



General Technical Information

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Heat exchanger materials and corrosion resistance

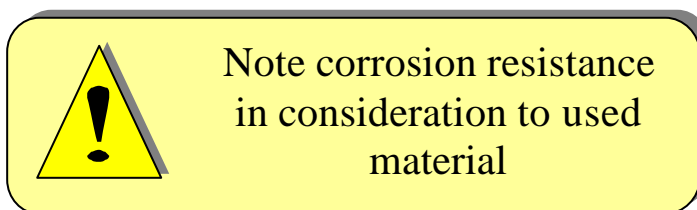
Used materials

Heatex heat exchangers of type H, P, F, W, B, R, T, L and M (counterflow) are manufactured in aluminium or epoxy coated aluminium.

The aluminium heat exchangers have end plates made of aluzink or aluminium depending of size. Corner profiles are made of aluminium.

Stainless heat exchangers of type Z are manufactured in SS 316 (acid resistant). Framework of these heat exchangers are also made of stainless steel.

For special applications where there is a high risk of corrosion of the aluminium, for example in swimming pool environments with chlorine present, we can deliver epoxy coated exchangers with a painted framework that protects the corner profiles and the end plates from corrosion and we can also seal the cut edges of the epoxy coated plates with a coating.



Note corrosion resistance
in consideration to used
material

The following table is a guide for choosing material when different substances are present in the airstream. We recommend that when possible actual tests are made to verify that the chosen material will work in the real application.

Corrosion Resistance Table

Resistance to fumes at normal temperatures

A=Excellent, B=Good, C=Fair, D=Poor, *=No Information

Substance	Formula	Aluminium	Epoxycoated Aluminium	Stainless Steel 304
Acetic Acid	CH ₃ COOH	A	A	A
Acetone	C ₃ H ₆ O	A	A	A
Ammonium Hydroxide	NH ₄ OH	D	A	A
Ammonium Sulphate	(NH ₄) ₂ SO ₄	C	A	A
Bakery Vapours		A	A	A
Beer		A	A	A
Benzene	C ₆ H ₆	A	*	A
Boric Acid	H ₃ BO ₃	A	A	A
Calcium Chloride	CaCl ₂	B	A	C
Carbon Dioxide	CO ₂	A	A	A
Carbon Tetrachloride	CCl ₄	B	*	C
Carbonic Acid	H ₂ CO ₃	A	A	A
Chlorine, water		C	A	C
Chloroform	CHCl ₃	*	*	A
Chromic Acid	CrO ₃	B	B	B
Citric Acid	C ₆ H ₈ O ₇	B	A	A
Copper Cyanide	CuCN	D	*	*
Creosote		*	*	*
Diesel Oil		A	A	A
Ethyl Alcohol	C ₂ H ₅ OH	A	A	A
Ethylene Dichloride	C ₂ H ₄ Cl ₂	*	*	*
Fatty Acids		B	A	A
Ferric Chloride	FeCl ₃	D	A	*
Fluorine Gas	F ₂	D	*	D
Formaldehyde	CH ₂ O	*	A	A
Fruit Vapours		A	A	A
Fuel Oil		A	A	A
Gasoline		A	A	A
Glycerine	C ₃ H ₈ O ₃	A	*	A
Glycol	C ₂ H ₆ O ₂	A	*	A
Hydrochloric Acid	HCl	D	A	D
Hydrocyanic Acid	HCN	*	*	C
Hydrofluoric Acid	HF	D	A	D
Hydrogen Peroxide	H ₂ O ₂	C	B	A
Hydrogen Sulphide	H ₂ S	D	A	B
Jet Fuel		A	A	A
Kerosene		A	A	A
Lactic Acid	CH ₃ CHOHCO OH	C	A	A
Lube Oils		A	A	A
Mercury	Hg	*	*	*
Milk		A	A	A
Mineral Thinner		A	*	A
Molasses		A	A	A
Nitric Acid	HNO ₃	B	*	A
Oils & Fats		B	A	A
Oleic Acid	CH ₃ (CH ₂) ₇ CH CH(CH ₂) ₇ COO H	B	*	*
Oxalic Acid	C ₂ Cl ₂ O ₂	C	*	C
Petroleum Oils		A	A	A
Phosphoric Acid	H ₃ PO ₄	*	A	A

