

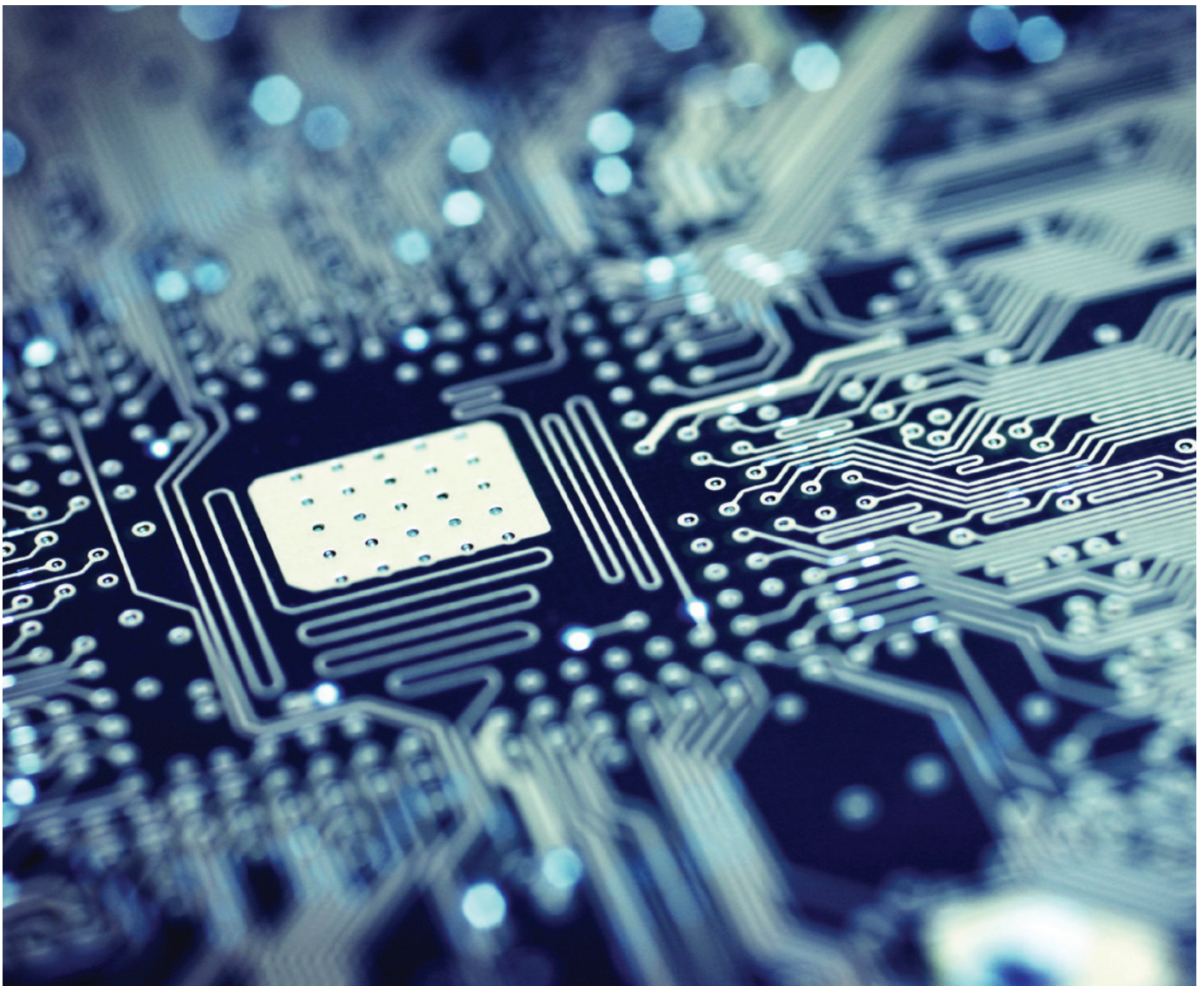


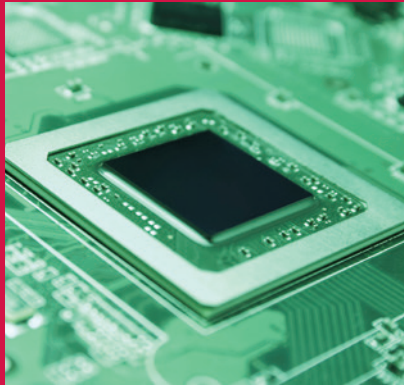
Dow Electronic Materials

Interconnect Technologies

Product Selection Guide

Europe, Middle East, and Africa





Dow Electronic Materials, a global supplier of materials and technologies to the electronics industry, brings innovative leadership to the semiconductor, interconnect, finishing, display, photovoltaic, LED and optics markets. From advanced technology centers worldwide, teams of talented Dow research scientists and application experts work closely with customers, providing solutions, products and technical service necessary for next-generation electronics. These partnerships energize Dow's power to invent.

