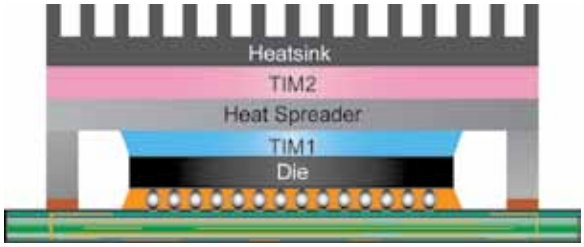
SilCool* Silicone Adhesive - Addition Cure

The SilCool series silicone adhesives from Momentive Performance Materials offer 1-Part, heat curable materials that bond well to a wide variety of substrates without the need for primers. They help deliver outstanding thermal conductivity, low thermal resistance, excellent dielectric properties, and low stress. SilCool adhesives are excellent candidates for addressing the heat management challenges arising from the higher frequencies, power, and miniaturization in today's electronic devices. Designed to efficiently conduct heat, these materials are valuable additions to semiconductor packages that incorporate heat-generating chips, heat spreaders, and heat sinks (TIM1 & TIM2).

Key Features

- Highly workable – excels in automated dispensing, screen printing, and stamping applications
- Fast cure & good adhesion
- High thermal conductivity
- Low thermal resistance
- Wide operating temperature range
- Compatible with high-temperature lead-free processing
- Minimal ionic impurities & excellent dielectric properties



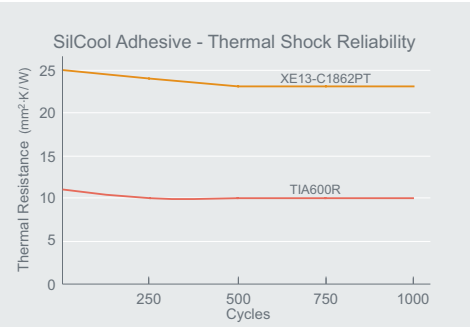
Product Details

Properties		TIA600R	TIA320R	TIA260R	XE13-C1862PT	TSE3281-G	TSE3380
Features		High thermal conductivity, strong adhesion	High thermal conductivity, thin bond line	Good thermal conductivity, fast cure	Good thermal conductivity, high elongation	-	-
Type		1 Part	1 Part	1 Part	1 Part	1 Part	2 Part
Property (uncured)		Flowable	Flowable	Flowable	Flowable	Flowable	Flowable
Color		Gray	Gray	Gray	Gray	Gray	Gray
Mixing Ratio ((A):(B) by weight)		-	-	-	-	-	100:100
Pot Life (23°C)	h	-	-	-	-	-	8
Viscosity (23°C)	Pa.s	130	70	70	55	60	40
Cure Condition	°C/h	150/1	150/1	120/0.5	150/1	150/1	150/0.5
Thermal Conductivity[1]	W/m·K	6.0	3.2	2.6	2.5	1.7	1.7
Thermal Resistance[2] (BLT)	mm^2·K/W	11 (50µm)	14 (30µm)	25 (50µm)	25 (50µm)	35 (50µm)	-
Specific Gravity (23°C)		3.44	4.0	2.89	2.87	2.70	2.70
Hardness (Type A)		95	93	55	65	84	70
Tensile Strength	MPa	7.0	4.0	1.1	1.5	4.5	2.5
Elongation	%	10	10	40	80	50	100
Adhesion (Al lap shear)	MPa	5.4 (Ni/Ni)	2.7 (Ni/Ni)	0.8	1.0	2.5	1.5
CTE	ppm/K	90	140	130	130	140	140
Glass Transition Temp.	°C	-120	-120	-120	-120	-120	-120
Volume Resistivity	MΩ·m	$4.8x10^6$	2.6[*4]	$4.8x10^6$	$4.8x10^6$	$4.8x10^6$	$2.1x10^6$
Dielectric Strength	kV/mm	20	-	20	20	15	15
Volatile Siloxane (D_3-D_{10})	ppm	<100	<100	<200	<200	-	-
Ionic Content[3] (Na/K/Cl)	ppm	each <5	each <10	each <5	each <5	each <10	each <10
Moisture Absorption	wt%	<0.6	<0.02	<0.6	<0.6	<0.6	<0.6

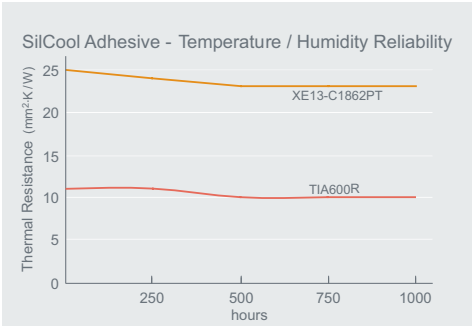
[1]Hot wire method, [2]Laser flash analysis on Si-Si sandwiched material, [3]Ion chromotography analysis on water extracts, [*4]Impressed voltage: 100V
Typical property data values should not be used as specifications

Thermal Resistance is proportional to the thickness of the material through which the heat must travel. Increases in pressure during the component assembly process are known to contribute to reductions in thickness of the thermal interface (BLT), and subsequently, reduced thermal resistance.

Test Conditions: Sandwich material between10mm×10mm silicon dies, and cure for 1 hour at 150°C. Measure thermal resistance using laser flash method.



Test Conditions: Sandwich material between10mm×10mm silicon dies, assemble at 500kPa and cure at 150°C for 1 hour. Thermal cycle (-55°C~150°C, dwell time 30 minutes at each extreme). Measure thermal resistance using laser flash method.



Test Conditions: Sandwich material between10mm×10mm silicon dies, assemble at 500kPa and cure at 150°C for 1 hour. High temperature / humidity test (85°C, 85%RH, 250, 500, 750, 1000 hours). Measure thermal resistance using laser flash method.

Silicone Adhesive - Condensation Cure

Momentive Performance Materials offers a range of condensation cure adhesives & sealants that deliver thermal conductive performance. These materials cure to form an elastic rubber when exposed to atmospheric moisture at room temperatures, eliminating the need for heat ovens. The result is a unique combination of process efficiency and excellent thermal conductivity. Our condensation-cure adhesives and sealants are commonly applied in board assembly and sensor applications that require moderate thermal management performance and ease of use.

Product Details

Properties		TIA0260	TIA0220	XE11-B5320
Features		High thermal conductivity, strong adhesion	High thermal conductivity, strong adhesion	Fast tack free time, UL certified
Type		1 Part	1 Part	1 Part
Property (uncured)		Semi-Flowable	Semi-Flowable	Non-Flowable
Color		Light Gray	Gray	White
Viscosity (23°C)	Pa.s	180	300	-
Tack Free Time	min	10	10	5
Thermal Conductivity[1]	W/m·K	2.6	2.2	1.3
Thermal Resistance[2] (BLT)	mm^2·K/W	18 (50µm)	25 (50µm)	35 (50µm)
Specific Gravity (23°C)		3.01	2.87	2.59
Hardness (Type A)		92	88	80
Tensile Strength	MPa	6.5	5.2	3.6
Elongation	%	20	40	40
Adhesive Strength	MPa	2.6	4.2	1.3
CTE	ppm/K	100	110	120
Volume Resistivity	MΩ·m	$7.0x10^6$	$1.0x10^7$	$2.0x10^7$
Dielectric Strength	kV/mm	20	20	17
Volatile Siloxane (D_3-D_{10})	ppm	10	20	100
Flame Retardancy		-	-	UL94 HB

[1]Hot wire method, [2]Laser flash analysis on Si-Si sandwiched material
Typical property data values should not be used as specifications