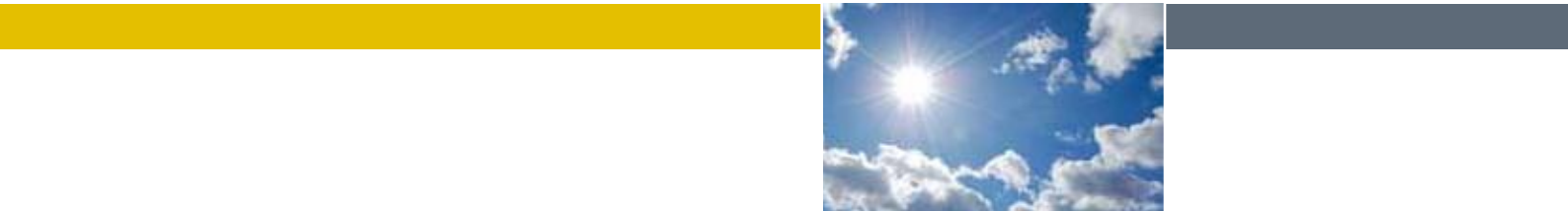
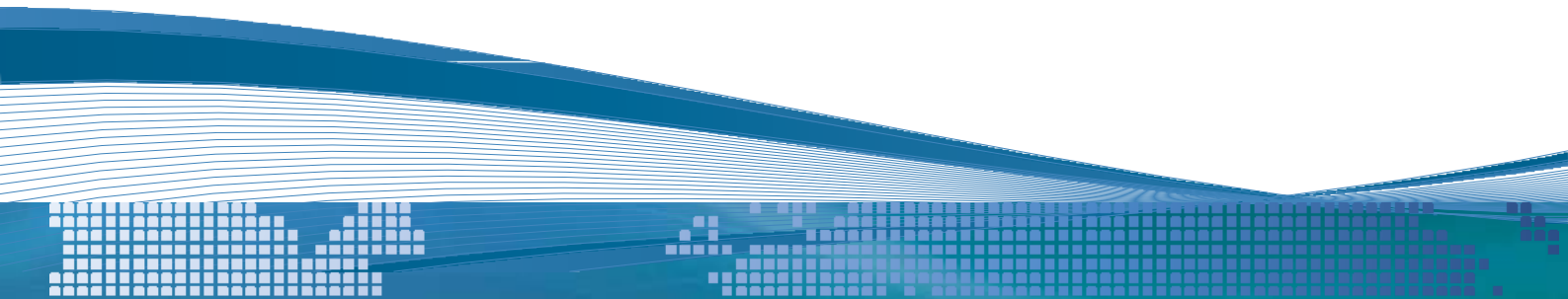




Silicone Material Solutions for the Solar Industry



Momentive offers silicone material solutions developed for the solar industry.

Momentive's Silicones and Quartz Division is a global leader in silicones and advanced materials, with a 70+ year heritage of being first to market with performance applications for major industries that support and improve everyday life. Momentive delivers science-based solutions by linking custom technology platforms to opportunities for customers. The strength of Momentive's silicones technology, technical service and application development comes from a long and prestigious history — and its heritage company GE Silicones. It's a story about commitment to successful business relationships, global reach and value added process innovations that can help customers reduce costs, improve quality and realize their business objectives.

Applications

- Sealants and Adhesives for Frame Sealing, Rail Bonding and Junction Box Attaching: Fast cure, high mechanical strength, primerless
- Junction Box Potting: Fast cure, room temperature adhesion, UL94 HB to UL94 V-0 flame resistance
- Solar Cell Encapsulation: Optically clear, engineered refractive index, allows more electricity per unit area, long-term uv stability
- Optical Coupling Materials: High transparency, precise dimensional stability, high temperature resistance
- Thermal Management: High thermal conductivity, easy process ability, primerless, low volatiles

Segment

- Crystalline silicon type PV modules
- Flexible Thin-film type PV modules
- Rigid Thin-film type PV modules
- Concentrated PV modules
- Building Integrated Photovoltaic

