



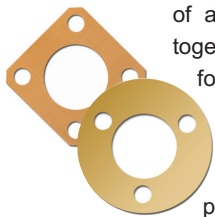
# PEELABLE SHIMS

## KAPTON

# ALKOMPOSIT **K**

## KAPTON PEELABLE SHIMS ALKOMPOSIT **K**

**Alkomposit K laminated peelable shims** are high performance shims for adjustment made from a composite material. They consist of a stack of polyimide (Kapton) leaves, joined together by gluing over the whole surface, thereby forming a laminated set of compact appearance.

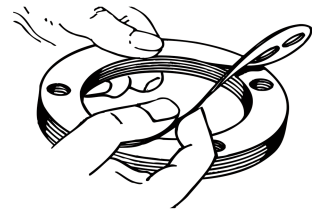


Each basic leaf constituting the stack can be peeled off extremely easily, in complete safety and by hand, until the exact thickness desired is obtained. The shim is therefore perfectly and easily adjusted to compensate accurately for the play in a mechanical assembly.

They can satisfy all types of new applications where it is important to introduce concepts of insulation and lightness over a wide range of temperatures (-269°C to 400°C). Alkomposit shims can be used advantageously to replace machined or ground solid metal shims.

### ADVANTAGES:

- Low density (50% of that of aluminium)
- Fineness of basic thickness: from 0.025 to 0.1mm
- Cleaving without tools, by hand
- Safety in use (almost zero risk of cuts)
- Excellent resistance to chemical agents
- Can be used for damping or as an anti-vibration filter
- Resistance to a wide range of temperatures: from - 269°C to + 400°C (-452°F to +752°F)
- Avoids problems of contact corrosion
- Facilitates bending and adaptation to curved surfaces
- Peeled leaves can be reused
- Dual functionality (shimming + sealing) under certain conditions

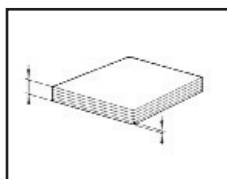


## SHAPES AVAILABLE

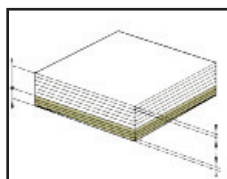
Alkomposit K high performance peelable shims can be produced in any geometrical shape, by cutting out or machining, to your dimensions and specifications. If the dimensions are large, it is possible to produce shims in several parts, mechanically connected or otherwise. Peelable U shims are also available in standard dimensions.

## THICKNESS COMPOSITION

Alkomposit K peelable shims may consist solely of basic leaves of the same thickness (single composition) or of leaves of different thickness on each side (dual composition).



Single-composition



Dual-composition

(An example of dual composition is a shim of total thickness 1 mm made up from 8 leaves of 0.1 mm and 4 leaves of 0.05 mm.)

## DUAL-COMPOSITION

With dual composition, the thickness is obtained commencing by peeling off the thickest basic leaves, then the fine adjustment is obtained by peeling off

## KAPTON MATERIAL

Alkomposit K peelable shims are made of DuPont polyimide Kapton films. Alkomposit K shims have physical, chemical and thermal properties (opposite) that are extremely advantageous for all applications in which there are essential requirements for electrical insulation, excellent resistance to chemical agents, high resistance to temperature (-269°C to +400°C), low density (50% of that of aluminium) and also good safety in use. In addition, the use of Alkomposit shims prevents problems of contact corrosion.

## PHYSICAL PROPERTIES

Properties	unit	1mil / 25µm	2mil / 50µm	3mil / 75µm	5mil / 125µm	Test Method
Ultimate tensile strength at 23°C at 200°C	psi (MPa)	33500 (231) 20000 (139)	33500 (231) 20000 (139)	33500 (231) 20000 (139)	33500 (231) 20000 (139)	ASTM D-882-91 Methode A
Ultimate Elongation at 23°C at 200°C	%	72 83	72 83	72 83	72 83	ASTM D-882-91 Methode A
Tensile Modulus at 23°C at 200°C	psi (GPa)	370000 (2,5) 290000 (2,0)	370000 (2,5) 290000 (2,0)	370000 (2,5) 290000 (2,0)	370000 (2,5) 290000 (2,0)	ASTM D-882-91 Methode A
Density	g/cc	1,42	1,42	1,42	1,42	ASTM D-1505-90
MIT Folding endurance	cycles	285000	55000	6000	5000	ASTM D-2176-89
Tear strength-propagating (Elmendorf), N(lbf)		0,07 (0,02)	0,21 (0,02)	0,38 (0,02)	0,58 (0,02)	ASTM D-1922-89
Tear strength, Initial (Graves), N(lbf)		7,2 (1,6)	16,3 (1,6)	26,3 (1,6)	46,9 (1,6)	ASTM D-1004-90
Yield point 3% at 23°C at 200°C	Mpa (psi)	69 (10000) 41 (6000)	69 (10000) 41 (6000)	69 (10000) 41 (6000)	69 (10000) 41 (6000)	ASTM D-882-91
Stress to produce 5% elong. at 23 °C and at 200°C	Mpa (psi)	90 (13000) 61 (9000)	90 (13000) 61 (9000)	90 (13000) 61 (9000)	90 (13000) 61 (9000)	ASTM D-882-92
Impact strength at 23°C	N . cm . (ftlb)	78 (0,58)	78 (0,58)	78 (0,58)	78 (0,58)	DuPont
Coefficient of friction, kinetic (film to film)		0,48	0,48	0,48	0,48	ASTM D-1894-90
Coefficient of friction, static (film to film)		0,63	0,63	0,63	0,63	ASTM D-1894-90
Refractive Index (Sodium D line)		1,70	1,70	1,70	1,70	ASTM D-542-90
Poisson's Ratio		0,34	0,34	0,34	0,34	Moyenne (5,7,10%)

## THERMAL PROPERTIES

Properties	Typical value	Test Conditions	Test Method
Melting Point	No		ASTM E-794-85
Thermal Coef. of linear expansion	20ppm/°C	-14 to 38°C	ASTM D-696-91
Coef. of thermal conductivity	0,12 (W/m.K)	296 K to 23°C	ASTM F-433-77
Specific heat J/g.K (cal/g.°C)	1,09 (0,261)		Differential calorimetry
Heat sealability	Not heat sealable		
Smoke generation	Dm = <1	NBS (Smoke room)	NFPA - 258
Shrinkage, % 30min à 150°C 120min à 400°C	0,17 1,25		IPC-TM-650 Method 2.2.4A ASTM D-5214-91
Limiting Oxygen Index, %	37 - 45		ASTM D-2863-87
		Between 360°C and 410°C	

## Thermal coefficient of expansion (Kapton 25µm - 1mil-)

Temperature Range	ppm/°C
30-100°C	17
100-200°C	32
200-300°C	40
300-400°C	44
30-400°C	34

In the interests of quality improvement, Jicey reserves the right to change any of the characteristics and specifications contained herein at any time, without prior notice.

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**JICEY**  
PRECISION SHIMS