# **THERMAL COMPOUNDS, ADHESIVES & INTERFACE MATERIALS**



THERMAL

**INTERFACE PRODUCTS** 

# **120 SERIES**

The **120 Series** Silicone Oil-Based Thermal Joint Compound fills the minute air gap between mating surfaces with a grease-like material containing zinc oxide in a silicone oil carrier. It possesses an excellent thermal resistance of only 0.05°C/W for a 0.001 in. film with an area of one square inch. There is no measurable increase in case temperature of a mounted semiconductor on a heat sink after the 6-month stabilization period (Time versus Thermal Resistivity graph below).

TYPICAL VALUES FOR THERMAL RESISTANCE, CASE TO SINK (Øcs) WHEN THERMAL JOINT COMPOUNDS ARE USED			
Case Style Characteristics	Mounting Torque in inch • pounds (N•M)	Typical Thermal Resistance (°C/W)	
TO-3 TO-66 TO-220 0.19 (4.8) stud x 0.44 (11.2) hex 0.25 (6.4) stud x 0.69 (17.5) hex 0.38 (9.7) stud x 1.06 (26.9) hex 0.50 (12.7) stud x 1.06 (26.9) hex 0.75 (19.1) stud x 1.25 (31.8) hex	8 (0.9) 9 (0.9) 8 (0.9) 15 (1.7) 30 (3.39) 75 (8.47) 125 (14.12) 600 (67.79)	0.09 0.14 0.50 0.16 0.10 0.07 0.07 0.052	

120 SERIES - ORDER GUIDE		
Series - P/N	Container Size	
120-SA	4 gram plastic pak	
120-2	2 oz (0.06 kg) jar	
120-5	5 oz (0.14 kg) tube	
120-8	8 oz (0.23 kg) jar	
120-80	5 lb (2.27 kg) can	
120-320	20 lb (9.08 kg) can	

120 SERIES - THERMAL JOINT COMPOUND				
Characteristic	Description			
Volume Resistivity Dielectric Strength Specific Gravity Thermal Conductivity @ 36°C	5 X 10 <sup>14</sup> ohm-cm 225 volts/mil 2.1 min. 0.735 W/(m)(K) 5.1(Btu) (in.)/(hr)(ft <sup>2</sup> )(°F)			
Thermal Resistivity (P) Bleed, % after 24 hrs @ 200°C Evaporation, % after 24 hrs @ 200°C Color Shelf life Operating Temperature Range (°C)	56 (°C)(in.)/watt 0.5 0.5 opaque white 5 years -40/+200			



**122 SERIES** 

# **HIGH PERFORMANCE THERMAL** COMPOUND

**122 Series Thermal Joint Compound** is a stable, silicone based, thixotropic paste developed to provide premium performance at an affordable price. It is formulated to significantly reduce contact thermal resistance where power densities are concentrated in devices such as flip chip, reduced die size, and 'overclock' microprocessors. When applied as a thin film between a Wakefield-Vette heat sink and device it possesses superior thermal conductivity compared to traditional 'grease'. It is compatible with automated or manual dispensing methods and is fully RoHS compliant.

122 SERIES THERMAL JOINT COMPOUND		
Typical Characteristics	Description	
Appearance	Smooth Gray paste	
Thermal Conductivity	2.5 W / m °K,	
	17.3 (Btu) (in.)/(hr) (ft²) (°F)	
Thermal Resistance	0.02 °C in 2 / W	
Bleed	0.015 wt%, 24 hrs at 200°C	
Evaporation	0.150 wt%, 24 hrs at 200°C	
Volume Resistivity	1.4 x 1010 ohm-cm	
Dielectric Strength	225 volts/mil	
Specific Gravity	2.23 (gm/cc) at 25°C	
Operating Range	-40°C to 205°C	
Shelf Life	5 years	

R GUIDE				
122 SERIES - ORDER GUIDE				
Container Size				
10cc syringe 2 oz (0.06 kg) jar 30cc syringe				

# **THERMAL COMPOUNDS, ADHESIVES & INTERFACE MATERIALS**

The 126 Series is a nontoxic, synthetic, ester-based (nonsilicone) Thermal Joint Compound with metal oxide fillers designed to enhance thermal performance characteristics of plastic and metal package devices exceeding that of silicone-based compounds. Solved are problems associated with contamination of wave solder baths and migration of silicone-based products. Shelf life: 5 years.

