POWDER COATING

We Protect What’s Important to You

MetoKote CORPORATION
Customers today demand higher quality and durability from the products they buy. Not only do they expect these products to perform well but they want the finish to look good and resist corrosion for a much longer period of time. The finishing processes offered by MetoKote are designed to do just that. One of those finishing processes is powder coating.

Powder coating is different from painting. There are no liquids or solvents. Therefore, it is the ultimate coating for environmental friendliness. Being dry, the powder overspray can be reclaimed for very high application efficiency. It uses heat to convert its state from a powder to a continuous film. The powder coating materials are basically plastics that have been ground into a fine powder. The coating powder is formulated with plastic resins, pigments, flow agents and other special ingredients to provide the desired characteristics of the coating film.
Powder Classifications.

There are two basic classifications of powder coating materials. They are “thermoplastic” and “thermoset” powders.

Thermoplastic powders are generally applied to a surface that has been preheated to a temperature significantly higher than the melting point of the powder. As a thermoplastic powder material is applied to the hot surface it will melt and “fusion bond” to the surface and then “flow out” into a strong, continuous film. As the film cools it develops its physical properties. Nylon powder coating materials are the most commonly used thermoplastic powders by MetoKote. Thermoplastic coatings are known for their wear and chemical resistance.

Thermoset powders contain a heat activated catalyst and are generally applied to a surface at ambient temperature. The surface and the powder are then heated and as the temperature rises past the melt temperature of the powder (normally 250º-275ºF) it will melt and “fusion bond” to the surface. As the temperature continues to rise (normally 360º-380ºF) a heat sensitive catalyst becomes active and causes the molecular structure of the plastic material to change or “cross-link.” The temperature is maintained while the coating material cures and forms a strong, hard, continuous film. Thermoset powder coating systems offer broad formulation flexibility. They are very durable and widely used by MetoKote in both decorative and functional applications.
The Powder Coating Process.

MetoKote's surface preparation process begins with a process to ensure that the surface is properly cleaned and free of "soils" such as manufacturing oils. Subsequent surface treatments might include blasting, if required, and iron phosphate or zinc phosphate depending on the long term corrosion performance desired.

Thermoplastic powders normally require a primer to promote adhesion. Thermoset powders do not need a primer because they have an adhesion promoter built-in. However, primers may be used with thermosets to enhance certain properties. The priming material used must be compatible with the curing temperatures required for powder coatings.

Application of the powder at MetoKote is a function with many variations of two basic techniques. These techniques are fluidized bed and electrostatic spray.

The fluidized bed is the original powder coating technique. It is still the primary technique used for the application of thermoplastic powders. The fluidized bed is also used for the application of some thermoset powders where high film build is required. Thermoset powders designed for electrical insulation often use the fluidized bed technique. The parts are pre-heated to a temperature significantly higher than the melting point of the powder. The parts are then immersed into a “fluidized bed” of the powder.
coating powder where the plastic powder is melted onto the part.

**Electrostatic spray** is the primary technique used for thermoset powders. The particles of powder are given an electrical charge in the powder coating gun. The target part is attached to a fixture that is grounded. The electrically charged powder particles are attracted to the grounded part and attach themselves like little magnets to the part. The particles build-up on the surface of the part until it is covered with charged particles and the part surface is charged. At this point the oncoming particles are actually repelled by the charged particles on the part and the coating process stops. This provides an even film thickness.

**Heating of the surface** is normally accomplished at MetoKote using ovens fueled by natural gas. Thermoplastic powders normally require the part surface to be heated prior to the application of the powder via the fluidized bed technique. Thermoset powders are normally applied via the electrostatic spray technique while the part is at room temperature. The part surface and the powder are then heated at the same time.

**Curing of the coating** applies to thermoset powders. (Thermoplastic powders normally are not cured.) After the part surface is heated to the desired temperature (360º-380ºF) it is held at that temperature for a specified period of time, normally 20 minutes, while the curing agent develops the desired film properties.
Thermoset Powder Technologies.

Epoxy powder is normally used where a tough durable film is required and the product will not be exposed to direct sunlight for long periods of time. An epoxy coating will form a chalk like appearance on the surface with lengthy exposure to sunlight.

Polyester powder is widely used for decorative components where good resistance to the ultraviolet rays from sunlight is important. Many automotive trim components and other exterior components are coated with polyester powders.

Acrylic powder is specified where the decorative requirements and resistance to ultraviolet rays from sunlight for a longer period of time is critical. Many critical automotive trim components are coated with acrylic powder.

The Outsourcing Decision.

A powder coating system with the appropriate supporting equipment such as the treatment system for process fluids represents a significant capital and staffing investment. For low to moderate production volumes, outsourcing is an easy decision. It is the cost effective way to obtain the advantages of powder coating. However, when production volumes reach the levels which could justify an in-house system, the outsource decision for powder coating becomes more than a normal “make or buy” decision. It is also a “strategic” decision. It means “becoming a coater.” Considering an in-house coating system brings new meaning to the strategic question, “What is our business?”
MetoKote Advantages.
Here are a few of the advantages of outsourcing with MetoKote:

- **Project analysis**: MetoKote will assist with development and then support the most effective process to meet and exceed the customers’ goals.

- **Building and equipment**: MetoKote can design, build and manage these facilities for maximum efficiency specific to the customer’s product.

- **Coating application**: MetoKote will provide highly trained personnel for total custom coating system management.

- **Parts handling**: MetoKote is experienced in packaging, logistics, assembly, inventory control, masking and specialized fixturing.

- **Long-term management**: MetoKote’s unique “bundle” of skills related to painting technologies allows the customer to focus on their core business without the worries of operating a coating facility.

The Protective Coating Specialists.
MetoKote offers powder coating services in several different states within the U.S. and also in foreign locations. Other technologies such as electrocoating and liquid painting are available at certain locations for additional coating service options. Call the MetoKote Corporate Marketing Office (419-996-7800) for a brochure showing a map of plant locations and a chart of services offered.

Regardless of the size of the coating program, MetoKote services should be considered. MetoKote is known for the capabilities of its internal Technology Group, Equipment Division and experienced operating teams. These capabilities have earned MetoKote a reputation for providing a total, integrated, cost effective coating solution.