



## CENTRAL TOOL ROOM, LUDHIANA

Ministry of Micro Small & Medium Enterprises  
Government of India

### केन्द्रीय टूल रूम

सुक्ष्म, लघु एवं मध्यम उद्योग मंत्रालय.  
भारत सरकार



केन्द्रीय टूल रूम

**जरूरी: निविदाकर्ता निविदा पत्रक को सावधानीपूर्वक पढ़ना चाहिए; निविदा प्रस्तुत करने का मतलब यह है कि निविदाकर्ता ने नियमों और शर्तों को पढ़ा और समझ लिया है और सहमत भी है। निविदा दस्तावेजों के सभी पृष्ठों को निविदाकर्ता द्वारा हस्ताक्षर किए जाने चाहिए और ऑनलाइन जमा करनी होगी।**

निविदा संख्या : सीटीआर/लुधियाना/1810/मशीनरी/2020-90  
देय : 28.04.2021

दिनांक: 02.09.2020  
पर : 02.00 मध्याह्न के बाद

#### भाग- I

#### निविदा का निमंत्रण

से: महाप्रबंधक  
केन्द्रीय टूल रूम  
ए -5, फोकल प्वाइंट  
लुधियाना -141010  
भारत

सेवा मे :

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- 1.0 संलग्न अनुसूची (भाग- III) में दिए गए विशेष विवरण के अनुसार "पिट टाइप टेम्पेरिंग हार्डनिंग फरनेस्स" के लिए मुहरबंद निविदाएं सेंट्रल टूल रूम, लुधियाना, भारत (इसके बाद "टूल रूम और / या क्रेता" कहा जाता है) महाप्रबंधक द्वारा आमंत्रित की जाती हैं। निविदाएं को दिनांक 28.04.2021 तक 02.00 बजे तक प्राप्त की जाएंगी और निविदाधारी निविदाओं की उपस्थिति में अगले दिन यानी 29.04.2021 को 03.00 बजे तक खोला जाएगा। देर से प्राप्त निविदाओं को स्वीकार नहीं किया जाएगा। निविदाओं के साथ-साथ ब्याज-मुक्त अग्रिम धन "सेंट्रल टूल रूम लुधियाना" के पक्ष में मांग पत्र / बैंक गारंटी के रूप में 40,000/- (चालीस हजार रुपये केवल) जमा करवाना जरूरी है। डिमांड ड्राफ्ट या बैंक गारंटी के बिना निविदाएं स्वीकार नहीं की जाएंगी। भाग - 3 में उल्लिखित मशीन / उपकरण / वस्तुओं के लिए एनएसआईआई के साथ पंजीकृत निविदाकर्ता निविदा के साथ-साथ पंजीकरण के प्रमाण प्रस्तुत करने पर अग्रिम धन और बैंक गारंटी जमा करने से छूट प्राप्त है
- 2.0 निर्धारित तारीख और समय से पहले निविदाएं केवल [www.eprocure.gov.in](http://www.eprocure.gov.in) पोर्टल पर ऑन-लाइन जमा करनी होंगी।
- 3.0 इस निविदा दस्तावेज के सभी पृष्ठ को निविदा के साथ हस्ताक्षरित और जमा करना है।
- 4.0 ए) निविदाएं दो भागों में जमा की जानी चाहिए। भाग 'ए' में मशीन के तकनीकी विनिर्देश होना चाहिए, जिसे पर्याप्त विवरण में वर्णित किया जाना चाहिए। विस्तृत तकनीकी साहित्य संलग्न होना चाहिए। इसके साथ-साथ संगठनों की एक सूची भी होनी चाहिए जहां भारत में निविदाओं द्वारा समान मशीनों की आपूर्ति की जा रही है। इस भाग 'ए' में कोई कीमत नहीं दी जानी चाहिए। ईमानदार पैसा के लिए डीडी भी सबमिशन के समय, उसी माहौल में अनसुलझा

A-5, Focal Point, Ludhiana - 141010

Tel: (+91)-0161-2670059 (Ext. 237), 2670058, 2676166, 2673564

Fax: (+91)-0161-2674746.

E-mail: [info@ctrludhiana.com](mailto:info@ctrludhiana.com) ; [purchase@ctrludhiana.com](mailto:purchase@ctrludhiana.com) ; Visit us at : [www.ctrludhiana.com](http://www.ctrludhiana.com)



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होना चाहिए। इस निविदा दस्तावेज के सभी पृष्ठों पर हस्ताक्षर किए जाने और इस भाग 'ए' के साथ जमा किया जाना है।

इस लिफाफा को निम्नानुसार चिह्नित किया जाना चाहिए-

### **भाग 'ए'**

निविदा - पिट टाइप टेम्पेरिंग हार्डनिंग फरनेस

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बी) निविदा के भाग 'बी' में मशीन के लिए निविदाकार द्वारा उद्धृत कीमतों में होना चाहिए। यह बहुत महत्वपूर्ण है कि निविदा के भाग 'ए' में दी गई मशीन के विवरण के संदर्भ में कीमतें उद्धृत की गई हैं।

इस लिफाफा को निम्नानुसार चिह्नित किया जाना चाहिए-

### **भाग 'बी'**

निविदा - पिट टाइप टेम्पेरिंग हार्डनिंग फरनेस

निविदा संख्या : सीटीआर/लुधियाना/1810/मशीनरी/2020-90

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5.0 निविदाएं निविदा खोलने की तिथि (नियत तारीख) से 90 दिन की अवधि के लिए स्वीकृति के लिए मान्य होना चाहिए। यह समझा जाता है कि निविदाकारों को निविदा देने की अनुमति उनके भाग में निर्धारित किए जाने की अनुमति दे रही है कि वे अपने निविदाएं जमा करने के बाद वे अपने प्रस्ताव (प्रस्तावों) से नहीं छीनकर नियमों और शर्तों को संशोधित करेंगे। यदि उपकरण निविदा विनिर्देशों से विचलित करता है, तो एक विचलन बयान निविदा के साथ संलग्न होना चाहिए। अगर कोई विचलन नहीं है "शून्य विचलन" पुष्टि निविदा के साथ संलग्न होना चाहिए।

6.0 क) यदि आप एक फर्म हैं (यानी यदि आपके पास पार्टनर या पार्टनर:स हैं) तो मुख्तारनामा वाले अधिकृत पार्टनर को निविदा के प्रत्येक पृष्ठ पर हस्ताक्षर करना होगा। साझेदारी समझौते की एक प्रति संलग्न होना चाहिए। फर्म के व्यापार से संबंधित किसी भी विवाद को प्रस्तुत करने सहित, अनुबंध से संबंधित सभी मामलों में फर्म को बाध्य करने के लिए प्राधिकृत करने वाले मुख्तारनामा की एक कॉपी, उसे निविदा के साथ संलग्न किया जाना चाहिए। मूल दस्तावेज दिखाए जाने चाहिए कि अगर और / या आवश्यक हो।

ख) यदि आप एक फर्म नहीं हैं, निविदा के साथ निम्नलिखित प्रमाणपत्र संलग्न किया जाए-

"मैं यह प्रमाणित करता हूं कि मैं एकमात्र मालिक हूं और मेरे साथ संयुक्त रूप से कोई दूसरा पार्टनर काम नहीं कर रहा है"

