

Powder Coating Solutions with Kynar[®] ADX Fluoropolymer



Kynar[®] ADX fluoropolymer powder coatings

KEY BENEFITS

Outstanding Characteristics:

- Chemical resistance
- Imperviousness to UV
- High barrier properties
- High purity
- Good mechanical & thermo-mechanical properties

Ease of use for various application modes:

- Direct adhesion to metal substrates (steel, aluminum, copper) after standard surface preparation
- Dip coating in fluidized bed, Electrostatic spraying, Hot spraying

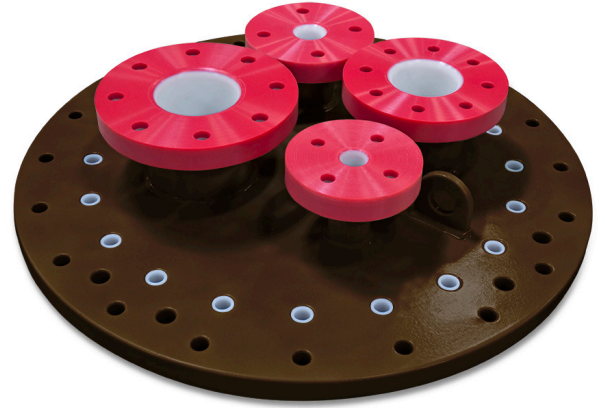


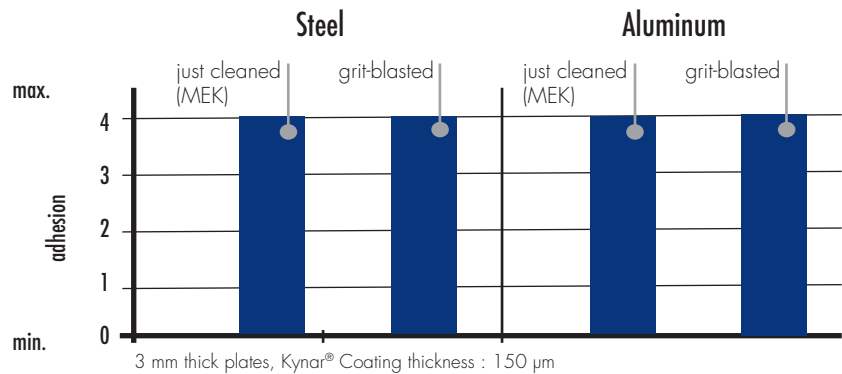
Image courtesy of SALCO PRODUCTS

EXCELLENT PRIMERLESS ADHESION, RETENTION OF ADHESION & BARRIER PROPERTIES

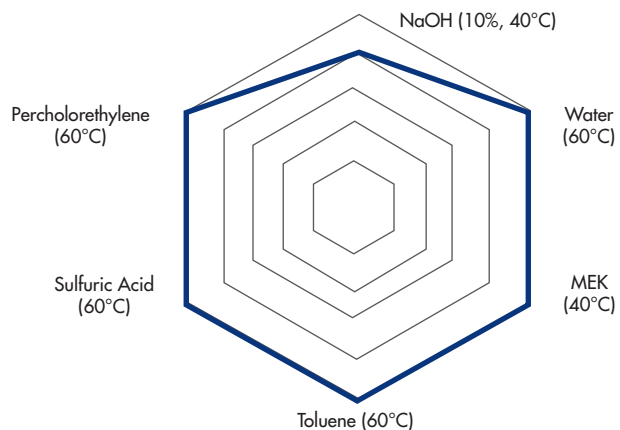
Kynar[®] ADX FLEX 281 fluoropolymer primer-free systems offer unique versatility in terms of application processes.

Kynar[®] ADX FLEX 281 Powder Electrostatic Spraying

Although good surface preparation is advised, adhesion to various metallic substrates is easily obtained with Kynar[®] ADX FLEX 281, even with reduced surface preparation of the metal prior to application.



