

SCOPE

- I ↗ 1.1 This practice covers the selection, design, application, and inspection of glass reinforced plastic (GRP) linings to the bottoms of storage tanks.
- I 1.2 **An asterisk (*)** indicates that a decision by the Purchaser is required or that additional information is furnished by the Purchaser.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I 2.1 **Table 1** lists the standards and specifications which shall be used with this practice.

TABLE 1

STANDARDS AND SPECIFICATIONS	
ASTM Specifications	
C 581	Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures
D 2563	Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts
D 2583	Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
NACE Standards	
RP0188	Discontinuity (Holiday) Testing of Protective Coatings
RP0287	Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces Using Replica Tape
SSPC Specifications	
PA-1	Shop, Field and Maintenance Painting
PA-2	Measurement of Dry Paint Thickness with Magnetic Gages
SP10	Near-White Blast Cleaning
VIS 1-89	Visual Standard for Abrasive Blast Cleaned Steel

- I * 2.2 **The application specifications of the lining vendor** shall be followed in addition to the requirements of this International Practice. All conflicts with this practice shall be submitted to the Purchaser for approval by Owner's Engineer.

DOCUMENTATION

- O * 3.1 **Temperature and Service Conditions** within the storage tank will be provided by the Purchaser.
- O 3.2 **Applicator qualification.** Lining installation shall be undertaken only by applicators qualified by experience in installing the type GRP lining proposed. Applicator shall furnish details of this experience.
- O * 3.3 **Proposal information.** The following data shall be submitted to the Purchaser for approval of the Owner's Engineer:
 - a. All product specifications, MSDS sheets and ventilation requirements.
 - b. Verification that the type GRP lining proposed is suitable for the specified service conditions.
 - c. Repair procedures for damaged areas.
 - d. Reference panels per **Par. 8.2** shall be prepared by the applicator.
- R 3.4 Contractor shall submit plans for Quality Assurance and Quality Control plus names of their coating inspectors and degree of training.

MATERIALS

- S ↗ 4.1 **The resin system** shall be polyester, vinyl ester or epoxy suitable for the specified service conditions. The resin system of choice shall be 100% volume solids (solventless) epoxy if it is suitable for the service conditions, since this system is inherently safer to apply than the polyester or vinyl ester systems. The glass content of GRP linings shall be 20 to 30% by weight, excluding resin rich surface coatings.
- R 4.2 **Prime coating for the GRP** shall be an amine or polyamide cured epoxy.
- R 4.3 **Caulks for filling or smoothing of steel surfaces** shall be based on the resin used in the laminate.

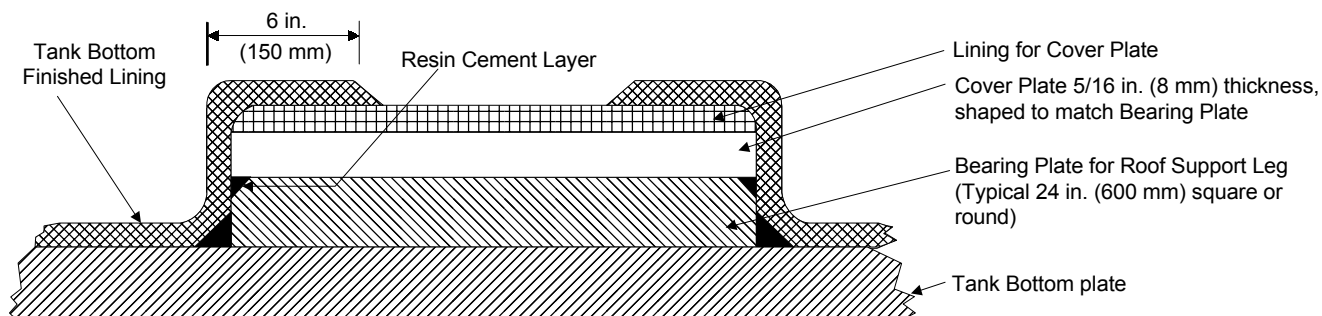
DESIGN

- R 5.1 **Temperatures and service limitations** for aggressive service shall be determined by testing per ASTM C581 unless satisfactory exposure experience at comparable conditions is clearly established.

