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ISO 9001:2008

No. NML-FG/MTE-MMH/9-19/CORR-1

Date: 25.10.2019


CORRIGENDUM – 1

Sub: Tender for Supply of "Instrumented Experimental Rolling Mill".

Ref: 1) Enquiry No. NML-FG/MTE-MMH/9-19, Date: 04/10/2019
2) CPPP Tender ID No. 2019_CSIR_472800_1

With reference to the above procurement, It is informed that **technical specification has been revised after Pre-Bid Meeting held on 22.10.2019**. The bid may be submitted as per the revised technical specifications. **All other terms and conditions will remain unaltered.**


25/10/19


(N.K. Singh) 25.10.19
Stores & Purchase Officer

Revised Technical Specifications after Pre bid Conference

Specification for Instrumented Experimental Rolling Mill**1.0 Introduction**

CSIR- National Metallurgical Laboratory (NML) Jamshedpur requires an experimental rolling mill with the provision for both the hot as well as cold rolling (2-high for hot rolling and 4-high for cold rolling) with centralized PLC or advanced level of automation. The equipment should be complete in all respect, including all power and control cables, requisite electrical distribution and operating panels etc., mounted accessories and other allied necessities.

2.0 Technical Specifications

Both the 2-high and the 4-high configurations of rolls to be assembled in a single housing for respective rolling i.e. hot and cold rolling. The mill should be capable of reverse rolling.

2.1 For Hot Rolling (2-high Mill):

Working Roll diameter	300 mm
Roll Width	300 mm
Input thickness	75 mm (max.)
Input Width	150 mm (max.)
Finish thickness	2 mm (in multiple passes)
Temperature of rolling materials	1250°C (maximum)
Material strength	500 MPa (for hot rolling condition at 1000°C)
Materials to be rolled	Iron, Steel, Al, Magnesium, Cu alloys and Ti alloys
Roll peripheral speed	3 - 10 MPM (Variable)
Roll separating force	150 metric ton (with accuracy of $\pm 2\%$ of output).
Entry and exist roll tables	- Electromechanically powered one meter (01 meter) detachable roller table on both ends
Laminar cooling facility	- For hot rolled strip cooling: 1.5 meter non-powered detachable run-out table at one end only - Multiple water cooling heads, with appropriate and equal number of sprays per head, to achieve different cooling rates with controlled valve opening and flow pressure - Cooling must be possible from top as well as bottom of the strip simultaneously

2.2 For cold Rolling (4-high mill):

Working Roll diameter	100 mm
Backup Roll diameter	300 mm
Roll Width	300 mm
Input thickness	8 mm (max.)
Input Width	150 mm (max.)
Finish thickness	0.5 mm (in multiple passes)
Material strength	800 MPa (at ambient temperature)
Materials to be rolled	Iron, Steel, Al, Magnesium, Cu alloys and Ti alloys
Roll Peripheral Speed	3 - 10 MPM (Variable)
Roll Separating Force	150 Metric ton (with accuracy of $\pm 2\%$ of output)

2.3 System Configuration requirements:

Rolling mill should consist of the following major parts/sub-assemblies /accessories:

Rolling mill stand	To accommodate rolls with bearing supporting chocks, either in 2-high configuration or in 4-high configurations
Drive gear box	To transmit power from motor to mill rolls
Electric motor	Reversing motor to generate rolling torque at mill rolls at desired speed
Electrical controls	Digital converters to supply power to motor in a protected manner
Material feeding	Roller entry guiding plates to be provided for easy stock feeding
Control desk	To be located near mill location, with all control elements for rolling operations e.g. roll gap, roll speed, cooling control etc.
Heating furnace	Electrical muffle furnace for stock heating (up to 1400 °C maximum temperature, 1250 °C continuous operating temperature) should be provided
Temperature measurement	Pyrometers should be provided on both sides of rolling stand for rolling stock temperature measurement
Cooling facility	Run-out table with cooling facility to be provided for cooling of rolled stock
Spring back	Spring back in both hot rolling and cold rolling should be minimum and needs to be specified

Reverse rolling	Should be able to reverse the rolling direction within short time (i.e. without the need of switching off the drives)
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3. Further requirements of the system

A detailed design of various parts/sub-assemblies/accessories need to be provided by the vendor.

- Rolling mill stand should be complete with appropriate mill housing, roll neck chocks, roll drafting arrangement, roll neck bearing assembly etc.
- Mill housing should be made of appropriate materials to withstand rolling stresses.
- All bearings should be antifriction bearings with grease lubrication.
- Top roll assembly should have the facility to traverse up / down in the mill using geared motor.
- Material of hot rolls should be forged steel with hardness of ~50-55 HRC.
- Material of cold rolls should be of die steel (D2).
- Roll drive motor should have variable speed controller.
- Roll drive motor should have in-built oil lubrication.

