

# Steele Plastics, Inc

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## Specifications

### Filament Wound Fiberglass Basins With Steel Anti-floatation Flange

#### SCOPE

This specification is intended to describe the minimum design and manufacturing requirements for Fiberglass Reinforced Plastic Sump Basin and Wet wells with steel anti-floatation flanges supplied by Steele Plastics Inc.

#### REFERENCED STANDARDS

- ASTM D2583, Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
- ASTM D3753, Standard Specification for Glass-Fiber Reinforced Polyester Manholes and Wet wells.
- AWWA C950, Fiberglass Pressure Pipe.
- ASME RTP-1 MN3-321

#### DESIGN

**General:** Shell design shall be in accordance with the methods and formulas in AWWA C950 M-45. Design of flat bottoms shall account for both limiting stress and deflection. Design shall be based on industry standard lamination analysis for the glass reinforcement layers and resins system. Design shall determine cylinder and flat bottom thicknesses.

**Laminate Properties:** The minimum flexural modulus in the circumferential direction shall be 2,000,000 psi and in the longitudinal directions shall be 1,000,000 psi.

**Wall Thickness:** Wall thickness shall vary with basin/wet well height. Calculated wall thicknesses shall be based on the following site assumed conditions:

- Soil Modulus: 700 PSI.
- Soil Density: 120 Lbs. per cubic foot.

Calculations shall employ a Luchers's safety factor of 2.

## **MATERIALS**

**Resin:** Resins used shall be commercial grade unsaturated polyester type, suitable for the intended service as indicated by usage history or resin manufacturer's recommendation.

**Cure System:** Resin promotion and catalyst system used shall follow resin manufacturers' guidelines.

**Fillers and additives:** No fillers or resin extenders of any type shall be utilized. A maximum of two percent by weight of any commercial grade thixotropic agent may be added to resins for the purpose of viscosity control.

**Reinforcing Materials:** Reinforcing material shall be commercial grade "E" type glass fibers in the form of chopped strand mat, chopped roving, woven roving or continuous roving. Uni-directional glass shall be used in addition to any other glass used. Glass fibers shall be treated with a coupling agent that facilitates bonding between the reinforcement and the resin.

## **LAMINATE**

**General:** Basin laminates shall consist of three layers (inner surface, interior layer and structural layer).

**Inner Surface:** The inner surface shall consist of a resin rich layer with no exposed fibers.

**Interior Layer:** The interior layer shall consist of a resin rich reinforced layer with a nominal fiber content of 30 percent. Reinforcements shall be chopped strand mat or chopped roving.

**Structural Layer:** The structural layer shall be chop-hoop filament wound consisting of chopped strand and continuous roving reinforcement oriented in the hoop direction. As required, uni-directional roving shall be incorporated into this layer to enhance longitudinal properties. The exterior surface shall be relatively smooth and with no exposed fibers or sharp projections. Nominal fiber content on the structural layer shall be a minimum of 62 percent.

## **APPURTENANCES**

**Top Flange:** The basin shall have a top flange that is 3" larger in diameter than the interior diameter of the tank.

**Bottom:** The bottom of the wet well shall be built to withstand full exterior water column with a maximum deflection 3/8".

**Bottom Square Steel Anti-floatation Flange:** A square steel anti-floatation flange shall be installed in the bottom of the wet well. It shall be one solid piece of 3/16" thick A-36 carbon steel that covers the entire bottom of the tank, and extends past the wall of the tank. The steel plate shall be totally encapsulated in resin and glass. The bottoms of all fiberglass tanks and wet wells manufactured by Steele Plastics do not require a steel plate bottom be installed in order to meet the 3/8" minimum deflection specification. The installation of a steel anti-float is in addition to the minimum material required to meet the above mentioned specification.

**Basin/Wetwell:** Shall be designed to withstand H-20 traffic load when properly installed.

**Cover Attachments:** Stainless steel threaded inserts shall be installed in the top flange of the basin/wet well to accommodate attachment of covers. The inserts shall be 3/8 inch diameter in a 6-bolt pattern, 60 degrees apart, and secured using polyester resin to permanently hold in place.

## **QUALITY ASSURANCE**

**Visual Acceptance:** The inner surface shall be free of exposed fiber, crazing and delaminations. No Blisters larger than 1/2 inch or wrinkles more than 1/8 inch in depth will be allowed.

**Laminate Cure:** Laminate cure shall be indicated by means of Barcol hardness measured in accordance with ASTM D2583. The average Barcol hardness shall not be less than 90 percent of the resin manufacturer's recommendation for clear resin castings.

**Workmanship:** All workmanship and materials throughout shall be of the highest quality available.

## **INSTALLATION**

Installation Instructions shall be laminated into the wall of each basin/wetwell. The installation must comply with the Installation Instructions.

This basin shall be as manufactured by Steele Plastics, Inc Conway, AR.