# Specifications for ProtectoliteTM Composites Density Current Baffles

# Part 1.0: GENERAL

**Description of Work**

 The scope of this specification is for FRP Density Current Baffles and all required accessories shown on the drawings. This includes but is not limited to the following:

* Fiberglass Reinforced Plastic (FRP) baffle panels,
* FRP mounting brackets.
* Fasteners are required to secure the panels and brackets.

**References**

* 1. ANSI/AWWA F102 - Matched-Die-Molded, Fiberglass – Reinforced Plastic Weir Plates, Scum *Baffles,* and Mounting Brackets; American Water Works
	2. ASTM D 256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
	3. ASTM D 570 - Standard Test Method for Water Absorption of Plastics
	4. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics
	5. ASTM D 696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C.
	6. ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
	7. ASTM D 2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor

**Submittals**

**Product Data**

Submit manufacturer’s sales & technical product data, including brochures, sample O&M manual, description and physical properties of the FRP laminate.

Submit manufacturer’s installation & product maintenance instructions.

**Shop Drawings**

Submit manufacturer’s shop drawings showing plans, elevations, components, supports, dimensions, attachments, mounting, fasteners, and anchors.

Submit CFD analysis detailing effectiveness of the DCB.

Submit structural calculation for wind, snow, and meteorological loads according to ASCE 7-10 in an empty tank.

Submit P.E. or P. Eng stamp in the state or province of installation.

**Manufacturer’s Certification**

Submit manufacturer’s certification that materials comply with specified requirements.

**Quality Control Submittals**

 Manufacturer’s Certificate of Compliance.

 Special shipping, storage and protection and handling instructions.

 Manufacturer’s written/printed installation instructions.

 A list of ten installations of comparable size in operation for at least ten years in North America.

Submit a 3-year manufacturer’s warranty.

## PRODUCTS

**Manufacturer**

Protectolite Composites Inc.

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**Part 2: Materials and Finishes**

FRP Density Current Baffles shall be Protectolite™ Composites or an approved equal that conforms to these specifications.

* 1. All FRP components used in the Density Baffle system shall be designed & manufactured by the FRP Density Baffle system supplier. Subcontracting of the manufacturing or fabrication is not acceptable.
	2. The Protectolite Density Current Baffle system shall consist of a series of baffle panels that are attached to the wall of the clarifier or underneath the launder trough to form an inclined, shelf-like surface around the entire inner periphery of the tank. Each DCB panel shall be made of *Protectolite™ Series 210 Corrosion ISO or VE 310 Grade FRP Laminate match metal die* compression molded corrosion-resistant laminate with molded-in UV inhibitors throughout the entire laminate. UV resistance solely provided by a gel coated surface is not acceptable.
	3. All FRP components including the *baffle panels & FRP brackets* shall be manufactured using the matched metal die compression molding process.
	4. Resin shall be premium grade Isophthalic Polyester or Vinylester Resin as requested/owner specified.
	5. Nominal thickness ¼ inch on all FRP items.
	6. Glass Reinforcement shall be continuous strand mat or continuous filament fat. Glass content shall be a minimum of 30% by weight.
	7. Chopped Strand Mat and Coreglass which is layered chopped strand mat with non-woven synthetic fibers as core material are both not acceptable. Similarly, stiffening and thickness increasing materials such metal stiffeners, balsa wood and foam are not acceptable.
	8. UV resistance solely provided by a gel coated surface is not acceptable.
	9. Color: Light gray. Color shall be mixed throughout the resin matrix/molded-in with ultraviolet inhibitor.

**PART 3: DESIGN**

* 1. **Technical Properties**
		1. Fiberglass Reinforced Plastic (FRP) Physical Properties

Tensile Strength: ASTM D 638: 15,000 psi

Flexural Strength: ASTM D 790: 25,000 psi

Barcol Hardness: ASTM D 2583: 40

Notch Izod Impact: ASTM D 256: 15 ft-lbs/inch

Water Absorption: ASTM D 570: <0.10%

Coefficient of Thermal ASTM 696 10.5 x10^-6

Expansion

* + 1. The panels shall be a maximum of 8 ft in length and shall be designed to follow the curvature of the tanks. The panels shall be designed such that adjacent panels fit together without overlapping or cutting, and the completed baffle when installed, has a well-engineered and professional appearance.
		2. The inclination of the baffle shall be 30 degrees as measured from the horizontal and the horizontal projection of the baffle shall be designed to the owner specification.
		3. Provision shall be made to attach the panels to the clarifier wall and support them at the proper angle using compression molded FRP support brackets. The panel and bracket shall form a baffle module. Stiffeners such as steel, aluminum or balsa wood are not acceptable.
		4. Panels may be cut as required to fit around obstructions as directed by the Contract Administrator.

* + 1. Provision shall also be made to vent gases that may form beneath the baffle. Half-round vent holes shall be provided along the upper baffle edge at a frequency of one vent hole for each 4 feet of baffle length. Hole diameter shall be based on baffle length.
		2. Reinforcements of the baffle panel using a return flange or “turn-back” are not acceptable as they reduce the efficiency of the clarifier.
		3. The FRP Density Current Baffle System product supplier shall also be the manufacturer of the product. The subcontracting of the FRP product manufacturing is not acceptable.
		4. All cut and exposed FRP edges shall be factory sealed with a water repellent, penetrating Pro’Lac 50 sealer. The manufacturer shall supply the owner/installer with enough Pro’Lac 50 sealer to allow to coat all field cuts.

**Part 4: Mounting Fasteners**.

* 1. Type 304 or Type 316 stainless steel (owner to specify)
		1. Fasteners: 3/8"x1-1/2", HEX HEAD BOLT
		2. Wedge or Epoxy Anchor Bolts:1/2"DIA x 4-1/4 LG, the owner to select.

**Part 5: Execution**

* + 1. All flat FRP plate materials shall be properly strapped to wooden skids with a protective poly wrapping of a minimum of 4 mils thick.
		2. All other FRP materials & hardware shall be packaged in wood crates for protection and for loss prevention.
		3. Protect the surface of FRP components from cuts, scratches, gouges, abrasions, and impacts. Do not use wire slings unless the material is fully protected. Use spreader bars when lifting the FRP material.
	1. **Storage**
		1. Once removed from the wooden crates & skids, store panels under cover. Keep panels dry in accordance with manufacturer’s instructions.
	2. **Installation Instructions of FRP Weirs and Baffles**
		1. The installer must follow the manufacturer’s installation instructions and the shop drawings.
		2. Seal cut edges with manufacturer’s supplied sealant Protectolite Pro’Lac 50**.**

**Revised: January 2024**