

Sl No	Specification	Requirement
1	Purpose	To mold small component and samples of silicone polymer compound using suitable molds in C frame transfer/molding machine.
2	Description of Operation	Suitable mould shall be mounted on the C-frame machine platen and shall be heated to achieve requisite temperature through top and bottom heating platen of the machine. Mould release agent is sprayed on the molding surface and The component shall be cleaned and placed in the mold suitably. The top and bottom halves are closed. The HTV silicone rubber compound is fed into the stuffer / injection cylinder and transfer in the by hydraulic injection unit and gets filled in the mould. After the pre-set curing time, the mold shall open and the component is released from the mould. In case bigger component over hang support to be provided.
3.	Scope of Supply	Complete Transfer / Injection molding machine - One number consisting suitable clamping unit, Transfer / injection unit, Hydraulic unit etc. Equipment to be supplied along with standard accessories and details user manual. The list of standard accessories offered shall be provided in Techno-commercial offer Part - A. Spare parts list for 2 years smooth operation to be provided by the vendor
4	Training	Two BHEL engineers are to be trained for acquaintance on operation and maintenance of the equipment at vendors' works during Pre-Dispatch Inspection. Further, training shall be provided to the operators during installation and commissioning at BHEL.
5	Inspection	The equipment shall be inspected at vendors' works and molding as described above is to be demonstrated satisfactorily. The Equipment to be dispatched after inspection and dispatch clearance from BHEL. Final acceptance of the machine will be after successful trials at BHEL EPD.

6	Utilities Requirement :	Information on requirement of various utilities such as power, compressed air, cooling water, handling facilities such as cranes are to be furnished in the Part - A : Techno-commercial bid.
7	Equipment Layout Plan	Information on the requirements for proper layout plan for installation and commissioning of the equipment and its associated accessories to be suggested by the bidders and the same to be provided in the Part - A : Techno-commercial bid.
8	Manufacturing process Control assistance:	Manufacturer has to assist BHEL in establishing suitable process control parameters during trial run of the moulding at BHEL-EPD. Machine should be able to run the 24 hours satisfactorily.
9	Safety features	Bidders to provide the details of safety devices & features incorporated in the equipment.
10— Technical parameters		
10.1	Clamping Force	250 kN
10.2	Injection / transfer Volume	600 CC
10.3	Heating Plate Dim.	300 mm × 400mm
10.4	Day light	580 mm
10.5	Mould Open Stroke	430 mm
10.6	Min Mould Height	150mm
10.7	Injection Pressure	300 Bar
10.8	Clamping unit	<ol style="list-style-type: none"> 1. C-frame clamping structure; 2. Must be able to set and provide different clamping pressure 3. Protection for highest closing pressure 4. Linear transducer to control the clamping stroke; 5. Low speed and low pressure mold protection before complete mold closing. 6. Parallelism between the upper and lower heating plate <0.08mm 7. Safety features to be incorporated like double hand operation

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10.9	Injection transfer Unit	<ol style="list-style-type: none">1. Injection device on the top centre of the machine platen,2. Two stage adjustable injection,3. Pressure holding4. 3 stage speed, pressure adjustable5. Must be able to clean easily in case of change in material in stuffing box/cylinder.
10.10	Heating platen and temperature control	<ol style="list-style-type: none">1. Electrical heating cartridge for heating with proper safe electrical connections with spare heating cartridge heater.2. High temperature, high pressure endurable insulation plate3. PID temperature control; control tolerance$\pm 2\%$
10.11	Hydraulic system	<p>Hydraulic Unit compatible to the system specification shall be provided. The hydraulic system integration shall be with preferred make of components as in Sl no 12 provided in this specification. Hydraulic unit shall be with electronically adjustable hydraulic pump and regulating valve for oil supply of the clamping unit and the injection unit.</p> <ol style="list-style-type: none">1. High efficient hydraulic system;2. Proportional flow valve, pressure control valve, hydraulic valve, high-pressure endurable vane pump.3. Non-dynamic clamping pressure holding4. All hydraulic circuits proper label

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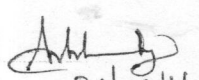
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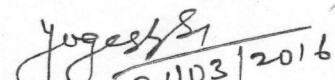
10.12	Operating Control unit	<p>The control unit incorporating PLC controls interfaced with HMI for providing inputs to the equipment, operation of the equipment in auto & manual modes and display of process parameters with a mimic diagram or process parameter display shall be provided.</p> <p>Function related to molding parameters must be able to set typical molding process parameters / steps are as below.</p> <ol style="list-style-type: none"> Clamping injection (stage wise) Degassing / bumping (multiple) Curing time Opening <p>The control unit shall provide information of fault codes and graphic displays for errors / faults / alarms.</p> <p>The indicative requirements of the control unit or construction is described in this specification. Bidders may suggest additional / advanced features for improving the operational efficiency of the equipment.</p> <ul style="list-style-type: none"> - I/O diagnostic in graphical fashion - Display of actual and set process parameters. - Stroke measurement for injection cylinders and for mold movement via potentiometric transducers or non-contact linear transducer of suitable resolution. - Variable adjustment of the machine sequence Through program input via HMI.
11	Total connected load in KW	Bidders to specify
12	Preferred make of components	<p>-PLC : Siemens, Schneider, ABB, Allen Bradley, OMRON</p> <p>-Hydraulic components: Vickers, Rexroth</p> <p>-Pneumatic components : Festo, SMC</p> <p>- Electrical components: L&T, Siemens, ABB</p>

Note : 1. Any technical deviation should be brought out in a separate sheet


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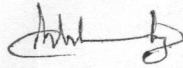
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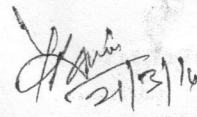
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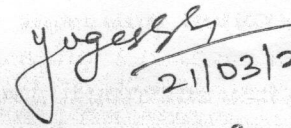
Qualification criterion:

Sl. No	BHEL Standard Terms & Conditions	Documentary Evidence provided for Compliance along with offer
1	The vendor shall be an Original Equipment Manufacturer (OEM). Dealers have to submit authorisation certificate from OEM	Copy of NSIC / Registration certificate to be submitted
2	The vendor shall have qualified personnel, their own adequate manufacturing / integrating and testing facilities for the equipment offered.	Company profile with qualified staff to be submitted
3	The vendor shall have manufactured, supplying and successful commissioned two similar Transfer-Injection Molding Machines in the last 2 years.	PO copies with performance certificate to be submitted


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