

SEALED SPRAYED COATINGS

Technical Bulletin 5.4.1

Porosity inherent in 'as-sprayed' coatings will allow the ingress of fluids which may give rise to:-

- Corrosion of the coating or the base material
- Contamination of the coating or of products handled by the coated articles
- Pressure loss in hydraulic systems due to seepage beneath seals
- Premature coating failure due to sudden or fluctuating pressure changes

These problems may be overcome by applying a suitable sealant, deforming the coating to seal porosity (only for some materials), preventing interconnecting pore networks with thicker coatings (in some cases only). Choice of method and material depends on the type of coating, its thickness, the coating function and the operator environment.

Properties Required of Sealants

Sealability

The sealant must fill the pores sufficiently to prevent fluid penetration.

Chemical Stability

To be effective the sealant must not react chemically with the environment unless the reaction promotes sealing without harming the coating or any products.

Thermal Stability

Many organic materials deteriorate rapidly at moderately high temperatures (>120°C). The sealant must be effective at the expected operating temperatures of the coating.

Mechanical Stability

Sealants must be strong enough to resist abrasive or cavitation erosion and hydraulic washing by the environment.

Viscosity

Sealants must be sufficiently fluid to penetrate the deposit yet sufficiently viscous to prevent drainage from the coating.

SEALANT TYPE	ADVANTAGES	LIMITATIONS
NON-CURING (Oils, grease, wax)	Easy to apply. Good penetration	May be flushed out by solvents or hydraulic action of fluids
CURING-TYPES (Vinyl's, polyesters, epoxies, anaerobic's)	Usually stronger than non-curing types. Usually relatively inert when cured	Penetration often poor with high viscosity materials. If thinned, lower solids concentration may not always fill pores.
SELF SEALING METALS (Tin, copper, aluminium, 18/8 stainless steel)	Higher temperature capability. Lower added cost	Coating may be damaged during compression. Depth of sealing usually shallow and may be removed by wear.

Methods of Sealing

Sealants may be applied by painting (brushing or spraying), dipping or vacuum impregnation depending on which method is appropriate to the sealant and the component. For instance, vacuum impregnation may not be appropriate for fast curing anaerobic's or very large components.

'Self Sealing' coatings may be sealed by machining using high pressures and blunt tools, by rolling or by peening. These methods may be used to control surface finish and, in some cases, dimensional tolerances. However, care must be taken since excessive tool pressures may detach the coating from its substrate.

Typical Uses of Sealing

Atmospheric Corrosion Protection	02E Zn or 01E Al	Sealed with vinyl's, epoxies, alkyds, polyesters
High Temperature Protection	02E Zn or 85E Ni/Cr	Sealed with silicones or silicates.
Hydraulic Rams	60E	Sealed with Metallisation Sprayseal M
Bearings	10E & 15E	Sealed with Metallisation Sprayseal M
Journals	30E & 60E	Sealed with Metallisation Sprayseal M
Printing Cylinders	05E Cu, 30E	Sealed with Metallisation Sprayseal M
Food Processing Machinery	01E Al	Sealed with vinyl
Chemical Vessels	01E Al, 80E	Self sealed

✦ REFERENCE INFORMATION :-

2.5.2.1 Sprayseal M