



The application of special finishes for the prevention of corrosion, abrasion, and erosion has been the subject of study in the air handling industry for quite some time. As might be expected, some materials or finishes are more resistant to corrosion than others, but no finish or coating is completely immune from corrosion in all respects. Therefore, corrosion resistance is of degree only, based upon the choice of material made for any particular problem. The data published in this bulletin is based on the recommendations and claims put forward by the manufacturers of such paints or coatings. While we cannot be responsible for the accuracy of this data, it should serve as a useful guide in selecting special paints and/or coatings for handling corrosive atmospheres. Twin City Fan & Blower does not, however, assume any liability for the effectiveness of these coatings, since they are rated in accordance with their manufacturers' claims only.

The rate of corrosion on any application depends to a large extent on the concentrations of fumes, their temperature, and the extent of moisture associated with them. These parameters make it extremely difficult to define corrosion resistance of any one coating by a single rating as shown by a letter in our guide. Plant engineers, with their experience on specific applications, are in a better position to suggest the best coating for their requirements. We suggest you refer to them when possible for such advice.

Some restrictions on fans to be coated are deserving of mention. Naturally, bearings cannot be placed in the airstream. The use of variable intake vanes and outlet dampers is not recommended, since it is almost impossible to properly protect some of their component parts such as linkages, bearings, etc. Shaft seals of a variety of types are available and should be used. Special types of seals may be required in some instances; refer to factory. Drains, especially in handling moist atmospheres, are a necessity. With these points in mind, the corrosion resisting paint or finish can be applied either to the complete airstream of the fan, or to the entire fan, both inside and out.

Coatings and Their Characteristics

For all special paints or coatings and their applications with variation in fan design, construction, and metal preparation, AMCA recommended practice No. 2601-66 is carefully followed. For special paints, fans are phosphatized and washed followed by a prime coat and one or more finish coats depending upon the application and its requirement. In some cases, and as indicated, sandblasting of the parts to be coated is necessary, followed by the necessary coats of corrosive finish to the thickness specified in the chart.

Selection Chart

CORROSIVE REAGENT			ACIDS																ACID SALTS, NEUTRAL SALTS ALKALINE SALTS, ALKALIES, ETC.															
CORROSION RESISTANT: • METALS • PAINTS • COATINGS	NUMBER OF COATS	MAX OPERATING TEMP. (°F)**	ASCETIC	BORIC	CARBOLIC	CARBONIC	CHROMIC	CITRIC	FLUOROBIC	FORMIC	HYDROBROMIC	HYDROCHLORIC	HYDROFLUORIC	HYDROCHLOROUS	LACTIC	NITRIC	PERCHLORIC	PHOSPHORIC	PICRIC	SULPHURIC ACID	SULPHUROUS ACID	ALUMINUM CHLORIDE	ALUMINUM NITRATE	ALUMINUM SULPHATE	AMMONIUM CHLORIDE	AMMONIUM HYDROXIDE	AMMONIUM NITRATE	AMMONIUM SULPHATE	BRINE	BROMINE	CALCIUM CHLORIDE	CALCIUM CARBONATE	CALCIUM HYDROXIDE	CALCIUM DISULPHIDE
			METALS																															
LOW CARBON STEEL	—	600	U	F	F	F	F	U	X	U	U	U	U	U	U	U	U	U	X	U	U	U	U	U	U	E	F	U	X	U	F	X	F	F
ALUMINUM	—	250	G	G	G	G	F	G	U	U	U	U	U	U	G	U	F	U	E	U	G	F	G	F	F	E	E	F	G	U	G	E	F	E
304 S.S.	—	1000	G	E	F	G	G	G	C	G	U	U	U	U	F	E	G	G	E	U	F	F	E	F	F	E	E	U	E	U	F	E	E	E
316 S.S.	—	1000	E	E	F	E	E	E	X	G	E	U	U	U	G	E	E	E	E	F	G	F	E	G	E	E	E	F	E	U	F	E	E	G
PAINTS — TCF&B STANDARD SURFACE PREPARATION																																		
ASPHALTUM (Not Recommended For Fans)	2	200	F	E	F	F	F	G	X	F	X	G	F	F	F	F	U	F	F	F	X	G	F	G	F	E	E	G	X	U	E	E	E	F
VINYL (PVC)	2	150	F	G	U	G	G	G	G	X	G	F	X	G	G	F	G	X	F	G	G	F	G	G	G	E	G	X	U	E	E	E	G	
ZINC	2	350	U	E	U	E	U	U	U	X	U	U	X	X	U	U	U	U	X	U	U	X	X	E	G	G	E	G	X	U	G	X	G	E
EPOXY	2	200	G	G	G	E	F	G	X	G	X	G	G	F	G	G	F	G	U	G	G	G	X	G	G	E	G	G	X	F	E	E	G	
POLYESTER SYNTHETIC RESIN	2	200	E	E	U	E	G	G	X	G	G	E	U	E	E	E	U	E	E	G	G	E	E	E	G	E	X	E	E	X	E	E	E	U
AIR-DRIED PHENOLIC	4	150	G	G	G	G	U	G	G	E	U	G	U	X	E	G	F	G	X	G	G	G	F	G	G	U	G	F	G	U	G	G	E	G
COATINGS — SURFACE PREPARATION INCLUDES STEELBLASTING																																		
EPOXY PHENOLIC	2	350	G	E	G	E	U	G	X	E	X	G	G	F	E	F	U	G	X	U	G	E	X	E	G	F	E	G	G	U	E	E	E	E
BAKED EPOXY PHENOLIC	4 to 5	400	E	E	E	E	F	E	X	E	U	E	U	F	E	F	G	E	X	E	E	E	G	E	F	E	G	E	E	U	E	E	E	E
BAKED EPOXY	2 to 4	400	E	E	E	E	G	E	X	E	U	E	E	G	E	X	G	E	X	G	E	E	X	E	E	E	E	E	E	U	E	E	E	E

