



AEROSPACE

ADVANCED SOLUTIONS FOR YOUR NEEDS

CREATING A STRONG FUTURE

Worldwide solutions in PUR and EP resins

YOUR ADDED VALUE

Reliability and Safety

Advanced Resins is on your side as a strong global player. As an inherent part of the Swiss concern Sika AG you can rely on us.

Quality and Innovation

Our clients expect high-quality end products. Benefit from over 75 years of intensive expertise in the development of high-quality PUR and EP resins. With innovative and coordinated PUR and EP product systems, we help you to achieve end user satisfaction.

Flexibility and integrated solutions

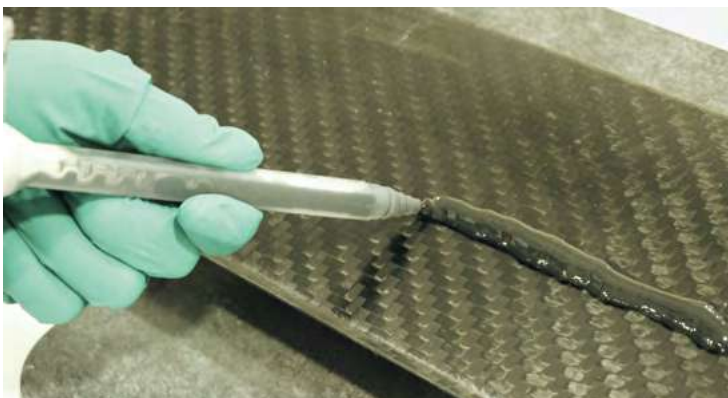
As individual as your task. The comprehensive and integrated product range of Sika Advanced Resins offers you even more solutions for your applications.

Professional global support worldwide

Local experts provide you with personal on-site support in all issues relating to product processing and plant technology.

Global Availability

The consolidation of worldwide production sites, several development departments and our global dealer network maximizes the availability of our products – wherever you are located.



“As a global leader in Adhesives it is our aim to provide our customers with best in class innovative and tailor made solutions. Being close to our customers is not only a word for us: Worldwide production and on-site support of our experts is the basis of our success. Every day, we are looking forward to create new and better solutions together with our customers.”

MORTEN MUSCHAK
Corporate Target Market Manager Industry

CUSTOMIZED SOLUTIONS FOR ...

- Foundry model making
- Automotive industry
- Transportation industry
- Sports and leisure
- Industrial applications
- Boat and yacht building industry
- Aviation industry
- Renewable energies
- Dielectrics

ADVANCED RESINS IS PART of Sika Industry and with over 75 years of experience, is a world leading provider and developer of high performance resins. It offers customized solution for the composite industry as well as structural adhesive. In addition Advanced Resins offers technical casting for industrial filters.

Sika Industry is a part of Sika AG, which is headquartered in Baar Switzerland. Sika has subsidiaries in 100 countries worldwide with 300 manufacturing sites. It has approx. 25,000 employees, who generated annual turnover of CHF 8,1 billion.

With over 30 years of experience in the manufacturing of polymer solutions for aerospace, Sika Industry with the Advanced Resins Team proposes to the market specific solutions for part making, assembly and honeycomb. Partnerships developed with market leaders in Europe and USA makes the difference to bring tailor made solutions complying with the toughest specifications and bringing efficiency in production to reduce global cost.

CONTENT

| | |
|----------------------------------|----|
| Overview | 04 |
| Densification and Edging | 06 |
| Honeycomb Assembly | 08 |
| Inserts | 10 |
| Mastics | 12 |
| Carbon Parts for Light Aircrafts | 13 |
| To Go Further | 14 |

OVERVIEW

WITH MORE THAN 30 YEARS of experience in manufacturing of polymer solution for aero, Sika Industry with the Advanced Resins Team proposes to the market specific solutions for part making, assembly and honeycomb.

Partnerships developped with market leaders in Europe and USA makes the differenece to bring tailor made solutions with the toughest specifications and bringing efficiency in production to reduce global cost.



