

M/s OPEN TENDER  
 BHEL  
 HARIDWAR INDIA Vencd 00001  
 Emailid -

Item Description	Quantity	Unit	Lot	Quantity	Lot Date
1 ZWC010701010 5 AXIS CNC TUBE BENDING M/C FOR TUBE DIAMETER (6MM-65MM) & TUBE THICKNESS (0.5 MM-3MM) AS PER ENCLOSED SPECIFICATIONS SIZE: -	1	NO	1	1	31/12/22

Special Instructions:

- A) Technical offers and inputs are required from vendors for establishment of CNC Tube Bending facility at Heavy Electricals Equipment Plant BHEL, Haridwar.
- B) This Expression of Interest (EOI) is for identification of prospective vendors and finalization of tender specifications only and not for procurement. There is no commercial aspect associated to this EOI.
- C) BHEL reserves the right to evaluate the responses, based on technical merits, in the process of short-listing and identification of the participants for further discussions.
- D) Technical specification are attached.
- E) Value considered in estimate field of indent is for reference only and not to be considered as actual.
- F) Vendor must comments against each point of technical specification.

General Instructions:

SL	MATERIAL CODE	QUANTITY	UNIT	LOTNO	LOT DELIVERY QTY SCHEDULE
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Please visit our site [www.bhelhwr.co.in](http://www.bhelhwr.co.in) for latest version of General Instructions and Standard Terms & Conditions (GISTC) for Tender Enquiries. All the bidders/vendors must ensure compliance of latest GISTC. Terms & Conditions printed overleaf of this Standard Tender enquiry format are null & void.

For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract / PO / WP against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

Default purchase preference under Make in India order shall be 20% to suppliers with default minimum local content of 50% for all items / works / services.

For further details, please refer latest version of GISTC.

Procurements where the Estimated value to be procured is less than Rs. 5 lakhs shall be exempted from Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018

Kindly produce GeM seller Id with documentary proof along with your Bids/offers for case Value more than 25 Lacs.

**SANJAY SINGH**  
**SR. ENGINEER**

M/s OPEN TENDER

BHEL

HARIDWAR INDIA Vencd 00001

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संजय सिंह  
SANJAY SINGH  
व० अभियन्ता  
Sr. ENGINEER  
सामग्री प्रबन्धन  
MATERIALS MANAGEMENT  
बी०एच०ई०एल०, (हीप), हरिद्वार  
BHEL, (HEEP), HARIDWAR

31/12/2021

## General Instructions:

12/12/11



Office Copy

SL	MATERIAL CODE	QUANTITY	UNIT	LOTNO	LOT DELIVERY QTY SCHEDULE
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**SANJAY SINGH**  
**SR. ENGINEER**

संजय सिंह  
SANJAY SINGH  
Sr. ENGINEER  
सामग्री प्रबन्धन  
MATERIALS MANAGEMENT  
बी.एच.ई.एल., (हीप), हरिद्वार  
B.H.E.L., (HEEP), HARIDWAR

गिस्टिकाई  
31/12/2021







**BHARAT HEAVY ELECTRICALS LIMITED**  
**HEEP: HARDWAR-249 403 (UA)**  
**Fax : 0091 01334-226462, Phone : 0091 01334-281995, 284009**  
**E-mail: [sanjay.singh@bhel.in](mailto:sanjay.singh@bhel.in); +91 9899095970**

**Tender no. C/6580/2021/2311/T1**

**Date 31/12/2021**

**Subject: Expression of interest as detailed below:**

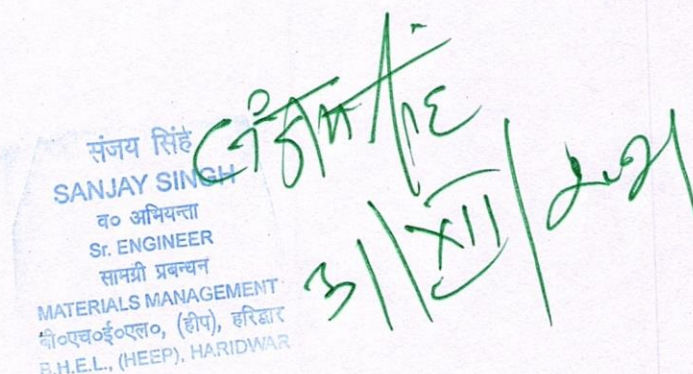
1. Sealed tenders with the Tender No. and opening date clearly super scribed on the cover are invited for the supply of the following items.
2. Last date for obtaining tender documents and opening of tenders is indicated below. Tenders will be received up to 1.45 P.M. on opening date and opened on the same day at 2.00 P.M. in the Tender Room.
3. BHEL will not be responsible for any type of postal delay / incomplete information from vendor.
4. The notification shall be published on [www.bhel.com](http://www.bhel.com) or [www.bhelhwr.co.in](http://www.bhelhwr.co.in).
5. No price bid is to be submitted along with this offer.
6. EMD and Tender Fee is not applicable.