Dow's portfolio includes: CMP, lithography, metallization and ceramic materials for semiconductor applications; surface preparation, metallization and imaging materials for interconnect, electronic and industrial finishing, and photovoltaic applications; precursor materials for LED, solar and semiconductor manufacturing; OLED materials, display films, and display chemicals for LCD and plasma display fabrication; and zinc-based materials for optics.

Interconnect Product Selection Guide

What Our Technology Does

- Versatile plating technology used for metallizing a wide variety of boards from very high aspect ratio through holes to embedded microvias for the manufacture of the most complex end-use printed circuit boards
- Imaging technologies that help to define the finest of lines for dense circuitry

What is Unique

- Innovations that facilitate advanced circuitry design delivering reliability, improved yield, and improved cost of ownership for a large variety of printed circuit board applications

End-use Markets

- Computing
- Communication
- Consumer
- Automotive
- Industrial & Medical
- Military & Aerospace

Processes

- Inner Layer Bonding
- Image Transfer
- Metallization
- Making Holes Conductive
- Electrolytic Plating
- Final Finishes
- Optical Waveguide

Applications

- MLB (Multi Layer Board)
- HDI (High Density Interconnection)
- IC Substrate
- FPC (Flexible Printed Circuit)
- Optical Waveguide

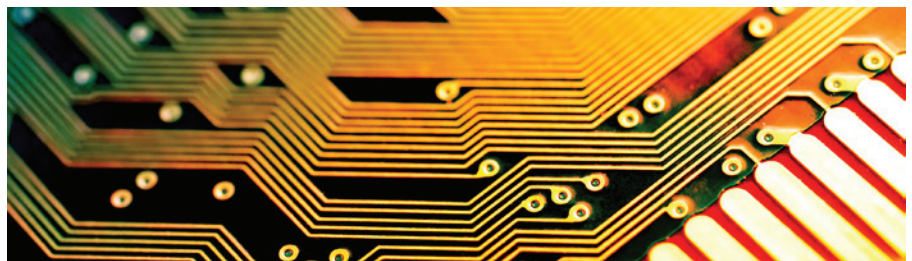
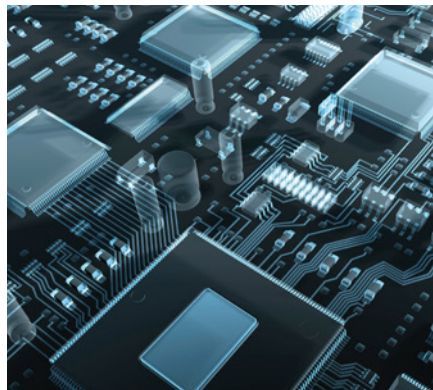


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PWB Metallization – Making Holes Conductive

