



Integrated Device Technology, Inc.  
2975 Stender Way, Santa Clara, CA - 95054

## PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN #: **I-0404-04** DATE: 4/19/2004

Product Affected: PBGA package (BB416)  
(see attachment for affected part #s).

Date Effective: 7/19/2004

### MEANS OF DISTINGUISHING CHANGED DEVICES:

- ☐ Product Mark  
☒ Back Mark Lot Number will have "N1" suffix  
☐ Date Code  
☐ Other

Contact: Geoffrey Cortes

Title: Manager, Corporate Quality & Reliability

Phone #: (408) 492-8321

Fax #: (408) 727-2328

E-mail: [Geoffrey.Cortes@idt.com](mailto:Geoffrey.Cortes@idt.com)

Attachment: ☒ Yes ☐ No

Samples: See attachment

### DESCRIPTION AND PURPOSE OF CHANGE:

- ☐ Die Technology  
☐ Wafer Fabrication Process  
☐ Assembly Process  
☐ Equipment  
☒ Material IDT has qualified the PBGA package (BB416) using new mold compound Sumitomo EME-G770 series and a new die attach material Ablestik 2300. This notification is to advise our customer of qualification and addition of new assembly materials. The new mold compound and die attach material can meet 260°C peak reflow temperature requirements. Please see attachment for qualification data and additional details.  
☐ Testing  
☐ Manufacturing Site  
☐ Data Sheet  
☐ Other

### RELIABILITY/QUALIFICATION SUMMARY:

Please see attached reliability qualification data.

### CUSTOMER ACKNOWLEDGMENT OF RECEIPT:

IDT records indicate that you require written notification of this change. Please use the acknowledgement below or E-Mail to grant approval or request additional information. If IDT does not receive acknowledgement within 30 days of this notice it will be assumed that this change is acceptable.

IDT reserves the right to ship either version manufactured after the process change effective date until the inventory on the earlier version has been depleted.

Customer: \_\_\_\_\_

☐ ***Approval for shipments prior to effective date.***

Name/Date: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Title: \_\_\_\_\_

Phone# /Fax# : \_\_\_\_\_

CUSTOMER COMMENTS: \_\_\_\_\_

### IDT ACKNOWLEDGMENT OF RECEIPT:

RECD. BY: \_\_\_\_\_

DATE: \_\_\_\_\_



Integrated Device Technology, Inc.  
2975 Stender Way, Santa Clara, CA - 95054

## PRODUCT/PROCESS CHANGE NOTICE (PCN)

### ATTACHMENT - PCN #: I-0404-04

**PCN Type:** Assembly Material Change

**Data Sheet Change:** None

**Detail Of Change:** A new mold compound material Sumitomo EME-G770 series and a new die attach material Ablestik 2300 has been qualified for PBGA package (BB416). The successful completion of this qualification has improved IDT's support of current and future production needs for components that meet 260°C peak reflow temperature. There is no change in Moisture Sensitive Level (MSL). Products will be shipped at the existing MSL and each shipment is labeled with the correct MSL. Please refer to the label for MSL information. Customer should not be adversely impacted by this change.

Description	Material	
	Existing	Add
Mold compound material	Nitto HC100XJAA series	Sumitomo EME-G770 series
Die attach material	Ablestik 2000	Ablestik 2300

#### The affected products are as follow:

Industry Package	IDT Part No	Industry Package	IDT Part No
PBGA 416	IDT79RC32K438-200BB	PBGA 416	IDT79RC32K438-233BBI
PBGA 416	IDT79RC32K438-200BBI	PBGA 416	IDT79RC32K438-266BB
PBGA 416	IDT79RC32K438-233BB	PBGA 416	IDT79RC32K438-300BB

Note: For T & R (shipping method) "8" is added to the part number and for industrial grade, letter "I" is added to the part number.