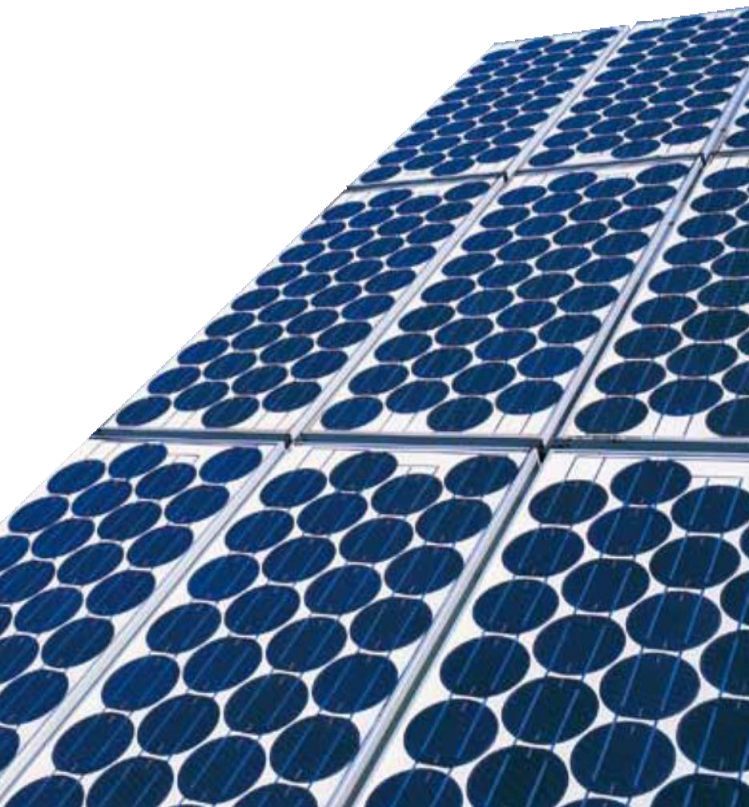
Overview

Adhesive	Pottant	Optical Applications	Thermal Management
TSE382	TSE3660	RTV615	TSE3941-W
SP100	TSE3667	TSE3033	XE11-B5320
SnapSil RTV230	TIA207GN	SiTRUST E1110	TIA0220
	TSE3664K		TIG830SP
	RTV6428		



Silicone Solutions for PV Industry

In addition to commercial products, Momentive has a broad range of material solutions to help solve your specific needs. Contact your local sales or marketing representative to learn more.



Properties	Frame Sealing, Rail Bonding and	
	TSE382	SP100
Cure Type	1K, Oxime ⁽²⁾	Neutral Room Temperature
UL Listing	UL94 HB	UL94 HB
Characteristics	Ready to use, neutral type, non flowable, fast cure	Robust primerless adhesion, fast non corrosive cure, non flowable paste that solidifies at room temperature
Color	TSE382-W:White TSE382-B:Black TSE382-C:Clear	White, Black
Mixing Ratio by Weight [A:B]	–	1 part
Mixng Ratio by Volume [A:B]	–	–
Adhesion to Substrate	Self adhesive	Excellent
Viscosity (25°C), [cPs]	–	Paste
Viscosity After Mixing (25°C), [cPs]	–	–
Working Environment	-55°C to +200°C	–
Special Gravity (25°C)	1.04	1.41
Hardness, [Type A]	28	34
Tensile Strength, [psi]	275	2.3 MPa
Elongation, [%]	380	650
Thermal Conductivity ⁽³⁾ , [W/mK]	0.18	0.38
Heat Resistance (BLT), [mm ² ·K/W]	–	–
CTE, [ppm]	–	–
Dielectric Strength (75 mils), [kV/mm]	23	20
Dielectric Factor (60 Hz)	2.9	4.0
Dissipative Factor (60 Hz)	0.0040	0.04
Volume Resistance ⁽⁴⁾ , [Ω·cm]	1.0E+15	–
Pot life (25°C)	–	–
Tack Free Time (25°C)	10min	20 min
Cure Time*		
25°C	24hrs(2mm)	72 hours
65°C	–	–
100°C	–	–
125°C	–	–
150°C	–	–
Penetration (23°C), [mm/10]	–	–
Bleeding (@150°C, 24hrs), [w%]	–	–
Evaporation (@150°C, 24hrs), [w%]	–	–

Typical data are average. The actual results may vary.