Adhesion retention after immersion (15 days)



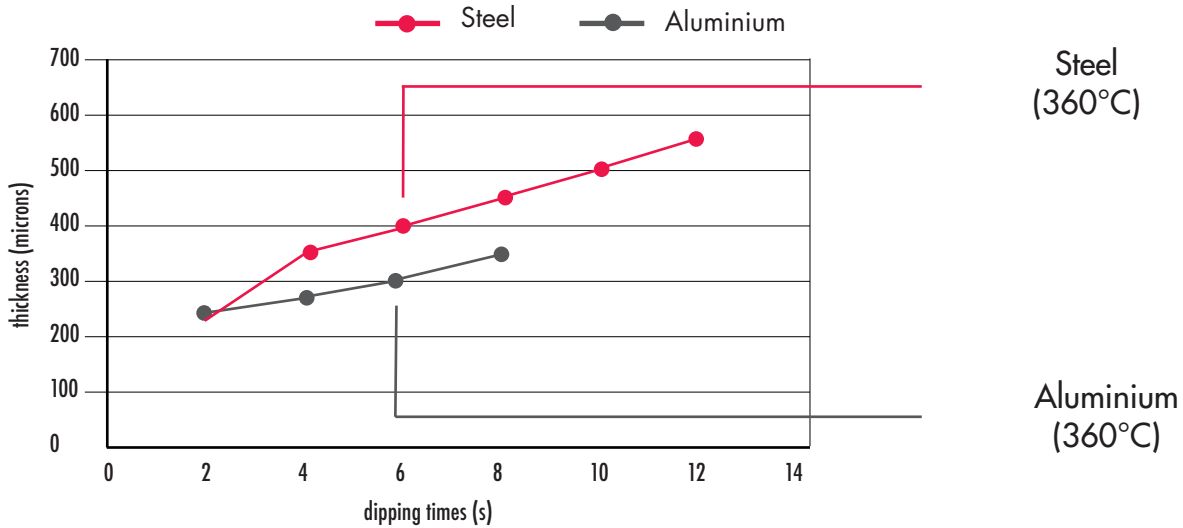
3 mm thick plates, Kynar[®] Coating thickness : 300 µm

Kynar[®] ADX FLEX 281 Powder Dipping

As a fluoropolymer, Kynar[®] ADX FLEX 281 exhibits very good chemical resistance and low permeability to solvents. Even in contact with aggressive solvents, the adhesion of the Kynar[®] coating is retained over time, making the Kynar[®] solution extremely durable.

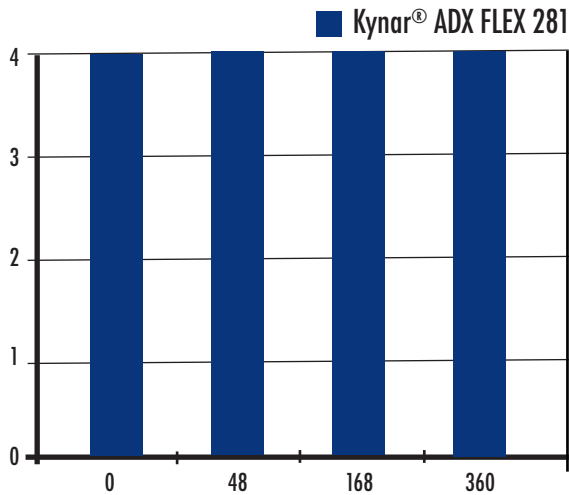
Building thickness:

- Typical thickness achievable by each process
 - Electrostatic spraying : 80 - 120 µm per application
 - Dip coating : 200 -500 µm typical and up to 1 mm
 - Hot flocking : up to 1 mm or even higher
- Example of Dip Coating
 - 3 mm thick plaques, preheating 10 min at 360°C, with Kynar® ADX FLEX 281



