




No. NITS/CPUI/25/53 .
Dated: 13.01.2025

Corrigendum

With reference to the GeM Bid Number: GEM/2024/B/5713420, Dated 16.12.2024, which pertains to the procurement of the Spark Plasma Sintering (SPS) Machine, it is hereby informed to all concerned that the technical specifications have been revised, in view of the clarifications/representations received by our office during Pre-bid meeting, to enhance clarity and meet the requirements effectively.

The revised technical specifications are attached as Annexure A. All other terms and conditions mentioned in the bid document remain the same and will continue to apply.


13/1/25
प्रभारी अधिकारी
Officer Incharge
केंद्रीय क्रय इकाई
Central Purchase Unit

Technical specifications of Spark Plasma Sintering Machine

1. Configuration:

- (1) Sintering Machine Unit
- (2) Sintering DC Pulse Generator and 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 servo motor |
| (b) Maximum Pressure | 60 kN {6,120 kgf} |
| (c) Sintering Pressure | 0.5~60 kN {51~6,120 kgf} |
| (d) Sintering Stroke | 150 mm (open height: 200mm) |
| (e) Pressure Control System | Hydraulic / Servo motor control ←
Digital readout strain gauge
pressure transducer manual
operation and PID Digital
Programmable Pressure Control |
| (f) Table size | <70 mm |
| (g) Sintering Electrode Rods | With special sealed water cooling |
| (h) Z axis position display | Digital readout (min. 0.001 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 DC Pulse Generator and Energizing System

- | | |
|----------------------------------|---|
| (a) Sintering DC Pulse Generator | ON / OFF control system
On time: 1~999 msec, Off time: 1~99 msec |
| (b) AC Input | 3-phase, 200V, 50Hz, 39kVA
(Matching transformer is not included as
standard equipment) |
| (c) DC Output | Pulse output 10V, 3000A |
| (d) Output Range | Voltage 0~10V, Current 0-3000A |
| (e) Control System | 2 Modes <ul style="list-style-type: none">• Automatic mode control with PID
programmable temperature controller• Manual mode operation with volume |
| (f) Energizing System | Water-cooled stainless steel rod connected
with special flexible lead wire |

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

30

2-3. Vacuum Chamber and Vacuum Unit

- (a) Vacuum Chamber Chamber with water cooling jacket
- (b) Material Stainless steel (SUS304)
- (c) Dimensions Inside: Ø200mm x H250mm
- (d) Vacuum Limit 5 Pa {3.8x10⁻² Torr}
- (e) Exhaust Speed From air pressure to 5 Pa {3.8x 10⁻² Torr} within 5 minutes
- (f) Exhaust System Rotary pump
- (g) Sintering Ambience Air, vacuum or inert gas
- (h) Viewing Windows Ø 50mm quartz glass
- (i) Vacuum Meters Plus-minus Bourdon pressure gauge, Pirani vacuum gauge
- (j) Automatic Temperature control PID Digital Programmable Temperature Control or Programmable current control
- (k) Temperature Detector Program registration: 100 patterns
2-way system
 - Radiation Thermometer system
Measurement range from 600 to 3000°C (Radiation Thermometer is optional equipment)
 - Thermocouple system
Max. 1000°C (K-Type)
 Sheathed Thermocouple detects and digitally displays sintering temperature of die and/or punches.
2200°C (working temperature)
2500°C (Max. temperature)
Conditions for the maximum temperature are subject to manufacturer's consent.
Tap water 0.15~0.3MPa {1.53~3.06kgf/cm²}, greater or equal to 10~15 lt./min
 - Connection port for High Frequency Energizing System.
 (High Frequency Energizing System is not include)
 - Connection port for Glove Box. (Glove Box is not include)
- (l) Operation Temperature of Chamber
- (m) Cooling Water
- (n) Connection port

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 will be automatically interrupted by an ALARM indication. Neither a water pump system nor water chiller system are provided as standard accessories. Such cooling system should be prepared by the user according to necessity.

2-4. Sintering Operation and Control Unit

- (a) AC Input 3-Phase, 200V, 50Hz, 4kVA -
- (b) [POWER ON / OFF] button switch ✓
- (c) Emergency Stop button switch ✓
- (d) [SPS POWER] Volume
- (e) [PRESSURE SET] Volume
- (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 (digital signal, 16-bit resolution): SPS Current, 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 11 Home/Pro Windows 8.1 update/pro update/enterprise with Bing Windows 7 Home Premium/Professional/Ultimate
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

[Handwritten signatures in blue ink]

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 cp30/15.5x30mm | 2 pcs |
| • Ø cp40/20.0x40mm | 1 pc. |
| • Ø cp40/20.5x40mm | 2 pcs. |
| Graphite punch | |
| • Ø cp15x20mm | 6 pcs. |
| • Ø cp20x20mm | 6 pcs. |
| Graphite spacer | 1 set |
| • Ø cp50x30mm | 2 pcs. |
| • Ø cp80x20mm | 2 pcs. |
| • Ø cp40/70x60mm | 2 pcs. |
| (d) Fuse | 1 pc. |
| (e) Thermocouples (K type) | 1 pc. |
| (f) O-ring | 1 set |
| • G-55 | 1 pc. |
| • P-190 | 1 pc. |
| (g) Clamping Tool | 1 pc. |

2-6. Additional Accessories and Items

- 1) Digital radiation thermometer
Measurement ranges from 600 to 3000°C
- 2) Note PC + PC arm for SPS Data Acquisition System

OS	Windows 11 Pro 64bit
Language	English
Processor	Core i5
Other	Memory :4GB, HDD:500GB, DVD-ROM:x8
Display	15.6inch, TFT monitor

*Or equivalent

- 3) Matching Transformer
3-phase, 415V / 200V, 50Hz, 43kVA

3. Warranty and Training:

- (a) 2 years after successful installation and commissioning.
- (b) 2 AMC after completion of warranty.