

**LOCTITE**<sup>®</sup>

MATERIAL SOLUTIONS FOR

# FINGERPRINT SENSORS





# CONTENTS

Introduction.....	2	Underfills.....	11
Product Portfolio .....	5	Wirebond Sealing / Encapsulants .....	12
Adhesives in Action .....	6	Reinforcement of FPC.....	13
Glass to IC Attach .....	8	Ring Attach Materials.....	14
Electrically Conductive Adhesives .....	9	Hard Coating Materials.....	15
Sensor Die Attach Materials .....	10		

## INTRODUCTION

As confidential transaction capabilities become integrated into mobile devices, security and reliability play an even more critical role in device development. The rollout of point-of-sale payment options on smartphones has accelerated the need for unique customer identification via fingerprint recognition. To facilitate this functionality, fingerprint sensors are now an integral part of the latest-generation mobile devices, and the market for these sensors is growing exponentially.

As a market leader in conductive and non-conductive adhesives and inks, Henkel is the ideal partner for fingerprint sensor manufacturers, delivering a full portfolio of material solutions for robust sensor development and production.

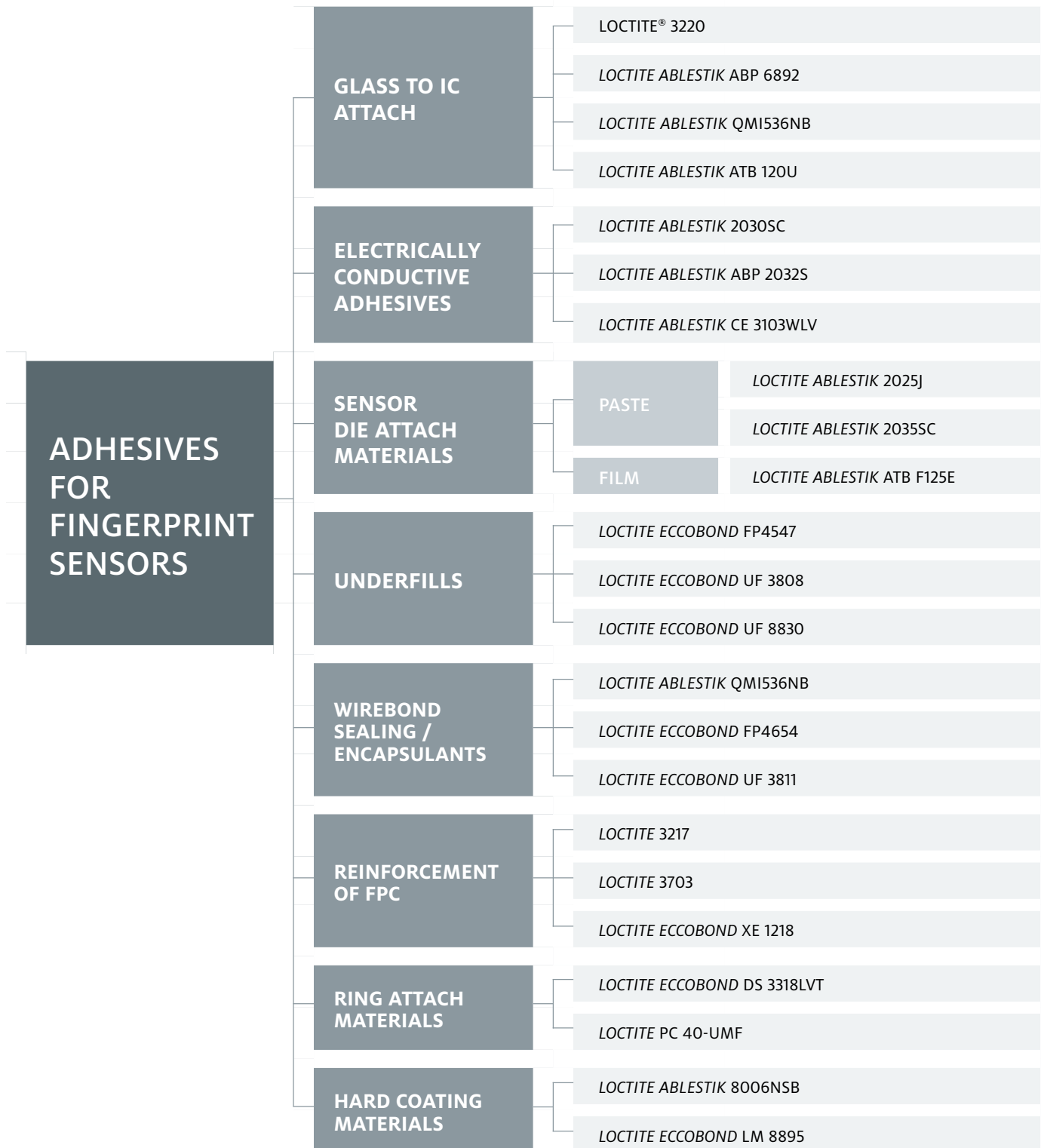








# PRODUCT PORTFOLIO



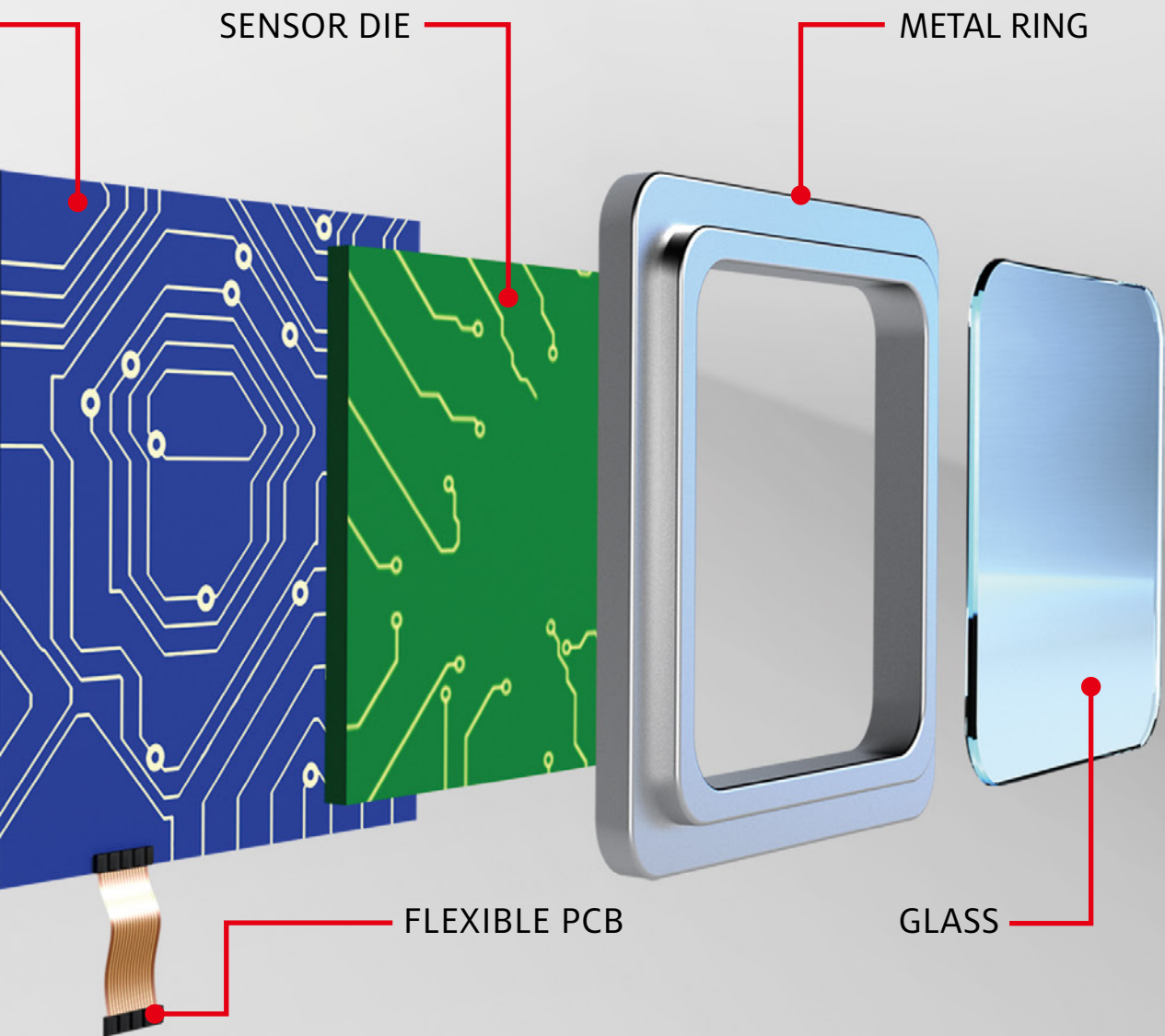
# ADHESIVES IN ACTION



SUBSTRATE

CONTROLLER DIE



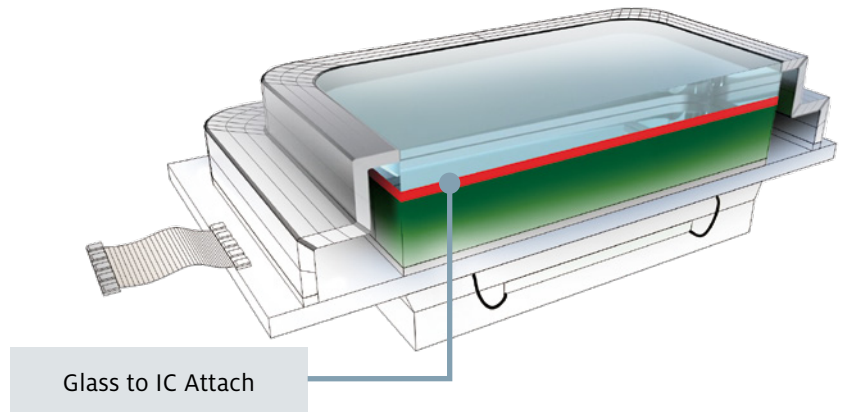


# GLASS TO IC ATTACH

## ADHESIVE TO ATTACH GLASS TO SENSOR DIE

### Key Material Properties

- High adhesion
- Low-temperature cure
- Low-moisture absorption
- Thin bond line control



### Glass to IC Attach

LOCTITE® 3220

LOCTITE  
ABLESTIK ABP 6892

LOCTITE  
ABLESTIK QMI536NB

LOCTITE  
ABLESTIK ATB 120U

Properties	Units	LOCTITE 3220	LOCTITE ABLESTIK ABP 6892	LOCTITE ABLESTIK QMI536NB	LOCTITE ABLESTIK ATB 120U	
Appearance		Black	Clear	White	Transparent	
Cure Type		Heat	Heat	Heat	Heat	
Viscosity	cP	2,500	4,100	10,000	-	
Glass Transition Temperature (T <sub>g</sub> )	°C	26	-24.6	-30	75	
Modulus at 25°C	N / mm <sup>2</sup>	550	176	300	875	
CTE	below	ppm / °C	61	111	80	62
	above		171	191	150	238
Recommended Cure		10 min. at 80°C	60 min. at 80°C	30 min. at 150°C	30 min. at 120°C	
Alternative Cure		-	30 min. at 130°C	60 min. at 80°C	30 min. at 90°C	