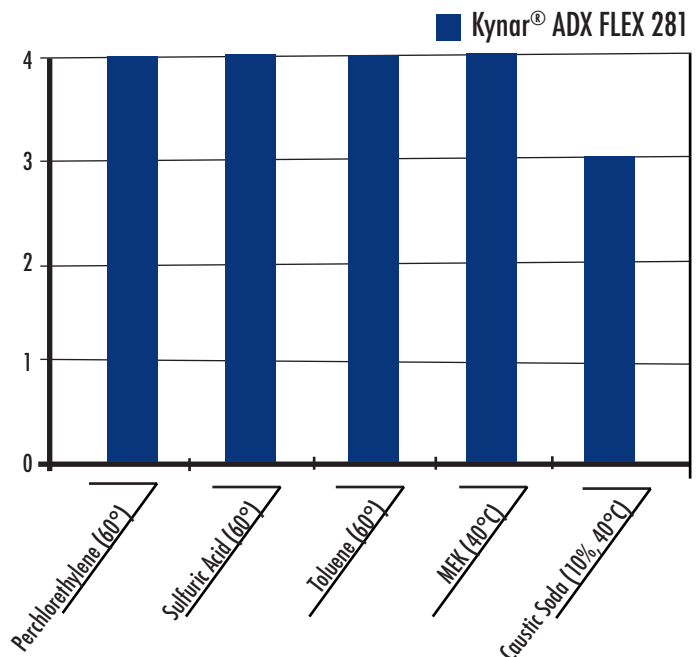
Durability of adhesion

In boiling water (coating ~ 350 µm, dip coating, steel)



excellent adhesion after 2 weeks immersion

In various chemical environments (coating ~100 µm, ES, steel)



excellent adhesion retained after 2 weeks immersion

Electrostatic spraying of Kynar® ADX powder

Surface preparation:

Degreasing

Pretreatment: grit-blasting (G17 steel grit typical) or chemical etching

NO PRIMER REQUIRED

Powder Spraying:

Negative (-80V to -100V typical) or positive voltage can be used

Fusion Conditions:

10 - 15 minutes at 240 - 270°C depending on thickness and nature of metal

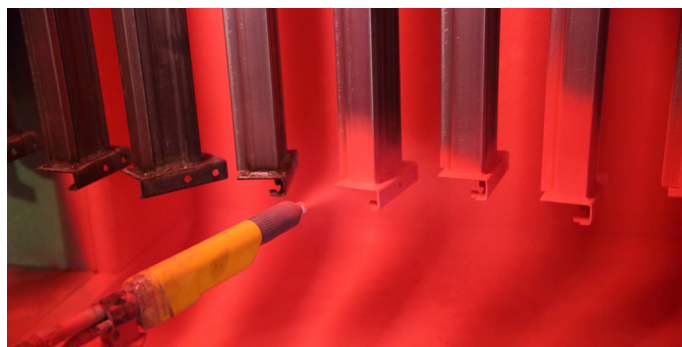
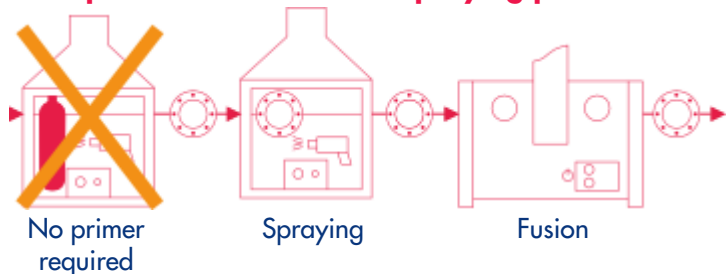
In oven with good ventilation (air speed up to 3 m/s)

Coating Thickness:

From 80 µm to 120 µm per application

Additional layers can be applied in similar conditions

Principle of the electrostatic spraying process:



Dip Coating in a fluidized bed of Kynar® ADX powder

Surface preparation:

Degreasing

Pretreatment: grit-blasting (G17 steel grit typical) or chemical etching

NO PRIMER REQUIRED

Preheating conditions:

The preheating time and temperature depend on design and metal thickness and coating thickness target:

- from 4 to 10 min. at 340 - 360°C for thin parts

- up to 30 min. at 300 - 340°C for massive parts

Dipping conditions in a fluidized bed:

Operate in well ventilated area, with air exhaust near the top of the bed.

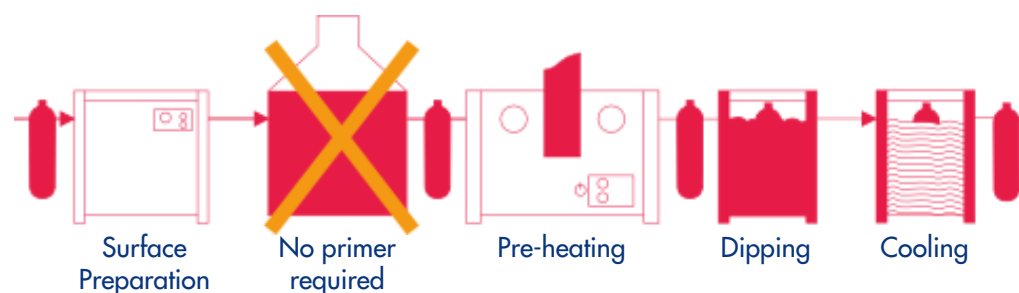
Surface temperature of the hot part should not exceed 350°C for contact with Kynar® ADX powder

Hot part dipped into the fluidized powder, from 2 to 6 sec. typically.

