

16,000 Liter ISO Tank Specification (FY 2016)

1. SCOPE

1.1 General

- 1.1.1 This specification reflects those characteristics that are essential to the minimum needs of the Government for the procurement of ISO standard intermodal tanks.
- 1.1.2 Quantity requested three (3) 16,000 liter ISO tanks.
- 1.1.3 The tanks will be consecutively numbered/identified with the following numbers: PSNS-HLT-004, PSNS-HLT-005, and PSNS-HLT-006. All associated documents for each tank shall reference the applicable tank number.
- 1.1.4 It is the Government's intent that a single (primary) contractor be awarded this contract and be responsible for the accomplishment of all the work detailed by this specification.

1.2 Applicability

- 1.2.1 This specification covers ISO standard intermodal tanks for long haul transport of low hazard liquids as defined in 49 CFR 173.241.
- 1.2.2 The term "ISO tank" as used in this specification refers to "T" code UN portable tanks as defined in 49 CFR 172.102.
- 1.2.3 The ISO tanks specified herein shall comply with the provisions set forth in UN Portable Tank Instruction T11.
- 1.2.4 The tank design shall meet the approval requirements of 49 CFR 171-180.

1.3 Definitions

Acronyms

CSC	International Convention for Safe Containers
DOT	[US] Department of Transportation
EN	European Standards
HSLA	High strength low alloy [steel]
PSNS & IMF	Puget Sound Naval Shipyard and Intermediate Maintenance Facility
RAL	Reichs-Ausschuss für Lieferbedingungen
SANS	South African National Standards
UN	United Nations [Committee of Experts on the Transport of Dangerous Goods]

Table 1.1

Cargo means the liquid being transported in the cargo vessel.

Cargo vessel means an ASME BPVC VIII-1 pressure vessel that holds the liquid cargo and meets the DOT requirements for UN portable tanks specified in CFR Title 49. The term includes the shell, dished ends, penetrations and direct attachments.

Drop-in rinse system means a removable spraying device that is inserted through the cargo vessel manhole and secured in place of the open manlid.

Frame means the structure around the cargo vessel conforming to ISO 1496-3 for purposes of load restraint and safe handling.

Full Frame means an ISO frame with top and bottom side rails, top and bottom end rails, four uprights and eight corner castings.

Government means the federal government of the United States of America

ISO tank means a liquid cargo vessel mounted entirely within the space envelop of a frame of the same dimensions and structural strength as a standard intermodal shipping container.

Shipping consignment means the fully equipped ISO tank plus the cargo it contains.

Type 316/316L/304/304L stainless steel means austenitic stainless steel conforming to ASTM A240 Type 316 or 316L or 304 or 304L or equivalent weldable stainless steels conforming to other commonly recognized standards such as DIN or SANS.

1.4 List of Equipment

- 1.4.1 As a minimum, each ISO tank procured to this specification shall include the components listed in Table 1.2 below, and as detailed in the referenced paragraphs of this specification.

Components	Paragraph
Vessel technical characteristics	4
Insulation	4.9
Steam heating channels	4.10
Cladding	4.11
Top fill connection	4.12
Bottom connection including foot valve	4.13
Manlid	4.14
Relief valve assembly	4.15
Airline valve and vent connection	4.16
Spill boxes	4.17
Surface thermometer	4.18
Level Indication	4.19
Frame technical characteristics	5
Earthing connection (ground)	5.6
Document holder	5.7
Drop-in rinse system	6.2
External ladder	6.3
Walkways	6.4
Markings	6.5

Table 1.2

1.5 Inspection Agency

1.5.1 The independent inspection authority shall be Bureau Veritas, Lloyds Register, or American Bureau of Shipping.

2 REFERENCE DOCUMENTS

2.1 **Issues of Publications:** The following documents in effect on the date this specification is received form a part of this specification to the extent applicable, or as specified herein. Within the specification, they shall be referred to by their basic designation only.

2.2 Government Publications:

- *Code of Federal Regulations (CFR):*
 - 49 CFR Parts 171 – 180, Hazardous Materials Regulations
- *Commercial Item Description (CID)*
 - CID A-A-59326: Coupling Halves, Quick-Disconnect, Cam-Locking Type, General Specification for
 - CID A-A-59326/10: Coupling Half, Cap, Dust, Type IX

- *Federal Standard (Fed Std):*
 - FED-STD-313: Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

2.3 **Nongovernmental Publications:**

- *American Society of Mechanical Engineers (ASME)*
 - ASME BPVC Section VIII Division 1: ASME Boiler and Pressure Vessel Code, Pressure Vessels – Division 1
 - ASME B46.1: Surface Texture (Surface Roughness, Waviness, and Lay)
- *American Society for Testing and Materials (ASTM)*
 - ASTM A216: Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
 - ASTM A240: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
 - ASTM A480: Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
 - ASTM A572: Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- *Deutsches Institut für Normung [German Institute for Standardization] (DIN)*
 - DIN EN 10025-1: Hot Rolled Products of Structural Steels – Part 1: General Technical Delivery Conditions
 - DIN EN 10025-2: Hot Rolled Products of Structural Steels – Part 2: Technical Delivery Conditions for Non-alloy Structural Steels
 - DIN EN 10293: Steel Castings – Steel Castings for General Engineering Uses
 - DIN 17100: Steels for General Structural Purposes; Quality Specifications
- *International Organization For Standardization (ISO)*
 - ISO 668: Series 1 Freight Containers – Classification, Dimensions and Ratings
 - ISO 1161: Series 1 Freight Containers – Corner Fittings - Specification
 - ISO 1496-3: Series 1 Freight Containers - Specification and Testing - Part 3: Tank Containers for Liquids, Gases and Pressurized Dry Bulk