MASTICS
Specially designed technical mastics for surface finishings, offering an easy application to get perfect finishing.
>> page 12



INSERTS
Key in interior conception, adhesives for inserts to cover all production needs.
>> page 10



HONEYCOMB ASSEMBLY
Structural epoxy adhesives to offer a maximum of freedom in design to make any possible assembly.
>> page 8

DENSIFICATION AND EDGING

DENSIFICATION AND EDGING REQUIRE light and fireproof products offering hardness and modulus: harness for scratchproof and modulus to secure insert anchoring. Sika's core filler range is designed to fulfill fire smoke and toxicity requirements of major plane manufacturers and to save production costs when applying.

PRODUCTS KEY ADVANTAGES

CF 180:

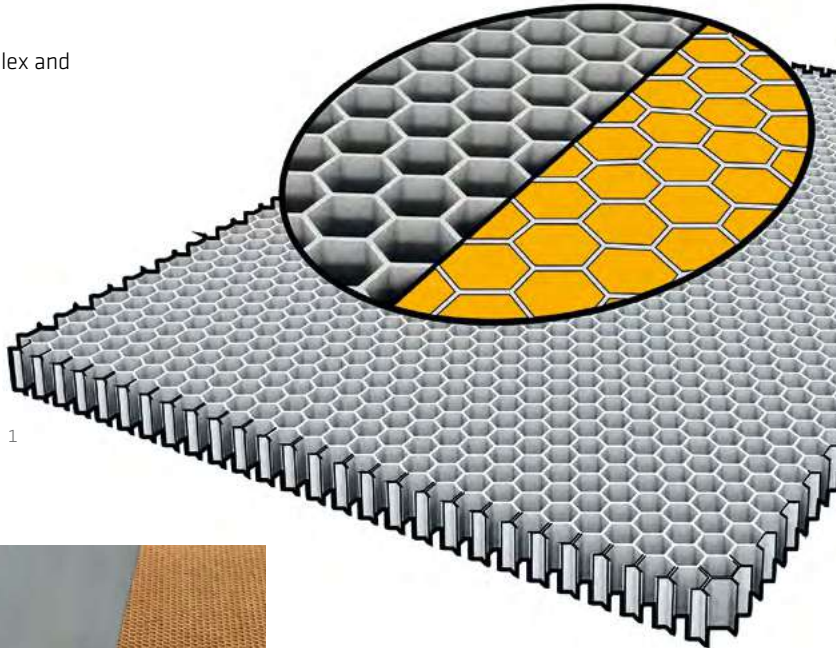
- Can be applied manually and complies with dosing machine
- Accept vacuum pressure to fill cell
- Used by leaders since decades

CF 230 / CF 234-1:

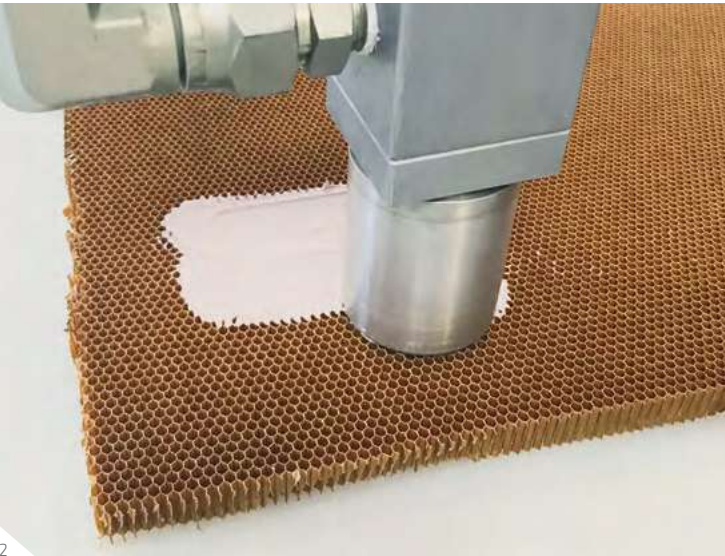
- For manufacturing and maintenance
- High viscosity complies with edging of complex and wide part
- Available in ready to use kit

CF 230 / CF 238-1:

