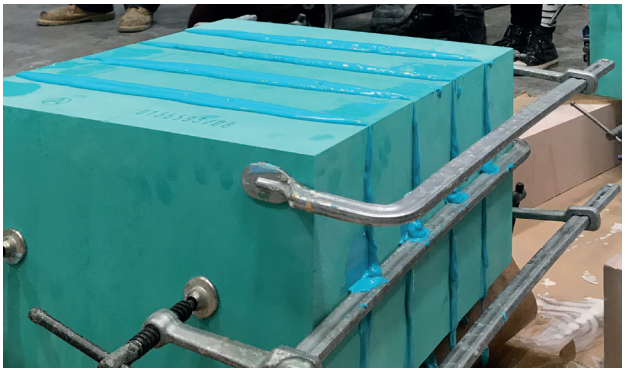
WORKING INSTRUCTIONS

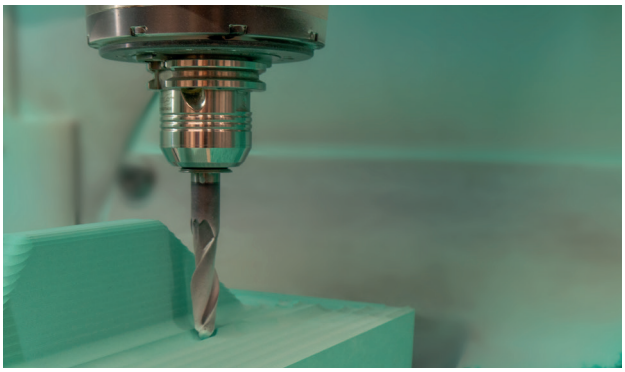
SikaBlock® M976 EP/LAB 975 New
Epoxy Boards