* Please refer to page 4 for descriptions.

** Max. operating temperature indicates coating failure, not color change. Chalking or discoloration may be below this temperature.

SELECTION INSTRUCTIONS

Coatings with E or G ratings should be selected, if possible, for best results throughout.

E = Satisfactory from 15% to 85% (depending upon coating) of concentration of fumes and for continuous operation. Also suitable for splash or condensation.

G = Good for up to 5% to 15% of concentration of fumes. Not recommended for applications involving splash or condensation.

F = Fair. Recommended for low (maximum 5%) concentration application. Should not be specified unless detailed application is available.

U = Unsatisfactory and hence not recommended.

X = Sufficient data not available at present. User comments would be appreciated.

CORROSIVE REAGENT			ACID SALTS, NEUTRAL SALTS, ALKALINE SALTS, ALKALIES, ETC.													HYDRO-CARBONS				GASES & FUMES					MISCELLANEOUS												
CORROSION RESISTANT: • METALS • PAINTS • COATINGS	NUMBER OF COATS	MAX OPERATING TEMP. (°F)**	COPPER SULPHATE	FERRIC CHLORIDE	HYDROGEN PEROXIDE	POTASSIUM CYANIDE	POTASSIUM HYDROXIDE	POTASSIUM DICHROMATE	SODIUM BICARBONATE	SODIUM CHLORIDE	SODIUM DICHROMATE	SODIUM HYDROXIDE	SODIUM HYPOCHLORITE	ZINC CHLORIDE	ZINC SULPHATE	BENZENE	BUTANE	GASOLINE	XYLOL/TOLUOL	STEAM VAPOR - SAT.	AMONIA GAS - DRY	AMMONIA - WET	CHLORINE - DRY	HYDROGEN SULPHIDE	SULPHUR DIOXIDE	ABRASION	MOISTURE	SALT SPRAY	ACETONE	ALCOHOL	FORMALDEHYDE	METHYL ETHYL KETONE	MINEARAL OILS	POLYVINYL ACETATE	TRI CHLORETHYLENE		
			METALS																																		
LOW CARBON STEEL	—	600	U	U	U	X	G	G	X	G	G	E	X	X	F	E	X	G	E	G	X	X	F	U	F	F	G	U	E	E	F	E	G	X	F		
ALUMINUM	—	250																		E	E	E	U	F	G	E	E	U	E	G	E	E	E	X	F		
304 S.S.	—	1000	U	U	E	U	U	E	E	G	X	U	G	U	E	E	E	E	E	E	E	E	U	F	F	E	E	F	E	E	E	E	E	X	E		
316 S.S.	—	1000	E	U	E	E	E	E	E	G	X	E	F	U	E	E	X	E	E	E	E	E	E	F	E	G	U	E	G	E	E	E	E	G	X	G	
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VINYL (PVC)	2	150	G	G	F	X	E	F	E	E	X	G	F	X	X	F	X	G	U	G	F	X	G	G	X	U	E	E	U	F	G	U	E	X	U		
ZINC	2	350	E	E	X	X	U	E	X	E	E	G	U	X	U	E	X	E	G	X	X	X	X	U	U	G	E	E	E	E	E	E	E	X	X	U	
EPOXY	2	200	G	G	G	X	G	F	G	E	X	G	F	X	G	G	X	G	G	G	X	F	G	G	X	U	E	E	E	G	G	G	G	E	E	G	
POLYESTER SYNTHETIC RESIN	2	200	E	E	G	X	E	X	E	E	X	G	G	E	E	U	E	E	U	E	E	X	E	G	G	G	E	E	U	E	X	U	U	X	U		
AIR-DRIED PHENOLIC	4	150	E	E	U	G	F	G	E	E	U	U	U	G	G	G	G	U	U	U	U	U	G	G	G	G	E	G	G	G	G	G	F	U	G		
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BAKED EPOXY PHENOLIC	4 to 5	400	E	E	U	E	U	E	E	E	F	U	U	G	E	E	E	E	E	E	U	U	E	E	E	G	E	E	E	E	E	E	E	E	E	G	E
BAKED EPOXY	2 to 4	400	E	E	G	X	G	E	E	E	X	G	G	X	E	E	X	E	G	E	X	X	E	E	U	G	E	E	E	E	E	E	G	X	X	U	

