

Tecnoflon® PFR X1055B

Perfluoroelastomer

Tecnoflon® PFR X1055B is a new perfluoroelastomer (FFKM) offering outstanding thermal resistance, lower compression set and enhanced sealing force retention at extreme temperatures. Tecnoflon® PFR X1055B is suitable for most applications at temperatures ranging from –10 to 315 °C.

Along with excellent thermal resistance, it can offer broad chemical resistance in a wide variety of media including acids, caustics, ketones, aldehydes, esters, ethers, alcohols, solvents, sour gases and hydrocarbons. However, it is not recommended for use in severe aqueous and amine applications.

This unique combination of thermal and chemical resistance makes Tecnoflon® PFR X1055B the sealing material of choice for high temperature chemical and hydrocarbon processing industries as well as aerospace applications.

At the same time its extreme cleanliness (low metal ion content with low extractables) along with its superior thermal stability and its plasma resistance make Tecnoflon® PFR X1055B a very suitable sealing material for most dry plasma (etching, PECVD, LPCVD, metal CVD, PVD, ALD, plasma cleans) and high temperature thermal processes in the semiconductor manufacturing industry.

Tecnoflon® PFR X1055B can be combined with other typical fluoroelastomer compounding ingredients; it can be mixed either by using two-roll mills or internal mixers. Finished goods may be produced by a variety of rubber-processing methods.

The primary use of Tecnoflon® PFR X1055B is manufacture of any kind of elastomeric sealing element such as O-rings, gaskets, flanges, valve bodies, butterfly valves, pump housings and stators, metal bonded parts, diaphragms, profiles, etc. These sealing elements can be used in mechanical seals, pumps, compressors, valves, reactors, mixers, sprayers, dispensers, quick connect couplings, controls, instrumentation, etc. in the chemical and petrochemical industry as well as the hydrocarbon processing, aerospace and semiconductor manufacturing industries.

Tecnoflon® PFR X1055B is marketed in raw polymer form (1 kg box) in order to give the transformer the freedom and the opportunity to develop and fine-tune compounds as well as items best-suited to producing high performance rubber articles.

Handling and safety

Normal care and precautions should be taken to avoid skin contact, eye contact and breathing of fumes. Smoking is prohibited in working areas. Wash hands before eating or smoking. For complete health and safety information, please refer to the safety data sheet.

Basic characteristics of the raw polymer are as follows

Property	Typical Value	Unit	Test Method
ML (1+10') at 121 °C	60	MU	ASTM D1646
Specific gravity	2.03	g/cm ³	ASTM D792
Color	Translucent		
Packaging/Form	1 kg/Slabs		

Tecnoflon® PFR X1055B

Perfluoroelastomer

Typical black compound

Test Compound	Typical Value	Unit	Test Method
Tecnoflon® PFR X1055B	100	phr	
BOAP*	0.7	phr	
N-990 MT Carbon Black	20	phr	

