

# Glossary of Powder Coating Terms

## B

**Back ionization.** A condition that can occur during electrostatic application of powder, in which an excessive buildup of charged powder particles limits further powder from being deposited on the substrate and can reverse the electrical charge of the surface layer of powder particles. Also called *electrostatic rejection* or *repelling*.

**Bulk density.** Mass per unit of volume in powder form, including the air trapped between particles.

## C

**Cloud chamber technique.** A method of moving a charged or uncharged object through a charged or uncharged cloud of powder in an enclosed chamber.

**Compatibility.** The capacity of powder coatings from different sources or of different compositions to be combined and applied so as to yield no visible or mechanically measurable differences in the cured film or application properties.

**Coronacharging.** The process of inducing a static electric charge on powder particles by passing the powder through an electrostatic field generated by a high-voltage device.

**Cure end point.** The point either during or following the cure schedule at which the powder-coating film is determined to have developed specified properties.

**Cure schedule.** The time/temperature relation required to properly crosslink a thermosetting powder coating.

**Cut-through resistance.** A powder coating film's resistance to penetration from

the combined application of sharp edges, heat, and pressure. A formalized test used by applicators of insulative powder to electrical motors.

## D

**Delivery.** The process of moving the powder coating through the application equipment to the end product.

**Dry blending.** A process of powder coatings' manufacture in which materials are blended without melting.

## E

**Edge coverage.** A powder coating's capability to flow over, build, and adhere to sharp corners, angles, and edges.

**Electrostatic deposition.** A technique of moving and charging powder so that it is deposited on a grounded substrate.

**Electrostatic fluidized bed technique.** A deposition method of charging fluidized powder so that it is deposited onto a grounded substrate.

**Electrostatic rejection.** See *Back ionization*.

**Electrostatic spray technique.** A deposition method of spraying and charging powder so that it is deposited onto a grounded substrate. See *Coronacharging* and *Tribocharging*.

## F

**Faraday cage effect.** A condition that can exist on a substrate because of its geometric configuration, which can inhibit the electrostatic application of powder particles at that specific localized area.

**Film formation.** The forming of a continuous film by melting powder particles and coalescing them by the application of energy. For thermosetting materials, a chemical reaction, through the further application of energy, also takes place. The fused and cured film has the uniformity, color, toughness, and other properties associated with protective and decorative coatings.

**Flocking deposition technique.** A deposition method of applying powder by spray to a substrate heated above the melt point of the powder material.

**Fluidized bed.** A fixed container in which powder is suspended in a continuous stream of air. Preheated objects can be coated by dipping directly into a fluidized bed. The fluidized bed can also be used to facilitate transfer of powder materials to an alternate application site.

**Fusion.** The melting and flow of individual powder particles under the influence of heat to form a continuous film.

## G

**Gel time.** Interval required at a given temperature for a powder to be transformed from a dry solid to a gel-like state.

**Glass plate flow.** See *Plate flow*.

**Grounding.** An electrical grounding of the item to be coated.

## I

**Impact fusion.** The tendency of finely divided powders to combine with other particles in the application equipment during the application process.

**Inclined plate flow.** See *Plate flow*.

**Intercoat adhesion.** A powder coating's capability to adhere to previously applied films.

## L

**Lower explosive limit (LEL).** The lower point for a range of concentrations of organic particles suspended in air that can be ignited by a sufficient energy source. Also called *minimum explosive concentration (MEC)*.

## M

**Melt mixing.** A predominant process for the manufacture of powder coatings involving the continuous compounding of the pigments, fillers, catalysts, and resins at elevated temperatures.

**Melt point.** The temperature at which a finely divided powder will begin to melt and flow.

**Micron/mil.** Common units of measurement of coating thickness: 25 microns (micrometers) equals 1 mil (one thousandth of an inch).

**Minimum explosive concentration.** See *Lower explosive limit*.

## N

**Nonelectrostatic deposition.** A technique of depositing powder onto a substrate, which may be heated above the melt point of the powder material. Some methods are flocking and fluidized bed.

## P

**Particle size.** The average diameter of an object having irregular boundaries, which can be determined to have diameter through various test methods.

**Pill flow.** See *Plate flow*.

**Plasma deposition technique.** A method of applying powder by using compressed gas and by melting the powder in a flame before the powder impinges on the surface.

**Plate flow.** The distance a powder coating flows in the molten state before gel.

Also called *inclined plate flow*, *glass plate flow*, and *pill flow*.

**Pourability.** The capability of a dry powder to flow uniformly or to be continuously poured from a container at a steady rate.

**Powder coatings.** Coatings that are protective, decorative, or both; and that are formed by the application of a coating powder to a substrate and fused into continuous films by the application of heat or radiant energy. Coating powders are finely divided particles of organic polymer that generally contain pigments, fillers, and additives and that remain finely divided during storage under suitable conditions.

## R

**Reclaim.** A process to recycle nondeposited powder through the delivery system for reuse.

**Recovery.** The process of removing nondeposited powder from the air before recirculating the powder through the delivery system.

**Repelling.** See *Back ionization*.

## S

**Sintering.** The tendency of some powders and powder coating materials to agglomerate during storage.

**Spray/reclaim booth.** A specially designed enclosure in which coating powders are introduced, contained, and recovered during the coating process.

**Storage stability.** The capability of powder coatings to maintain uniform physical and chemical properties after being subjected to the manufacturer's specified storage conditions.

**Surface appearance.** Generally refers to the smoothness and gloss of powder-coating films and the presence or degree of surface defects.

## T

**Thermoplastic.** A powder coating that will repeatedly melt when subjected to heat and solidify when cooled. Typical

examples are vinyl (PVC), nylon, and polyolefin.

**Thermosetting.** A powder coating designed to undergo an irreversible chemical change during the cure schedule. Typical examples are acrylic, epoxy, and polyester.

**Transfer efficiency.** The ratio of the powder deposited compared with the amount directed at the part to be coated.

**Transportability.** A powder coating's capability to be carried in an airstream and be passed through tubing and ducts designed to transfer the powder.

**Tribocharging.** The process of creating a static electric charge on powder particles by friction against a nonconductive material.

## V

**Virgin powder.** Unsprayed powder as opposed to sprayed or reclaimed powder.

**Volatile content.** The quantity, expressed as a weight percent of the powder, that is lost under specified conditions of temperature and time.

## W

**Wrap.** A characteristic of powder coatings in electrostatic application to seek out and adhere to parts of the substrate not in direct line of sight of the delivery system end point.

*Adapted with the kind permission of the Powder Coating Institute from Technical Brief #2. (Alexandria, Va.: Powder Coating Institute, 1986).*