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Description of Coating Materials

Asphaltum Coating

Offers excellent moisture resistance. Fair protection against very mild concentrations of most organic and inorganic acids. Exhibits poor caustic and solvent resistance. Due to poor coating and drying time characteristics, Twin City Fan & Blower DOES NOT recommend the use of asphaltum coating for fans.

Enamel Coatings

Enamel offers a quick dry time, high gloss, and good color and gloss retention. For long term corrosion protection, a primer is recommended.

Epoxy / Epoxy Phenolic Coatings

Offers longer service life than conventional paint against mild acid of caustic solvent. Their resistant characteristics are similar to phenolic. Four different epoxy systems are shown in the chart.

Epoxy Mastic Coatings

Excellent chemical resistance to splash/spillage, fumes, high humidity and moisture. Self-priming and suitable over most existing coatings and tightly adherent to rust.

Fluoropolymer Resin (PVDF) Coatings

Thermoplastic coatings used as excellent corrosion barriers. They are specified because of their unique properties: unaffected by sunlight, most chemicals and solvents, abrasion resistance, mechanical strength and toughness.

High Temp Aluminum Coatings

Heat-resistant coating with good corrosion resistance and thermal stability for temperature over 500°F.

Phenolic Coatings

These are widely used as a fan coatings for a variety of applications. Good resistance to high concentrations of organic or inorganic acids with the exception of strong oxidizing agents, i.e., nitric and chromic. Resistant to only low concentrated alkalis, but excellent solvent resistance. It is not recommended for hydrofluoric acid or hypochlorite salts. Air dried phenolic will have shorter life than baked phenolic. Heresite baked phenolic is most effective while handling dust and explosive gases.

Polyester Powder Coatings

TGIC powder coating offers good exterior durability, mineral acid resistance and hard films. Good humidity and salt resistance.

Polyester Synthetic Resin Coatings

Low cost and adequate resistance to severe acidic and alkaline conditions makes this coating popular. Widely used for evaporative cooling and other air conditioning equipment.

PFA Fluoropolymer Coatings

PFA has excellent release properties, low coefficient of friction, withstands temperatures of up to 500°F, and it is a melt flow nonporous film that offers excellent corrosion protection. PFA is an excellent choice for a wide variety of uses, especially those involving chemical resistance.

Vinyl Coating

All vinyls listed in the chart are thermoplastic material. Generally resistant to most organic and inorganic acids with fair concentrations and low temperature.

Zinc Coatings

Hot-dipped galvanizing of large fans is not physically practical. Cold zinc coating applied as a spray is said to have better corrosion resistance than hot-dip galvanizing, and offers high impact resistance.

OTHER COATINGS AVAILABLE UPON REQUEST FROM TWIN CITY FAN & BLOWER

Color-match Enamel
Teflon (PFA)
Kynor/Dykor (PVDF)
Powder Polyester

