

SMT Dictionary

A

- Accelerated stress test** A test designed to stress the application until failure.
- Acceptable Quality Level** AQL. The maximum allowable number of defects per 100 units.
- Accuracy** The ability to reach the target.
- Acoustic Microscopy** A test method using ultrasonic sound to produce high resolution images.
- Activator** A chemical substance used to improve the ability of a flux to clean component and PCB surfaces for oxides and contaminants.
- Active Component** Component that actively can change an electrical applied signal. Such as transistors and IC's.
- Adhesive** A substance used to hold two materials together. SMT adhesive is used to hold components from placement until wave soldered. Conductive adhesive is used to form a mechanical and electrical connection as an alternative to soldering.
- Ag** Chemical symbol for silver. Metal with atomic No. 47. Used as protective layer on component terminals, PCB solder pads and in some solder alloys.
- Air Knife** Unit blowing air towards an object in a thin straight line. E.g. used in wave soldering machines to remove excess flux from the PCB.
- Algorithm** A specification of actions solving a task.
- Alloy** A material made by melting two or more metals together.
- Alumina** White substrate material used primarily in thick film applications.
- Antimony** Sb. Semi-metallic with atomic No. 51. Used in some solder alloys.
- Antistatic Material** Partly conductive material resisting rapid static charging.
- AOI** Short for **Automatic Optical Inspection**. Unit inspecting solder paste print or soldered PCB's.
- Aperture** Opening in a metal stencil or mesh screen.
- Aperture file(s)** Computer file(s) containing X, Y coordinates, shape and aperture sizes used in the stencil manufacturing process.
- AQL** Short for **Acceptable Quality Level**. The maximum allowable number of defects per 100 units.
- Aqueous** Water soluble.
- Archimedes Pump** Or auger pump. Dispensing unit using an auger to force the adhesive onto the PCB.
- Aspect Ratio** Stencil thickness to the width of the smallest aperture or PCB thickness to the diameter of the smallest hole.
- Au** Chemical symbol for gold. Metal with atomic No. 79. Used as protective layer on PCB solder pads, keyboards etc.
- Auger Pump** Or Archimedes pump. Dispensing unit using an auger to force the adhesive onto the PCB.
- Automatic Optical Inspection** AOI. Unit inspecting solder paste print or soldered PCB's.

B

- Ball Grid Array** BGA. IC package with solder spheres in an array on bottom side of component base substrate.
- Ball Pitch** Refers to the distance between the centres of two balls on an BGA package.
- Bare Board** PCB that are not mounted with components.
- Bare Die** An unpackaged IC (Die).
- Bi** Chemical symbol for bismuth. Metal with atomic No. 83. Used in some solder alloys.
- Bill of Materials** BoM. List of components for a PCBA. Containing reference no. and part no. etc.
- Bismuth** Bi. Metal with atomic No. 83. Used in some solder alloys.
- BGA** Short for **Ball Grid Array**. IC package with solder spheres in an array on bottom side of component base substrate.
- Board Handling Unit** Unit conveying PCBs from one machine to another or turning or flipping the PCB.
- BoM** Short for **Bill of Materials**. List of components for a PCBA. Containing reference no. and part no. etc.
- Bonding** Materials joined together.
- BQFP** Short for **Bumpered Quad Flat Package**. IC packages with leads on four sides and corner bumpers.
- Bulk Components** Loose components. Components delivered in special bulk containers can be supplied to the placement machine using a bulk feeder.
- Bulk Feeder** Unit used to feed components from bulk containers into the placement machine.
- Bumpered Quad Flat Package** BQFP. IC packages with leads on four sides and corner bumpers.

