

3M Advanced Materials Division

# 3M™ Dyneon™ Peroxide Cure Fluoroelastomer FPO 3650

**Important Notice and Disclaimer:** This 3M product is an experimental or developmental product that has not been introduced or commercialized for general sale, and its formulation, performance characteristics and other properties, specifications (if any), availability, and pricing are not guaranteed and are subject to change or withdrawal without notice.

## Features and Benefits

- Medium viscosity
- No metal oxides required for cure
- Process targets: compression and transfer molding, extrusion, calendaring
- High resistance against chemical fluids
- Good physical properties right out of the press

## Typical Applications

- Suitable for seals, such as O-rings and gaskets

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

## Typical Properties

Property	Units	Value
Color		White to Light Brown
Fluorine Content	%	67.3
Mooney Viscosity ML 1 + 10 @ 121°C (250°F)	MU	Approximately 50
Solubility		Ketones and Esters
Specific Gravity	%	1.81
Tg	°C (°F)	-17 (1)

## Product Description

3M™ Dyneon™ Peroxide Cure Fluoroelastomer 3650 is a terpolymer of vinylidene fluoride, hexafluoropropylene, and tetrafluoroethylene plus cure site monomer.

## Processing Guidelines

Dyneon fluoroelastomer FPO 3650 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, Dyneon fluoroelastomer FPO 3650 should be banded on the mill several minutes prior to adding the blended dry ingredients. Low mooney and medium mooney grades can be blended to achieve desired viscosity.

## Delivered Product Form

Dyneon fluoroelastomer FPO 3650 is packaged in crumb form and is available in 25 kg (55 lbs) boxes, comprised of 2 individual polyethylene bags containing 12.5 kg (27.5 lbs) of product. Due to the nature of crumb material, product color may vary within a bag and between bags and lots. It is typical to see variations of opaqueness and color due to product cold flow.

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

## ISO Registrations

All 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 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.

Compounding or processing under excessively high temperature conditions may cause the evolution of toxic vapors. 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) With ZnO	Amount (in parts/100) Without ZnO
3M™ Dyneon™ Fluoroelastomer FPO 3650	100	100
TAIC®-DLCA (72%)	2.5	2.5
Varox® DBPH-50	1.5	1.5
ZnO	3	0
Carbon Black N-990	30	30

## Typical Rheological Properties [ASTM D5289]

Moving Die Rheometer (MDR) 100 cpm, 0.5° Arc  
12 Minutes @ 177°C (351°F)

Property	Units	With ZnO	Without ZnO
ML, Minimum Torque	dNm (in-lb)	1.5 (1.3)	1.4 (1.2)
MH, Maximum Torque	dNm (in-lb)	22.9 (20.3)	22.2 (19.6)
ts2, Time to 2 Inch-lb Rise from Minimum	Minutes	0.51	0.53
t'50, Time to 50% Cure	Minutes	0.73	0.77
t'90, Time to 90% Cure	Minutes	1.28	1.42

## Typical Physical Properties [ASTM D412 Method A, Die D]

Press Cure 10 Minutes @ 177°C (351°F)

Property	Units	With ZnO	Without ZnO
Durometer Type A Hardness [ASTM D2240]	Points	64	64
Tensile	MPa (psi)	17.4 (2528)	17.5 (2542)
Elongation at Break	%	318	316
100% Modulus	MPa (psi)	3.6 (529)	3.7 (531)

## Typical Physical Properties [ASTM D412 Method A, Die D]

Press Cure 10 Minutes @ 177°C (351°F)

Post Cure 4 Hours @ 232°C (450°F)

Property	Units	With ZnO	Without ZnO
Durometer Type A Hardness [ASTM D2240]	Points	67	66
Tensile	MPa (psi)	22.2 (3225)	24.0 (3475)
Elongation	%	291	296
100% Modulus	MPa (psi)	3.9 (567)	3.6 (528)

### Heat Resistance [ASTM D573]

Press Cure 10 Minutes @ 177°C (351°F)

Post Cure 4 Hours @ 232°C (450°F)