*SnapSil is a trademark of Momentive Performance Materials Inc.

Note: Detail data are available in Product Data Sheet

*Cure time may vary dependent on the specimen, temperature, environmental humidity and equipment.

Condensation cure grade will reach its final properties after 3 to 7 days at standard condition of 25°C, 50% relative humidity.

J-Box Attaching	J-Box Potting					
SnapSil* RTV230	TSE3660	TSE3667	TIA207GN	TSE3664K	RTV6428	RTV615
2K, Alkoxy	2K , Neutral Room Temperature	2K , Neutral Room Temperature	–	2K, Alkoxy	2K, Addition ⁽¹⁾	2K, Addition ⁽¹⁾
UL94 HB	UL94HB	UL94 V-0	UL94 V-0, RTI 150C	UL94 V-0	UL94 V-0	–
Fast deep seccion cure, low odor, non corrosion	Robust primerless adhesion at room temperature, dielectric insulator, flow able liquid that forms an elastic rubber	Robust primerless adhesion at room temperature, dielectric insulator, flow able liquid that forms an elastic rubber	Thermally conductive, flow able liquid that forms a soft rubber	Low viscosity, fast deep section cure at room temperature, non corrosion	Low viscosity, non corrosion, fast cure by elevated temperature	Low viscosity, optical clear, non corrosion, fast cure by elevated temperature
White	White, Blue-green	Gray	Dark Gray	Grey	Dark Grey	Cklear
100:8.3	100:8	100:8	1:1	100:7.5	1:1	10:1
10:1	100:10	100:10	–	10:1	1:1	10:1
Self adhesive	Excellent	Excellent	Requires primer	Self adhesive	Need primer	Need primer
A:700,000; B:95,000	Base: 3100, Catalyst: 10	Base: 3500, Catalyst: 10	–	A:4,000; B:15	–	–
–	3,000	3,300	6,000	3,000	1,300	4,000
-50°C to +200°C	–	–	–	-50°C to +200°C	-60°C to +200°C	-60°C to +200°C
1.39	1.27	1.25	1.6	1.41	1.37	1.02
36	31	35	40	60	62	44
363	1.0 MPa	0.7 MPa	100	435	478	957
280	100	50	100	70	60	120
–	–	0.43	0.7	0.42	0.31	–
–	–	–	–	–	–	–
–	–	–	–	–	210	270
16	26	8	28	26	21	20
3.8	3.4	4.0	3.3	3.1	3.0	2.7
0.1300	0.02	0.03	0.013	0.0100	0.0061	0.0006
9.3E+13	–	–	–	5.0E+15	5.7E+14	1.8E+15
5-10min	0.1 hr	0.05 to 0.1 hr	3 hrs	6min	4min	4hrs
7min	10-15min	15-20min	–	–	–	–
30min ⁽⁵⁾	72 hours	72 hours	24 hrs	24hrs(2mm)	30min	7 days
–	–	–	0.5 hr	–	15min	4hrs
–	–	–	–	–	10min	1hr
–	–	–	–	–	5min	45min
–	–	–	–	–	2min	15min
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Optical Applications		Thermal Management			
TSE3033	SilTRUST E1110	TSE3941-W	XE11-B5320	TIA0220	TIG830SP
2K, Addition ⁽¹⁾	2K, Addition ⁽¹⁾	1K, Alkoxy	1K, Alkoxy	1K, Alkoxy	1K, Grease
–	UL Listed	UL94 V-0	UL94 HB	–	–
Low viscosity, optical clear, non corrosion, fast cure by elevated temperature, self adhesive	Designed for PV Encapsulation, non corrosion, UV stable, low temperature fast cure, self adhesive	Ready to use, non flowable, fast cure, low volatile, non corrosion	Ready to use, non flowable, fast cure, low volatile	Semi-flowable, fast cure, low volatile, non corrosion, high thermal conductivity	Applicable by screen printing, high thermal conductivity, extremely low weight loss at high temperature
Clear	Translucent	White	White	Grey	Grey
1:1	1:1	–	–	–	–
1:1	–	–	–	–	–
Self adhesive	Self adhesive	Self adhesive	Self adhesive	Self adhesive	–
A:1,100; B:800	–	–	–	–	300,000
900	30,000	–	–	–	–
–	- 55°C to +200°C	- 55°C to +200°C	-55°C to +200°C	-40°C to +150°C	-40°C to +170°C
1.02	1.01	1.71	2.59	2.88	2.88
35	20	76	80	88	–
145	2.0 MPa	610	522	520	–
210	400	80	40	40	–
0.17	–	0.70	1.30	2.20	4.10
–	–	–	–	25 (50micron)	8 (45micron)
230	–	–	190	–	–
21	37	–	17	20	18
2.8	–	–	2.6	–	–
0.0010	–	–	0.0050	–	–
2.0E+15	–	2.3E+15	2.0E+15	1.0E+15	1.0E+12
6hrs	–	–	–	–	–
–	–	5min	5min	10min	–
–	24hrs(2mm)	24hrs(2mm)	24hrs(2mm)	–	–
–	–	–	–	–	–
2hrs	< 3min	–	–	–	–
1hr	–	–	–	–	–
30min	–	–	–	–	–
–	–	–	–	–	310
–	–	–	–	–	<0.1
–	–	–	–	–	0.3