C

- CAD** Short for **Computer Aided Design**. Computer system used to design a product.
- CAM** Short for **Computer Aided Manufacturing**. Computer system used to manufacture a product.
- CBGA** Short for **Ceramic Ball Grid Array**. As Ball Grid Array with a ceramic base substrate.
- Ceramic Ball Grid Array** CBGA. As Ball Grid Array with a ceramic base substrate.
- Chemical Tin** Or Immersion Tin. Used as protection on PCB solder pads.
- Chip** Slang expression for a very small component or an integrated circuit.
- Chip On Board** COB. An unpacked silicon die placed directly on the PCB and wire bonded.
- Chips** Slang expression for very small components like resistors and capacitors.
- Chip Shooter** Fast SMD placement machine primarily placing small chips.
- Chip-Scale Package** CSP. Very small package type. The IC chip is attached to a carrier and connected to the balls on the component bottom side using via's and wire bonding.
- CIM** Short for **Computer Integrated Manufacturing**.
- COB** Short for **Chip On Board**. COB. An unpacked silicon die placed directly on the PCB and wire bonded.
- Coefficient of Thermal Expansion** CTE. The ratio of change in dimension per unit change in temperature.
- Component** Part. An element of a complete functional unit.
- Component Camera** A camera in the SMD placement machine used to recognize and measure the position and

angle of the picked up components. The vision system then calculate the necessary corrections for an accurate placement on the PCB.

Computer Integrated Manufacturing CIM.

Computer Aided Design CAD. Computer system used to design a product.

Computer Aided Manufacturing CAM. Computer system used to manufacture a product.

Conductor Electrical connection. E.g. Printed wiring on a PCB.

Conductor Thickness The thickness of a PCB conductor track.

Conductor Width Width of a PCB conductor track.

Controlled Convection Convection heat transferred were temperature, flow, rate and velocity are accurately controlled.

Convection Heat transfer occurring due to temperature difference.

Cool Down Refers to the solder profile period, after reaching the peak temperature, where the solder alloy cools below the point where the alloy solidify again.

Coplanarity The vertical variation of the lead positions on a package.

Copper Cu. Metal with atomic No. 29. Used mainly on PCB's as electrical connections forming the circuit between the components.

CSP Chip-Scale Package. Very small package type. The IC chip is attached to a carrier and connected to the balls on the component bottom side using via's and wire bonding.

CTE Short for **Coefficient of Thermal Expansion**. The ratio of change in dimension per unit change in temperature.

Cu Chemical symbol for Copper. Metal with atomic No. 29. Used mainly on PCBs as electrical connections forming the circuit between the components.

Cycle Time The time it takes to perform a complete cycle on the process in question.

D

Discrete Component Defined as separate components in each package.

Delamination (PCB) A separation of the different bonded layers within the PCB.

Delta T ΔT . Temperature differential.

Desoldering Removal of the solder alloy from a joint.

Dewetting The molten solder repels on the solder pad or component lead. Effect of poor solder-ability.

Double Layer PCB Double layer printed circuit board. Laminate with two layers of conductors forming a circuit pattern.

Double Layer Printed Circuit Board Double layer PCB. Laminate with two layers of conductors forming a circuit pattern.

Double Sided Reflow Soldering A technique were SMC's are placed in solder paste and reflow soldered firstly on one side of the PCB and secondly repeated on the other side. Gravity limits the type of packages that can be used on the first mounted side.

Dross Oxidized solder alloy and contamination laying on top of the molten solder in a wave soldering machine.

Dry-Pack Bags specially designed to MSD storage.

Dry Run An expression for a SMD placement machine running but without actually placing components.

Dummy Component Non-functional component.

E

Edge Conveyor Device transporting and supporting the product (PCB) on the edge.

Electronics Manufacturing Services EMS.

Electrostatic Discharge ESD. The transfer of an electrical charge between two objects with different electrostatic potential. Certain IC's are very sensitive to ESD.

EMS Short for **Electronics Manufacturing Services**.

ESD Short for **ElectroStatic Discharge**. The transfer of an electrical charge between two objects with different electrostatic potential. Certain IC's are very sensitive to ESD.

Etched Stencil Thin plate of steel or brass with etched holes. Used in solder paste printing.

Etching A chemical process that removes selected material that are not covered by a protective resist.

Eutectic Solder Alloy An alloy that change directly from solid to liquid state at an exact temperature. The eutectic alloy also have a lower melting point than its different metal components.

F

FC Short for **Flip-Chip**. Refers to bare silicon IC's flipped and attached directly onto the PCB.

Fiducial Camera Camera used to measure the PCB position relative to the placement head.

Fiducial Mark A small mark on the PCB used to calculate the PCB position relative to the placement head. The calculations are then used to ensure precise placement of the components.

