BUILDING TRUST

SikaBlock® M974

Technical Data Sheet

Epoxy Tooling Board

Intermediate-temperature Use, Low CTE

DESCRIPTION

SikaBlock® M974 is an epoxy tooling board suitable for epoxy prepregs or Intermediate temperature lay-up tools or parts and short run thermoforming applications.

APPLICATIONS

- *Thermoforming tools*
- *Master models*
- *Curing prepreg*
- *Intermediate temperature lay-up tool*

PROPERTIES

- *Good temperature resistance*
- *Medium density*
- *Excellent surface aspect*
- *Easily machined*
- *Easily polished*
- *Low CTE*

PHYSICAL PROPERTIES		
		SikaBlock® M974
Composition		Epoxy
Color	Visual	Light blue
Density at 77° F (25° C) lbs./ft.^{3} (g/cm^3)	ASTM D-792	45 lbs./ft.^{3} (0.72g/cc)

MECHANICAL AND THERMAL PROPERTIES AT 74° F (23° C)			
Hardness	ASTM D-2240	Shore D	74
Flexural strength	ASTM D-790	psi (MPa)	4,700 (32)
Flexural modulus	ASTM D-790	psi (MPa)	354,000 (2,443)
Tensile strength	ASTM D-638	psi (MPa)	4,070 (28)
Tensile modulus	ASTM D-638	psi (MPa)	228,000 (1,573)
Tensile % elongation	ASTM D-638	%	2.0
Compressive yield strength	ASTM D-695	psi (MPa)	7,400 (51)
Compressive modulus	ASTM D-695	psi (MPa)	250,000 (1,725)
Tg (TMA onset) (TMA midpoint)	ASTM E-1545	°F (°C)	239 (115) 252 (122)
Coefficient of linear thermal expansion 50 – 140°F (10 – 60°C)	ASTM E-1545	In/in/°F In/In/°C	20 (±) 2 x10^{-6} 36 (±) 2 x10^{-6}
Izod Impact Resistance - notched	ASTM D-256	KJ/m^2	0.92
Izod Impact Resistance - unnotched	ASTM D-256	KJ/m^2	3.3

NOTE : *These physical properties are reported as typical test values obtained by our test laboratory. SikaBlock® M974 can be used up to 235°F (113°C) maximum temperature for curing prepregs with autoclave (40–100 psi or 3–7 bar pressure) or without autoclave. Depending on tool configuration, with careful cure consideration (ramp and soak times), it may be possible to go higher in temperature use with this tooling board.*

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CURE PARAMETERS FOR USE WITH SikaBlock® M974 Tools:

*To protect from excess movement, cracking, thermal shock, or warpage **t**he temperature differential (ΔT) between the center of the tool and the external surface should never exceed 55°F on either ramp up or cool down. To achieve this, temperature soaks of 6-8 hours every 55°F up and down in the oven and temperature ramp rates of no more than .5°F/min are recommended, Leave the tool in the oven for at least 6-8 hours below 100°F before opening doors and exposing the tool to room temperature conditions. Do not cure or use over a 235°F temperature.*

ASSEMBLY

The recommended adhesive for bonding SikaBlock® M974 is EL-336 laminating resin. Cure adhesive 16 – 24 hours at room temperature before applying the heat cure to adhesive (this is all before machining board to shape needed). Heat cure the adhesive per slow ramp rate/soak rates given above to the required tool or part cure temperature needed up to 235°F maximum. Machine board to final shape only after curing adhesive per these parameters.

MACHINING PARAMETERS		
	Cutter edge velocity (Vc in ft/min (m/min))	Feed per tooth (fz in inches (mm)/revolution)
Rough cut(1)	328 – 1312 (100 – 400)	0.014 (0.35)
Finishing cut(2)	1312 – 2625 (400 – 800)	0.002 – 0.006 (0.05 – 0.15)

n = (12 English or 1000 metric) X Vc) / (PI X Dc)	Vf = n X fz X Z

- *Vc: Cutter edge velocity in ft/min (m/min)*
- *Dc: cutting diameter in inches (mm)*
- *n: Spindle speed in revolution/min*
- *fz: Feed per tooth in inches (mm)/revolution*
- *Z: number of teeth*
- *Vf: feed speed in inches (mm)/min*

(1) ***Rough cut:*** *Cutting parameters are determined with a carbide-insert ball nose end mill:*
- *Helix angle: 6°*
- *Clearance angle: 14°*

(2) ***Finishing cut:*** *Cutting parameters are determined with a 2 teeth ball nose end mill:*
- *Helix angle: 30°*
- *Clearance angle: 14°*

These machining parameters represent starting points. *Cutter type and material, spindle speed, feed rate, machine power and rigidity all affect machining results. User must determine the best parameters for specific situations.*

STORAGE CONDITIONS

- *Product should be stored in a flat and dry place between temperature ranges no greater than +15°C and +40°C (+60°F and 104°F).*

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HANDLING PRECAUTIONS

Normal health and safety precautions should be observed when handling these products :

- *Ensure good ventilation*
- *Wear gloves, and safety glasses.*

For further information, please consult the material safety data sheet.

DISCLAIMER

The information contained in this technical data sheet results from research and tests conducted in our laboratories under precise conditions. Seller cannot anticipate all conditions under which seller's products, or the products of other manufacturers in combination with seller's products, may be used. It is the responsibility of the user to determine the suitability of the SikaAxson's products, under their own conditions, before commencing with the proposed application. In no event shall SikaAxson US be liable for any direct, indirect, punitive, incidental, special, and/or consequential damages, to property or life, whatsoever arising out of or connected with the use or misuse of our products.

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