TIMTRONICS
THERMAL INTERFACE MATERIALS

Thermal Greases

NON –SILICONE Thermal Greases(Blue Ice Series):

Blue Ice Series are unique synthetic thermal greases engineered to provide **low bleed and oil migration (Pump Out)** to prevent component contamination associated with silicone greases. They offer superior thermal conductivity and low thermal resistance with long term stability.

Property	Test Method	411	412	4100	4100LV	430	4200	4050LV	4060
Type		Silicone Free	Silicone Free	Silicone Free	Silicone Free	Silicone Free	Silicone Free	Silicone Free	Silicone Free
Special Future		Low Vis, Thin BLT	High Die-electric	No Sag, Stable	Screen printable, thin BLT	High Die-electric	Tacky, Zero Pump out	Tacky, Zero Pump out	High TC, Stable
Color	Visual	White	White	Gray	Gray	White	Gray	Gray	Gray
Viscosity 5 rpm @ 25°C, PaS	Helipath	90	400	400	100	220	450	480	700
Specific Gravity	ASTM D792	2.4	2.7	2.2	2.2	2.7	2.4	2.4	2.4
Operating Temperature Range.°C		-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C
Shelf Life		5 years	5 years	5 years	5 years	5 years	5 years	5 years	5 years
THERMAL									
Thermal Conductivity (W/m-K)	ASTM D5470	0.8	2.0	2.6	2.6	3.0	3.2	5.0	6.0
Thermal Resistance °C-in²/W	ASTM D5470	0.03	0.03	0.014	0.014	0.01	0.01	0.005	0.005
ELECTRICAL									
Breakdown Voltage (KV/mm)	ASTM D149	12.4	16	2.8	2.8	16	2.8	2.8	2.8
Dissipation Factor (1KHz)	ASTM D150	0.0021	0.003	0.12	0.12	0.017	0.12	0.12	0.12
Volume Resistivity (Ohm-cm)	ASTM D257	10^14	10^14	10^9	10^9	10^14	10^9	10^9	10^9

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THERMAL INTERFACE MATERIALS

Silicone Thermal Compounds (White Ice Series)

White Ice series are silicone based thermal greases engineered with special binding agents to reduce bleed and oil separation. These compounds offers excellent wetting properties, spreadability and the low viscosity formulation makes them easy to apply to thin bond line thickness for minimum thermal resistance. Timtronics silicone compounds offer superior conductivity, low thermal resistance and long term stability.

Property	Test Method	510	510CR	511	515	5100	530
Type		Silicone	Silicone	Silicone	Silicone	Silicone	Silicone
Special Futures		Screen Printable	Thixotropic. Non-Sag	High Dielectric	High Dielectric	Non-Sag Stable	High TC,
Color	Visual	White	White	White	White	Gray	Light Gray
Viscosity 5 rpm @ 25°C, PaS	Helipath	150	720	50	40	550	180
Specific Gravity	ASTM D792	2.2	2.3	2.5	2.0	2.2	2.7
Operating Temperature Range.°C		-55°C to 205°C	-55°C to 205°C	-55°C to 205°C	-55°C to 205°C	-55°C to 205°C	-55°C to 205°C
Shelf Life	5 years	5 years	5 years	5 years	5 years	5 years	5 years
THERMAL							
Thermal Conductivity (W/m-K)	ASTM D5470	0.8	1.0	2.0	2.0	2.6	3.0
Thermal Resistance °C-in²/W	ASTM D5470	0.05	0.05	0.025	0.017	0.01	0.01
ELECTRICAL							
Breakdown Voltage (KV/mm)	ASTM D149	15	15	16	16	2.8	16
Dissipation Factor (1KHz)	ASTM D150	0.0021	0.0021	0.0028	0.0026	0.1277	0.0028
Volume Resistivity (Ohm-m)	ASTM D257	10^14	10^14	10^14	10^14	10^9	10^14

TIMTRONICS
THERMAL INTERFACE MATERIALS

High Temperature Thermal Compounds (Red Ice Series)

Product Description: Red Ice series are high temperature stable thermal greases engineered with special aerospace fluid technology to eliminate compound "dry out" problems due to continuous operating temperature above 200 °C. This series of thermal compounds has shown outstanding heat transfer and high temperature stability for all types of electronic and industrial applications. Recommended for aerospace application because of low to zero out gassing, No dry out when application stays under recommended temperature range.

Typical Applications: Aero Space applications, Heater cartridges, 3D printers Thermistors, RTD, Thermocouple wells, Portable heaters and Tank heaters.

