

Epoxy – vinylester resins for the chemical industry

BASF
We create chemistry



BASF Epoxy – vinylester resins: Chemical solutions for the chemical industry

Innovation through experience, creating resins for the requirements of the present and the future

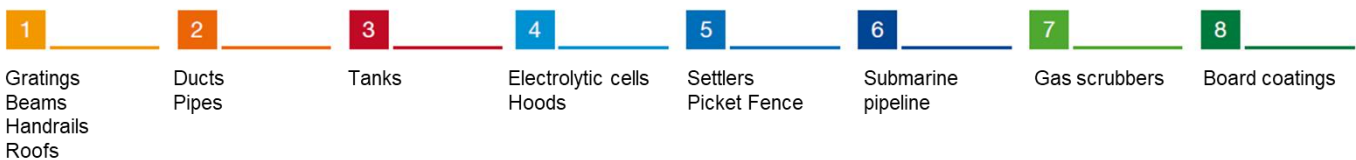
In BASF we create chemistry... and we have done it for more than 150 years! Since our founding in 1865, we have been evolving to respond the world around us. Through science and innovation, we contribute to satisfy the current and future needs of the society delivering solutions with the aim of conserving the resources and improve the life quality. The phrase “we create chemistry for a sustainable future” summarize our corporative strategy.



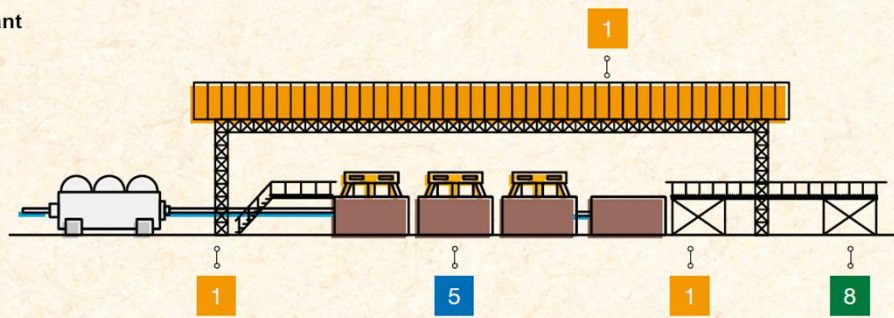
As a German company, a global leader in the chemical world, our products are used in almost every industry. In mining, we are a strategic partner by accompanying the different stages of the value chain and our experience allows us to close collaboration with engineering companies. There is a lot of possibilities for composite materials. Mechanical and corrosion resistance properties of composites based in our resins, makes it the perfect material to replace steel, wood, and other plastics.

BASF Epoxy – vinylester resins are produced in our plant in Concon (Chile, Valparaiso Region), from where we supply to our local and export clients. This way we assure the maximum stability of the products. Our resins have been present for more than 35 years in the main industries in Latin American, responding to the high infrastructure requirements of the mining processes, due to their excellent chemical, thermal, and a high mechanical properties. Included segments are desalination plant, lithium infrastructure (extraction and treatment), pulp industry, corrosion barrier, among others.

Contribution of Palatal resins to the value chain of mining industry



Solvent Extraction plant



BASF Epoxy – vinylester resins in mining plants and chemical industry

Solvent extraction plants

Settlers - Picket Fence - Tanks - Roofs - Gratings - Handrails - Beams



Electrowinning plants

Roofs - Gratings - Handrails - Hoods - Beams - Cells – Polymer concrete – Capping boards



Desalination plants

Submarine pipeline – Piping in Osmosis plants – Storage tanks



Acid plants

Gas scrubbers – Ducts and pipes - Chimneys



Palatal A-430

Epoxy – vinylester resin with a middle viscosity and reactivity. It has an elongation to rupture of 6%. Appropriate for the fabrication of reinforced pieces with fiberglass that requires excellent chemical and thermal resistance and a high mechanics strength.

Palatal A-430 FR

Brominated epoxy – vinylester resin of low viscosity, middle reactivity and with flame retardant properties.

Palatal A-440

Epoxy – vinylester resin based on Novolac with low viscosity and middle reactivity. Recommended for the fabrication of reinforced pieces with fiberglass with amazing mechanics qualities and an excellent thermic and chemical resistance.

Epoxy – vinylester high viscosity characterized by its high rupture elongation (a 30% higher than an epoxy – vinylester as the A-430). It is appropriate for the use as a primer in the coating of steel pieces.