Fillet A solder fillet is the build up of solder between the solder land and the component terminal.

Fine Pitch Refers to a short distance between the centres of two leads on an IC. 0.5 mm (20 mil) and down.

Fine Pitch Ball Grid Array FPBGA. See Ball Grid Array.

Fine Pitch Placer A very accurate SMD placement machine capable of placing fine pitch components.

Fine Pitch Quad Flat Package FPQFP or FQFP. Refers to a specific group of Fine Pitch IC packages with leads on all four sides.

Fine Pitch Technology FPT. Technology involving components with very short distance between the centres of two leads. From 0.5 mm (20 mil) and down.

First Pass Yield Yield. Finished units (in percent) not requiring rework.

Flex PCB Flexible (bendable) printed circuit board. Base materials are Polyamide (Kapton) or Polyester (PET), adhesive and conductive foil.

Flip-Chip FC. Refers to bare silicon IC's flipped and attached directly to the PCB.

Flood Bar Used in some screen printers to drag the printing material back after a squeegee stroke. Not commonly used anymore.

Flux Chemical mixture usually containing Rosin or synthetic resin (40-50%), activators (20-35%), rheological additives

and finally solvents. When heated used to clean component and PCB surfaces for oxides and contaminants.

Flux Activation Temperature The temperature at which the flux starts cleaning component and PCB surfaces for oxides and contaminants.

Fluxer Unit used in a wave soldering machine to apply flux to the bottom side of the PCB.

Foam Fluxer Fluxer unit creating a foam wave of flux by pumping the flux through a porous material. Used in a wave soldering machine to apply flux to the bottom side of the PCB.

Forced Convection Heat transfer occurring when forcing a gas over a solid media.

Forced Convection Furnace Oven. Soldering machine using a high flow of hot air / N₂ to transfer heat and solder SMD mounted PCB's .

Forced Convection Oven Furnace. Soldering machine using a high flow of hot air / N₂ to transfer heat and solder SMD mounted PCB's.

Foot Length The length of the component lead foot. The part of the lead approximately parallel with the solder pad.

Foot Width Width of the component lead.

Footprint Land Pattern. Refers to the area, pad dimensions and the pattern of pads for a particular component.

Footprint Refers to the floor area a machine takes up.

FPBGA Short for Fine Pitch Ball Grid Array. See Ball Grid Array.

FPQFP Short for Fine Pitch Quad Flat Package. Refers to a specific group of fine pitch IC packages with leads on all four sides.

FPT Short for Fine Pitch Technology. Technology involving components with very short distance between the centres of two leads. From 0.5 mm (20 mil) and down.

FQFP Short for Fine pitch Quad Flat Package. Refers to a specific group of fine pitch IC packages with leads on all four sides.

FR2 Phenol PCB base laminate. Widely used in consumer products.

FR4 Glass epoxy laminate. The most commonly used PCB base material.

G

GEM Short for **General Equipment Module**. A communication protocol for communication between production equipment.

General Equipment Module GEM. A communication protocol for communication between production equipment.

Glass Transition Temperature T_g. The temperature at which a material changes from hard to soft state.

Global Fiducial Marks Two or three small marks on the PCB are used to calculate the PCB position relative to the placement head. The calculations are then used to ensure precise placement of all the components.

Gold Au. Metal with atomic No. 79. Used as protective layer on PCB solder pads, keyboards etc.

Golden Board Known Good Board. Used as reference in electrical testing.

Gull Wing An "Old" frase for QFP IC's. The leads flare outward from the component body.

H

HAL Short for **Hot Air Levelling**. Also called HASL. A hot air knife levels the SnPb solder pad finish.

Halide A chemical compound used as activator in flux.

HASL Short for **Hot Air Solder Levelling**. Also called HAL. A hot air knife levels the SnPb solder pad finish.

Hot Air Levelling HAL. Also called HASL. A hot air knife levels the SnPb solder pad finish.

Hot Air Solder Levelling HASL. Also called HAL. A hot air knife levels the SnPb solder pad finish.

I

IC Short for **Integrated Circuit**. Package containing multiple components forming a specific circuit.

Integrated Circuit IC. Package containing multiple components forming a specific circuit.