Integrated Device Technology, Inc.  
2975 Stender Way, Santa Clara, CA - 95054

## PRODUCT/PROCESS CHANGE NOTICE (PCN)

### ATTACHMENT - PCN #: I-0404-04

**Qualification Plan #:** P02-11-10

**Test Vehicle:** IDT72815BG

**Qualification Test Plan and Results:**

Test Description	Test Method	Test Results BG121 IDT72815BG (SS / # of Fails)
* High Accelerated Stress Test (Biased, 130 °C/85% RH, 100 Hrs)	JESD22-A110-B	45/0
* Temperature Cycling (-55 °C to 125 °C, 1000 cycles)	JESD22-A104-B	45/0
* Auto Clave (121 °C, 2 ATM, 168 Hrs)	JESD22-A102-C	45/0
High Temperature Life Test (1000 Hrs @ 125 °C or equivalent)	JESD22-A108-B	77/0
High Temp Bake (1000 Hrs @ 150 °C)	JESD22-A103-B	77/0
Moisture Sensitivity Classification	J-STD-020B	90/0
Internal Visual Inspection	MIL-STD-883, M2010	5/0
External Visual Inspection	JESD22-B101	25/0
X-ray Examination	MIL-STD-883, M2015	45/0
Bond Pull Test	MIL-STD-883, M2011	5/0
Bake & Ball Shear Strength	JESD22-B116	5/0
Physical Dimensions	JESD22-B100-B	5/0
Die Shear Strength	MIL-STD-883, M2019	5/0

**Notes:** \* Test requires moisture pre-conditioning sequence per JESD22-A113C.

# SUMITOMO BAKELITE

## SUMIKON<sup>®</sup>

EME-G770

MULTI-AROMATIC RESIN  
Br/Sb FREE  
FOR Pb FREE PKG  
LOW WARPAGE

## EME-G770

### TYPICAL PROPERTIES:

ITEM	TEST METHOD	UNIT	VALUES
SPIRAL FLOW	SB-U-03-003	cm	110
GEL TIME (at 175°C)	SB-U-03-005	sec	32
THERMAL EXPANSION $\alpha_1$	SB-U-02-002	X 10 <sup>-5</sup> 1/°C	0.8
THERMAL EXPANSION $\alpha_2$	SB-U-02-002	X 10 <sup>-5</sup> 1/°C	3.7
Tg	SB-U-02-002	°C	130
THERMAL CONDUCTIVITY	SB-U-02-004	W/m •°C	96x 10 <sup>-2</sup>
FLEXURAL STRENGTH	SB-U-01-001	N/ mm <sup>2</sup>	
(at 25°C)			170
(at 240°C)			17
FLEXURAL MODULUS	SB-U-01-002	X 10 <sup>2</sup> N/mm <sup>2</sup>	
(at 25°C)			260
(at 240°C)			6.0
SPECIFIC GRAVITY	SB-U-03-018	-----	2.01
VOLUME RESISTIVITY	SB-U-00-004	Ω - cm	1 x 10 <sup>12</sup>
(at 150°C)			
UL FLAME CLASS	SB-U-03-003	UL-94	V-0
WATER ABSORPTION	SB-U-03-002	% weight gain	0.15
(boiling, 24 h)			
EXTRACTED Na <sup>+</sup>	SB-U-04-043	ppm	1
EXTRACTED Cl <sup>-</sup>	SB-U-04-043	ppm	5

TYPICAL, NOT GUARANTEED PROPERTIES

### MOLDING AND POST MOLD CURE CONDITIONS:

	STANDARD	RANGE
TRANSFER PRESSURE	80 x10 <sup>5</sup> Pa	70-120 x10 <sup>5</sup> Pa
MOLD TEMPERATURE	180°C	175-185°C
CURE TIME (C or A)#	A/90 sec	70-120 sec
POST-MOLD CURE TEMP	175°C	170-180°C
POST-MOLD CURE TIME	6 h	4-8 h

#Conventional or Auto

rev.Feb. '03

The information contained herein is true and accurate to our best knowledge. Sumitomo Bakelite Co., makes no warranty or guarantee of results and assumes no obligation or liabilities from the use of any products mentioned herein. This publication is not to be taken as license to operate under or recommendations to infringe upon any patents.



SUMITOMO BAKELITE CO., LTD.

Tennoz Parkside Building, 5-8 Higashi-Shinagawa, 2-Chome Shinagawa-ku, Tokyo 140, Japan

## PILOT TECHNICAL DATA SHEET

# ABLEBOND® 2300

## ELECTRICALLY CONDUCTIVE ADHESIVE FOR PBGA

### DESCRIPTION

Ablebond® 2300 electrically conductive die attach adhesive is designed for Pb-free PBGA and Array BGA packaging. The proprietary hybrid chemistry used in Ablebond® 2300 adhesive has high hot / wet adhesion, low stress and ultra-low moisture absorption allowing packages to withstand the high reflow temperatures necessary

for Pb-free solders (260°C) . It is suitable for die sizes up to 12.7 x 12.7 mm.