ग) सीमित कंपनी के मामले में, निविदा दस्तावेज के प्रबंध निदेशक द्वारा हस्ताक्षरित होना चाहिए और निविदा के साथ निम्नलिखित प्रमाण पत्र संलग्न होना चाहिए-

"मैं प्रमाणित करता हूं कि मैं और मुझे कंपनी की ओर से सभी दस्तावेजों पर हस्ताक्षर करने के लिए कंपनी के लेख के अनुसार निष्पादित वकील की शक्ति है"

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- घ) अपेक्षित प्रमाण पत्र के अनुसार प्रति (ए), (बी) या (सी) के ऊपर, वर्तमान आय कर मंजूरी प्रमाण पत्र और डीजीएस के साथ पंजीकरण प्रमाण पत्र।
- 7.0 टूल रूम किसी भी या सभी प्रस्तावों को बिना किसी कारण बताए अस्वीकार करने का अधिकार सुरक्षित रखता है। टूल रूम में किसी भी प्रकार के बिना किसी भी कारण बताए पूरे या आंशिक रूप से किसी भी निविदा को स्वीकार करने का अधिकार सुरक्षित है। सफल निविदाकर्ता को निविदा की स्वीकृति के बारे में अधिसूचित किया जाएगा और जब तक ऐसी सूचना नहीं मिलती है, तब तक निविदाकर्ता (निविदाओं) को कोई भी व्यवस्था नहीं करनी चाहिए या निविदा की स्वीकृति के नोटिस की प्राप्ति के अनुमान में कोई भी खर्च नहीं करना चाहिए।
- 8.0 **सीटीआर एक्सटेंशन सेंटर, नीलोखेरी, हरियाणा में मशीन का इस्तेमाल और स्थापित किया जाना है।**

निविदा की अन्य शर्तें इस प्रकार हैं:

1. अनुबंध का मूल विचार और सार का अनुबंध अनुबंधित मशीन / उपकरण / माल / सॉफ्टवेयर की आपूर्ति के लिए निर्धारित समय सारिणी का सख्त पालन होगा "समय अनुबंध का सार है"।
  2. विफलता और समाप्ति: निविदा को स्वीकार करने पर, यदि निविदाकर्ता निविदा स्वीकार कर लेता है तो अनुबंध में ऐसे डिलीवरी के लिए तय अवधि के भीतर मशीन / उपकरण / सामान / सॉफ्टवेयर को देने में विफल रहता है या यदि ठेकेदार किसी भी अनुबंध को अस्वीकृत कर देता है ऐसी अवधि की समाप्ति से पहले का समय, क्रेता अपने अन्य अधिकारों के प्रतिकूल प्रभाव के बिना हो सकता है-
- क) ठेकेदार से मुआवजा हुआ नुकसान और जुर्माना के माध्यम से किसी भी मशीन / उपकरण / सामान / सॉफ्टवेयर (करों, कर्तव्यों, माल, इत्यादि के तत्व सहित) की कीमत के 2% के बराबर राशि प्राप्त करें। जो ठेकेदार निविदा में डिलीवरी के लिए तय अवधि के भीतर या विस्तारित अवधि के भीतर वितरित करने में असफल रहा है, प्रत्येक माह या एक महीने के कुछ अंश के लिए जिसके लिए ऐसी मशीन / उपकरण / सामान / सॉफ्टवेयर का वितरण बकाया राशि में हो सकता है, जब उसे वितरित किया जाता है उपरोक्त अवधि की समाप्ति के बाद अनुबंध मूल्य के अधिकतम 10.0% के अधीन।

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- ख) अनुबंध या इसके एक हिस्से को रद्द करें और यदि ऐसा मशीन / उपकरण / माल / सॉफ्टवेयर जो कि ऐसा नहीं है या अन्य समान विवरण (जहां मशीन / उपकरण / माल बिल्कुल विवरणों का पालन करते हैं) राय में नहीं हैं ठेकेदार के जोखिम और लागत पर खरीदार (जो अंतिम होगा) आसानी से प्राप्य, हालांकि, फर्म / फर्मों से निष्पादन गारंटी बांड प्राप्त करने या प्राप्त करने के लिए खरीदार का विवेकाधिकार होगा, जिनके अनुबंध को जोखिम और वित्तीय फर्म / फर्मों के खर्च पर रखा गया है।
3. अप्रत्याशित घटना: ठेकेदार सुरक्षा जमा को जप्त करने, क्षतिग्रस्त क्षति या डिफॉल्ट रूप से समाप्त करने के लिए उत्तरदायी नहीं होगा, यदि अनुबंध के तहत उसके दायित्वों को निष्पादित करने में प्रदर्शन या अन्य विफलताओं में देरी की सीमा है, और अप्रत्याशित घटना का नतीजा है। इस खंड "अप्रत्याशित घटना" के प्रयोजन के लिए इसका मतलब है कि एक घटना ठेकेदार के नियंत्रण से परे है और इसमें ठेकेदार की गलती या लापरवाही शामिल नहीं है और निकट भविष्य में नहीं है। इस तरह की घटनाओं में शामिल हो सकते हैं, लेकिन खरीदार के कार्य को अपनी संप्रभु या निविदागत

A-5, Focal Point, Ludhiana - 141010

Tel: (+91)-0161- 2670059 (Ext. 237), 2670058, 2676166, 2673564

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- क्षमता, युद्ध या क्रांति, आग, बाढ़, महामारी, संगरोध प्रतिबंध और माल ढुलाई प्रतिबंधों में शामिल नहीं किया जा सकता है। यदि किसी बल की स्थिति पैदा हो जाती है, तो ठेकेदार तुरंत ऐसी स्थिति के लिखित में खरीदार को सूचित करेगा और उसके कारण जब तक कि खरीदार द्वारा लिखित रूप में निर्देशित नहीं किया जाता है, ठेकेदार अनुबंध के तहत अपने दायित्वों को यथासंभव व्यावहारिक रूप से जारी रखेगा, और बल माजयरे घटना से रोके नहीं जाने वाले प्रदर्शन के लिए सभी उचित वैकल्पिक माध्यमों की तलाश करेगा।
4. किसी भी विवाद या अनुबंध के प्रावधानों के व्याख्याओं या अनुप्रयोगों में होने वाले अंतर को विकास आयुक्त, एमएसएमई मंत्रालय, सरकार के एकमात्र मध्यस्थता के संदर्भ में भेजा जाएगा। भारत या उसके द्वारा नियुक्त किसी भी अन्य व्यक्ति का मध्यस्थ का पुरस्कार अंतिम और दोनों पक्षों पर बाध्यकारी होगा। मध्यस्थता भारतीय मध्यस्थता अधिनियम द्वारा नियंत्रित किया जाएगा किसी भी मुकदमेबाजी के मामले में न्यायिक क्षेत्र लुधियाना होगा
  5. फर्म निविदाकर्ता / ठेकेदार के संविधान में किसी भी बदलाव के मामले में टूल रूम को सूचित किया जाएगा, बशर्ते इस तरह के बदलाव से अनुबंध के तहत किसी भी दायित्व से फर्म के किसी पूर्व सदस्य / भागीदार को राहत नहीं होगी और बशर्ते कि कोई नया सदस्य / भागीदार न हो फर्म द्वारा स्वीकार किया जाएगा, जब तक वह इस अनुबंध के सभी नियमों और शर्तों का पालन करने से सहमत नहीं हों
  6. ये निविदा दस्तावेज गैर-हस्तांतरणीय हैं।

