



YEG Powerline

KERATHERM[®]

Special Films and Services

Copper Film

Spaceform[®]

**Adhesive Film
“Gluey Soft”**

PVA-Film

Dispensing Technology

**Tape Development &
Production**

KERAFOL[®]

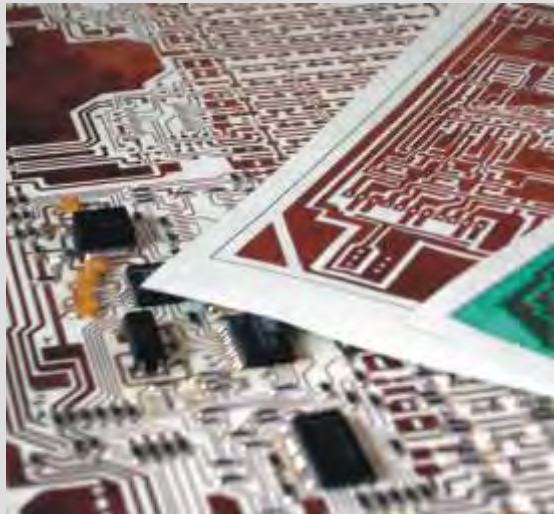
KERAMISCHE FOLIEN GMBH

Innovation in Technology and Environmental Protection

Keratherm® - Copper FTC 86/77

Applications:

- Motor control units
- IGBT-controlling
- Powerfull LED-Arrays



Properties	Unit	86/77 ¹⁾
Colour		green / copper
Thermal Properties		
Thermal resistance R_{th}	K/W	0.90
Thermal impedance R_{θ}	$^{\circ}\text{Cmm}^2/\text{W}$ Kin^2/W	227 0.35
Thermal conductivity	W/mK	1.1
Electrical Properties		
Breakdown voltage $U_{d; ac}$	kV	2.0
Dielectric breakdown $E_{d; ac}$	KV/mm	10.0
Mechanical Properties		
Thickness (+/-10%)	mm	0.300
Thickness of copper layer	mm	0.037
Hardness	Shore A	85
Tensile strength	N/mm ²	70
Elongation	%	15
Physical Properties		
Application temperature	$^{\circ}\text{C}$	-60 to +250

1) Options: with adhesive coating
with netting (one or two layers)

The following copper thicknesses are available: 17 μm ; 25 μm ; 37 μm ; 50 μm ; 75 μm and 101 μm

Heat conducting films manufactured by a special process with copper film (electrolyte) on one side. The beneficial properties of the heat conducting film and copper create entirely new application possibilities, for example, as active EMC protection or as a system carrier for electronic switches.



On these system carriers, power densities of 5-10 W/cm² can be realized. In this case the heat conductive silicone film carries the electrical conducting circuit paths in copper etching technique. The second conductor path layer, for example in resistors, capacitors or coils, can be produced by applying polymer paste pressure. In contrast to conventional circuit board technology, this method allows efficient production from a roll. The outstanding flexibility of the film permits the formation of interfaces and cable harnesses.

These system carriers for electronic switches represent state-of-the-art design from an economical and ecological perspective.

Keratherm® - Spaceform®

Applications:

- Mechanical engineering
- PCB-housings
- "Heat Pipe" applications
- Computer units



Properties	Units	Spaceform® Q non-curing	Spaceform® R non-curing
Colour		brown	grey-green
Thermal resistance R_{th}	K/W	1.80*	0.56*
Thermal impedance	$^{\circ}\text{Cmm}^2/\text{W}$ Kin^2/W	529 0.83	164 0.26
Thermal conductivity	W/mK	1.4	2.25
Breakdown voltage $U_{d; ac}$	kV	4.0	8.0
Dielectric breakdown $E_{d; ac}$	KV/mm	4.0	8.0
Thickness (+/-10%) *	mm	0.5	0.5
Hardness (after curing)	Shore 00	30 - 40	70 - 80
Youngs Modulus	N/cm ²	97	82
Density	g/cm ³	2.38	2.38
Application temperature	$^{\circ}\text{C}$	-40 to +180	-40 to +180
TML	Ma.%	0.22	0.20
Tempering needed		no	no