SikaBiresin® B176
Matched Adhesive

BUILDING TRUST

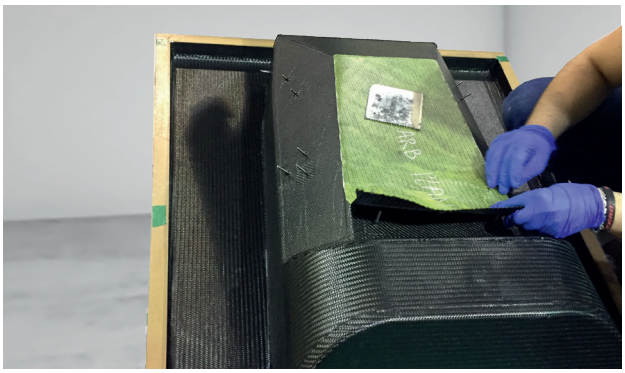


1 Glue-up the boards



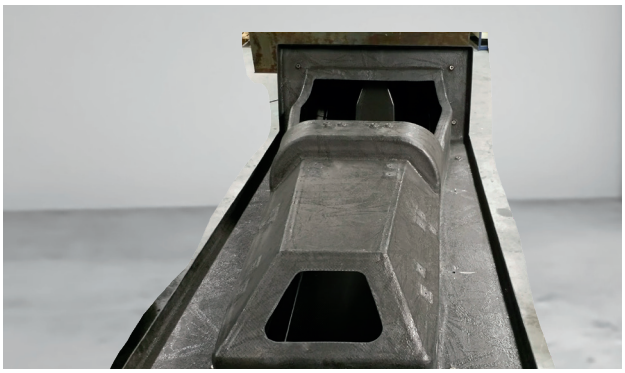
2 CNC Milling

3 Sealing and flange preparation

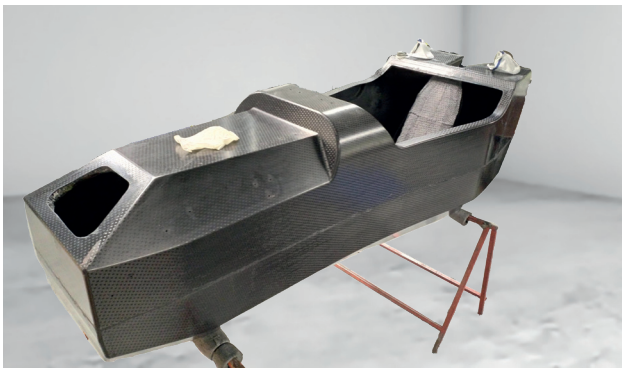


4 Tooling Prepreg Lay-up

5 Vacuumbagging for autoclave curing cycle



6 Prepreg mould

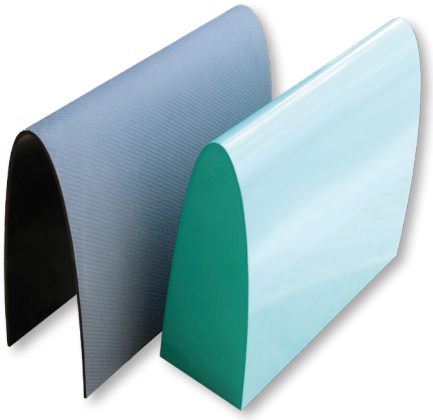


7 Prepreg parts assembled

Credit: Oxford Brookes Racing and FIS Berlin

PROCESSING GUIDE
MAKING PREPREG MOLD OR DIRECT PART USING SIKABLOCK® M976 EP/LAB 975 NEW EPOXY BOARDS

THE USE OF FIBER REINFORCED COMPOSITES has been growing in numerous industries at a double digit growth rate for many years and is predicted to continue doing so. Among various manufacturing technologies, composite parts made of prepreg technology are being used within several industries such as **aerospace, automotive, wind rotor blades, marine** etc ... Today, prepreg technology is delivering the highest quality of composite parts with an unmatched ratio of premium performance and weight reduction.



Sika Advanced Resins is a global leader with a long proven expertise in providing soft tooling package solutions for the manufacturing of prepreg tools or parts.
Beyond the performance of our epoxy tooling boards and its matched adhesive with data available in our product data sheet (PDS), we aim at supporting professionals by advising of best processing practices for complete satisfaction.

This processing guide will especially enable new users to follow our recommendations for every step of their project.
From cutting and glueing the board to the tempering, the milling and finishing of the surface, this guide will provide useful recommendations to obtain a perfect master or direct mould.
Finally, advise on what thermal cycling is required to apply for either low temperature tooling prepregs on a board master or prepreg for parts on a board one-off direct tooling.

AVAILABLE BOARD SIZES

LAB 975 New
1500 x 500 x 50 mm
1500 x 500 x 75 mm
1500 x 500 x 100 mm
1500 x 500 x 150 mm
1500 x 500 x 200 mm

Imperial sizes 1524x610 mm upon demand with same thicknesses.

SikaBlock® M976 EP
1500 x 500 x 50 mm
1500 x 500 x 75 mm
1500 x 500 x 100 mm
1500 x 500 x 150 mm
1500 x 500 x 200 mm

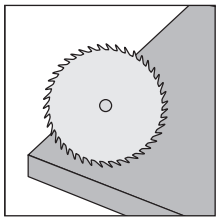
Imperial sizes 1524x610 mm upon demand with same thicknesses.

MATCHED ADHESIVE

SikaBiresin® B176	
Resin:	6 x 0,6 kg
Hardener:	6 x 0,09 kg

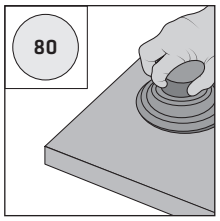
STEP BY STEP
PROCESSING SIKABLOCK®M976 EP/LAB 975 NEW AND SIKABIRESIN® B176

1



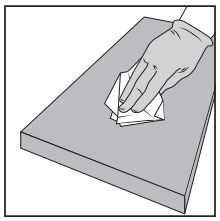
- Cut the board with a bimetal band saw blade or a hard metal circular saw blade.

2



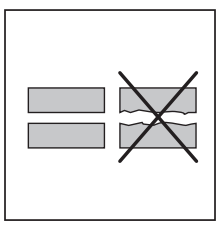
- Sand the boards with 80 grit sandpaper.
- Remove the dust with a vacuum cleaner.

