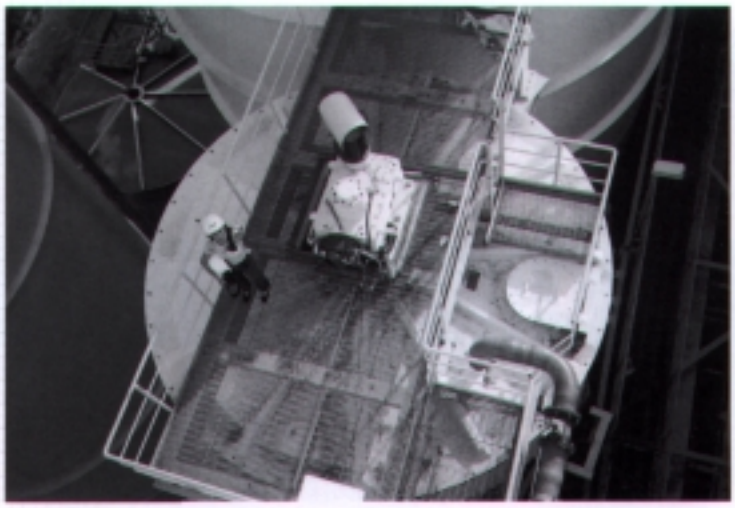
CHEMPOSITE®

GRATING &
WALKWAY SYSTEMS

Chemposite Fiberglass Reinforced Plastic (FRP) Grating and Walkway Systems are designed for tough, corrosive environments. The excellent structural and chemical characteristics of Chemposite FRP Grating and Walkway Systems make fiberglass reinforced plastic products the material of choice for industrial plants and commercial applications.

Chemposite Grating and Walkway Systems are perfect for demanding environments in numerous industries:

- Chemical
- Pulp and Paper
- Mining
- Electronic and Electrical
- Metal Plating
- Transportation
- Food and Beverage
- Textile
- Wastewater Treatment
- Marine
- Oil and Gas
- Pharmaceutical



APPLICATIONS

Chemposite FRP Grating and Walkway Systems are the solution wherever walkway systems are subject to corrosion, rapid deterioration and constant maintenance problems.

The characteristics of resin and glass composite technology and advanced manufacturing techniques used in the production process, make FRP products ideal for a wide range of applications:

- Flooring
- Stairs and Platforms
- Trench Covers
- Ramps and Walkways
- Bridges
- Safety Guards and Screens
- Tower Packing Supports
- Hand Railings
- Ladders
- Kick Plates
- Guard Rails
- Grating

ADVANTAGES

Corrosion Resistant

The superior corrosion resistance of Chemposite Grating and Walkway Systems make it the product of choice for architects and engineers. Premium grade polyester and vinylester resin systems are used to resist a wide range of caustic, acid, and other corrosive chemicals.

High Resin to Glass Content

High resin to glass content is required for corrosive and chemical plant applications. Our products, manufactured with 65% resin for a high resin to glass content, ensure maximum product life and strength retention in corrosive environments.

High Strength to Weigh Ratio

Unique integral one-piece molded construction provides tremendous strength by distributing loads evenly to bidirectional bearing bars. Chemposite grating weighs only one-third as much as welded steel grating of equivalent strength. The flexibility of FRP also allows for load absorption and shock that would otherwise permanently deform metal grating.

Non-conductive

The non-conductive property of FRP products is ideal for work platforms, flooring and fencing in electrically hazardous areas. Acting as an insulator, fiberglass greatly reduces the risk of electrical shock for workers. Chemposite Grating and Walkway Systems have low thermal conductivity, are non-sparking and nonmagnetic, essential for installations where hydrogen or other combustible gases are present.

Fire Retardant

Tested in accordance to the ASTM E-84 Tunnel Test Method, a Class 1 Flame Spread Rating of 25 or less was achieved for our standard grating products. Where maximum resistance with a Flame Spread Rating of 10 or less is required, Derakane 510A (Dow Chemical) epoxy vinylester resin with an antimony trioxide additive is used.

Slip Resistant

During the molding process, a concave profile is formed along the upper surface of each bar to provide a positive traction and slip resistant surface on the grating. Silica sand coated surfaces are available for added safety and protect against wear.

Maintenance Free

Rust-free Chemposite Grating and Walkway Systems ensure long life and low maintenance. Ultraviolet inhibitor additives, ideal for outdoor applications, extend life by preventing deterioration and degradation from the sun.