- For manufacturing and maintenance
- Smooth aspect for easier application in small gaps
- Available in ready to use kit



1

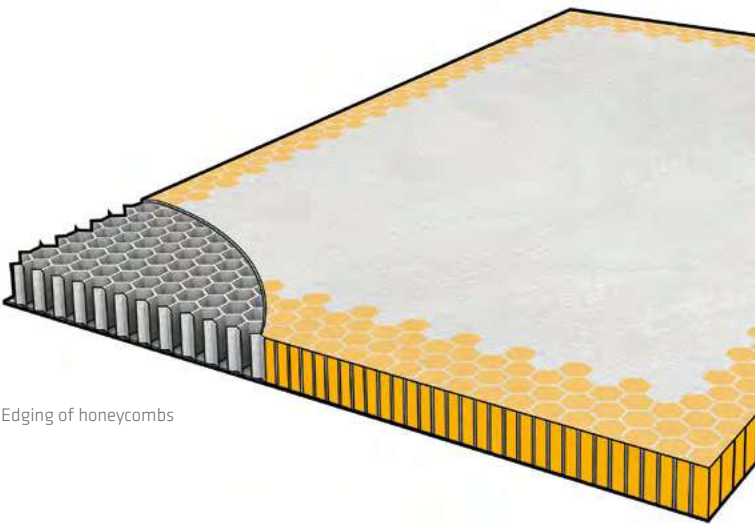


2

- 1 Densification
- 2 Automatic dispense of CF 180
- 3 Densification and edging



3



Edging of honeycombs

OVERVIEW DENSIFICATION AND EDGING RESINS

| | Characteristics | Aspect | Density of cured product at 23 °C | Pot life at 25 °C [min] | Reactivity on 20 mm at 120 °C [min] | Hardness [Shore D] | Compressive strength [MPa] | Self-extinguishing properties | Shelf life | Colour |
|-------------------|--|-----------------|-----------------------------------|-------------------------|-------------------------------------|--------------------|----------------------------|---|---|------------|
| EP | | | | | | | | | | |
| CF 180 | Designed for edging of honeycomb sandwich structures and / or for cells densification for inserts fixing | Paste 1K | 0.80 | – | 25 | 85 | 85 | FAR 25§853 (a), Amdt 23 FAR 25§853 (d), Amdt 23 ABD0031 (issue G) | 18 months at –18 °C 9 months at 6 °C 3 months at 25 °C | white |
| CF 230 / CF 234-1 | | Paste 2K | 0.60 | 14 | – | 70 | 35 | FAR 25§853 (a), Amdt 20 FAR 25§853 (d), Amdt 20 ABD0031 (issue G) | 12 months at 15–25 °C | pale green |
| CF 230 / CF 238-1 | | Thick liquid 2K | 0.64 | 20 | – | 70 | 45 | FAR 25§853 (a), Amdt 21 ABD0031 (issue G) | 12 months at 15–25 °C | blue |

HONEYCOMB ASSEMBLY

INTERNAL DESIGN IS A KEY point for a successful passenger experience. Creating a relaxing and safe atmosphere requires specifics designs for seat, galley and all interior furnitures.

Sika's structural epoxy adhesives are developed to offer a maximum of freedom in design to make any possible assembly. From highly thixotropic but smooth adhesive, complying with edge bonding and big gap filling to thin assembly line: all combinations are possible.

The range also includes full FST adhesives (ABD0031, FAR25) and high peel and impact resistance adhesives.

