

FIBERGLASS REINFORCED PLASTIC (FRP)

PART 1 - GENERAL

1.01 SUMMARY:

- .01 Provide special fiberglass reinforced plastic (FRP) shapes in accordance with the requirements of the contract documents.
- .02 The installing contractor shall be responsible for verifying that all required blocking is provided and installed in the correct locations for FRP component's proper installation.

1.02 WORK INCLUDED:

- .01 Supply of FRP units.
- .02 Erection / installation.
- .03 Joint treatment.
- .04 Supply and installation of backup supports, shimming, labor and materials, etc.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

- .01 Masonry work.
- .02 Structural steel: Support framing for fiberglass components.
- .03 Rough carpentry.
- .04 Joint sealants.
- .05 Finishing: Paint manufacturer shall recommend paint suitable for FRP surfaces.

1.04 RELATED DOCUMENTS:

- .01 Composites Fabricators Association's (CFA) "Guidelines and Recommended Practices for Fiberglass Reinforced Plastic Architectural Products".

1.05 QUALITY ASSURANCE:

- .01 Materials and work shall conform to the latest edition of reference specifications specified herein and to applicable codes and requirements of local authorities having jurisdiction.

1.06 QUALIFICATION:

- .01 The manufacturer of FRP work shall submit evidence of satisfactory projects it has achieved in the last (5) years.
- .02 The installer of the work specified herein shall be approved by the manufacturer of the specified material.
- .03 The installer of the work shall be fully experienced in the installation of FRP units and shall carry out the installation efficiently and co-operate fully with other trades.

1.07 CERTIFICATION & REFERENCES:

- .01 Submit manufacturer's product data, including copies of fire test reports.

.02 Except as otherwise additionally indicated on the drawings or specified herein, the standards referred to below, shall apply to work under this section.

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| .1 | ASTM D-256 | - Impact Resistance |
| .2 | ASTM D-638 | - Ultimate Tensile Strength |
| .3 | ASTM D-638 | - Young's Modulus |
| .4 | ASTM D-696 | - Coefficient of Linear Thermal Expansion |
| .5 | ASTM D-785 | - Rockwell Hardness |
| .6 | ASTM D-790 | - Flexural Properties |
| .7 | ASTM D-2583 | - Indentation Hardness |
| .8 | ASTM E-84 | - Surface Burning |
| .9 | ASTM D-570 | - Water Absorption |
| .10 | ASTM D-648 | - Deflection Temperature |
| .11 | ASTM D-4060 | - Abrasion Resistance |

1.08 DESCRIPTION OF WORK:

.01 This specification is intended to outline the general requirements of the DecoForm (FRP) units as they pertain to the overall design of the project. The manufacturer's recommendations shall not govern the work in this section.

.02 The installing contractor shall perform all work in this section, including installation, caulking (filling) and patching and will assume responsibility for coordinating installation with the work and associated trades.

1.09 DESIGN CRITERIA:

.01 Unless otherwise stated on DecoForm's drawings, fabrication tolerances are as indicated below.

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| .1 | Dimensional - all directions (0' - 10') | ± 1/8" |
| .2 | Dimensional - all directions (10' - 20') | ± 3/16" |
| .3 | Straightness along an edge or surface | ± 1/16"/linear ft. |
| .4 | All reveals, grooves, setbacks or returns 3° draft (min.) | |
| .5 | All outside corners | 1/16" - 1/8" radius |

1.10 SAMPLES:

.01 Submit duplicate min. 6" x 6" FRP samples.

1.11 SHOP DRAWINGS:

.01 Submit for approval, shop drawings of units which show sections, details, joint treatment and the relation of the FRP units to adjoining components. Approvals are not required for catalog (standard) items.

1.12 SCHEDULING:

.01 Special scheduling for site coordination must be specified at time of bidding.

1.13 DELIVERY, STORAGE AND HANDLING:

- .01 Units shall be handled and transported per manufacturer's recommendation, in a manner so as not to create damage or excessive stresses.
- .02 FRP units shall be stored level on a clean dry surface in an area protected from weather, moisture and damage. The units shall not be stacked or leaned unless instructed otherwise by the manufacturer.
- .03 The installer is responsible for chipping, cracking, or other damage to fiberglass components, after delivery to the job-site and until installation is completed and inspected approved by the Owner's representative.

1.14 WARRANTY:

- .01 The manufacturer warrants that the delivered material supplied will conform to sample and to specifications and will be free from defects in workmanship or material under normal use and conditions for a period of one year from date of shipment. Should defects, attributable to the manufacturer, appear within one year of the date of shipment, the manufacturer has the option of replacing or repairing the defective material.
- .02 Limitations: The aforementioned general warranty is exclusive. All other warranties whether expressed or implied or arising by operation of law, usage of trade, course of dealings or otherwise, are excluded. The only warranties are those expressed above. The manufacturer shall not be liable for any penalty or for any loss or damages associated with the removal or installation of its product or claims of third parties against the Purchaser.

