DMU DecoMold Ultrabond Technical Data Sheet

DMU Ultrabond is a patented ink series developed for 1st and 2nd surface decoration of polycarbonate and other plastic films that will undergo subsequent in-mold decoration (IMD) processing used in the manufacture of Automotive, Telecommunication, and Appliance display parts.

typical characteristics and features

DMU inks are formulated to have the following properties:

- Excellent printability
- Printed films have exceptional elongation properties as well as resistance to the extreme heat and shear inherent in IMD processing and are ideal for IMD operations
- Molten polymer can be injected directly onto cured DMU series ink films without the need for a barriercoat or adhesion promoter when using polycarbonate and polycarbonate / ABS blends of resins

technical information and handling

Screen mesh and stencil

Monofilament polyester mesh in the range of 305 – 390 / inches (120 –155 / cm) is recommended. Sharp urethane squeegee of approximately 70 – 90 durometer.

Pre-press power mix recommendation

In order to maximize the curing, adhesion and IMD performance of DMU series inks, it is essential that the inks be given a thorough power mix immediately prior to use on press. Mixing by hand with an ink spatula will not be sufficient.

Product range

9 Blending Colors plus Blending White, Black and Clear which can be mixed together to match virtually any color.

•Opaque Black and White designed for use as stand-alone products, and not normally recommended for use in color blends.

•High Density Process Colors matched to SWOP standards.

•DMU-799 Mixing/Overprint Clear that can also be used to prepare metallic blends.

•DMU-700 Barrier Coat/Adhesion Promoter for use as a protective coating for more severe IMD applications.

IMD processing

Due to the diversity of forming and molding techniques used during insert in-mold decoration, it is essential to test and confirm the performance of substrate(s), inks, and IMD process parameters prior to commencing full-scale production.

Embossing / Forming –DMU series inks were formulated to have good elongation, and thus perform well when used with most common forming and molding techniques, such as thermoforming; hydroforming; high pressure forming; and matched metal forming.

Product Code	Description	SAP Number
DMU-711	G.S Yellow	90066617
DMU-715	R.S Yellow	90066619
DMU-721	Y.S Red	90066620
DMU-725	B.S Red	90066621
DMU-749	Green	90066622
DMU-755	R.S Blue	90066623
DMU-759	G.S. Blue	90066624
DMU-783	Magenta	90066626
DMU-785	Violet	90066627
DMU-705	Blending White	90066616
DMU-770	Blending Black	90066625
DMU-799	Mixing Clear/Overprint Clear	90066628
DMU-W70	Opaque White	90066633
DMU-N70	Opaque Black	90066629
DMU-S231	Process Yellow	90066630
DMU-S235	Process Cyan	90809751
DMU-S240	Process Magenta	90809806
DMU-S271	Process Black	90066631
DMU-TPS	Prcoess Base	90066632
DMU-700	Adhesion Promoter	90066615
CXT-0382	Adhesion Promoter for PVC	90928290
CXT-0384	Adhesion Promoter for Polyethylene and Polypropylene	90983921
ST-290	Viscosity Modifier	90020029 1Gal
ST-290	Viscosity Modifier	90020030 Qt

In accordance with information received from suppliers, the full DMU series is formulated without heavy metals and complies with: 16 CFR, Part 1303; ANSI Z66, 1-1964; ASTM F 963; CONEG packaging regulations; EC Packaging Waste Directive EC/94/62; EN71m section 3; RoHS 2002/95/EC; WEEE 2002/96/EC; E2003/11/EC.

Die-Cutting–The exceptional flexibility of DMU series inks makes them ideally suited for most common die-cutting operations. Injection Molding–DMU series inks were formulated to have excellent washout resistance to various injection resins. However, actual performance is affected by many IMD processing variables such as type of injection resin used; injection temperature; injection pressure injection gate design; and distance from gate to ink surface. Wherever possible, preference should be given to gating that reduces the shear of the injected polymer on the ink film. However, in some applications, as a result of more demanding gating configurations and/or high injection shear rates needed with certain backfilling polymers, DMU-700 Barrier Coat / Adhesion Promoter can be necessary to ensure a good bond between the injection resin and the printed ink surface.

