

# 3M™ Dyneon™ Fluoroelastomer FC 2178

## Product Description

3M™ Dyneon™ Fluoroelastomer FC 2178 is a dipolymer made from hexafluoropropylene and vinylidene fluoride. FC 2178 is a raw gum without curatives.

## Special Features

- Composition: dipolymer of vinylidene fluoride and hexafluoropropylene
- High viscosity gum stock without incorporated curatives
- Process targets: compression moulding
- Amine and bisphenol curable

## Typical Applications

3M™ Dyneon™ Fluoroelastomer FC 2178 is a high viscosity raw gum to be used to adjust parameters, e.g. crosslink density and viscosity. The product is compliant with US-FDA CFR 177-2600.

## Typical Polymer Properties

Property	Test method	Unit	Value
Fluorine Content	QCM 50.18.3.C	%	65.9
Specific Gravity	QCM 14.10	g/cm <sup>3</sup>	1.80
Solubility	-	-	Ketones and Esters
Mooney Viscosity ML 1+10 @ 121 °C	QCM 2.14.4.C	MU	approx. 100

## Storage and Handling

Store and use all Dyneon Fluoroelastomers only in well-ventilated areas under cool and dry conditions.

The shelf life of FC 2178 is 3 years from date of manufacturing.

## Delivery Form

3M™ Dyneon™ Fluoroelastomer FC 2178 is delivered in slab form.

Packaging sizes are:

- 25 kg cardboard box, containing two PE-bags with 12.5 kg content each
- 600 kg bulk container, containing 48 PE-bags with 12.5 kg content each

## Processing Recommendations

Dyneon FC 2178 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, FC 2178 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.

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### Typical Properties

Compound	Amount (in Parts/100)
FC 2178	100
N-990 MT Black	30
MgO	3
Ca(OH) <sub>2</sub>	6
Phosphonium Accelerator	0.5
Dihydroxy Crosslinker	2.0

### Typical Rheological Properties (ASTM D5289)

Moving Die Rheometer (MDR 2000®)  
100 cpm, 0.5° Arc, 6 minutes, 177 °C

Property	Unit	Value
ML, Minimum Torque	dNm	3.5
Ts2, Time to 2 inch-lb rise from minimum	Minutes	1.3
t'50, Time to 50 % cure	Minutes	1.8
t'90, Time to 90 % cure	Minutes	2.5
MH, Maximum Torque	dNm	27.8

### Typical Physical Properties (ASTM D 412 Method A, Die D)

Press Cure 5 minutes @ 177 °C  
Post Cure 24 hours @ 260 °C

Property	Unit	Value
Tensile	MPa	15.7
100% Modulus	MPa	7.3
Elongation at Break	%	180
Hardness (ASTM D 2240)	Shore A	74

### Compression Set on O-rings (ASTM D 1414)

Air aged 70 hours @ 200 °C	%	10
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### Retraction at Lower Temperatures (ASTM D 1329)

TR 10	°C	-18
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## 3M™ Dyneon™ Fluoroelastomer FC 2178

### Safety Instructions

Follow the normal precautions observed with all fluoropolymer materials.

Please consult the Material Safety Data Sheet and Product Label for information regarding the safe handling of the material. By following all precautions and safety measures, processing these products poses no known health risks. General handling/processing precautions include: 1) Process only in well-ventilated areas. 2) Do not smoke in areas contaminated with powder/residue from these products. 3) Avoid eye contact. 4) If skin comes into contact with these products during handling, wash with soap and water afterwards. 5) Avoid contact with hot fluoropolymer.

Potential hazards, including release of toxic vapours, can arise if processing occurs under excessively high temperature conditions. Vapour extractor units should be installed above processing equipment. When cleaning processing equipment, do not burn off any of this product with a naked flame or in a furnace.

### Important Notice

All information set forth herein is based on our present state of knowledge and is intended to provide general notes regarding products and their uses. It should not therefore be construed as a guarantee of specific properties of the products described or their suitability for a particular application. Because conditions of product use are outside Dyneon's control and vary widely, user must evaluate and determine whether a Dyneon product will be suitable for user's intended application before using it.

The quality of our products is warranted under our General Terms and Conditions of Sale as now are or hereafter may be in force.

Technical information, test data, and advice provided by Dyneon personnel are based on information and tests we believe are reliable and are intended for persons with knowledge and technical skills sufficient to analyze test types and conditions, and to handle and use raw polymers and related compounding ingredients.

No license under any Dyneon or third party intellectual rights is granted or implied by virtue of this information.

General recommendations on health and safety in processing, on work hygiene and on measures to be taken in the event of accident are detailed in our material safety data sheets.

You will find further notes on the safe handling of fluoropolymers in the brochure "[Guide for the safe handling of Fluoropolymers Resins](#)" (download link) by PlasticsEurope, Box 3, B-1160 Brussels, Tel. +32 (2) 676 17 32.

You can also download it with your smartphone using the QR code below.



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