Technical Information

DEGALAN® 4150 E

Binder for heat seal lacquers - Organic dispersion of copolymers on methacrylic esters and olefins basis.

DEGALAN® 4150 E will give good adhesion to aluminium in formulation with PVC-copolymer. Primed with polyesters like DYNAPOL® L 206 / 208[1] adhesion to PET is achieved.

Usage as an universal binder for heat seal lacquers for sealing aluminium foil or PET film versus polypropylene (PP), polystyrene (PS), polyethylene terephthalate (PET) or vinyl (PVC).

Formulation example:

- 66.4 parts DEGALAN® 4150 E (~43% solid content)
- 1.4 parts PVC-copolymer (Vinnol® H 30/48 M[1] or Vinnol® H 15/45 M[2])
- 32.2 parts ethyl acetate

Application:

DEGALAN® 4150 E formulated with a PVC-copolymer (e.g. Vinnol® H 30/48 M or Vinnol® H 15/45 M) results in best adhesion to aluminium foil. PVC-copolymer has to be applied in quantities of 0.5 to 1.0 g/m² or typically DEGALAN® 4150 E is formulated with PVC-copolymer in a minimum ratio of 97.5 : 2.5 to 95.0 : 5.0 calculated solid to solid. An excess of 5 to 10% PVC-copolymer leads to a decrease in heat seal strength.

If a PVC-free formulation is required, we recommend the usage of DEGALAN® 4151 E instead of DEGALAN® 4150 E, since DEGALAN® 4151 E shows direct adhesion on aluminium.

Since DEGALAN® 4150 E is an organic dispersion, we recommend stirring with care prior to usage, also in formulation. For optimized performance during processing, we recommend dilution with esters or ketones (ethyl acetate or methyl ethyl ketone) to a solids content of about 30%.

In bench-scale testing, DEGALAN® 4150 E is applied by a spiral coater (K-Handcoater) and dried at 180°C for 15 seconds. Recommended drying temperature range is between 160°C and 240°C, respectively.

DEGALAN® 4150 E will give best heat seal performance at a typical dry coating weight of 7 g/m².

Sealing conditions:

Foils prepared as described above are typically sealed at a pressure of 6 bar and a temperature of 200°C within one second.
Typically sealing strength between 8 and 10 N/15 mm is observed with PP and PVC substrates, whereas sealing strength between 10 and 12 N/15 mm is observed with PS substrate.

Typical sealing temperatures are between 180°C and 240°C. If PS or PVC is of concern, heat sealing starts at a temperature of 140°C.

Sealing strength may vary due to variation of sealing conditions or contaminations on the surface of the aluminium foil (e.g. grease residuals).

Performance range:

DEGALAN® 4150 E is very versatile in use. It can be applied on aluminium foil and PET film, which then can be sealed versus PP, PS, PVC, PET, (PE).

Stability to pasteurization at 70°C / 2 hr is given.

Typically the heat seal strength will remain constant in water immersion testing, 28 days at 23°C or 1 hr at 80°C.

Variations of the PVC-copolymer content will impact the sealing properties. An increased PVC-copolymer content ensures a more resistant coating, whereas a decrease in heat seal strength is observed at the same conditions.

Typically addition of 1.5% Acematt® HK 450[3] or 5% Vestosint® 2159[4] will reduce blocking or abrasion tendency.

Structure of coating:

- Base Aluminium
- Intermediate layer Primering with PVC-copolymer
- Heat seal layer DEGALAN® 4150 E in formulation with PVC-copolymer no primering necessary.
- Sealing substrate PP, PS, PVC, PET, (PE)

- Base PET
- Intermediate layer Primering with polyester
- Heat seal layer DEGALAN® 4150 E
- Sealing substrate PP, PS, PVC, PET, (PE)

Use for pharmaceutical blister and food packaging.

[1] DYNAPOL® L 206 and 208 are products of Evonik Industries AG, Germany, Tel. +49 2365 49-7628, www.evonik.com

[2] Vinnol® H 30/48 M and Vinnol® H 15/45 M are products of Wacker Chemie AG, Germany, Tel. +49 89 6279-0, Fax +49 89 6279-1770, info@wacker.com

[3] Acematt® HK 450 is a product of Evonik Industries AG, Germany, Tel. +49 6181 59 8118, ask-si@evonik.com, www.acematt.com

[4] Vestosint® 2159 is a product of Evonik Industries AG, Germany, Tel. +49 2365 49 9878, www.vestosint.com

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