सामान्य प्रबंधक के लिए

दिनांक, लुधियाना, 15 अप्रैल, 2021

**A-5, Focal Point, Ludhiana - 141010**

**Tel: (+91)-0161- 2670059 (Ext. 237), 2670058, 2676166, 2673564**

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Government of India

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केन्द्रीय टूल रूम

### भाग- II (ए)

#### निविदा

सेवा मे  
महाप्रबंधक,  
केन्द्रीय टूल रूम,  
ए-5, फोकल प्वाइंट,  
लुधियाना-१४१०१० (भारत)

श्रीमान,

मैं / हम उस संपूर्ण / आंशिक रूप से निविदा को स्वीकार करने के लिए सहमत हैं, जो सेंट्रल टूल रूम, लुधियाना, भारत, मशीन / उपकरण / सामान, जो कि मेरे द्वारा / हमारे द्वारा उद्धृत कीमतों में संलग्न हैं, निविदा में विस्तृत है। मैं / हम प्रस्ताव को नियत तारीख से 90 दिनों के लिए खोलने के लिए सहमत हैं। मैं / हमने निविदा दस्तावेजों के नियमों और शर्तों को पढ़ा और समझा है, जो निविदा की स्वीकृति पर अनुबंध बन जाएगा और इसके द्वारा शासित होने के लिए सहमत होगा। मैं / हम विशेष रूप से यह काम करते हैं कि मैं / हम अपनी / हमारी पेशकश में परिवर्तन नहीं करेंगे या इसके नियमों और शर्तों को संशोधित नहीं करेंगे।

#### निविदाकर्ता के हस्ताक्षर

जगह :

दिनांक :

नाम

पद

नाम तथा पता

फर्म का

: \_\_\_\_\_

: \_\_\_\_\_

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: \_\_\_\_\_

#### गवाह

हस्ताक्षर

नाम

पद

फर्म का नाम व पता

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### भाग- II (बी)

#### निविदा

व्यावसायिक बोली के लिए प्रदर्शन:-

(निविदाकार को इस दस्तावेज को विशेष रूप से उपयोग करने की आवश्यकता नहीं है लेकिन प्रस्ताव इस प्रारूप में यथासंभव यथाशीघ्र होना चाहिए)

1. निविदा संख्या तथा दिनांक
2. मद / मशीन की विशेषताओं की पेशकश की गई:-

क्रमांक	विवरण	मात्रा	मूल्यांकन	रकम
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3. मानक और आवश्यक सहायक और पुर्जों के विवरण:-

क्रमांक	विवरण	मात्रा	मूल्यांकन	रकम
---------	-------	--------	-----------	-----

4. वैकल्पिक सहायक उपकरण का विवरण

क्रमांक	विवरण	मात्रा	मूल्यांकन	रकम
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कुल \_\_\_\_\_

कुल \_\_\_\_\_

कुल \_\_\_\_\_

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5. मुख्य वस्तुओं और आवश्यक सहायक उपकरण की कुल पेशकश मूल्य (2+3): -

रकम	मूल्यांकन
1. मूल राशि :	
2. पैकिंग खर्च :	
3. जी०एस०टी० :	
4. अग्रेषण शुल्क :	
5. माल भाड़ा (कृपया परिवहन का भी उल्लेख करें) :	
6. पारगमन बीमा :	
7. स्थापना शुल्क :	
8. कमीशनिंग शुल्क :	
9. प्रशिक्षण शुल्क (कृपया कर्मियों और दिनों की संख्या के लिए स्वतंत्र प्रशिक्षण और भुगतान प्रशिक्षण निर्दिष्ट करें) :	
10. कोई अन्य शुल्क (कृपया निर्दिष्ट करें) :	
(सीटीआर बोलीदाताओं को लोड करने की स्वतंत्रता पर होगा)	
	कुल _____
11. वितरण अवधि	
12. वारंटी / गारंटी: - (कृपया कवर किए गए भागों का विवरण निर्दिष्ट करें और यह उल्लेख करें कि वारंटी मरम्मत के लिए है या प्रतिस्थापन के लिए। प्रतिस्थापन / मरम्मत के लिए परिवहन आदि की जिम्मेदारी भी स्पष्ट रूप से उल्लेख किया जाना चाहिए)	
13. निरीक्षण विवरण: -	
14. भुगतान की शर्तें: - (हमारी भुगतान शर्तें सफलतापूर्वक स्थापना के 30 दिनों के भीतर हैं कुछ मामलों में विचलन स्वीकार किए जा सकते हैं लेकिन हमारे भुगतान शर्तों को स्वीकार करने वाली पार्टियों को प्राथमिकता दी जाएगी)	
15. प्रापण को क्रम संख्या नं० के अनुसार लागू किया जाएगा। P-45021/2/2017-B.E.-II, दिनांक 15.06.2017, वाणिज्य एवं उद्योग मंत्रालय, औद्योगिक नीति एवं संवर्धन विभाग, भारत में मेक इन प्राधानिकता के संबंध में।	

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# CENTRAL TOOL ROOM, LUDHIANA

Ministry of Micro Small & Medium Enterprises

Government of India

केन्द्रीय टूल रूम

सुक्ष्म, लघु एवं मध्यम उद्योग मंत्रालय.

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## भाग- III

### TECHNCIAL SPECIFICATION FOR PIT TYPE TEMPERING FURNACE – Qty. 01 No.

1.	Description	Electrically heated pit type tempering furnace.
2.	Quantity	One No.
3.	Scope of supply	The scope should cover design, engineering, manufacturing, and supply, erection, commissioning and proving of the furnace. The furnace consisting of the following main components.
		a) The furnace complete with shell, energy saving ceramic fiber module and blanket lining with heating element. b) Door with hydraulic lifting arrangement. c) AISI 310 baffle. d) 1 No. Multi blade centrifugal fan. Assembly with one no.3 HP motor. e) Temperature indicating, controlling and recording equipment. f) Control panel with complete electrical switchgear. g) Cabling between furnace and control panel.
4.	Purpose for which the item is intended for	The furnace is meant for high tempering of press tools, molds, sprockets, cutters, steel alloys other components with maximum 1000 mm long and 500kg charge weight including fixture. Inner effective diameter of the furnace 800 mm.
5.	Specifications	
a)	Furnace capacity	500 kg
b)	Heat treatment temperature	Up to 700 deg C
c)	Furnace max. temperature	750 deg C
d)	Heat treatment cycle– maximum soaking time at 700deg C	10.0 hrs
e)	Allowable variation of temp	+/-5degC.
f)	Overall outside dimensions of furnace (suggested)	1400mm dia x 2000mm ht (approx.)
g)	Inside dimension of furnace	Baffle size: 800mm dia x 1000mm depth.
h)	Skin temperature	25 deg C above ambient temperature.max.
6.	Heating Elements	
a)	Type	Strip type
b)	Material	Ni/Cr80/20%
c)	Cross section area	12mm x 1.5mm
d)	Heating power	52KW
e)	Number of electric zone	Single zone
f)	Scheme for type of power regulation	PID controller should have 4–20mA output to regulate the power input to the heaters through Thyristor power pack. Thyristor power pack is provided along with PID controller to give precise power input to the heaters as per 4-20 mA signal.
g)	Number of phases	Three