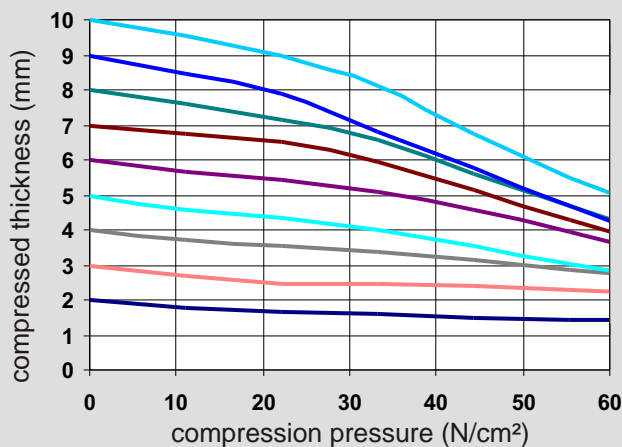
* Measured thickness 0.5 mm

** Youngs modulus sample size 30mm x 2.5mm;
variable contact pressure; compression 50% of the measured thickness

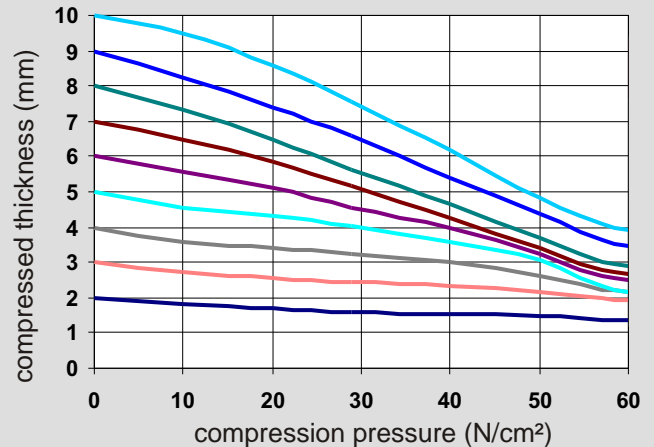
Following thicknesses are available: 2.0 mm - 10.0 mm

Spaceform® Q and R are non-curing moulding compounds for individual thermal solutions. Spaceform® is a highly filled, mouldable silicone compound that is applied by the customer and possesses exceptional mechanical, electrical and thermal properties. Thanks to its excellent ability to conform to any shape or size, there are no restrictions in dimensions or shapability. Spaceform® Q and R are characterized by their exceptional flexibility, easy handling and recyclability.

Compressibilities of Spaceform® Q



Compressibilities of Spaceform® R



Advantages of Spaceform®:

- spotted heat dissipation
- good thermal properties
- extremely good compressibility
- good electrical properties
- excellent plasticity
- good dielectrical properties

Keratherm® - Gluey-Soft 100 Adhesive Pad

Versatile applications:

- non-slip mat for car interior
- fit-up aid
- adhesive surface for notes or small parts e.g. on the refrigerator
- protection and mounting of delicate products
- vibration attenuation and acoustic insulation

Technical properties:

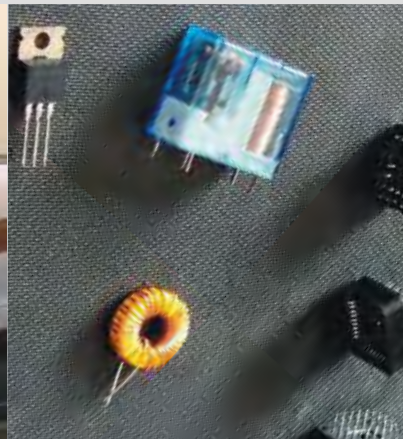
- residue-free removable
- electrical insulating
- high dielectric breakdown
- punchable and cuttable
- application temperature: -40 to +150°C

Properties	Unit	Gluey Soft
Colour		grey
Thickness (+/-10%)	mm	1.2
Reinforcement		fiber glass
Hardness	Shore 00	45
Peel strength	Side A	N
Peeling 180°C; peeling speed 300mm/min.	Side B	N
Adhesive strength (25x25 mm adhesive surface)	kPa	300
Bonding strength *	N x mm	> 1.4
Adhesive strength on surface *	mm	> 1.0
Dielectric breakdown E _{d,ac}	KV/mm	> 20
Thermal conductivity	W/mK	0.25
TML	Ma.-%	< 0.8
Elongation	%	40
Application temperature	°C	-40 to +150

* Texture Analyser



Non-slip mat for car interior



fit-up aid



vibration attenuation and fixation e.g. for external hard discs

This adhesive film with reinforcement made of fiberglass fixes parts on all smooth and slightly rough surfaces, even in extreme angled positions or perpendicular to walls - almost "magnetically"! Optimal fixation of components for repairs, installation assistance, anti-slip mat for mobile phones, sunglasses in the car, adhesive surface for notes or small parts on the refrigerator etc. The non-toxic film guarantees the best adhesion without containing adhesives and has an extremely long life. In addition, it can be used in a very large temperature range.

The adhesive strength depends on the material, position and weight. The film can be cleaned with tap water if needed.