3



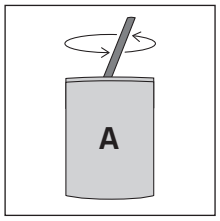
- Clean with **Sika® Cleaner G&M** or Iso Propyl Alkohol and allow 15 minutes to evaporate.

4



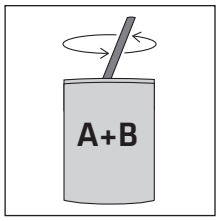
- Surfaces to be bonded should be flat and parallel to each other.

5



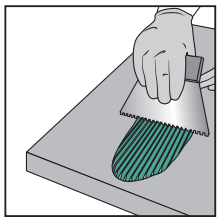
- Open **SikaBiresin® B176** resin can and stir to ensure a homogenous aspect before adding the **SikaBiresin® B176** hardener.

6



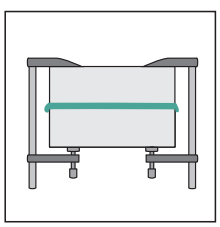
- Add the **SikaBiresin® B176** hardener according to the mixing ratio 100 (resin) : 15 (hardener) by weight.
- Homogenize the mixture thoroughly.
- The use of a kit (0,69 kg) will cover approximately 1,3 m^2.

7



- Apply the mixture with a notched metal spatula (3 mm) on each side of the board to bond.
- Manually adjust the positioning of the boards together by sliding them on top of each other.

8

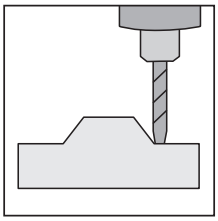


- Fix the assembly with sufficient clamps, a press or a vacuum bag.
- Remove excess mixture squeezing out from the bonding lines between the boards.
- Remove the clamps or the vacuum bag after 16 hours at room temperature (20–25 °C).

ACCORDING TO THE USAGE PLEASE FOLLOW INSTRUCTION A) OR B):

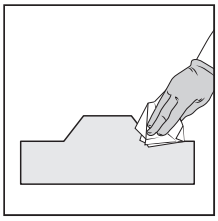
A) MASTER MODEL FOR LOW TEMPERATURE TOOLING PREPREGS

9A



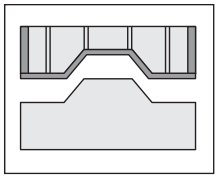
- Mill the bonded boards with a CNC milling machine.
- See milling parameters on page 7.

10A



- Final manual sanding with 800 grit or higher to remove milling steps.
- Remove dust prior applying a sealer on the board with a clean and soft cotton cloth or a foam brush or by spraying method.
- Please follow the instructions from ChemTrend L.P. (for example Chemlease® MPP 712) or Marbocote Ltd. (for example HP2002).

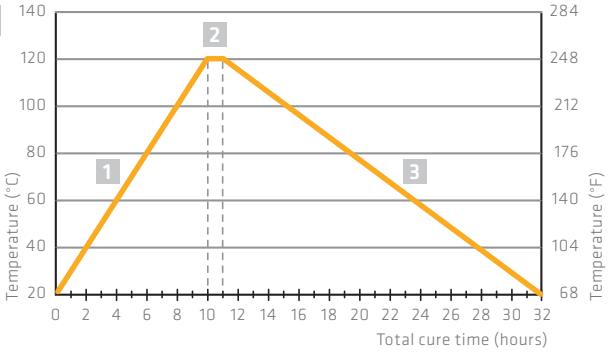
11A



- Master model for tooling prepregs.
- Please turn to page 6 for further process to produce parts.

B) DIRECT MOULD TO PRODUCE PREPREG PARTS UP TO 120 °C

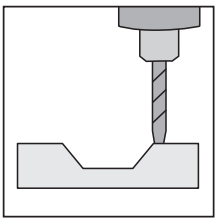
9B



Temper the assembled boards free standing:

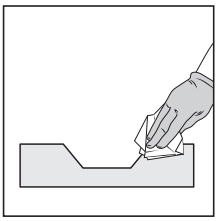
1. Ramp up to 120 °C (11°/h).
2. Hold on for 1 hour.
3. Ramp down to 20–25 °C (7°/h)
4. For 200 mm blockup allow to cool down for 12 hours

10B



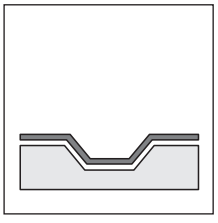
- Mill the assembled boards with a CNC milling machine.
- See milling parameters on page 7.

