

DuPont™ Nucrel® 3990L

Nucrel® resins Product Data Sheet

**Description**

**Product Description** Nucrel® 3990L is a copolymer of ethylene and acrylic acid. It is available for use in conventional extrusion coating, coextrusion coating and extrusion laminating equipment.

**Restrictions**

- Material Status**
  - Commercial: Active
- Availability**
  - Europe, North America, South America

**Typical Characteristics**

**Composition** 9.5 % By Weight Acrylic Acid comonomer content

**Characteristics / Benefits** This is a version of Nucrel® 3990 that has been further devolatilized for very sensitive applications.

**Typical Properties**

| Physical                        | Nominal Values         | Test Method(s) |          |
|---------------------------------|------------------------|----------------|----------|
| * Density ( )                   | 0.94 g/cm <sup>3</sup> | ASTM D792      | ISO 1183 |
| * Melt Flow Rate (190°C/2.16kg) | 10.0 g/10 min          | ASTM D1238     | ISO 1133 |
| Thermal                         | Nominal Values         | Test Method(s) |          |
| * Melting Point (DSC)           | 97°C (207°F)           | ASTM D3418     | ISO 3146 |
| Freezing Point (DSC)            | 78°C (172°F)           | ASTM D3418     | ISO 3146 |
| Vicat Softening Point ( )       | 79°C (174°F)           | ASTM D1525     | ISO 306  |

**Processing Information**

**General**

\* Maximum Processing Temperature 310°C (590°F)

**General Processing Information** Nucrel® 3990L is normally processed at melt temperatures ranging from 235° to 305°C (455° to 580°F) in extrusion coating equipment. Typical extruder profiles are shown below. Actual processing temperatures will usually be determined by either the specific equipment or one of the other polymers in a coextrusion. Nucrel® 3990 can also be used in cast extrusions and coextrusions.

Materials of construction used in the processing of this resin should be corrosion resistant. Stainless steels of the types 316, 15-5PH, and 17-4PH are excellent, as is quality chrome or nickel plating, and in particular duplex chrome plating. Type 410 stainless steel is satisfactory, but needs to be tempered at a minimum

temperature of 600°C (1112°F) to avoid hydrogen-assisted stress corrosion cracking. Alloy steels such as 4140 are borderline in performance. Carbon steels are not satisfactory. While stainless steels can provide adequate corrosion protection, in some cases severe purging difficulties have been encountered. Nickel plating has been satisfactory, but experiments have shown that chrome surfaces have the least adhesion to acid based polymers. In recent years, the quality of chrome plating has been deteriorating due to environmental pressures, and the corrosion protection has not always been adequate. Chrome over top of stainless steel seems to provide the best combination for corrosion protection and ease of purging.

If surface properties of the extruded resin require modification (such as, lower C.o.F. for packaging machine processing), refer to the Conpol™ Processing Additive Resins product information guide.

After processing Nucrel®, purge the material out using a polyethylene resin, preferably with a lower melt flow rate than the Nucrel® resin in use. The "Disco Purge Method" is suggested as the preferred purging method, as this method usually results in a more effective purging process. Information on the Disco Purge Method can be obtained via your DuPont Sales Representative.

Never shut down the extrusion system with Nucrel® in the extruder and die. Properly purge out the Nucrel® with a polyethylene, and shut down the line with polyethylene or polypropylene in the system.

| Extrusion Coating/Lamination Processing   | Nominal Values                                |
|---|---|
| Extrusion Coating / Lamination Processing | A suggested extruder set temperature profile. |
| Feed Zone                                 | 185°C (365°F)                                 |
| Second Zone                               | 235°C (455°F)                                 |
| Third Zone                                | 260°C (500°F)                                 |
| Fourth Zone                               | 285°C (545°F)                                 |
| Fifth Zone                                | 285°C (545°F)                                 |
| Adapter Zone                              | 285°C (545°F)                                 |
| Die Zone                                  | 285°C (545°F)                                 |

#### FDA Status Information

NUCREL® 3990L complies with Food and Drug Administration Regulation 21 CFR 177.1310(a)(1) - - Ethylene-acrylic acid copolymers, subject to the limitations and requirements therein. This Regulation describes polymers that may be used in contact with food, subject to the finished food-contact article meeting the extractive limitations under the intended conditions of use, as shown in paragraph (b) of the Regulation.

The information and certifications provided herein are based on data we believe to be reliable, to the best of our knowledge. The information and certifications apply only to the specific material designated herein as sold by DuPont and do not apply to use in any process or in combination with any other material. They are provided at the request of and without charge to our customers. Accordingly, DuPont cannot guarantee or warrant such certifications or information and assumes no liability for their use.

#### Regulatory Information

For information on regulatory compliance outside of the U.S., consult your local DuPont representative.

#### Safety & Handling

For information on appropriate Handling & Storage of this polymeric resin, please refer to the Material Safety Data Sheet..

A Product Safety Bulletin, Material Safety Data Sheet, and/or more detailed information on extrusion processing and/or compounding of this polymeric resin for specific applications are available from your DuPont Packaging and Industrial Polymers representative.

**Read and Understand the Material Safety Data Sheet (MSDS) before using this product**

**Regional Centres**

DuPont operates in more than 70 countries. For help finding a local representative, please contact one of the following regional customer contact centers:

**Americas**

DuPont Company  
Chestnut Run Plaza – Bldg. 730  
974 Centre Road  
Wilmington, Delaware  
19805 U.S.A.  
Toll-Free (USA): 1-800-628-6208  
Telephone: 1-302-774-1000  
Fax: 1-302-355-4013

**Asia Pacific**

DuPont China Holding Co., Ltd.  
Shanghai Branch  
399 Keyuan Road, Bldg. 11  
Zhangjiang Hi-Tech Park  
Pudong New District, Shanghai  
P.R. China (Postcode: 201203)  
Telephone +86 21 3862 2888  
Fax +86-21-3862-2889

**Europe / Middle East / Africa**

DuPont de Nemours Int'l. S.A.  
2, Chemin du Pavillon Box 50  
CH-1218 Le Grand Saconnex  
Geneva, Switzerland  
Telephone +41 22 717 51 11  
Fax +41 22 717 55 00

DuPont do Brasil, S.A.  
Alameda Itapecuru, 506  
06454-080 Barueri, SP Brasil  
Telephone: +55 11 4166 8000  
Fax: +55 11 4166 8736

<http://nucrel.dupont.com>

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*This data sheet is effective as of 08/07/2010 07:56:34 PM and supersedes all previous versions.*