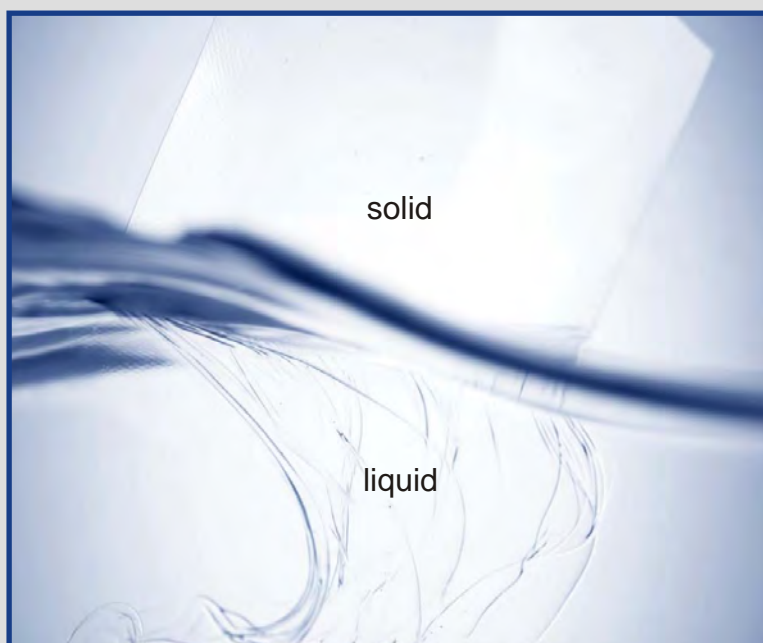
Kerafol® - PVA-Film water soluble

Unsupported, water-soluble PVA-film, for encapsulation and packaging applications. The film is biodegradable, printable, writable and sealable. PVA-film has aroma sealing and gas sealing characteristics.

Properties	Unit	PVA-Film
Colour*		transparent
Basis		polyvinyl alcohol
Mechanical Properties		
Film thickness**	mm	0.015 – 0.02
Film width up to	mm	900
Tensile strength (lengthwise)	MPa	> 20
Tensile strength (crosswise)	MPa	> 25
Elongation (lengthwise)	%	> 500
Elongation (crosswise)	%	> 1400
Physical Properties		
Density	g/cm ²	1.353
Solubility in water at***	10°C	45
	20°C	35
	30°C	30
	40°C	25

* Colouring in diverse colours possible! ** Other thicknesses possible on request!

*** Further solubilities possible!



dissolving PVA-film in water

Applications:

as packing material for

- agrochemicals
- detergent
- agents for dishwasher
- cleaning concentrate
- pigments and colours
- bactericides and enzymes
- additives for chemical products
- disinfecting agents
- toilet deodorizer
- chemicals for water treatment

Kerafol® - Dispensing Technology as a Service



Consulting, Development and Production

With our knowledge in dispensing technology, we offer our customers not only customized solutions, but also consulting, developing and production services regarding the processing of Keratherm® sealing compounds.

Improved thermal, mechanical and electrical properties, which cannot be achieved by conventional products such as heat conducting pastes or thermal conducting tapes, can be generated by our specially developed dispensing materials.

Using the latest dispensing systems for sample production or prototyping and fully automated and robot-controlled manufacturing lines for serial production, we produce in fully air-conditioned cleanrooms.



Technical characteristics of dispensed applications:

- outstanding adaptability and compressibility
- low mechanical stress
- high thermal conductivity
- long term stability
- compatible with industrial production sequences
- good electrical insulation



You benefit from:

- a professional service-provider for dispensing production and technology
- a more economical dispensing material compared to conventional thermal pastes and tapes
- a time-saving, easy assembly, due to the prefabricated ready-dispensed components

We look forward to receiving your inquiry!

Kerafol® - Services

Customer specific tape development and production

Tape development with your raw material from lab scale to mass production



KERAFOL® keramische Folien GmbH, is one of the world's leading manufacturers of ceramic films. Experience and know-how range from a large number of products to customer specific solutions.

We offer:

- Customer specific solutions
- Consulting and development
- Production services from lab scale to mass production

As a specialist in producing ceramic films we can offer you the development of films from your raw material and production services from lab scale to mass production. Depending on the material, it is possible for us to develop and produce films in a thickness of 20 µm to 2 mm and widths from 160 mm to 1000 mm.

An independent research laboratory, equipped with modern facilities, test and measurement equipment, as well as technicians and laboratory technicians from various disciplines enable us to implement your needs quickly and effectively.

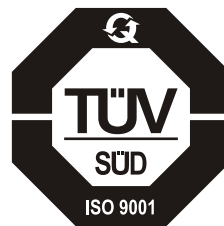
Materials such as aluminum oxide, zirconium oxide, ferrites, enamels, porcelain, mullite, Sic, LTCC, glass solders and many more have already been developed into films.

Customers from all over the world use our experience and our know-how. You too can be a satisfied customer and take advantage of short reaction times and a fast and efficient implementation.

We look forward to your challenge!

Customized Solutions!

We look forward to receiving your inquiry!



Innovations in Technology and Environmental Protection are the objectives of Kerafol®.

Competent customer-oriented advice and problem solutions are our principles as well as a constant further development of our product range to provide the optimal solution for each application.

Discover our wide range of products and benefit from a broad range of applications!

For further information please contact:

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