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COOLMAG

COOLMAG 28

Thermally Conductive Compound

DESCRIPTION

COOLMAG 28 is a thermally conductive composite PDMS based elastomeric compound of encapsulant two-component system, designed for Power Electronics in Automotive, especially in Electrified Vehicles with a triple functionality:

- Heat Transfer, reduction of hot spots and minimising average temperature of systems.
- Electric Isolation
- Mechanical protection.
- Flame and fire protection (Retardant and Extinction)

TYPICAL APPLICATIONS

COOLMAG is designed to provide thermal conductivity, electrical safety, hazard protection, mechanical and fire protection for electrical/electronic encapsulating applications specially designed for:

i. **Power Transformers and Semiconductors**
ii. **Automotive** and High reliability **Power Electronics**.
iii. On Board Chargers (**OBC), Inverters** and **DC/DC converters** in **Electric Vehicles**.
iv. Inter- Cell coating and protection in batteries
v. **Gap Filler** to interface with liquid cooling in **Battery Packs**.

FEATURES/BENEFITS

High Thermal Conductivity and diffusivity: CoolMag 28 has all properties of RT PDMS xylene compounds with **x7 higher thermal conductivity** and **x10 thermal diffusivity** than silicones, making allowing high heat transfer at low temperature with fast stabilization of temperatures thus minimising hot spots in transients.
Low stress: performs low shrinkage and stress on components as it cures. Its very low hardness (Shore A 42) and its elasticity with a fully shape recovery helps absorbing mechanical energy and dilatation efforts, reducing breaking chipping and cracking risks in ferrite cores and Li-Ion batteries expansion overheating.
Durable: Will not depolymerize when heated in confined spaces. Fully AECQ 200 compliant. Negligible mass loss in at high temperature.
Low viscosity: Low viscosity product compared to other thermally conductive materials, easing the encapsulation process thus fully injectable and low pressure and room Temperature. Simple degassing and fast die casting and potting by gravity or at low vacuum.
Environmentally Resistant: Excellent thermal shock, water-proof, and ageing resistance.

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Flame retardant: CoolMag 28 as a constant temperature absorption point an 180ºC by its PCM (Phase Change Material) components with high Enthalpy.
Designed for Manufacturability: Easy to clean and with working lifespan of the mixed product of 1hour, CoolMag 28 do not require special tooling's, high pressure nor high temperature. It can be used for die-casting by gravity (vacuum not mandatory) and is easily mouldable while liquid and it is not sticky and easy to demould. The products can be cured at room temperature or quickly cured and relatively low temperature of polymerization thus making process clean, fast and simple.

APPLICATIONS

Mixing process

Thoroughly mix each component individually. Vibrating and degassing recommended.

Mix COOLMAG 28 resin component A with COOLMAG 28 hardener component B at a 1:1 ratio in weight or volume. For high volume production, may be used an automatic meter/mix/dispense equipment.

For high voltage and other critical applications, vacuuming mixing systems may be appropriate: air may be introduced into the encapsulant system either during mixing or when catalysing the mixture changing the electrical and thermo-conductive properties of the product. Thermal conductivity and electric isolation are best when air bubbles and voids are minimized.

Speed Mixers, centrifugal mixers or vibration mixers are recommended.

Applying
Apply COOLMAG 28 using handheld cartridges or automatic meter/mix/dispense equipment on a clean surface and without cure inhibiting ingredients, such us amines, sulphur or tin salts.
If bonding surface is in question, perform a test with a patch of COOLMAG 28, setting for the normal curing time.

Curing
For the proper curing process of the COOLMAG 28, after the application need to be allowed **at room temperature (25ºC, 24h), 60min at 90ºC** or 4**0 minutes at 125ºC**. The time starts when the material has reached the temperature of curing. Parts with large thermal mass and other circumstances may delay material reaching the target temperature.