IP 19-4-1		Glass Reinforced Plastic Tank Bottom Linings	EXXON INTERNATIONAL PRACTICE
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(This practice is appropriate for attachment to Inquiry or Purchase Document)

- O 5.2 Linings shall be applied to all new aboveground storage tank bottoms where there has been a past history of bottom corrosion by the stored products.
- R 5.3 The **tank bottom lining** shall be **extended to cover at least 18 in. (450 mm) of the first shell course**.
- I * 5.4 **Tank components** such as equipment supports and flush drawoff nozzles, shall be lined when specified.
- R 5.5 Acceptable procedures for lining roof support column bearing areas are given below:
- a. **Floating roof tank roof-support legs:**

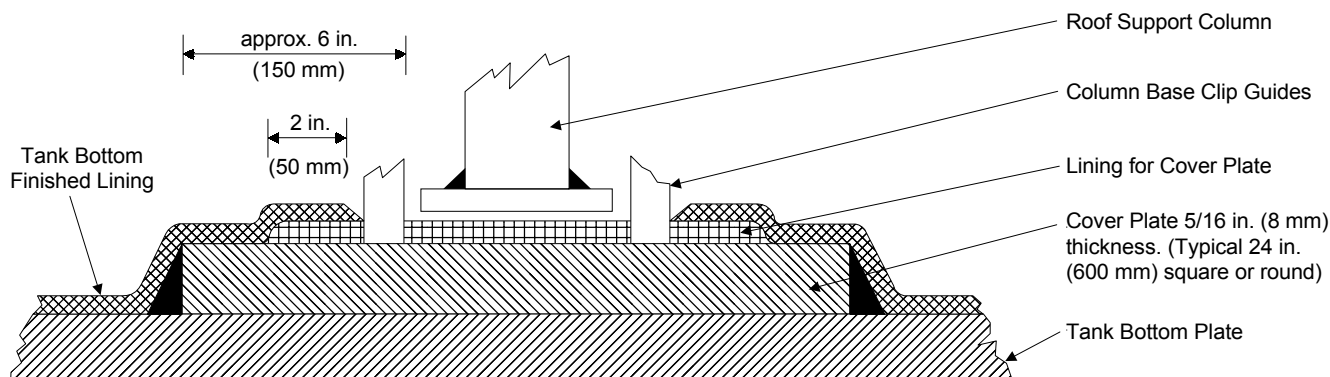


Notes: Installation procedure shall conform with the following:

- (1) Cover Plate blast cleaned and primed both sides; top surface only finished with complete lining system.
- (2) Bearing Plate blast cleaned and primed; Cover Plate then cemented to Bearing Plate.
- (3) Tank Bottom Finished Lining to overlap edges of Cover Plate.

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b. Fixed roof tank roof-support columns:



Notes: Installation procedure shall conform with the following:

- (1) Fabricate Cover Plate Assembly, consisting of cover plate and Column Base Clip Guides welded in place.
- (2) **If a bearing plate is welded to the Column base (illustrated):**
Top surface only of Cover Plate Assembly blast cleaned, primed, and finished with complete coating system.
- (3) **If a bearing plate is welded to the Tank Bottom plate:**
Cover Plate shaped to match Bearing Plate. Both surfaces of the Cover Plate Assembly, and the top of the Bearing Plate, blast cleaned and primed. top surface only of Cover Plate Assembly finished with complete lining system. Cover Plate Assembly cemented to bearing Plate (per procedure for Floating Roof Tanks).
- (4) Lining for Cover Plate Assembly shall terminate within 2 to 3 in. (50 to 75 mm) of edges. Tank Bottom Finished lining shall overlap edges of Cover Plate Lining at least 2 in.

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