Ablebond® 2300 adhesive has also been designed for ease of manufacture with excellent dispensing characteristics, fast cure capability and low bleed on solder mask surfaces.

### FEATURES

- Ultra-low moisture absorption
- High hot / wet adhesion
- Low stress
- Fast cure with no voids
- Minimal resin bleed

UNCURED PROPERTIES		TEST DESCRIPTION	TEST METHOD
Filler Type	Silver	Brookfield CP51 @ 5 rpm Viscosity @ 0.5/Viscosity @ 5 rpm 25% increase in viscosity @ RT	ATM-0018 ATM-0089 ATM-0087 ATM-0068
Viscosity @ 25°C	9,000 cP		
Thixotropic Index	5.9		
Estimated Work Life @ 25°C	> 24 hours		
Estimated Storage Life @ -40°C	6 months		
CURE PROCESS DATA			
Weight loss on cure	1.2%	10 x 10 mm Si die on glass slide	ATM-0031
Recommended Cure Condition	15 minutes @ 175°C		

Typical properties are not intended for use as specification limits. If you need to write a specification, ask for our Standard Release Specification. This is a Pilot product that has been converted to high volume manufacturing and is being monitored for process stability. During this monitoring period, certain properties may be adjusted slightly.

PHYSIOCHEMICAL PROPERTIES- POST CURE			TEST DESCRIPTION	TEST METHOD
<b>Ionics</b>	<b>Chloride</b>	<b>2 ppm</b>	<b>Teflon flask 5 gm sample / 20-40 mesh 50 gm DI water 100°C for 24 hours</b>	<b>ATM-0007</b>
	<b>Sodium</b>	<b>2 ppm</b>		
	<b>Potassium</b>	<b>&lt; 1 ppm</b>		
<b>Weight Loss @ 300°C</b>		<b>1.22%</b>	<b>Thermogravimetric Analysis</b>	<b>ATM-0073</b>
<b>Coefficient of Thermal Expansion</b>			<b>TMA expansion mode</b>	<b>ATM-0055</b>
	<b>Below Tg</b>	<b>60 ppm/°C</b>		
	<b>Above Tg</b>	<b>129 ppm/°C</b>		
<b>Dynamic Tensile Modulus</b>			<b>Dynamic mechanical thermal analysis using &lt; 0.5mm thick sample</b>	<b>ATM-0112</b>
<b>@ 25°C</b>		<b>1800 MPa</b>		
		<b>(260,400 psi)</b>		
<b>@ 250°C</b>		<b>240 MPa</b>		
		<b>(34,350 psi)</b>		
<b>Moisture Absorption @ Saturation</b>		<b>0.22%</b>	<b>Dynamic vapor sorption after 85°C/85% RH exposure</b>	<b>ATM-0093</b>
<b>THERMAL/ELECTRICAL PROPERTIES - POST CURE</b>				
<b>Thermal Conductivity</b>	<b>0.6 W/mK</b>		<b>Laser Flash 4-point probe</b>	<b>ATM-0116</b>
<b>Volume Resistivity</b>	<b>0.5 ohm-cm</b>			<b>ATM-0020</b>

Typical properties are not intended for use as specification limits. If you need to write a specification, ask for our Standard Release Specification. This is a Pilot product that has been converted to high volume manufacturing and is being monitored for process stability. During this monitoring period, certain properties may be adjusted slightly.

# ABLEBOND<sup>®</sup> 2300

## ELECTRICALLY CONDUCTIVE ADHESIVE FOR PBGA

### APPLICATION GUIDELINES

#### *SHIPMENT*

This Ablestik product is packed and shipped in dry ice at -80°C. Inside every dry ice shipment of Ablestik's products is a small packet containing the ABLECUBE. This is a small blue cube which retains its shape at -40°C. If the ABLECUBE is exposed to temperatures higher than -40°C, the cube will melt.

Please check the state of the ABLECUBE to ensure the integrity of the shipment. If the ABLECUBE has melted upon Receiving Inspection, place the entire shipment in a -40°C freezer and contact your Ablestik Customer Service or Sales Representative.

