**DuPont™ Surlyn® 1705-1**

**Surlyn® resins Product Data Sheet**

### Description

**Product Description**

DuPont™ Surlyn® 1705-1 is an ionomer of ethylene acid copolymer.

The resin can be processed in conventional extrusion coating, blown film, cast film, sheet extrusion and coextrusion equipment designed to process polyethylene and ethylene copolymer type resins.

### Restrictions

**Material Status**

- Commercial: Active

### Typical Characteristics

**Composition**

Zinc Ionomer

### Typical Properties

#### Physical

<table>
<thead>
<tr>
<th>Property</th>
<th>Nominal Values</th>
<th>Test Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Density (g/cm³)</strong></td>
<td>0.95</td>
<td>ASTM D792</td>
</tr>
<tr>
<td><strong>Melt Flow Rate (190°C/2.16kg)</strong></td>
<td>5.5 g/10 min</td>
<td>ASTM D1238</td>
</tr>
</tbody>
</table>

#### Thermal

<table>
<thead>
<tr>
<th>Property</th>
<th>Nominal Values</th>
<th>Test Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Melting Point (DSC)</strong></td>
<td>95°C (203°F)</td>
<td>ASTM D3417</td>
</tr>
<tr>
<td><strong>Freezing Point (DSC)</strong></td>
<td>61°C (142°F)</td>
<td>ASTM D3417</td>
</tr>
<tr>
<td><strong>Vicat Softening Point ()</strong></td>
<td>65°C (149°F)</td>
<td>ASTM D1525</td>
</tr>
</tbody>
</table>

### Processing Information

**General**

- **Maximum Processing Temperature**

Surlyn® 1705-1 is normally processed at melt temperatures ranging from 160°-282°C (320°-540°F) in blown, cast and extrusion coating equipment. Typical extruder profiles are below. Actual processing temperatures will usually be determined by either the specific equipment or substrate or one of the other polymers in a coextrusion.

While it may be possible to extrude Surlyn® 1705-1 at temperatures as high as 299°C (570°F) in certain scenarios, this will be dependent on screw design (shear heating factors), and extruder configuration & throughput, which influence residence time in the machine. Please consult with a technical representative in DuPont Packaging & Industrial Polymers.

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 Surlyn®, purge the material out using a polyethylene resin, preferably with a lower melt flow rate than the Surlyn® 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 Surlyn® in the extruder and die. Properly purge out the Surlyn® with a polyethylene, and shut down the line with polyethylene or polypropylene in the system.

### Blown Film Processing

<table>
<thead>
<tr>
<th>Feed Zone</th>
<th>110°C (230°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Zone</td>
<td>135°C (275°F)</td>
</tr>
<tr>
<td>Third Zone</td>
<td>160°C (320°F)</td>
</tr>
<tr>
<td>Fourth Zone</td>
<td>160°C (320°F)</td>
</tr>
<tr>
<td>Fifth Zone</td>
<td>160°C (320°F)</td>
</tr>
<tr>
<td>Adapter Zone</td>
<td>160°C (320°F)</td>
</tr>
<tr>
<td>Die Zone</td>
<td>160°C (320°F)</td>
</tr>
</tbody>
</table>

### Cast Film / Sheet Processing

<table>
<thead>
<tr>
<th>Feed Zone</th>
<th>135°C (275°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Zone</td>
<td>185°C (365°F)</td>
</tr>
<tr>
<td>Third Zone</td>
<td>210°C (410°F)</td>
</tr>
<tr>
<td>Fourth Zone</td>
<td>210°C (410°F)</td>
</tr>
<tr>
<td>Fifth Zone</td>
<td>210°C (410°F)</td>
</tr>
<tr>
<td>Adapter Zone</td>
<td>210°C (410°F)</td>
</tr>
<tr>
<td>Die Zone</td>
<td>210°C (410°F)</td>
</tr>
</tbody>
</table>

### Extrusion Coating / Lamination Processing

<table>
<thead>
<tr>
<th>Feed Zone</th>
<th>160°C (320°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Zone</td>
<td>210°C (410°F)</td>
</tr>
<tr>
<td>Third Zone</td>
<td>250°C (482°F)</td>
</tr>
<tr>
<td>Fourth Zone</td>
<td>280°C (536°F)</td>
</tr>
<tr>
<td>Fifth Zone</td>
<td>282°C (540°F)</td>
</tr>
<tr>
<td>Adapter Zone</td>
<td>282°C (540°F)</td>
</tr>
</tbody>
</table>
FDA Status Information

SURLYN® 1705-1 complies with Food and Drug Administration Regulation 21 CFR 177.1330(a) - Ionomeric resins, 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 (c) 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 Itapeuru, 506
06454-080 Barueri, SP Brasil
Telephone: +55 11 4166 8000
Fax: +55 11 4166 8736

http://surlyn.dupont.com

The data listed here fall within the normal range of properties, but they should not be used to establish specification limits nor used alone as the basis of design. The DuPont Company assumes no obligations or liability for any advice furnished or for any results.

CAUTION: Do not use DuPont materials in medical applications involving implantations in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding
obtained with respect to this information. All such advice is given and accepted at the buyer’s risk. The disclosure of information herein is not a licence to operate under, or a recommendation to infringe, any patent of DuPont or others. Since DuPont cannot anticipate all variations in actual end-use conditions, DuPont makes no warranties and assumes no liability in connection with any use of this information.

medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Applications H-50102-3.

Copyright © 2009 DuPont. The DuPont Oval Logo, DuPont™, The miracles of science™, and trademarks designated with “®” are registered trademarks or trademarks of E.I. du Pont de Nemours and Company or its affiliates. All rights reserved.

This data sheet is effective as of 10/01/2014 06:54:05 PM and supersedes all previous versions.