

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% By Weight Acrylic Acid

**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	
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 Processing Information	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 conforms to the U.S. Code of Federal Regulations, Title 21, Paragraph 177.1310 covering its use as a food contact surface subject to the extractives limitations on the finished food contact article as described in the regulation.

#### Regulatory Information

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

#### Safety & Handling

Nucrel® acrylic acid copolymer resins as supplied by DuPont are not considered hazardous materials. As with any hot material, care should be taken to protect the hands and other exposed parts of the body when handling molten polymer. At recommended processing temperatures, small amounts of fumes may evolve from the resins. When resins are overheated, more extensive decomposition may occur. Adequate ventilation should be provided to remove fumes from the work area. Disposal of scrap presents no special problems and can be by landfill or incineration in a properly operated incinerator. Disposal should comply with local, state, and federal regulations. Resin pellets can be a slipping hazard. Loose pellets should be swept up promptly to prevent falls. For more detailed information on the safe handling and disposal of DuPont resins, a Material Safety Data Sheet can be obtained from the DuPont Packaging and Industrial Polymers website or by contacting your sales 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:

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