Coating thickness:

From 200 µm to 500 µm (or even higher for massive parts)

Principle of the fluidized bed dip coating process:



Kynar® ADX 281 resin

Outstanding characteristics: chemical resistance, imperviousness to UV, high barrier properties, high purity, good mechanical and thermo-mechanical properties.

Kynar® ADX 281 resin properties table

	Value	Units	Test Standard
Rheological properties			
Melt volume-flow rate, MVR	25	cm ³ / 10 min	ISO 1133
Temperature	230	°C	-
Load	5	kg	-
Mechanical properties			
Tensile Modulus	1500	MPa	ISO 527-1/-2
Yield stress	42	MPa	ISO 527-1/-2
Yield strain	10	%	ISO 527-1/-2
Normal strain at break	46	%	ISO 527-1/-2
Thermal properties			
Melting temperature, 10°C/min	157	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	-40	°C	ISO 11357-1/-2
Electrical properties			
Relative permittivity, 100Hz	10.5	-	IEC 60250
Relative permittivity, 1MHz	6.5	-	IEC 60250
Dissipation factor, 100Hz	380	E-4	IEC 60250
Dissipation factor, 1MHz	2340	E-4	IEC 60250
Volume resistivity	2E12	Ohm*m	IEC 60093
Surface resistivity	1E13	Ohm	IEC 60093
Electric strength	21	kV/mm	IEC 60243-1
Comparative tracking index	600	-	IEC 60112
Other properties			
Water absorption	0.1	%	Sim. to ISO 62
Humidity absorption	0.06	%	Sim. to ISO 62
Density	1770	kg/m ³	ISO 1183

Kynar® ADX 281 resin chemical media resistance table

Acids	Mineral oils	Salt Solutions
Acetic Acid (5% by mass) (23°C)	SAE 10W40 multigrade motor oil (23°C)	Sodium Chloride solution (10% by mass) (23°C)
Citric Acid solution (10% by mass) (23°C)	SAE 10W40 multigrade motor oil (130°C)	Sodium Hypochlorite solution (10% by mass) (23°C)
Lactic Acid (10% by mass) (23°C)	SAE 80/90 hypoid-gear oil (130°C)	Sodium Carbonate solution (20% by mass) (23°C)
Hydrochloric Acid (36% by mass) (23°C)	Insulating oil (23°C)	Sodium Carbonate solution (2% by mass) (23°C)
Nitric Acid (40% by mass) (23°C)	Standard Fuels	Zinc Chloride solution (50% by mass) (23°C)
Sulfuric Acid (38% by mass) (23°C)	ISO 1817 Liquid 1 (60°C)	Other
Sulfuric Acid (5% by mass) (23°C)	ISO 1817 Liquid 2 (60°C)	Hydrogen peroxide (23°C)
Chromic Acid solution (40% by mass) (23°C)	ISO 1817 Liquid 3 (60°C)	Ethylene Glycol (50% by mass) in water (108°C)
Bases	ISO 1817 Liquid 4 (60°C)	Water(23°C)
Sodium Hydroxide solution (35% by mass) (23°C)	Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23°C)	Deionized water (90°C)
Sodium Hydroxide solution (1% by mass) (23°C)	Standard fuel without alcohol (pref. ISO 1817 Liquid 4) (23°C)	Phenol solution (23°C)
Ammonium Hydroxide solution (10% by mass) (23°C)	Diesel fuel (pref. ISO 1817 Liquid F) (23°C)	Hydrocarbons
Alcohols	Diesel fuel (pref. ISO 1817 Liquid F) (90°C)	n-Hexane (23°C)
Isopropyl alcohol (23°C)	Diesel fuel (pref. ISO 1817 Liquid F) (>90°C)	Toluene (23°C)
Methanol (23°C)		iso-Octane (23°C)
Ethanol (23°C)		
Ethers		
Diethyl ether (23°C)		

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