across the arc from a consumable electrode to the molten pool.
<i>MIG - welding</i>	Inert-gas welding using a consumable electrode (inert-gas metal-arc welding).
<i>Multi-stage regulator</i>	A gas regulator in which the gas pressure is reduced to the working pressure in more than one stage.
<i>Nick-break test</i>	A fracture test in which a specimen is broken from a notch cut at a predetermined position, where the interior of the weld is to be examined.
<i>Open arc welding</i>	Arc welding in which the arc is visible.
<i>Open circuit voltage</i>	In a welding plant ready for welding, the voltage between two output terminals which are carrying no current.
<i>Overlap</i>	An imperfection at a toe or a root of a weld caused by metal flowing on to the surface of the parent metal without fusing it.
<i>Oxygen-arc cutting</i>	Thermal cutting in which the ignition temperature is produced by an electric arc, and cutting oxygen is conveyed through the centre of an electrode, which is consumed in the process.
<i>Oxygen lance</i>	A steel tube, consumed during cutting, through which cutting oxygen passes, for the cutting or boring of holes.
<i>Oxygen lancing</i>	Thermal cutting in which an oxygen lance is used.
<i>Packed lance</i>	An oxygen lance with steel rods or wires.
<i>Penetration bead</i>	Weld metal protruding through the root of a fusion weld made from one side only.
<i>Plug weld</i>	A weld made by filling a hole in one component of a workpiece so as to join it to the surface of an overlapping component exposed through the hole.
<i>Porosity</i>	A group of gas pores.
<i>Powder cutting</i>	Oxygen cutting in which powder is injected into the cutting oxygen stream to assist the cutting action.
<i>Powder lance</i>	An oxygen lance in which powder is mixed with the oxygen stream.
<i>Preheating oxygen</i>	Oxygen used at a suitable pressure in conjunction with fuel gas for raising the ignition temperature of the metal to be cut.
<i>Residual welding stress</i>	Stress remaining in a metal part or structure as a result of welding.

<i>Reverse bend test</i>	A bend test in which the other than that specified for a face bend test is in tension.
<i>Root (of weld)</i>	The zone on the side of the first run farthest from the welder.
<i>Root face</i>	The portion of a fusion face at the root that is not beveled or grooved.
<i>Run-off-plate(s)</i>	A piece, or pieces, of metal placed to enable the full section of weld to be obtained at the end of the joint.
<i>Run-on-plate(s)</i>	A piece, or pieces, of metal so placed as to enable the full section of weld metal to be obtained at the beginning of a joint.
<i>Scarfig</i>	The removal of the surface defects from ingots, blooms, billets and slabs by means of a flame-cutting machine.
<i>Shrinkage groove</i>	A shallow groove caused by contraction of the metal along each side of a penetration bead.
<i>Side bend test</i>	A bend test in which the face of a transverse section of the weld is in tension
<i>Slag-trap</i>	A configuration in a joint or joint preparation that may lead to the entrapment of slag.
<i>Slot lap joint</i>	A joint between two overlapping components made by depositing a fillet weld round the periphery of a hole in one component so as to join it to the other component exposed through the hole.
<i>SMAW (Shielded metal arc welding)</i>	Also known as Stick welding or Manual metal arc (MMA) welding. The Arc welding process melts & fuses metal using the heat of an arc between a covered electrode & the base metal. The electrode wire also acts as a filler metal.
<i>Spray transfer</i>	Metal transfer which takes place as globules of diameter substantially larger than that of the consumable electrode from which they are transferred.
<i>Stack cutting</i>	The thermal cutting of a stack of plates usually clamped together.
<i>Staggered intermittent weld</i>	An intermittent weld on each side of a joint (usually fillet welds in T and lap joints) arranged so that the welds on one side lie opposite the spaces on the other side along the joint.
<i>Striking voltage</i>	The minimum voltage at which any specified arc may be initiated.
<i>Submerged-arc welding</i>	Metal-arc welding in which a bare wire electrode or electrodes are used; the arc or arcs are enveloped in a flux, some of which fuses to form a removable covering of slag on the weld.
<i>Surface-fusion welding</i>	Gas welding in which a carbonizing flame is used to melt the surface of the parent metal which then unites with the metal from a suitable filler rod.
<i>Sustained backfire</i>	Retrogression of the flame into the blowpipe neck or body, the flame remaining alight. Note: This manifests itself either as "popping" or "squealing" with a small pointed flame issuing from the nozzle orifice or as a rapid series of minor explosions inside.
<i>Test piece</i>	Components welded together in accordance with a specified welding procedure, or a portion of a welded joint detached from a structure for test.
<i>Thermal cutting</i>	The parting or shaping of materials by the application of heat with or without a stream of cutting oxygen.
<i>TIG - welding</i>	Inert-gas welding using a non-consumable electrode (inert-gas tungsten-arc welding).

<i>Toe</i>	The boundary between a weld face and the parent metal or between the weld faces.
<i>Touch welding</i>	Metal-arc welding using a covered electrode, the covering of which is kept in contact with the parent metal during welding.
<i>Tungsten inclusion</i>	An inclusion of tungsten from the electrode in TIG-welding.
<i>Two-stage regulator</i>	A gas regulator in which the gas pressure is reduced to the working pressure in two stages.
<i>Undercut</i>	An irregular groove at a toe of a run in the parent metal, or in previously deposited weld metal, due to welding.
<i>Weld junction</i>	The boundary between the fusion zone and the heat affected zone.
<i>Welding procedure</i>	A specified course of action followed in welding including the list of materials and, where necessary, tools to be used.
<i>Welding sequence</i>	The order and direction in which joints, welds, or runs are made.
<i>Welding technique</i>	The manner in which the operator manipulates an electrode, a blowpipe or a similar appliance.
<i>Worm-hole</i>	An elongated or tubular cavity formed entrapped gas during the solidification of molten metal.