(1) Catalyst inhibition is a concern for addition cure grades.

(2) Non-corrosive to most sensitive metals but may cause corrosion to copper and copper alloys. May cause some discoloration to certain sensitive metals such as copper and brass.

(3) Bulk sample measurement (Hot wire method).

(4) ASTM E14561 method utilized.

(5) Cure through time @25°C.

Momentive Customer Service Centers

Email

4information@momentive.com

Telephone

Americas

+1 800 295 2392
+1 614 986 2495

Asia Pacific

China
+800 820 0202

Europe, Middle East, Africa and India

+00 800 4321 1000
+40 212 534754

Japan
+81 276 20 6182

All Other Countries
+60 3 9206 1543

To find a specific language, visit the Contact Us page at Momentive.com. You may select a country to view additional languages and the corresponding telephone numbers.

For email inquiries, we will make every attempt to respond in the incoming written language. If that is not possible, we will respond in English.

DISCLAIMER:

THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS INC. AND ITS SUBSIDIARIES AND AFFILIATES (COLLECTIVELY "SUPPLIER"), ARE SOLD SUBJECT TO SUPPLIER'S STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN THE APPLICABLE DISTRIBUTOR OR OTHER SALES AGREEMENT, PRINTED ON THE BACK OF ORDER ACKNOWLEDGMENTS AND INVOICES, AND AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING ITS PRODUCTS, MATERIALS, SERVICES, RECOMMENDATIONS OR ADVICE. EXCEPT AS PROVIDED IN SUPPLIER'S STANDARD CONDITIONS OF SALE, SUPPLIER AND ITS REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN. Each user bears full responsibility for making its own determination as to the suitability of Supplier's materials, services, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating Supplier's products, materials, or services will be safe and suitable for use under end-use conditions. Nothing in this or any other document, nor any oral recommendation or advice, shall be deemed to alter, vary, supersede, or waive any provision of Supplier's standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in a writing signed by Supplier. No statement contained herein concerning a possible or suggested use of any material, product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Supplier covering such use or design, or as a recommendation for the use of such material, product, service or design in the infringement of any patent or other intellectual property right.

*SnapSil is a trademark of Momentive Performance Materials Inc.

Momentive and the Momentive logo are trademarks of Momentive Performance Materials Inc.



260 Hudson River Road
Waterford, NY 12188 USA
momentive.com