



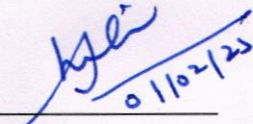
No. NITS/CPU/25/129
Dated: 01.02.2025

Corrigendum

With reference to the GeM Bid Number GEM/2024/B/5713420, dated 16.12.2024, pertaining to the procurement of the Spark Plasma Sintering (SPS) Machine, it is hereby informed to all concerned that the technical specifications have been revised. This revision has been made in response to representations received by this office, with the objective of enhancing clarity and ensuring that the specifications effectively meet the requirements.

The revised technical specifications are attached herewith as Annexure **XI**.

All other terms and conditions of the bid document remain unchanged and will continue to apply.


01/02/25
प्रभारी अधिकारी
Officer Incharge
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Annexure I

Specifications of Spark Plasma Sintering Machine

1. Configuration:

- (1) Sintering Machine Unit
- (2) Sintering Energizing System
- (3) Vacuum Unit
- (4) Sintering Operation and Control Unit
- (5) Standard Accessories
- (6) Additional Accessories and Items

2. Main Specification:

2-1. Sintering Machine

- | | |
|------------------------------|--|
| (a) Sintering Press System | Vertical single axis, hydraulic |
| (b) Maximum Pressure | 50 kN or more |
| (c) Sintering Pressure | 5~50 kN |
| (d) Sintering Stroke | 150 mm |
| (e) Pressure Control System | Servo motor control/ Hydraulic proportional valve control
Digital readout strain gauge pressure transducer manual operation and PID Digital Programmable Pressure Control |
| (f) Table size | Ø 100mm |
| (g) Sintering Electrode Rods | With special sealed water cooling |
| (h) Z axis position display | Digital readout (min. 0.01 mm) |
| (i) Safety devices | Emergency stop system, warning alarm system |
| U) Control Panel | Up / Down selector switch
(two-hand control safety device) |

2-2. Sintering Energizing System

- | | |
|---------------------|---|
| (a) AC Input | AC input 3 phase 400V 50Hz 40kVA
(Matching transformer must be included as standard equipment) |
| (b) DC or AC Output | Output Range 0 - 7300A |
| (c) Output Range | Voltage 5.5~7.5V, Current 0 - 7300A |
| (d) Control System | 2 Modes <ul style="list-style-type: none"> • Both Automatic/ Manual mode |

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By Effarman

2-3. Vacuum Chamber and Vacuum Unit

(a) Vacuum Chamber

Chamber with water cooling jacket

(b) Material

Suitable material with better insulating properties

(c) Dimensions

Inside: 350 x 330 x 320mm

(d) Vacuum Limit

20 mBar or better with 1 stage vacuum pump

(e) Exhaust System

Exhaust duct outlet

(f) Sintering Ambience

Air, vacuum or inert gas

(g) Viewing Windows

Suitable quartz glass window

(h) Vacuum Meters

Digital vacuum gauge, display on HMI

(i) Automatic Temperature control

PLC Digital Programmable Temperature Control with full Graphic LCD with 100 programs

(j) Temperature Detector

2-way system

- Radiation Thermometer system
Measurement range from 300 to 2400°C
- Three Thermocouple system
Max. 1100°C (K-Type)

(k) Operation Temperature of Chamber

Upto 2400°C or more

Conditions for the maximum temperature are subject to manufacturer's consent.

(l) Cooling Water

approx. 40 l./min, Supply temp. 15 – 25 °C

Supply pressure 2 – 4 bar

(m) Connection port

Connection port for High Frequency Energizing System or Exhaust etc.

Caution:

In the event that cooling water temperature exceeds the predetermined safe value due to heavy duty operation or high frequent use, operation of the machine must be automatically interrupted by an ALARM indication.

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2-4. Sintering Operation and Control Unit

- (a) AC Input 3-Phase, 400V, 50Hz, 40 kVA
- (b) [POWER ON / OFF] button switch
- (c) Emergency Stop button switch
- (f) Touch Panel
 - Energizing Power Supply Control for Pressure and Vacuum devices.
 - Control of digital Pressure and Temperature PID programs.
 - Digital readout indication of SPS Current, Voltage, Temperature, Pressure, Displacement and Vacuum.
 - Display of operating condition and warning alarm.

(g) Data Acquisition System

This system includes the ability to output the following data to the PC (Voltage, Temperature, Pressure, Displacement and Vacuum. Live sintering data can be loaded via USB port to the PC, where SPS Sintering conditions are graphically displayed on the screen in real-time.

2-4. PC Specs for Data Acquisition Software

Interface	USB Revision 3.0/2.0
OS	Windows 10 or above
Language	English
Processor	Maximum System requirement of OS
Memory	Maximum System requirement of OS
Install	200MB
Resolution	1026 x 768, High Colour (16 bit) or more

2-5. Standard Accessories

- (a) Operation Manuals 2 sets
- (b) Tools 1 set
- (c) SPS Sintering die & punch 1 set
- Graphite die
 - Ø 30/15.0x30mm 1 pc.
 - Ø 30/15.5x30mm 2 pcs
 - Ø 40/20.0x40mm 1 pc.
 - Ø 40/20.5x40mm 2 pcs.
- Graphite punch
 - Ø 15x20mm 6 pcs.
 - Ø 20x20mm 6 pcs.

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- Graphite spacer 1 set
 - Ø 50x30mm 2 pcs.
 - Ø 80x20mm 2 pcs.
 - Ø 40/70x60mm 2 pcs.
- (d) Fuse 1 pc.
- (e) Thermocouples (K type) 1 pc.
- (f) Clamping Tool 1 pc.

2-6. Additional Accessories and Items to be included in offer

1) Digital radiation thermometer

Measurement ranges from 600 to 2400°C

2) Note Laptop / PC + attached arm for SPS Data Acquisition System

OS Windows 10 or above

Language English

Processor Core i5

Other Memory :4GB, HDD:500GB, DVD-ROM:x8

Display 15.6inch, TFT monitor

*Or equivalent

3) Matching Transformer for power input to be included

3-phase, 415V / 200V, 50Hz, 40kVA

2-7 Optional Item

1) Suitable Water chiller system

3. Warranty and Training:

(a) 2 years after successful installation and commissioning.

(b) 2 AMC after completion of warranty.

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