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<b>7. Door</b>		
a)	<b>Number of Doors</b>	One
b)	<b>Driving arrangement</b>	Hydraulic
c)	<b>Driving power</b>	2.2 KW (Motor-Bharat Bijilee / Kirloskar / Crompton Greaves / Siemens / Crompton)
d)	<b>Sealing details</b>	Asbestos rope sealing.
e)	<b>Size of the doors</b>	To suit furnace chamber dimension.
<b>8. Fan</b>		
a)	Motor Make	Bharat Bijilee / Kirloskar / Crompton Greaves
b)	Fan type	Centrifugal
c)	Number provided	One
d)	Motor Drive rating	2.2KW
e)	Fan capacity	Fan to be designed and provided so as to provide uniform heating inside the chamber.
<b>9. Power</b>		
a)	Control circuit voltage	230V,AC,50 Hz.
b)	Input	3 Phase,415V,AC,50Hz.
c)	Rating	60 KW
<b>10. Steel Fabrication</b>		
a)	Shell	The shell should be cylindrical shape fabricated out of 5mm thick rolled mild steel plates and should be suitably reinforced with rolled steel sections like angles and channels to make the structure robust. The construction of shell should be self-supporting type so that the shell can be placed on the shop floor pit directly. Inside of the shell MS rods should be welded circumferentially before lining to arrest the baffle movement.
b)	Door	The circular furnace door/lid should be fabricated out of 5 mm thick mild steel plate and should be reinforced with angles and channels. Angle support should be provided at the centre for placing the motor on the lid. The inner cover of the door which comes in contact with working temperature of 700° C should be fabricated out of 6 mm thick AISI 310 quality heat resistant alloy steel material. Asbestos rope sealing arrangement should be provided in the door to prevent heat loss. The furnace lid should be lifting and lowering type for which one hydraulic power pack of suitable capacities and controls should be provided. The rise of the door should be sufficient to clear the door as well as fan blades above the shell. The swinging of the door shall be of manually operated and end limits switches for limiting rise and fall of door should be provided. These limit switches should be interlinked with the heating elements to ensure that the heating elements are OFF and Fan OFF when the door opens. The door should have hole provision at the top to insert removable thermocouples for checking inside temperature of the furnace. Normally the hole should be in closed condition with removable plug and open able to check the temperature whenever required.

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c)	Hot Air Circulation Arrangement	A circular baffle fabricated out of AISI310, 5mm thick for entire height of furnace chamber with bottom support grid fabricated out of AISI310, 5mm thickness. 1 No. Fan motor of 3 HP capacity mounted on top of the lid should ensure even heat circulation inside the chamber. The fan assembly both shaft and blades should be fabricated out of AISI310 material and assembly should be dynamically balanced. The hot air should be blown through heater batteries and should be sucked into the furnace chamber. This should ensure maintenance of uniform temperature within $\pm 5$ deg C in the charge inside the furnace chamber.
d)	Terminal cover	This should be fabricated out of mild steel sheet and should cover the heating elements terminals. Louvers should be provided for heat dissipation.
11.	Heating Elements	Ni/Cr80/20% minimum size of 12mm width by 1.5mm thick to with stand maximum temperature 750 deg C accommodated along with inner periphery of height should be employed. The heating element should be designed to operate on direct supply voltage of 415volts, the gap between heating element and baffle should be approximate 100mm. The terminal of heating elements should be minimum thrice the cross section of the strip of the heating elements and should bring out on to heat cum electrical syndanio frame at the side of the furnace through sillimanite tubes.
12	Automatic Temperature Indicator and Controller	The furnace should be provided with thermocouple on side wall. Apart from temperature controller, a over temperature protection should be provided. The control equipment should be capable of maintaining the temperature accuracy within $\pm 5$ deg C of the set temperature. The temperature should be measured and controlled by automatic digital indicating PID controller and safety controller should act in conjunction with the Cr-Al thermocouple sensors having range of 0-1200 deg C and should be complete with protective heat resisting sheath with junction head and adequate length of as best oscovered compensating cables. Thyrist or power pack should be provided for precise accuracy and regulation of input power to the heater as per 4-20 mA output signal from PID controller. Digital PID temperature indicating controller— Make: Eurotherm/Samwontech/Autonics
13	Control Panel	The control panel should be a metal sheet cubical floor mounted type and the scope of supply should include 1 No. control panel with power supply and instrumentation panel. The control panel should be neatly wired and ferruled prior to dispatch. All electrical controls for regulation of heating of the furnace instruments such as voltmeters , ammeters , signal lamps should be provided.
14	Temperature Recorder	4 Point paper less recorder along with software for retrieving data shall be provided. (Eurotherm make / Yokogawa make of 0 -1200 C range)
15.	The control panel should be housed with the following:-	
a)	1 No. Micro Processor based PID Digital temperature Indicating controller	Make: Eurotherm /Samwontech/ Autonics
b)	1 No. Digital safety controller.	Make:Masibus/Radix Samwontech
c)	1 No. 4 point paperless temperature recorder	Make: Eurotherm/Yokogawa.

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d)	1 No. 3 Phase phase angle firing Thyristor along with semi-conductor fuses	Make: Eurotherm / Para Ent/ Promod
e)	3 Nos. Ammeter.	Make: AE(Automatic electric) / Rishab
f)	1 No. Voltmeter.	Make: AE /Rishab
g)	Air Break Magnetic Contactor	Make: L&T / Siemens
h)	Over Load Relays	Make: L&T / Siemens
i)	HRC Fuse base with links	Make: L&T / Siemens
j)	On/ Off Rotary Switches	Make: L&T / Kaycee / Selzer / Siemens
k)	1 No. Voltmeter selector switch	Make: L&T / Kaycee / Selzer / Siemens
l)	Push Buttons with Relays	Make: L&T / Teknik / Siemens
m)	Indicating Lamps	Make: L&T / Groupe Schneider / Teknik / Siemens
n)	1 No. Main switch	Make: L&T / Siemens

### 16. Refractory and Insulation

a)	<b>SIDES</b>	The furnace chamber should be lined with 250 mm thick energy saving ceramic fiber modules of 160Kg/m <sup>3</sup> density backed with 25mm thick ceramic fiber blanket of 128Kg/m <sup>3</sup> at circumference and the hearth should be lined with IS-8 refractory bricks backed up with hot face and cold face insulation bricks. The total thickness of insulation should be such a way that the heat loss to the body is kept as minimum as possible (not more than 25 deg C above ambient)
b)	<b>DOOR</b>	The furnace door should be lined with light weight energy saving ceramic fiber blankets to withstand temperature. Make of Ceramic fiber insulation: Murugappa Morganite/Unifrax.