PRODUCTS KEY ADVANTAGES

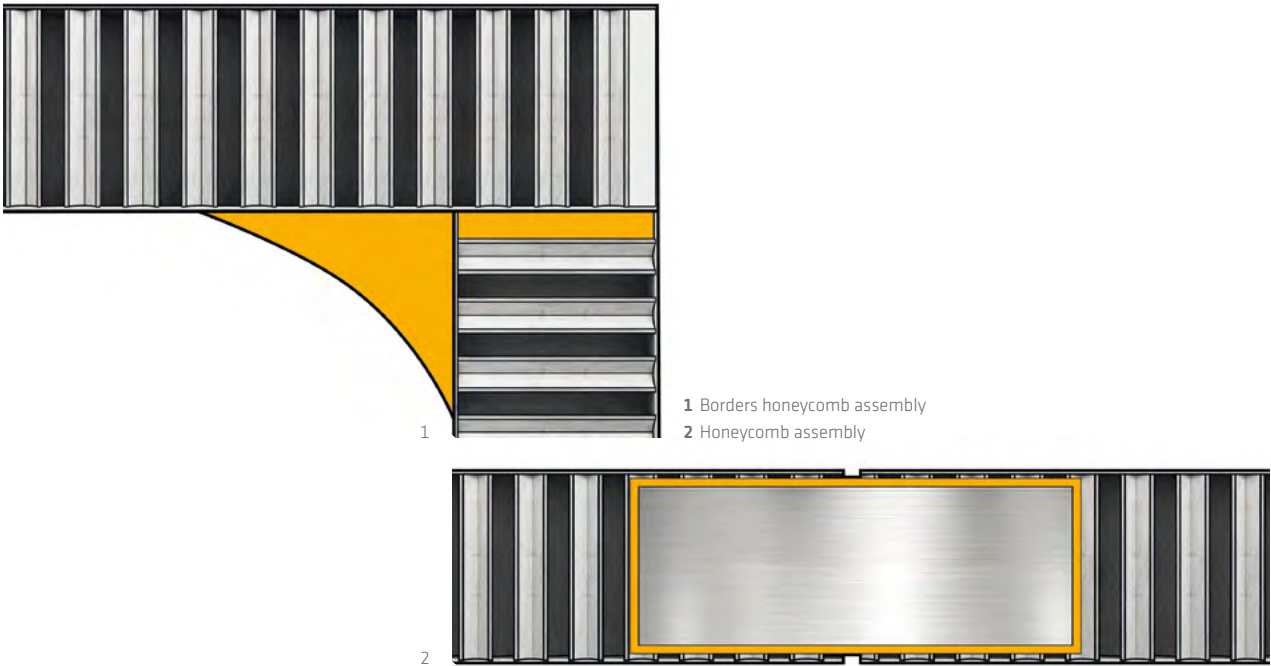
- A 140-1:**
- Versatile product
 - Can be used in bead
 - Can be injected, even for long insert

- A 155:**
- For big parts such as galley assembly
 - High lap shear (35 Mpa)
 - High elongation (8.5 %)
 - High impact resistance

- H 9952 BK:**
- FAR25 and ABD0031 fire standards
 - Bead calibration of 250 micrometers
 - Long open time at room temperature
 - Fast curing with limited heating



1 Panels assembly, intended for galleys
2 In yellow, application of Sika Products in galley components



1 Borders honeycomb assembly
2 Honeycomb assembly

OVERVIEW HONEYCOMB ASSEMBLY RESINS

| | Characteristics | Open time at 23 °C [min] | Max lap shear strength [MPa] | Max peel strength [kN/m] | Elongation at break [%] | Impact resistance [N/mm] | Hardness [Shore D] | Self-extinguishing properties |
|-----------|---|--------------------------|------------------------------|--------------------------|-------------------------|--------------------------|--------------------|---|
| EP | | | | | | | | |
| A 140-1 | Multipurpose epoxy adhesive with excellent mechanical properties. Pasty non sagging gap filler material. High impact resistance. | 40 | 23 | 6 | 4 | 10 | 80 | — |
| A 155 | Pasty epoxy structural adhesive with long pot life. For large composite parts repair and maintenance. Good mechanical, chemical performances and temperature resistance. High impact resistance. | 60 | 35 | 3 | 8.5 | 15 | 85 | — |
| A 171-1 | High performances epoxy structural adhesive. Slow setting product suitable to bond wide surfaces. Self-extinguishing according to FAR 25§853. | 50 | 26 | 4 | 3 | — | 85 | FAR25§853 ((a), Amdt 21) ABD0031 (issue G) |
| H 9952 BK | High mechanical properties and ageing resistance epoxy adhesive. Short handling time got with limited heating. Self-extinguishing according to FAR25§853, ABD0031 and EN45545-2. | 120 | 25 | 5 | 3 | — | 85 | FAR25§853 ((a), Amdt 25-116) ((d), Amdt 25-116) ABD0031 (issue G) |