PART 2 - PRODUCTS**2.01****.01 MANUFACTURER:**

DecoForm Corp.
270 REXDALE BLVD.
ETOBICOKE, ONTARIO
CANADA M9W 1R2
Phone: (416) 745-4970
Toll free 1 877-DECOFORM
FAX: 416 745-6636
E-mail: sales@decoform.com
website:www.decoform.com

2.02 MATERIALS:

- .01 Show face shall be colored, ISO/NPG, ultra violet stabilized, polyester gelcoat minimum thickness 15-20mil. Color to be matt white, ready for field painting.
- .02 Fiberglass reinforcement shall consist of a glassfiber reinforced polyester composite with glass content and thickness to meet structural design. Additional stiffeners (as required) shall be encased in the fiberglass composite to ensure straightness and strength. If sandwich core constructed, flat

surfaces equal to or greater than 12" x 12" or any running surface equal to or greater than 9" in width, shall be fabricated with a minimum 1/4" thick sandwich core.

- .03 Anchors and fasteners: Type 304 stainless steel where exposed; hot dip galvanized steel where unexposed.
- .04 Form stripping agent must be compatible with and for application of sealant and applied finishes.
- .05 Units will be suitably reinforced with additional materials (such as wood, metal, etc.) as required.
- .06 Caulk joints where required with Sonneborn Ultra, one-compound elastomeric sealant or equivalent low modulus urethane product. Do not use acrylic based products. Color of caulk to be selected by Architect.

2.03 PHYSICAL PROPERTIES:

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| .01 | Glass Content | - 25% by weight |
| .02 | Specific Gravity | - 1.7 |
| .03 | Shell Thickness | - 1/8" min. |
| .04 | Flame Spread Index (FSI) | - 20 (Class 1)(Class A) |
| .05 | Smoke Developed (SD) | - 375 (Class 1)(Class A) |
| .06 | Flexural Strength | - 24.1×10^3 p.s.i. |
| .07 | Flexural Modulus | - 1.13×10^6 p.s.i. |
| .08 | Tensile Strength | - 10.6×10^3 p.s.i. |
| .09 | Young's Modulus | - 1.45×10^6 p.s.i. |
| .10 | Ultimate Elongation | - 1.09% |
| .11 | Impact Strength (Method A) | - 11.4 ft.-lb.f/sq. in. |
| .12 | Indentation Hardness (Barcol) | - 45 - 51 |
| .13 | Water Absorption | - Mean value - .350%/24hrs. |
| .14 | Heat Deflection | - >220°C |
| .15 | Coefficient of Linear Thermal Expansion | - 2.06×10^{-5} 1°C |
| .16 | Abrasion Resistance (Taber) | - .0662 g weight loss |

PART 3 - EXECUTION

3.01 EXAMINATION:

- .01 Prior to the manufacture of non-catalog items, the installer shall check all pertinent site dimensions and conditions against the manufacturer's drawings and relay discrepancies to the manufacturer for inclusion in the drawings.
- .02 Prior to the manufacture of catalog items, the installer shall check all pertinent site dimensions and conditions against the manufacturer's drawings to confirm compatibility.
- .03 Prior to installation, the installer shall compare job site dimensions and conditions against the Architect's drawings and shall report any discrepancies to the General Contractor and the Architect. Work shall not proceed until discrepancies are corrected.

- .04 Prior to installation, the installer shall examine pertinent job-site conditions to insure proper arrangement and fit of the work. Start of work implies acceptance of job-site condition.
 - .05 All surfaces or framing structures shall be plumb and true as required.
- 3.02 PREPARATION:
- .01 Examine the contract drawings and specifications in order to ensure the completeness of the work required under this section.
 - .02 Verify measurements and dimensions at the job-site and cooperate in the coordination and scheduling of the work of this section with the work of related trades, so as not to delay job progress.
- 3.03 ERECTION:
- .01 Install work as indicated on drawings, as specified herein and in accordance with approved shop drawings and manufacturer's recommendations.
 - .02 Provide all support framing/reinforcing/support brackets required for work of this section and to ensure solid and secure installation.
 - .03 Provide temporary supports to maintain position as units are being installed.
 - .04 FRP units shall be handled with care and lifted with appropriate equipment.
 - .05 FRP units shall be installed true and plumb, shimmed where necessary.
 - .06 Caulk or fill and sand joints as required. Control joints shall be provided where required as specified by Architect.
 - .07 Expansion joints shall be installed as per Architect's recommendation.
- 3.04 TOLERANCES - ERECTED UNITS
- | | |
|---|------------------|
| .01 Face width of joint | ± 1/8" (3.2 mm.) |
| .02 Variation from plumb (in any dist. of 20' max.) | ± 1/8" (3.2 mm.) |
| .03 Variation from level (in any dist. of 20' max.) | ± 1/8" (3.2 mm.) |
| .04 Max. differential between adjacent units in erected position (non-cumulative) | ± 1/8" (3.2 mm) |
- 3.05 PATCHING AND CLEANING:
- .01 Repair any defects found after the work of all trades has been completed, regardless of how, or by whom, the damage was caused. Patching shall match the original work.
 - .02 Patch all countersunk fasteners and damages to match unit's texture, finished flush with face of unit.
- 3.06 FINISHING:
- .01 Reference shall be made to the painting/texturing section of the specifications.