

## PRODUCT DESCRIPTION



The AIRCOM Freezeline system has been designed and manufactured for use in Coolant transport and distribution systems.

The materials and production technology used have generated a System that perfectly solves most of the problems caused by the use of traditional materials.

### **CORROSION**

The special alloy used to manufacture the AIRCOM Freezeline System is resistant to corrosion from all atmospheric agents and a many chemical agents which rapidly attack and deteriorate the systems made out of traditional materials; this makes the system last much longer than if it were made from traditional materials (black iron, galvanised steel, etc.).

### **SHOCK RESISTANCE**

Unlike most thermoplastics, AIRCOM Freezeline offers excellent resistance to internal and external impacts even at low temperatures: -20°C. The material does not splinter if it is broken.

### **U.V. RADIATION**

Similarly to all thermoplastics, AIRCOM Freezeline is sensitive to direct ultraviolet radiation (direct exposure to the sun), while it withstands indirect exposure reasonably well (behind a window or a similar screen). For outdoor installation and all other cases of direct exposure to UV radiation, shield the piping (paint, lagging, aluminium film, PE or PVC drain pipe, etc.).

### **CONDENSATION**

Condensation will appear much later compared with traditional materials thanks to the lower coefficient of thermal conductivity.

### **FIRE RESISTANCE**

The AIRCOM Freezeline system is V0 rated. In the event of fire, therefore, it neither feeds nor generates flames.

### **FLOW RATE**

The AIRCOM Freezeline System, featuring an extremely low coefficient of friction, allows much higher rated and effective flow rates than those offered by metals; generally speaking, the AIRCOM Freezeline System reduces the diameter of a plant fitted with metal pipes by one size, though this must be accurately calculated on a case-by-case basis. Please consult the flow rate tables for more accurate calculations (page 30).

### **INSTALLATION**

The AIRCOM Freezeline System is extremely quick to install. Even the most complex plants do not require any special construction equipment. They are lightweight and resistant and therefore do not require lifting equipment or special safety precautions on the work-site, while electricity is not an indispensable requirement. It is very simple to modify or extend the plant even after installation.

### **DIMENSIONS AND CONFORMITY**

Pipes, unions and valves comply with ISO, UNI and NF standards governing pipes and unions in PVC.

All the products in the AIRCOM Freezeline System also comply with European and North American Standards governing the transport of FLUIDS.



**ATTENTION:** the information, data and characteristics of the products featured in this document are subject to modification at any time and without prior notice. All the applications specified in this document are guaranteed by AIRCOM as long as the temperatures, pressures and nature of the fluid specified in this document are respected

### COMPATIBILITY WITH ANTI-FREEZE

Fully compatible with most glycol-based liquids and anti-freeze products.

PLEASE ASK OUR TECHNICAL DEPT. FOR CERTIFICATION OF COMPATIBILITY

### PHYSICAL CHARACTERISTICS

Characteristics	Standards	Units	Values
VICAT class	ISO R/306 NF T 51-021	°C	≥ 75
Water absorption	ISO R507 NF T 50-023	mg/cm <sup>3</sup>	< 4
Coefficient of heat expansion	ASTM D 696-70	mm°C	75x10 <sup>-6</sup>
Density	ISO 1183/3514 NF T 54.022	g/cm <sup>3</sup>	≥ 1,35

### MECHANICAL CHARACTERISTICS

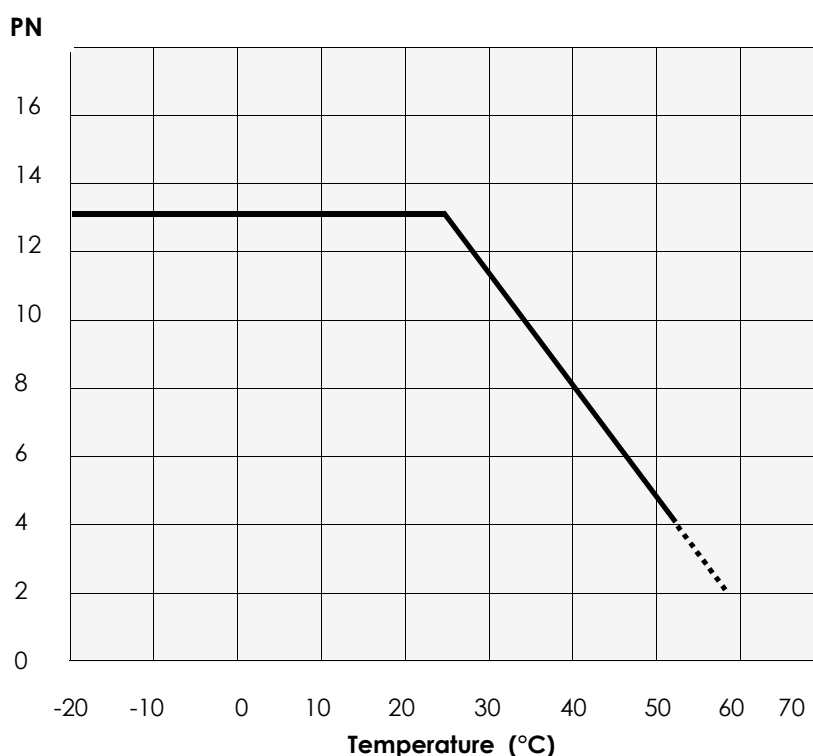
Characteristics	Standards	Units	Values
Ultimate elongation	ISO R 527/NF T 54-026	%	> 130
Bending elastic modulus	ISO R 527/NF T 54-026	KN/cm <sup>2</sup>	233
IZOD impact resistance	NF T 51-911	KJ/m <sup>2</sup>	> 100
Breaking resistance	ISO 527	MPa	36