### 17. Running Time

Minimum running time before subjecting the same to performance test should be 1 week. Connection of the furnace to the power switch should be done with PV Carmored cable of 3½ core with copper conductors of adequate capacity and voltage rating of 650/1100 volts grade.

### 18. Hydraulic Power Pack Specifications :-

a)	Stroke	300 mm
b)	Capacity	1.5 Tonne
c)	Mounting	Foot mounted
d)	Power pack motor capacity	2.2KW, 750rpm
e)	Gear pump	1 No.
f)	Relief valve	1 No.
g)	D.C valve	1 No.
h)	Flow control valves	2 Nos
i)	Pressure gauge with isolator	1 No.
j)	Oil tank capacity	100 liters
k)	Filter breather	1 No.
l)	Suction strainer	1 No.
m)	Oil level indicator	1 No.

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# CENTRAL TOOL ROOM, LUDHIANA

Ministry of Micro Small & Medium Enterprises

Government of India

केन्द्रीय टूल रूम

सुक्ष्म, लघु एवं मध्यम उद्योग मंत्रालय.

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n)	Electrical control panel	1 No.
The hydraulic cylinder should be MS round and honed. Piston rod should be of EN-9 precision machine ground and hard chrome plated. Pistons head should be of cast iron; accurately machined fabric impregnated synthetic rubber seal. Supply of hydraulic power pack includes first filling of oil.		
Make		Electro pneumatic /Flow Lines
19. Painting		The furnace shall be painted with heat resistant Aluminum Paint after giving two coats of red oxide and primer and the control panel should be painted with attractive grey.
20. Erection and commissioning		The furnace should be erected and commissioned in the workshop area provided by EC Nilokheri.
21. Spares to be quoted separately:-		
a)	Ni/Cr 80/20% strip type heating element with terminal rod	1 full set
b)	K type duplex thermocouple	2 Nos.
c)	Thyristor fuse semiconductor fuse	3 Nos.
d)	SS 310 impeller with shaft	1 No.
e)	Door sealing rope	3 Nos.
f)	Limit switches	2 Nos.
g)	PID Controller	1 No.
h)	Safety controller	1 No.
22. Manuals & Drawings:-		
a)	3 sets of operating manuals of the furnace and electrical & mechanical circuit drawings shall be supplied.	
b)	Complete furnace spares list with part no. shall be supplied.	
c)	3 sets of manuals for electrical & mechanical maintenance for break down maintenance shall be supplied.	
23. Inspection Criteria:-		
A) Pre Dispatch Inspection:		
a)	The PDI of the furnace shall be carried out by CTR or his authorized representative at firm's premises.	
b)	The furnace shall be in full assembled condition in all respects and all furnace dimensions, movement of furnace doors, motors, gear boxes etc., shall be operated / proved at firm's premises.	
c)	Test certificate for all bought out items shall be submitted at the time of PDI.	
d)	Test certificates for raw materials shall be produced from NABL accredited laboratory.	
e)	However, final acceptance of the furnace shall be carried out at CTR premises	
B) Final acceptance:-		
a)	The furnace shall be erected and commissioned at EC Nilokheri premises.	
b)	The furnace shall be successfully proved in all respects as per technical specification	
c)	Three batches of tempering of CTR components shall be provided at CTR premises.	

## Note:

The supplier shall be required to submit a performance bank guarantee of value equal to 10% of the order value, for the warranty period.

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#### भाग- IV

#### विशेष स्थिति:

1. खरीदार के कर्मचारियों का प्रशिक्षण निविदाकर्ता की जिम्मेदारी है।
2. वितरण अनुसूची: खरीद आदेश की शर्तों के अनुसार
3. सीटीआर तक पहुंचने के लिए अपेक्षित समय के साथ-साथ भविष्य में स्पेयर पार्ट्स की उपलब्धता की स्थिति के साथ ब्रेक डाउन / सपोर्ट के मामले में सेवा अभियंता की उपलब्धता की स्थिति स्पष्ट रूप से बताई जानी चाहिए।
4. अगर हिन्दी की निविदा में कुछ त्रुटि है तो आप हमारी अंग्रेजी निविदा का संदर्भ ले।

#### निविदाकर्ता के हस्ताक्षर

जगह : नाम : \_\_\_\_\_  
दिनांक : पद : \_\_\_\_\_  
नाम तथा पता : \_\_\_\_\_  
फर्म की : \_\_\_\_\_

#### गवाह

हस्ताक्षर :  
नाम :  
पद :  
नाम तथा पता :  
फर्म की

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IMPORTANT: TENDERERS SHOULD READ THE TENDER PAPERS CAREFULLY; SUBMISSION OF TENDER SHALL MEAN THAT THE TENDERER HAS READ AND UNDERSTOOD ALL THE TERMS AND CONDITIONS OF THE TENDER AND AGREES AND BINDS HIMSELF/THEMSELVES TO THE SAME. ALL PAGES OF THE TENDER DOCUMENTS SHOULD BE SIGNED BY THE TENDERER(S) AND RETURNED WITH THE TENDER.

**TENDER NO: CTR/LDH/1810/Mach/2020-90**

**DUE ON : 28.04.2021**

**DATED: 02.09.2020**

**AT: 02:00 p.m.**

### PART – I

### INVITATION OF TENDER

From: The General Manager.  
Central Tool Room  
A-5, Focal Point  
Ludhiana-141 010  
India.

To :

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- 1.0 Tender for “**Pit type Tempering Hardening Furnace**” as per specifications attached in Schedule (Part-III) are invited by the General Manager, Central Tool Room, Ludhiana, India (hereinafter called the “Tool Room and/or the Purchaser”). The tenders shall be received up to 02.00 p.m. on 28.04.2021 and shall be opened in the presence of intending tenderers at 3:00 p.m. on the next day i.e. 29.04.2021. Tenders received late will not be accepted. Tenders should be accompanied by interest free Earnest Money of an amount of Rs. 40,000/- (Rupees Forty Thousand Only) in the form of Demand Draft / Bank Guarantee in favour of “Central Tool Room Ludhiana” payable at Ludhiana. Tenders without Earnest Money or bank guarantee in lieu thereof will not be accepted. Tenderers registered with NSIC for machine/equipment/goods mentioned in Part-III are exempted from depositing Earnest Money and Security Deposit on submission of proof of registration, along with the tender.
- 2.0 Tenders must be submitted only on on-line on [www.eprocure.gov.in](http://www.eprocure.gov.in) portal before the stipulated date and time.
- 3.0 All pages of this tender document are to be signed and submitted with tender.

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- 4.0 a) The tenders should be submitted in two parts. Part 'A' should contain the technical specifications of the machine, which should be described in sufficient details. Detailed technical literature should be enclosed. It should also be accompanied by a list of organizations where similar machines have been supplied by the tenders in India. No price should be indicated in this Part 'A'. COPY OF DD FOR EARNEST MONEY SHOULD ALSO BE UPLOADED PART A. All pages of this tender document are to be signed and uploaded with this part 'A'. This envelop should be marked as follows-

*PART 'A'*

*Tender for : Pit type Tempering Hardening Furnace*

*Tender No. : CTR/LDH/1810/Mach/2020-90*

*Due on : 28.04.2021*

*Dated : 02.09.2020*

*At : 02:00 p.m.*

- b) Part 'B' of the tender should contain the prices quoted by the Tenderer for the machine. It is very important that the prices are quoted with reference to the description of the machine offered in Part 'A' of the tender.