Immersion Tin Chemical applied tin. Used as protection on PCB solder pads.

In Chemical symbol for Indium. Metal with atomic No. 49. Used in some solder alloys.

Indium In. Metal with atomic No. 49. Used in some solder alloys.

Inert Gas Inactive gas such as nitrogen. Nitrogen is used in the soldering process to avoid oxidation of the components, pads and solder alloy.

Infrared IR. Refers to energy (heat) transfer by Infrared wave length radiation. Used in some soldering systems.

Inner Layer A conductive internal layer of a PCB laminate.

Intelligent Feeder A feeder equipped with a microprocessor system designed to avoid set-up and inventory errors.

Intermetallic Layer A relatively thin layer of metal compound formed between two different metals. E.g. between the copper pads and solder alloy used.

IR Short for Infrared. Refers to energy (heat) transfer by Infrared wave length radiation. Used in some soldering systems.

J

J lead Refers to a component with J shaped leads like PLCC and SOJ packages.

Joint Solder joint. Mechanical and electrical connection between component terminal and PCB solder pad.

K

Known Good Board Golden board. Used as reference in electrical testing.

L

Land Pad or solder pad. A PCB termination area.

Land Pattern Footprint. Refers to the area, pad dimensions and the pattern of pads for a particular component.

Large Component Mounter A SMD placement machine capable of handling large components.

Laser Cut Stencil Thin plate of steel, brass or plastic with laser cut holes. Used in solder paste printing.

Lead Pb. Metal with atomic No. 82. At the time used in most solder alloys.

Lead Component terminal or electrical connection point.

Lead-Free Refers to solder alloy and solder joints not containing lead.

Lead-Free Solder Refers to solder alloy that are not containing lead.
Lead-Free Soldering Refers to a soldering process where lead-free solder alloy are used.
Leadless Component An "old" phrase for surface mount component.
Lead Pitch Refers to the distance between the centres of two leads on an IC.
Liquidus Temperature The temperature above which an alloy become totally liquid.
Local Fiducial Marks Two or three small marks on the PCB are used to calculate the PCB position relative to the placement head. The calculations are then used to ensure precise placement of a particular component.

M

Manual Assembly Assembly process done manually by an operator.
Matrix Tray Tray. Flat plastic matrix component carrier.
Melf Metal Electrode Face. Refers to a specific group of cylindrical components.
Melting Point The specific temperature at which an alloy become liquid.
Mesh Screen A woven stainless steel or polyester fibre mesh attached with emulsion, used in the screen printing process.
Mesh Size The number of openings per inch in a mesh screen.
Metal Content The weight percent of the solder powder in a solder paste.
Metal Electrode Face Melf. Refers to a specific group of cylindrical components.
MicroBga μ BGA. Refers to a group of fine pitch BGA's.
Moisture Sensitive Device MSD. Components that obtain moist and has a high potential of cracking during soldering due to moist expansion.
MSD Short for **Moisture Sensitive Device**. Components that obtain moist and has a high potential of cracking during soldering due to moist expansion.
Multilayer PCB Multilayer Printed Circuit Board. Laminate with more than 2 layers of conductors forming a circuit pattern.
Multilayer Printed Circuit Board Multilayer PCB. Laminate with more than 2 layers of conductors forming a circuit pattern.

N

Ni Chemical symbol for nickel. Metal with atomic No. 28. Used under Au on PCB solder lands and on component terminals.
Nickel Ni. Metal with atomic No. 28. Used under Au on PCB solder lands and on component terminals.
N₂ Nitrogen. Inert gas used in the soldering process to avoid oxidation of the components, pads and solder alloy.
Nitrogen N₂. Inert gas used in the soldering process to avoid oxidation of the components, pads and solder alloy.
No-Clean Term used about flux, solder paste and solder wire that contain flux, formulated in such a way that it is not necessary to remove the remaining flux on the PCB. Acids should be encapsulated in the flux residue and the residue should work as an electrical insulator.
Nozzle A vacuum nozzle holding the component during transport from feeder unit to PCB. An adhesive nozzle used to transfer adhesive to the PCB.