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TYPICAL PROPERTIES*

	COOLMAG 28 Resin	COOLMAG 28 Hardener	COOLMAG 28 mixed
Appearance	Beige Liquid	Beige Liquid	Beige Liquid
Viscosity, cps@ 25ºC	>40000	>40000	>40000
Ratio	1	1	
Pot Life (min)			60
Cured time (min)(125ºC)			40
Density, g/cm^3	1.8± 0.1	1.8± 0.1	1.8± 0.1

**Property values represent typical results only and are not to be considered specifications.*

TYPICAL CURED PROPERTIES**

Thermal Conductivity, W/mk (Hot Disc Transient Method)	1,5
Arc Resistance Test, PLC (ASTM D495)	4
High Current Arc Ignition, PLC (HAI, UL 746A sec.33)	0
High Voltage Arc Tracking Rate, PLC (HVTR, UL 746A sec.25)	0
Comparative Tracking Index, PLC (CTI, ASTM D3638)	0
Hardness (Shore A, UNE-ISO 7619-1:20111)	42
Tensile Strength, N (ISO 37:2011)	11.25
Elongation at Break, % (ISO 37:2011)	50
Coefficient of linear Thermal Expansion (ASTM D696)	0.00011
Dielectric Strength, kV/mm	>4
Density, g/cm^3 (ISO 1183-1:2013)	1.824
Water Absorption % (ASTM D570 – 98:2018)	0.04

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Cure schedule of 60 minutes at 125ºC.

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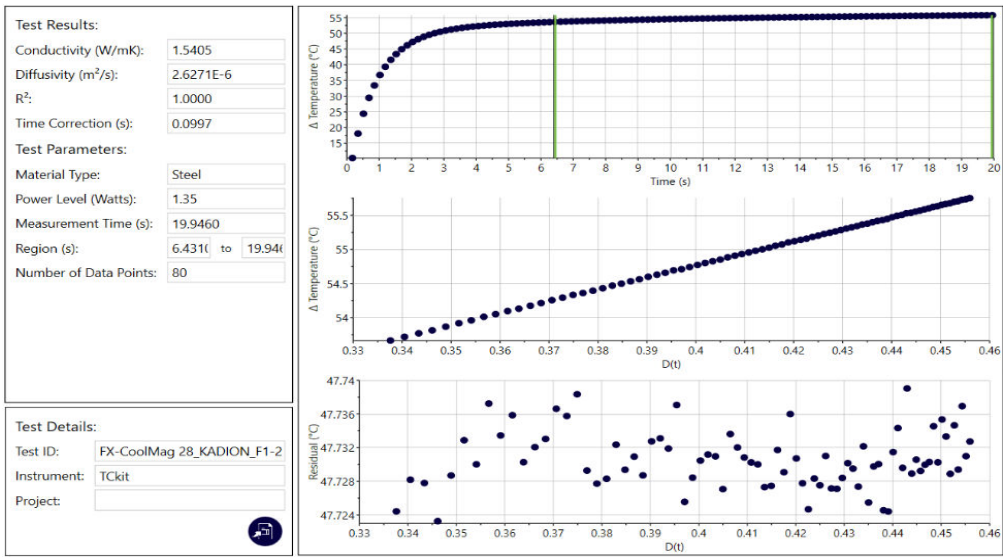

PACKAGING, STORAGE AND SELF-LIFE

COOLMAG 28 is packed in:

- Dual Nordosn 1:1 400 ml (700 g) cartridge
- 1 liter (1,8 Kgs), 25 liters (45 Kgs) , 50 liters (90 Kgs) and 100 liters (180 Kgs) thin.
- Other packaging could be offer under demand.

COOLMAG 28 components may release small quantities of hydrogen gas. Do not repacking or store the product in unvented containers and ventilate work areas properly to prevent the accumulation gas.

Before using COOLMAG 28, please refer to the Material Safety Data Sheet (MSDS) and label for safe use and handling instructions.

For industrial/professional use only. Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

Shelf life of each component is 3 months from date of manufacture, in unopened original container at 25ºC.