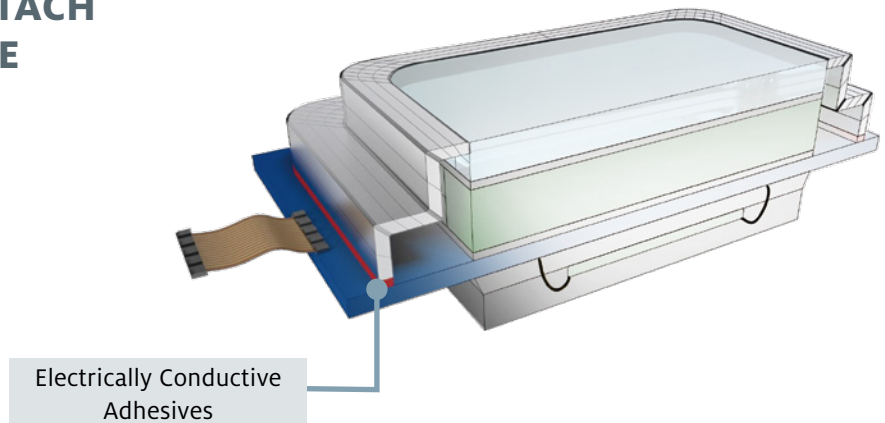


# ELECTRICALLY CONDUCTIVE ADHESIVES

## SOLDER ALTERNATIVE TO ATTACH METAL RING TO METAL PLATE

### Key Material Properties

- Good electrical connection
- Low-temperature cure
- Fast cure
- High adhesion



### Electrically Conductive Adhesives

LOCTITE ABLESTIK 2030SC

LOCTITE ABLESTIK ABP 2032S

LOCTITE ECCOBOND CE 3103WLV

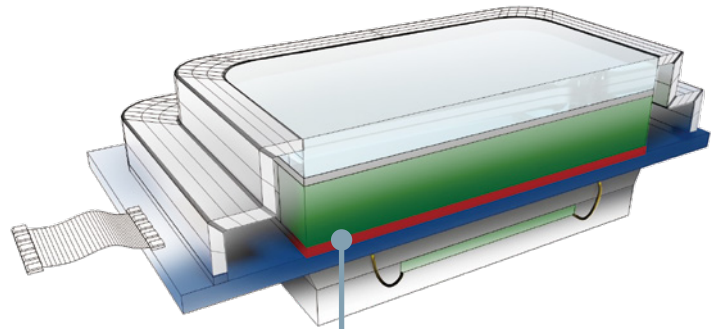
Properties	Units	LOCTITE ABLESTIK 2030SC	LOCTITE ABLESTIK ABP 2032S	LOCTITE ECCOBOND CE 3103WLV
Appearance		Silver	Silver	Silver
Viscosity (Brookfield CP51 / 5 rpm)	cP	11,600	11,000	15,000
Glass Transition Temperature (T <sub>g</sub> )	°C	29	110	114
Modulus at 25°C	N / mm <sup>2</sup>	3,300	4,600	4,500
CTE	below	45	54	45
	above	130	162	225
Recommended Cure		90 sec. at 110°C	60 min. at 80°C	10 min. at 120°C
Alternative Cure		30 min. at 80°C	-	110 min. at 80°C

# SENSOR DIE ATTACH MATERIALS

## SENSOR DIE ATTACH TO FR4, CERAMIC OR PCB

### Key Material Properties

- High adhesion
- Low-temperature cure
- Low warpage



Sensor Die Attach Materials

### Sensor Die Attach Materials

Paste		Film
LOCTITE® ABLESTIK 2025J	LOCTITE ABLESTIK 2035SC	LOCTITE ABLESTIK ATB F125E

Properties	Units	LOCTITE ABLESTIK 2025J	LOCTITE ABLESTIK 2035SC	LOCTITE ABLESTIK ATB F125E
Type		Paste	Paste	Film
Viscosity (Brookfield CP51 / 5 rpm)	cP	12,900	11,000	-
Thickness	µm	-	-	25
Glass Transition Temperature (T <sub>g</sub> )	°C	22	120	215
Modulus at 25°C	N / mm <sup>2</sup>	320	2,500	5,256
CTE	below	45	54	37
	above	135	128	83
Recommended Cure		30 min. ramp to 175°C + 15 min. at 175°C	90 sec. at 110°C	30 min. ramp + 1 hr. at 130°C
Alternative Cure		-	30 min. at 80°C	-

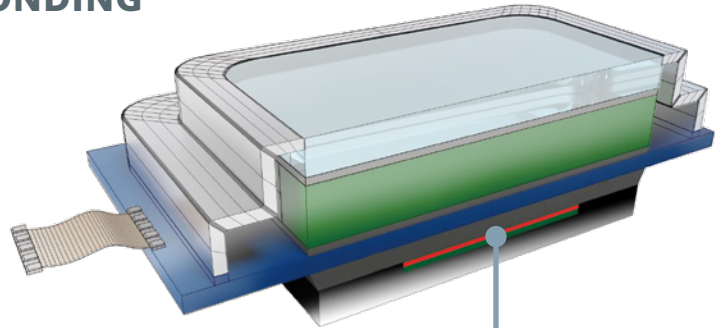


# UNDERFILLS

## REINFORCEMENT OF FLIP-CHIP DIE BONDING AND RIGID SUBSTRATE CONNECTION

### Key Material Properties

- Good flow ability
- Flexible product to accommodate stress
- High adhesion
- High reliability