This envelop should be marked as follows-

*PART 'B'*

*Tender for : Pit type Tempering Hardening Furnace*

*Tender No. : CTR/LDH/1810/Mach/2020-90*

*Due on : 28.04.2021*

*Dated : 02.09.2020*

*At : 02:00 p.m.*

- 5.0 The tenders should be valid for acceptance for a period of 90 days from the date of tender opening (due date). It is understood the tenderers are being permitted to tender in consideration of the stipulation on their part that after submitting their tenders they will not resile from their offer(s) or modify the terms and conditions thereof. If the equipment tendered deviates from tender specifications, a deviation statement should be enclosed with the tender. If there is no deviation "Nil Deviation" confirmation should be enclosed with the tender.

- 6.0 a) If you are a firm (i.e. if you have a Partner or partner(s), the authorized partner holding the Power of Attorney must sign each page of tender. A copy of the partnership agreement should be enclosed. A copy of the Power of Attorney duly executed in his favour authorizing him to bind the firm in all matters pertaining to the contract, including the submission of any dispute relating to business of the firm to arbitration, should be attached to the tender. Original documents are to be shown if and/or when required.

- b) If you are not a firm, the following certificate is to be attached to the tender:

"I certify that I am the sole proprietor and there are no other partner doing business jointly with me."

- c) In case of the limited company, tender documents should be signed by the managing director and the following certificate should be attached to the tender:

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“I certify that I am the managing director and I hold the power of attorney executed in accordance with the Articles of Association of the Company to sign all the documents on behalf of the company.”

- d) THE REQUISITE CERTIFICATE AS PER (a), (b) OR (c) ABOVE, CURRENT INCOME TAX CLEARANCE CERTIFICATE AND CERTIFICATE OF REGISTRATION WITH NSIC, IF APPLICABLE, ARE TO BE ENCLOSED WITH PART “A” OF THE TENDER.

7.0 The Tool Room reserves the right to reject any or all offers without assigning any reason whatsoever. The Tool Room also reserves the right to accept any tender in whole or in part without assigning any reason whatsoever. The successful tenderer shall be notified of the acceptance of the tender and till such intimation is received, tenderer(s) should not make any arrangement or incur any expenditure in anticipation of the receipt of notice of acceptance of the tender.

### 8.0 Machine to be used and installed at CTR Extension Centre, Nilokheri

Other conditions of the Tender are:

- i) The basic consideration and the essence of the contract shall be strict adherence to the stipulated time schedule for the supply of contracted machine/equipment/goods/software i.e. “Time is the Essence of Contract”.
- ii) Failure and Termination: On acceptance of tender, if the tenderer whose tender is accepted fails to deliver the machine within the period fixed for such delivery in the contract or as extended, or if the contractor repudiates the contract at any time before the expiry of such period, the purchaser may, without prejudice to their other rights-
  - a) Recover from the Contractor Liquidated Damages and by way of penalty a sum equivalent to 2% of the price of any machines /equipments/goods/software (including element of taxes, duties, freights, etc) which the Contractor have failed to deliver within the period fixed for delivery in the contract or as extended, for each month or part of a month for which the delivery of such machine/equipment/goods/software may be in arrears when deliver thereof is accepted after expiry of the aforesaid period subject to maximum of 10.0% of the contract value.

OR

- b) Cancel the contract or a portion thereof and, if so desired and purchase the machine/equipment/goods/software not so delivered or others of a similar description (where machine/equipment/goods exactly complying with particulars are not, in the opinion of the Purchaser [which shall be final] readily procurable) at the risk and cost of the Contractor. It

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shall, however, be the discretion of the Purchaser to obtain or not, the Performance Guarantee Bond from the firm/firms on whom the contract is placed at the risk and expense of the defaulting firm/firms.

- iii) Force Majeure: The Contractor shall not be liable to forfeiture of security deposit, liquidated damages or termination for default, if and to the extent the delay in performance or other failures to perform its obligations under the contract is the result of an event of Force Majeure. For the purpose of this clause "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. If a Force Majeure situation arises, the Contractor shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Contractor shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
- iv) Any dispute or difference arising in interpretations or applications of provisions of the Contract shall be referred to the sole arbitration of Development Commissioner, Ministry of MSME, Govt. of India or any other person appointed by him. The award of the arbitrator shall be final and binding on both the parties. Arbitration shall be governed by Indian Arbitration Act. In case of any litigation the jurisdiction shall be Ludhiana
- v) In case of any change in the constitution of firm tenderer/contractor shall notify the same to the Tool Room provided that such change shall not relieve any former member/partner of the firm from any liability under the contract and provided that no new member/partner shall be accepted by the firm unless he agrees to abide by all the terms and conditions of this contract.
- vi) These tender documents are non-transferable.

For GENERAL MANAGER

Dated, Ludhiana, 15<sup>th</sup> April, 2021

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### PART – II (a)

#### TENDER

To  
The General Manager,  
Central Tool Room,  
A-5, Focal Point,  
Ludhiana-141010. (India)

Dear Sir,

I/We agree, on acceptance of the tender in whole or in part, to supply to Central Tool Room, Ludhiana, India, the machine/equipment/goods and accessories, detailed in the Tender enclosed herewith at prices quoted by me/us therein. I/We agree to hold the offer open for 90 days from the due date. I/We have read and understood the terms and conditions of the Tender Documents which shall become Contract on acceptance of tender, and agree to be governed by the same. I/We specifically undertake that I/We will not resile from my/our offer or modify the terms and conditions thereof.

\_\_\_\_\_  
Signature of the Tenderer

Place : \_\_\_\_\_  
Date : \_\_\_\_\_

Name : \_\_\_\_\_  
Designation : \_\_\_\_\_  
Name & Address : \_\_\_\_\_  
Of the firm : \_\_\_\_\_

#### WITNESS

Signature : \_\_\_\_\_  
Name : \_\_\_\_\_  
Designation : \_\_\_\_\_  
Name & Address : \_\_\_\_\_  
Of the firm. : \_\_\_\_\_

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## Part-II (b)

### Tender

Performa for commercial bid :-

(Tenderer need not use this document exclusively but the offer should be in this format to the extent possible)

1. Tender No. & Date
2. Particulars of item/machine offered:-

<u>Sr. No.</u>	<u>Particulars</u>	<u>Qty.</u>	<u>Rate</u>	<u>Amount</u>
----------------	--------------------	-------------	-------------	---------------

Total \_\_\_\_\_

3. Particulars of Standard and Essential Accessories and Spares:-

<u>Sr. No.</u>	<u>Particulars</u>	<u>Qty.</u>	<u>Rate</u>	<u>Amount</u>
----------------	--------------------	-------------	-------------	---------------

Total \_\_\_\_\_

4. Particulars of optional Accessories & Spares:-

<u>Sr. No.</u>	<u>Particulars</u>	<u>Qty.</u>	<u>Rate</u>	<u>Amount</u>
----------------	--------------------	-------------	-------------	---------------