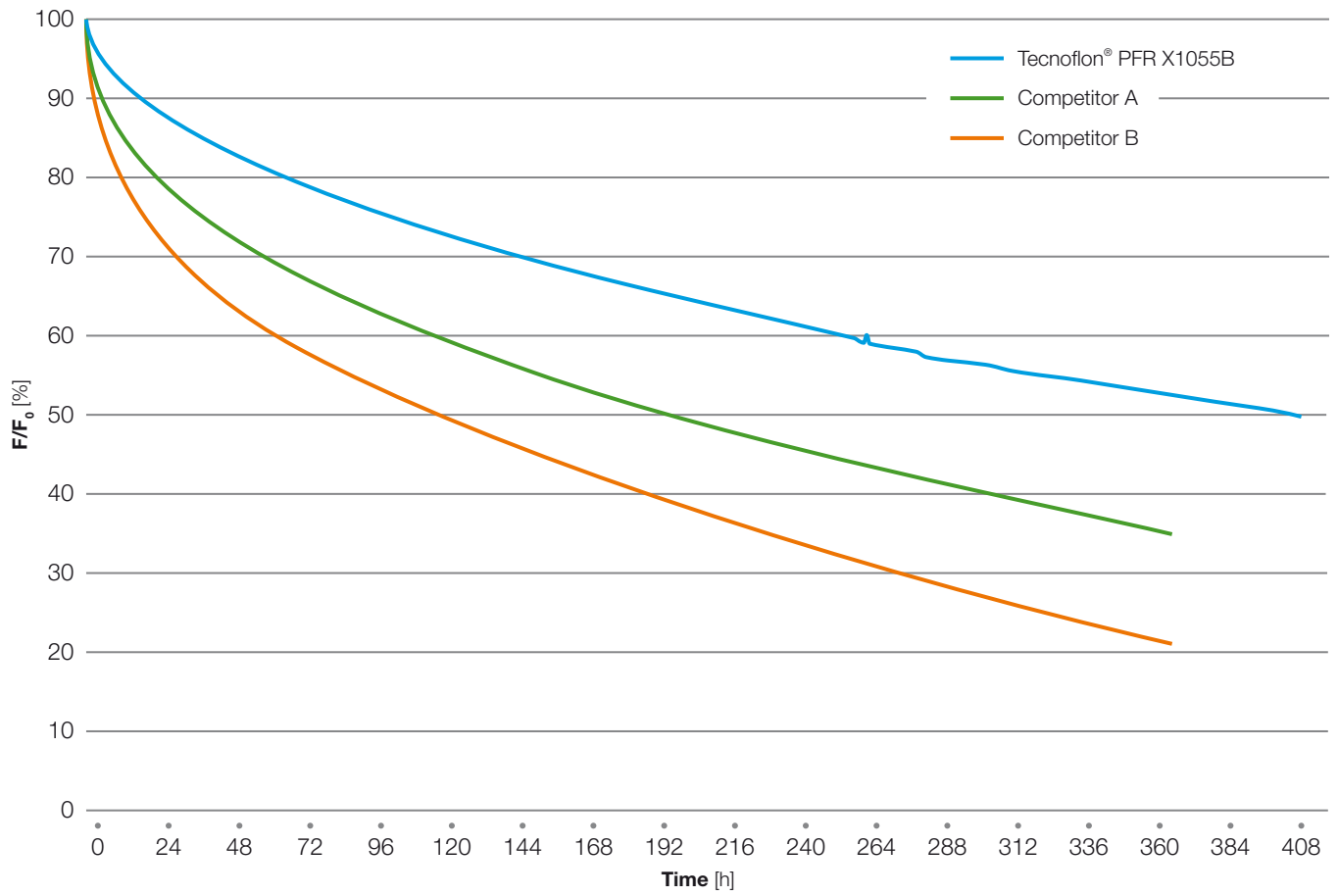
Property	Typical Value	Unit	Test Method
MDR 30 min at 170°C arc 0.5°			ASTM D2084
Minimum torque	0.9	lb·in	
Maximum torque	16.1	lb·in	
t _{s2}	3.3	min	
t' ₅₀	6.0	min	
t' ₉₀	18.6	min	
Press cure: 20 min at 170°C, post cure: (8 + 16) h at 290°C			
100% Modulus	9.0	MPa	ASTM D412C
Tensile strength	19.0	MPa	
Elongation at break	145	%	
Hardness	68	ShoreA	ASTM D2240
Compression set 25% deformation, O-ring #214			ASTM D395 method B
70 h at 200°C	8	%	
70 h at 275°C	10	%	
70 h at 300°C	16	%	
70 h at 316°C	22	%	
1,000 h at 250°C	21	%	
70 h at 120°C + 2 h cool-down	22	%	
70 h at 200°C + 2 h cool-down	23	%	
1,000 h at 250°C + 2 h cool-down	31	%	