Ease of Installation

Our light weight grating is easy to handle and install. It is easily cut with a masonry type cutting blade and the cut edges are easily sealed with a catalysed resin kit. Assembly is simple, the grating easily attaches to the support framework. See the installation instructions on page 8. Custom colour coding for different areas of your facility is also available.

TYPES OF CHEMPOSITE® GRATING

Chemposite offers four different types of grating for various application requirements; (P) Polyester Grating, (S) Standard Vinylester Grating, (FR) Fire Retardant Grating and (CR) Corrosion Resistant Grating.

	TYPE			
DESCRIPTION	P	S	FR	CR
RESIN	Polyester	Vinylester	Vinylester	Vinylester
FILLER	Yes	Yes	Yes	No
CORROSION RESISTANCE	Good	Very Good	Very Good	Excellent
FLAME SPREAD RATING	25	25	10	115
COLOUR	Yellow	Light Grey	Dark Blue	Dark Green

P = Polyester Grating

- **Standard Polyester Resin**
- **Medium resistance to corrosion**
- **Good impact and fatigue resistance**
- **Excellent electrical and thermal insulating properties**
- **For general use in industrial plant applications**

S = Standard Vinylester Grating

- **Premium Epoxy Vinylester Resin**
- **Outstanding resistance to corrosion**
- **High impact and fatigue resistance**
- **Excellent electrical and thermal insulating properties**
- **For installation in areas constantly subjected to corrosive chemicals**

FR = Fire Retardant Grating

- **Fire Retardant Brominated Epoxy Vinylester Resin**
- **Designed for high fire hazard areas where a Flame Spread Rating of 10 is required**
- **Outstanding chemical resistance & strength, high impact & fatigue resistance**
- **Excellent electrical and thermal insulating properties**
- **For installation in areas constantly subjected to corrosive chemicals**
- **Lower flame spread rating than Chemposite Standard Grating**

CR = Corrosion Resistant Grating

- **Premium Epoxy Vinylester Resin (no filler)**
- **Excellent corrosion resistance**
- **High impact and fatigue resistance**
- **Excellent electrical and thermal insulating properties**
- **For installations subject to submersion in corrosive chemicals**
- **Ideal for packing supports in scrubbers**

PANEL DESCRIPTION

Panel Size:	4'- 0" wide x 12'- 0" long
Mesh Pattern:	1.5" x 1.5" openings (38 mm x 38 mm)
Load Bearing Bars:	1/4" thick (6.4 mm)
Open Area:	70% of total area
Panel Thickness:	1" (25 mm) and 1.5" (38 mm)
Surface:	Concave, non-slip surface

PANEL TOLERANCE

Length: +/- 1/8" (+/- 3 mm)
Width: +/- 1/8" (+/- 3 mm)
Thickness: +/- 1/16" (+/- 1.5 mm)

PANEL WEIGHT

	TYPE			
WEIGHT	P	S	FR	CR
lb./ft.^{2}	3.5	3.3	3.3	3.0
kg/m^2	20.7	18.8	18.8	17.2
Full Panel (lb.)	170	155	155	140
Full Panel (kg)	77	70	70	64

DESIGN DATA

The design of fiberglass grating is similar in principle to conventional metal grating with one important difference. The inherent elasticity of fiberglass allows for greater deflection than steel, without the danger of structural failure. 'Acceptable deflection' is usually the factor which determines the maximum span in fiberglass grating rather than specific strength. The flexural modulus of the fiberglass bars are less than that of equivalent size metal bars. Although Chemposite Grating supports heavy loads, the load deflection of fiberglass grating will be greater than that of comparable metal grating. For example, a 36" span of Chemposite Grating will deflect as much as 2" before any plastic deformation takes place. This also allows for visual detection of overload on the FRP grating long before failure loads are reached.

IMPORTANT INFORMATION WHEN DESIGNING A WALKWAY SYSTEM:

1. Know the design loads and the acceptable deflection
2. Check the deflection chart to determine the maximum span
3. Check the maximum safe load at that span to ensure it exceeds the design load

ACCEPTABLE DEFLECTION*

Pedestrian Traffic	3/8" (9.5 mm) in short span deflections
Walkway	1/2" (13 mm) in long span deflections
Equipment	1/2" (13 mm) in long span deflections

* Do not exceed 1/2" (13 mm) or 1% deflection (whichever is smaller) over maximum span in any application.

