

# Technical Specifications

Item	Statement of Compliance
<p>No. 1)</p> <p><b>1 UNIT OZONE TEST CHAMBER</b></p> <p><b>Ozone Chamber should comply with PNS ISO 1431 as follows:</b></p> <p><b>Chamber:</b> Closed, non-illuminated chamber, thermostatically controlled to within <math>\pm 2</math> °C of test temp, lined with, or constructed of, a material (ie Aluminum) that does not readily decompose ozone. With window through which the surface of test piece can be observed. With light to examine test pieces but switched off at all other times. Chamber size should not exceed 0.9mx1.5mx2m.</p> <p><b>Source of Ozonized Air:</b> Ozonized air shall be free of nitrogen oxides and other contaminants. Ultra-violet lamp or silent-discharge tube apparatus shall be used. With activated charcoal for air used for generation of ozone. Temperature of source kept constant to within <math>\pm 2</math> °C. With heat exchanger to adjust temp. With means of adjusting the ozone concentration either by adjusting voltage applied or by shielding part of the tube from UV light, etc. Ozone concentration shall return to the test concentration within 30min after opening of chamber for insertion or inspection of samples. With means of determining the ozone concentration.</p> <p><b>Verification for Ozone Concentration:</b> Provide means of sampling the ozonized air from the vicinity test pieces in the chamber and determine the ozone content.</p> <p><b>Gas Flow:</b> With mechanism capable of adjusting the average velocity of flow of ozonized air in chamber to a value not less than 8mm/s and preferably between 12mm/s and 16mm/s. Velocity shall not vary by more than <math>\pm 10\%</math>. The ration of the exposed surface area of the test piece to the gas flow rate should not exceed 12s/m. With air circulation apparatus that leads in fresh ambient air to adjust ozone concentration and exclude the effect of volatile components from rubber samples. With fan to raise velocity to 600mm/s<math>\pm</math>100mm/s when desired.</p>	<p>Bidders must state here either "Comply" or "Not Comply" against each of the individual parameters of each Specification stating the corresponding performance parameter of the equipment offered. Statements of "Comply" or "Not Comply" must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer's un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate. A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidders statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the provisions of ITB Clause 3.1(a)(ii) and/or GCC Clause 2.1(a)(ii).</p>

**Mounting test Pieces for Static Testing:** Provided with clamps, made of aluminum, to hold test pieces at required elongation, both sides in contact with ozonized air, longitudinal axis is substantially parallel to the direction of gas flow. At least 24-pc sample capacity.

With **mechanically rotating carrier** mounted in chamber with area swept by test pieces at least 40% of cross sectional area of chamber

**Special Mounting Piece for Hose Sample for Static Testing:** specified in ISO 7326 for Method 1, 2 and 3. At least 24-pc sample capacity

**Mounting Test Pieces for Dynamic Strain Testing:** Provided with clamps, made of aluminum, to hold one end of test piece in fixed position and similar but reciprocating parts for holding the other end. Longitudinal axis is substantially parallel to the direction of gas flow. At least 16-pc sample capacity. With constant-speed motor to give a frequency of  $0.5\text{Hz} \pm 0.025\text{Hz}$  and timing device to stop and start apparatus at certain period.

**Maximum Elongation:** Test shall normally carried out on following strain levels: 5% and  $10\% \pm 1\%$ ; 15%, 20%, 25%, 30%, 40%, 50%, 60%,  $80\% \pm 2\%$

**Ozone Concentration:** Test carried in the following condition: 250ppb and 500 ppb ( $\pm 50\text{ppb}$ );  $1000\text{ppb} \pm 100\text{ppb}$  and  $2000\text{ppb} \pm 200\text{ppb}$  [ $25\text{pphm}$  and  $50\text{pphm} (\pm 5\text{pphm})$ ;  $100\text{pphm} \pm 10\text{pphm}$  and  $200\text{pphm} \pm 20\text{pphm}$ ] and capable to extend 20ppm

**Temperature and Relative Humidity:** Preferred test temperatures are  $40^\circ\text{C}$ ,  $30^\circ\text{C}$ , and  $23^\circ\text{C} \pm 2^\circ\text{C}$ ; RH of the ozonized air normally be NOT more than 65%. However, for damp climates, 80% to 90% will be used.

**Other requirements:**

- RO system for required treated water supplies for humidity generation, cooling water recirculating chiller for test  $< 35^\circ\text{C}$ , UPS and AVR
- Installation: where necessary installation facilities such as power line, water line from main tank, etc. are included

**Mounting test Pieces for Static Testing:** Provided with clamps, made of aluminum, to hold test pieces at required elongation, both sides in contact with ozonized air, longitudinal axis is substantially parallel to the direction of gas flow. At least 24-pc sample capacity.

With **mechanically rotating carrier** mounted in chamber with area swept by test pieces at least 40% of cross sectional area of chamber

**Special Mounting Piece for Hose Sample for Static Testing:** specified in ISO 7326 for Method 1, 2 and 3. At least 24-pc sample capacity

**Mounting Test Pieces for Dynamic Strain Testing:** Provided with clamps, made of aluminum, to hold one end of test piece in fixed position and similar but reciprocating parts for holding the other end. Longitudinal axis is substantially parallel to the direction of gas flow. At least 16-pc sample capacity. With constant-speed motor to give a frequency of  $0.5\text{Hz} \pm 0.025\text{Hz}$  and timing device to stop and start apparatus at certain period.

**Maximum Elongation:** Test shall normally carried out on following strain levels: 5% and 10%  $\pm 1\%$ ; 15%, 20%, 25%, 30%, 40%, 50%, 60%, 80%  $\pm 2\%$

**Ozone Concentration:** Test carried in the following condition: 250ppb and 500 ppb ( $\pm 50\text{ppb}$ ); 1000ppb $\pm 100\text{ppb}$  and 2000ppb $\pm 200\text{ppb}$  [25pphm and 50 pphm( $\pm 5\text{pphm}$ ); 100pphm $\pm 10\text{pphm}$  and 200pphm $\pm 20\text{pphm}$ ] and capable to extend 20ppm

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