

New Extrusion Coating Die Eliminates Edge Bead and Enhances Coat Weight Uniformity for Korean Maker of Flexible Packaging



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CHUNGBUK, SOUTH KOREA, January 5, 2015: An advanced extrusion coating die designed to reduce edge bead has enabled one leading producer of aluminum foil and foil-laminate flexible packaging to actually eliminate edge bead, as well as reducing coat width variation by half or more, it was announced today by Nordson Corporation.

After a die for applying LDPE on an existing production line for flexible food packaging had been causing problems with die lines and leakage, Korea Aluminium Co. Ltd. recently replaced it with the Nordson Extrusion Dies Industries Edge Profile Control (EPC™) die. The new die has not only eliminated the previous problems but has also made it possible to address the issue of edge bead and the waste of coating and substrate material that results from it, according to Mr. Jeonghyeon Heo, senior manager of Korea Aluminium's headquarters facility in Chungbuk.

While the degree of edge bead reduction achievable with the EPC die depends on a number of factors, the reduction in the Korea Aluminium coating line was 100%. "We are now manufacturing product with zero edge bead," said Mr. Heo.

In addition, he noted, the EPC die reduced coat weight variation by 50 to 60%: "Thickness uniformity was +/- 2 or 2.5 microns with the old die, but with Nordson's EPC die uniformity has been improved to almost +/- 1 micron."

The EPC unit installed on Korea Aluminium's coating line was a manual die, noted Sam G. Iuliano, Nordson Extrusion Dies Industries chief technologist. "The 4 to 5% range of variation from target coat weight is very good indeed for a manual die," he said. "With an automatic die, the range could easily be cut in half."

Nordson Extrusion Dies Industries is represented in South Korea by Dae Joo Ind. Co., whose president is S.J. Kang. Nordson field service agent Andy Svenningsen traveled from the USA to provide on-site startup support for Korea Aluminium, and Chooni Kim, senior sales manager for Nordson in South Korea, supplied technical recommendations for enhancing coat weight uniformity.

EPC™ Die Makes Possible Fine Tuning of the Edge Profile of a Coating



An EPC die includes an external deckle as a secondary seal to prevent leakage and an internal deckle system that sets coat width and seals polymer at the die exit. Internal deckle parts provide independently adjustable components that seal off the internal flow channel and can be positioned to set the overall coating width and to minimize edge bead. Similarly, a manual or automated system for adjusting a flexible lip of the die makes it possible to maintain coat weight uniformity.

Internal deckle systems used for fine-tuning the edge profile of a coating are effective because of the tendency of molten polymer to exhibit transverse flow if lateral barriers to flow are removed at the die exit. In the EPC die, the internal deckle components for adjusting the edge bead profile are located upstream of the lip land—one in the primary manifold section, the second in the preland area. By adjusting the positions of these components relative to the deckle rod, it is possible to reduce the flow of polymer at the extreme edges of the coating, thereby minimizing edge bead.

KOREA ALUMINIUM CO., LTD has been a producer of aluminum foil since 1987 and is a manufacturer of pharmaceutical, food, and confectionary packaging that complies with U.S. and EU codes and standards.

Caption for Photo No. 2: Schematic shows how the internal deckle system (orange and yellow components) of the EPC™ extrusion coating die can be adjusted to reduce edge bead in a coating (shown in gray). In this example, edge bead is reduced from six times the target coating thickness to twice that thickness.

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Nordson Polymer Processing Systems provides customers with engineered components to melt, homogenize, dispense, and give shape to plastic and fluid coating materials. Nordson Corporation leverages the collective plastics industry experience from a series of strategic acquisitions to offer a uniquely broad portfolio of industry-leading technologies. Nordson delivers a full range of precision melt stream products — from screws and barrels for extrusion and injection molding — to filtration systems, pumps, and valves — to the extrusion dies and pelletizing systems to meet the constantly evolving needs of the polymer industry.

Nordson Corporation provides customers with local technical sales, service and remanufacturing capabilities through sales organizations and regional manufacturing facilities in over 30 countries.

Please contact us directly:

Authorized Exclusive Sole Agent in ASEAN Countries:

Kenda (S) Pte Ltd

67 Loyang Way Singapore 508757

Attention : Ms Wenn Tan

Tel: (65) 6543-1183 x 128 Fax: (65) 6543-1182

E-mail address : WennTan@kenda.net

Website : www.kenda.net