

Tecnoflon® PFR 70-WA1

Perfluoroelastomer Compound

Tecnoflon® PFR 70-WA1 is a 70 Shore A white, FDA and USP Class VI compliant, chemical resistant perfluoroelastomer (FFKM) compound based on Tecnoflon® PFR 94. It offers the widest range of aggressive media sealing capabilities along with excellent compression set values.

It is suitable to most applications in temperatures ranging from -10 °C to 230 °C, offering outstanding resistance to aggressive media such as acids, caustics, ketones, aldehydes, esters, ethers, methanol, solvents, sour gases, amines, hydrocarbons, steam, hot water, ethylene and propylene oxide and mixed process streams. Moreover it was specifically developed to cope with a wide range of potent active pharmaceutical ingredients (API's) and aggressive cleaning agents, being especially suited to withstand steam-in-place (SIP) and clean-in-place (CIP) procedures.

Tecnoflon® PFR 70-WA1 can be transformed into virtually any kind of elastomeric sealing element, including O-rings, gaskets, 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, hydrocarbon processing, petroleum exploration and extraction, food processing, the pharmaceutical and bio-analytical industry, the aerospace and semiconductor manufacturing industries.

Handling and safety

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

Basic characteristics of the compound are as follows:

Property	Typical Value	Unit	Test Method
ML (1+10') at 121 °C	45		
Specific gravity	2.40	g/cm ³	ASTM D792
Color	White		
Packaging/form	1 kg / Slabs		

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Typical rheological and physical properties

Property	Typical Value	Unit	Test Method
MDR 12 min at 160°C arc 0.5°			ASTM D6601
ML	1.0	lb·in	
MH	33.3	lb·in	
t _{s2}	26	s	
t' ₅₀	46	s	
t' ₉₀	94	s	
MDR 12 min at 150°C arc 0.5°			ASTM D6601
ML	1.1	lb·in	
MH	34.0	lb·in	
t _{s2}	41	s	
t' ₅₀	78	s	
t' ₉₀	200	s	

Mechanical Properties	Typical Value	Unit	Test Method
Press cure: 10 min at 150°C, post cure: 4 h at 230°C			
100 % modulus	7.4	MPa	ASTM D412C
Tensile strength	13.8	MPa	
Elongation at break	175	%	
Hardness	73	Shore A	ASTM D2240
Compression set, 25 % deformation, 70 h at 200°C			
#214 O-ring	22	%	ASTM D 395 Method B

Chemical resistance overview

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

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Food and pharma applications

Tecnoflon® PFR 70-WA1 is intended for repeated use in food processing equipment and to be in contact with food types I through VII Table – Types of Raw and Processed Food. The base perfluoroelastomer is registered in the FDA Inventory of Effective Food Contact Substances (FCS) Notifications, being the subject of Food Contact Notification (FCN #128).

See the list of effective notifications for FCN available on the Agency's website at:

<http://www.accessdata.fda.gov/scripts/fcn/fcnNavigation.cfm?rpt=fcsListing>

Types of Raw and Processed Foods

- I. Nonacid, aqueous products; may contain salt or sugar or both (pH above 5.0).
- II. Acid, aqueous products; may contain salt or sugar or both and include oil-in-water emulsions of low- or high-fat content.
- III. Aqueous, acid or nonacid products containing free oil or fat; may contain salt, and include water-in-oil emulsions of low- or high-fat content.
- IV. Dairy products and modifications:
 - A. Water-in-oil emulsions, high- or low-fat.
 - B. Oil-in-water emulsions, high- or low-fat.
- V. Low-moisture fats and oil.
- VI. Beverages:
 - A. Containing up to 8 percent of alcohol.
 - B. Non-alcoholic.
 - C. Containing more than 8 percent alcohol.
- VII. Bakery products other than those included under Types VIII or IX of this table:
 - A. Moist bakery products with surface containing free fat or oil.
 - B. Moist bakery products with surface containing no free fat or oil.
- VIII. Dry solids with the surface containing no free fat or oil (no end test required).
- IX. Dry solids with the surface containing free fat or oil.

Tecnoflon® PFR 70-WA1 post cured either 8 h at 200 °C or (8+16) h at 230 °C is in compliance with the requirements of USP Plastic Class VI as it passed the United State Pharmacopoeia (USP) Biological Reactivity test, IN VIVO.

Any intermediate combination of both post-curing time and temperature is compliant too.

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