Property	Test Method	615	613	614	610	611	611LV	611HTC
Type		Silicone	Silicone	Silicone	Silicone Free	Silicone Free	Silicone Free	Silicone Free
Special Future		250°C Low cost	250°C High TC	250°C High TC	300°C No-Sag	360°C No-Sag	Low viscosity. 360°C No-Sag	360°C High TC
Color	Visual	White	White	Gray	White	White	White	Gray
Viscosity 50 rpm @ 25°C, PaS	Helipath	50	60	100	600	200	100	150
Specific Gravity	ASTM D792	2.4	2.3	2.1	2.9	3.0	3.0	3.2
Shelf Life		5 years	5 years	5 years	5 years	5 years	5 years	5 years
Operating Temperature Range.°C		-55°C to 250°C	-55°C to 250°C	-55°C to 250°C	-55°C to 300°C	-55°C to 360°C	-55°C to 360°C	-55°C to 360°C
THERMAL								
Thermal Conductivity (W/m-K)	ASTM D5470	0.9	1.2	2.2	1.0	0.8	0.8	3.2
Thermal Resistance °C-in²/W	ASTM D5470	0.045	0.04	0.03	0.05	0.06	0.06	0.0016
ELECTRICAL								
Breakdown Voltage (KV/mm)	ASTM D149	17	16	2.8	14	15	15	3
Dissipation Factor (1KHz)	ASTM D150	0.0025	0.0025	0.12	0.0020	0.0016	0.0016	0.12
Volume Resistivity (Ohm-m)	ASTM D257	10^15	10^14	10^9	10^14	10^14	10^14	10^10
Outgassing %TML %CVCM	ASTM E595	Not Tested	Not Tested	Not Tested	Not Tested	0.90 0.01	Not Tested	0.90 0.01

TIMTRONICS
THERMAL INTERFACE MATERIALS

Food Grade Heat Sink Compound (White Ice Series)

Product Description: White Ice FG series is a Non-Reactive, Silicone, Thermally Conductive food grade thermal grease with low thermal resistance and a soft, non-flowable consistency. This product is formulated with FDA (Food & Drug Administration) approved ingredients in compliance with CFR, Title 21 paragraph 178.3570 of the FDA guidelines and NSF Registered. This product is acceptable as incidental food contact for use in and around food processing areas.

Typical Applications:

White Ice food grade Heat Sink Compound is applied to the any electronic devices for heat transfer which is located in and around food processing areas. Also industrial applications include mounting studs of transistors, diodes and silicone controlled rectifiers. In these situations, a small amount of the thermal grease is applied using screen printing/stencil methods. It is also used in mounting semiconductor devices; thermoelectric modules; power transistors and diodes; coupling entire heat generating assemblies to chassis; heat transfer medium on ballasts; thermal joints; thermocouple wells; mounting power resistors; and for any devices where efficient cooling is required in major industries including, electronic (computer, appliance, wireless, etc.), automotive and electrical.

Property	Test Method	510FG	610FG
Type		Silicone	Silicone Free
NSF Registration Number. Company Number: N06854		139292	149699
Special Future		Low viscosity. General purpose	High Temperature. Rated up to 300C
Color	Visual	White	White
Viscosity @ 25°C, PaS	Helipath	160	600
Specific Gravity	ASTM D792	2.2	2.9
Shelf Life		5 years	5 years
Operating Temperature Range.°C		-55°C to 200°C	-55°C to 300°C
THERMAL			
Thermal Conductivity (W/m-K)	ASTM D5470	0.8	1.0
Thermal Resistance (°C-in²/W)	ASTM D5470	0.05	0.05
ELECTRICAL			
Breakdown Voltage (KV/mm)	ASTM D149	15	14
Dissipation Factor (1KHz)	ASTM D150	0.0021	0.0020
Volume Resistivity (Ohm-cm)	ASTM D257	10^14	10^14

TIMTRONICS
THERMAL INTERFACE MATERIALS

Electrically and Thermally Conductive Compounds (700 Series) (Black Ice and Silver Ice)

Product Description:

700 series are electrically and thermally conductive greases engineered with highly conductive fillers and silicone/non silicone fluids. Excellent wetting and spreadability with screen printable consistency. The 700 series is ideal for low power applications that require static drain, grounding, and soft electronics connection. High thermal conductivity ratings up to 7 W/mºK are readily available.

These products fills microscopic pits/gaps, providing multiple pathways for current to follow so no current lost. This creates almost zero resistance in the connection, protecting against vibration, no overheating and no voltage fluctuations.

Typical Applications:

High power electrical applications, Power switches, Circuit breakers, Grounding semiconductor components and high power cpu to heat sink. Communication equipment-cell phone connections; antennas; HAM radios. Lighting-LED, motion sensors.

