

**SPECIFICATION for
HDPE METHANE CONDENSATE SUMPS (KO TANKS)**

1. GENERAL

This specification shall govern the materials and fabrication of Methane Condensate Filter Sumps or Knockout Tanks, herein referred to as KO Tanks.

2. SCOPE

The contract covers the materials and fabrication of KO Tanks.

3. MATERIALS

3.1 HDPE MATERIAL SPECIFICATION - The KO Tanks shall be made from high density polyethylene (HDPE) resin meeting the following requirements:

3.1.1 HDPE MATERIAL - The HDPE material supplied under this specification shall be high density, high molecular weight, HDPE material supplied by ISCO Industries LLC. The HDPE material shall conform to ASTM D 3350 with a minimum cell classification value of 345464C. All pipe and fittings supplied shall be equal to HDPE material, which meets this same specification.

3.1.2 PHYSICAL PROPERTIES OF HDPE COMPOUND

3.1.2.1 Density - the density shall be no less than 0.955 gms/ccm as referenced in ASTM D 1505.

3.1.2.2 Melt Index - the melt index shall be no greater than 0.15 gms/10 minutes when tested in accordance with ASTM D 1238- Condition 3.2.3.

3.1.2.3 Flex Modulus - flexural modulus shall be 110,000 to less than 160,000 psi as referenced in ASTM D 790.

3.1.2.4 Tensile Strength at yield - tensile strength shall be 3,200 to less than 3,500 psi as referenced in ASTM D 638.

3.1.2.5 Slow Crack Growth Resistance shall be per ASTM F 1473 (PENT test). The results shall be greater than 100 hours.

3.1.2.6 Hydrostatic Design Basis shall be 1,600 psi at 23 degrees C when tested in accordance with ASTM D 2837.

- 3.2 DEVIATIONS - If a contractor chooses to submit a bid that does not meet all of the requirements of this specification, his bid shall include a written description of the deviations with data that show the magnitude of the deviations and the justification for the deviation from the specification. The decision to accept material deviating from this specification shall be the responsibility of the specifying engineer.
- 3.2 THIRD PARTY TESTING - The owner or the specifying engineer may request certified lab data to verify the physical properties of materials not meeting the requirements of this specification.

4. SUBMITTALS AND QUALITY ASSURANCE

4.1 QA/QC CERTIFICATION-

- 4.1.1 The KO Tank supplier shall submit certification that the HDPE material meets the specifications.
- 4.1.2 The fabricator of the KO Tank shall submit drawings showing the position of the inlets, outlets and the overall dimensions along with any other special features such as sight glass, pressure gage, demister pad etc.
- 4.1.3 The fabricator shall submit data indicating that the buried condensate tanks meet the requirements of ASTM F 1759, "Design of High Density Polyethylene (HDPE) Manholes for Subsurface Applications". The tanks should be proven to have acceptable design for burial and groundwater loading conditions. Calculations supporting these requirements will be part of the submittal package.
- 4.1.4 The fabrication technician shall perform work in accordance to butt fusion of high-density polyethylene per ASTM F 2620 and for extrusion and hot air welding per ASTM C 1147. The fabricator shall submit the written quality assurance program used during fabrication of the manholes. The fabricator may be required to submit their overall QA/QC program for fabricating thermoplastic structures, the welding certification program for the fabrication technician, and the facility safety program.
- 4.1.5 The structure shall be tested with water or air when required. A written certification shall be sent to the engineer certifying the manholes are leak free. The test results shall become part of the submittals. An identification plate indicating, the job number, testing data, and when built and by whom, shall be attached to the manhole.

4.2 Approval or Rejection

- 4.2.1 Written approval or rejection of substitution given by the ENGINEER.
- 4.2.2 ENGINEER reserves the right to require proposed product to comply with any or all requirements of specified product.
- 4.2.3 In the event substitution results in a change of Contract Price or time, provisions in the Agreement will be applied for adjustment.

