



Thermal Interface Materials

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose/Material Description. This specification details the requirements of Thermal Interface Materials (TIMs) that are suitable for use as thermally conductive adhesives, gap fillers, pads, greases, and thermal tapes for use in Rechargeable Energy Storage System (RESS) applications.

1.2 Symbols. Not applicable.

1.3 Applicability. RESS components requiring thermally conductive attachments or interfaces, such as a Cell Module Assembly (CMA) interface to the cooling plate.

1.4 Remarks. TIMs are described a family of thermally conductive materials designed to manage varying or uneven surfaces by adding component stability, vibration control, and electrical insulation to the device. Many gap fillers also add structural strength to components and provide both thermal conductivity and high bond strength.

1.5 Classification by Application Type.

1.5.1 Type 1: Gap Filler. Liquid dispensed gap filler which may be desirable when removal/serviceability is required.

1.5.2 Type 2: Thermal Adhesive and Gap Filler. Liquid dispensed gap filler with semi-structural adhesive characteristics.

1.5.3 Type 3: Thermal Pad. Typically consist of a highly conformable, slightly tacky sheet filled with conductive particles. Available in sheets, die cut shapes, and custom thicknesses.

1.5.4 Type 4: Thermal Grease. Generally used in applications where the heat sink may need to be removed (serviceable), such as electronic components. Typically, single component, low-viscosity, non-reactive silicone or polymer.

1.5.5 Type 5: Thermally Conductive Tape. Used to provide a preferential heat-transfer path between heat generating devices and cooling devices, typically using a pressure sensitive adhesive.

1.6 Classification by Curing Method.

1.6.1 Curing Method A: Not applicable.

1.6.2 Curing Method B: Room Temperature Cure.

1.6.3 Curing Method C: Elevated Temperature Cure.

1.6.4 Curing Method D: Ultraviolet Cure.

1.6.5. Curing Method E: Other. Identified within the material note on the part print.

1.7 Classification by Polymer Matrix. The polymer comprising the matrix shall be classified and coded according to the descriptions shown in Table 1, where X = 1 or 2, based on the number of polymer components. Example: 2E is two-part epoxy.

Table 1: Coding by Material Type

Code	Polymer/Matrix	Description
XA	Acrylic	Often used in applications requiring semi-structural adhesion. Typically, do not require primers or surface preparation.
XE	Epoxy	Good durability and adhesive properties. Can be customized to cover a wide range of physical, electronic, and thermal properties.
XU	Urethane	Not for use in high temperature applications (> 130 °C). Provide good protection against water and vibration.
XS	Silicone	Versatile, temperature resistant, permanent flexibility.
XZ	Z-Type (Other)	The matrix shall be identified within material note of part print.
XA	Acrylic	Often used in applications requiring semi-structural adhesion. Typically, do not require primers or surface preparation.

1.8 Classification by Performance. Thermal Conductivity per ASTM D5470. Report as X.X for material coding.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D149	ASTM D792	ASTM D2240	ASTM D6111
ASTM D150	ASTM D903	ASTM D3330	ASTM E831
ASTM D257	ASTM D1002	ASTM D3418	ISO 527
ASTM D412	ASTM D2094	ASTM D5470	ISO 4587
ASTM D638	ASTM D2196	ASTM D5656	UL 94

2.2 GM Standards/Specifications.

GMW3059	GMW3420	GMW15481	GMW16449
GMW3221	GMW14270	GMW15735	

2.3 Additional References.

- GM Part Number 9986619
- Statement of Requirements (SOR)

3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221.

3.2 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to obtain a GM-approved International Material Data System (IMDS) submission.

3.3 Stability (GMW15735). Material conditioned using potential storage conditions must be capable of passing all of the requirements of this specification.

3.3.1 Elevated Temperature Stability. As shipped, the adhesive must be capable of withstanding a temperature of 55 °C for 72 h without separation or caking.

3.3.2 Low Temperature Stability. As shipped, the adhesive must be capable of withstanding three cycles of the applicable cycle schedule outlined in GMW15735.

3.4 Compatibility. Materials supplied to this standard shall be compatible with adjacent/mating materials and/or substrates within the battery assembly; such as Polyester (PET) films, foams, or thermal barrier materials which are in direct contact with cured and uncured thermal interface materials. Electrical component liquid compatibility per GMW16449 Method C, DexCool® (GMW3420).