11B



- Final manual sanding with 800 grit or higher to remove milling steps.
- Remove dust prior applying a sealer on the board with a clean and soft cotton cloth or a foam brush or by spraying method.
- Please follow the instructions from ChemTrend L.P. (for example Chemlease® MPP 712) or Marbocote Ltd. (for example HP2002).

12B

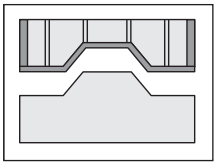


- Please turn to page 6 for further process to produce parts.

PREPREG CURING CYCLES

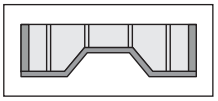
A) PRODUCING OF LOW TEMPERATURE TOOLING PARTS

11A

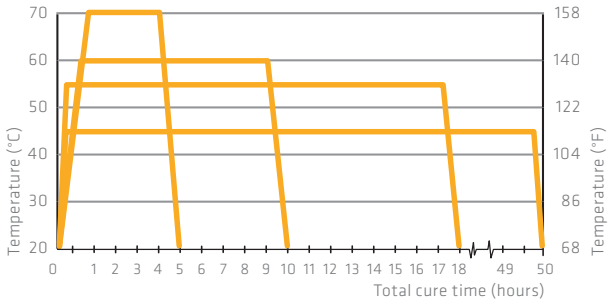


■ Master model for tooling prepregs.

12A



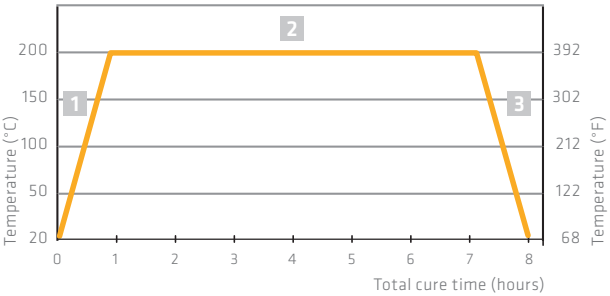
■ Example of cure cycling with LTC216 Prepreg from SHD Composites.



Temperature	Ramp up	Hold	Ramp down
45 °C	> 25 min	40–50 h	> 25 min
55 °C	> 35 min	16–18 h	> 35 min
60 °C	> 40 min	10 h	> 40 min
70 °C	> 50 min	5 h	> 50 min

Please refer to SHD Composites PDS for detailed instructions.

13A Postcuring LTC216

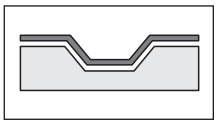


Postcuring for max. 220 °C T_g:
1. Ramp up to 200 °C (18°/h).
2. Hold on for 8 hours.
3. Ramp down to 200 °C (18°/h).

Please refer to SHD Composites PDS for detailed instructions.

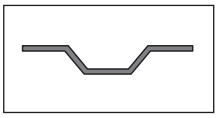
B) PRODUCING PARTS UP TO 120 °C

12B

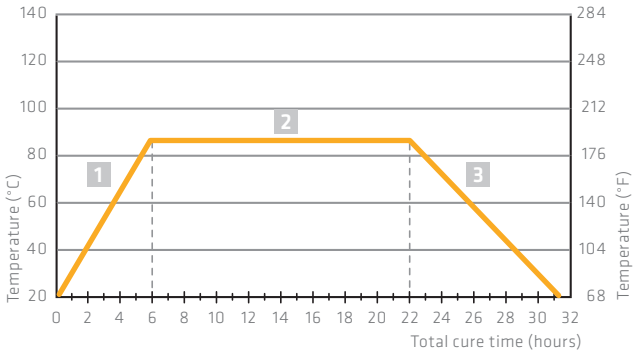


■ Direct mould to produce parts.