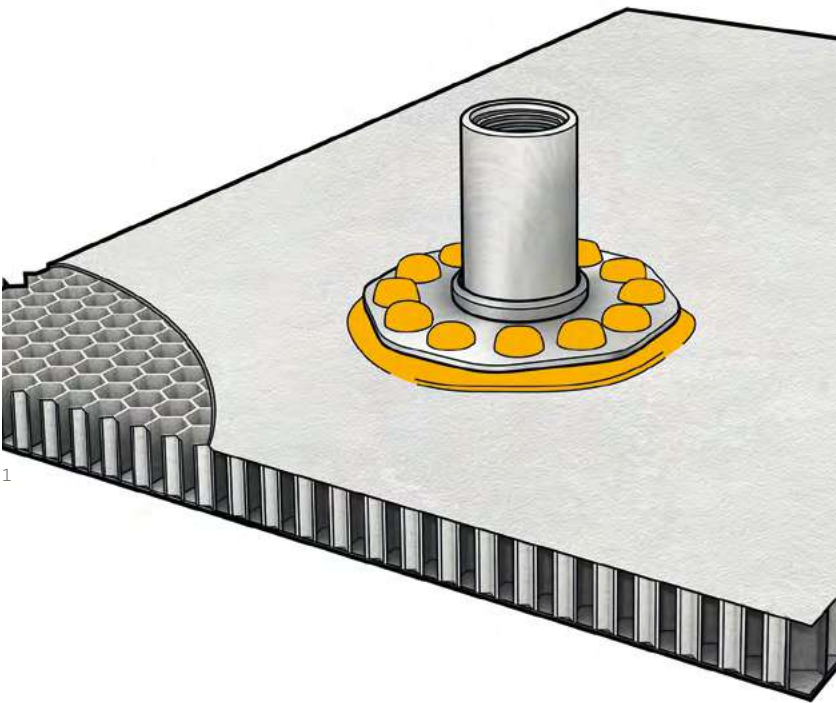
INSERTS

INSERTS ARE KEY IN interior conception. Sika develops adhesives for inserts to cover all production needs. Special rheology makes injection possible combined with non-sagging properties. Fast adhesives can be proposed. The range include full FST adhesive (ABD0031, FAR25) and high impact resistance adhesives used for seat anchoring for instance.

PRODUCTS KEY ADVANTAGES

- A 140-1:**
- Versatile product
 - Can be used in bead
 - Can be injected, even for long insert
- A 155:**
- For big parts such as galley assembly
 - High lap shear (35 Mpa)
 - High elongation (8.5 %)
 - High impact resistance

- H 9952 BK:**
- FAR25 and ABD0031 fire standards
 - Bead calibration of 250 micrometers
 - Long open time at room temperature
 - Fast curing with limited heating
 - Can be injected