Underfills

Underfills		
<i>LOCTITE ECCOBOND FP4547</i>	<i>LOCTITE ECCOBOND UF 3808</i>	<i>LOCTITE ECCOBOND UF 8830</i>

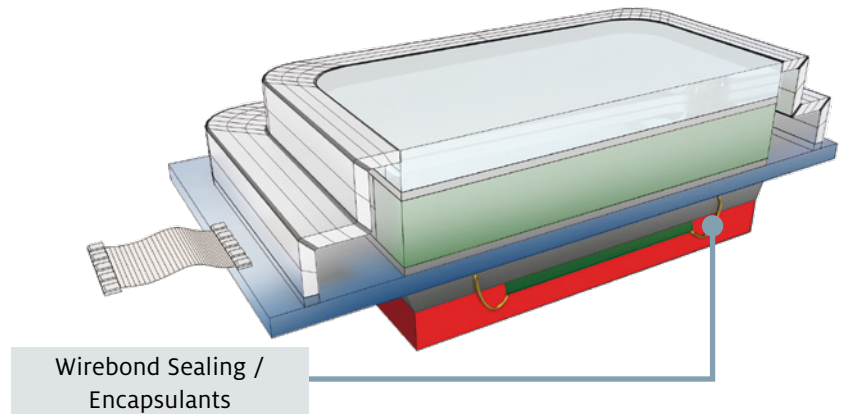
Properties	Units	<i>LOCTITE ECCOBOND FP4547</i>	<i>LOCTITE ECCOBOND UF 3808</i>	<i>LOCTITE ECCOBOND UF 8830</i>
Viscosity	cP	18,000	360	12,000
Glass Transition Temperature ( $T_g$ )	°C	135	113	92
Modulus at 25°C	N / mm <sup>2</sup>	11,000	2,610	5,800
CTE	below	21	55	31
	above	80	171	120
Recommended Cure		30 min. at 165°C	≥ 8 min. at 130°C	2 hr. at 150°C

# WIREBOND SEALING / ENCAPSULANTS

## PROTECTIVE ADHESIVE FOR WIREBOND

### Key Material Properties

- Low-temperature cure
- Suitable modulus
- Pass reliability



### Wirebond Sealing / Encapsulants

LOCTITE® ABLESTIK QM1536NB

LOCTITE ECCOBOND FP4654

LOCTITE ECCOBOND UF 3811

Properties	Units	LOCTITE ABLESTIK QM1536NB	LOCTITE ECCOBOND FP4654	LOCTITE ECCOBOND UF 3811
Viscosity (Brookfield CP51 / 5 rpm)	cP	10,000	32,000	354
Glass Transition Temperature (T <sub>g</sub> )	°C	-30	146	124
Modulus at 25°C	N / mm <sup>2</sup>	300	16,900	2,445
CTE	below	80	13	61
	above	150	53	190
Recommended Cure		30 min. at 150°C	90 min. at 165°C	60 min. at 100°C

