

FFR35PC

TECHNICAL DATA SHEET

TECHNICAL INFORMATION

FLUONOX[®] FFR35PC is a fully fluorinated fluoroelastomer (FFKM) copolymer consisting of PMVE and TFE. It does not contain curatives. It can be cross-linked using organic peroxides in combination with a coagent. FLUONOX[®] FFR35PC shows the best chemical resistance among all

elastomers. It can be used in a temperature range from -10°C to 250°C.

It is suitable for organic as well as inorganic acids, caustic, ketones, aldehydes, esters, ethers, alcohols, fuels, solvents, sour gases, hydrocarbons, steam, hot water, ethylene and propylene oxide and mixed process streams.

TYPICAL PROPERTIES

Properties	Test Method	Unit	Nominal Value
Appearance	-	-	Translucent slab
Specific gravity at 23°C (73°F)	ASTM D792	g/cm ³	1.99
Mooney viscosity ML (1+10) at 121°C (250°F)	ASTM D1646	MU	35
Shelf stability at room temp.	-	-	Excellent
Fluorine content	Internal NMR Method	%	72.3

Note: These are typical properties and not to be used for specification purposes.

PACKAGING

FLUONOX[®] FFR35PC is available in 250 grams, 500 grams and 1kg box.

STANDARD FORMULATION OF COMPOUND

FLUONOX [®] FFR35PC		100
Luperox 101 XL45	phr	1.5
TAIC 100%	phr	1.5
N990 MT	phr	15

Fluonox®FFR35PC

PHYSICAL AND GENERAL PROPERTIES

Compound Mooney viscosity	Test Method	Unit	Values
ML (1+10) at 121°C	ASTM D1646	MU	35
MDR (12 min at 160°C)			
ML	ASTM D6601	in x lb	0.6
MH		in x lb	21.7
ts2		min	0.3
t_50		min	1.1
t_90		min	2.8
MDR (6 min at 177°C)			
ML	ASTM D6601	in x lb	0.7
MH		in x lb	21.2
ts2		min	0.4
t_50		min	0.6
t_90		min	1.0
MECHANICAL PROPERTIES AFTER POST CURE Press-cure 10 min at 160°C/Post cure 4 h at 230°C			
100% Modulus	ASTM D412C	MPa	8.5
Tensile Strength		MPa	18.2
Elongation at Break		%	148
Hardness Shore A	ASTM D2240	points	69
Heat aging 70 h at 250°C			
Δ Tensile Strength	ASTM D573	%	-14
Δ Elongation at Break		%	+50
Δ Hardness Shore A		points	0
Δ Weight		%	-1.1
Heat aging 70 h at 275°C			
Δ Tensile Strength	ASTM D573	%	-52
Δ Elongation at Break		%	+158
Δ Hardness Shore A		points	0
Δ Weight		%	-1.6
Compression set			
70 h at 200°C	ASTM D395 Method B	%	24
70 h at 250°C		%	33
Low Temperature Retraction			
TR10	ASTM D1329	°C	-2
Differential Scanning Calorimetry (DSC)			
Tg onset		°C	-4.3
Tg midpoint		°C	-5.9

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FLUID RESISTANCE OVERVIEW PROPERTIES

Fluid	Test Condition	Volume Swelling
Acetonitrile	168h X 23°C	+1.9%
Methyl ethyl ketone (MEK)	168h X 23°C	+1.3%
Ethyl acetate	168h X 23°C	+3.8%
H ₂ SO ₄ , 98%	70h X 60°C	+1.6%
Ammonia, 28% solution	72h X 70°C	+1.8%
Toluene	168h X 70°C	+6.0%
HNO ₃	168h X 80°C	+4.6%
Ethylenediamine	72h X 100°C	+14.2%
Diethanolamine	72h X 100°C	+0.2%
Glacial acetic acid	336h X 100°C	+5.1%
Diethanolamine	72h X 150°C	+4.5%
Diethanolamine	168h X 150°C	+10.0%
Dimethylformamide	168h X 150°C	+3.1%
1,2 - Dichlorobenzene	168h X 180°C	+6.7%

ACID FLUIDS

H ₂ SO ₄ , 98%, 70 h at 60°C	Test Method	Unit	Values
Δ Tensile Strength		%	+16
Δ Elongation at Break		%	+4
Δ Hardness Shore A		points	+0
Δ Weight		%	+0.1
Δ Volume	ASTM D471	%	+1.6
HNO ₃ , 65%, 168 h at 80°C	Test Method	Unit	Values
Δ Tensile Strength		%	-49
Δ Elongation at Break		%	+14
Δ Hardness Shore A		points	-3
Δ Weight		%	+2.1
Δ Volume	ASTM D471	%	+4.6
Glacial acetic acid, 336 h at 100°C	Test Method	Unit	Values
Δ Tensile Strength		%	-18
Δ Elongation at Break		%	+2
Δ Hardness Shore A		points	-4
Δ Weight		%	+2.1
Δ Volume	ASTM D471	%	+5.1