1 Inserts on honeycombs assembly
2 Inserts with A 140
3 Inserts



Adhesives for interior conceptions

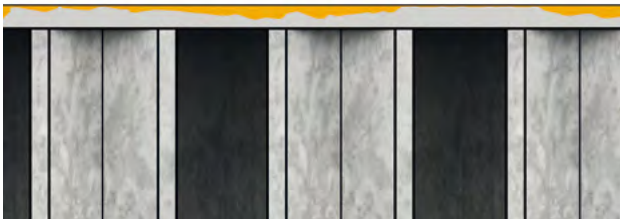
OVERVIEW INSERTS RESINS

| | Characteristics | Open time at 23 °C [min] | Max lap shear strength [MPa] | Max peel strength [kN/m] | Elongation at break [%] | Impact resistance [N/mm] | Hardness [Shore D] | Self-extinguishing properties |
|------------------------|--|--------------------------|------------------------------|--------------------------|-------------------------|--------------------------|--------------------|---|
| PU / EP | | | | | | | | |
| A 130 | Fast curing at room temperature. Suitable for injection. Multipurpose adhesive suitable to bond composites, metals wood, concrete. | 5 | 20 | 1.5 | 3.5 | – | 75 | – |
| A 140-1 | Multipurpose epoxy adhesive with excellent mechanical properties. Pasty non sagging gap filler material. High impact resistance. | 40 | 23 | 6 | 4 | 10 | 80 | – |
| A 155 | Pasty epoxy structural adhesive with long pot life. For large composite parts repair and maintenance. Good mechanical, chemical performances and temperature resistance. High impact resistance. | 60 | 35 | 3 | 8.5 | 15 | 85 | – |
| A 290 | Fast curing polyurethane adhesive. Structural bonding of metallic inserts/ big head to composites. Vibration absorbing. Good chemical resistance. Short handling time got with limited heating. | 3 | 16 | 12 | 95 | 30 | 50 | – |
| H 9951-1 H 9951-1 T | Non filled tough adhesive for panels bonding when mechanical performances and ageing resistance are requested. High impact resistance. | 40 | 24 | 4 | 10 | – | 75 | – |
| H 9952 BK | High mechanical properties and ageing resistance epoxy adhesive. Short handling time got with limited heating. Self-extinguishing according to FAR25§853, ABD0031 and EN45545-2. | 120 | 25 | 5 | 3 | – | 85 | FAR25§853 ((a), Amdt 25-116) ((d), Amdt 25-116) ABD0031 (issue G) |

MASTICS

COMPOSITE PART SURFACES COMPLETION is essential to designing finishing touches, a key point required by any modern airplane constructor in order to develop their brand image.

Sika specially designs technical mastics for surface finishings, offering an easy application to get perfect finishing. Fireproof mastic are also available.



Inserts on honeycombs assembly

| OVERVIEW MASTICS | | | | | | | | |
|------------------|--|-------------------------|-----------------------------------|--------------------|----------------------------|-------------------------------|-----------------------|-------------------------------|
| | Characteristics | Pot life at 25 °C [min] | Density of cured product at 25 °C | Hardness [Shore D] | Compressive strength [MPa] | Peak service temperature [°C] | Shelf life | Self-extinguishing properties |
| POLYESTERS | | | | | | | | |
| APF 7 | Quick setting styrene and odor free polyester filler paste, chemical and water resistant, excellent machining and finishing results achieved by grinding and sanding, high gloss finish. | 6 | 1.69 | 90 | 68 | 204 | 12 months at 15-25 °C | — |
| PFR 405* | * Only available in the USA | 6 | 0.99 | 73 | 28 | 204 | — | FAR25,853 (a) |



In yellow, application of Sika products

CARBON PARTS FOR LIGHT AIRCRAFTS

SIKA WITH THE ADVANCED RESINS Team has a long experience in light aircrafts parts making and assembly. Assembly from leading edge in helicopter blades to structural assembly of body parts, the range offers a wide choice to solve any specific situation.

Epalam 2500-2501 is a self-extinguishing resin laminating system designed for the impregnation of substrates used in aircraft interiors. Comply with AIMS 04-27-002 Rev1 for the repair of on-board composite components.

PRODUCTS KEY ADVANTAGES

- A 175-1:**
- Long open time
 - Used for carbon bonding parts in helicopters
 - Can fill large gaps
- A 155:**
- High lap shear (35 Mpa)
 - High elongation (8.5 %)
 - High impact resistance
- H 9952 BK:**
- Carbon bonding
 - Used in drone assembly
 - Long open time and fast curing with limited heating

