

**CITY OF ANN ARBOR
STANDARD SPECIFICATIONS
FOR
LIQUID OXYGEN
FOR CITY OF ANN ARBOR BID NO. ITB-3948**

This specification pertains to liquid oxygen (O₂, LOX) used as feedstock in the production of ozone for the treatment of municipal water supplies.

SECTION 1: General Information

Sec. 1.1 Definitions

The following definitions shall apply in this specification:

Manufacturer: Any party that produces liquid oxygen as covered by this specification.

Purchaser: Any party that enters into a contract, either written or verbal, to purchase liquid oxygen in accordance with the provisions of this specification.

Vendor: Any party that enters into a contract, either written or verbal, to supply liquid oxygen for purchase in accordance with this specification.

Sec. 1.2 Affidavit of Compliance

The purchaser requires an affidavit from the manufacturer or vendor that the LOX furnished under the purchaser's orders meets or exceeds these specifications.

Sec. 1.3 Rejection

Notice of Nonconformance. If the liquid oxygen does not meet the requirements of this specification, a notice of

nonconformance shall be provided by the purchaser to the vendor within 10 working days of receipt of the shipment at its point of destination. The results of the purchaser's test shall prevail unless the vendor notifies the purchaser within five working days of receipt of the notice of nonconformance that a retest is desired. On receipt of the request for a retest, the purchaser shall forward to the vendor one of the sealed samples taken in accordance to section 3.2 of this standard. In the event that the retest results do not agree with the test results of the purchaser, the other sealed sample shall be forwarded to a referee laboratory agreed upon by both parties for analysis. The results of the referee laboratory's analysis shall be considered final. If the shipment is found to be in compliance with this standard, then the cost of the referee laboratory shall be assumed by the purchaser. If the shipment is found not to meet the specifications of this standard, the cost of the referee laboratory shall be assumed by the vendor.

If the material delivered is found to not meet the requirements of this standard, the responsibility of removal from the point of destination shall fall wholly on the vendor. An exception to this point may be

made if a price adjustment is made between the vendor and the purchaser.

SECTION 2: Specifications

Sec. 2.1 Description

Liquid oxygen is a slightly bluish cryogenic liquid. Oxygen gas is colorless, odorless, tasteless and liquifies at -183°C . Liquid oxygen has a density, at -183°C , of 1.14 g/cc.

Sec. 2.2 Physical and Chemical Requirements

Liquid oxygen as supplied under this specification shall be CGA Grade D, Type II, with a minimum 99.5% oxygen. The dew point shall be -82°F .

Sec. 2.3 Impurities

The total hydrocarbon content of the liquid oxygen shall be less than 15 ppm. The LOX provided under this standard shall contain no material, either organic or inorganic, capable of producing deleterious or injurious effects on the health of those consuming water that has been properly treated with ozone prepared from this liquid oxygen. The LOX shall not impart to the water at its rate of feed any contaminants that exceed the limits established by appropriate governing agencies, when the concentration of the impurity imparted by the liquid oxygen is combined with the concentration of that impurity already present in the water to be treated.

SECTION 3: Marking and Shipping

Sec. 3.1 Marking

All shipment containers, cylinders or bulk, shall have markings, tags, labels, or serial numbers as required by the United States Department of Transportation (USDOT).

Sec. 3.2 Sampling

Samples shall be representative of the oxygen supply. Samples shall be obtained by either filling the sample container and delivery container at the same time, on the same manifold and in the same manner or by withdrawing a sample from the supply container through a suitable connection into the sample container (no regulator is to be used between the supply and the sample container but a suitable purge valve is permissible).

SECTION 4: Testing Procedures

All testing shall be done in accordance with ANSI/CGA G-7.1 - 1989. The following is a partial list of chemical and physical characteristics that may be tested for:

- 1. Percent oxygen concentration**
- 2. Water content**
- 3. Total hydrocarbon content**