

## Release Coatings

For the Hot Stamping Foil Market

### Description

Release Coatings are used mainly in two different market segment or applications:

- Hot Stamping Foil
- Tapes

Hot Stamping Foils are multilayer structures produced by subsequent coatings followed by high vacuum metallization and embossing on special grade PET. The structure consists of at least three different coatings each one with a function in the overall structure. The function of the release layer is to avoid or minimize adhesion to the substrate or carrier (PET in most cases). The technology used in some of these coatings involves low melting point waxes like Carnauba, Montana or Paraffin. Some customers include release resins in order to get better film consistency and release uniformity.

Release coatings technologies for HSF are, mostly, based on natural waxes or release resins. Release coatings are normally applied at very low coating weight (between 0,02 grs/sqm and 0,08 grs/sqm) and should not be affected by the subsequent deposition of the embossable coating and also by the embossing process for holographic reproduction. Release coatings should also be carefully designed in order not to affect printability on the already stamped material.

Release coatings should also be stable in order not to affect release values after extended stock time, so migratables should be minimised in order not to affect release values. This is particularly noticeable in wax based coatings where some of the waxes used tend to bloom on the surface affecting the release values.

Tapes could be manufactured using different plastic and paper substrates. These substrates will have a Pressure Sensitive Adhesive applied on one side and a Release coating on the other. Due its nature, Pressure Sensitive Adhesives are extremely tacky and if in contact directly with the substrate they are coated on will give huge blocking issues. As tapes are produced in a web, the Pressure Sensitive Adhesive will be in contact with the backside of the substrate after unwinding, and so it will easily produce blocking.

In order to avoid this phenomena, a release coating is applied on the back of the substrate.

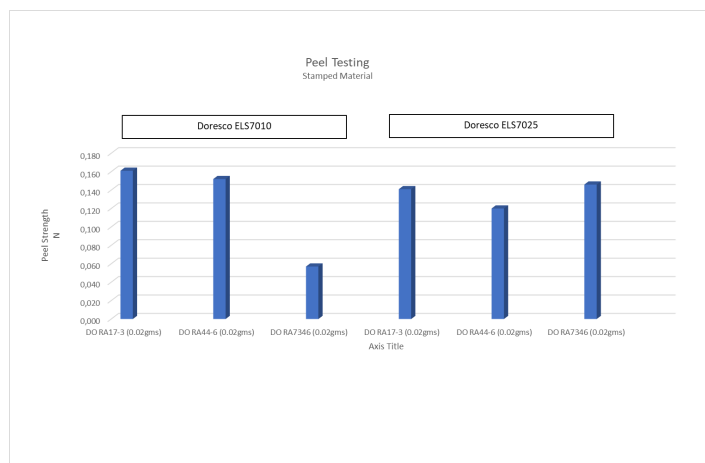
Lubrizol has developed new release coatings for the Hot Stamping Foil market and the Tapes market.

DORESCO® RA7346	
PHYSICAL CHARACTERISTICS*	
Appearance	Pale slightly yellow liquid
<b>Solids (%)</b>	<b>35</b>
Brookfield Viscosity, cP	50
<b>Solvent</b>	<b>Ethyl Acetate</b>

## Performance

Doresco® RA7346 for Hot Stamping Applications has been developed to supersede the old range of RA products with several performance targets in mind:

- Higher Solids. Former RA range (Doresco® RA17-3 and Doresco® RA44-6) had lower solid content, Doresco® RA7346 has been increased up to 35% solids.
- More friendly solvency. Former products were based in solvents that were either difficult to handle or had some safety restrictions.
- Less colouration. Doresco® RA7346 is pale yellow, the former range was brown.



Doresco® RA7346 has been tested for Hot Stamping Foils applications using different solvency in the embossable coating applied after the release to show the influence of the solvent used in the embossable coating on the release of the material. As expected, the solvent in the embossable coating influence the release values due to the “biting” of the solvent in the release coating. Care must be taken in the solvent selection to provide the best release values. Release has been tested using tape applied on the applied release coating applying a pressure of 10 Nw and then delaminating the structure with Tensile tester.

Doresco® RA7346 has also been tested as a release coating for Tapes. In this application testing has been focused in evaluating the release properties of the resin applied on the back side of PET in comparison of the former range. Release Coating has been applied at 0.5 grs/sqm coating weight. Carbotac® 1811 has been used as Pressure Sensitive Adhesive applied in the back side of the PET at 5 grs/sqm and release has been measured after 24 hours and 3 Bar pressure.

Doresco® RA7346 is a specially modified acrylic release resin that is designed as a release coating for Hot Stamping Foil applications. Doresco® RA7436 is and Ethyl Acetate based acrylic and it is high solids for a release coating which minimises the amount and gives much more formulation latitude in case this is required.

Unlike our previous release resins, Doresco® RA7346 has only a slight colouration. Resin based release lacquers are less sensitive to solvent attack from the embossable coating that is normally applied on top of them and also as there are migratable components in the product the stability over time is better than wax based release coatings.