O

OA Short for **Organic Acid** flux. Classification for a water soluble flux usually containing organic acids and no rosin.
OEM Short for **Original Equipment Manufacturer**.
OMPAC Short for **Over Molded Plastic Array Carrier**. Motorola brand name for PBGA.
Organic Acid flux OA. Classification for a water soluble flux usually containing organic acids and no rosin.
Organic Solder ability Preservative OSP. Used as protective layer over cobber solder pads.
Original Equipment Manufacturer OEM.
OSP Short for **Organic Solder ability Preservative**. Used as protective layer over cobber solder pads.
Over Molded Plastic Array Carrier OMPAC. Motorola trade name for PBGA.
Oxidation Oxygen absorption on metal surfaces. The oxides resist solder wetting.

P

Pad Land or solder pad. A PCB termination area.
Panel Cluster panel. A PCB panel usually containing an array of identical PCB's. After end assembly the PCB's are separated.
Part Component. An element of a complete functional unit.
Parts Per Million PPM. Unit commonly used in statistics.
Paste In Hole A SMT technique used to solder through hole / leaded components. Solder paste is printed onto the through-hole solder pad, part inserted and reflow soldered.
Pattern Repeat A placement method where each PCB in a panel is completely populated before moving on to the next.
Pb Chemical symbol for lead. Metal with atomic No. 82. At the time used in most solder alloys.
PBGA Short for **Plastic Ball Grid Array**. As Ball Grid Array with a thin BT resin epoxy PCB base substrate.
PCA Short for **Printed Circuit Assembly**. Completed PCB unit.
PCB Short for **Printed Circuit Board**. Substrate with conductors forming a circuit pattern.
PCBA Short for **Printed Circuit Board Assembly**. Completed PCB unit.
PCB Support Pins or plates supporting the PCB during a process.
Peak Temperature The maximum temperature reached in the soldering process.
pH A liquid acidity and alkalinity measurement unit. Scale 1 - 14, 1 acid, 7 neural and 14 alkaline.
Pick and Place P&P. Refers to the process where the components are picked up from a feeding unit, moved and placed onto the PCB solder pads.
Pick and Place Head P&P Head. Refers to the head in a placement machine, picking up the components from a feeding unit, moving and placing them on the PCB solder pads.

Pin In Paste A SMT technique used to solder through hole / leaded components. Solder paste is printed onto the through-hole solder pad, part inserted and reflow soldered.

Piston Pump Dispensing unit using a piston to force the adhesive onto the PCB.

Pitch The distance between the centres of two leads on an IC. Or the distance between the components in a tape carrier. Or the distance between two tape adjacent sprocket holes (4 mm).

Placement A manual, semi-automatic or fully automatic component assembly process.

Placement Head P&P Head. Refers to the head in a placement machine, picking up the components from a feeding unit, moving and placing them on the PCB solder pads.

Placement Program Computer data containing placement sequence and other necessary information that the placement machine require.

Plastic Ball Grid Array PBGA. As Ball Grid Array with a thin BT resin epoxy PCB base substrate.

Plastic Leaded Chip Carrier PLCC. Refers to a specific group of IC packages with J-lead on four sides.

PLCC Short for **Plastic Leaded Chip Carrier**. Refers to a specific group of IC packages with J-lead on four sides.

Popcorning Internal delamination of a BGA due to moist expansion inside the BGA housing.

PPM Short for **Parts Per Million**. Unit commonly used in statistics.

Preform Solder preform. A preformed shape of solder alloy. Usually flux containing.

Preheat Refers to the part of the soldering profile where the PCB is heated from ambient temperature until reaching the chosen preheat temperature.

Printed Circuit Board PCB. Laminate with conductors forming a circuit pattern.

Printed Circuit Board Assembly PCBA or PCA. Completed PCB unit.

Process Control A manual or automatic procedure set up to monitor the process in question.

Profiler A unit recording the soldering profile during the soldering process at a number of locations.

P&P Short for **Pick and Place**. Refers to the process where the components are picked up from a feeding unit and moved to and placed on the PCB solder pads.

P&P Head Short for **Pick and Place Head**. Refers to the head in a placement machine, picking up the components from a feeding unit and moving and placing them on the PCB solder pads.