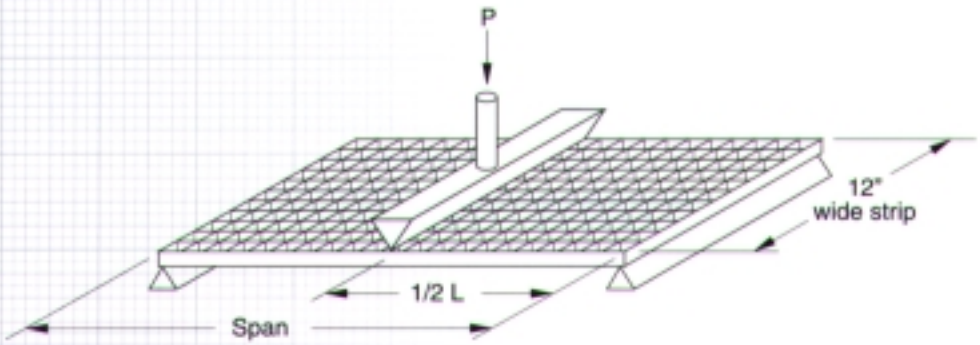
LOAD & DEFLECTION DESIGN

Chemposite has used three different test methods to determine the deflection and strength of the FRP grating; concentrated load test, uniform load test and a full panel concentrated load test.

The test results are a guideline to help you determine the acceptable support spacing required for your grating application.

CONCENTRATED LOAD

A 12" wide strip of grating is supported at both ends and spanned at various distance from 12" to 48". The load is then applied across the full width (12") of the strip and positioned in the center of the span. The deflection of the strip is measured for loads from 200 lb. to 2,000 lb.

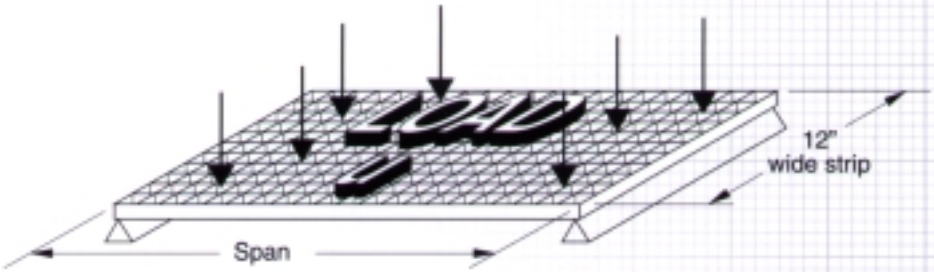


Load "P"	Span				
(lb.)	12"	24"	36"	42"	48"
200	0.007	0.055	0.187	0.296	0.442
400	0.014	0.110	0.374	0.592	-
600	0.020	0.166	0.560	-	-
800	0.028	0.220	-	-	-
1000	0.035	0.275	-	-	-
1200	0.040	0.332	-	-	-
1400	0.048	0.387	-	-	-
1600	0.056	0.440	-	-	-
1800	0.062	0.498	-	-	-
2000	0.072	0.550	-	-	-

Deflection dimensions in inches.

UNIFORM LOAD

A 12" wide strip of grating is supported at both ends and spanned at various distances from 12" to 42". The load is then applied uniformly over the full surface of the strip. The deflection of the strip is measured for uniform loads from 200 lb. to 2,000 lb.

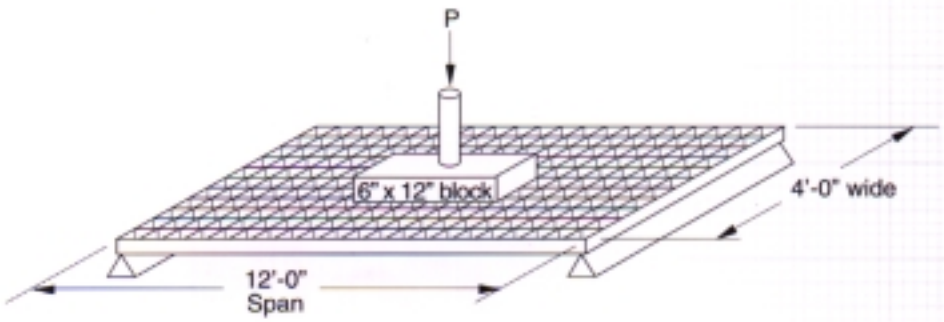


Load "U"	Span			
(lb.)	12"	24"	36"	42"
200	0.004	0.066	0.336	0.622
400	0.008	0.132	0.672	-
600	0.012	0.198	-	-
800	0.016	0.264	-	-
1000	0.020	0.330	-	-
1200	0.025	0.397	-	-
1400	0.029	0.462	-	-
1600	0.032	0.528	-	-
1800	0.036	-	-	-
2000	0.040	-	-	-
Load at 1% Deflection	5950 lb.	750 lb.	260 lb.	90 lb.