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ALKALINE FLUIDS AND AMINES

Ethylenediamine, 72 h at 100°C	Test Method	Unit	Values
Δ Tensile Strength		%	-30
Δ Elongation at Break		%	+47
Δ Hardness Shore A		points	-1
Δ Weight		%	+6.6
Δ Volume	ASTM D471	%	+14.2
Diethanolamine, 168 h at 150°C	Test Method	Unit	Values
Δ Tensile Strength		%	-17
Δ Elongation at Break		%	+18
Δ Hardness Shore A		points	-3
Δ Weight		%	+5.4
Δ Volume	ASTM D471	%	+10.0
Diethanolamine, 72 h at 150°C	Test Method	Unit	Values
Δ Tensile Strength		%	-11
Δ Elongation at Break		%	+16
Δ Hardness Shore A		points	-4
Δ Weight		%	+2.7
Δ Volume	ASTM D471	%	+4.5
Diethanolamine, 72 h at 100°C	Test Method	Unit	Values
Δ Tensile Strength		%	-32
Δ Elongation at Break		%	-20
Δ Hardness Shore A		points	-2
Δ Weight		%	0
Δ Volume	ASTM D471	%	+0.2
Ammonia, 28% solution, 72 h at 70°C	Test Method	Unit	Values
Δ Tensile Strength		%	+6
Δ Elongation at Break		%	+9
Δ Hardness Shore A		points	-1
Δ Weight		%	+0.5
Δ Volume	ASTM D471	%	+1.8

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PAINT SPRAY APPLICATIONS

Methyl ethyl ketone (MEK), 168 h at 23°C	Test Method	Unit	Values
Δ Tensile Strength		%	-4
Δ Elongation at Break		%	+5
Δ Hardness Shore A		points	0
Δ Weight		%	+0.4
Δ Volume	ASTM D471	%	+1.3
Ethyl acetate, 168 h at 23°C	Test Method	Unit	Values
Δ Tensile Strength		%	-27
Δ Elongation at Break		%	-8
Δ Hardness Shore A		points	0
Δ Weight		%	+0.7
Δ Volume	ASTM D471	%	+3.8
Toluene, 168 h at 70°C	Test Method	Unit	Values
Δ Tensile Strength		%	-24
Δ Elongation at Break		%	-8
Δ Hardness Shore A		points	-3
Δ Weight		%	+1.7
Δ Volume	ASTM D471	%	+6.0

POLAR SOLVENTS

Acetonitrile, 168 h at 23°C	Test Method	Unit	Values
Δ Tensile Strength		%	0
Δ Elongation at Break		%	+8
Δ Hardness Shore A		points	+1
Δ Weight		%	+0.1
Δ Volume	ASTM D471	%	+1.9
Dimethylformamide, 168 h at 150°C	Test Method	Unit	Values
Δ Tensile Strength		%	-27
Δ Elongation at Break		%	+7
Δ Hardness Shore A		points	-3
Δ Weight		%	+1.5
Δ Volume	ASTM D471	%	+3.1

FLUID RESISTANCE (MISCELLANEOUS)

1,2 - Dichlorobenzene, 168 h at 180°C	Test Method	Unit	Values
Δ Tensile Strength		%	-31
Δ Elongation at Break		%	-9
Δ Hardness Shore A		Points	-3
Δ Weight		%	+3.3
Δ Volume	ASTM D471	%	+6.7

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SAFETY AND HANDLING

Handling and processing of fluoroelastomer must be done in ventilated areas to prevent personnel exposure to the fumes liberated during curing or use of cured rubber at high temperatures. During the process, some fumes may generate at high temperatures which are harmful to human beings. Fumes should not be inhaled; eye and skin contact must be avoided. In case of skin contact flush skin with cold water immediately. In case of eye contact, flush with water immediately and seek medical help. Smoking tobacco or cigarettes should not be allowed in the working area. Mixing agents that contain metallic particulate such as powdered Aluminium can rapidly decompose at high temperatures; therefore do not use metallic particulate as a mixing agent. Fluoroelastomer should be stored away from heat. It should be kept in a clean and dry area where it can be protected until it is used. Please read the Material Safety Data Sheet before handling the product.

FLUONOX® is the brand name of Gujarat Fluorochemicals Limited (GFL) used for its brand of fluoroelastomer. FLUONOX® can be used in applications duly approved by GFL. Customers who plan to use the word FLUONOX® as the trade mark on or relation to their own fluoroelastomer parts and other products in any style or combination or in any manner whatsoever must contact GFL for prior permission for such use. No consumer/user of GFL fluoropolymer resin is permitted to claim that their products contain FLUONOX®without prior permission from GFL.

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Note warning: Do not use any of FLUONOX® Fluoroelastomer in medical devices that are designed for permanent implantation in the human body. For other medical uses, prior permission of GFL may be sought.

SALES AND TECHNICAL SUPPORT

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