Q **QFP** Short for **Quad Flat Package**. Refers to a specific group of IC packages with leads on all four sides.
Quad Flat Package QFP. Refers to a specific group of IC packages with leads on all four sides.

R **R** Short for **Rosin flux**. Flux usually containing 40% solids (Rosin) and 60% solvents.
RA Short for **Rosin Activated flux**. Classification for an aggressive flux, containing 1 - 5 % activators.
Reflow Furnace Reflow oven. Equipment used to solder SMD mounted PCB's.
Reflow Oven Reflow furnace. Equipment used to solder SMD mounted PCB's.
Reflow Period Refers to the part of the soldering profile, after the equalization periode, used to melt the solder paste and form the solder joints.
Reflow Process Refers to the process, where the mounted PCB is heated in a furnace by a hot atmosphere or IR radiation in specific stages, finally melting the solder paste and thereby forming the solder joints.
Reflow Soldering The mounted PCB is heated in a furnace by a hot atmosphere or IR radiation in specific stages, finally melting the solder paste and thereby forming the solder joints.
Reflow Temperature The temperature at which the reflow soldering are performed. Usually described as a window. E.g. 215 - 230°C.
Reliability The products, PCB's, solder joints ability to fulfil the specifications required.
Repair Rework or Touch-Up. Refers to a process where a defective unit or part is changed into a working condition.
Repeatability The ability to deliver consistent results.
Resin Chemically synthesized rosin.
Rework Repair or Touch-Up. Refers to a process where a defective unit or part is changed into a working condition.
Rheology Material viscous and flow property.
Rosin Natural rosin extracted from pine trees.
Rosin flux R. Flux usually containing 40% solids (Rosin) and 60% solvents.
RMA Short for **Rosin Mildly Activated flux**. Classification for an moderate flux containing less than 1% activators.
Rosin Activated RA. Classification for an aggressive flux, containing 1 - 5 % activators.
Rosin Mildly Activated RMA. Classification for a moderate flux containing less than 1% activators.
RMS Short for **Root Mean Square**.
Root Mean Square RMS.

S **Sb** Chemical symbol for antimony. Semi-metallic with atomic No. 51. Used in some solder alloys.
Scooping When a squeegee blade bend and scoop the solder paste out of a wide aperture.
Screen Mesh A woven stainless steel or polyester fibre mesh attached with emulsion, used in the screen printing process.
Screen Printing Solder paste or adhesive printed through a mesh screen.
Self-Alignment Swimming. When a component moves on the solder pads due to the surface tension of the molten solder alloy.
Selica Gel Moisture absorbing crystals. Used in Dry-Packs to maintain a low moist level.
Short Solder bridge. An unintentional mechanical and electrical short between two component terminals or solder pads.
Shrink Small Outline Package SSOP. Refers to a specific group of small IC packages.
Single Layer PCB Single layer printed circuit board. Laminate with one conductive layer forming a circuit pattern.
Single Layer Printed Circuit Board Single layer PCB. Laminate with one conductive layer forming a circuit pattern.
Silver Ag. Metal with atomic No. 47. Used as protective layer on component terminals, PCB solder pads and in some

solder alloys.

Skew Component misalignment from its target position.

Slump Solder paste spreading after printing.

Small Outline SO. Refers to a specific group of IC packages with leads on two sides.

Small Outline Diode SOD. Refers to a specific group of diode packages.

Small Outline Integrated Circuit SOIC. See SO.

Small Outline J-lead package SOJ. Refers to a specific group of IC packages with J-lead on two sides.

Small Outline Package SOP. Refers to a specific group of IC packages.

Small Outline Transistor SOT. Refers to a specific group of transistor and diode packages.

SMC Short for **Surface Mount Component**. Component designed for PCB surface mounting.

SMD Short for **Surface Mounted Device**. PCB mounted with SMC's.

SMD Short for **Solder Mask Defined**. Pad that are defined by the solder mask.

SMEMA Short for **Surface Mount Equipment Manufacturers Association**. Provides standards for mechanical equipment interface, fiducial marks etc.

SMT Short for **Surface Mount Technology**. A technology where components are attached directly onto the PCB surface.

Sn Chemical symbol for tin. Metal with atomic no. 50. Main ingredient in solder alloys.

Snap Off The distance between the stencil and the PCB in the printing situation.

