

THERMAL CONDUCTIVITY  
(W/m<sup>2</sup>·K)

**1W/mK up  
to  
220 W/mK**

Electrically insulating  
and  
electrically non insulating



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# Thermal Interface Recommendation for LED Applications

Kunze thermally conductive interface materials are available in both electrically insulating and electrically non insulating version. Through these materials the thermal contact resistance is reduced to a minimum and the thermal performance of LED application is optimized

## PROPERTIES

· All five materials ensure the production process, easy handling and available in sizes suitable for Citizen LEDs

· **KU-SAD20:**

silicone-free, no outgassing (siloxanes), both sides strongly adhesive

· **KU-SAS20:**

aging resistant, both sides strongly adhesive.

UL flammability rating: UL 94 VO (File No.: E337894)

· **KU-CBMA125:**

Anisotropic thermal conductivity (high thermal conductivity in the Z direction, very high thermal conductivity in X - Y directions).

Ideal for large-scale cooling of small hot spots. Silicon free, no outgassing. High operation temperature.

· **KU-ALC5 / KU-ALF5**

extremely low thermal contact resistance, silicone-free, no outgassing, no bleeding.



We disclaim all liability for accuracy of this information. Technical detail is subject to change.

Image may differ from the original product

PART	KU-	SAS20	SAD20	CBMA 125	ALC5	ALF5
<b>GENERAL PROPERTIES</b>						
Material	Body	Silicone	Acrylic	Grafite	Aluminium	
Phase-Change-Material		---	---	---	CRAYOTHERM®	
Colour		white	white	dark-grey	white	black
Total thickness	µm	200	200	125	76	76
<b>ELECTRICAL PROPERTIES</b>						
Dielectric strength	V (AC)	6500	2500	---	---	---
<b>THERMAL PROPERTIES</b>						
Thermal conductivity (Z direction)	W/mK	1,15	1,0	1,8	220 (Aluminium substrate)	
Thermal conductivity (X-Y direction)	W/mK			134		
Thermal resistance (inch <sup>2</sup> )	°C/W	0,23	0,48	0,11	0,021	0,009
Phase change temperature	°C	--	--	--	60	51

Issue date: 13.10.2011

THERMAL CONDUCTIVITY  
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**220**

Electrically non insulating



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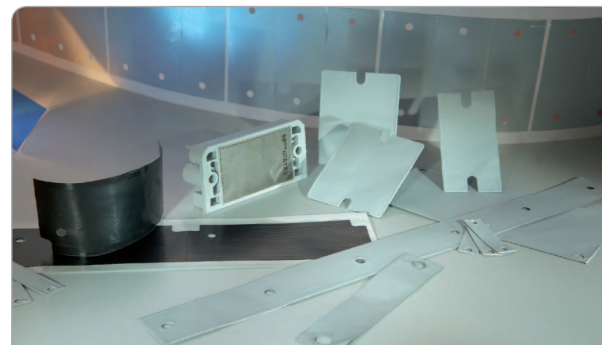
# Aluminium foils with phase-change coating (CRAYOTHERM®) KU-ALC5 and KU-ALF5

HEATPAD® KU-ALC and KU-ALF are very thin aluminium foils, coated on both sides with silicone-free thermally conductive CRAYOTHERM® wax. The coating changes its aggregate state - i.e. turns soft - at ca. 60 °C (KU-ALC) or ca. 51°C (KU-ALF), respectively. Through CRAYOTHERM®'s volumetrical expansion above the phase-change temperature (by 15 to 20 per cent) and the active covering of the surfaces, thermal contact resistance is minimized.

Optimal thermal contact - and consequently, optimal total thermal transfer resistance - is achieved already after the phase-change temperature is first exceeded, and is then permanently sustained at all temperatures above and below phase-change temperature. In the case of KU-ALF, the CRAYOTHERM® thermally conductive wax is enriched by high-performance thermoconducting carbon as a filler, thereby reducing total thermal contact resistance to a minimum.

## PROPERTIES

- Minimal total thermal contact resistance through volumetric expansion by ca. 15 to 20 per cent and active covering of contact surfaces
- Silicone-free
- Guaranteed constant layer thickness
- Low tightening torque required
- Quick and clean handling through lateral adhesive strips for ALC/S and ALF/S
- Replaceability of the material without surface treatment
- Cleaning with isopropyl alcohol
- Non-adhesive or with lateral adhesive strips S



Aluminium foil with phase-change coating KU-ALF5

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PART	KU-	ALC5	ALC5/H	ALF5	ALF5/H	ALF5/H2
<b>GENERAL PROPERTIES</b>						
Material	Body	CRAYOTHERM® – Aluminium – CRAYOTHERM®				
Phase-Change-Material		CRAYOTHERM®				
Colour		Bright grey		Black		
Material gauge without coating	µm	51				
Total gauge	µm	76	83	76	83	102
<b>THERMAL PROPERTIES</b>						
Thermal conductivity (aluminium substrate)	W/mK	220				
Thermal resistance (inch <sup>2</sup> )	°C/W	0,021	0,036	0,009	0,01	0,012
Operating temperature	°C	-60 to +150				
Storage temperature	°C	max. 40				
Phase-change temperature	°C	60		51		

Stand: 30.11.2010

THERMAL CONDUCTIVITY  
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**220**

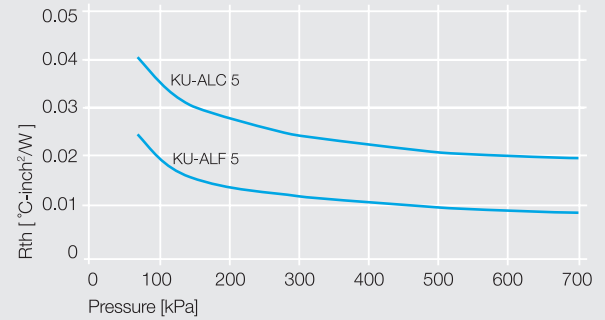
Electrically non insulating



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### PRESSURE DEPENDENCE

Thermal resistance vs.  
mounting pressure



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Stand: 30.11.2010