### Operating pressure

Pn 13 means that the products in the AIRCOM System can be used at a constant pressure of 13 bar starting from a temperature of -20 °C.

Increases in temperature correspond to decreases in rated pressure as shown by the curve in the following graph.

PRESSURE/TEMPERATURE CURVE



## APPLICATIONS

### 1. COOLANTS

The FREEZELINE System has mainly been designed for the secondary cooling of direct conditioning systems. The product range allows systems to be constructed starting from the production unit, the distribution manifolds up to all the external connectors. A set of special pieces effectively solves all specific installation problems connected with the distribution of COOLANTS. Compatibility with cooling lubricant emulsions (contact the AIRCOM technical dept.)

### 2. OTHER FLUIDS

The AIRCOM Freezeline System is compatible with liquid foodstuffs and with many aggressive and non-aggressive chemical fluids (see chemical resistance table)

**CHEMICAL RESISTANCE TABLE (AT AMBIENT TEMPERATURE)**

reactives	resistance	reactives	resistance	reactives	resistance
acetaldehyde	0	maleic acid 35%	2	asphalt	2
amyl acetate	0	malic acid	2	photographic fixers	2
butyl acetate	0	nitric acid 30-50%	2	rayon coagulation bath	2
ethyl acetate	0	nitric acid 50-60%	2	sugar beet (sweetened liqueur)	2
lead acetate	2	nitric acid 60%	2	benzaldehyde	0
sodium acetate	2	nitric acid 68%	2	benzene	0
vinyl acetate	0	nitric acid anhydrous	0	sodium benzoate	2
acetylene	2	oleic acid	2	benzol	0
vinegar	2	oxalic acid	2	potassium bicarbonate	2
acetone	0	palmitic acid 100%	2	sodium bicarbonate 36%	2
fatty acids	2	peracetic acid 40%	2	potassium bichromate	2
acetic acid 0-20%	2	perchloric acid 10%	2	ammonium bifluoride	2
acetic acid 20-30%	2	perchloric acid 70%	2	beer	2
acetic acid 30-60%	2	picric acid 1%	0	sodium bisulphate	2
acetic acid 80-100%	2	selenic acid	2	calcium bisulphite	2
glacial acetic acid	2	silicic acid	2	sodium bisulphite	2
adipic acid	2	sulphuric acid 0-40%	2	borax	2
arsenic acid 80%	2	sulphuric acid 40-80%	2	potassium borate	2
benzoic acid	2	sulphuric acid 80-90%	2	potassium bromate	2
boric acid	2	sulphuric acid 95%	2	liquid bromine	0
hydrobromic acid 10%	2	sulphurous acid	2	ethylene bromide	0
carbonic acid	2	stearic acid	2	potassium bromide	2
hydrocyanic acid	2	tannic acid	2	sodium bromide	2
citric acid 20%	2	tartaric acid	2	butadiene	2
chloroacetic acid	2	demineralised water	2	primary butyl alcohol	2
hydrochloric acid 0-25%	2	bromine water	2	secondary butyl alcohol	2
hydrochloric acid 20%	2	chlorine water 5%	2	butylene	2
hydrochloric acid 25-40%	2	distilled water	2	butylphenol 100%	2
chlorosulphonic acid 100%	2	rain water	2	butynediol (erythritol)	2
chromic acid 10%	2	hydrogen peroxide 30%	2	ammonium carbonate	2
chromic acid 30%	2	hydrogen peroxide 50%	2	barium carbonate	2
chromic acid 40%	2	hydrogen peroxide 90%	2	bismuth carbonate	2
chromic acid 50%	2	acqua regia	2	calcium carbonate	2
nicotine acid	2	sea water	2	magnesium carbonate	2
diglycolic acid 30%	2	ethyl acrylate	2	potassium carbonate	2
fluoboric acid	2	allyl alcohol 96%	2	sodium carbonate (soda ash)	2
hydrofluoric acid 40%	2	amyl alcohol	2	cellosolve	2
hydrofluoric acid 60%	2	butyl alcohol	2	kerasene	2
fluosilicic acid	2	ethyl alcohol 5%	2	silver cyanide	2
formic acid	2	methyl alcohol 10%	2	potassium cyanide	2
phosphoric acid 0-25%	2	propargyl alcohol	2	copper cyanide	2
phosphoric acid 25-50%	2	propyl alcohol 1%	2	sodium cyanide	2
phosphoric acid 50-85%	2	alum	2	zinc cyanide	2
gallic acid	2	chrome alum	2	mercuric cyanide	2
glycolic acid	2	acetic anhydride	0	cyclohexanol	0
hydrofluoric silicon acid	2	sulphur trioxide	2	cyclohexanone	0
hypochlorous acid	2	sulphur dioxide	2	aniline chlorate	2
lactic acid 28%	2	aniline	0	calcium chlorate	2
lauric acid	2	anthraquinone	2	potassium chlorate	2
linoleic acid	2	sodium arsenite	2	sodium chlorate	2