SO Short for **Small Outline**. Refers to a specific group of IC packages with leads on two sides.

Soak Period Stabilization Period. Refers to the part of the soldering profile, after preheat, used to equalize the components temperature differences before raising the PCB temperature above the solder alloys melting point.

SOD Short for **Small Outline Diode**. Refers to a specific group of diode packages.

SOIC Short for **Small Outline Integrated Circuit**. See SO.

SOJ Short for **Small Outline J-lead package**. Refers to a specific group of IC packages with J-lead on two sides.

Solder-ability The ability of the solder to wet a solder land.

Solder Alloy A material made by melting two or more metals together.

Solder Bead A solder ball positioned at the side of the component. Usually seen at chips.

Solder Bridge Short. An unintentional mechanical and electrical short between two component terminals and solder pads.

Solder Joint Joint. Mechanical and electrical connection between component terminal and PCB solder pad.

Solder Mask Solder protection coating masking selected areas of the PCB surface.

Solder Mask Defined SMD. Pad that are defined by the solder mask.

Solder Pad Land or solder pad. A PCB termination area.

Solder Paste A homogeneous paste of solder particles, flux, solvents and additives. Used in the SMT reflow soldering process.

Solder Preform Preform. A preformed shape of solder alloy. Usually flux containing.

Solder Wire A wire of solder alloy containing flux. Used for hand soldering.

Solder Thief A special designed solder land positioned outside the real SMC solder pads used to attract excess solder and thereby avoid solder bridges. Used in wave soldering process.

Solidus Temperature The temperature just below the point where the alloy become liquidus.

Solvent A liquid cleaning agent and ingredient in some fluxes and solder pastes.

SOP Short for **Small Outline Package**. Refers to a specific group of IC packages.

SOT Short for **Small Outline Transistor**. Refers to a specific group of transistor and diode packages.

SPC Short for **Statistical Process Control**. A method used to continuously monitor a process and thereby be able to reduce product failure.

Spray Fluxer Fluxer unit used in a wave soldering machine to apply flux to the bottom side of the PCB by spraying it through a nozzle or an ultrasonic transducer.

Squeegee A metal or rubber blade used in solder paste / adhesive printing. By an angled movement across the stencil or screen the squeegee force the solder paste or adhesive through the stencil apertures and onto the PCB surface.

SSOP Short for **Shrink Small Outline Package**. Refers to a specific group of small IC packages.

Stabilization Period Soak period. Refers to the part of the soldering profile, after preheat, used to equalize the components temperature differences before raising the PCB temperature above the solder alloys melting point.

Statistical Process Control SPC. A method used to continuously monitor a process and thereby be able to reduce product failure.

Stencil Thin plate of steel, brass or plastic with etched or laser cut holes. Used in solder paste printing.

Stencil Printing Solder paste printing through a metal stencil.

Step & Repeat A placement method where one particular component is placed on each PCB in a panel before placing the next component.

Stick Plastic tube component carrier.

Stick Feeder Unit used to feed components from plastic tube carrier into the placement machine.

Substrate An insulating material on which the components are placed, soldered and forming a circuit.

Surface Mount Component SMC. Component designed for PCB surface mounting.

Surface Mounted Device SMD. PCB mounted with SMC's.

Surface Mount Equipment Manufacturers Association SMEMA. Provides standards for mechanical equipment interface, fiducial marks etc.

Surface Mount Technology SMT. A technology where components are attached directly onto the PCB surface.

Surface Tension The attraction force on the surface of a liquid.

Swimming Self-Alignment. When a component moves on the solder pads due to the surface tension of the molten solder alloy.

T

TAB Tape Automated Bonding. A process where a taped IC chip is bonded directly onto a PCB.

Tact Time The time a placement head use to pickup and place one component.

Tape Paper or plastic embossed / blister component carrier.

Tape Carrier The paper or plastic embossed / blister carrier tape in which the components are stored in pockets.

Tape Cover A clear plastic film covering the components stored in the tape carrier.

Tape Automated Bonding TAB. A process where a taped IC chip is bonded directly onto a PCB.

Tape feeder Unit used to feed components from tape into the placement machine.