DESMEAR	
CIRCUPOSIT™ Hole Prep 3304	<ul style="list-style-type: none"> Prepares resin surfaces for efficient and complete treatment in CIRCUPOSIT™ Promoter 4130 Enhances resin removal for desmear, long life, easy to control
CIRCUPOSIT™ Hole Prep 4120	<ul style="list-style-type: none"> Cleans and conditions hole wall surfaces prior to treatment in alkaline permanganate Ensures excellent removal of drill smear and good adhesion and coverage of electroless copper
CIRCUPOSIT™ Hole Prep 4126 Sweller	<ul style="list-style-type: none"> Enhanced resin removal for high Tg materials Suitable for both traditional FR-4 laminates and high Tg materials
CIRCUPOSIT™ 4130 Promoter	<ul style="list-style-type: none"> Alkaline permanganate solution that effectively removes resin smear from inner layer junctions Cleans and texturizes the hole wall to improve adhesion of plated copper
CIRCUPOSIT™ Neutralizer 3319/ MLB Glass Etch	<ul style="list-style-type: none"> Amine-based neutralizers to remove manganese residues while simultaneously etching exposed glass fibers Glass Etch controllable from frost to etch back
ELECTROLESS COPPERS (PRE-PLATE)	
CIRCUPOSIT™ 3320 A Conditioner	<ul style="list-style-type: none"> Contains a novel conditioning agent, which promotes the adsorption of a thin layer of catalyst, thus producing total electroless copper coverage while avoiding problems associated with over catalyzation Designed to provide the optimum palladium adsorption for all laminate and dielectric materials
CIRCUPOSIT™ 3323 A Conditioner	<ul style="list-style-type: none"> Alkaline conditioner containing a powerful catalyst promoter that ensures total copper coverage of all epoxy and glass fibre surfaces
CIRCUPOSIT™ 3327 Conditioner	<ul style="list-style-type: none"> Mildly acidic conditioner that is free of strong complexing agents Prepares hole wall surfaces for optimal catalyst adsorption, ensuring complete electroless copper coverage in the PTH process
CIRCUPOSIT™ Etch 3330	<ul style="list-style-type: none"> Persulfate- and sulfuric/peroxide-based microetch systems for reliable copper to copper bonds Dow Electronic Materials steady state control systems available
CATAPOSIT™ 449 Catalyst	<ul style="list-style-type: none"> Industry standard system consisting of a low acid colloidal tin-palladium catalyst, liquid or solid CATAPREP™ Pre-dip Components, catalyst salt additives, and control additive
ELECTROLESS COPPERS (VERTICAL)	
CIRCUPOSIT™ 3350	<ul style="list-style-type: none"> Self-accelerating copper; EDTA-based Fine-grained deposit ideal for high performance multilayers Deposits 2.0–2.5 µm (80–100 millionths of an inch) in 30 minutes
CIRCUPOSIT™ 3350-1	<ul style="list-style-type: none"> Self accelerating copper; EDTA-based Fine grained deposit ideal for high performance multilayers Deposits 1.2-1.3 µm (47-51 millionths of an inch) in 30 min
CIRCUPOSIT™ 7950 Electroless Copper for SAP Metallization	<ul style="list-style-type: none"> EDTA-based, controlled deposition with exceptionally fine-grained deposits with high uniformity for SAP applications Excellent coverage of blind micro via holes and exceptional adhesion on high-performance SBU dielectric materials Deposits 0.5–1.0 µm (20–40 millionths of an inch) in 20 minutes
CUPOSIT™ 328 Copper Mix	<ul style="list-style-type: none"> High-yield, “thin” electroless copper, tartrate-based Very stable and simple to operate Excellent copper-to-copper bonds achieved with all electroplate coppers Deposits 0.4–0.6 µm (15–25 millionths of an inch) in 20 minutes Suitable for FPC application
ELECTROLESS COPPER BATHS (HORIZONTAL)	
CIRCUPOSIT™ 3350-1	<ul style="list-style-type: none"> Advanced self-accelerating copper, EDTA-based, suitable for horizontal applications Fine-grained deposit ideal for high performance multilayers and HDI (High Density Interconnection) applications Deposits 0.3–0.5 µm (12–20 millionths of an inch) in 4–5 minutes
CIRCUPOSIT™ 4500	<ul style="list-style-type: none"> Advanced self-accelerating copper, EDTA-based, for horizontal applications Stable system that yields a very fine grained deposit ideal for high performance multilayers and HDI (High Density Interconnection) applications Deposits 0.4–0.6 µm (15–25 millionths of an inch) in 4–5 minutes

DIRECT PLATE (PALLADIUM-BASED)

CONDUCTRON™	<ul style="list-style-type: none"> • Distinct palladium-based system that offers one of the most conductive direct plate coatings on the market • Does not require a post-coating microetch • May be used in vertical or horizontal applications <p>Process Sequence: Conditioner > Microetch > Glass Conditioner > Pre-Dip > Conductor Activator > Activator</p>
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PWB Metallization Electrolytic Plating**ACID CLEANERS**

RONACLEAN™ 960	<ul style="list-style-type: none"> • Non-chelated acid cleaners
RONACLEAN™ EVP-209	<ul style="list-style-type: none"> • Non-chelated acid cleaner • NPE (APE) free
RONACLEAN™ EVP-210S	<ul style="list-style-type: none"> • Sprayable, low-foaming cleaner • NPE (APE) free

MICRO-ETCHANTS

CIRCUPOSIT™ ETCH 3330	<ul style="list-style-type: none"> • Peroxysulfate-based • Automatic feed and bleed control
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ACID COPPERS (VERTICAL)