### CHEMICAL RESISTANCE TABLE

reactives	resistance	reactives	resistance	reactives	resistance
phenylhydrazine chlorhydrate	2	disodium phosphate	2	sweet crude oil	2
ethylene chlorohydrin	0	tributylphosphate	0	aluminium oxychloride	2
chlorobenzene	0	trisodiumphosphate	2	phosphorous pentoxide	2
chloroform	0	hydrogen phosphide	2	potassium perborate	2
allyl chloride	0	gas phosgene 100%	2	potassium perchlorate 1%	2
aluminium chloride	2	liquid phosgene	0	potassium permanganate 10%	2
amyl chloride	0	fructose	2	ammonium persulphate	2
ammonium chloride	2	phthalates	0	potassium persulphate	2
barium chloride	2	furfural	0	tetraethyl lead	2
calcium chloride	2	carbonic gas in aqueous solution	2	fruit pulp and juice	2
ethyl chloride	0	gelatine	2	caustic potassium	2
lauryl chloride	2	glycerine	2	brine	2
magnesium chloride	2	glucose	2	diazo-salts	2
methyl chloride	0	chloral hydrate	2	soap	2
methylene chloride	0	hydroquinone	2	sodium silicate	2
nickel chloride	2	aniline hydrochloride	0	caustic soda	2
potassium chloride	2	aluminium hydroxide	2	aluminium sulphate	2
copper chloride	2	ammonium hydroxide	0	ammonium sulphate	2
sodium chloride	2	barium hydroxide	2	barium sulphate	2
thionyl chloride	0	calcium hydroxide	2	calcium sulphate	2
zinc chloride	2	magnesium hydroxide	2	hydroxylamine sulphate 12%	2
ferric chloride	2	potassium hydroxide	2	lauryl sulphate	2
ferrous chloride	2	sodium hydroxide	2	magnesium sulphate	2
mercuric chloride	2	calcium hypochlorite	2	methyl sulphate	2
stannic chloride	2	sodium hypochlorite	2	nickel sulphate	2
stannous chloride	2	milk	2	potassium sulphate	2
cresol 90%	2	molasses	2	copper sulphate	2
potassium chromate	2	mercury	2	sodium sulphate	2
zinc chromate	2	ammonium metaphosphate	2	zinc sulphate	2
dextrine 18%	2	methyl-ethyl-ketone	0	ferric sulphate	2
dextrose	2	monopropylene glycol	0	ferrous sulphate	2
dichloroethylene	0	naphtha	2	ammonium sulphite	2
dichloropropylene	0	naphthaline	0	barium sulphite	2
potassium dichromate	2	nicotine	2	calcium sulphide	2
sodium dichromate	2	aluminium nitrate	2	sodium sulphide	2
dimethylamine	0	ammonium nitrate	2	lard	2
hexane	2	silver nitrate	2	titanium tetrachloride	2
tertiary hexanol	2	calcium nitrate	2	tetrahydrofuran	0
raw acetic esters	0	magnesium nitrate	2	ammonium thiocynate	2
pure acetic esters	0	nickel nitrate	2	ammonium thiosulphate	2
ethyl ether	0	potassium nitrate	2	toluene	0
ethers	0	copper nitrate	2	trichloroethylene	0
phenylhydrazine	0	sodium nitrate	2	antimony trichloride	2
phenol	2	zinc nitrate	2	phosphorous trichloride	0
potassium ferricyanide	2	ferric nitrate	2	triclesyl phosphate	0
sodium ferricyanide	2	mercurius nitrate	2	triethanolamine	0
potassium ferrocyanide	2	sodium nitrite	2	triethylamine	2
sodium ferrocyanide	2	nitrobenzene	0	boron trifluoride	2
aluminium fluoride	2	ocenol (unsaturated alcohol)	2	trimethylpropane 10%	2
ammonium fluoride	2	oleum	0	urea 30%	2
potassium fluoride	2	oils and fats	2	urine	2
copper fluoride	2	mineral oil	2	wine	2
sodium fluoride	2	linseed oil	2	whisky	2
formaldehyde	0	lubricating oil	2	xylene or xylol	0
sodium phosphate acid	2	castor oil	2	sulphur	2
ammonium phosphate (ammoniacal and neutral)	2	acid crude oil	2		

Key: 2 good resistance  
0 no resistance (not recommended)

This table is only a guide. Please contact the AIRCOM technical dept.