Deflection dimensions in inches.

FULL PANEL CONCENTRATED LOAD

A full panel, 4 ft. wide by 12 ft. long, is supported along the width on both ends. The load, which is a 6" x 12" foot print, is applied at the center of the panel. The deflection of the full panel is measured for loads from 100 lb. to 1,000 lb.



Load "P" (lb.)	Deflection (inch)
100	0.06
200	0.12
300	0.18
400	0.23
500	0.29
600	0.35
700	0.37
800	0.44
900	0.55
1000	0.56

SIMPLE CALCULATIONS FOR LOAD & DEFLECTION

The calculation for load and deflection is based on a 12" wide panel fixed on both ends with anchor clips. This formula is only a guideline for engineers and designers and does not serve as a specific warranty of product performance in any type of installation. The minimum recommended 'Safety Factor' for any application is 5.

TO CALCULATE A CONCENTRATED LOAD ON A 12" WIDE PANEL:

Safety Factor (SF): $\frac{C_1 \times 10^3}{P \times L}$

Deflection: $\frac{P \times L^3}{C_2 \times 10^6}$

Whereas:
C_1 & C_2 are constants
P = Concentrated load in lb.
L = Distance of span in inches

Based on a 1 1/2" thick grating material, the constants are:

$C_1 = 120$
$C_2 = 50$

TO CALCULATE A UNIFORM DISTRIBUTED LOAD ON A 12" WIDE PANEL:

Safety Factor (SF): $\frac{U_1 \times 10^3}{W \times L^2}$

Deflection: $\frac{W \times L^4}{U_2 \times 10^6}$

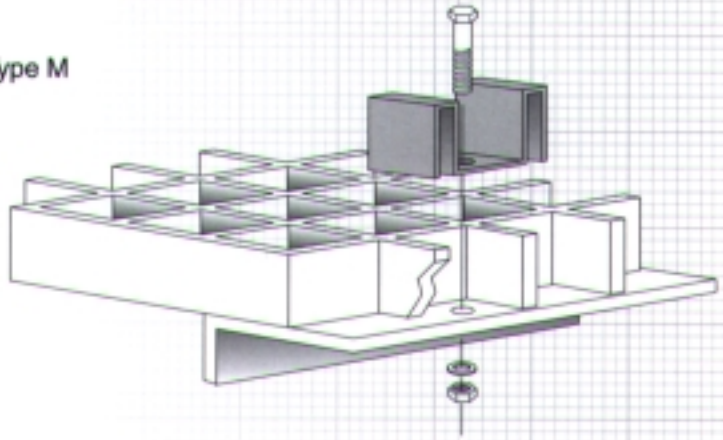
Whereas:
U_1 & U_2 are constants
W = Distributed load in lb./ft.^{2}
L = Distance of span in inches

Based on a 1 1/2" thick grating material, the constants are:

