

**DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI - 620 015**

27.12.2013

Minutes of the Pre-Bid conference

Tender Notification No.: NITT /F.NO: 022/UG LAB MODERNISATION/PLAN 2013-2014/MME

The pre-bid conference was held on 27.12.2013 at 10.30 am. In the committee room of MME to discuss the specification published in the tender. All other terms and conditions mentioned in the tender document remains same.

Based on the discussion, the committee recommends the following amendments to the specification.

Specification for Compression molding press

Original tender specification		Amended specification
ITEM	SPECIFICATIONS	Amended specification
Compression Molding Press	<p><u>Compression molding press</u> Mode of operation : Press under vacuum condition Capacity 1000 tons Die: Graphite Dia: 65mm High vacuum, inert , Kanthal metallic wires, graphite heating elements, these furnaces can reach Temperatures up to 2000°C. <u>Heating Furnace atmosphere / Type</u></p> <ul style="list-style-type: none"> ➤ Press Frame ➤ Hydraulic System ➤ Vacuum or inert gas systems ➤ Control Unit (Temperature / Power /Pressure / Gas Flow) 	<p>No amendment Capacity :20 tons No amendment Dia: 65mm x 100mm (Ht.) No amendment No amendment No amendment</p>
	<p><u>Compression molding press</u> Mode of operation : hot isostatic pressing mode Press environment : vacuum Capacity: 1000 tons Die: Graphite Dia: 50 mm High vacuum, inert , Kanthal metallic wires, graphite heating elements, these furnaces can reach Temperatures up to 2000°C. <u>Heating Furnace atmosphere / Type</u></p> <ul style="list-style-type: none"> ➤ Press Frame ➤ Hydraulic System ➤ Vacuum or inert gas systems ➤ Control Unit (Temperature / Power /Pressure / Gas Flow) 	<p>Mode of operation : Hot Pressing Mode Press environment : vacuum Capacity: 20 tons Die: Graphite Hot zone Dia (EFFECTIVE): 75mm dia (Inner Diameter) x 100mm Hot zone Dia: (ACTUAL) 175mm dia x 200mm (Ht.) <u>Furnace Chamber</u> Vertical double walled water cooled chamber made of SS 304L (both internal & external chamber) with internal surface of the chamber is electro chemically polished .The chamber should be leak proof (Preferably He leak tested).</p>

		<p>Type of design & ports Front side will have full opening hinge supported dished end door. Chamber is provided with ports for top and bottom rams, evacuation, heater feed throughs, thermocouple feed throughs, view port, gas inlet, pyrometer port etc. View ports and protective shutter should be placed in the door. Max. Operating Temperatures up to 2000°C under vacuum. TEMPERATURE UNIFORMITY: $\pm 10^{\circ}\text{C}$ in the effective hot zone above 600°C Power supply: 415 V AC, 50 Hz, 3 P.</p>
	<p>Compression Molding Press</p>	<p>RAM Top and Bottom RAMs should be made of SS</p> <p>Bottom RAM should support the Graphite bottom punch and is fixed at the bottom end of the hot zone through the bottom cylindrical portion of the vacuum chamber and is located in co-ordination with the top ram.</p> <p>The bottom moving RAM should be made of stainless steel, water cooled having a pedestal and passing through the bottom water cooled solid chamber plate through an accurately machined and bored sliding seal bushing. The other end of RAM is firmly screwed to the bottom cylinder of the hydraulic press which operates from the bottom.</p> <p>The top surface of the bottom ram should be ground to flatness to support Graphite Punch in line with the moving ram.</p> <p>The bottom pedestal should be made of Graphite having stepped groove to locate the Graphite Die. The pedestal is supported on the stainless steel support which in turn is supported on the bottom plate. Both stainless steel support and pedestal will have central opening for the movement of the bottom ram</p>
		<p>Inert Gas Filling System Gas inlet manifold with a provision to connect 2 to 3 argon cylinder has to be provided to the furnace chamber with a solenoid operated valve with a preset needle valve, Pressure gauge to fill the furnace chamber with required argon gas pressure. A pressure switch is provided to cut off the gas supply line by closing the solenoid Valve once the chamber reaches the set pressure. (approx. 800 m.bar). A digital pressure gauge is also provided to sense the chamber pressure to give signal For solenoid valve to close. Apart from the above a mechanical pressure relief valve Set at 1-1.5 bar to release the excess argon pressure is required.</p>

<p style="text-align: center;">Compression Molding Press</p>		<p>Sealing arrangement Bottom cylindrical portion of the chamber is fitted with a port housing a shaft seal for bottom ram shaft movement. Proper sliding top RAM seal & guidance to be provided Proper vacuum sealing by NEOPRENE O rings & gaskets as well as high temperature sealing by Silicon (or) Viton "O" rings. Chamber is mounted on a Mild Steel support legs, which is further supported on hot press frame structure. A water cooling sliding shaft & port housing shaft sealing packing should be provided for hydraulic ram shaft movement. No. of Cylinders: 01 no. RAM stroke :approx. 150mm Pressing speed:1-5 mm/sec Load Cells attached to top and bottom ram of reputed make to measure the total force Compact Hydraulic System with Oil Reservoir and Control Accessories has to be provided. Other controls like ON/OFF Switches etc will be attached to the front of the frame.</p>
		<p>Vacuum pumping system: Fully automatic with manual overriding and capable of producing 5×10^{-6} mbar. Operation vacuum: 1×10^{-4} mbar Vacuum plumbing lines should be made of SS Method of heating: Graphite heating elements arranged in a circular fashion should be provided.(10-12 Nos.) Necessary Heat insulation arrangements by means of foiled rigid graphite Board insulation on all sides has to be made. The total thickness should be around 60 -80 mm. The insulation is suitably supported on Perforated Stainless Steel SS 310 sheet Necessary dial gauges has to be Supplied for measuring pressures& gas flow rate. A pressure relief valve has to be supplied to protect the chamber from being exposed to high pressure</p>

Compression Molding Press	<p>Temperature Programmer and Control Microprocessor based digital programmer controller</p> <p>Over Temperature Controller Digital temperature controller has to be provided with a relay output which is interlocked with Furnace power supply in the event of any malfunctioning of programmer temperature controller and if the temperature level shoots beyond the normal operating level.</p> <p>Temperature measurements: 2 nos. of R type thermocouple has to be supplied. 1 No. is used for Temperature Measurement Control upto 1400° C. Other one is used for over temperature Controller up to 1400° C. Infrared pyrometer capable of measuring 1000°C to 3000°C has to be supplied.</p>
	<p>Safeties & Interlocks has to be provided for safety operation. Necessary spares for Vacuum system, furnace chamber & other required tools.</p>
	<p>Thermal Overload Switch Thermal Overload Protection facility has to be provided to protect the vacuum pump motor from drawing excessive current due to overload</p>
	<p>Should quote for 5 years AMC</p>



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