

The AIM Solder Glossary

Whether you're new to the soldering industry or a seasoned professional, you may occasionally come across unfamiliar terms. Here we provide detailed definitions for more than 100 of the most commonly used solder-related words and abbreviations.

A-B

TERM	DEFINITION
Activator	A chemical that improves the ability of a flux to remove oxides and aid the wetting of parts being soldered
Aging	Aging in SMT refers to the natural degradation or change in electrical, mechanical, or thermal properties of components and materials over time, which can affect the performance and reliability of electronic devices.
Alloy	A mixture of metals used to create solder. Common alloys include tin-lead, tin-silver-copper, and others.
Annular Ring	The conductive area around a plated through hole
Area Ratio (AR)	In stencil printing, the ratio of the cross-sectional area of an aperture to the area of the side walls.
Assembly Process Window	The range of acceptable or optimal conditions and parameters within which a soldering process can be performed successfully
Automated Optical Inspection (AOI)	A method for visually inspecting PCBs using cameras and software.
Ball Grid Array (BGA)	A type of surface-mount packaging used for integrated circuits, which utilizes an array of solder balls as its connectors.
Bar Solder	Solid bars of solder alloy, often used as a source material for wave soldering machines.
Billboarding	A defect that occurs when a surface mount component, such as a chip resistor or capacitor, is soldered onto a PCB in a way that it stands upright like a billboard instead of lying flat against the PCB surface as intended.



The AIM Solder Glossary

B-D

TERM	DEFINITION
Blow Holes	Small holes or voids caused by out gassing in a plated through hole
Bono Testing	Testing that assesses the corrosive nature of solder pastes.
Bottom Terminating Component (BTC)	Electronic components with flat terminations on the bottom.
Bridge	An unintentional connection of solder between adjacent pads or leads.
Classification, Labelling and Packaging (CLP)	A United Nations system to identify hazardous chemicals and to inform users about these hazards.
Coefficient Of Thermal Expansion (CTE)	The rate at which the size or length of a material changes with change in temperature.
Copper Dissolution	The process of copper from a PCB dissolving into molten solder during soldering.
Copper Erosion	Degradation of copper traces or pads on a PCB due to prolonged exposure to molten solder.
Cored Solder Wire	Solder wire with an inner core of flux, used to facilitate the soldering process.
Creep Rate	The rate at which a solder material deforms or flows over time when subjected to a constant load or stress at elevated temperatures.
Daisy Chain	In points (such as resistors, capacitors, or integrated circuits) are connected in a sequential manner. The electrical connections are made in such a way that they form a continuous loop.
Defects Per Million Opportunities (DPMO)	A measure of process quality that tallies the number of defects that occur per million opportunities.
Delta T (ΔT)	The greatest difference in temperature found across an assembly
Desoldering	The process of removing soldered components from a circuit board.



The AIM Solder Glossary

D-F

TERM	DEFINITION
Drop Shock	Drop shock testing is a reliability test used to assess how well electronic components or assemblies, such as SMT PCBs, can withstand mechanical shocks during their operational life. It involves subjecting the device to controlled drop impacts to evaluate its resistance to mechanical stress and potential damage.
Dross	Oxidized solder that forms on the surface of molten solder, especially in wave soldering machines.
Electroless Nickel Immersion Gold (ENIG)	A type of PCB surface finish.
Electromigration	The tendency of conductive material to spread from one solder interconnect to another, causing a short circuit
Electropure™ Process	A process which minimizes oxides during alloy manufacturing, resulting in reduced drossing, and improved solder flow and drainage
Electrostatic Discharge (ESD)	A sudden flow of electricity between two charged objects.
Elemental Grain Structure Refiners	Materials or substances added to solder that improve the microstructure of the material by reducing the size of the grain structure.
Eutectic	In a eutectic mixture, the components are combined in such a way that the melting and solidification processes occur at a constant temperature, rather than over a range of temperatures as in non-eutectic mixtures.
Flux	A chemical compound or substance used in soldering to facilitate the soldering process by improving the wetting and bonding of the solder to the surfaces being joined
Flux Pen	A pen-like tool that applies flux to specific areas for localized soldering.
Flux Residue	The remnants of flux left on the board after soldering.