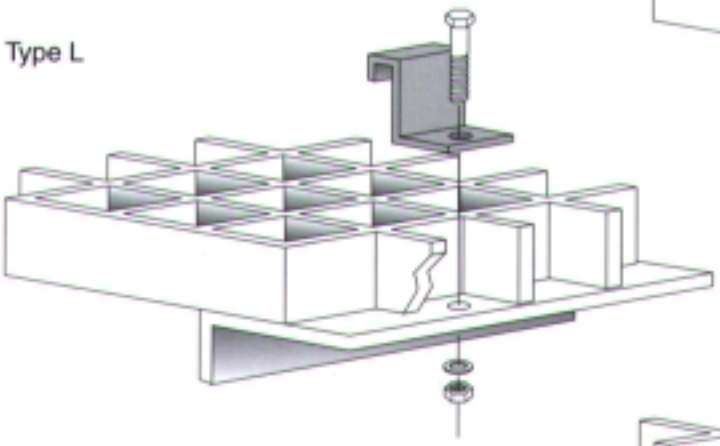
$U_1 = 2850$
$U_2 = 1000$

PANEL INSTALLATION

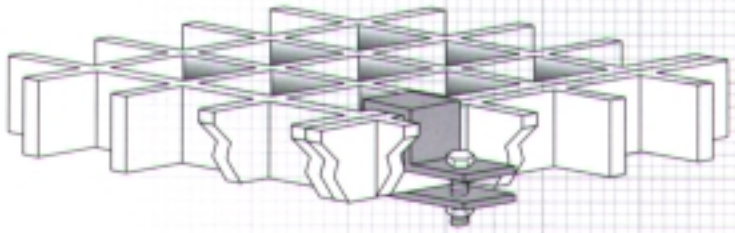
Type M



Type L

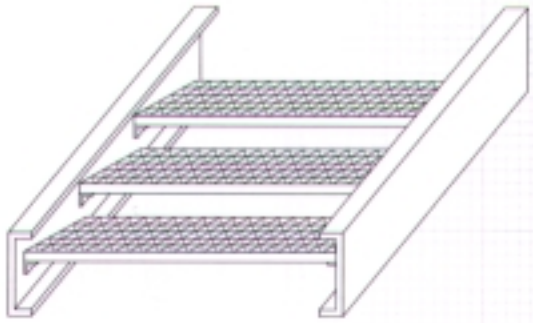


Type C



- Gratings should be supported along all sizes with the above types of metal hold-down clips.
- A maximum spacing of 42" between each hold-down clip should be placed along the sides.
- Use Type C clips, bottom supports or pedestals where panels are connected together.
- Hold-down clips can be anchored with nuts and bolts, rivets or self-tapping screws.
- Leave approximately 0.25" clearance between all adjoining grating or edges.

STAIR TREADS & STEPS



OPENINGS	WIDTH	STOCK LENGTH	COLOUR
1½" x 1½"	11¾"	8' - 0"	Yellow*

*Custom color available

CHEMICAL RESISTANCE CHART

CHEMICAL ENVIRONMENT	TYPE S / FR / CR	Maximum Recommended Temperature		TYPE P	Maximum Recommended Temperature	
	Concentration %	°F	°C	Concentration %	°F	°C
Acetic Acid	50	180	82	50	150	65
Acid Cleaner (31% Hydrochloric Acid)	-	180	82	-	-	-
Aluminum Hydroxide	100	180	82	20	150	65
Auminum Nitrate	100	180	82	Saturated	160	71
Ammonia	Gas	100	38	Gas	90	32
Ammonium Chloride	All	210	99	Saturated	180	82
Ammonium Hydroxide	5	180	82	5	NR	NR
Ammonium Nitrate	All	210	99	Saturated	160	71
Ammonium Sulfate	All	210	99	Saturated	170	77
Benzene	100	NR	NR	100	LS:90	LS:32
Benzoic Acid	Saturated	210	99	Saturated	170	77
Bisulfite in Scrubber	Gases	180	82	Gases	NR	NR
Black Liquor (Pulp Mill)	All	180	82	All	NR	NR
BLEACHES						
Calcium Hypochlorite	All	180	82	Saturated	120	49
Chlorine Dioxide Wet	Saturated	200	93	-	NR	NR
Hydrogen Peroxide/Caustic	-	185	85	-	NR	NR
Sodium Hypochlorite	5¼ - 10	180	82	5¼	120	49
Brine	All	210	99	-	NR	NR
Calcium Carbonate	All	180	82	Saturated	160	71
Calcium Hydroxide	100	210	99	25	160	71
Calcium Hypochlorite	All	180	82	Saturated	120	49
Calcium Nitrate	All	210	99	Saturated	180	82
Chlorine Dioxide	All	200	93	-	NR	NR
Chlorine Dry Gas	100	210	99	100	180	82
Chlorine Water	Saturated	200	93	Saturated	LS:125	LS:52
Chlorination Washer, Hoods & Vent Systems	-	180	82	-	-	-
Chromic Acid	10	150	65	10	NR	NR
Citric Acid	All	210	99	Saturated	180	82
Copper Chloride	All	210	99	Saturated	180	82
Copper Cyanide	All	210	99	Saturated	90	32
Diesel Fuel	100	180	82	100	175	80
Ethanol	50	100	38	50	90	32
Ethylene Glycol	All	210	99	All	180	82
Ferric Chloride	All	210	99	Saturated	180	82
Ferric Sulfate	All	210	99	Saturated	180	82
Ferrous Chloride	All	210	99	Saturated	180	82
Ferrous Nitrate	All	210	99	Saturated	160	71
Flue Gas Wet	All	180	82	-	-	-
Formaldehyde	All	150	65	25	150	65
Fuel Oil	100	180	82	-	-	-
Gasoline, Leaded	100	180	82	-	-	-
Gasoline, No Lead, No Methanol	100	120	49	-	-	-
Glucose	100	210	99	100	180	82
Glycerine	100	210	99	100	180	82
Hydrobromic Acid	48	150	65	48	160	71