- 2.4 **Reference Revisions:** The latest published revision shall be applicable to this project unless identified by a specific revision date.
- 2.5 **Order of Precedence:** In the event of conflict between the text of this specification and that of the references cited above, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws or regulations unless a specific exemption has been obtained.

3 GENERAL REQUIREMENTS

3.1 Materials and Parts:

- 3.1.1 All materials and parts comprising of the ISO tank and frame shall be new, of current design and manufacture, and shall not have been in prior service except as required for factory testing. Standard, off-the-shelf components with proven reliability shall be used wherever possible to increase performance, reliability, reduce initial costs, and ensure availability of replacement parts.
- 3.1.2 Deviations from the requirements of this specification are not permitted without written authorization from PSNS & IMF.
- 3.1.3 Where this specification does not specify either make or model of component(s) the contractor shall propose make and model; subject to written approval by PSNS & IMF prior to start of fabrication.

3.2 **Interchangeability:** All replacement parts shall be manufactured to definite standards, tolerances, and clearances in order that any such parts of a particular type or model may be replaced or adjusted without modification of the equipment.

3.3 Discrepancies:

- 3.3.1 *Clarification:* Clarification shall be obtained before submitting a proposal for work as to discrepancies or omissions from the contract documents or questions as to the intent thereof. All questions and requests for clarifications shall be submitted in writing to the Contracting Officer.
- 3.3.2 *Contractor Agreement:* Consideration will not be granted for misunderstanding of the amount of work to be performed. Submission of a bid conveys full contractor agreement of the items and conditions specified, shown, scheduled, or required by the nature of this project.

3.4 On Site Inspections:

- 3.4.1 PSNS & IMF representative(s) will inspect each of the completed ISO tank assemblies prior to shipment to PSNS & IMF. Allow five (5) working days for each tank inspection.
- 3.4.2 Contractor shall provide a minimum of ten (10) working days advance notice to PSNS & IMF when tanks will be complete and ready for shipment to allow time for inspection specified in paragraph 3.4.1.
- 3.4.3 All deficiencies found during inspection shall be corrected prior to ISO tank leaving the fabrication site.
- 3.4.4 PSNS & IMF reserves the right to inspect the ISO tank assembly at any time during fabrication at their option. A minimum of two (2) working days' notice will be given to the contractor for unplanned visits by PSNS & IMF representative(s).

3.5 Summary of Deliverables:

3.5.1 Bid Proposal Deliverables

- 3.5.1.1 Submit a current copy of their "*Certificate of Authorization*" from the ASME Boiler and Pressure Vessel Code committee.
- 3.5.1.2 Furnish descriptive literature in sufficient detail to show that the proposed product design meets these specifications.
- 3.5.1.3 Submit photos, if available, of similar type ISO tanks the contractor has fabricated.
- 3.5.1.4 Provide statement of compliance with or exceptions to this specification.
- 3.5.1.5 Provide a preliminary schedule detailing key events (e.g. design, material receipt and inspection, manufacturing, certification, etc.) that shows how the contractor intends to meet the delivery date stated on the bid request.

3.5.2 Pre-Construction Deliverables

- 3.5.2.1 After contract award but prior to start of fabrication, the following data shall be submitted to the contracting officer for review and written approval by the PSNS & IMF engineer. Allow ten (10) work days, starting upon receipt of fabrication drawings, for review and comment by PSNS & IMF representative.
 - Final Fabrication Drawings
 - Calculations for ISO tank assembly

3.5.2.2 Prior to painting, the contractor shall provide the paint information (i.e. manufacturer's information, paint formula, and material safety data sheets).

3.5.3 Deliverables

3.5.3.1 A minimum of ten (10) working days prior to shipping each tank, the contractor shall provide a certified copy of the independent inspection authority report documenting conformance to applicable codes and standards for design, fabrication and testing of each completed tank. The documentation shall consist of one paper copy and one electronic copy in PDF (Portable Document Format) of all pertinent documents.

3.5.3.2 A minimum of ten (10) working days prior to the delivery date of the tanks, the contractor shall provide information and certified reports specified below for each completed tank. All certified reports shall be referenced to a specific tank using the tank's number specified in paragraph 1.1.3. The documentation shall consist of one paper copy and one electronic copy of all documentation in Portable Document Format (PDF).

