



## APPEEL™ 53011

### Peelable Resin

#### General Information

**Product Description** APPEEL™ 53011 is a modified ethylene vinyl acetate copolymer resin designed to function as a sealing layer for lidding applications.

This resin is available in pellet form for use in conventional extrusion or coextrusion equipment designed to process polyethylene resins.

#### Status

**Material Status** Developmental: Active

#### Typical Characteristics

**Uses** Lidding Sealant

**Applications**

- Excellent heat sealability to I/C chip paper carrier tape.
- Provides a clean peel with a steady peel force.
- Good transparency
- Excellent processability

Typical structures for this lidding would be:  
OPET / primer / PE / APPEEL™ 53011

#### Typical Properties

Physical	Nominal Values	Test Method(s)	
*Density ( )	0.93 g/cm <sup>3</sup>	ASTM D792	ISO 1183
*Melt Flow Index ( 190°C/2.16kg)	22 g/10 min	ASTM D1238	ISO 1133

Thermal	Nominal Values	Test Method(s)	
*Melting Point ( DSC )	98 °C ( 208.4 °F )	ASTM D3418	ISO 3146
Freezing Point ( DSC )	88 °C ( 190.4 °F )	ASTM D3418	ISO 3146
Vicat Softening Point ( )	71 °C ( 159.8 °F )	ASTM D1525	ISO 306

**Heat Seal Evaluation** The performance of any sealant resin should be evaluated within the context of the application. The sealant is designed to bond to particular substrate(s). Many variables can affect seal strength, including the physical properties of the substrate being sealed to, thickness, flange or surface design, heat seal temperature, dwell time and pressure. The condition and type of the sealing equipment used, such as roller sealers versus platen seal mechanisms can make a significant difference.

In most cases sealant peel strength is used as a measure of performance. Although this is a convenient test, peel strength is affected not only by substrate adhesion but also by peel angle, separation rate, ambient temperature, tensile and modulus properties of the materials, and often by the time elapsed since the formation of the bond.

If sealant peel strength is used as a measure of sealant performance, it is imperative that peel strength be evaluated not only at the time of initial heat sealing the lid to the substrate, but throughout the life of the product and under all the conditions to which the sealant will be exposed. Only then does peel strength provide a reliable indication of adhesive performance in the specific application.

#### Processing Information

\*Maximum Processing Temperature 235 °C ( 455 °F )



## General Processing Information

If the process is stopped for short periods of time, the screw for the APPEEL™ extruder should be kept turning at a low rpm to keep material flowing.

After processing APPEEL™, purge the material out using a polyethylene resin, preferably with a lower melt flow rate than the APPEEL™ 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 Dow Sales Representative.

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

## Extrusion Coating/Lamination Processing Information

### Nominal Values

**Extrusion Coating:** The melt temperature of APPEEL™ 53011 should be maintained in the 185 - 235°C range in extrusion coating processes. Selection of a specific melt temperature will depend on screw configuration, potential power limitations, and the need to match melt viscosities. However, melt temperatures above 238°C (460F) should be avoided because of possible thermal degradation of the resin.

If the process is stopped for short periods of time, the APPEEL™ 53011 resin extruder should be kept turning at low rpm. For a permanent shutdown, the APPEEL™ 53011 resin should be purged out using an available polyethylene resin run at the same extrusion temperature used for the APPEEL™ 53011 resin. Never raise temperature over 235°C until APPEEL™ 53011 resin is completely purged out. APPEEL™ 53011 requires relatively low processing temperatures and cooling the bottom of hopper due to its low Vicat point and higher comonomer level.

Following is an example for suggested temperature profile on the high side of the processing range. Lower temperatures in the final metering zone, adapter and die are suggested if compatible with the process and application.

Feed Zone	135 °C ( 275 °F )
Second Zone	185 °C ( 365 °F )
Third Zone	210 °C ( 410 °F )
Fourth Zone	235 °C ( 455 °F )
Fifth Zone	235 °C ( 455 °F )
Adapter Zone	235 °C ( 455 °F )
Die Zone	235 °C ( 455 °F )

## FDA Status Information

APPEEL™ 53011 resin complies with Food and Drug Administration Regulation 21 CFR 177.1350(a), subject to the limitations and requirements therein. This regulation describes resinous and polymeric coatings for polyolefin films that may be used in contact with food types I, II, IV-B, VI-A, VI-B, VI-C, VII-B and VIII identified in Table of 21 CFR 176.170(c) under Conditions of Use B, C, D, E, F, G and H described in 176.170(c), and provided the finished food contact articles with a thickness not to exceed 30 microns (1.18 mils), may be used in contact with food types III, IV-A, V, VII-A, and IX under condition of use B through H as defined in 176.170(c).

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 Dow 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, Dow cannot guarantee or warrant such certifications or information and assumes no liability for their use.