- 4.2.4 Substitutions will be rejected if:
 - 4.2.4.1 Submittal is not through the CONTRACTOR with his stamp or approval.
 - 4.2.4.2 Requests are not made in accordance with this Section.
 - 4.2.4.3 In the ENGINEERS opinion, acceptance will require substantial revision of the original design.
 - 4.2.4.4 In the ENGINEERS opinion, substitution is not equal to original product specified or will not perform adequately the function for which it is intended.
- 4.3 THIRD PARTY TESTING-The owner or the specifying engineer may request certified lab data to verify the physical properties of materials not meeting the requirements of this specification.
- 4.4 DEVIATIONS- Procedure for requesting substitute
 - 4.4.1 Consider after award of Contract.
 - 4.4.2 A letter defining the deviation and justification must be sent to the engineer. The letter must identify:
 - 4.4.2.1 The Product
 - 4.4.2.2 Manufacturer's Name
 - 4.4.2.3 Representative Contact Name and Telephone Number
 - 4.4.2.4 Specification Section or drawing reference of originally specified product
 - 4.4.2.5 Discrete name or tag number assigned to original product in the Contract Document.
 - 4.4.3 Manufacturer's literature clearly marked to show compliance of proposed product with Contract Document.
 - 4.4.4 Itemize comparison of original and proposed product addressing product characteristics including but not necessarily limited to:
 - 4.4.4.1 Size
 - 4.4.4.2 Composition or material of construction
 - 4.4.4.3 Weight
 - 4.4.4.4 Electrical or mechanical requirements
 - 4.4.4.5 Product Experience:
 - 4.4.4.5.1 Location of past projects utilizing product
 - 4.4.4.5.2 Name and telephone numbers of persons associated with referenced projects knowledgeable concerning proposed product.
 - 4.4.4.5.3 Available field data and reports associated with proposed products
 - 4.4.4.6 Data relating to changes in construction schedule
 - 4.4.4.7 Data relating to changes in cost.
 - 4.4.4.8 Samples: At request of the Engineer, a full size sample may be required. This sample maybe held by the Engineer until completion of the project.

4.5 REJECTION – The high-density polyethylene manholes may be rejected for failure to meet any of the requirements of this specification.

5. KO TANKS DETAILS

- 5.1 The body of the KO Tanks shall be fabricated from HDPE solid wall pipe, with a nominal OD of 48" and DR of 32.5, extruded according to ASTM F714. Rotational molded sections or wall thickness of less than 1.25" will not be accepted.
- 5.2 The top of the KO Tanks shall be flanged for easy access. A forty-four hole bolt pattern flange using one inch bolts will be used to secure the top. The top will be 1.5" HDPE sheet. The seal at the top shall use a neoprene gasket. The bottoms of the KO Tanks shall be 1.5" thick and extrusion welded to the body.
- 5.3 The inlets and outlets shall be extrusion welded on the inside and outside of the structure using good welding practice. Gussets shall be attached at 90 degrees, 180 degrees, 270 degrees, and 360 degrees around the inlets and outlets. All KO Tanks connections larger than 4" nominal OD pipe shall be butt fusion welded, electrofusion welded or flanged connections. For 4" OD pipe and smaller, a threaded transition fitting can also be used as well as the acceptable connections listed above.
- 5.4 KO Tanks shall be tested with 2 psi air by the fabricator and certified to have leak free welds. Data will be supplied with the submittal. The owner or his representative may request to observe the test.

ISCO Industries, LLC has carefully checked the accuracy and standards used in the preparation of these sample specifications, it does not guarantee or warranty piping or manhole installations. Sample specifications are to be used as a guide to assist engineers and owners of piping systems containing HDPE manholes. Sample specifications do not cover all situations or applications. These specifications are not intended to provide installation training or instructions. Since every job is different, a trained professional engineer should be used to determine the needs of a particular job.

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