- Final "as-built" drawings on CD-ROM disks. The format of the drawing files shall be in AutoCAD. Files shall have "DWG" extensions in version 2005 or newer or DXF format. Contractor may request to supply drawings in an alternative file format if desired. Government approval is required for alternative file format.
- Documentation per UG-120 of the ASME BPVC, Section VIII, Division 1.
- Certified report for the actual weight of each ISO tank assembly.
- Certified report for satisfactory hydrostatic test of each ISO tank.
- Certified report for satisfactory hydrostatic test of the steam heating channels on each ISO tank.
- Certified report for satisfactory air test of each ISO tank.
- Certified report for satisfactory drop-in rinse system operational test.
- Certified report for calibrated fill of each ISO tank dip stick.

- Manufacturer's information including part number for all components (e.g. valves, connection fittings, manlid, etc.) used in the ISO tank assembly.
- 3.5.3.3 ISO tank and components fabricated as specified in these specifications.
 - 3.5.3.4 Operation manual for ISO tank assembly.
 - 3.5.3.5 Maintenance manual for ISO tank assembly.
 - 3.5.3.6 Provide a complete set of final radiographic film, a shooting sketch, and radiograph review forms of all weld joints to PSNS & IMF for baseline historical information.
 - 3.5.3.7 Provide written certification that the ISO tank assembly contains no detectable polychlorinated biphenyls (PCBs) (less than two (2) parts-per-million). The certification shall be from the manufacturer, on the manufacturer's letterhead, and signed by a company official empowered to provide same.
 - 3.5.3.8 Certificate of Compliance
 - 3.5.3.9 Warranty

4 VESSEL TECHNICAL CHARACTERISTICS

4.1 Type:

- 4.1.1 The vessel shall meet the strength requirements and other provisions of UN Portable Tank Instruction T11 and 49 CFR "T" code tanks.
- 4.1.2 Maximum Allowable Working Pressure (MAWP) = 4.0 barg (58 psig)
- 4.1.3 Vessel design temperature = -40°C to 130°C (-40°F to 266°F)
- 4.1.4 Test pressure = 6.0 barg (87 psig)
- 4.1.5 External pressure = 0.21 barg (3 psig)
- 4.1.6 Nominal wall thickness of cylindrical portion, ends, and manlid shall be based on 49 CFR 178.274(d) (2).

4.2 **Capacity:** 16,000 (+/- 500) liters [4,227 (+/- 132) gallons]

4.3 Size:

- 4.3.1 The overall dimensions of the vessel shall be determined as necessary to ensure insulation, cladding, connections, lids, spill boxes, housings and other external attachments are inside the frame envelope.

4.4 **Weight Restrictions:**

4.4.1 These ISO tanks are intended to carry standard shipments of 14,511 liters (3,833 gallons) of liquid under the proper shipping name environmentally hazardous substance, liquid, n.o.s. The density of the solution is 1.00 kg/liter (8.35 lbs/gal), which equates to a standard cargo weight of approximately 14,515 kg (32,000 lbs.). The preferred tare weight of an ISO tank equipped as specified above is 3,856 kg (8,500 lbs.). Government approval is required to exceed a tare weight of 3,856 kg (8,500 lbs). The maximum tare weight of the ISO tank is 4,536 kg (10,000 lbs).

4.5 **Design:**

- 4.5.1 Vessels shall be designed to meet the requirements of ASME BPVC VIII - Division 1 and 49 CFR.
- 4.5.2 Vessels shall be stamped with the Code "U" symbol.
- 4.5.3 The cargo vessel shall be a fully welded, longitudinally oriented, cylindrical shell with dished ends.
- 4.5.4 The cargo vessel shall be fabricated with the fewest number of plates to reduce the amount of welded seams.

4.6 **Testing:**

- 4.6.1 Vessels shall be tested to meet the requirements of ASME BPVC VIII Division 1, 49 CFR, and per the requirements specified below.
- 4.6.2 The cargo vessel, penetrations, and direct attachments shall meet all applicable design, testing, fabrication, and inspection requirements of ASME BPVC Section VIII - Division 1, CFR Title 49, and UN Portable Tank Instruction T11.
- 4.6.3 Perform a full (100 %) radiographic examination per ASME BPVC VIII - Division 1, UW 51 on all tank shell welds after pressure testing.
- 4.6.4 Provide a complete set of final radiographic film, a shooting sketch, and radiograph review forms of all weld joints to PSNS & IMF for baseline historical information.
- 4.6.5 Welds that cannot be radiographically inspected due to interferences or joint design shall be liquid penetrant inspected per the requirements of ASME BPVC Section VIII, Division 1.
- 4.6.6 Perform a calibrated fill of tank to verify dip stick (see section 4.19) is accurate at each 1,000 gallon (3,785 liter) interval. Tolerance is +/- 25 gallons (+/- 95 liters).