COPPER GLEAM™ 2001 ELECTROPOSIT™ 1000	<ul style="list-style-type: none"> • Low current density (0.3-2.0 ASD, 3-20 ASF) • DC plating for the most demanding technologies (HDI) • High aspect ratio plating and excellent surface distribution • Suitable for backplane thick board plating
COPPER GLEAM™ PCM, 125, 2001, ELECTROPOSIT™ 1100, 1300	<ul style="list-style-type: none"> • Medium current density (0.5-2.5 ASD, 5-25 ASF) • Good productivity, applicable to the majority of products plated today • High performance systems, robust and with wide operating windows
COPPER GLEAM™ ST-901	<ul style="list-style-type: none"> • High current density capability (2-4 ASD, 20-40 ASF) • Conventional DC plating for high productivity, throwing power and surface distribution
COPPER GLEAM™ PPR	<ul style="list-style-type: none"> • Periodic Pulse Reverse plating for high productivity and complex designs (HDI) applications
COPPER GLEAM™ CUPULSE™ Plus	<ul style="list-style-type: none"> • Periodic Pulse Reverse plating for improved performance in throwing power and bath stability for HLC applications

COPPER GLEAM™ ACID COPPERS (HORIZONTAL)

HS-200	<ul style="list-style-type: none"> • Two component DC additive systems designed to operate at high current densities (5-10 ASD, 50-100 ASF) • Bright, uniform deposit • Fully compatible with insoluble anodes
PPR-H	<ul style="list-style-type: none"> • Distinct two-component additive system that utilizes periodic pulse reverse rectification • Engineered to deliver dramatic improvements in throwing power and surface distribution • Operates at current densities between 5-10 ASD (50-100 ASF) • Fully compatible with insoluble anodes

COPPER GLEAM™ ACID COPPERS FOR FLEX PRINTED BOARD PLATING

CLX	<ul style="list-style-type: none"> • Operates at current densities between 0.5-2.0 ASD (5-20 ASF) • Excellent physical properties for FPC requirements • Bright, uniform deposit • Compatible with soluble anodes
HGX	<ul style="list-style-type: none"> • Operates at current densities between 0.5-2.0 ASD (5-20 ASF) • Excellent physical properties for FPC requirements • Bright, uniform deposit • Special designed pre-dip process to improve plating appearance • Compatible with soluble anodes

MICROFILL™ ACID COPPERS FOR VIA AND THROUGH HOLE FILL PLATING	
LVF-3	<ul style="list-style-type: none"> • Exceptional microvia filling performance • Operates at medium current densities between 1–2 ASD (10–20 ASF) • Bright, leveled, uniform deposit • Designed for use with soluble anodes
EVF	<ul style="list-style-type: none"> • Exceptional microvia filling performance • Operates at current densities between 1–3 ASD (10–30 ASF) • Bright, leveled, uniform deposit • Designed for use with insoluble anodes
THF-100	<ul style="list-style-type: none"> • Exceptional through hole filling performance • Operates at current densities between 1–2.5 ASD (10–25 ASF) • Bright, leveled, uniform deposit • Designed for use with insoluble anodes
TIN PLATING (SULFURIC ACID BASED)	
RONASTAN™ EC-1	<ul style="list-style-type: none"> • Matte tin for etch resist applications • Exceptional throwing power • NP/NPE-free
TIN PLATING (METHANESULFONIC ACID BASED)	
SOLDERON™ PC-T	<ul style="list-style-type: none"> • Pure tin for etch resist applications • Designed for medium to high technology applications

PWB Final Finish

ACID CLEANERS	
RONACLEAN™ 960, EVP-209	<ul style="list-style-type: none"> • Acidic cleaners, specially designed for removing residues after development aqueous, alkali-strippable dry films
MICRO-ETCHANTS	
CIRCUPOSIT™ Etch 3330	<ul style="list-style-type: none"> • Peroxy-sulfate based • Mildly-acidic micro-etch providing excellent copper adhesion • Stable and active for longer periods of time while maintaining consistent etch rate
RONAMERSE™ CATALYSTS	
SMT Catalyst CF	<ul style="list-style-type: none"> • Palladium sulphate-based
ELECTROLESS NICKEL	
DURAPOSIT™ SMT 88	<ul style="list-style-type: none"> • 8–10% P content electroless nickel with excellent corrosion resistance and solderability • Low skip plating risk
PALLAMERSE™ ELECTROLESS PALLADIUM	
SMT 2000	<ul style="list-style-type: none"> • Electroless palladium-phosphorous • Used as part of ENEPIG finish for gold wire bonding and excellent solder joint reliability
IMMERSION GOLDS	
AUREUS™ 7950	<ul style="list-style-type: none"> • Uniform deposits of soft pure gold with excellent electroless nickel coverage to reduce Ni corrosion • Deposits 50-150 nm immersion gold for ENIG plating in 10-30 min • Deposits 30-120 nm immersion gold for ENEPIG plating in 10-30 min
AUROLECTROLESS™ SMT-525 G	<ul style="list-style-type: none"> • EDTA-free Immersion gold formulation • Performance is comparable to SMT 520

