

SECTION 02615**CONCRETE PROTECTIVE LINER SYSTEM
FOR PRECAST STRUCTURES****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. Furnish and install all labor, materials, equipment, and incidentals required to supply polypropylene, random copolymer (PP-R) concrete protective liner in the precast wet wells and manholes as required and as shown on the plans. The liner system shall be AGRU "Sure-Grip" PP-R Concrete Protective Liner, or approved equal polypropylene lining, as installed by U.S. Precast Corporation, Miami, Florida and Joelson-Taylor Concrete Products at Venice, FL, Deland, FL and other locations in this state.
- B. PP-R concrete protective liner shall be designed and installed by the manufacturer of the precast structure to protect the structure's interior surfaces from chemical attack and microbial corrosion, and to facilitate the prevention of ground water infiltration. A watertight seal between the ring and cover, or access hatch, and the liner, must be incorporated into the design. Additionally, the liner must be sealed at the bottom of the concrete structure's wall with a waterstop assembly thermo-welded to the wall liner, or with continuous liner coverage over the top of the base slab. All construction joints must be sealed by extrusion welding the liner seams together to form a continuous and flexible seal between structure sections.

1.02 SUBMITALS

- A. The contractor shall submit for review a detailed CAD shopdrawings for each type of structure to be used on the project. These drawings shall detail the precast structure, per the design specified for the project, and shall show the concrete protective liner's placement on the structure's interior wall surfaces, at the construction joints, at pipe and other conduit connections, and at the adjustment area between the precast structure and the ring and cover. A manhole frame sealing system, in accordance with Section 02620, may be used in lieu of liner at the adjustment area.
- B. The contractor shall provide, upon request, detailed thermo-welding and weld testing procedures, and supply to the engineer, upon request, a copy of the liner manufacturer's certification of training for those personnel performing the welding.

PART 2 - PRODUCTS**2.01 PHYSICAL PROPERTIES**

- A. The PP-R liner shall be free of pores, pinholes, voids and foreign bodies. All anchoring studs shall be manufactured during the extrusion process in one piece with the sheet. No welding to attach the studs to the sheet or mechanical finishing work is permitted. All welding rod, profile strips, cap strips and polyester backed transition wrapping shall be manufactured from

the same resins by the same manufacturer. The liner manufacturer shall be ISO 9001 certified.

- B. The characteristic values of the raw materials shall be as follows:

PROPERTY	TEST METHOD	UNIT	STD. VALUE
Density	ASTM D 792-86	G/cm ³	.898
Melt Flow Index	ASTM D 1238-88	G/10min	(190/5)
Heat Reversion	ASTM D 1637-83	%	< 2
Yield Stress	ASTM D 638-89	PSI	≥ 2,900
Elongation of Yield	ASTM D 638-89	%	≥ 10
Elongation at Break	ASTM D 638-89	%	≥ 50
Fire Classification	UL 94		V2
Electric Conductivity			10 ¹³
Resistance to Pull-Out	SKZ Test Directives	T/m ² T/ft ²	30 3
Maximum Working Temperature		C. F.	90 degrees C. 194 degrees F.

2.02 CONFIGURATION

- A. Studded PP-R liner sheets shall have a minimum design thickness of 2 mm (.079 inches) and have a minimum of 39 wedge shaped anchoring studs per square foot of liner. Minimum stud height shall be no less than 9 mm (.39 inches) with a minimum length of 14 mm (.55 inches). Anchoring studs must be capable of resisting continuous hydraulic backpressure, to a minimum of 40 feet of hydraulic backpressure, exerted between the interior wall of the concrete structure and the anchoring stud side of the protective liner.
- B. Non-studded PP-R cap strips, used to bridge construction joints, shall have a minimum design thickness of 2 mm (.079 inches). Polyester backed non-studded PP-R transition sheets, used for the purpose of bonding PP-R to dissimilar materials, shall be attached to the PP-R sheet during the extrusion process.
- C. The lining system shall be designed to be repaired, or modified, at any time during the design life of the system.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The installation of the PP-R concrete protective liner into precast wet wells and manholes shall be accomplished only by a precast concrete manufacturer certified by the liner manufacture, with a minimum of five years of manufacturing experience, and a minimum of five years experience in the installation of corrosion resistant thermoplastic sheet liners in concrete structures. Upon request, the liner installer shall provide written certification that the installation is in accordance with the liner manufacturer's installation specifications.
- B. Placement of the liner on forms shall conform to the liner manufacturer's written instructions. All shop and field welding shall be performed only by thermoplastic extrusion welders certified by the liner manufacturer. All field thermo-welding shall additionally be performed only by confined space trained, and certified personnel.

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