Metal Mining: Copper

BHP



**Desalination plant:
BHP Coloso project (2016-2017)**

aes



**CMP Mining transport system
(2021)**

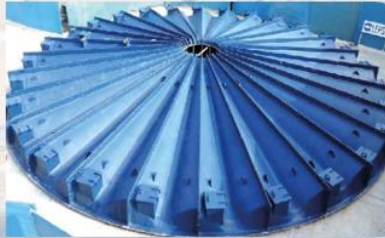


**ANTOFAGASTA
MINERALS**



**Zaldivar Mine: Sulphide leaching settlers
(2019)**

Not Metal Mining: Lithium, Iodine, Potassium



“Sales de Jujuy” Project

Dimensions:

19.4 x 9.0 x 1.8 m (LxWxH)

Useful capacity: 160 m3

Chemical product: Acid solution / organic.



“Cauchari – Olaroz” Project

FRP segmented cover with Ø 18 m to clarifying equipment

Made up of 28 radial segments.

Includes gaskets and inspection windows for each segment.



“Lithium carbonate plant expansion – 120 KTPA” Project

Dimensions: Ø 8.30 x 9.40 m

Capacity: Hasta 500 m3

Chemical product : Multiple fluids, mainly lithium carbonate solutions, brine and dilute acids.

Operating Temperature: 25 -100 °C

Pulp & Paper

cmpc.  Creando valor natural



Santa Fe Plant (2004)

Chlorine dioxide storage pond

Dimensions:

Ø 4 m x 12 m

pH: 3 – 4



Laja Plant (1990)

Interior chemical protection coating in FRP

Dimensions:

Ø 5,2 m x 35 m

Operating Temperature: 65°C

pH: 3 – 5

arauco



Valdivia Plant (2005)

Battery 8 chlorine dioxide storage tanks

Dimensions:

Ø 5,0 m x 11,3 m

pH: 3 – 4



Nueva Aldea Plant, Itata (2006)

Tank for storage of 10% sodium hypochlorite

Dimensions:

Ø 4,5 m x 4,5 m

Operating Temperature: 5 – 60 °C

pH: 14

Technical description of the main products

The use of BASF Epoxy – vinylester resins allows the elaboration of different pieces that are used in industry, characterized by withstand the most diverse chemical aggressions even at high temperatures as shown below:

Mechanics properties of BASF Epoxy – vinylester resins reinforced with fiberglass

Bending strength and modulus of flexural strength for laminates with 30% to 40% of fiberglass (Mat) at different temperatures.

Temperature	Bending strength ¹ / Modulus E of flexural strength ² [MPa]	
	A-430 ³	A-440 ⁴
Environment	215 / 9370	180 / 8950
50 °C	228 / 10120	172 / 8890
80 °C	210 / 8970	176 / 8460
100 °C	190 / 8210	165 / 7780
120 °C	134 / 7200	168 / 7560
140 °C	40 / 1750	156 / 6540
160 °C	-	100 / 4740
180 °C	-	81 / 4600
200 °C	-	43 / 2360

1.- Bending strength determined by DIN 53 452.

2.- Modulus of tractional elasticity determined by DIN 53 457.

3.- Test objects with 38% of fiberglass.

Hardening 24 h at environment conditions and 24 h at 100°C.


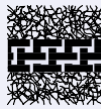
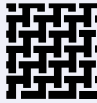
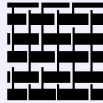
4.- Test objects with 34% of fiberglass.

Hardening 24 h at environment conditions and 24 h at 100°C.

Mechanics properties of A-430 reinforced with fiberglass.

Curing conditions: 1 ml Peroxide LPT and 0,2 ml CoB1 above 100g of resin, 12 h at 25 °C.

Post-curing conditions: 24 h at 120 °C.

Property	Mat 450 g/m ²	Mat 450 g/m ² Fabric 780 g/m ²	Fabric 780 g/m ²	Unidirectional fabric 530 g/m ²	Unity	Test method
						
Glass composition	38,6	50	59	54	%	-
Traction strength	138	240	330	475	MPa	DIN 53 455
Modulus of tractional elasticity	10.000	16.700	21.200	31.300	MPa	DIN 53 457
Elongation to rupture	1,54	1,70	1,85	1,63	%	DIN 53 455
Bending strength	210	420	600	790	MPa	DIN 53 452
Modulus of flexural strength	10.000	14.900	21.500	25.000	MPa	DIN 53 457

* Mechanical properties in standard environment of laboratory determined by DIN 50 014 (23/50-2)



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