AXSON TECHNOLOGIES

COMPOSITES

Global Solution

THE GLOBAL PARTNER FOR YOUR TECHNOLOGY

For several decades, Axson has been developing its unique experience in the formulation of polyurethane and epoxy materials for use in numerous industrial sectors.
While in the vast majority of cases polyurethane resins are recommended for mock-ups and prototypes, epoxy resins are essentially used in high-performance composite environments.*

Axson now proposes a global solution shown here in the development stages context…
from model design to finished part…
for the entire composites transformation chain:

- DEVELOPMENT OF MODELS
- CHOICE OF GELCOATS
- CHOICE OF LAMINATION
- CHOICE OF REINFORCEMENTS
- ASSEMBLY

These innovating solutions are intended for all sectors of industries where enhanced performance associated with weight gain is a deciding factor.

NAUTICAL COMPOSITES

*Axson presents a wide range of epoxy laminating systems **meeting the specific demands of marine environments** regarding the mechanical and environmental aspects.*
*For users, what makes these products outstanding is their **ease of use** in **optimal safety conditions** regardless of the transformation processes selected for the development of models, moulds or fully assembled structures.*

AERONAUTICAL COMPOSITES

*AXSON product ranges integrate all the aeronautics sector specific demands and requirements regarding **quality, reliability** and **security**.*
*These products are mainly used in the development of moulds and composite models on the ground, but more and more products are **approved for aircraft internal fittings** and are **FAR25.853** approved.*

OTHER INDUSTRIES

*Apart from these two key sectors that constitute the greater part of the composites field, the performances of epoxy systems also concern a number of booming and innovative activity sectors such as **Transport** (railways, automobile, automobile racing), **Energy** (mainly wind turbines, tanks and reservoirs), **Construction** (concrete structures and reinforcements), **Sports and leisure** (sports equipment, yachting).*

** Please refer to our Modelling brochure on our Internet site: www.axson.com*

DEVELOPMENT OF MODELS

Axson has developed a wide range of products intended for CNC and other control machining methods.

Machinable slabs

These slabs can be quickly assembled and machined to create shapes, in mass, with smooth and precise surfaces.

PROLAB 65 : Polyurethane slab with 0.65 density, used for functional mock-ups as well as models, thanks to its high dimensional stability and a temperature resistance of 80°C.

LAB 973 : Epoxy slab specially designed for creating models for low temperature prepreg moulds, thanks to its exceptional dimensional stability up to 130°C.

Extrudable pastes

Paste products are intended for extrusion machine deposit on a pre-form, and then machined to the required measurements. Several surface densities and hardnesses are available depending on the final intended use.

Epoxy

SC 166: Epoxy paste with 0.82 density and a hardness of 62 Shore D. Used for design shape studies, negatives to produce moulds by infusion and direct mould for laminating in wet lay-up or by infusion process.

SC 300: High resistance epoxy paste (density 1.58, hardness 88 Shore D, TG: 88°C) for creating models for low temperature prepreg tools.

Polyurethane

SCP 270: Polyurethane extrudable paste (density 0.7, hardness 52 Shore D) Easy to apply, fast polymerization with very little shrinkage. Development of negative models for mould production.

Finishing

Mastercoat 890: Epoxy surface coating for spray application for models in Prolab 65 and Lab 973 for a high finish surface state.

RPM 712 N : Single component permanent pore-sealer for model and mould surface preparation.

CHOICE OF GELCOATS:

Epoxy gelcoats are designed for their chemical and thermal resistance, for parts or tools. Depending on the references, special characteristics for shine rework (GC1), abrasion resistance (GC2) or special properties (GC3).

Parts:

GC1 050/10: Epoxy, polishing after rework, for mock-ups or models.

GC3 070 : Pre-accelerated polyester, spray application, resistant to UV, epoxy compatible.

Tools:

GC1 080/: Epoxy, good chemical resistance, for polyester injection moulds.

GC1 150/: Epoxy, good chemical resistance, polishability after rework. Polyester RTM moulds.

GC3 130 : Pre-accelerated vinylester, spray application, epoxy compatible.

