

3M™ Dynamar™

Elastomer Additives

FC 5157E, FX 5166 and RC 5251Q

Product Description

Dynamar FC 5157E, FX 5166 and RC 5251Q are developed specifically as a cure system for vulcanising polyepichlorohydrin elastomers. FX 5166 functions as the cure accelerator, FC 5157E functions as the vulcanising agent. In non-lead containing polyepichlorohydrin compounds, Dynamar RC 5251Q functions as the acid acceptor.

Special Features

- Cure system results in excellent scorch resistance, significant rheological flexibility, good heat aging and compression set resistance of the compound
- Compounds cured with this system are capable of bonding directly with incorporated cure 3M™ Dyneon™ Fluoroelastomers and 3M™ Dyneon™ Fluoroplastic THV grades without the use of an external bonding agent
- Nitrile rubber compounds, containing low levels (0.25 – 1.0 phr) of FX 5166 demonstrate the same bonding characteristics

Typical Applications

3M™ Dynamar™ FC 5157E, FX 5166 and RC 5251Q are used as a cure system in veneer fuel and filler hose constructions.

Typical Polymer Properties

Property	FC 5157E	FX 5166	RC 5251 Q
Colour	Pink	White	White
Active Ingredients	75 %	70 %	100 % (< 325 mesh)
Specific Gravity	1.2	1.3	2.51

Storage and Handling

Store and use all Dyneon Fluoroelastomers only in well ventilated areas under cool and dry conditions. These materials are hygroscopic to some degree. Use caution in storing these products, as well as the mixed compound.

The shelf life of products Dynamar FC 5157E, FX 5166 and RC 5251Q is 3 years from date of manufacturing.

Delivery Form

3M™ Dynamar™ FC 5157E is a free-flowing powder, FX 5166 is delivered in pellet form and RC 5251Q is a free-flowing powder.

Packaging sizes are:

- 12.5 kg cardboard boxes for FX 5157E and FC 5166, 34 kg cardboard boxes for RC 5251Q

Processing Recommendations

Dynamar FC 5157E, FX 5166 and RC 5251Q can be added at any point during the mixing cycle. However, best results are usually obtained when incorporated early in the mix, preferably to the gum directly after polymer breakdown. Recommended concentration of FC 5157E is 1 - 3 phr, FX 5166 is 0.5 - 2.0 phr, RC 5251Q is 8 - 12 phr. Because these curatives offer excellent scorch resistance when used at typical levels, normal mixing temperatures (up to 132 °C) can be employed. Use caution when selecting process aids and plasticisers. Acidic materials will retard the cure. Also, sulphur at very low concentrations will adversely affect the cure.

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Typical Properties

Compound	Unit	A	B	C
Hydrin™ C-85	phr	100	100	100
N-550	phr	50	50	50
Dibasic Lead Phosphate (100 %)	phr	12	-	-
Dynamar RC 5251Q	phr	-	12	12
Dynamar FC 5157E	phr	2.0	2.0	2.0
Dynamar FX 5166	phr	2.0	2.0	0.5
NBC	phr	1.0	1.0	1.0
Stearic Acid	phr	0.5	0.5	0.5

Typical Rheological Properties

Property	Unit	A	B	C
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Mooney Scorch, MS @ 121 °C [ASTM D1646]

Minimum		26.1	34.5	29.1
t ₃ , Time to 3 in-lb rise from minimum	min	> 60	40.3	56.5
t ₁₀ , Time to 10 in-lb rise from minimum	min	> 60	> 60	> 60

Monsanto ODR @ 177 °C, 100 cpm, 3° Arc, microdie 12 minutes [ASTM D 5289]

ML, Minimum Torque	Nm	0.94	1.24	1.08
ts ₂ , Time to 2 in-lb rise from minimum	min	4.5	2.2	3.6
t'50, Time to 50 % cure	min	8.9	5.9	8.0
t'90, Time to 90 % cure	min	11.3	8.7	11.1
MH, Maximum Torque	Nm	3.99	9.87	4.09

Typical Physical Properties [ASTM D412, "Die D"]

Press Cure 15 minutes @ 177 °C

Post Cure 24 hours @ 150 °C

Property	Unit	A	B	C
Tensile	MPa	12.73	11.07	12.26
100 % Modulus	MPa	4.62	6.00	4.94 MPa
Elongation at Break	%	312	208	280
Hardness, Shore "A" [ASTM D2240]		80	85	80

Compression Set [ASTM D395 Method B (O-rings)]

Aged 24 hours @ 150 °C	%	35	32	36
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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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