#### *UNPACKING*

Transfer the syringes from the dry ice to a -40°C freezer without ANY delays. Freeze-thaw voids will form in the syringes if the syringes are repeatedly thawed and refrozen.

#### *STORAGE*

This Ablestik product must be stored at -40°C. The shelf life of the material is only valid when the material has been stored at the specified storage condition. Incorrect storage conditions will degrade the performance of the material in both handling (e.g. dispensing or screen printing) and final cured properties.

#### *THAWING*

Allow the container to reach room temperature before use. After removing from the freezer, set the syringes to stand vertically while thawing. Refer to Syringe Thaw Time chart on the next page for the thaw time recommendation.

DO NOT open the container before contents reach ambient temperature. Any moisture that collects on the thawed container should be removed prior to opening the container. DO NOT re-freeze. Once thawed to room temperature, the adhesive should not be re-frozen.

#### *ADHESIVE APPLICATION*

Thawed adhesive should be immediately placed on dispense equipment for use. If the adhesive is transferred to a final dispensing reservoir, care must be exercised to avoid entrapment of contaminants and/or air into the adhesive.

Apply enough adhesive to achieve a 25-50 µm (1-2 mil) wet bondline thickness, dispensed with approximately 25% - 50% filleting on all sides of the die. Alternate dispense amounts may be used depending on the application requirements. Star or cross shaped dispense patterns will yield fewer bondline voids than the matrix style of dispense pattern.

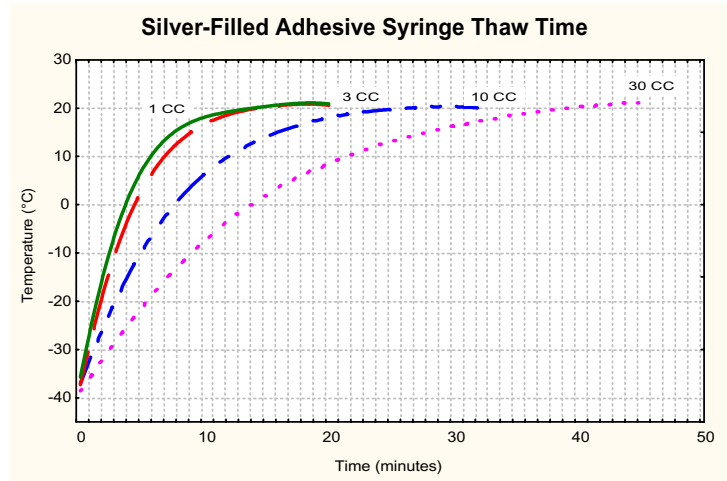
Contact Ablestik Technical Service Department for detailed recommendation on adhesive application, including dispensing.

**CURE**

Ablebond® 2300 adhesive can be cured in box ovens. See the cure process data on page 1.

**AVAILABILITY**

Ablebond adhesives are packaged in syringes or jars per customer specification. Available package sizes range from 1cc to 30cc and 1 ounce to 1 pound. For details, refer to the Ablestik Standard Package Data Set or contact your Customer Service Representative.



**CAUTION** This product may cause skin irritation in sensitive persons. Avoid skin contact. If contact does occur, wash area immediately with soap and water. Please refer to Material Safety Data Sheet (OSHA) for more details.

NATIONAL STARCH MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESSED OR IMPLIED, CONCERNING THE SUITABILITY OF THESE MATERIALS FOR USE IN IMPLANTATION IN THE HUMAN BODY OR FOR ANY OTHER USE. These materials are not designed or manufactured for use in implantation in the human body. National Starch has not performed clinical testing of these materials for implantation. National Starch has neither sought, nor received, approval from the FDA for the use of these materials in implantation in the human body.



20021 Susana Road, Rancho Dominguez, CA 90221  
 (310) 764-4600 Fax 310-764-2545 CUSTOMER SERVICE FAX 310-764-1783  
[www.ablestik.com](http://www.ablestik.com)

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be accurate, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of warranty express or implied. Seller and manufacturer's obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arise from the use or inability to use the product. Before using, effect unless in an agreement signed by officers of seller and manufacturer. to his intended use, and user assumes all risk and liability whatsoever in connection therewith. No statement or recommendation contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.