SELECTION

Axson epoxy resins are developed according to precise ap
and operator ease-of-use technologies and in strict compli
The table below summarizes the entire range cla
The technical and safety data sheets are available at all

Reference	Description	Colour	Mixing ratio w/w	Viscosity mPa.s	Pot life 500 g, 25°C	Density	Time before demoulding (h)	Module / Flexion constraint (MPa)
PARTS								
EPOLAM 2010								
2010	Flexible, variable reactivity system		100 / 50	1000	30	1,10	16	3000 / 100
2011			100 / 50	900	60		24	2700 / 90
2012			100 / 50	800	120		36	2500 / 90
EPOLAM 2015								
2013	Variable reactivity laminating system, Lloyd's approved		100 / 32	650	8	1,12	7	2900 / 105
2014			100 / 32	600	60	1,12	18	3100 / 120
2015			100 / 32	500	130	1,08	24	3000 / 120
2016			100 / 32	600	400	1,14	48	2900 / 110
RSF 816	UV resistant, glossy	transparent	100 / 40	500	25	1,15	16	3200 / 115
EPO 912	Flex system, long pot life		100 / 34	600	180	1,19	24	2700 / 117
EPOLAM 2020	Variable reactivity		100 / 34	500	15' - 135'	1,10	48	3100 / 120
EPOLAM 2500	Self-extinguishing (FAR 25.853)		100 / 22	3500	80'	1,21		3900 / 90
EPOLAM 2022	High mechanical performance		100 / 40	600				3400 / 125
EPOLAM 2063	Very low viscosity when hot, excellent mechanical properties	translucent	100 / 100	700 à 25°C 25 à 100°C	100 à 100°			3000 / 120
EPOLAM 5015								
5014	Low viscosity, controlled reactivity, good wettability		100 / 34	225	45	1,12	16	2900 / 100
INFUSION 5015			100 / 30	210	125	1,10	24	3000 / 105
5016			100 / 36	225	235	1,12	48	2800 / 95
TOOLING								
EPO 95								
95 A	Multifunctional, versatile		100 / 25	850	55	1,10	24	2500 / 80
95 B			100 / 17	400	70	1,06	36	2600 / 85
95 C			100 / 17	2200	20	1,10	16	2800 / 90
95 S			100 / 32	600	50	1,06	36	2200 / 65
EPOLAM 2035	Excellent wettability, temperature definition		100 / 27	400	100	1,15	12	2800 / 108
INFUSION 2025								
EPOLAM 2080	High thermal and chemical resistance		100 / 35	700	300	1,09	48	2900 / 40
INFUSION 2025								
EPOLAM 2080	Excellent thermal resistance		100 / 41	3000	135	1,12	48	2800 / 62
EPOLAM 2050	Simplified curing profile		100 / 32	2000	60	1,12	30	3300 / 105
EPOLAM 2028/2014	Vertical wall application Quick set characteristics		100 / 24	1600	50	1,31	16	4200 / 115
2015			100 / 24	1300	125	1,31	24	4200 / 110
2016			100 / 24	1400	200	1,31	36	3700 / 105
EPOLAM 2025	Low exotherm		100 / 28	1400	70	1,12	24	3200 / 110

GUIDE

lications based on the latest formulation
nce with the latest toxicology regulations.
ified according to specific uses.
times on our Web site: www.axson.com

Hardness Shore D	final TG °C	Use/working ★★★ : recommended ★★ : good ★ : possible					Applications
		Wet lay up	Infusion	RTM	Filament winding	Others	
83	50	★ ★ ★	-	-	-		Laminated reinforcements / resin concrete
83	50	★ ★ ★	-	-	-		
83	55	★ ★ ★	-	-	-		
83	70	★ ★ ★	-	-	-		Industrial and nautical laminates. Strip planking
83	91	★ ★ ★	★	★	★		
82	91	★ ★ ★	★	★	★		
84	70	★ ★ ★	★	★	★ ★		
82	75	★ ★ ★				top coat	Glazing for surf boards
85	95				★ ★ ★		Pressurized vessels hooping
85	80-100	★ ★ ★	★ ★	★ ★ ★	-		Structure parts
	100	★ ★ ★	-	-	-		Interior fittings
	100	★ ★ ★		★ ★	★ ★ ★		Structural parts for aircraft and boats
	190	-		★ ★ ★	★ ★		Very high performance composite parts via RTM
85	90	★	★ ★ ★	★ ★	★ ★		Boat hulls, wind turbine blades
85	90	★	★ ★ ★	★ ★ ★	★ ★		
85	90	★	★ ★ ★	★ ★ ★	★ ★		
82	55	★ ★	-	-	-		Common laminates for parts and tools
85	50	★ ★	-	-	-		
85	65	★	-	-	-		
82	55	★ ★	-	-	-		
86	120	★ ★	★ ★ ★	-	-		Large size parts and tools
90	190	★ ★	★ ★ ★		★ ★ ★		Large size parts and tools
90	190	★ ★ ★	-	-	-		Tools
87	125	★ ★ ★	-	-			Tools
86	94	★ ★	-	-	-		Highly developed tool manual lamination
86	91	★ ★	-	-	-		
86	86	★ ★	-	-	-		
87	135	★ ★ ★	-	-	-		Tools

PROCESS SELECTION

Wet lay-up

Technique: The reinforcements are successively impregnated in the mould, then degassed. Once laminating has terminated, it is all vacuum compacted during the polymerization.