126 SERIES THERMAL JOINT COMPOUND				
Characteristics		Description		
Appearance Solids Content, w Thermal Conduct Interface Therma Bleed, 24 hrs at 2 Evaporation, 24 h Volume Resistivit Dielectric Strengt Specific Gravity @ Penetration Operating Range	t % ivity at 36°C I Resistance :00°C, wt% irs at 200°C, wt% y h 0 60°F	Smooth, white 65% min .69 W / m <sup>o</sup> K, 4 0.043°C/W TC 0.09% max 0.6 max 2.3 x 10 <sup>12</sup> ohn 200 volts/mil 2.93 (gm/cc) 280 to 320 -40°C to 200°		



### **DELTABOND<sup>™</sup> 152**

DeltaBond<sup>™</sup> 152 adhesive is ideal for general cementing; thermally bonding semiconductors and components to chassis or heat sinks, while electrically isolating one from the other; fabricating heat sinks or thermal links; and for all permanent bonding of assemblies which require high thermally conductive interfaces. It produces a rigid, high strength bond to most materials when cured. DeltaBond™ 152 is available in bi-packs, kits, and quarts. Order one bottle of hardener A-4 or B-4 per one quart of **DeltaBond™ 152** separately. Shelf life: 152KA 1 year, all others 2 years.

DELTABOND™ 152			DELTABOND™152		
Characteristics	Harden	er Type	Mixing Proportions and Working Properties		
Typical Properties Fully Cured	A4	B4	Characteristics	A4	B4
Thermal conductivity - W/(m) (°K) (Btu) (in.)/(hr) (ft²) (°F) Thermal resistivity - (°C) (in.) watt Bond shear strength 77°F 1 in. overlap - psi 125°F etched aluminum to etched aluminum 212°F Heat distortion point - °F Minimum dielectric strength, v/mil, 0.125 in. sample Max operation Continuous temp - °C Intermittent	0.836 5.8 47 2,900 2,200 400 130 400 65 100	0.908 6.3 42 2,300 2,000 800 225 400 150 190	Parts of hardener per 100 parts of resin by weight *Working Time - at 77°F †Initial cure time 77°F 150°F 250°F ‡Post-cure time at a temp in °F ‡Alternate room temp. aging time at 77°F Working consistency (77°F) Working viscosity (77°F) cps	7.5 45 min 8 hrs 45 min 20 min 4 hrs @200°F 4 days viscous liquid 25,000	3.5 30 min 6 hrs 30 min 15 min 4 hrs @ 200°F 4 days paste —

#### NOTES:

- \* Since the hardener/resin reaction is exothermic, it is important that batch Isize be matched to hardener speed. Working times given are for approximate batch sizes: A-200 gms, B-200 gms. Larger batch sizes will greatly reduce working time.
- \*\* For optimum electrical properties, dry parts for 15 minutes at 150°F (65°C) or 30 minutes at 75°F (24°C) to slowly
- evaporate the thinner and then final cure for 4 hours at 275°F (135°C). + After initial cure, material may be handled, removed from fixture, etc., but has not yet achieved full properties and should be room temperature aged or post-cured as shown to achieve full physical and electrical properties
- ‡ After initial cure, material may be brought to full physical and electrical properties during post-cure or may be room temperature aged for charted length of time to achieve same full properties. The information contained herein is based on data believed to be reliable but we do not assume responsibility



140





**126 SERIES** 

126 SERIES - ORDER GUIDE

Container Size

2 oz (0.6 kg) jar 4 oz (0.11 kg) tube 4 oz (0.11 kg) syringe

5 lb (2.27 kg) can

Series - P/N

126-2 126-4

126-4S 126-5LB



e homogeneous paste

4.8 (Btu)(in.)/(hr) (ft²) (°F) O-3 at 0.0008 thick film

ms-cm

DELTABOND™152					
	Ordering Guide - Resin and Hardener				
Model	Resin		Hardener		
Number	Part No.	Container	Part Number		
DeltaBond™ 152	152-1A 152-1B 152-KA 152-Q	Bi-Pack (1 oz) Bi-Pack (1 oz) Kit (7 oz Resin, 0.5 oz Hardener) 1 quart (4 lbs)	Included in PIN 152-1 A ("A-4") Type Included in P/N 152-1 B ("B-4") Type Included in P/N 152-KA A-4 (0.316 lb), B-4 (0.14 lb), (order 1 only)		
All hardener part numbers: A-4, B-4					

for accuracy. All such information is used at the customer's own risk, conditions of use being beyond our control