IMMERSION TIN

TINPOSIT™ LT34	<ul style="list-style-type: none"> • Advanced immersion tin for lead-free assembly • Smooth dendrite-free deposits • Fine-grained deposit offering excellent solderability and reliability • Notably reduces galvanic corrosion and solder mask attack • Deposits 1.0–1.2 µm (40–50 millions of an inch) tin in 10–13 minutes
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PWB Imaging Materials - Inner Layer**ACID CLEANERS**

RONACLEAN™ EVP-210S	<ul style="list-style-type: none"> • Sprayable, low foaming cleaner • NPE (APE) free
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MICRO-ETCHANTS

CIRCUPOSIT™ Etch 3330	<ul style="list-style-type: none"> • Peroxy-sulfate based • Mildly acidic micro-etch offering excellent copper adhesion • Stable and active for longer periods of time while maintaining consistent etch rate
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LITHOJET™ INKJET PHOTO RESIST

210	<ul style="list-style-type: none"> • UV-curable acrylic hybrid ink used for etching applications on copper, stainless steel and other metals • Compatible with most PZT drop-on-demand inkjet systems
220	<ul style="list-style-type: none"> • Etching and plating resist for Printed Circuit Board applications • Very high chemical resistance to acid and alkaline solutions • UV curable • Alkaline strippable
250	<ul style="list-style-type: none"> • Plating resist compatible with plating chemistries • Designed for high resolution plating • Very high chemical resistance to acid and alkaline solutions • UV curable • Alkaline strippable • Used in selective plating of connectors, electrolytic gold, nickel, copper, and electroless nickel

PHOTOPOSIT™ LIQUID PHOTORESIST

SN68 H-3	<ul style="list-style-type: none"> • Negative working photoresist designed for inner layer fabrication and photochemical machining • Stackable – in excess of 24 hrs. • Fast exposure speeds • Extremely low-foaming during developing • Suitable for acid etching applications
SP24	<ul style="list-style-type: none"> • Positive working photoresist designed for inner layer fabrication and photochemical machining • Can be used on virtually all metals and alloys including copper, stainless steel, aluminum, and on glass, ceramic and many other substrate • Dried film is extremely hard and stackable
Thinner Type P	<ul style="list-style-type: none"> • Diluent for adjusting resist viscosity

DEVELOPERS	
RESOLVE™ DEVELOPER 9033	<ul style="list-style-type: none"> • Aqueous developer for photoresist • 600+ g/L potassium carbonate solution with proprietary equipment cleaner
ANTI-FOAM	
DOWFAX™ DF-146	<ul style="list-style-type: none"> • Highly effective foam suppressant designed for use with developing and stripping solutions used with aqueous dry films
PHOTORESIST STRIPPING	
SURFACESTRIP™ 419, 715	<ul style="list-style-type: none"> • Highly concentrated, alkaline liquid designed to be used to fully strip aqueous dry film • Leaves underlayer of copper free of spots and oxidation for easy AOI inspection
BLACK OXIDE	
PROBOND™ 80 Oxide	<ul style="list-style-type: none"> • One of the fastest commercially-available self-limiting oxide for inner-layer manufacturing • Enhanced inner-layer adhesion on a variety of resin material • Will not over-oxidize or produce powdery surface • Addresses all industry specifications
CIRCUBOND™ OXIDE REPLACEMENT	
CIRCUBOND™ Cleaner 140	<ul style="list-style-type: none"> • Low-foaming alkaline-spray cleaner • Minimal attack on copper surfaces
CIRCUBOND™ PreDip 2217	<ul style="list-style-type: none"> • Designed to provide a surface compatible with either CIRCUBOND™ 2200 or CIRCUBOND™ 2200 Plus Treatment Bath
CIRCUBOND™ 2200	<ul style="list-style-type: none"> • Peroxide-based etchant for formation of uniform organo-metallic films for enhanced adhesion promotion • High copper loading of above 45 g/L
CIRCUBOND™ 2200 Plus	<ul style="list-style-type: none"> • Extremely consistent and high peel strength • High copper loading of above 45 g/L • Excellent peel strength on full range of lead-free and high Tg prepreg • Compatible with most halogen-free high-Tg and mid-Tg prepregs with high peel strength

A Worldwide Presence



Interconnect Technologies Locations:

DongGuan, Hong Kong, Shanghai and Suzhou, China

Sasakami, Japan

Tokyo, Japan

Seoul, South Korea

Taoyuan Hsien, Taiwan

Lucerne, Switzerland

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NOTE: Before using any product mentioned herein, consult the product's Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage. Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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