

Minutes of the Pre-Bid conference

Tender Notification No.: NITT/F. No: RES 002/PLAN 2013 – 14/CEC dt: 28.11.2013


The pre-bid conference was held on 11.12.2013 at 11.15 a.m. in the committee room of CECASE and the following amendments are made. All other terms and conditions mentioned in the tender document remains same.

Specification for Vacuum & High Temperature Tribometer

Original tender specification	Amended specification
1. Test Configuration : Ball-on- disc, Pin-on-disc and reciprocating	
2. Temperature range : upto 800 °C or better (Samples should be heated up to the maximum temperature of 800 °C, Suitable thermocouple should be provided for measuring sample temp and heater temperature with a resolution of 0.5 °C at 800 °C)	2. Temperature range : 600 °C (Samples should be heated up to the maximum temperature of 600 °C, Suitable temperature measurement system with a resolution of 0.5 °C at 600 °C) [Upgradable to 800 °C]
3 Disc rotation : 1 to 1500 rpm	3 Disc rotation : 1 to 2000 rpm
4 Sliding speed : 10 ms ⁻¹	4 Sliding speed : 10 ms ⁻¹
5 Wear track diameter : 15 -70 mm or better	5 Wear track diameter : 15 -90 mm
6 Stroke length : 100 mm or better	
7 Debris collection and current carrying contact optional	
8 Maximum torque : 400 N mm or more	8 Maximum torque : 400 N mm or more
9 Normal load :1- 60 N or better (Weights : increment of 0.5 N up to 10 N, increments of 2 N from 10 – 20N and 10 N up to 60 N)	9 Normal load :1- 200 N (Weights: minimum increment of 5N)
10 Friction force : 20 N or more (Frictional Load resolution 1 mN)	10 Friction force: 200 N (Frictional Load resolution 1 mN)
11 Maximum disk dimensions: max. Ø70 mm; min Ø10 mm	11 Maximum disk dimensions: max. Ø100 mm; min Ø20 mm

12 Thickness : upto 10 – 12 mm	
13 Environment : Vacuum $760 - 1 \times 10^{-3}$ m bar (Appropriate pump should be provided)	13 Environment : Pressure 1 bar - 1×10^{-3} m bar (Appropriate pump should be provided)
14 Humidity measurement : Sensors should be provided to measure humidity	
15 Sample holders for all tests : 1. For holding balls of sizes varying from dia 1 mm to 10 mm 2. Holders for high temperature measurement: Dia 3 to 5 mm 3. For mounting pins of dia 2 mm to 10 mm and length 10 mm 4. For mounting disc samples of dia upto 60mm to 20 mm 5. For mounting flat samples of sizes ranging from 15 mm x 15 mm to 30 mm x 30 mm 6. Holder for testing samples under lubrication condition (20 mm dia)	4. For mounting disc samples of \varnothing upto 100mm in steps of 10mm 5. For mounting flat samples of sizes ranging from 20 x 20 mm to 60 x 60 mm
16. Spherical balls of dia 6mm and 10mm of Stainless Steel, WC, Silicon nitride, Alumina and Sapphire (each 10 Nos.)	
17 Cooling system: Water cooling should be provided for high temperature oven	17 Cooling system: Appropriate cooling should be provided
18 UPS : Capacity 5 kV	18 UPS : Capacity minimum 5 kVA
19 RVDT Sensor (for Wear measurement)	19 Suitable Sensor for Wear measurement upto 2000 microns, resolution 1 microns.
20 Data acquisition and processing system: 1. Fully automated computerized control, data acquisition and processing system with option for unattended operation. 2. Continuous real time data acquisition of friction (Ft) signal during a test 3. Tangential force Ft sampling rate (adjustable frequency in Hz) 4. Suitable software for complete data analysis including friction, normal load, wear, etc along with software for calibration to obtain reliable results. 5. Automatic calibrating procedures for Force, Speed and Radius measurement Tangential force measurement Ft with LVDT sensors	

<p>6. Friction & wear variation should capable to study under the variation of time, velocity, temperature etc.</p> <p>7. Calculation of Hertzian pressure, contact radius and contact area</p>	<p>5. Automatic calibrating procedures for Force, Speed and Radius measurement Tangential force measurement Ft with suitable sensors</p>
<p>21 Computer system details :</p> <p>A computer facility (PC) with latest configuration (Intel Dual core processor, 4 GB RAM or better, 500 GB Hard disk, Key board, Optical mouse, 17" LCD monitor, One DVD Writer, Four USB ports) along with HP Laser Printer and Operating system – Windows 7</p>	<p>21 Computer system details :</p> <p>A computer facility (PC) with latest configuration (Intel Dual core processor, 4 GB RAM or better, 500 GB Hard disk, Key board, Optical mouse, 17" LCD monitor, One DVD Writer, Four USB ports) along with HP Laser Printer and Operating system – Windows 7 or later</p>
<p>22 Calibration of the equipment : Accessories for the calibration of the equipment should be provided</p>	
<p>23 Spares: Essential spares for two years trouble free operation should be provided</p>	


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