

3M™ Dyneon™

Base Resistant Elastomer BRE 7231

Features and Benefits

- Composition:
Terpolymer of tetrafluoroethylene propylene and vinylidene fluoride
- Improved resistance to many new types of amine containing automotive fluids and other basic chemicals
- Improved low temperature sealing performance
- Possible applications:
bonded shaft seals and other molded goods
- Excellent processability and metal adhesion
- Possible processes:
injection, transfer and compression molding
- Proprietary incorporated cure technology

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

Typical Properties

Property	
Fluorine Content	60%
Specific Gravity	1.60
Color	Straw
Solubility	Ketones and Esters
Mooney Viscosity ML 1 + 10 @ 121°C (250°F)	Approximately 34

Product Description

3M™ Dyneon™ Fluoroelastomer BRE 7231 is a Base Resistant Fluoroelastomer containing 60% fluorine. It is a bisphenol cured terpolymer and is categorized as a type 4 FKM per ASTM D1418. This product offers improved resistance to high amine containing oils and lubes, coolants and transmission fluids as compared to Type 1 and Type 2 FKM's. Possible applications for BRE 7231 are engine, transmission, transfer case or differential shaft seals or as a rubber coating for cylinder head gaskets, where multifluid resistance to engine oils and coolants is required.

Product Form

BRE 7231 is packaged in slab form and is available in a returnable bulk shipping container system for 1,320 lbs (600 kg) of material. The bulk container system is comprised of 48 individual green polyethylene bags containing 27.5 lbs (12.5 kg) of product. Smaller quantities are available in 55.1 lb (25.0 kg) boxes.

Recommended Processing Procedure

BRE 7231 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.

Note: The cure system in BRE 7231 can be retarded by contamination with fluoroelastomers (FKM). For this reason, curatives and/or chemical dispersions in FKM, as well as blends with FKM, should not be used.

For best results, BRE 7231 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.

Safety/Toxicology

Before processing this 3M product, be sure to read and follow all precautions and directions for use contained in the product label and the Material Safety Data Sheet (MSDS). The user should also read and follow the precautions and directions for use in the product label and MSDS for other compound ingredients to be used. General handling precautions for this 3M product include: (1) Store and use all 3M base resistant elastomers only in well ventilated areas; (2) Do not smoke in areas contaminated with dust from 3M base resistant elastomers; (3) Avoid eye contact; (4) After handling 3M base resistant elastomers wash any contacted skin with soap and water. Potential hazards, including evolution of toxic vapors, can exist during compounding or processing under excessively high temperature conditions. Appropriate local exhaust ventilation such as vapor extractor units should be installed above processing equipment. When cleaning processing equipment, do not burn off any of this product with an open flame or in a furnace.

ISO 9001/QS-9000

All 3M base resistant elastomers are manufactured at ISO 9001 registered facilities. 3M base resistant elastomers produced in North America are manufactured at QS-9000 registered facilities.



Typical Properties of Vulcanizate

Compound	phr
BRE 7231	100
N-990 MT Black	30
MgO	9
Struktol™ WS-280	2

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Typical Rheological Properties (ASTM D5289)

Moving Die Rheometer (MDR)

100 cpm, 0.5° Arc, 6 Minutes

Temperature	177°C (350°F)
ML, Minimum Torque, Inch-lb (dN m)	1.2 (1.3)
t ² , Time to 2 Inch-lb Rise from Minimum – Minutes	1.7
t ⁵⁰ , Time to 50% Cure – Minutes	2.3
t ⁹⁰ , Time to 90% Cure – Minutes	4.3
MH, Maximum Torque, Inch-lb (dN m)	9.9 (11.2)

Typical Physical Properties

Press Cure 10 Minutes @ 177°C (350°F)

Post Cure 16 Hours @ 232°C (450°F)

Tensile, psi (MPa)	2000 (13.8)
100% Modulus, psi (MPa)	850 (4.5)
Elongation at Break, %	210
Hardness, Shore A (ASTM D2240)	70

Compression Set Resistance (ASTM D395 Method B, -214 O-rings)

Aged 70 Hours @ RT	27%
Aged 70 Hours @ 150°C (302°F)	19%
Aged 70 Hours @ 177°C (350°F)	20%

TR10 (ASTM D1329)	-9°C (16°F)
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