4. Auxiliary Equipment

4.1 General requirements

- Roll changing should be efficient and easy. The vendor needs to give details of the roll changing process for their equipment.
- Electromechanically powered entry and exit roller tables (1.0 meter length) should be provided on both sides of rolling stand.
- An additional run-out table (1.5 meter length) with Laminar Cooling facility should be provided for controlled cooling of the rolled material.
- Electrical controls should be provided for speed control of rolls, auto tuning of the system, protection for motor. All operations should be possible from a remote control desk.
- Control desk should be PC based and it should be possible to set various process parameters for rolling. Suitable software should be provided for process control and data acquisition.
- Suitable capacity load cells must be provided for the measurement of roll separating force.
- All safety parameters (Mechanical and Electrical/Electronic) should be provided to meet the relevant technical/statutory regulations, wherever applicable.
- Suitable guards should be provided for cordoning the shafts.
- Emergency stops should be provided near the mill to shut-off control powers to the electrical systems.

4.2 Specification for muffle furnace

- Chamber Size: 600 mm (Width) x 150 mm (Height) x 400 mm (Length)
- Maximum operating temperature: 1350 °C
- Continuous (6 hours) operating temperature: 1250 °C
- Heating Elements: Silicon Carbide

- Door Opening: Vertical with quick open action supported on counter weights
- A suitable PID Controller should be provided
- The furnace design and other details should be provided by the vendor

4.3 Requirements on operator control station

The operator control station should have the following controls and indications:

- Motor start / Stop push buttons
- Rolling speed increase / decrease push buttons
- Roll gap increase / decrease push buttons
- Hydraulic Power packs Start / Stop button
- Emergency Switch
- Motor Speed Indicator
- Rolling Load Indicator
- Roll gap Indicator

5. Make of accessories

All the parts/accessories should be of reputed make, wherever necessary, as follows:

Bearings	SKF / FAG (or equivalent)
Motors	ABB/SEIMENS/CG (or equivalent)
Drives, PLC & SCADA	SIEMENS / ABB/ ROCKWELL (or equivalent)
PC	HP / LENOVO / DELL (or equivalent)
MCB'S	SIEMENS / ABB (or equivalent)

6. Warranty and annual maintenance contract (AMC)

- Comprehensive warranty for one year
- Non-comprehensive AMC is required for two years. The cost of AMC will not be used for price comparison.

7. Training

Intensive training of CSIR-NML personnel needs to be provided by the vendor during acceptance test at CSIR-NML. A tentative time frame of installation, commissioning and training programme at CSIR-NML premises should be furnished.

8. Spares and consumables

The vendor should provide a list of spares and consumable which might be needed for smooth operation of the rolling mill. The prices quoted for these items will not be taken into account for the price comparison

9. CSIR-NML's scope of supply

CSIR-NML will provide space with a covered shed along with single point water and power connection of required capacity. . If any special or civil infrastructure is required the same may be executed by NML based on GAD/foundation drawing provided by the supplier well in advance.

10. Vendor's scope of work

- Supply of equipment, as stipulated in section 2 to section 8.
- Unpacking, placement, installation and commissioning of the equipment.
- Detailed drawings related to the foundation, erection, if any, are to be provided by the vendor well in advance and indicated during the bidding stage.
- Supplier has to furnish pre-installment requirements along with necessary GA drawings well before the supply, preferably along with the order acceptance.
- Complete documentations/manuals providing operation, maintenance and troubleshooting of the main machine and all bought-out component parts as well as the accessories such as data acquisition system, controllers, measuring system etc. should be furnished. All documents are to be supplied in English.
- Vendor needs to provide the weight and size of different large components. Appropriate values must be indicated during bidding stage.

10.1 Other General requirements

- The vendor should supply the list of organizations where they have supplied such equipment. In addition, they have to provide at least 2 customer satisfaction reports for the equipment supplied (preferably government organizations in India).
- Details of service and maintenance capabilities (details of Indian operation, if the vendor is from abroad) in India are to be provided.
- After successful installation of equipment, vendor should provide test run of the supplied/installed equipment for cross checking of the technical parameters and acceptance of the equipment.

Note:

- ***Vendor should follow the sequential requirements (point 2.1 to point 10.1) in this document and provide a compliance statement for each requirement in sequence, both for the technical as well as price comparison.***
- ***Vendor should provide the brochure of the equipment/components, wherever applicable.***

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25.10.19
(N.K. Singh)

Stores & Purchase Officer