

Technical Glossary

5G The fifth generation of cellular networks up to 100× faster than 4G that will enable connected vehicles, smart power grids and industrial automation.

AI (artificial intelligence) The simulation of human intelligence in machines that are programmed to think like humans and mimic their actions.

ALD (atomic layer deposition) An advanced deposition technique that allows for ultra-thin films of a few nanometers to be deposited in a precisely controlled way.

Control Valve A valve that controls pressures or gas flows in different steps of semiconductor manufacturing.

Deposition The transfer of material onto a semiconductor wafer, including physical vapor deposition (PVD), chemical vapor deposition (CVD), and molecular beam epitaxy (MBE).

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

EUV (extreme ultraviolet) lithography Uses light with a wavelength of 13.5-nm to manufacture transistors and interconnect wiring of a semiconductor chip.

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

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.

Internet of Things (IoT) The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data.

Isolation Valve Used to seal high-vacuum process chambers from neighboring processes that are at different pressure levels.

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

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.

Mechatronics Multidisciplinary branch of engineering that focuses on electrical and mechanical systems, and includes robotics, electronics, telecommunications, control and product engineering.

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. 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) 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.

Subfab The area underneath a semiconductor fabrication plant that contains support equipment (pumps, etc.) for processing tools.

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.

Transfer 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.