| OVERVIEW CARBON PARTS STRUCTURAL BONDING | | | | | | | | |
|--|---|--------------------------|------------------------------|--------------------------|-------------------------|--------------------------|--------------------|---|
| | Characteristics | Open time at 23 °C [min] | Max lap shear strength [MPa] | Max peel strength [kN/m] | Elongation at break [%] | Impact resistance [N/mm] | Hardness [Shore D] | Self-extinguishing properties |
| EP | | | | | | | | |
| A 140-1 | Multipurpose epoxy adhesive with excellent mechanical properties. Pasty non sagging gap filler material. High impact resistance. | 40 | 20 | 6 | 4 | 10 | 80 | — |
| A 155 | Pasty epoxy structural adhesive with long pot life. For large composite parts repair and maintenance. Good mechanical, chemical performances and temperature resistance. High impact resistance. | 60 | 35 | 3 | 8.5 | 15 | 85 | — |
| A 175-1 | High performances epoxy structural adhesive. Long open time product suitable to bond wide surfaces and heavy duty applications subject to impact or vibration. Shock resistant. | 100 | 19 | 4 | 11 | — | 80 | — |
| H 9952 BK | High mechanical properties and ageing resistance epoxy adhesive. Filled with nanoparticles. Short handling time got with limited heating. Self-extinguishing according to FAR25§853, ABD0031 and EN45545-2. | 120 | 25 | 5 | 3 | — | 85 | FAR25§853 ((a), Amdt 25-116) ((d), Amdt 25-116) ABD0031 (issue C) |
| HP 317F2 | High performances epoxy adhesive. Long open time product suitable for big parts assembly. High mechanical and ageing resistance. For helicopter blade leading edge assembly. | > 120 | > 12 | > 3 | 10 | — | 85 | — |

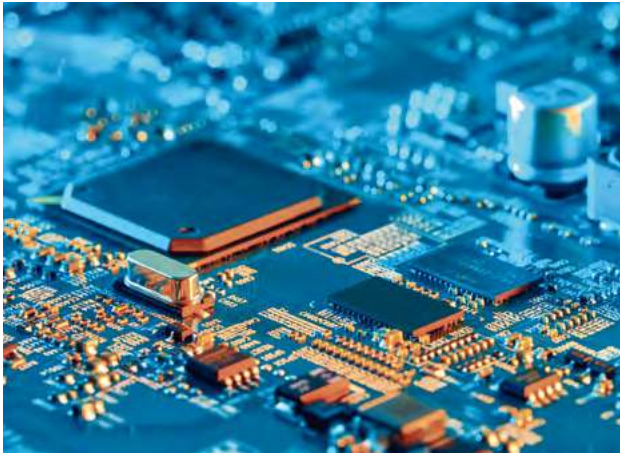
TO GO FURTHER

PRODUCTS FROM SIKA'S RANGE FOR YOUR OTHER AEROSPACE APPLICATIONS

FILTERS
FR2461-1 is a fireproof casting resin designed for air filter.

ELECTRONICS
Electronic components bonding is used to reinforce link between mainboard and component.

SikaBiresin® RE 451A is a dielectric resin providing electric insulation, thermal dissipation and protection from harsh environment. It is used in aerospace and military applications.



RESINS TO GO FURTHER

| | Characteristics | Open time at 23 °C [min] | Max lap shear strength [MPa] | Max peel strength [kN/m] | Elongation at break [%] | Impact resistance [N/mm] | Hardness [Shore D] | Self-extinguishing properties |
|-------------|--|--------------------------|------------------------------|--------------------------|-------------------------|--------------------------|--------------------|--|
| FILTERS | | | | | | | | |
| FR 2461-1 | Two-component polyurethane product, halogen free, semi-flexible, used for making luths in aeronautics air filters when self-extinguishing properties are required. | 15 | 6 | 4 | – | – | 42 | FAR25§853 ((a), Amdt 25-83) ABD0031 (issue C) |
| A 171-1 | High performances epoxy structural adhesive. Slow setting product suitable to bond wide surfaces. Self-extinguishing according to FAR 25§853. | 50 | 26 | 4 | 3 | – | 85 | FAR25§853 ((a), Amdt 21) ABD0031 (issue G) |
| ELECTRONICS | | | | | | | | |
| A 211 BG | Multipurpose Epoxy adhesive with excellent mechanical properties. Pasty non sagging gap filler material. High impact resistance. | 45 | 10 | 9 | 80 | 10 | A 94 | FAR 25§853 (a), Appendix F, Part I (a) (1) (ii), Amdt.25-116 |

