

# 3M™ Dyneon™

## Fluoroelastomer FG 5690Q

### Product Description

3M™ Dyneon™ Fluoroelastomer FE 5690Q is a dipolymer made from hexafluoropropylene and vinylidene fluoride. FG 5690Q has an incorporated bisphenol cure system. It has been especially designed for finished parts which are compliant with the regulations of the U.S. Food and Drug Administration (FDA) 21 CFR 177.2600(c)(4)(i).

### Special Features

- Composition: dipolymer of vinylidene fluoride and hexafluoropropylene
- High mooney version of 3M™ Dyneon™ Fluoroelastomer FG 5630Q
- Excellent mould release
- Superior compression set resistance compared to diamine cured compounds
- In compliance with U.S. Food and Drug Administration (FDA) 21 CFR 177.2600(c)(4)(i)
- Better mould flow compared to diamine cured compounds
- Superior water resistance at elevated temperatures compared to diamine cured compounds
- Proprietary incorporated cure technology

### Typical Applications

The recommended processing method for 3M™ Dyneon™ Fluoroelastomer FE 5690Q is compression moulding. Applications for this product grade include O-rings, e.g. for wet cylinder liners and moulded parts.

### 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
Colour	-	-	opaque off-white
Solubility	-	-	Ketones and Esters
Mooney Viscosity ML 1 + 10 @ 121 °C	QCM 2.14.4.C	MU	approx. 97

### Storage and Handling

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

The shelf life of FG 5690Q is 3 years from date of manufacturing.

### Delivery Form

3M™ Dyneon™ Fluoroelastomer FG 5690Q 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 FG 5690Q 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, FG 5690Q 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 (Formulation for comparison purposes only)

Compound	Amount (in Parts/100)
FG 5690Q	100
N-990 MT Black	30
MgO	3
Ca(OH) <sub>2</sub>	6

### Typical Rheological Properties (ASTM D 5289)

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

Property	Unit	Value
ML, Minimum Torque	dNm	3.9
Ts2, Time to 2 inch-lb rise from minimum	Minutes	1.8
t'50, Time to 50 % cure	Minutes	2.7
t'90, Time to 90 % cure	Minutes	3.9
MH, Maximum Torque	dNm	26.5

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

Press Cure 7 minutes @ 177 °C  
Post Cure 16 hours @ 230 °C

Property	Unit	Value
Tensile	MPa	17.2
100 % Modulus	MPa	6.7
Elongation at Break	%	215
Hardness (ASTM D 2240)	Shore A	76

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

Air aged 70 hours @ 200 °C

Post cured 16 hours @ 230 °C	%	19
Post cured 24 hours @ 260 °C	%	17

### Retraction at Lower Temperatures (ASTM D 1329)

TR 10	°C	-18
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## 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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Web Site: [www.dyneon.eu](http://www.dyneon.eu)

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