Advantages: Technique universally employed, requiring little or no equipment.

Resin qualities: Middle range viscosity, ensuring good vertical wall application.

Examples: EPOLAM 2015, 2010, 2020, 2028

Infusion

Technique: The reinforcements are placed under vacuum between a rigid mould and a vacuum bag. The resin is sucked into the part through the reinforcements.

Advantages: The resin is distributed equally, without excess, and without any operator contact.

Resin qualities: Low viscosity and good wettability.

Examples: EPOLAM 5015, 2035/2025, 2080/2025.

RTM

Technique: The reinforcements are placed in a two parts rigid mould. The resin is injected with or without vacuum assistance.

Advantages: Immediate finishing of the two sides of the part, low dimensional tolerance.

Resin qualities: Very low viscosity, very good wettability of the reinforcements.

Examples:

EPOLAM 2063

Filament winding

Technique: The fibres are wound on a rotating mandrel. The movement of the lay-on head along the rotation axis enables the fibres to be directed.

Advantages: Continuous process for obtaining rotation parts.

Resin qualities: Long elongation at break, long pot life.

Examples:

EPO 912

REINFORCEMENTS

Fabric and multiaxis:

CARBON or **GLASS**, woven or multiaxis, they have been tested and selected for their complete compatibility with the AXSON range of resins and for the quality of the results obtained. All weaves and weights, all titration.

Honeycomb panels:

Panels for industrial applications, aluminium or composite skins (glass or carbon), aluminium or phenolic core. High or ambient temperature applications.

Prepregs:

HX42, HX50: Low temperature polymerizing tool prepregs. High thermal resistance after post-curing (200°C).

E644, E720: Prepregs for parts, low to medium polymerization temperature. Numerous variants for different applications.

SURFACE PREPARATION and ACCESSORIES:

Demoulding agents:

841 : Wax release agent in solvent phase. Can be polished.
Allows working up to 90°C.
Ideal for a satin finish.

Monocoat 1367 L : Semi-permanent single component release agent .
Effective up to 200°C.
Ideal complement to pore-sealer RPM 712 N

Infusion peripherals:

Peel ply: Peeling fabric
Pliospire: Infusion and aspiration pipe
Draining net: Distribution medium for infusion

Bordering pastes:

Developed in the aeronautics field, they are used for local reinforcements in the core or centre of the honeycomb panels. Self-extinguishing as per FAR25.853

CF 230/234: Bi-component bordering paste, density 0.62. AIRBUS approved.
CF 230/238: Bi-component densification paste. Density 0.58. DASSAULT approved.
CF 180: Single component bordering and densification paste. Density 0.75. DASSAULT approved.

ASSEMBLIES

ADEKIT

Axson proposes a wide range of completely compatible structural adhesives, selected for their excellent mechanical and thermal performance and resistance to ageing.

	Pot life	Single lap shear strength	Peeling strength	Elongation at break	Application Substrates
EPOXY					
A 140	40'	21 MPa	5 N/mm	5%	Epoxy/metal composite
A 170	30'	24 MPa	5 N/mm	2%	Epoxy/metal composite
A 171	30'	20 MPa	3 N/mm	2%	Epoxy/metal composite - **FAR25.853**
A 175	90'	21 MPa	4 N/mm	5%	Epoxy/metal composite
H 9951	50'	29 MPa	4 N/mm	10%	Honeycomb bonding
POLYURETHANES					
A 211	40'	10 MPa	9 N/mm	80%	Aeronautics - **PPSU, FAR25.853**
A 220	16'	16 MPa	12 N/mm	95%	Polyester composite
A 252	8'	11 MPa	9 N/mm	300%	Polyester composite
A 280	6'	19 MPa	10 N/mm	85%	Polyester composite
A 290	3'	15 MPa	9 N/mm	90%	Polyester composite
METHACRYLATES					
A 310 NF	15'	30 MPa	4 N/mm	40%	Plastic bonding

A 175, A 170, A 140: High performance epoxies, paste, quick to slow set.
H 9951: High performance epoxy, liquid. Available in kits.
A 290, A 280, A 252: High resistance polyurethanes, paste, quick to slow set.
A 310 NF: Methacrylate, quick set, limited surface preparation.