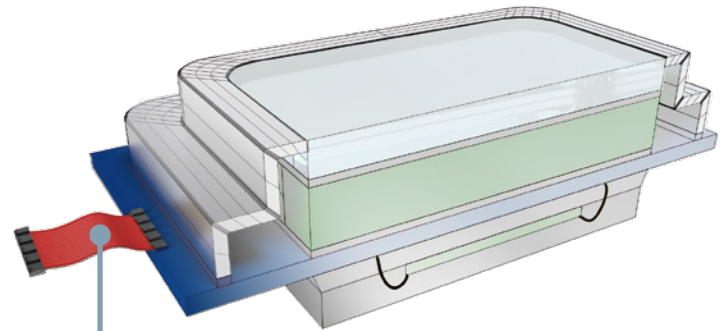


# REINFORCEMENT OF FPC

## REINFORCEMENT OF FLEXIBLE PCB AND RIGID SUBSTRATE CONNECTION

### Key Material Properties

- Flexible product to accommodate stress
- High adhesion



Reinforcement of FPC

### Reinforcement of FPC

LOCTITE 3217

LOCTITE 3703

LOCTITE ECCOBOND XE 1218

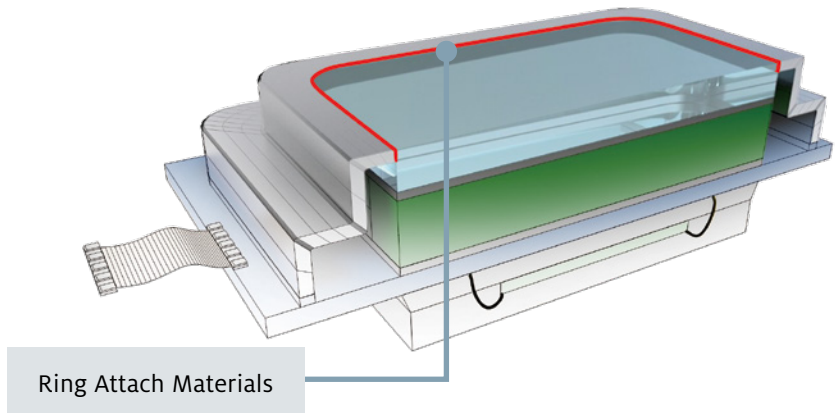
Properties	Units	LOCTITE 3217	LOCTITE 3703	LOCTITE ECCOBOND XE 1218
Appearance		Amber	White	Black
Cure Type		Dual Cure	UV	Heat Cure
Chemical Type		Acrylate Epoxy	Acrylate Urethane	Epoxy
Viscosity	cP	37,600 Cone PK AT 20 S <sup>-1</sup>	18,000 Brookfield AT 20 rpm	1,118 Casson vis AT 25°C
Modulus at RT	N / mm <sup>2</sup>	330	490	400
Recommended Cure		1 sec. at 100 mW / cm <sup>2</sup> + 30 min. at 60°C or 20 min. at 80°C	80 sec. at 30 mW / cm <sup>2</sup>	35 min. at 90°C

# RING ATTACH MATERIALS

## RING ATTACH TO GLASS

### Key Material Properties

- Good adhesion
- UV or low-temperature cure
- Good gap fill capability
- Low bleed



Ring Attach Materials	
LOCTITE® ECCOBOND DS 3318LVT	LOCTITE PC 40-UMF

Properties	Units	LOCTITE ECCOBOND DS 3318LVT	LOCTITE PC 40-UMF
Appearance		Clear	Clear
Viscosity	cP	142	250
Glass Transition Temperature ( $T_g$ )	°C	96	94
Modulus at RT	N / mm <sup>2</sup>	408	1,493
Recommended Cure		15 sec. at 100 mW / cm <sup>2</sup>	10 sec. at 600 mW / cm <sup>2</sup> + RT cure

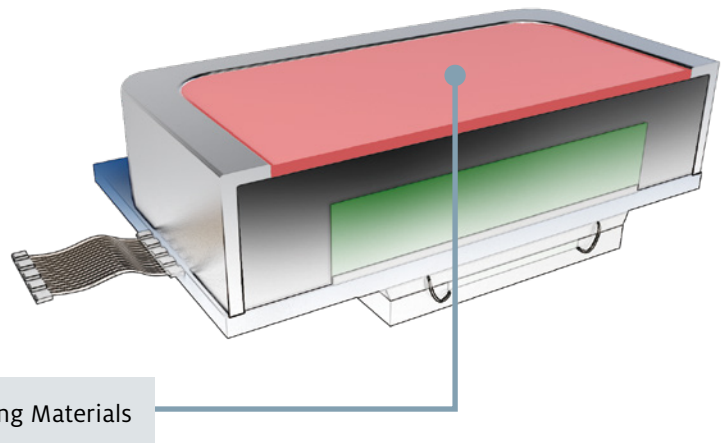


# HARD COATING MATERIALS

## REPLACE GLASS / HARD FILM

### Key Material Properties

- Hard hardness > 5H
- Water-resistant
- Passes sweat or salt test
- Gloss finish
- Void-free
- Scratch-resistant
- Chemical-resistant
- UV-light-resistant



