



Chemical Resistance Chart For Protectowire Type XCR Jacket Material

Protectowire Type XCR demonstrates excellent overall chemical resistance. In general only a few species are known to chemically attack the jacket and significantly swell the polymer causing damage to the jacket material.

The XCR fluoropolymer jacket is especially resistant to:

- most acids and acid mixtures,
- weak bases,
- salts, aliphatic hydrocarbons, alcohols,
- strong oxidants and halogens.

However, some chemicals can attack and swell the XCR jacket, particularly at high temperature:

- esters, aromatic hydrocarbons, amines, gaseous fluorine,
- ethers, ketones, amides, partially halogenated solvents and certain halogenated compounds.

Chemical attack and jacket swelling are very complex phenomena. A partial list of factors affecting chemical suitability of all Protectowire Linear Heat Detector jacket materials for chemical applications are as follows:

- Specific chemical or mixture composition,
- Temperature and temperature variation,
- Concentration of the attacking chemical which may be a complex completely different than the individual components,
- Exothermic heat or mixing pressure due to the effect of pressure on a reactive gas,
- Time of exposure, velocity, or material thickness.

The recommended procedure to determine suitability of Protectowire jacket materials is as follows:

- Determine as accurately as possible the chemicals in the application in question,
- Determine the maximum temperature and the normal operating temperature,
- Review the chemical effect ratings including the maximum recommended temperature from the charts provided.

The maximum recommended temperatures listed in the XCR Chemical Resistance Chart refers to the point at which the chemicals indicated would damage the jacket material. These temperatures have no relationship to the alarm temperature of the Detector, but should be referenced to determine if limitations to the maximum recommended ambient temperature for the Detector is necessary in chemical environments. Any breach or adverse chemical effect on the integrity of the Protectowire jacket, will lead to premature detector failure and a reduced service life for the product.

All information supplied in this bulletin by The Protectowire Company in relation to its products and their application is intended for general reference only. The information is not a guarantee of product performance or a recommendation for product use in the environments indicated. The Protectowire Company assumes no liability whatsoever in respect to application, or use made of the aforementioned information or products, or any consequence thereof.

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**Manufacturer of
Special Hazard
Fire Detection Systems**

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This chemical resistance chart cannot predict the effect on the jacket of complex chemical mixtures. The appropriate chemical resistance tests using a representative sample of the chemical(s) or a trial installation of the Protectowire Linear Heat Detector should be performed to determine acceptable product performance.

Chemical	Formula	Concentration	Max. Temp. [°C]
Acids			
Hydrochloric	HCl	37%	135
Hydrofluoric	HF	40%	120
Nitric	HNO ₃	11 - 70%	65
Phosphoric	H ₃ PO ₄	<85%	135
Sulphuric	H ₂ SO ₄	93 - 98%	65
Bases			
Ammonium hydroxide	NH ₄ (OH)	100%	135
Calcium hydroxide	CA(OH) ₂	100%	120
Sodium hydroxide	NaOH	<10%-stabilized at pH13.5	25
Sodium hypochlorite	NaClO	5%	110
Hydrocarbons			
n-Hexane	CH ₃ (CH ₂) ₄ CH ₃	100%	135
Toluene	C ₆ H ₅ CH ₃	100%	80
Alcohols and Ethers			
Methyl alcohol		100%	135
Ethanol	CH ₃ CH ₂ OH	100%	110
Organic Acids, Esters and Ketones			
Acetic acid	CH ₃ COOH	100%	50
		50%	95
Acetone	CH ₃ COCH ₃	10%	40
Formic acid	HCO ₂ H	100%	120
Ethyl formate	C ₃ H ₆ O ₂	100%	25
Solvents			
Benzene	C ₆ H ₆	100%	75
Methylene chloride	CH ₂ Cl ₂	100%	40
Ethylene dichloride	C ₂ H ₄ Cl ₂	100%	120
Halogenated Solvents			
Chlorobenzene	C ₆ H ₅ Cl	100%	75
Chloroform	CHCl ₃	100%	50
Amines and Nitriles			
Acetonitrile	CH ₃ CN	100%	40
Aniline	C ₆ H ₅ NH ₂	100%	40
Dimethyl amine	(CH ₃) ₂ NH	100%	Not resistant
Peroxides			
Hydrogen peroxide	H ₂ O ₂	30%	95
Automotive Fluids			
Crude Oil		100%	135
Motor Oil		100%	135
Gasoline		100%	135
Diesel Fuels		100%	135
Mineral Oil		100%	135

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