The AIM Solder Glossary

G-I

TERM	DEFINITION
Globally Harmonised System of Classification and Labelling of Chemicals (GHS)	Adopted by many countries around the world and used as the basis for international and national transport regulations for dangerous goods.
Graping	A solder defect where small solder balls form around the periphery of a solder deposit.
Halides	A group of chemical compounds that are formed when halogen elements (fluorine, chlorine, bromine, iodine, and astatine) combine with other elements.
Halogens	A group of chemical elements known for their high reactivity and tendency to form compounds with other elements, particularly alkali metals and metals.
Hand Soldering	Manual soldering using a soldering iron, typically for rework or prototypes.
Head-In-Pillow (HiP)	Also known as ball-and-socket, this is a solder joint defect where the solder paste deposit wets the pad but does not fully wet the ball. This results in a solder joint with enough of a connection to have electrical integrity but lacking sufficient mechanical strength.
Homologous Temperature	The homologous temperature, in the context of materials science and SMT, is a temperature relative to the melting point of a material (typically expressed as a fraction of the melting point). It's used to compare the mechanical and thermal behavior of a material at different temperatures, especially when studying properties like creep and stress relaxation.
Hot Air Solder Leveling (HASL)	A method used to coat PCB pads with solder.
Hot Tears	Cracks or fissures that can develop in solder joints or metal components during solidification due to mechanical stresses
Institute of Printed Circuits (IPC)	Regulating body
Intermetallic Compound (IMC)	A compound formed at the interface between solder and substrate, which can affect joint integrity.



The AIM Solder Glossary

I-O

TERM	DEFINITION
International Automotive Task Force (IATF)	Regulating body
International Organization for Standardization (ISO)	Regulating body
Japan Electronic Industries Development Association (JEIDA)	Regulating body
Joint Standard (J-STD)	A standard developed by the IPC
Laminar Flow	A smooth, steady flow of molten solder in wave soldering machines.
Land Grid Array (LGA)	A type of SMT package with an array of contacts on the bottom.
Leaching	The process where a metal (often pad or lead) gets dissolved into the molten solder.
Light Emitting Diode (LED)	A semiconductor light source.
Liquidus	The temperature at which solder reaches its fully molten or liquid state
Melting point	The temperature at which a solid transitions into a liquid.
No Clean Flux	A type of flux that doesn't require removal after soldering due to its low residue and non-corrosive nature.
Non-Wet Open (NOW)	A defect where solder doesn't properly wet a component lead or pad.
Non-Wetting	A surface that has contacted but rejected molten solder
Opens	Two electrical conductors not bridged by solder.
Organic Solderability Preservative (OSP)	A surface finish applied to PCBs to improve solderability.
Outgassing	The emission of impurities from a PCB or component that occurs when the assembly is exposed to heat or reduced pressure

The AIM Solder Glossary

P-Q

TERM	DEFINITION
Package on Package (PoP)	A technique in electronics manufacturing in which multiple chips are stacked on top of each other.
Pad	A portion of exposed metal on a printed circuit board where components are soldered.
Paste-In-Hole (PiH)	A method where solder paste is applied in through-holes before placing components, combining SMT and THT techniques.
Phase Diagram	a graphical representation that shows how the composition and properties of a material change as a function of temperature and pressure. Phase diagrams are particularly important when dealing with solder alloys in SMT, as they help determine the melting and solidification behavior of solder, ensuring proper reflow soldering processes.
Pinhole	A small hole in the solder joint, often caused by trapped gases or flux.
Plated Through Hole (PTH)	A hole in a PCB that is plated with a conductive material to create a connection between different layers.
Popcorning	A defect caused by the rapid outgassing of moisture trapped in plastic-encased components during reflow soldering.
Power cycling	Power cycling, also known as electrical cycling or electrical stress testing, involves repeatedly turning a device or assembly on and off. It's designed to simulate the real-world conditions where electronic devices experience temperature fluctuations due to their operation.
Printed Circuit Boards (PCB)	A board made from non-conductive material with conductive traces to connect electronic components.
Printed Wiring Board (PWB)	Another term for PCB, focusing on the wiring or conductive pathways.
Quad Flat No-Leads (QFN)	Electronic packages that connect integrated circuits to printed circuit boards.