4.7 Materials and Finishes:

- 4.7.1 The vessel, penetrations, and structural members directly attached to the vessel shell or ends shall be ASTM A240 Type 316L or 304L stainless steel or equivalent.
- 4.7.2 Interior surface finish of the tank vessel shall be number 4 or finer finish per ASTM A480.
- 4.7.3 All pits, gouges, scratches, tool marks, weld spatter, etc. on the interior tank surface shall be faired into surrounding surface. Keep grinding to a minimum.
- 4.7.4 Interior tank weld surface finish shall have a roughness average (RA) equivalent to 30 to 35 micro inches or better per ASME B46.1.
- 4.7.5 Interior tank weld seams shall be ground flush.
- 4.7.6 Internals shall be chemically cleaned and passivated.
- 4.7.7 Exterior surface finish on the tank shell shall be free of mil scale and surface defects.
- 4.7.8 All surfaces shall be smooth and all sharp edges shall be rounded to a minimum of 1/8 inch or to a radius equal to one half of the material thickness when the material thickness is less than 1/4 inch.
- 4.7.9 All grinding tools coming in contact with stainless steel shall be for use on stainless steel only. Grinding wheels shall be aluminum oxide or silicon carbide. Brushes shall be stainless steel wire.
- 4.7.10 During work on interior of the tank, the Contractor shall take measures necessary to prevent scratching the surface and/or inclusion of foreign material on the interior surfaces.
- 4.7.11 Materials furnished for these vessels shall be free of all mercury contamination during manufacturing, testing, and inspection. The materials shall not have come in direct contact with mercury containing device employing a single boundary of containment.

4.8 Certifications:

- 4.8.1 The tank shall be ASME certified and stamped with the code "U" symbol.

4.9 Insulation

- 4.9.1 Insulate cargo vessel shell, ends, and wherever possible to ensure contents will not freeze while in transit during cold weather as characterized in paragraphs 4.9.3, 4.9.4, and 4.9.5.
- 4.9.2 Insulation shall be the greater than or equal to the equivalent of 50mm of mineral (rock) wool with foil back and a minimum density of 28 kg/m³.

- 4.9.3 Assumed cargo:
 - 4.9.3.1 For purposes of freeze prevention, assume cargo is potable water and cargo vessel is 20% full.
- 4.9.4 Filling conditions:
 - 4.9.4.1 ISO tanks will be located outdoors and filled via transfer hoses from storage tanks located inside a heated facility.
 - 4.9.4.2 Assume outside temperature is -5° C (23° F) and cargo is received at 10° C (50° F).
 - 4.9.4.3 Maximum pre-heat temperature for the cargo is 54° C (130° F).
- 4.9.5 Route characterization:
 - 4.9.5.1 Assume shipment takes 5 days with no heat available to the ISO tank while in transit and during layovers. Use average temperatures specified in Table 4.1 for calculations.

Average Route Temperatures	
Day	Average Temp.
1	-5.6° C (22° F)
2	-6.7° C (20° F)
3	-8.3° C (17° F)
4	-6.1° C (21° F)
5	-1.7° C (29° F)

Table 4.1

- 4.9.6 Discharge conditions:
 - 4.9.6.1 ISO tanks will be discharged via transfer hoses to a freeze protected tank at the final destination.
 - 4.9.6.2 The steam heating system (see section 4.10) shall be capable of independently maintaining the cargo at 5° C (41° F) indefinitely, assuming an average outside temperature of -12° C (10° F).

4.10 Steam Heating Channels

- 4.10.1 Provide steam heating channels on the exterior of the cargo vessel shell.
- 4.10.2 Determine effective heating area based on the insulation provided and the amount of heat necessary to maintain the specified cargo temperature under the discharge conditions described in section 4.9.6.

- 4.10.3 Minimum effective heating area is 3.75 m² (40 ft²) for the steam heating channels to aid in reducing overall weight of vessel.
- 4.10.4 Working pressure: 4 barg (58 psig) minimum.
- 4.10.5 Pressure test steam heating channels to 6 (+0.18, -0) barg [87 (+3, -0) psig] minimum.
- 4.10.6 End fittings shall be 3/4 inch NPT with threaded protective caps.
- 4.10.7 Both the steam inlet and outlet connections shall be located on the outlet end of the vessel on left side when facing the outlet end of the tank.
- 4.10.8 The steam connections shall be positioned with the inlet on the right and the outlet on the left when facing the outlet end of the tank.
- 4.10.9 Ensure steam piping is within the frame boundary by at least 1/2 inch.

4.11 Cladding

- 4.11.1 Fully cover the exterior of the insulated vessel with glass reinforced plastic (GRP) cladding.
- 4.11.2 Color: white (RAL 9010 or equivalent)
- 4.11.3 Thickness: 2mm (minimum)

4.12 Top Fill Connection

- 4.12.1 Locate top fill connection and isolation valve toward the rear (lower end of vessel, see paragraph 5.1.2) of the ISO frame.
- 4.12.2 The top fill connection shall consist of a weld-in flange pad, clamped butterfly valve, and male cam locking type fitting.
- 4.12.3 Top Fill Connection Valve Description: 3 inch nominal size, Bray Butterfly Valve, Series 40, Wafer Type Pattern, ASME 150.
- 4.12.4 Top Fill Connection End Fitting Description: 2 inch nominal size male cam-locking type quick disconnect coupling half meeting the requirements of Figure 2 of CID A-A-59326, Class SS, Style 1. Cam-locking coupling shall be welded to flange to fit valve described in paragraph 4.12.3. No threaded connection allowed.
- 4.12.5 Equip the top fill connection end fitting with a 2 inch nominal size cam-locking type quick disconnect dust cap meeting the requirements of CID A-A-59326/10-8, Class SS, Style A to fit the end fitting described in paragraph 4.12.4.
- 4.12.6 The minimum allowable working pressure of the components shall be 4 barg (58 psig).
- 4.12.7 The metal components shall be type 316/316L/304/304L stainless steel or equivalent casting material, as applicable.

