

GLOSSARY OF TERMS

A

Anchor: A device by which grating is attached to its supports. See also Hold-Down Clip.

Approval Drawings: Initial grating layout drawings developed from the Customer or contract drawings by the grating supplier, illustrating the grating supplier's interpretation of those drawings. Approval drawings are generally reviewed by the contractor for accuracy with the "as built" conditions and by the engineer for structural integrity and compliance to the specification. Either or both of these reviewers may mark up approval drawings to note required changes.

Apparent "EI": Composites experience significant shear deflections at short spans due to a low shear modulus. Back calculating from deflections under load results in a modulus inclusive of the shear deflection. Grating manufacturers have generally termed the back calculated modulus the apparent EI.

B

Banding: Flat bar epoxied and/or mechanically attached flat against the outer edge of a section of grating or stair tread.

Bearing Bars: Load-carrying bars made from pultruded or molded fiberglass composite.

Bearing Bar Centers: The center to center distance of the bearing bars.

Bi-directional: Generally refers to equivalent properties in the two principal directions of a square mesh molded grating panel, i.e. width and length. As a result, bi-directional panels span in either direction.

Bonded Grit: Grit epoxy bonded or resin bonded to finished panels of grating as a secondary operation for slip resistance

C

Clear Length: The clear distance between the edges of supports that support the grating. See also CLEAR SPAN.

Clear Span: The clear distance between the edges of supports that support the grating.

Composite: A combination of two or more materials (reinforcing elements, fillers, and composite matrix binder), differing in form or composition on a macroscale. The constituents retain their identities; that is they do not dissolve or merge completely into one another although they act in concert. Normally, the components can be physically identified and exhibit interface between one another.

Compression Molded Grating: Fiberglass grating manufactured by the compression molding process where continuous glass rovings and resin matrix are formed in a matched die mold, to the shape of the finished grating panel, under heat and pressure. not a standard product)

Concave Surface: Non-slip surface finish on open molded grating that is generally accepted as offering acceptable resistance to the foot under most conditions. Due to the surface tension of the resin against the mold blocks, the finished surface results in a concave or meniscus top. See also MENISCUS SURFACE

Concentrated Line Loading: A load measured in pounds per foot / width when applied to a section of grating.

Continuous Strand Glass Mat: The sheet-like glass fiber reinforcement used in pultrusion to provide transverse (crosswise) mechanical properties. The mat is cut to the width of the pultruded section.

Coupon Property: Refers to a physical property (tensile strength, compressive strength, etc.) of a composite sample or coupon, tested in accordance with an orderly test procedure established by ASTM or some other testing standards body. Coupon properties are used as relative benchmarks and are not always representative of full size member performance.

Covered Grating: Covered fiberglass grating consisting of grating with fiberglass plate or flat sheet either bonded or molded to the surface for applications where a solid surface or extra stiffness is required. A non-skid finish is usually added for extra skid resistance.

Cross Bars or Cross Rods: The connecting bars which extend perpendicular to, and through, the bearing bars. In Pultruded Grating, cross bars are both mechanically locked (by notching) and chemically attached (by bonding) to the bearing bars. See also TIE BARS or TIE RODS.

Cross Bar Centers: The center to center distance of the cross bars.

Cross Rod System: An assembly of fiberglass components that intersect the load or bearing bars and fiberglass components driven behind to lock them into place.

Curved cut: A cut following a curved pattern.

Cutout: An area of grating removed to clear an obstruction or to permit pipes, ducts, columns, etc. to pass through the grating.

D

Deflection: The vertical deviation from the horizontal plane of the grating when a load is applied.

Die: A steel tool which has been machined to the contour of the desired FRP part used in the pultrusion process.

E

Embedded Grit: Grit that is embedded into the top of molded grating panels during the molding process before the composite has cured.

F

Fiberglass: Silica glass drawn into filaments from the molten state, primarily used for composites reinforcement.

Filler: A relatively inert substance added to a material to alter its physical, mechanical, thermal, electrical, and other properties or to lower cost or density. Sometimes the term is used specifically to mean particulate additives.

Flame Retardant: The flame retardant is the additive which retards (does not prevent) development of fire within the grating panel.

Four Sided Support: Support along four sides of gratings that are bi-directional in strength will exhibit reduced deflections under load. Consult the grating manufacturer.

DRAFT

G

Glass Content: The amount of glass in a given unit as a percentage of the total glass and resin matrix.

Glass Roving: A collection of continuous glass filaments loosely bound together to form a continuous reinforcement strand.

Glass to Resin Ratio: Percentage, by weight, of amount of glass and amount of resin as a percentage of the total weight of the composite. Glass-to-resin ratios are generally: molded gratings-not exceeding 35% to 65% and pultruded grating not exceeding 70% to 30%.

Grating: An open grid matrix of fiberglass bars in which the bearing bars, running in one direction, are spaced by rigid attachment to cross bars running perpendicular to them.

Grit: Sand, Silica, Bauxite beads, quartz, aluminum oxide, etc. bonded to the grating walking surface to provide a slip resistant surface.

Grit Surface: A skid resistant or slip resistant finish either bonded to or molded into the walking surface of a grating panel usually consisting of sand or silica particles.

H

Hold Down Clips: A device used to fasten panels of grating to their supports, usually in the form of a metal clip or fastener.

I

I-Bar: A pultruded fiberglass bearing bar having a cross sectional shape resembling the letter "I".

