3M™ Dyneon™
Ultra High Viscosity Fluoroelastomer FC 2299

Features and Benefits

- Ultra high viscosity gumstock without incorporated curatives
- Copolymer composition of vinylidene fluoride and hexafluoropropylene
- Targeted for compression molding
- Diamine or dihydroxy curable

Note: Data in this document are not for specification purposes.

Typical Properties of Raw Gum

Property	FC 2299
Fluorine Content	65.9%
Specific Gravity	1.80
Color	Translucent Amber
Solubility	Ketones and Esters
Mooney Viscosity – ML (1+10) @ 150°C (302°F)	Approximately 100
Mooney Viscosity – ML (1+10) @ 121°C (250°F)	Approximately 150

Product Description

3M™ Dyneon™ FC 2299 is an ultra high viscosity fluoroelastomer designed for use in applications such as o-rings, gaskets and seals requiring higher strength than achievable with lower viscosity fluoroelastomer copolymers. When appropriately formulated, Dyneon FC 2299 will provide higher tensile strength, improved tear resistance, and lower compression set than comparably formulated, lower viscosity fluoroelastomer copolymers.

Processing

FC 2299 can be compounded using standard water cooled internal mixers or two-roll mills with standard fillers and ingredients utilized in typical fluoroelastomer formulations. The “dry” ingredients should be blended before adding to the masticated gum. For best results, products should be banded on the mill several minutes prior to adding the blended dry ingredients. Once mixed, the compounded stocks have good scorch resistance and storage stability.

Product Form

FC 2299 is packaged in crumb form and is available in 25 lb (11.4 kg) boxes.

Safety/Toxicology

Before processing 3M fluoroelastomers, read and follow all applicable precautions and directions for use contained in the product label and Material Safety Data Sheet (MSDS). General handling precautions and directions for use include: (1) Store and use all 3M fluoroelastomers only in well ventilated areas; (2) Do not smoke in areas contaminated with dust from 3M fluoroelastomers; (3) Avoid eye contact; (4) After handling 3M fluoroelastomers wash any contacted skin with soap and water. Potential hazards, including evolution of toxic vapors, can occur during compounding or processing under excessively high temperature conditions. Appropriate local exhaust ventilation such as vapor extractor units should be installed above compounding or processing equipment. When compounding, be sure to read and follow all precautions and directions for use from other compound ingredient suppliers.

Typical Properties of Vulcanizate

Compound	phr
FC 2299	100
N-990 MT Black	30
Elastomag® 170 Magnesium Oxide	3
Calcium Hydroxide	6
Phosphonium Accelerator	0.67
Dihydroxy Crosslinker	2

Typical Rheological Properties [ASTM D5289]
Moving Die Rheometer (MDR)
100 cpm, 0.5° Arc, 6 Minutes @ 177°C (350°F)

Property	
ML, Minimum Torque, inch-lb (dN/m)	4.9 (5.5)
t_s2, Time to 2 inch-lb Rise from Minimum – Minutes	1.0
t'50, Time to 50% Cure – Minutes	1.6
t'90, Time to 90% Cure – Minutes	2.3
MH, Maximum Torque, inch-lb (dN/m)	27.8 (31.4)

Typical Physical Properties
Press Cure 10 Minutes @ 177°C (350°F)
Post Cure 16 Hours @ 232°C (450°F)

Property	
Tensile, psi (MPa)	2139 (14.8)
100% Modulus, psi (MPa)	1176 (8.1)
Elongation at Break, %	175
Hardness, Shore A [ASTM D2240]	77

Compression Set Resistance [ASTM D395 Method B, – 214 O-rings]

Aged 70 Hours @ 200°C (392°F), % Set	14

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