4.12.8 Gaskets shall be PTFE or synthetic rubber compatible with dilute potassium chromate solution.

4.13 **Bottom Connection including Foot Valve**

4.13.1 Locate bottom connection at the rear (lower end of vessel, see paragraph 5.1.2) of the ISO tank.

4.13.2 The bottom connection shall consist of a 3 inch nominal size 45 degree foot valve discharge assembly with integral butterfly valve coupled to a male cam locking type fitting.

4.13.3 Foot Valve Characteristics:

4.13.3.1 The foot valve shall be remotely controlled.

4.13.3.2 The control device shall be readily accessible and able to be quickly operated in event of an emergency.

4.13.3.3 Connect the fusible link to the remote control device.

4.13.3.4 The fusible link and remote control device shall be mounted on the right side of the tank when facing the outlet end.

4.13.4 Foot Valve Assembly Description: Fort Vale Part No.: 804/4020A. 45 Degree Composite Bottom Outlet System comprising of a 3 inch 45 Degree Hi-Lift Foot valve, a 3 inch Butterfly Valve (with straight handle), a 3 inch male cam-locking type quick disconnect coupling half meeting the requirements of CID A-A-59326, Class SS, and a 3 inch nominal size cam-locking type quick disconnect dust cap meeting the requirements of CID A-A-59326/10-8, Class SS, Style A.

4.13.5 The minimum allowable working pressure of the components shall be 4 barg (58 psig).

4.13.6 Metal components shall be type 316/316L/304/304L stainless steel or equivalent casting material, as applicable.

4.13.7 Gaskets shall be PTFE or synthetic rubber compatible with dilute potassium chromate solution.

4.14 **Manlid**

4.14.1 Locate a low profile, 6 point fastening manlid with inside diameter of 500 mm in the center of the cargo vessel.

4.14.2 Manlid Description: Fort Vale 500mm Pendle 4 Bar Manlid/Straight Neck Assembly

4.14.3 Swingbolt Description: Fort Vale Low Profile Stainless Steel Part No.: FVU496/5375

4.14.4 Metal parts shall be type 316/316L/304/304L stainless steel.

4.14.5 Designed for pressure tight sealing.

- 4.14.6 Necking radius as required to suit the shell diameter.
- 4.14.7 Gasket shall be PTFE braided fiber or fiber reinforced synthetic rubber compatible with dilute potassium chromate solution.

4.15 Relief Valve Assembly

- 4.15.1 Install a 2-1/2 inch nominal size safety relief valve assembly specified below and as required per 49 CFR for protection of T11 UN portable tanks from over pressurization and vacuum collapse.
- 4.15.2 Description: Fort Vale 2.5 inch Super Maxi High Flow, Make/Model 010/16312
- 4.15.3 No other type of relief/vent valve assembly is allowed without permission from PSNS & IMF.
- 4.15.4 Locate the safety valve in the manlid spill box.
- 4.15.5 Set relief pressure to 4.4 bar.
- 4.15.6 The device must be set to relieve at a vacuum setting not greater than 0.21 bar.
- 4.15.7 The gasket shall be PTFE or synthetic rubber compatible with dilute potassium chromate solution.

4.16 Airline Valve and Vent Connection

- 4.16.1 Install a 1-1/2 inch nominal size airline valve to perform pressurized discharge and to vent the tank during pumped discharge.
- 4.16.2 Valve Description: 1-1/2 inch Airline Ball Valve
- 4.16.3 Vent Connection End Fitting Description: 1-1/2 inch nominal size male cam-locking type quick disconnect coupling half meeting the requirements of Figure 2 of CID A-A-59326, Class SS, Style 1. Cam-locking coupling shall be by welded or integral with the valve described in paragraph Error! Reference source not found.4.16.2. No threaded connection allowed.
- 4.16.4 Equip the vent connection end fitting with a 1-1/2 inch nominal size cam-locking type quick disconnect dust cap meeting the requirements of CID A-A-59326/10-8, Class SS, Style A to fit the end fitting described in paragraph 4.16.3.
- 4.16.5 Locate the airline valve in the top connection spill box at the outlet end of the ISO tank.
- 4.16.6 The minimum allowable working pressure of the components shall be 4 barg (58 psig).
- 4.16.7 Metal components shall be type 316/316L/304/304L stainless steel or equivalent casting material, as applicable.

4.16.8 The gasket shall be PTFE or synthetic rubber compatible with dilute potassium chromate solution.

4.17 Spill Boxes

- 4.17.1 Install one spill box around the manlid (paragraph 4.14) and safety relief valve (paragraph 4.15).
- 4.17.2 Install one spill box around the top fill connection (paragraph 4.12) and airline connection (paragraph 4.16).
- 4.17.3 Install a spill box around bottom connection (paragraph 4.13).
- 4.17.4 Minimum thickness for spill boxes is 3 mm (11 gauge).
- 4.17.5 Construct spill boxes using type 316L/304L stainless steel.
- 4.17.6 Equip each spill box on top of the tank with two drain lines at the low points on either side of the longitudinal centerline of the tank. No drain line required for spill box on bottom connection.
- 4.17.7 Equip each spill box with lockable lids/door to protect against tampering.
- 4.17.8 Do not paint the spill boxes.