*2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane – CAS #83558-87-6

Tecnoflon® PFR X1055B

Perfluoroelastomer

Compression stress relaxation at 300°C



Tecnoflon® PFR X1055B

Perfluoroelastomer

Fluid resistance overview

Fluid	Volume Swelling
Inorganic acids	< 10%
Organic acids	< 10%
Alkalis	< 10%
Amines (RT)	< 10%
Hot amines (> 70 °C)	10 – 30%
Water / Steam	30 – 50%
Ketones	< 10%
Esters	< 10%
Ethers	< 10%
Aldehydes	< 10%
Alcohols	< 10%
Hydrocarbons	< 10%
Sour gas	< 10%
Lubricants	< 10%
Fluorinated fluids	30 – 50%

Fluid resistance

Property	Typical Value	Unit	Test Method
Ethylene diamine, 336 h at 60 °C			
Δ Tensile strength	30	%	
Δ Elongation at break	25	%	
Δ Volume	3.0	%	
NH₃, 30%, 168 h at 100 °C			
Δ Tensile strength	-5	%	
Δ Elongation at break	10	%	
Δ Volume	2.0	%	
Nitric acid, 65% 168 h at 80 °C			
Δ Tensile strength	-60	%	
Δ Elongation at break	34	%	
Δ Volume	2.8	%	

Tecnoflon® PFR X1055B

Perfluoroelastomer

Miscellaneous PFR properties

In general, the following properties can be considered as typical or average values for perfluoroelastomers.

Thermal expansion

Following the definition of linear coefficient of thermal expansion: $L = L_0 \cdot (1 + \alpha \cdot \Delta T)$, the average value between 80 and 250 °C is as follows:

$$\alpha = 3.2 \cdot 10^{-4} \text{ 1/K}$$

Specific heat

Temperature	Unit	Black Compounds	White Compounds	Test Method
50 °C	J/g	0.98	0.83	
100 °C	J/g	1.05	0.86	
150 °C	J/g	1.12	0.91	

Gas permeation

Test Compound	Permeability (T = 30°C)	Unit	Test Method
Nitrogen	250	(cm ³ (STP)·mm/m ² ·atm·d)	
Oxygen	450	(cm ³ (STP)·mm/m ² ·atm·d)	
Helium	5,400	(cm ³ (STP)·mm/m ² ·atm·d)	

Electrical properties

Dielectric constant and loss factor at 50 Hz frequency.

Volume and surface resistivity were measured applying 100 V direct tension.

Property	Typical Value	Unit	Test Method
Dielectric constant ϵ'	3.50		
Loss factor $\tan(\delta)$	0.030		
Surface resistivity R_s	$5.0 \cdot 10^{16}$	Ω	
Volume resistivity R_v	$6.1 \cdot 10^{16}$	$\Omega \cdot \text{cm}$	

www.solvay.com

SpecialtyPolymers.EMEA@solvay.com | Europe, Middle East and Africa

SpecialtyPolymers.Americas@solvay.com | Americas

SpecialtyPolymers.Asia@solvay.com | Asia Pacific



Safety Data Sheets (SDS) are available by emailing us or contacting your sales representative. Always consult the appropriate SDS before using any of our products. Neither Solvay Specialty Polymers nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, or accepts any liability in connection with this product, related information or its use. Some applications of which Solvay's products may be proposed to be used are regulated or restricted by applicable laws and regulations or by national or international standards and in some cases by Solvay's recommendation, including applications of food/feed, water treatment, medical, pharmaceuticals, and personal care. Only products designated as part of the Solviva® family of biomaterials may be considered as candidates for use in implantable medical devices. The user alone must finally determine suitability of any information or products for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. The information and the products are for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. All trademarks and registered trademarks are property of the companies that comprise Solvay Group or their respective owners.

© 2016 Solvay Specialty Polymers. All rights reserved. D 06/30/2016 | Version 1.0 Design by ahlersheinel.com