Hard Coating Materials	
<i>LOCTITE ABLESTIK 8006NSB</i>	<i>LOCTITE ECCOBOND LM 8895</i>

Properties	Units	<i>LOCTITE ABLESTIK 8006NSB</i>	<i>LOCTITE ECCOBOND LM 8895</i>
Viscosity Brookfield at 20 rpm	cP	52,000	12,000
Glass Transition Temperature (T <sub>g</sub> )	°C	158	29
CTE	below	45	26
	above	134	231
Modulus at RT	N / mm <sup>2</sup>	4,376	4,194
Recommended Cure		2 hr. at 160°C / 30 min. at 175°C	60 min. at 150°C

**AMERICAS****UNITED STATES**

Henkel Corporation  
14000 Jamboree Road  
Irvine, CA 92606  
United States  
Tel: +1.888.943.6535  
Fax: +1.714.368.2265

Henkel Corporation  
20021 Susana Road  
Rancho Dominguez, CA 90221  
United States  
Tel: +1.310.764.4600  
Fax: +1.310.605.2274

Henkel Corporation  
18930 W. 78th Street  
Chanhassen, MN 55317  
United States  
Tel: +1.952.835.2322  
Tel: +1.800.347.4572  
Fax: +1.952.835.0430

**BRAZIL**

Henkel Brazil  
Av. Prof. Vernon Kriebler, 91  
06690-070 Itapevi, Sao Paulo  
Brazil  
Tel: +55.11.3205.7001  
Fax: +55.11.3205.7100

**ASIA-PACIFIC****CHINA**

Henkel Management Center  
Building 7, No. 99 Jiang Wan Cheng Road  
Shanghai 200438,  
China  
Tel: +86.21.2891.8999  
Fax: +86.21.2891.8952

ABLESTIK (Shanghai) LIMITED  
No. 332 Meigui South Road  
WaiGaoQiao Free Trade Zone, Pu Dong  
Shanghai 200131,  
China  
Tel: +86.21.2702.5888  
Fax: +86.21.5048.4169

**JAPAN**

Henkel Japan Ltd.  
27-7, Shin Isogo-cho  
Isogo-ku Yokohama, 235-0017  
Japan  
Tel: +81.45.286.0161  
Email: [jp.ae-csdesk@henkel.com](mailto:jp.ae-csdesk@henkel.com)

**KOREA**

Henkel Korea Co Ltd.  
18th Floor of tower B, BYC High City Bldg  
Gasam Digital 1-ro, Geumcheon-gu,  
Seoul, 08506  
South Korea  
Tel: +82.2.6150.3000  
Fax: +82.2.6947.5203

**SINGAPORE**

Henkel Singapore Pte Ltd.  
401, Commonwealth Drive  
#03-01/02 Haw Par Technocentre,  
Singapore 149598  
Tel: +65.6266.0100  
Fax: +65.6472.8738 / +65.6266.1161

**TAIWAN**

Henkel Taiwan Ltd.  
10F, No. 866, Zhongzheng Road,  
Zhonghe District, New Taipei City, 23586  
Taiwan  
Tel: +866.2.2227.1988  
Fax: +866.2.2226.8699

**EUROPE****BELGIUM**

Henkel Belgium N.V.  
Nijverheidsstraat 7  
B-2260 Westerlo  
Belgium  
Tel: +32.1457.5611  
Fax: +32.1458.5530

**UNITED KINGDOM**

Henkel Ltd.  
Adhesives Limited Technologies House  
Wood Lane End  
Hemel Hempstead  
Hertfordshire HP2 4RQ  
United Kingdom  
Tel: +44.1442.278000  
Fax: +44.1442.278071

Across the Board,  
Around the Globe.



[henkel-adhesives.com/electronics](http://henkel-adhesives.com/electronics)