4.18 Surface Thermometer

- 4.18.1 Install surface thermometer in the bottom half of the ISO tank on same end as bottom outlet to indicate the temperature of the cargo vessel.
- 4.18.2 Temperature Range: -4°F to 320°F (-20°C to 160°C) minimum
- 4.18.3 Dial size: 100mm (4 inches) diameter.
- 4.18.4 Readout: Fahrenheit only or dual scale.

4.19 Level Indication

- 4.19.1 Dipstick mounted internally inside manlid.
- 4.19.2 Calibrate dipstick in 100 gallon increments. Accentuating and labeling every 500 gallons.
- 4.19.3 Calibrated increments should be marked (e.g. engraved, laser etched, etc.) for easy readability.
- 4.19.4 Mark (e.g. engraved, laser etched, etc.) tank number on dipstick.
- 4.19.5 Do not use ink or paint to accentuate or label dipstick.

5 FRAME TECHNICAL CHARACTERISTICS

5.1 Type:

- 5.1.1 The frame style shall be ISO 1CC full frame per ISO 668.

5.1.2 Slope vessel 2 (+/- 1/2) degrees toward the bottom connection at the rear of the tank for complete draining and rinsing.

5.1.3 Support vessel with collars.

5.2 Design and Testing

5.2.1 Frame shall be designed and tested in compliance with ISO 1496-3.

5.2.2 Frame Design Temperature: -20°C to 130°C (-4°F to 266°F).

5.3 Materials and Finishes

5.3.1 Framework shall be constructed of ASTM A572 Gr 50, DIN EN 10025-2 S355JO, DIN 17100 st52-3 or equivalent HSLA steel, except frame members that are directly attached to the vessel shell or ends shall be ASTM A240 type 316L/304L.

5.3.2 Corner castings shall be constructed of ASTM A216 WCB, DIN EN 10293 GS45.3 or as otherwise permitted by ISO standards.

5.4 Dimensions (External) [per ISO 668, Table 2]

5.4.1 Length: 6,058 (+0, -6) mm 19 feet 10-1/2 inches (+0, -1/4 inches)

5.4.2 Width: 2,438 (+0, -5) mm 8 feet (+0, -3/16 inches)

5.4.3 Height: 2,591 (+0, -5) mm 8 feet 6 inches (+0, -3/16 inches)

5.4.4 No part of the container will protrude beyond the external dimensions mentioned above.

5.4.5 Maximum allowable differences between two diagonals on any one of the following surfaces will be as follows:

- Roof, bottom, and side diagonals: 13 mm (1/2 inches)
- Front and rear diagonals: 10 mm (3/8 inches)

5.5 Paint

5.5.1 Exposed carbon steel surfaces including bimetallic (carbon steel to stainless steel) welds shall be coated with an acrylic paint system formulated for exterior use in a marine environment.

5.5.2 Acrylic paint system must have less than 100 mg/kg (0.01%) lead, chromium, and cadmium in the cured product.

5.5.3 Use Sherwin-Williams Pro-Industrial Multi-Surface Acrylic with Gloss finish.

5.5.4 Color: Sherwin-Williams Safety Orange (SW 4083) or equivalent.

5.5.5 Other equivalent coating systems may be substituted if approved by the Government.

5.5.6 Other equivalent coating systems must be compatible with paint specified in paragraph 5.5.3 and 5.5.4 for future maintenance.

5.5.7 Do not paint any stainless steel surfaces.

5.6 Earthing Connection (Ground)

5.6.1 Weld an Earthing connection (electrical ground) to the bottom of the frame on both ends of the tank.

5.6.2 Size: 75mm x 50mm x 5mm stainless steel plate with a 15mm hole.

5.7 Document Holder

5.7.1 Provide a standard document holder near the outlet end in an accessible part of the ISO tank frame.

5.7.2 Dimensions shall be approximately 110mm diameter by 300mm long.
Color: clear.

6 ADDITIONAL OUTFITTING

6.1 General

6.1.1 The minimum thread protrusion for all fasteners shall be one (1) thread beyond the face of the nut with a maximum of five (5) threads beyond the face of the nut.

6.2 Drop-In Rinse System

6.2.1 General

6.2.1.1 Provide a removable rinse system to flush the internal surfaces of the cargo vessel after discharge of contents.

6.2.1.2 A lifting point shall be designed into the top of the rinse assembly.

6.2.1.3 The rinse system shall be designed to prevent any fluid from exiting the system.

6.2.1.4 The rinse system shall drop in the manhole, be clamped in place of the open manlid, and provide a positive seal (gasket) which prevents any fluid from exiting the tank during a rinsing process.

6.2.1.5 The rinse system shall be capable of rinsing the entire vessel without generating more than approximately 2650 liters (700 gallons) of effluent.