Property	Units	With ZnO	Without ZnO
70 Hours @ 200°C (392°F)			
Change in Hardness	Points	0	1
Change in Tensile Strength	%	-4	0
Change in Ultimate Elongation	%	-7	-7
70 Hours @ 232°C (450°F)			
Change in Hardness	Points	0	0
Change in Tensile Strength	%	0	-11
Change in Ultimate Elongation	%	5	1

### Compression Set Resistance

Press Cure 10 Minutes @ 177°C (351°F)

Post Cure 4 Hours @ 232°C (450°F)

Test Conditions	Sample Tested	Units	With ZnO	Without ZnO
70 Hours @ 200°C (392°F) ASTM D1414	-214 O-ring	%	25	28
22 Hours @ 150°C (302°F) VDA 675 218	15 × 2 mm Disc	%	44	43

### Low Temperature [ASTM D1329]

		With ZnO	Without ZnO
TR10	°C (°F)	-	-16.6 (2.1)

## Customer Service

### Europe

**Dyneon GmbH**  
**3M Advanced Materials Division**  
Carl-Schurz-Straße  
41453 Neuss  
Germany  
Phone: +00 800 396 366 27  
Fax: +00 800 396 366 39  
www.dyneon.eu

### Italy

Phone: 0 800 7 910 18  
Fax: 0 800 7 910 19

### Latin America

**3M Brasil**  
Via Anhanguera km  
110 Sumare  
Sao Paulo CEP 13181-900  
Brasil  
Phone: 0800 0132333

**3M Mexico**  
Santa Fe 190, Col. Santa Fe  
Deleg. Alvaro Obregon  
Mexico D.F., C.P. 01210  
México  
Phone: 0052 5552700 400  
Ext 82935

### Asia

**3M Japan**  
6-7-29, Kita-Shinagawa  
Shinagawa-ku  
Tokyo 141-8684  
Japan  
Phone: 81 570 022 123

**3M Korea**  
19F, 82, Uisadang-daero  
Yeongdeungpo-gu, Seoul, 150-705  
Korea  
Phone: 82 2 3771 4027

**3M Taiwan**  
6F, No.95, Sec. 2  
Dunhua S. Rd.  
Taipei 10682  
Taiwan  
Phone: 886 2 2704 9011

**3M Thailand**  
150 Soi Chalongkrung 31  
Ladkrabang Bangkok, 10520  
Thailand  
Phone: 66 2739 4803 9  
Ext 2354

### USA

**3M Advanced Materials Division**  
3M Center, 280-01W-03  
St. Paul, MN 55144-1000  
United States  
Phone: 1 800 810 8499

Please visit [3M.com/fluoropolymers](http://3M.com/fluoropolymers) for additional regional contact information.

**Important Notice and Disclaimer:** This 3M product is an experimental or developmental product that has not been introduced or commercialized for general sale, and its formulation, performance characteristics and other properties, specifications (if any), availability, and pricing are not guaranteed and are subject to change or withdrawal without notice. User is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application. User is solely responsible for evaluating third party intellectual property rights and for ensuring that user's use of 3M product does not violate any third party intellectual property rights. This 3M product is sold or made available "AS IS."  
**3M MAKES NO WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OF NON-INFRINGEMENT OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE.**

**Limitation of Liability:** Except where prohibited by law, 3M will not be liable for any loss or damages arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

**Technical Information:** Technical information, recommendations, and other statements contained in this document or provided by 3M personnel are based on limited information and the accuracy or completeness of such information is not guaranteed. Such information is intended for persons with knowledge and technical skills sufficient to assess and apply their own informed judgement to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.



### 3M Advanced Materials Division

3M Center  
St. Paul, MN 55144 USA

Phone 1-800-810-8499  
Web [www.3M.com/fluoropolymers](http://www.3M.com/fluoropolymers)

Varox is a registered trademark of Vanderbilt Co. TAIC is a registered trademark of Nippon Kasei Co. Ltd.

3M and Dyneon are trademarks of 3M Company. Used under license.

Please recycle. Printed in USA © 3M 2021.  
All rights reserved. Issued: 10/20 14814HB  
98-0050-0376-3 Rev. B