NR = Not Recommended — = Data Not Available LS = Limited Service

CHEMICAL RESISTANCE CHART

CHEMICAL ENVIRONMENT	TYPE S / FR / CR	Maximum Recommended Temperature		TYPE P	Maximum Recommended Temperature	
	Concentration %	°F	°C	Concentration %	°F	°C
Hydrochloric Acid	37	150	65	36	125	52
Hydrogen Peroxide	30	150	65	5	150	65
Lactic Acid	All	210	99	All	160	71
Lithium Chloride	Saturated	210	99	Saturated	160	71
Magnesium Bisulfite	All	180	82	All	-	-
Magnesium Chloride	All	210	99	Saturated	180	82
Magnesium Sulfate	All	210	99	Saturated	180	82
Nickel Chloride	All	210	99	Saturated	180	82
Nickel Sulfate	All	210	99	Saturated	180	82
Nitric Acid	20	120	49	10	90	32
Ozone	-	140	60	3	-	-
Paper Mill Effluent	-	180	82	-	-	-
Phosphoric Acid	100	210	99	85	160	71
Potassium Aluminum Sulfate	All	210	99	Saturated	180	82
Potassium Bicarbonate	50	180	82	Saturated	140	60
Potassium Chloride	All	210	99	All	180	82
Potassium Nitrate	All	210	99	All	180	82
Potassium Sulfate	All	210	99	All	180	82
Propylene Glycol	All	210	99	All	170	77
Sea Water	-	210	99	100	180	82
Sodium Acetate	All	210	99	100	150	65
Sodium Bicarbonate	Saturated	180	82	Saturated	140	60
Sodium Bisulfate	All	210	99	All	180	82
Sodium Bromide	All	210	99	All	180	82
Sodium Chlorate	50	210	99	90	130	54
Sodium Cyanide	All	210	99	Saturated	100	38
Sodium Fluoride	All	180	82	All	-	-
Sodium Hydroxide	25	180	82	25	NR	NR
Sodium Hydroxide	50	210	99	50	NR	NR
Sodium Hypochlorite	5¼ - 18	180	82	5¼	120	49
Sodium Hypochlorite 5% NaOH Scrubbing CL_2, $CL0_2$	5¼ - 18	180	82	-	-	-
Sodium Nitrate	All	210	99	Saturated	180	82
Sodium Sulfate	All	210	99	All	175	80
Sugar Cane, Liquor & Sweetwater	All	180	82	All	-	-
Sugar / Sucrose	All	210	99	60	90	32
Sulfur Chloride	Fumes	200	94	100	NR	NR
Sulfur Dioxide (Dry or Wet)	-	210	99	100	180	82
Sulfur Dioxide Burner, Wet Gas	-	210	99	-	NR	NR
Sulfuric Acid	50	210	99	50	150	65
Sulfuric Acid	75 - 80	100	38	75	NR	NR
Uranium Extraction	-	180	82	-	-	-
Vinegar	100	210	99	100	180	82
Water, Steam Condensate	100	180	82	100	160	71
White Liquor (Pulp Mill)	-	180	82	-	-	-
Zinc Nitrate	All	210	99	Saturated	180	82
Zinc Sulfate	All	210	99	All	180	82

The chemical resistance chart data is for general information purposes only. Resin manufacturers have provided test data which indicates that each specific resin can withstand the corrosion conditions listed in this chart. Chemposite Inc., believes the data to be accurate and true, but no guarantee is expressed or implied as to specific performance. Testing for specific chemical and corrosion environments is recommended. Our responsibility for claims arising from breach of warranty, negligence or otherwise, is limited to the purchase price of the material sold by Chemposite Inc.

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