Powder coating is a method of coating a substrate in a polymer powder via directional spray equipment. The big difference between this and wet spraying is that the wet spray principle requires a carrier or solvent to allow the material to be successfully atomised and transferred from gun to the substrate, here the powder is carried out of the spray equipment with low pressure air and is drawn towards the substrate via an electrostatic charge which is induced at the exit of the spray equipment. The powder is then cured via an oven to flow the powder out across the surface fusing the particles together in a chemical crosslink.

There are two types of powders used, Thermo plastic, which re-melts with any further application of heat and the more common Thermosetting powders which are much more widely used. The Thermoset system are primarily composed of relatively high molecular weight solid resins of between 30 and 50 um in particle size and cure agent or catalyst which forms or assists in the formation of crosslink between the polymer chain to form a non-reversible polymer film that will not re-melt if subjected to heat for a second time.

The primary resins used in the formulation of thermosetting powders are:
- Epoxy
- Polyester
- Polyester /Epoxy blends (known as Hybrids)
- Acrylic
- Polyurethane

plus some more specialist blend and variations of the above.

Epoxy powders are one of the most common used systems and are produced in a wide range for differing formulations depending upon the final use, and the field that the item will be used in. They provide excellent gloss, toughness, adhesion, chemical resistance, corrosion resistance and flexibility, and, as such, are useful for under bonnet and under body automotive applications, as well as office equipment. The primary drawback in line with wet paint systems is that epoxies will chalk when subjected to long term UV exposure. For this reason they are rarely specified for full outdoor applications. They also have a poor heat tolerance and yellow at raised temperatures.

Polyester powders: general performance can be categorised between epoxy and acrylic powders. They have excellent durability and a high resistance to yellowing under ultra-violet light. Polyester resin systems are available with two types of crosslinking systems, urethane or triglycidyl isocyanurate (TGIC). Whilst there are subtle differences between the systems, most modern powders are TGIC free, they both are able to offer resistant weather properties and exterior durability, and also offer very good visual appearance on fairly low film thicknesses.

They are used for exterior applications such as patio furniture, automotive wheels and trims, lawnmowers and a wide range of other products requiring high quality, decorative finishes comparable to wet coatings.
Epoxy Polyester Hybrids
Epoxy Polyester "Hybrids", a blend of the two materials, sometimes in excess of 50% polyester, with the aim of giving reasonable chemical resistance and adhesion with improvement in durability and outdoor weatherability.

The resultant powders are tough, flexible and competitively priced and are frequently used in the same application as epoxies.

Acrylic
Like the polyesters, acrylics give good gloss and colour retention, excellent exterior durability as well as heat and alkali resistance, however they are not as flexible but can be applied as a thick film.

Polyurethane powders: provide good all-round physical and chemical properties as well as giving good exterior durability.

There are many advantages that make the choice of applying thermosetting powder coatings so attractive;
• Powder coatings emit zero or near zero VOC.
• Powder is immediately ready for use.
• Less powder wastage during the application process, as overspray can be recycled.
• Reduced health hazard in case of exposure of operators.
• Robust cured-film properties.
• Coatings can be achieved in one coat without primers.
• Ability to mask or hide flaws in machined or cast surfaces.

Anochrome Group offers Thermoset Epoxy, Polyester and a hybrid range of Akzo Nobel powders which are applied via a manual application process.

Pre-treatment which is critical to obtaining good adhesion and longevity, can be carried out in house in the forms of anodised, phosphated, sandblasted or electrocoated prior to application.

<table>
<thead>
<tr>
<th>Powder types and properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Property</strong></td>
</tr>
<tr>
<td>Weatherability</td>
</tr>
<tr>
<td>Corrosion Resistance</td>
</tr>
<tr>
<td>Chemical Resistance</td>
</tr>
<tr>
<td>Heat Resistance</td>
</tr>
<tr>
<td>Impact Resistance</td>
</tr>
<tr>
<td>Hardness</td>
</tr>
<tr>
<td>Flexibility</td>
</tr>
<tr>
<td>Adhesion</td>
</tr>
</tbody>
</table>

Information presented in this data sheet is considered reliable, but conditions and methods of use, which are beyond our control, may modify results. Before these products are used, the user should confirm their suitability.

We cannot accept liability for any loss, injury or damage which may result from its use.

We do not warranty the accuracy or completeness of any such information whether orally or in writing.

We reserve the right at anytime and without notice to update or improve products and processes and our information concerning the same.