

**Bharat Heavy Electricals Limited**  
**Ramachandrapuram : : Hyderabad – 502032**  
**M&S – DIVISION**

**ANNEXURE-I (Scope of Work)**

Tender No.: M&S/P&S/2020/75, Dt.:11.12.2020

Name of Work: Validation of Vacuum Furnace.

**Furnace Details:**

Make: Hind High Vacuum Company Pvt. Ltd.

Hot Zone (Job Loading Area) =Size 1200mm(W) X 1200mm(H) X 1200mm(D)

Hot Zone (Actual) =Size 1850mm Dia. X 1550mm Depth,

No. of Hot Zone =3 No's, Max temperature is 1320°C

Normal Cycle Temperature = 1175 °C

Maximum Charge Weight =1200Kgs.

**Scope of Work:** Calibration / Tests for validation of vacuum furnace machine. **All tests should be as per standard AMS 2750D and NABL Certified.**

**Calibration / Tests :**

1. Thermocouple Calibration
2. Recorder Calibration
3. Temperature Controllers Calibration
4. Furnace Temperature Uniformity Survey (TUS)
5. System Accuracy Test (SAT)
6. Vacuum Gauges Calibration

**1. Thermocouple Calibration (Quantity :6 No's)**

Range: 0 to 1450° C,

Type: Platinum-Platinum Vs Rhodium recrystallized alumina sheathed S type)

Accuracy:  $\pm 2.2^{\circ}\text{C}$  or 0.75% RDG whichever is greater.

**2. Recorder Calibration (Yokogawa Model UP550) (Quantity :1 No's)**

Range: 0.0 to 1700° C

Type: 6 Channels, 2Type

Accuracy:  $\pm 0.15\%$   $\pm 1$  digit of instrument range

**3. Temperature Controllers Calibration (Quantity: 6 No's)**

Range: Max 1320°

Accuracy:  $\pm 5^{\circ}\text{C}$

**4. Furnace Temperature Uniformity Survey (TUS) (Quantity :1 No's)**

No of the Thermocouples required: 9No.s

Length of Thermocouples: 6 Meter

Range of Thermocouples: 50°C to 1200°C

Accuracy of Thermocouples:  $\pm 2.2^{\circ}\text{C}$  or 0.75% RDG whichever is greater.

Number of channels in the recorder: 18

Accuracy of recorder: 0.05°C

4 Temperatures Points (600°C, 820°C, 1080°C, 1200°C).

**5. System Accuracy Test (SAT) Temperature Points (Quantity :1 No's)**

No of the Thermocouples required: One thermocouple per zone

Length of Thermocouples: 6 meter

Range of Thermocouples: 50°C to 1200°C

Accuracy of Thermocouples:  $\pm 2.2^{\circ}\text{C}$  or 0.75% RDG whichever is greater

Number of channels in the recorder:18

Accuracy of recorder: 0.05°C

4 Temperatures Points (600°C, 820°C, 1080°C, 1200°C).

**6. Calibration of Vacuum Gauge Controller with one penning sensor (Quantity: 1 No's)**

Make: INFICON

Range: Range 1000 m .bar to  $10^{-6}$  m.bar