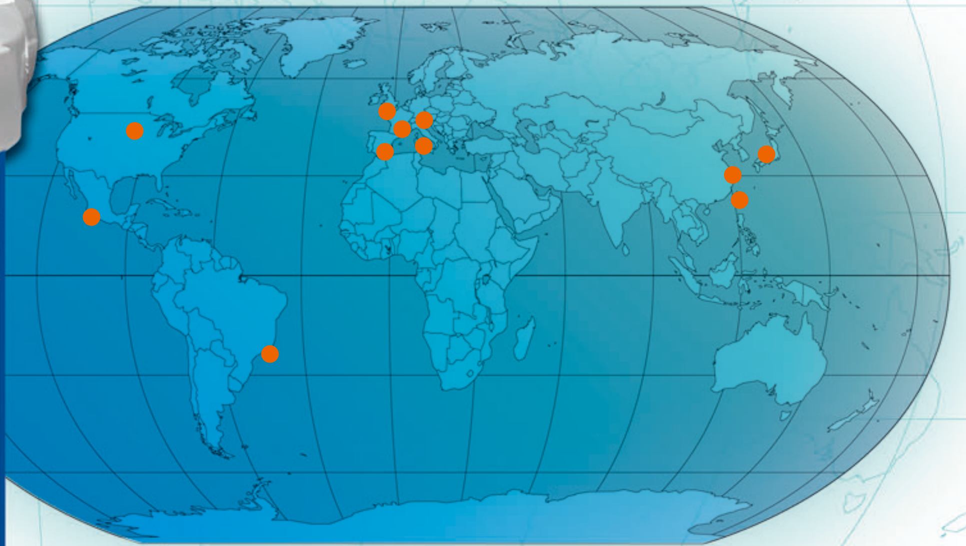
The ADEKIT range is available in cartridges (50 ml and 400 ml), in small volume kits and larger bulk sizes.

AXSON also provides application accessories and surface primers.

Note: *please consult our recommendations guide, available on our Internet site: www.axson.com*

Modelling

www.axson.com



Composites

Adhesives

Dielectrics

AMERICAS

AXSON NORTH AMERICA
1611 Hults Drive
MI 48827 Eaton Rapids - USA
Tel.: (++ 1) 517.663.81.91
Fax: (++ 1) 517.663.50.35
E-mail: info@axson-na.com

AXSON MEXICO
San Luis Potosi N° 211 - Piso 7
Desp.701 Col. Roma
Mexico D.F. 06700 - MEXICO
Tel.: (++ 52) 55 5264 49 22
Fax: (++ 52) 55 5264 49 16
E-mail: axson@prodigy.net.mx

AXSON BRAZIL
Rua Domingos Jorge, 306
Socorro - São Paulo - SP
CEP 04761 000 - BRAZIL
Tel.: (++ 55) 11 5687 7331
Fax: (++ 55) 11 5687 7211
E-mail: axson@uol.com.br

ASIA

AXSON TAIWAN
Shih Pai rd, Sec 2, Lane 315,
Alley 1, N°7-4 FL, Peitou District,
Taipei - TAIWAN R.O.C.
Tel.: (++ 886-2) 28 73 99 30
Fax: (++ 886-2) 28 71 36 67
E-mail: jm.philippot@axson.com

AXSON SHANGHAI
Ground floor, n°140, Hedan Road,
Wai Gao Qiao Free Trade Zone
Pudong - Shanghai 200131 - CHINA
Tel.: (++ 86-21) 58 68 30 37
Fax: (++ 86-21) 58 68 26 01
E-mail: f.brau@axson.com

AXSON JAPAN
2 - 5 - 12 Onishi
Okazaki-City - MZ 44460871
JAPAN
Tel.: (++81) 564 26 2591
Fax: (++81) 564 26 2593
E-mail: mokita@axson.com

EUROPE

AXSON FRANCE - Headquarters
Rue de l'équerre BP 40444
95005 Cergy cedex - FRANCE
Tel.: (++ 33) 1 34 40 34 60
Fax: (++ 33) 1 34 21 97 87
E-mail: axson@axson.fr

AXSON GmbH
Waldstraße 72
63128 Dietzenbach - GERMANY
Tel.: (++ 49) 60.74.407.110
Fax: (++ 49) 60.74.407.11.77
E-mail: verkauf@axson.de

AXSON ITALIA
Via Morandi 13/15
21047 Saronno (Va) - ITALY
Tel.: (++ 39) 02 96 70 23 36
Fax: (++ 39) 02 96 70 23 69
E-mail: axson@axson.it

AXSON IBERICA
Ramon Turro 100,1°
08005 Barcelona - SPAIN
Tel.: (++ 34) 93 225 16 20
Fax: (++ 34) 93 225 03 05
E-mail: axson@axson.es

AXSON UK
15 Studlands Park Ind. Estate
Newmarket CB8 7AU-Suffolk
UNITED KINGDOM
Tel.: (++ 44) 1638 660 062
Fax: (++ 44) 1638 665 078
E-mail: sales@axson.co.uk

DISTRIBUTED BY:

AXSON TECHNOLOGIES

Design Laure POIRIER

Photographs AXSON - TRESCO - DOUCET - STRATE COLLEGE - JOHN FOXX - GOODSHOT