Isophthalic Resin: Polyester resin with the addition of phthalic acid for additional corrosion resistance.

J

"J" Clips: Grating anchors of gage steel that are bent into the shape of a "J" or "Z", to fit over one bearing bar and attach to the supporting surface with one screw or bolt assembly.

K

Keeper: A pultruded component that is driven behind the notch bar in a pultruded grating panel to assure that notch bar does not back out of pultruded grating panel.

L

L/D Ratio: Deflection limits as expressed as a ratio of span, (L), in inches (or millimeters) to maximum deflection, (D), in inches (or millimeters).

Length: The center to center distance between the grating supports. See also SPAN

Line Load: Load, in pounds per foot of width (kg/m) that can be modeled as acting along a line, transverse to the span of a panel of grating. See CONCENTRATED LINE LOADING

Load Bars: Load-carrying bars of gratings made from pultruded or molded fiberglass.

M

"M" Clip: Grating anchors of gage steel that are bent into the shape of an "M", to fit over two (2) bearing bars and attach to the supporting surface with one screw or bolt assembly. See also SADDLE CLIP.

Meniscus Surface: A concave surface inherent in open molded grating produced as the resin forms a meniscus interface at the mold block during cure, resulting in two (2) sharp edges on the grating bars. This provides an anti-slip surface.

Mesh: General reference of a grid pattern of a molded grating panel.

N

Nosing: That portion of a tread projecting beyond the face of the riser immediately below.

Notch bar: A pultruded component with notches spaced according to desired pultruded load bar spacing in a pultruded grating panel. Notch bar mechanically maintains load bar spacing by passing through each load bar and intersecting the web.

O

Open Molded Grating: Grating that is manufactured by layering reinforcing fiber and a resin matrix into an open mold. The part is then cured generally through heating of the mold.

P

Panel Load: Applying a single load at the center of a panel of grating.

Point Load: A load that is modeled as acting at a single point on a grating panel. A person standing on a grating or the leg of a piece of equipment can be interpreted as a point load.

Polyester Resin: A type of thermoset resin used in the manufacture of FRP products. The principal advantage being a fast cure time and very good chemical resistance in many acidic environments.

Pultruded Grating: Fiberglass grating assembled from pultruded components.

Pultrusion: (1) A process described as the reversed "extrusion" of resin-impregnated reinforcements in the manufacture of rods, tubes, sheets, and shapes of uniform cross section. The reinforcement, after being wetout by the resin-application system, is drawn through a die to form the desired cross section. (2) A term that is applied to the product of the above process. (3) A term used to show association with the above process.

Q

R

Radially Cut Grating:

Grating which is cut into panels shaped as annular segments, for use in circular or annular areas.

Resin: The portion of a composite, which encapsulates and bonds the reinforcing fibers into a single mass. The resin acts to protect the reinforcement from environmental degradation and transfers forces from fiber to fiber.

DRAFT

Resin System: Group of components including resin, catalyst, and additional additives, which determine among other properties the chemical resistance characteristics of the grating.

Resin Bath: A reservoir containing the solution of polymer resin, plus catalyst, plus additional additives. The reinforcements are saturated with the resin mixture in the resin bath, before entering the mold or die.

Resin Content: The amount of resin in a laminate expressed as either a percentage of total weight or total volume.

Resin Matrix: The solution of polymer (whether polyester or vinyl ester) dissolved in styrene, which is the basic liquid raw material for the pultruder. The term resin matrix is often used because of the networking caused by the crosslinking process.

Roving: A collection of continuous glass filaments loosely bound together to form a continuous reinforcement strand.

S

Saddle Clip: Grating anchors of gage steel that are bent into the shape of an "M", to fit over two (2) bearing bars and attach to the supporting surface with one screw or bolt assembly. See also "M" Clip.

Safety Factor: The ratio of the limit state of a structural element to the actual anticipated load state.

Sealing: Applying a catalyzed resin to cut surface of fiberglass.

Span: (1) The center-to-center distance between the grating supports. See also LENGTH (2) .The direction in which load is carried.

Straight Cut: That portion of the cut edge or cutout of a grating edge, which follows a straight line.

Surfacing Veil: A polyester type non-woven fabric which is placed in the exposed surface of the pultruded composites imparting various beneficial properties, most notably a resin rich surface for better corrosion resistance and UV inhibitor for better UV protection.

T

T-bar: A pultruded fiberglass bearing bar having a cross section shape resembling the capital letter "T".

Thermosetting Resin: A resin whose molecules are chemically linked (crosslinking) and which cannot be remelted after curing. Monomers such as styrene form the links between the resin molecules.

Tie Bars or Tie Rods: The connecting bars which extend perpendicular to and through the bearing or load bars. In Pultruded Grating cross bars are both mechanically locked (by notching) and chemically attached (by bonding) to the bearing or load bars. See also CROSS BARS or CROSS RODS.

Tread: A section of grating having nosing attached and designed specifically to serve as a stair tread.

U

Unidirectional: Generally refers to span direction of a grating panel. Pultruded gratings and rectangular mesh gratings span in one direction.

Uniform Loading: A load measured in pounds per foot applied over an entire section of grating.

V

Vinyl Ester Resin: A type of thermoset resin used for its excellent chemical resistance as well high temperature resistance.

W

Width: For pultruded gratings and rectangular mesh molded gratings, the panel dimension perpendicular to the bearing bars or span.