B

HALAR® (E-CTFE)

Halar is a durable copolymer of ethylene and chlorotrifluoroethylene. It is resistant to a wide variety of corrosive chemicals and organic solvents including strong acids, chlorine, and aqueous caustics. Best known as its trade name Halar, it has excellent abrasion resistance and electrical properties, extremely low permeability, and handles temperatures from cryogenic to 171° C (340° F), with continuous service to 149° C (300° F). Its brittleness temperature is 105° F.

Severe stress tests have demonstrated that Halar is not subject to chemically induced stress cracking from strong acids, bases, or solvents. Only hot amines and molten alkali metals affect Halar. There is no known solvent for Halar below 250° F. Additionally, Halar is most likely the best known material for handling high concentrations of sodium hypochlorite.

Asahi/America Halar systems are manufactured from unpigmented fluoropolymer E-CTFE resin. Their chemical structure, a one-to-one alternating copolymer of ethylene and chlorotrifluoroethylene, provides a unique combination of properties. In addition to superior chemical resistance and unmatched mechanical properties, Halar maintains its usefulness during exposure to cobalt 60 radiation at dosages of 200 megarads, and meets the fire requirements of UL-94 V-0 vertical flame tests.

For these reasons, Halar is considered one of the most durable and versatile thermoplastics used in piping systems. Applications ranging from the harshest of chemicals to the purest of hot DI water are ideal. No other known thermoplastic offers as much versatility in chemical resistance and strong mechanical properties as Halar.

Table B-5. Halar Physical Properties

Characteristic	Standard	Units	Value
Specific Gravity	ASTM D 792	g/cm^3	1.69
Tensile Strength	ASTM D 638	psi	4500
Ultimate Tensile Strength	ASTM D 638	psi	7250
Elongation at Break	ASTM D 638	%	200
Flexural Modulus	ASTM D 792	psi	6200
E-Modulus	ASTM D 790	psi	240,000
Impact Strength (IZOD with V-notch)	ASTM D 256	—	No Break
Hardness–Shore D	ASTM D 2240	—	75
Abrasion Resistance	DIN 53 754	mg/100 cycle	0
Friction Coefficient	DIN 375	—	0.15
Dynamic Friction Coefficient	—	—	0.65
Crystalline Melting Point	DIN 53 736	° C ° F	240 464
Brittleness Temperature	ASTM D 648	° F	-105
Thermal Conductance @ 69° F (20° C) @ 302° F (150° C)	ASTM D 177	Btu–in/hr ft^{2}° F Btu–in/hr ft^{2}° F	1.07 1.11
Coefficient of Thermal Expansion -22 to 122° F (-30 to +50° C)	DIN 53 453	° F^{-1}	4.4×10^{-5}
Specific Volume Resistivity	ASTM D 257	Ohm•cm	10^{15}
Surface Resistivity	DIN 53 482	Ohm	$>10^{15}$
Dielectric Strength	ASTM D 149	V/mil	500
Burning Rate	UL94	—	V-O
Limiting Oxygen Index	ASTM D 2863	%	60

NOTE: Halar® is a registered trademark of Ausimont USA, Inc. Solef® is a registered trademark of Solvay.

P.O. Box 653 • 35 Green Street, Malden, MA 02148 • Tel: (800) 343-3618, (781) 321-5409
Fax: (800) 426-7058 • Internet: http://www.asahi-america.com • Email: asahi@asahi-america.com