

Powder coating is a type of coating that is applied as a free-flowing, dry powder. The main difference between a conventional liquid paint and a powder coating is that the powder coating does not require a solvent to keep the binder and filler parts in a liquid suspension form. The coating is typically applied electrostatically and is then cured under heat to allow it to flow and form a "skin". The powder may be a thermoplastic or a thermoset polymer. It is usually used to create a hard finish that is tougher than conventional paint. Powder coating is mainly used for coating of metals, such as household appliances, **aluminium extrusions**, drum hardware, and automobile and bicycle parts.

Powder coated aluminum involves the process of applying dry paint to an aluminum product by way of electrostatically charging the powder and then spraying it onto the product. Decoral's exclusive aluminum coating technology allows for detailed and vivid shapes and patterns.

Regarding coating metal, aluminum and metal materials can be decorated with various designs - from wood grain to custom picturesque compositions - by the use of powder coating. The result is material that is both durable and versatile, one that can be utilized for nearly any purpose. The best reason to use the powder painting process for aluminum coatings is that the product results are superior when aluminum and metal are used, compared to other materials.

Examples of powder coating aluminum products are aluminum windows for residential and commercial projects, appliances, furniture, elevator doors, decks and railings, and others. You can even powder coat aluminum parts such as aluminum wheels if cleaned and handled properly.

Powder coating aluminum is simple to clean. This is especially true when compared to wood, because powder aluminum coatings do not require any form of painting or staining. Powder coating metal is a durable, high grade powder coating process resulting in a finished product that withstands harsh environmental conditions. These include extreme UV exposure, salt spray and heavy pollution.

Wood grain powder coating on aluminum comes in a smooth or textured natural finish and looks so realistic that you can't believe it's not wood.

About 90% of materials that are powder coated are steel, aluminum or metal.

Metal powder coating entails:

- 1.) Part preparation (pre-treatment)
- 2.) Application of powder
- 3.) Curing

Powder coating metal pre-treatment process

Prior to the actual aluminum powder coating step, the metal or aluminum product must be thoroughly cleaned which typically starts by removing grease and existing coatings. It is essential to remove soil, metal oxides, oil, lubrication greases, etc. before moving forward with the metal powder coating process. It is accomplished by using any of a variety of chemical and mechanical methods, which depends on the product's size and material, the type of material to be cleaned and the expected function of the finalized product. Different powder coating applications may require alternate preparation methods, which may include abrasive blasting.

Powder coating metal application processes

Next in the powder painting process, after the pre-treatment step mentioned above, the product is then placed in advanced powder coating machines and the powder particles melt and coalesce to form a continuous film. The powder treatment will effectively apply the design chosen to use. One can then create a design of choice by selecting from a variety of powder coat colors and powder coating patterns.

Commonly, the powder coating is applied to metal objects by spraying via an electrostatic gun. This tool adds a positive electric charge to the powder, which is then applied via spraying (using mechanical or compressed air) in proximity of the grounded object. Motivated by the electrostatic charge, the spray accelerates toward the product, which is then heated. As a result, the powder melts into a uniform film before being cooled to form a hard coating. Alternatively, one may heat the metal and then apply the powder onto the hot substrate by spraying. This method creates a uniform finish, resulting in the finest of decorative coatings.

Powder coating metal curing process

The aluminum coatings cure process requires a specific temperature for a specific duration to achieve full cure and establish the full film properties for which the material was designed. The curing schedule and process could vary according to the manufacturer's specifications of the product being cured. It also depends on the finish and level of dye, aluminum wood grain for example.

Powder coating is a process which has a wide range of advantages like:

- Ready for use directly
- Wide range of finishes are available
- High utilization
- Aesthetic appeal

This is a process of the suitable color of powder forced out of the jet with force to apply on the surface of the aluminum through electro static guns especially made for this purpose and then baked in the oven at the required temperatures. The coated material on cooling acquires the required finish.