6.2.1.6 The inlet connection to the rinse system and any intermediate joints that are disassembled when rinse system is placed into a storage box shall be outfitted with foreign material exclusion (FME) covers, caps, and/or plugs. These FME fittings shall be designed to be reusable.

6.2.2 Operating conditions

6.2.2.1 Rinse system shall use ambient temperature water.

6.2.2.2 Rinse system shall operate without a booster pump or electrical power.

6.2.2.3 Rinse system inlet supply water operating parameters are 227 +/- 38 liters (60 +/- 10 gallons) of water per minute at a pressure of 4.8 +/- 0.7 barg (70 +/- 10 psig).

6.2.3 Material

6.2.3.1 Construct the drop-in rinse system of Type 304/316 stainless steel.

6.2.3.2 Use PTFE type thread sealant tape (e.g. stainless steel thread sealing tape UNASCO or equivalent) for threaded joints. Follow manufacturer's guidance for preparation, application, and cleanup. Use caution to prevent tape debris from entering the system. Paste or liquid type thread sealant is not allowed.

6.2.3.3 Gaskets shall be PTFE or synthetic rubber compatible with dilute potassium chromate solution.

6.2.4 Spray Head

6.2.4.1 Number of nozzles and spray pattern shall be appropriate for rinsing residual droplets of dilute potassium chromate solution and mildly adherent colloidal film from the tank walls.

6.2.4.2 When installed in the tank the spray head shall be positioned to be located in the center of the tank (vertically).

6.2.4.3 The spray head shall be fluid driven and water lubricated (self-lubricating with the cleaning fluid).

6.2.4.4 The spray head requires Government approval.

6.2.5 Inlet connection

6.2.5.1 Rinse System Inlet Connection Description: 1-1/2 inch nominal size male cam-locking type quick disconnect coupling half meeting the requirements of Figure 2 of CID A-A-59326, Class SS, Style 1.

6.2.5.2 Equip the rinse system inlet connection with 1-1/2 inch a cam-locking type quick disconnect dust cap meeting the requirements of CID A-A-59326/10, Class SS, Style A to fit the fitting described in paragraph 6.2.5.1.

6.2.5.3 The minimum allowable working pressure of the components shall be 10.3 barg (150 psig).

6.2.6 Storage Box

6.2.6.1 The drop-in rinse system shall be stored in a lockable storage box when not in use.

6.2.6.2 The storage box shall be located in a suitable location along bottom portion of frame on the left side of the vessel when facing the outlet end of the tank.

6.2.6.3 The storage box shall protect the rinse system from water, debris, theft, and damage during transport.

6.2.6.4 The storage box shall fully support the drop-in rinse system to prevent damage during transport.

6.2.6.5 Padding shall be used, as required, inside storage box to protect rinse system from damage.

6.3 External Ladder

6.3.1 An aluminum ladder shall be provided to access the top walkways.

6.3.2 The ladder shall be located at the outlet end of the vessel frame on right side when facing the outlet end of the tank.

6.3.3 The ladder shall be removable (bolted in place).

6.3.4 Ladder rungs shall be anti-slip.

6.3.5 Install a lockable security cover constructed from perforated aluminum over the ladder. Size perforations to provide air flow through security cover, to reduce overall weight, and minimize stresses on hardware during transport.

6.4 Walkways

6.4.1 Grated walkways shall be provided on top of the ISO tank.

6.4.2 At least one walkway shall run the length of the tank on right side when facing the outlet end of the tank.

6.4.3 Transverse walkways shall be provided for access to the two spill boxes (see paragraphs 4.17.1 and 4.17.2).

6.5 Markings

6.5.1 Mark end of tank opposite of outlet connection with "Puget Sound Naval Shipyard & IMF" in at least 50 mm (2 inch) tall by at least 6.0 mm (0.24 inch) wide black lettering per 49 CFR 172.326(b) and 172.302(b)(3).

7 RESPONSIBILITIES

7.1 Government Responsibilities

7.1.1 Procurement Activity Point of Contact - Upon contract award Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) Bremerton Site Procurement Activity will designate a Point of Contact who will be responsible for the appropriate surveillance and coordination of all services to be performed under this contract. The Procurement Activity Point of Contact shall serve as the contractor's primary contact for all interaction with PSNS & IMF and Government activities.

7.2 Contractor Responsibilities

7.2.1 Contractor Experience:

7.2.1.1 The contractor must have current experience fabricating stainless steel tanks in accordance with ASME BPVC, Section VIII, Division 1.

7.2.1.2 The contractor must have current experience fabricating UN T11 tank containers in accordance with ISO 1496-3, Series 1 freight containers -- Specification and testing -- Part 3: Tank containers for liquids, gases and pressurized dry bulk.

7.2.2 Post award meeting

7.2.2.1 A post award meeting between PSNS & IMF representatives and the contractor is required within 10 working days after notice of award of contract to ensure all the requirements of the specification are thoroughly understood prior to start of tank fabrication. This meeting may be a visit by PSNS & IMF representative(s) at the contractor's work site or a teleconference call between the contractor and PSNS & IMF representative(s) at PSNS & IMF discretion.

