ARC INDUSTRIAL COATINGS

What is an Industrial Protective Coating?

A film applied to surfaces to protect against damage from in-service exposures such as erosion, corrosion, chemical attack, abrasion, impact, high temperatures and thermal cycling.

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What are Coatings Made of ?

Coatings are typically made from either organic materials like epoxies, polyesters, urethanes, and acrylics, or inorganic materials, like plasma, thermal-sprayed metals and ceramics, and metallic coatings such as zinc and chromate.

TYPES OF CORROSION PROTECTION COATINGS

HYBRID	INORGANIC	ORGANIC
Epoxy - Polysiloxane and Acrylic- Polysiloxane	Glass, Cement, Ceramics, TiO_2, Al_2O_3 and Porous Silicon	Vinyls, Acrylics, Epoxy Ester Phenolic and Polyurethanes

Organic Protective Coatings

Organic coatings are made from carbon-based compounds, often derived from natural sources like vegetables, animals, or refined petroleum byproducts. Common examples include epoxy, urethane, alkyd, and acrylic.

Inorganic Protective Coatings

Inorganic coatings are mineral-based and typically composed of metallic or mineral materials. Examples include zinc silicate, chromates, phosphates and metalized or plasma-sprayed coatings made from metal powders or ceramics.

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When is One Chosen Over the Other?

Choosing between organic and inorganic coatings depends on service conditions. Organic coatings offer broad chemical resistance, flexibility, strong adhesion, and abrasion-resistant fillers, but are typically limited to 500F. Inorganic coatings like plasma-sprayed metals and ceramics provide superior wear and heat resistance, though they're more porous and susceptible to corrosion.

Can Both Coatings be Used Together?

Yes. A common coating systems for atmospheric service uses a zinc silicate (inorganic) primer for corrosion protection, followed by a two-part, or solvent-based epoxy (organic) for chemical resistance, and finished with an aliphatic or acrylic urethane (organic) topcoat for UV protection and color retention.

Cost Comparison: Organic Coatings

Industrial organic coatings can range from $70-$300 per gallon. Application costs are lower due to associated preparation and application costs. The higher-solids formulations deliver greater final film thickness with significantly less waste – typically under 20%.

Cost Comparison: Inorganic Coatings

Inorganic coatings are lower in purchase cost than organic coatings. Their application costs are as much as 2X more expensive, due to specialized application equipment and labor to operate. They require multiple coats to meet functional film thickness requirements. Waste factors can be 30-60% due to spray application.

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