The AIM Solder Glossary

Q-S

TERM	DEFINITION
Quad Flat Package (QFP)	An integrated circuit package with flat leads on all four sides.
Reflow Profile	The specific temperature-time profile or curve that dictates the heating and cooling cycle used during the reflow soldering process.
Reflow Soldering	A soldering process where solder paste is melted by heating to join surface-mounted components to printed circuit boards.
Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH)	An EU law designed to protect human health and the environment from risks posed by chemicals.
Restriction Of Hazardous Substances (RoHS)	A directive that restricts the use of certain hazardous substances, including lead, in electronic equipment.
Rework	The process of correcting or modifying an already soldered component on a circuit board.
Rheology	The branch of science and physics that deals with the study of the flow and deformation of matter, primarily liquids and soft solids, under the influence of applied forces or stresses.
Rosin Mildly Activated (RMA)	A type of flux used in soldering.
SAC	Refers to the combination of Sn/Ag/Cu or Tin, Silver, Copper, a very popular solder alloy.
Selective Soldering	A process that selectively solders components on a PCB, avoiding components that should not be soldered.
Skips	A soldering defect that occurs when there is an interruption or gap in the solder fillet that is supposed to join two components or solder pads on a printed circuit board (PCB)
Slump	The spreading or sagging of solder paste after application and before reflow.
Solder	A fusible alloy used to join two metal surfaces.



The AIM Solder Glossary

S-S

TERM	DEFINITION
Solder Ball	Small spherical blobs of solder that can form during reflow soldering, often seen as a defect.
Solder Bead	Small, bead-like formations of solder that may appear around soldered joints, typically seen as a defect.
Solder Bridge	An unintended electrical connection between two conductors due to excess solder.
Solder Fillet	The shape and formation of solder between the component lead and the PCB pad.
Solder Fountain	A device used in rework stations that provides a fountain of molten solder to desolder through-hole components.
Solder Mask	A protective layer applied to the non-conductive areas of a printed circuit board to prevent accidental solder bridging.
Solder Paste	A mixture of solder powder and flux that can be applied to surfaces to be joined before reflow soldering.
Solder Pot	A container filled with molten solder, often used in wave soldering processes.
Solder Preform	A specific shape or piece of solder used for specific soldering applications.
Solder Spatter	Tiny particles of solder that splatter around during soldering, which can cause short circuits.
Solderability	The ease with which a metal surface can be wetted by molten solder.
Soldering Iron	A hand tool used to melt solder and apply it to join two metal surfaces.
Solidus	The temperature at which solder reaches its fully solid state
Squeegee	A plastic, metal, or fiber blade used to push solder paste across the stencil surface while filling the stencil apertures



The AIM Solder Glossary

S-V

TERM	DEFINITION
Stencil Printing	A method of applying solder paste to PCBs using a stencil to ensure accurate placement.
Surface Insulation Resistance (SIR)	A measure of electrical resistance of an insulating material between contacts, conductors, or grounding devices.
Surface Mount Technology (SMT)	A method where components are placed directly onto the surface of circuit boards.
Surface Mount Technology Association (SMTA)	A professional organization for individuals and companies associated with the SMT sector.
Take Action Limit (TAL)	Limit of alloy impurities that require action to be taken
Thermal Cycling	The process in which a material or an object is subjected to a repetitive sequence of temperature changes over time
Thermal Fatigue	The weakening of materials, including solder joints, due to repeated heating and cooling.
Thermal Shock	Rapid temperature changes that can cause damage to components or solder joints.
Tombstoning	A defect in surface mount assemblies where a component stands up vertically from the board during reflow soldering.
Type 4, 5, 6, 7	Refers to solder ball size. Larger numbers indicate smaller ball size.
Undercooling	Refers to the phenomenon where a component or solder joint is exposed to a temperature below its liquidus temperature during the reflow soldering process
Underfill	A material used to fill the gap between a component and a PCB, often used with BGAs to provide mechanical strength.
Viscosity	A measure of a fluid's resistance to flow or deformation under the influence of an applied force, such as shear stress
Void	An empty space or air pocket within a solder joint, which can affect the joint's reliability.



The AIM Solder Glossary

V-Z

TERM	DEFINITION
Volatile Organic Compounds (VOC)	Organic compounds with high vapor pressure (low boiling point) at room temperature.
Wave Soldering	A process where assembled circuit boards are passed over a wave of molten solder to attach through-hole components.
Webbing	A wave solder defect recognized by a spiderweb-like extension of solder across the non-conductive portion of a PCB
Weibull Plot	A Weibull plot is a graphical representation of data that helps analyze and predict the reliability and failure characteristics of electronic components or systems. It's often used in SMT to model and understand the probability of failure over time, allowing for reliability predictions and risk assessment.
Wetting	The spreading of a liquid as it makes contact with a solid surface.
Whiskering	The growth of hair-like crystalline structures from a metal surface, which can cause short circuits in electronics.