

Technical Glossary

Control Valve A valve that controls pressures or gas flows in different steps of semiconductor manufacturing, by modulating its opening in response to a signal from a controller.

Deposition Any process that transfers a material onto a semiconductor wafer. These include physical vapor deposition (PVD), chemical vapor deposition (CVD), and molecular beam epitaxy (MBE), among others.

Doping A wafer fabrication process in which exposed areas of silicon are bombarded with chemical impurities to alter the way the silicon conducts electricity.

Etching A process for removing material in a specified area through a chemical reaction or physical bombardment.

Fab Common name for a semiconductor fabrication plant, a factory used to manufacture integrated circuits.

Flat-Panel Display (FPD) Any consumer display device with a flat (planar) surface, in contrast to the curved front of cathode ray tube displays.

Gate Valve A valve that regulates the flow of gases, fluids or materials by opening, closing or obstructing a port or passageway.

Integrated Circuit (IC) A semiconductor product of electrically connected components (such as transistors and capacitors) fabricated on the same substrate.

Isolation Valve Valve used, for example, to seal high-vacuum process chambers from neighboring processes that are at different pressure levels.

Light-Emitting Diode (LED) A semiconductor device that emits light when an electric current flows through it.

Liquid-Crystal Display (LCD) A type of flat-panel display that uses an array of backlit thin-film transistors to control each pixel.

Lithography The transfer of a pattern or image from one medium to another, such as from a photomask to a wafer.

Load Lock A chamber used to transfer a wafer from an environment at atmospheric pressure into and out of the vacuum environment used for processing.

Millibar (mbar) A unit of pressure, used to measure the level of vacuum (see "Vacuum").

NAND A type of flash memory often used in memory cards, USB drives, and solid-state drives.

Nanometer (nm) A unit of length; one billionth of a meter, commonly used in the semiconductor industry to describe device dimensions.

Packaging The protective container or housing for an electronic component or die, with external terminals to provide electrical access to the components inside.

Organic Light-Emitting Diode (OLED) A flat light-emitting technology made by placing a series of organic thin-films between two conductors. When electrical current is applied, a bright light is emitted. OLEDs can be used to make displays and lighting.

Process Chamber An enclosed area in which a single process is performed in the manufacture of an integrated circuit or other device.

Photovoltaic (PV) A process where light is converted to electricity. Solar PV is the generation of electricity from solar radiation.

Semiconductor A material whose electrical conductivity is between that of metals (conductors) and insulators (non-conductors) and can be modified physically or chemically to increase or decrease its conductivity.

Substrate The starting material for the semiconductor manufacturing process, typically silicon; also referred to as a wafer.

Thin-Film A layer of material ranging from fractions of a nanometer to several micrometers thick.

Thin Film Transistor (TFT) A transistor made by depositing thin-films on an active semiconductor layer as well as the dielectric layer and metallic contacts over a supporting (but non-conductive) substrate, i.e. a silicon wafer.

TFT Technology is used in liquid crystal displays (LCD) to improve image quality such as addressability and contrast.

Transfer Valve Valve used to move substrates such as wafers, glass panels and other materials into and out of manufacturing process chambers.

Vacuum A pressure below the ambient atmosphere

- Typical atmospheric pressure at sea level: 1,000 millibars (mbar)
- Pressure at typical cruising altitude for commercial aircraft: 100 mbar
- High vacuum used in coating processes: 10^{-8} mbar (1 one-hundred-millionth of a millibar)
- Ultra-high vacuum used in deposition processes: 10^{-10} mbar (1 ten-billionth of a millibar)

Wafer The thin, circular or nearly square slices of mono- or multicrystalline silicon on which semiconductors and PV cells are built.