Substance	Formula	Aluminium	Epoxycoated Aluminium	Stainless Steel 304
Photographic Chemicals		*	B	A
Potassium Permanganate	KMnO ₄	*	*	A
Silver Cyanide	AgCN	*	*	*
Soaps		C	A	A
Sodium Hydroxide	NaOH	D	B	A
Sodium Hypochlorite	ClONa	D	B	C
Stearic acid	C ₁₈ H ₃₆ O ₂	B	A	A
Sulphur Dioxide	SO ₂	D	D	A
Sulphuric Acid	H ₂ SO ₄	C	B	A
Sulphurous Acid	H ₃ SO ₃	C	A	A
Syrups		A	A	A
Tannic Acid	C ₇₆ H ₅₂ O ₄₆	C	A	A
Tetrahydrofluorane	C ₄ H ₈ O	*	*	A
Toluene	C ₇ H ₈	A	A	A
Tricresylphosphate	(CH ₃ C ₆ H ₄ O) ₃ P O	B	*	A
Turpentine		A	B	A
Urine		D	B	A
Vegetable Oils		A	A	A
Vegetable Vapours		A	A	A
Vinegar		D	A	A
Vinyl Acetate	C ₄ H ₆ O ₂	*	*	A
Water, Fresh		A	A	A
Water, salt		D	A	A
Whiskey		A	A	A
Wine		*	A	A
Xylene	C ₈ H ₁₀	A	*	A
Zinc Sulphate	ZnSO ₄	D	A	B

The above information is accurate to the best of our knowledge and experience but no guarantee is expressed nor implied in application or services over which we have no control.

Aluminiummaterial Standard

Alloy	8006/ 8011/ 8111/ 1200
Temper	H00/ H19

Mechanical properties	Min	Max
Rm	90 Mpa	140 Mpa
Rp 0,2	30 Mpa	140 Mpa
A%	30%	
Erichen	7,5 mm	

Chemical composition	Min	Max
% Weight		
Si	0,100	0,200
Fe	1,300	1,500
Cu		0,030
Mn	0,300	0,400
Mg		0,030
Cr		0,020
Zn		0,020
Ti		0,030

Epoxycoated material

COVERING CHARACTERISTICS

Epoxy-phenolic Gold colour paint

No toxic organic paint, as declared from Paint Producers "SUITABLE FOR FOOD CONTACT" as for Italian "Ministry Decree", "D.M. 220" of the 26.04.93 (issued in accordance with EEC Directives).

Total Grammage per side 6 +/- 1 gr/m² corresponding to 5 +/- 1 microns.

CORROSION-RESISTANCE TESTS

Salt-mist environment (Salt spray) 500 Hrs, no changes on the coating.

ASTM B117 (NaCl 5% at 35 °C)

Acetic Salt spray Tested for 500 Hrs, without any remarkable variation of coating.

ASTM B287-74 (NaCl 5% + Acetic acid PH 3.6)

Hot-Wet Environment Tested for 1500 Hrs, without any remarkable variation of coating.

ASTM 2247 (100% r.h at 38 °C)

MECHANICAL CHARACTERISTICS OF THE PAINT

Pencil Hardness (KOH-I-NOOR)

P

M.E.K. Resistance

50 double passing

Adhesion test in moist environment Amma 605.1

100%

Bending flexibility (ECCA T7)

OT without adhesion loss

Drawing "Erichsen" according to ECCA T6

No paint detachment before metal support breaking (Aluminium)

OTHERS CHARACTERISTICS

1.1.1 Trichloroethane resistance

No paint detachment

Resistance to Drawing lubricant

Good

Resistance to Thermal

Shock No alteration

(according to AICC N 13)