7.2.3 Contractor shall provide progress reports every two (2) months following contract award.

8 ADDITIONAL REQUIREMENTS

8.1 Paint Restrictions

8.1.1 Paints containing greater than 0.01% (100 mg/kg) lead, cadmium, and/or chromium in the cured product are prohibited.

8.2 Restricted Colors

8.2.1 The contractor is prohibited from using magenta, yellow, red or blue colored plastic wrapping materials or bags, tape, or other covering/sealing materials. PSNS & IMF uses the colors magenta, yellow, red and blue to identify specifically controlled materials.

8.3 Prohibited Packing Materials

8.3.1 The use of asbestos, excelsior, loose fill polystyrene, newspaper or shredded paper (all types including waxed paper, computer paper and similar hydroscopic or non-neutral material) is prohibited.

8.4 Hazardous Material Exclusions

8.4.1 Supplies being used in the performance of this contract or materials being provided as part of the equipment shall be free of known hazardous materials. Definitions of hazardous materials are specified in the latest version, including revisions adopted during the term of the contract, of FED-STD-313.

8.4.1.1 Notwithstanding any other hazardous material usage permitted in this contract, radioactive materials or instruments capable of producing ionizing radiation as well as materials which contain asbestos, mercury, cadmium, lithium, methylene chloride, lead (equal to or greater than 0.06%), or polychlorinated biphenyls (PCB's) are prohibited.

8.4.2 The manufacturer shall provide written certification that the equipment contains no hazardous material as defined in paragraph 8.4.1 and 8.4.1.1.

8.4.3 The certification shall be from the manufacturer, on the manufacturer's letterhead, and signed by a company official empowered to provide same.

8.5 Mercury Exclusion

8.5.1 The hardware or supplies furnished under this contract shall not contain mercury or compounds which contain mercury. In addition, the hardware or supplies furnished under this contract shall not have come in to direct contact with mercury or mercury containing compounds.

8.6 PCB Certification

8.6.1 The contractor shall provide written certification that the ISO tank assembly contains no detectable polychlorinated biphenyls (PCBs) (less than two (2) parts-per-million).

8.6.2 The certification shall be from the manufacturer, on the manufacturer's letterhead, and signed by a company official empowered to provide same.

8.7 PCB Label Plate

8.7.1 A label plate containing the PCB Certification information shall be permanently affixed to the tank in the vicinity of the manufacturer's identification plate.

8.7.2 The PCB certification label shall be engraved or etched on stainless steel material.

8.8 Manufacturer's Identification Plate

8.8.1 A stainless steel manufacturer's identification plate shall include the following information as a minimum:

- Manufacturer's Name
- Tank Model (e.g. "16,000 Liter Round Horizontal UN Portable Tank Type T11")
- Tank Serial Number
- Year of Manufacture
- Contract Number

8.8.2 The manufacturer's identification plate shall be attached to each tank using rivets and shall be located in the vicinity of the ASME nameplate.

8.9 ASME Nameplate

8.9.1 A stainless steel ASME nameplate shall include the information as required per ASME BPVC, Section VIII, Division 1 and be affixed using rivets to each tank.

8.10 Data Label Plate

8.10.1 A stainless steel data label plate shall include the information required per 49 CFR 178.274(i).

8.10.2 The data label plate shall be attached to each tank using rivets and shall be located in the vicinity of the ASME nameplate.

8.11 CSC Safety Approval Plate

8.11.1 A stainless steel CSC safety approval plate shall be attached to each tank using rivets and shall be located in the vicinity of the ASME nameplate.

8.12 Inspection Agency Report

8.12.1 A minimum of 10 working days prior to shipping each tank, the contractor shall provide a certified copy of the independent inspection authority report documenting conformance to applicable codes and standards for design, fabrication and testing of each completed tank. The documentation shall consist of one paper copy and one electronic copy in PDF (Portable Document Format) of all pertinent documents.

8.13 Standard Warranty

8.13.1 The contractor shall extend to the Government the full coverage of any standard warranty normally offered in a similar sale, provided such warranty is available at no additional cost to the Government. Acceptance of the standard warranty does not waive the Government's rights under any "Inspection" clause that may be in the contract nor does it limit the Government's rights with regard to the other terms and conditions of this contract. In the event of a conflict, the terms and conditions of the contract shall take precedence over the standard warranty. The standard warranty period shall begin upon final acceptance of the applicable material and/or services listed in the Schedule.

8.13.2 The contractor shall provide a copy of its standard warranty (if applicable) with its offer. The warranty covers a period of 12 months from date of acceptance.

8.14 Delivery

8.14.1 Procurement Activity Point of Contact

8.14.1.1 The contractor shall coordinate delivery with the Procurement Activity Point of Contact designated by PSNS & IMF Bremerton Site upon contract award.

8.14.1.2 Delivery of all tanks shall occur on or before the date stated on the bid request.

8.14.2 Delivery location:

Puget Sound Naval Shipyard and Intermediate Maintenance Facility
1400 Farragut Avenue
Bldg. 514 Receiving
Bremerton, WA 98314-5000
USA