

3M Advanced Materials Division

# 3M™ Dyneon™ Base Resistant Elastomer BRE 7231

## Features and Benefits

- Low viscosity
- Proprietary incorporated cure technology
- Improved low temperature sealing performance
- Upper use temperatures <200°C
- Improved resistance to many new types of amine containing automotive fluids and other basic chemicals.
- Excellent processability and metal adhesion
- **Process Targets:** injection, transfer and compression molding

## Typical applications:

- Molded goods
- Differential or bonded shaft seals
- Engine, transmission, or transfer case seals
- As a rubber coating for cylinder head gaskets
- Where multifluid resistance to engine oils and coolants is required.

## Typical Properties (Not for specification purposes)

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

## Product Description

3M™ Dyneon™ Fluoroelastomer BRE 7231 is a Base Resistant Fluoroelastomer terpolymer of tetrafluoroethylene, propylene, and vinylidene fluoride containing 60% fluorine. It contains a proprietary cure incorporated technology 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.

## Processing Guidelines

3M™ Dyneon™ Fluoroelastomer 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 3M™ Dyneon™ Fluoroelastomer 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, 3M™ Dyneon™ Fluoroelastomer 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.

## Delivered Product Form

Dyneon Fluoroelastomer BRE 7231 is packaged in bale 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 blue polyethylene bags containing 27.5 lbs (12.5 kg) of product. Smaller quantities are available in 55.1 lb (25.0 kg) boxes.

**Note:** Package size(s) may vary by region.

## ISO Registrations

All 3M™ Dyneon™ Fluoroelastomers are manufactured at ISO 9001 and 14001 registered facilities.

## Safety/Toxicology

Before processing 3M™ Dyneon™ Fluoroelastomers, read and follow all precautions and directions for use contained in the product label and Safety Data Sheet (SDS). General handling precautions and directions for use include: (1) Store and use all Dyneon fluoroelastomers only in well ventilated areas; (2) Do not smoke in areas contaminated with dust from fluoroelastomers; (3) Avoid eye contact; (4) After handling 3M™ Dyneon™ 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	Amount (in parts/100)
3M™ Dyneon™ Base Resistant Elastomer BRE 7231	100
N990 MT Carbon Black	30
Ca(OH) <sub>2</sub>	6
Armeen® 18D	1

## Typical Rheological Properties [ASTM D5289]

Moving Die Rheometer (MDR), 100 cpm, 0.5° Arc  
6 Minutes @ 177°C (350°F)

Property	Units	Value
ML, Minimum Torque	dN m (inch-lb)	0.9 (0.8)
ts2, Time to 2 Inch-lb Rise from Minimum	Minutes	0.93
t'50, Time to 50% Cure	Minutes	1.12
t'90, Time to 90% Cure	Minutes	2.18
MH, Maximum Torque	dN m (inch-lb)	11.3 (10.0)

## Typical Physical Properties [ASTM D412 MethodA, Die D]

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

Property	Units	Value
Tensile	MPa (psi)	14.1 (2050)
100% Modulus	MPa (psi)	6.0 (876)
Elongation at Break	%	190
Durometer Type A Hardness [ASTM D2240]	Points	71

## Compression Set Resistance [ASTM D1414]

Property	Unit	Result
Aged 70 Hours @ RT	%	18
Aged 70 Hours @ 150°C (302°F)	%	23
Aged 70 Hours @ 177°C (350°F)	%	36

## Low Temperature [ASTM D1329]

Property	Unit	Result
TR10	°C (°F)	-9 (16)

## Customer Service

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