

**PROTECTOPLAS COMPANY
STREETSBORO, OHIO**

**SODIUM HYPOCHLORITE STORAGE SPECIFICATION
THE BLEACH-GUARD SYSTEM™**

I. GENERAL

A. Scope of Work

1. Design, manufacture and furnish a storage system providing monitored primary and secondary containment for Sodium Hypochlorite. System shall include support vessel, lining, and support system as shown on the contract drawings and described herein.
2. All required labor, materials, supervision and equipment should be included.

B. Suitability for Service

1. The storage system shall be designed for the storage of sodium hypochlorite in concentrations up to 17% at ambient temperature and atmospheric pressure with design service life of 20 years.

C. Qualifications of Storage System Supplier

1. The storage system supplier shall have a minimum of 5 years experience in the design and manufacture of one piece, non-bonded lining systems.
2. The storage system supplier shall supply to the engineer the names of 5 sites currently using their system.
3. Engineer reserves the right to evaluate all bids based on long-term operation and maintenance costs.
4. Storage system shall consist of secondary containment support vessel and primary containment system as manufactured by Protectoplas Company 3500 Crane Centre Dr, Streetsboro, OH 44241 1-800-525-2661 or approved equal.

D. Submittal Drawings and Specifications

1. Prior to manufacture the storage system supplier shall submit to the engineer for approval (1) sets of shop drawings showing support vessel design, support vessel material, all piping connections, lining and lining support system details.
2. There shall be no deviation from the drawings and specifications, except upon written order from the engineer.

II. DESIGN CRITERIA

A. Vessel Size

1. The support vessel shall be one piece molded polyethylene 102"x194" oah, flat bottom, vertical, and dome top.

B. Vessel Capacity

1. Vessel capacity shall be nominal 6000 gallons as contained in the straight side of the tank.

C. Vessel Design Standards

1. The support vessel shall be one piece molded polyethylene, confirming to ASTM Standard 1998-91 for Type II classification for Polyethylene Upright Storage Tanks.

Material: High Density Polyethylene
% Gel on inside. 125" shall be minimum of 60%
Low Temperature Impact 200 ft. lbs to failure Fallen Dart Impact
Nominal Wall Thickness as measured in bottom third. 828".

2. Vessel shall be designed for 1.7 specific gravity to insure no sidewall bulging.
3. Vessel shall be equipped with integrally molded top mounted, minimum 24" diameter manhole.
4. Vessel shall be equipped with (1) sealed center dome lift lug and (4) molded combo lift/ hold down.
5. Vessel shall be equipped with a painted mild steel (4) post and cable lateral restraint system.
6. All nozzles shall be ANSI 150# drilled, full raised face, flanged and gusseted standard projection to be 6". Plate gussets shall be 1/2" thick. All welding is to be 5/32" hand beads made with nitrogen gas.

D. Primary Containment

1. Vessel shall be equipped with Protecto-line #2000 primary containment system, nominal 1/8" thick - 125 mils. Properties per ASTM D-369:

Tensile Strength	2700 psi
Elongation	330%
Modulus @ 100%	1500 psi
Shore Hardness	82
Brittleness Temp.	-27 degrees F
Specific Gravity	1.24
Thickness	125 mils

2. Primary containment shall be shop fabricated in one piece using "RF" heat seals.
3. Primary containment shall be supported with grade 2 titanium/HDLPE suspension system utilizing battens and titanium studs.
4. Primary containment shall be 100% Non-bonded to support vessel.
5. Primary containment shall be sized such that when installed it is 100% supported by the support vessel with no bulging that could occur.
6. All fittings shall be 150# flanged and gusseted nozzles containment. These shall be factory installed.
7. All nozzles shall be heat sealed to the primary containment utilizing the hot-air pressure technique. No glues or adhesive shall be permitted. All fitting seals shall have (2) coats of PL3 (Protectoplas Liquid Lining).

8. The primary containment system shall be continuously monitored with a minimum of one sight monitoring port. This port shall serve the dual capacity of monitoring and providing access to the interstitial space between the primary containment system and support vessel.

E. Testing

1. All field nozzle connections shall be vacuum tested with sight glass and minimum of 60" vacuum water column, with soap solution. A written log shall be kept documenting all test results and personnel involved. This log shall be made available to the engineer at his request.
2. Blank off all fittings and perform vacuum test as outlined in Protectoplas start up procedure
3. Prior to the introduction of any chemicals, all fittings shall be blanked off and the lined vessel shall be isolated and water tested at atmospheric conditions for a minimum of 8 hours. During this period the monitoring ports shall be observed for any evidence of leakage. The results of this test shall be noted on a written log with nozzle testing results. These logs shall be submitted to the engineer or owner for their records.
4. Report test results to Protectoplas as per startup procedure.

F. Inspection

1. Under normal operating conditions, the operator shall check the monitoring ports once a week to insure there is no breach in the primary containment system.

G. Warranty

1. Protectoplas Company, Division of Ebco, Inc., warrants all products manufactured and furnished by it for a period of two years from date of shipment from its factory to be free from defects in the material and workmanship, plus an additional three years pro-rated term. Warranty does not cover misuse, fire, accident, negligence or unauthorized alterations to the produce.

Liability of the manufacturer under this warranty (and under any other warranty, expressed or implied, statutory or otherwise) is limited to repair, or at the manufacturer's option, replacement of defective product which is shown to have been defective when shipped and only then if the manufacturer is notified of the defects within the warranty period and items in question are promptly delivered to its factory of origin, transportation charges prepaid. Manufacturer's liability hereunder shall not be enforceable until such equipment has been fully paid for. Except to the extent expressly assumed herein, manufacturer's liability for incidental and consequential damage is hereby excluded to the full extent permitted by the applicable law. Manufacturer's liability as stated herein cannot be altered or enlarged except by a writing signed by an officer of the manufacturer.