

Aesthetic Coatings

Technical Data Sheet



Decorative coating types



Anochrome applies decorative coatings to a wide range of substrates including plastics, metals, functional and sacrificial coatings.

With the widespread use of aluminium for wheels and brake components in the search for environmentally friendly and stylish options, the brake discs and callipers have become more visible than they used to be. Anochrome, by using its knowledge of paint options, can provide a variety of coatings in a number of striking metallic, solid and chrome finishes; in some cases, these can be applied to pre-assembled units without damaging internal seals.

These finishes are all barrier coatings, they impart colour and appearance which must be retained in specified environments. These coatings may need to withstand high temperatures, impacts, and be resistant to chemical attack. The colloid coating found to be most suitable for general application is one based upon an epoxy binder.

Epoxy, also known as polyepoxide, is a thermosetting polymer formed from the reaction of an epoxy resin with polyamine hardener. These two-part epoxy systems were first developed in 1936, and subsequent coatings have been developed for heavy duty service on metal substrates, using less energy than heat-cured powder coatings. These systems dry quickly providing a tough, protective coating with excellent hardness. They are generally used in industrial and automotive applications since they are more heat resistant than latex-based and alkyd-based paints. Epoxy paints tend to deteriorate, "chalk out" due to ultraviolet light (uv) exposure.



Epoxy systems

The benefits of these systems to the designer are illustrated in the following list of attributes:

Wide range of colours and clear coats available. Matt to high gloss appearance, Anochrome offers four standard gloss levels; full gloss 90% minimum, semi-gloss 60%, eggshell 30%, matt 10% (Typical thickness 30-35 μ , 60° reference)

A variance of +/-5% can occur, dependent upon application technique.

Easy to apply - good coverage.

Colour stable up to 180°C.

Paints can be selectively applied over hard anodised, and electroplated substrates. Two pack systems cure at relatively low temperatures.

Epoxy materials have good adhesion, toughness, chemical resistance,

Acrylic/polyurethane blends offer excellent uv stability.

Neutral salt spray (ASTM B117, EN ISO 9227) - unbroken films, 50 μ
1000 hours resistance, on hard anodising or zinc plating

Typical coating thicknesses ; primer 20-30 μ , colour coat 20-30 μ
(reds) 40 μ (yellows) lacquers 15-30 μ m

Painted coatings can have printed logos applied, in some cases, printing is performed prior to a clear lacquer layer.

Polyester silicon systems

To further enhance the range of coatings and to meet demands for high performance both in terms of temperature resistance and chemical resistance; new coatings have been developed. These materials are based upon a polyester/silicon binder matrix with pigments and are suitable for carbon rotor clad discs and high temperature environments, for example close to engines and in the vicinity of exhaust systems.

Typical features of polyester silicones:-

Good thermal performance 240°C continuous 270°C intermittent.

Wide range of colours

Clear topcoats

Matt to high gloss appearance good opacity on bright colours

Can be selectively applied over hard anodising or electroplating

Excellent adhesion, toughness, chemical resistance, corrosion resistance.

Self-cleaning properties

Neutral salt spray (ASTM B117, EN ISO 9227) - unbroken films, 50 μ
2000 hours resistance, on hard anodised LM 25 (B S 1490)
aluminium casting

No primer needed single coat application possible.

Typically, 20-30 μ .

Accepts printed logos.

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Special finishes and coatings



If a high gloss finish is not a major requirement, tough, easily cleaned, polytetrafluoroethylene (PTFE) containing materials can be used, for example Xylan® which gives a tough hard finish with very good chip resistance and good release properties; allowing mud and similar contaminants to be easily removed.

Specialised applications include chrome paint finishes, flip (colour or hue alters depending upon the angle at which light is reflected from the component) can be applied in accordance with customer specifications.

Testing of decorative coatings is the key to maintaining consistency, Anochrome carries out thermal cycling testing, brake fluid soak tests, wheel cleaner compatibility trials, as well as more widely used tests including cross hatch adhesion determinations, (ISO2409) neutral salt spray corrosion resistance (ASTM B117 EN ISO 9227) and pencil hardness (BSAU148 part 6).

Paints are applied using manual or robotic spraying on to jigged components which are masked when required.

There are other considerations when applying decorative finishes that need to be taken into account, some of these are listed below:

Full hardening of some paint finishes takes several days; for example, epoxies are hardened for five days before testing is performed. Provided parts are packed carefully they can be transported shortly after reaching room temperature when cooled after curing, but use may need to be delayed until chemical cross linking has been completed.

Top lacquers add protection, gloss and depth, and are frequently applied over metallic finishes.

Transit packing, for example foam lined trays may be required to prevent scuffing.

Colour combinations need to be considered; light colours need to be applied in several coats over a dark substrate; white primers are frequently needed to lift bright colours. Opacity on oranges, and particularly yellows, is difficult to achieve in thin films.

Some paints, whites and silver may yellow with age and heat over a protracted period.

A semi-gloss or matt finish will mask paint and casting faults more readily than high gloss paints.

Single pigment colours have poor opacity compared with mixed pigment shades.

White or grey primers can affect colours if top coated in poor opacity colours, for example, yellow.

Slightly rough castings when painted will create an "orange peel" effect. Dressing of castings is highly visible if it is done badly. Porosity in castings will show as bubbles or depressions in paint films. Organic contamination (oil or wax) can appear as "fisheyes" after painting.

Local filling on a cast finish yields smooth spots and an uneven finish. A smooth surface is much preferred.

Decoration and logos

The appearance of a plain coloured calliper can be dramatically enhanced by the addition of a legend or logo. Anochrome offers various methods of this embellishment; some rely on having raised or sunken lettering included in the substrate which may require filling or finishing. The most adaptable embellishment is silk screen or pad printing which enables, at low cost the addition of a model or range image onto a standard calliper in a variety of colours. Customers are encouraged to seek advice from Anochrome to source suitable ink colours and types.

The possible options for decoration are:



Pad or Screen Printing

- + Cheap
- + Fine detail
- + Can use the same casting
- Can be scuffed off.
- Requires a suitably prepared face.



Infill / Machined in

- + Robust,
- Must be machined or cast in limiting calliper use to specific companies or models.



Raised and Linished

- + Stylish, robust
- Needs protective coat.
- Cast in, limiting calliper use to named logos.

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