RESINS TO GO FURTHER

| | Characteristics | Pot life at 25 °C [min] | Dielectric strength [kV/mm] | Volume resistivity [Ω.cm] | Working temperature [°C] | Glass temperature transition [°C] | Hardness [Shore A1 /A5] | Self-extinguishing properties |
|----------------------|---|-------------------------|-----------------------------|---------------------------|--------------------------|-----------------------------------|-------------------------|-------------------------------|
| DIELECTRICS | | | | | | | | |
| SikaBiresin® RE 451A | Casting resin for mechanical and numerous electrical applications for low and medium voltage when requiring an extinguish characteristic. | 45 | 22 | 2.10 ¹² | – 55 to + 115 | – 40 | 47 / 43 | UL94 V0 12.7 mm |

BOARDS
Various metallic tooling are widely used in the production of airplanes or helicopters. Sika offers a range of modeling and tooling boards which are semi-finished blocks of PU or epoxy resin combined with special mineral or metallic fillers to achieve unique performances. Easily milled by CNC they are beneficial over metals in some applications by saving time to build, giving light weight tools while delivering sufficient durability.

- Here are some examples of several grades commonly used by major aerospace companies worldwide:
- Lab 973: master models for prepreg tools (fiber pre-impregnated composite tools)
 - SikaBlock® Prolab65: in development phase to make master models
 - SikaBlock® Lab850: metal sheet forming or stretch-forming tools
 - SikaBlock® M945: metal sheet stamping tools



RESINS TO GO FURTHER

| | Characteristics | Density | Hardness [Shore D] | Flextural strength [MPa] | Compressive strength [MPa] | Thermal resistance [°C] | CTE, α _T [1/K] | Dimensions [mm] | Adhesive |
|---------------------|--|---------|--------------------|--------------------------|----------------------------|-------------------------|----------------------------|---|---|
| BOARDS | | | | | | | | | |
| Lab 973 | Low density epoxy board with high dimensional stability under pressure and heat up to 125 °C; superior machinability and surface aspect. | 0.75 | 73 (63 at 130 °C) | 30 | 50 | 125 | 35 – 45 x 10 ⁻⁶ | 1500 x 500 x thickness: 50/75/100/150/200 | H 8973 |
| SikaBlock® Prolab65 | Easily workable; fine, dense surface; good compressive strength and edge stability; good heat distortion temperature. | 0.65 | 63 | 34 | 28 | 85 | 75 x 10 ⁻⁶ | 1500 x 500 x thickness: 30/50/75/100 | Biresin® Kleber braun / Prolab Glue |
| SikaBlock® Lab850 | High abrasion resistance, excellent milling behavior, very high strength. | 1.18 | 80 | 57 | 41 | 80 | 95 x 10 ⁻⁶ | 1000 x 500 x thickness: 50/75/100 | H 9930 / Biresin® Power Adhesive Thix |
| SikaBlock® M945 | Good abrasion resistance, easy to mill, high strength. | 1.3 | 83 | 100 | 95 | 80 | 85 x 10 ⁻⁶ | 1000 x 500 x thickness: 30/50/75/100 | Biresin® Kleber grün / Biresin® Power Adhesive Thix |



GLOBAL SOLUTIONS – LOCAL SERVICE

Our most current General Sales Conditions shall apply.

Please consult the Product Data Sheet
prior to any use and processing.

Actual Product Data Sheets and information about
additional products please find in:
www.sika.com/advanced-resins



Sika Deutschland GmbH Advanced Resins

Stuttgarter Strasse 139
D-72574 Bad Urach
Germany
Phone: + 49 (0) 7125 940-7692

E-Mail: industry@de.sika.com
www.sika.com/advanced-resins

Sika Automotive France SAS Advanced Resins

Z.I. des Béthunes - 15 rue de l'Équerre
CS 40444 Saint Ouen l'Aumône
95005 Cergy Pontoise Cedex - France
Phone: +33 (0) 134 40 34 60
Fax: +33 (0) 134 21 97 87
E-Mail: advanced.resins@fr.sika.com
www.sikaadvancedresins.fr

BUILDING TRUST