Note: For best results during injection molding processing, both the front and back of the mold should be maintained at a temperature between 130-140°F (60-70°C).

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DMU-700 Barrier Coat

DMU series inks will withstand most IMD processing without the need for a barrier coat. However, under more severe IMD conditions, it can be necessary to overprint DMU inks with DMU-700 Barrier Coat / Adhesion Promoter to create a protective layer between the ink film and molten polymer. It can also be used to increase adhesion between the ink and resin.

DMU-700 Processing Recommendations:
DMU-700 has been specifically formulated to have excellent printability compared to prior generations of water-based barrier coatings. Due to its water-based chemistry, it will be necessary to use water-resistant stencils when printing DMU-700. Monofilament polyester screen mesh in the range of 200 – 255 / inches (80 – 100 / centimetersm) is recommended. In order to fully cure and maximize the protective qualities of DMU-700, it should be dried at 140 – 160°F (60 – 70°C) for approximately 60 minutes.

Processing Recommendations:

CXT - 0382 solvent-based adhesion promoter for PVC resin use.

CXT - 0384 solvent-based adhesion promoter for polyethylene and polypropylene resin use.

Use a 230 –255 mesh. Need to be run through a jet air dryer at 160° – 180°F (70° – 80°C).

Note: For use of PVC resins and use of polyethylene and polypropylene resins, we have specific adhesion promoters for these applications.

Curing

Actual cure speeds for DMU series inks are dependant on a number of factors and processing variables, including ink film deposit; color shade, strength & opacity; mesh; wattage and type of UV lamps; efficiency of UV curing unit; and substrate. Ensuring adequate cure is essential to avoiding potential delamination during subsequent IMD processing. UV Energy-Typical UV energy levels in the range of 450 – 550 mJ / cm^2 for DMU colors, 500 – 600 mJ / cm^2 for DMU-W70 Opaque White, and approximately 700 – 750 mJ / cm^2 for DMU-N70 Opaque Black is required to ensure adequate cure. The use of iron doped UV lamps has been shown to be advantageous. Post-Curing–DMU series inks exhibit excellent intercoat adhesion and are suitable for multiple-layer prints. However, all UV curable inks and varnishes are subject to post-curing after initial exposure to UV light. Care should be taken not to overcure the ink film, which can adversely affect intercoat adhesion and cause delamination of the injected resin from the ink.

Metallics

DMU-799 Mixing/Overprint Clear can be used in the preparation of metallic blends, which should be limited to a maximum metallic pigment load of 15%.
Note: Metallic blends have a limited pot-life. Care should be taken to only prepare enough metallic blendfor use during the ensuing 24 hours.

Storage

DMU inks should be stored at 70-80°F (21-27°C). When stored at temperatures between 40-90°F (5-32°C), DMU has a shelf-life of twelve (12) months.

clean-up

Screens and equipment may be cleaned with many commercial screen washes.

substrates and applications

DMU series inks were formulated to have good adhesion to a wide range of polycarbonate and polycarbonateblend substrates, including Bayer polymers; GE's Lexan™; and Autotype's Autoflex™products. DMU series inks will also adhere to suitably treated print-receptive polyester substrates and PVC. Proper ink-to-substrate adhesion is essential for achieving satisfactory results during subsequent IMD processing. When properly cured on receptive substrates, DMU series ink films will pass the ASTM D 3359-95 cross-hatch/tape adhesion test after prints have been cooled to ambient room temperature. Substrate manufacturers'guidelines on the use of their materials for IMD processing should be taken into consideration.

Note: Pretest all substrates prior to use in production.

safety, health and environment

DMU inks should be used in accordance with normal standards of industrial hygiene and good manufacturing practice. Please refer to the supplied Material Safety Data Sheet for specific information. Material Safety Data Sheets will be supplied.

Printing inks, coatings and printing residues should be disposed of in accordance with local and national regulations.

Sun Chemical | North American Inks | 2445 Production Drive | St. Charles, IL 60174
+1.630.587.5100 | www.sunchemical.com | marketing@sunchemical.com

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