Chemical resistance of Dyneema® fibers

Dyneema® fibers are very resistant against chemicals.

Dyneema® fibers are High Modulus PolyEthylene (HMPE) fibers produced from ultrahigh-molecular weight polyethylene. It is highly crystalline and does not contain any chemical groups as aromatic rings, amide, hydroxyl or other that are susceptible to attack by aggressive agents. The result is that Dyneema® fibers are very resistant against chemicals.

Tensile strength loss levels

	++	+	+/-	-	--
	None	Slight	Moderate	Appreciable	Degraded
Loss in tensile strength	0-10%	11-20%	21%-40%	41-80%	81-100%

Tensile strength & chemical exposure

Chemical	Conditions			Effect on Tensile Strength
	Concentration [%]	Temperature [°C]	Exposure time [hr]	
Inorganic acids				
Hydrochloric acid	10	20	5000	++
Nitric acid	10	20	5000	++
Sulfuric acid	0.24	60	168	++
Organic acids				
Glacial acetic acid	100	20	5000	++
Alkalis				
Ammonium hydroxide	28	20	5000	++
Calcium hydroxide	0.25	60	168	++
Sodium hydroxide	10	20	5000	++
Strong oxidizing agent				
Kalium permanganate in sulfuric acid	0.6 25	23	720	+
Organic compounds				
Acetone	100	20	5000	++
Ethanol	100	20	5000	++
Oil	100	20	4320	++
	100	40	4320	++
	100	80	4320	++
Petrol	100	20	4320	++
	100	40	4320	++
	100	80	4320	++
Toluene	100	20	5000	++
Trichloromethane	100	20	5000	++
Miscellaneous				
Distilled water	100	20	5000	++
Sea water	100	20	5000	++
Detergent in aqueous solution	30	20	5000	++

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