Total \_\_\_\_\_

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### 5. Total Offer Price of Main items and Essential Accessories (2+3): -

<u>Amount</u>	<u>Rate</u>
1. Basic Amount	:
2. Packing charges	:
3. 3. GST	:
4. Forwarding charges	:
5. Freight (pl. mention mode of Transport also)	:
6. Transit Insurance	:
7. Installation charges	:
8. Commissioning charges	:
9. Training charges (Pl. specify free training and paid Training for no. of personnel and days separately)	:
10. Any other charges (Pl. specify)	:

(CTR will be at liberty to load the bidders & overheads etc. in case these are not indicated explicitly)

Total \_\_\_\_\_

11. Delivery period

12. Warranty/Guarantee: -

(Pl. specify the details of parts not covered and mention whether the warranty is for replacement or for repair. Responsibility for transportation etc. for replacement/repair should also be clearly mentioned)

13. Inspection Details: -

14. Payment terms: -

(Our payment terms are within 30 days after receiving of material. Deviations can be accepted in certain cases. But parties accepting our payment terms shall be preferred)

15. The procurement would be further governed as per order no. P-45021/2/2017-B.E.-II, dated 15.06.2017 issued by Ministry of Commerce and Industry, Department of Industrial Policy and Promotion with regard to preference to Make in India.

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## PART – III

### TECHNCIAL SPECIFICATION FOR PIT TYPE TEMPERING FURNACE – Qty. 01 No.

1.	<b>Description</b>	Electrically heated pit type tempering furnace.
2.	<b>Quantity</b>	One No.
3.	<b>Scope of supply</b>	The scope should cover design, engineering, manufacturing, and supply, erection, commissioning and proving of the furnace. The furnace consisting of the following main components.
		a) The furnace complete with shell, energy saving ceramic fiber module and blanket lining with heating element. b) Door with hydraulic lifting arrangement. c) AISI 310 baffle. d) 1 No. Multi blade centrifugal fan. Assembly with one no.3 HP motor. e) Temperature indicating, controlling and recording equipment. f) Control panel with complete electrical switchgear. g) Cabling between furnace and control panel.
4.	<b>Purpose for which the item is intended for</b>	The furnace is meant for high tempering of press tools, molds, sprockets, cutters, steel alloys other components with maximum 1000 mm long and 500kg charge weight including fixture. Inner effective diameter of the furnace 800 mm.
5.	<b>Specifications</b>	
a)	Furnace capacity	500 kg
b)	Heat treatment temperature	Up to 700 deg C
c)	Furnace max. temperature	750 deg C
d)	Heat treatment cycle– maximum soaking time at 700deg C	10.0 hrs
e)	Allowable variation of temp	+/-5degC.
f)	Overall outside dimensions of furnace (suggested)	1400mm dia x 2000mm ht (approx.)
g)	Inside dimension of furnace	Baffle size: 800mm dia x 1000mm depth.
h)	Skin temperature	25 deg C above ambient temperature.max.
6.	<b>Heating Elements</b>	
a)	Type	Strip type
b)	Material	Ni/Cr80/20%
c)	Cross section area	12mm x 1.5mm
d)	Heating power	52KW
e)	Number of electric zone	Single zone
f)	Scheme for type of power regulation	PID controller should have 4–20mA output to regulate the power input to the heaters through Thyristor power pack. Thyristor power pack is provided along with PID controller to give precise power input to the heaters as per 4-20 mA signal.
g)	Number of phases	Three

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## CENTRAL TOOL ROOM, LUDHIANA

Ministry of Micro Small & Medium Enterprises

Government of India

केन्द्रीय टूल रूम

सुक्ष्म, लघु एवं मध्यम उद्योग मंत्रालय.

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<b>7. Door</b>		
a)	<b>Number of Doors</b>	One
b)	<b>Driving arrangement</b>	Hydraulic
c)	<b>Driving power</b>	2.2 KW (Motor-Bharat Bijilee / Kirloskar / Crompton Greaves / Siemens / Crompton)
d)	<b>Sealing details</b>	Asbestos rope sealing.
e)	<b>Size of the doors</b>	To suit furnace chamber dimension.
<b>8. Fan</b>		
a)	<b>Motor Make</b>	Bharat Bijilee / Kirloskar / Crompton Greaves
b)	<b>Fan type</b>	Centrifugal
c)	<b>Number provided</b>	One
d)	<b>Motor Drive rating</b>	2.2KW
e)	<b>Fan capacity</b>	Fan to be designed and provided so as to provide uniform heating inside the chamber.
<b>9. Power</b>		
a)	<b>Control circuit voltage</b>	230V,AC,50 Hz.
b)	<b>Input</b>	3 Phase,415V,AC,50Hz.
c)	<b>Rating</b>	60 KW
<b>10. Steel Fabrication</b>		
a)	<b>Shell</b>	The shell should be cylindrical shape fabricated out of 5mm thick rolled mild steel plates and should be suitably reinforced with rolled steel sections like angles and channels to make the structure robust. The construction of shell should be self-supporting type so that the shell can be placed on the shop floor pit directly. Inside of the shell MS rods should be welded circumferentially before lining to arrest the baffle movement.
b)	<b>Door</b>	The circular furnace door/lid should be fabricated out of 5 mm thick mild steel plate and should be reinforced with angles and channels. Angle support should be provided at the centre for placing the motor on the lid. The inner cover of the door which comes in contact with working temperature of 700° C should be fabricated out of 6 mm thick AISI 310 quality heat resistant alloy steel material. Asbestos rope sealing arrangement should be provided in the door to prevent heat loss. The furnace lid should be lifting and lowering type for which one hydraulic power pack of suitable capacities and controls should be provided. The rise of the door should be sufficient to clear the door as well as fan blades above the shell. The swinging of the door shall be of manually operated and end limits switches for limiting rise and fall of door should be provided. These limit switches should be interlinked with the heating elements to ensure that the heating elements are OFF and Fan OFF when the door opens. The door should have hole provision at the top to insert removable thermocouples for checking inside temperature of the furnace. Normally the hole should be in closed condition with removable plug and open able to check the temperature whenever required.