Tape Pitch The distance between the components in a tape carrier. Jumps in 4 mm interval.

Tape width The width of the tape carrier. 8, 12, 16, 24, 32, 44, 56 and 72 mm.

Temperature Profile A profile showing the temperature over a period of time. In soldering the profile usually consist of 4 phases; preheat, stabilization, reflow and cooling.

Terminal Component lead or electrical connection point.

Tg Glass transition temperature. The temperature at which a material changes from hard to soft state.

Tin Sn. Metal with atomic no. 50. Main ingredient in most solder alloys.

Theta Amount of rotation.

Thin Quad Flat Package TQFP. Refers to a group of thin IC packages with leads on all four sides.

Thin Shrink Quad Flat Package TSQFP. Group of small and thin IC packages with leads on four sides.

Thin Shrink Small Outline Package TSSOP. Refers to a specific group of small and thin IC packages.

Thin Small-Outline Package TSOP. Refers to a package type usually used for memory ICs.

Thixotropic A solder paste or adhesives characteristic of becoming more fluid when in motion.

Time Above Liquidus Refers to the period of time at which the solder alloy is liquidus.

Tomb Stoning A component flipped to a vertical position on one solder pad.

Tooling Hole Non plated holes used for PCB alignment during processing.

Touch Less Centring Component centring using vision or laser alignment.

Touch-Up Repair or Rework. Refers to a process were a defective unit or part is changed into a working condition.

TQFP Short for **Thin Quad Flat Package**. Refers to a group of thin IC packages with leads on all four sides.

Tray Waffle tray. Flat plastic matrix component carrier.

Tray Elevator Tray Handler. Tray component feeding unit supplying the component into the placement machine.

Tray Handler Tray Elevator. Tray component feeding unit supplying the component into the placement machine.

TSOP Short for **Thin Small-Outline Package**. Refers to a package type usually used for memory ICs.

TSQFP Short for **Thin Shrink Quad Flat Package**. Group of small and thin IC packages with leads on four sides.

TSSOP Short for **Thin Shrink Small Outline Package**. Refers to a specific group of small and thin IC packages.

Turret Head A placement head unit with multiple heads, rotating parallel to the PCB.

U

Under Filling A filling material is injected under the component. Usually used on Flip-Chip applications to improve reliability.

Ultraviolet UV. Refers to energy transfer by ultraviolet wavelength radiation. Used in some curing systems.

UV Short for **Ultraviolet**. Refers to energy transfer by ultraviolet wavelength radiation. Used in some curing systems.

V

Vapor Phase Soldering Refers to condensation heating where the PCB is lowered into a hot vapor. The vapor condensate at the PCB surface and thereby heating it.

Via Hole A plated through-hole connecting the PCB conductive layers.

Vibrating Feeder A vibrating unit used to feed components from plastic tube carrier in to the placement machine.

Viscosity A materials resistance to flow. Measured in centipoise or millipascal.

Vision Centring A touch less component centring using vision process alignment.

VOC Volatile Organic Compound. A organic fluid that rapidly vaporizes.

Void A enclosed space inside a solder fillet. Primarily caused by solder encapsulated out-gassing of solvents.

Volatile Organic Compound VOC. A organic fluid that rapidly vaporizes.

W

Wafer Round silicon disc containing numerous integrated circuits.

Waffle Tray Tray. Flat plastic matrix component carrier.

Water Soluble Flux Flux usually containing organic acids and no rosin. Classified OA.

Wave Soldering A soldering process where the PCB's are soldered by passing a wave of molten solder alloy.

Wedge Bonding A specific method used attaching aluminium or gold wires between the pads of a bare IC and the component lead.

Wetting The solder alloys ability to flow and wet a metal surface.

Wetting Balance An instrument used to measure wet ability.

Wire Bonding A die connection method attaching aluminium or gold wires between the pads of a bare IC and the component lead.

X

X-axis One of the horizontal movement axis. Typically left and right.

X-Ray A ray of photons. Used in inspection machines for internal inspection of PCB's and solder joints.

Y

Yield First Pass Yield. Finished units (in percent) not requiring rework.

Y-axis One of the horizontal movement axis. Typically forward and backward.

Z

Z-axis The vertical movement axis in a placement or dispensing machine.