Technical Data

Thermal Conductive Filler Liquid TCFL 4.0S

Features & Benefits

- 4.0 W/mK Thermal Conductivity
- Low BLT (min 30µm) and low viscosity
- Electrically Isolating
- Low Interfacial Resistance

Applications

- Automotive Electronics (HEV, NEV, Batteries)
- PCBA to heatsink
- Discrete components to heat spreader
- Fiber optics and Telecom equipment

Introduction

TCLAD TCFL is a thermally conductive gap filling material that is offered in a two-part material. The purpose of the material is to minimize thermal resistance between the heat source and the heat sink or heat spreader. Depending on application the material is available in different viscosity and hardness.

Typical properties of gap filling materials have the following characteristics: Thermal conductivity, viscosity, hardness, pot life, volume resistivity etc. It is typically offered in cartridges, or containers and can be dispensed through a static mixing nozzle with a handheld dispensing gun or by automated dispensing equipment.

Mixing the two parts into a single material, the liquid form cures into a solid form depending on the curing time and temperature. Before the material cures into a solid form, the material should be placed in the interface and put into compression so that it can form around the surrounding surfaces to remove as much air and to wet out to the adjoining surfaces as much as possible.

How to use: Depending on storage time the material is stored from the date on manufacture, premixing prior to use may be required. Mix part A and B 1:1 and apply mixture to the surface. Apply pressure to remove the air gap as much as possible to improve heat dissipation.

Processing: After the material is exposed to air it will begin to cure. At room temperature. Curing can be accelerated by increasing the temperature.

Useable life and storage: TCFL products are best if stored in a cool and dry / non-humid environment, especially where it is not exposed to any sunlight. Containers that have been stored for longer than two months should be remixed with a clean mixer and vacuum to prevent air entrapment. Whereas the cartridge containers should be flipped upside down every two weeks to prevent the particle fillers from settling to the bottom. The shelf life can be up to 6 months when properly stored.

Package Information: Typical package size, cartridges: 50cc, and 400 cc. Containers: 20L and 200L or 1Kg and 200Kg. Custom size available.

Precautions: Please review the technical datasheet of the material before use of the products in terms of the material characteristic to fit one's application. All values stated here are typical values.

We provide custom solutions for your applications. For further inquiries, please contact your local sales agent or directly TCLAD in your region.

Item	Condition	Unit	Value	Method
General				
Color	Visual	-	A: Pink B: White	1:1
Continuous Use Temp	-	°C	-50 ~ 200	-
Viscosity (Mix)	25°C	cps	150,000	ASTM D2196
Density	25°C	g/cc	3.3	ASTM D792
Hardness	Shore	00	10	ASTM D2240
Min Bondline	-	µm	30	-
Electrical				
Dielectric Constant	1 GHz	-	7.5	ASTM D150
Dielectric Strength	-	kV/mm	8	ASTM D149
Volume Resistivity	-	Ω·cm	> $1x10^{13}$	ASTM D257
Thermal				
Thermal Conductivity	-	W/m-K	4.0	ASTM D5470
Cure Schedule				
Pot life @ 25°C	2x viscosity	Hours	2	
Cure @ 25°C	Oven	Hours	≥24	
Cure @ 70°C	Oven	Hours	≤2	
Cure @ 150°C	Oven	Minutes	≤30	
Durability				
RoHS	-	-	Compliant	
Flame Rating	Vertical Burn Test	-	V-0	UL94

Applications Tips:

- **Correct Mixing Ratio**: Ensure that both components (Part A and Part B) are mixed in the correct ratio (1:1) for optimal performance and reliable results.
- **Surface Preparation**: Thoroughly clean the surfaces before applying the liquid gap filler to ensure proper adhesion and to maximize thermal performance.
- **Consistent Mixing**: For consistent results, especially in high-volume applications, use a static mixer or an automatic mixing machine.
- **Curing Time**: Allow the gap filler to fully cure before subjecting the components to any mechanical stress, ensuring long-lasting effectiveness.
- **Proper Storage**: Store any unused materials in a cool, dry location and adhere to the manufacturer's guidelines for shelf life

TCLAD
US Sales.us@tclad.com
APACSales.asia@tclad.com
Europe Sales.eu@tclad.com
www.tclad.com

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