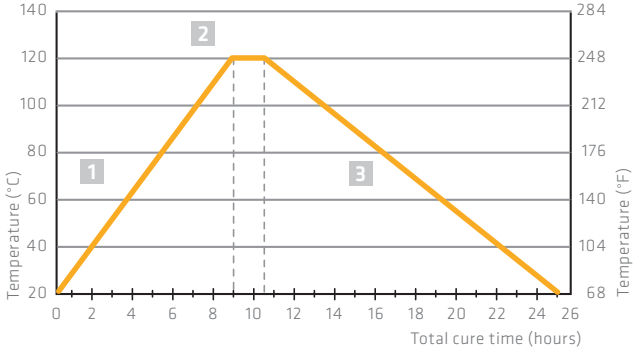
13B



■ Example of MTC400 component prepreg from SHD Composites.



85 °C Cure cycle for 90 °C T_g
1. Ramp up to 85 °C (11°/h).
2. Hold on for 16 hours.
3. Ramp down to 20 °C (7°/h).

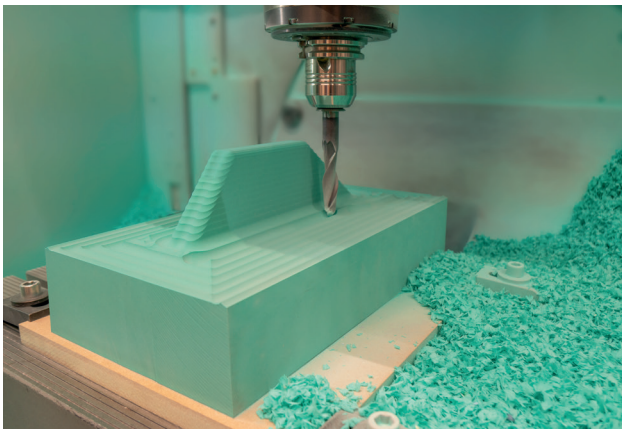


120 °C Cure cycle for 135 °C T_g
1. Ramp up to 120 °C (11°/h).
2. Hold on for 1 h 30 min.
3. Ramp down to 20 °C (7°/h).

14B Please refer to SHD Composites PDS for detailed instructions to obtain higher Tg up to 225 °C.

CNC MILLING PARAMETERS
FOR SIKABLOCK®M976 EP/LAB 975 NEW

MILLING PARAMETERS							
Milling steps	1	2	3	4	5	6	7
Strategy	Roughing Z-constant	Rest material Z-constant	Rest material Z-constant	Rest material Z-constant	Finishing flat areas	Finishing Z-constant	Finishing rest material shapes
Milling tool	Torus cutter	Torus copying cutter	Ball nose copying cutter	Ball nose copying cutter	Torus copying cutter	Ball nose copying cutter	Solid carbide ball nose cutter
Diameter [mm]	42	20	12	6	8	8	4
Number of teeth	3	2	2	2	2	2	2
Radius [mm]	3	4	6	3	1	4	2
Cutting speed (Vc) [m/min]	540	500	600	300	400	400	200
Revolutions [1/min]	4,100	7,957	16,000	16,000	16,000	16,000	16,000
Feedrate per tooth [mm]	0.6	0.5	0.2	0.18	0.13	0.13	0.13
Feed rate (Vf) [mm/min]	7,380	7,957	6,366	5,760	4,160	4,160	4,160
Cutting depth (ap) [mm]	3	2	1	0.3	0.3	0.15	0.1
Cutting Width / Line spacing (ae) [mm]	30	10	2	0.5	4	0.3	0.1



MOVING INDUSTRIES FORWARD

COMBINING GLOBAL REACH WITH LOCAL EXPERTISE

WHO WE ARE

Sika is a specialty chemicals company with a globally leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing, and protection in the building sector and industrial manufacturing. Sika has subsidiaries in 102 countries around the world and, in over 400 factories, produces innovative technologies for customers worldwide. In doing so, it plays a crucial role in enabling the transformation of the construction and transportation sector toward greater environmental compatibility. With more than 34,000 employees, the company generated sales of CHF 11.76 billion in 2024.

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