Property	Test Method	710	710NS	720	711	712	713
Type		Silicone Free /Silver	Silicone Free/Silver	Silicone Free/Silver	Silicone Free	Silicone	Silicone Free
Special Future		Dry Film Highly Electrically conductive	Wet/oily film. Highly Electrically Conductive	Wet/oily film. Highly Electrically Conductive	Low cost. Moderate Elec. Conductive	Low cost. Moderate Elec. Conductive	Stable up to 360°C Putty type. Moderate Electrically Conductive
Color	Visual	Silver	Silver	Silver	Black	Black	Black
Viscosity @ 25°C, PaS	Helipath	500	200	250	250	250	>5000
Specific Gravity	ASTM D792	4.8	4.0	4.2	1.3	1.3	3.2
Operating Temperature Range.°C		-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 200°C	-55°C to 360°C
THERMAL							
Thermal Conductivity (W/m-K)	ASTM D5470	7.0 (Laser Flash)	7.0 (Laser Flash)	7.2 (Laser Flash)	2.2	2.2	1.8
Thermal Resistance (°C-in²/W)	ASTM D5470	0.01	0.01	0.008	0.05	0.05	N/A
ELECTRICAL							
Breakdown Voltage (KV/mm)	ASTM D149	N/A	N/A	N/A	N/A	N/A	N/A
Dissipation Factor (1KHz)	ASTM D150	N/A	N/A	N/A	N/A	N/A	N/A
Volume Resistivity (Ohm-cm)	ASTM D257	<0.010	<0.010	<0.010	<0.25	<0.25	<0.25

TIMTRONICS
THERMAL INTERFACE MATERIALS

ELECTRICAL JOINT COMPOUNDS (EJC Series)

Electrical Joint Compounds (EJC) are specially formulated with latest technology to prevent oxide film formation on metal surfaces and prevents corrosion. It offers superior weathering characteristics over wide temperature ranges, and provides highly conductive tight joints. Proprietary filler particles help in penetrating oxide films and act as electrical bridges between conductor strands, aid in gripping conductor, Mounting Hockey Puck to improve electrical conductivity and enhance integrity of the connection.

PRODUCT	EJC-741	EJC-742	EJC-744	EJC-745SL	EJC-745NS
APPLICATION/ RECOMANDATION	Insulated Al/Al & Al/Cu connections, Aluminum conduit threads	Copper to copper connections,copper conduit thread and grounding	Transmission line compression dead-end, splice, aluminum terminal joints or ACSR conductor	Insulated Al/Al & Al/Cu connections, Excellent heat transfer paste.	Insulated Al/Al & Al/Cu connections. Excellent heat transfer paste.
Product Type	Non-Silicone	Non-Silicone	Non Silicone/Abrasive	Silicone	Non-Silicone
Color	Black	Copper	Amber	White/Gray	White/Gray
Penetration @77°F	250-300	250-300	250-300	300-320	300-320
Service Temperature Range.	-40°C to 150°C	-40°C to 150°C	-40°C to 150°C	-40°C to 200°C	-40°C to 200°C
Thermal Conductivity. W/mK	1.0	0.90	0.50	0.80	1.0
Water resistance	Excellent	Excellent	Good	Good	Good
Chemical resistance	Excellent	Excellent	Good	Good	Good
Oxidation Protection	Excellent	Excellent	Good	Good	Good

TIMTRONICS
THERMAL INTERFACE MATERIALS

Dielectric Valve Grease

Description/Applications:

Electrical connections are susceptible to the chemicals and moisture in their environments. If a connection develops corrosion it can affect the way the entire electrical system functions. Dielectric grease keeps moisture out of electrical connections. Use dielectric grease on spark plug wires and trailer hitch connections to prevent fusing, Dielectric grease can be used on battery terminals to keep them corrosion free. Prevent voltage leakage by using dielectric grease to seal high energy ignition systems. With a high temperature tolerance, dielectric grease is suitable for high heat under hood applications, such as automotive wiring connectors.

Property	Test Method	910
Type		Silicone
Special Future		Food Grade High Dielectric property Moisture repellent
Color	Visual	Translucent
Viscosity @ 25°C, PaS	Helipath	70
Penetration (Worked)	ASTN D217	310-330
Specific Gravity	ASTM D792	1.1
Operating Temperature Range.°C		-55°C to 200°C
THERMAL		
Thermal Conductivity (W/m-K)	ASTM D5470	0.09
Thermal Resistance (°C-in²/W)	ASTM D5470	N/A
ELECTRICAL		
Arc Resistance, Seconds	ASTM D495	120
Breakdown Voltage (KV/mm)	ASTM D149	20
Dissipation Factor (1KHz)	ASTM D150	N/A
Volume Resistivity (Ohm-cm)	ASTM D257	10^13