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c)	Hot Air Circulation Arrangement	A circular baffle fabricated out of AISI310, 5mm thick for entire height of furnace chamber with bottom support grid fabricated out of AISI310, 5mm thickness. 1 No. Fan motor of 3 HP capacity mounted on top of the lid should ensure even heat circulation inside the chamber. The fan assembly both shaft and blades should be fabricated out of AISI310 material and assembly should be dynamically balanced. The hot air should be blown through heater batteries and should be sucked into the furnace chamber. This should ensure maintenance of uniform temperature within $\pm 5$ deg C in the charge inside the furnace chamber.
d)	Terminal cover	This should be fabricated out of mild steel sheet and should cover the heating elements terminals. Louvers should be provided for heat dissipation.
11.	Heating Elements	Ni/Cr80/20% minimum size of 12mm width by 1.5mm thick to with stand maximum temperature 750 deg C accommodated along with inner periphery of height should be employed. The heating element should be designed to operate on direct supply voltage of 415volts, the gap between heating element and baffle should be approximate 100mm. The terminal of heating elements should be minimum thrice the cross section of the strip of the heating elements and should bring out on to heat cum electrical syndanio frame at the side of the furnace through sillimanite tubes.
12	Automatic Temperature Indicator and Controller	The furnace should be provided with thermocouple on side wall. Apart from temperature controller, a over temperature protection should be provided. The control equipment should be capable of maintaining the temperature accuracy within $\pm 5$ deg C of the set temperature. The temperature should be measured and controlled by automatic digital indicating PID controller and safety controller should act in conjunction with the Cr-Al thermocouple sensors having range of 0-1200 deg C and should be complete with protective heat resisting sheath with junction head and adequate length of as best oscovered compensating cables. Thyrist or power pack should be provided for precise accuracy and regulation of input power to the heater as per 4-20 mA output signal from PID controller. Digital PID temperature indicating controller— Make: Eurotherm/Samwontech/Autonics
13	Control Panel	The control panel should be a metal sheet cubical floor mounted type and the scope of supply should include 1 No. control panel with power supply and instrumentation panel. The control panel should be neatly wired and ferruled prior to dispatch. All electrical controls for regulation of heating of the furnace instruments such as voltmeters , ammeters , signal lamps should be provided.
14	Temperature Recorder	4 Point paper less recorder along with software for retrieving data shall be provided. (Eurotherm make / Yokogawa make of 0 -1200 C range)
15.	The control panel should be housed with the following:-	
a)	1 No. Micro Processor based PID Digital temperature Indicating controller	Make: Eurotherm /Samwontech/ Autonics
b)	1 No. Digital safety controller.	Make:Masibus/Radix Samwontech
c)	1 No. 4 point paperless temperature recorder	Make: Eurotherm/Yokogawa.

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d)	1 No. 3 Phase phase angle firing Thyristor along with semi-conductor fuses	Make: Eurotherm / Para Ent/ Promod
e)	3 Nos. Ammeter.	Make: AE(Automatic electric) / Rishab
f)	1 No. Voltmeter.	Make: AE /Rishab
g)	Air Break Magnetic Contactor	Make: L&T / Siemens
h)	Over Load Relays	Make: L&T / Siemens
i)	HRC Fuse base with links	Make: L&T / Siemens
j)	On/ Off Rotary Switches	Make: L&T / Kaycee / Selzer / Siemens
k)	1 No. Voltmeter selector switch	Make: L&T / Kaycee / Selzer / Siemens
l)	Push Buttons with Relays	Make: L&T / Teknik / Siemens
m)	Indicating Lamps	Make: L&T / Groupe Schneider / Teknik / Siemens
n)	1 No. Main switch	Make: L&T / Siemens
<b>16. Refractory and Insulation</b>		
a)	<b>SIDES</b>	The furnace chamber should be lined with 250 mm thick energy saving ceramic fiber modules of 160Kg/m <sup>3</sup> density backed with 25mm thick ceramic fiber blanket of 128Kg/m <sup>3</sup> at circumference and the hearth should be lined with IS-8 refractory bricks backed up with hot face and cold face insulation bricks. The total thickness of insulation should be such a way that the heat loss to the body is kept as minimum as possible (not more than 25 deg C above ambient)
b)	<b>DOOR</b>	The furnace door should be lined with light weight energy saving ceramic fiber blankets to withstand temperature. Make of Ceramic fiber insulation: Murugappa Morganite/Unifrax.
<b>17. Running Time</b>		Minimum running time before subjecting the same to performance test should be 1 week. Connection of the furnace to the power switch should be done with PV Carmored cable of 3½ core with copper conductors of adequate capacity and voltage rating of 650/1100 volts grade.
<b>18. Hydraulic Power Pack Specifications :-</b>		
a)	Stroke	300 mm
b)	Capacity	1.5 Tonne
c)	Mounting	Foot mounted
d)	Power pack motor capacity	2.2KW, 750rpm
e)	Gear pump	1 No.
f)	Relief valve	1 No.
g)	D.C valve	1 No.
h)	Flow control valves	2 Nos
i)	Pressure gauge with isolator	1 No.
j)	Oil tank capacity	100 liters
k)	Filter breather	1 No.
l)	Suction strainer	1 No.
m)	Oil level indicator	1 No.

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n)	Electrical control panel	1 No.
The hydraulic cylinder should be MS round and honed. Piston rod should be of EN-9 precision machine ground and hard chrome plated. Pistons head should be of cast iron; accurately machined fabric impregnated synthetic rubber seal. Supply of hydraulic power pack includes first filling of oil.		
Make		Electro pneumatic /Flow Lines
19. Painting		The furnace shall be painted with heat resistant Aluminum Paint after giving two coats of red oxide and primer and the control panel should be painted with attractive grey.
20. Erection and commissioning		The furnace should be erected and commissioned in the workshop area provided by EC Nilokheri.
21. Spares to be quoted separately:-		
a)	Ni/Cr 80/20% strip type heating element with terminal rod	1 full set
b)	K type duplex thermocouple	2 Nos.
c)	Thyristor fuse semiconductor fuse	3 Nos.
d)	SS 310 impeller with shaft	1 No.
e)	Door sealing rope	3 Nos.
f)	Limit switches	2 Nos.
g)	PID Controller	1 No.
h)	Safety controller	1 No.
22. Manuals & Drawings:-		
a)	3 sets of operating manuals of the furnace and electrical & mechanical circuit drawings shall be supplied.	
b)	Complete furnace spares list with part no. shall be supplied.	
c)	3 sets of manuals for electrical & mechanical maintenance for break down maintenance shall be supplied.	
23. Inspection Criteria:-		
A) Pre Dispatch Inspection:		
a)	The PDI of the furnace shall be carried out by CTR or his authorized representative at firm's premises.	
b)	The furnace shall be in full assembled condition in all respects and all furnace dimensions, movement of furnace doors, motors, gear boxes etc., shall be operated / proved at firm's premises.	
c)	Test certificate for all bought out items shall be submitted at the time of PDI.	
d)	Test certificates for raw materials shall be produced from NABL accredited laboratory.	
e)	However, final acceptance of the furnace shall be carried out at CTR premises	
B) Final acceptance:-		
a)	The furnace shall be erected and commissioned at EC Nilokheri premises.	
b)	The furnace shall be successfully proved in all respects as per technical specification	
c)	Three batches of tempering of CTR components shall be provided at CTR premises.	

## Note:

The supplier shall be required to submit a performance bank guarantee of value equal to 10% of the order value, for the warranty period.

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### PART – IV

#### SPECIAL CONDITIONS:

1. Training of Purchaser's staff is tenderer's responsibility.
2. Delivery Schedule: As per the terms of purchase order.
3. Position of availability of Service Engineer in case of break down / support, along with expected time to reach CTR and position of availability of spare parts in future should clearly be stated.

\_\_\_\_\_  
Signature of the Tenderer

Place: \_\_\_\_\_

Name :

Date: \_\_\_\_\_

Designation :

Name & Address of the firm : \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

#### WITNESS

Signature :

Name :

Designation :

Name & Address of the firm :

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