**Details are as following:**

Sl. No.	EOI no.	Description of Equipment	Qty. (Nos.)	Last date for submission of the offer	Opening date
1.	C/6580/2021/2311/T /1	5 AXIS CNC TUBE BENDING MACHINE FOR TUBE DIAMETER (6MM-65MM) & TUBE THICKNESS (0.5 MM-3MM)	01	31-01-2022 at 01:45 pm	31-01-2022 at 02:00 pm

- Technical Specifications & PQR are enclosed. Performa for performance feedback is also attached.
- **PREFERENCE TO MAKE IN INDIA**  
For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 and subsequent Orders issued by respective Nodal Ministry shall be applicable even if issued after issue of this Tender Enquiry but before finalization of EOI.

As per Clause 3(b) of MII circular dt. 04.06.2021, Class I Local Supplier and Class II Local Supplier are eligible to participate in the tender and Non-Local Supplier are not eligible to participate in the tender. Offers received from Non-Local Supplier shall be straight away rejected.









## Instruction to Bidders

### Clause 1.0 – Tender submission

The following shall be super scribed on the envelope:

1. EOI TENDER NO. AND ITEM DESCRIPTION.
2. DUE DATE FOR OPENING.
3. "TECHNICAL BID"

Vendor's full name and address should be clearly mentioned on the envelope and shall be addressed to:

To,

Tender Room  
4<sup>th</sup> floor, Main Administrative Building  
Heavy Electrical Equipment Plant,  
BHEL, Ranipur  
Hardwar- 249403

Envelopes not marked as above are liable to be ignored and will not be opened.

- The bidders (originals manufacturers) will have to submit ink-signed offer / bid in original directly to BHEL. In case the bid is submitted by fax / email, the bidders shall simultaneously ensure submission of ink-signed original bid to BHEL also in the manner prescribed in this tender. Unsigned bids shall be ignored.  
However, the suppliers or their authorized person may be allowed to attend the tender opening, if duly authorized by their principals, through a specific letter for a particular enquiry for opening on that particular day. General authorization letter is not acceptable.
- Any corrections / amendments shall be properly & fully authenticated with signature.

### Clause 1.1:

TECHNICAL BID shall comprise of following documents:

- a) Complete Technical offer
- b) Catalogue of the Equipment, Complete reference of the past supply of equipment for the same or similar specification giving details of customer with Name of the contact person, Fax no, phone no, E-mail if available.
- c) Deviation with reference to Technical specification to be laid down on separate sheet.
- d) Any additional documents (please specify).

**Note: No price bid is to be submitted along with this offer.**

### Clause 1.2:

Technical Bid will be opened on the date and time specified above, in the presence of those **vendors**, who wish to attend **the tender opening**.

### Clause 1.3:

**BHEL reserves the right to evaluate vendor's process capability / quality systems etc. by visiting vendor works (if required)**

### Clause 1.4:

The offers of the bidders who are on the banned list and also the offer of the bidders, who engage the services of the banned firm, shall be rejected. The list of banned firms is available on BHEL website [www.bhel.com](http://www.bhel.com)

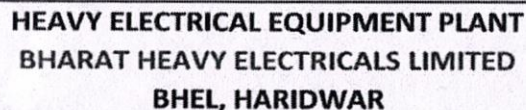
Thanking You,

For & on behalf of BHEL, Hardwar  
Sanjay Singh, Senior Engineer (Capital Purchase)

Sr. ENGINEER  
MATERIALS MANAGEMENT  
BHEL, (HEEP), VARANASI  
12/01/2021







## CAPITAL EQUIPMENT

Quantity- 1 No.

**Specification cum Compliance Certificate for 5 AXIS CNC TUBE BENDING MACHINE**

**Note:-**

**1. This specification is preliminary one intended only for " Expression of Interest" by prospective vendors.**

**2. Vendor(OEM) must submit complete information against clause no.09. The offer meeting this clause would only be processed.**

**3. The "Offered" Column and where applicable, the "Deviations" Column of this format shall be filled in by the Bidder/ Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.**

**4. The offer and all documents enclosed with offer should be in English language only.**

**Name & Address of the supplier:**

<b>Name &amp; Address of the Indian Agent:</b>
--

**Telephone No.**

Telephone No.

Fax No.

Fax No.

**e-mail :**

e-mail :

**Scope: Supply, Erection, Commissioning and prove-out of 5 AXIS CNC TUBE BENDING MACHINE complying with the specification as below.**

S. N.	Description - BHEL's Requirement	Specified	Offered	Deviations
1.0	<b>GENRAL FEATURES</b>			
1.1	<b>Job Application:</b> The tubes used in hydraulic system are having bending in all three planes and follow defined path in assembly on our product, therefore, it is must to ensure correct and precise bending of tubes in all 3 –planes	Vendor to confirm		
1.2	The tube bending machine is required for correct and precise cold bending of Carbon Steel, Stainless Steel and Aluminium tubes of different wall thickness & in length of any radii, irregular shapes and compound bends in similar and different planes without any filling. The Material grades for Stainless Steel and Aluminium tubes are MIL-T-6845D SS 304 & ASTM A 312-1995 SS TP321 and AL 5083 respectively.	Vendor to confirm		

Krishishel  
(KUMAR AGHESHEK)  
DABU

Sushant Kr. Thakur  
(Dy. Mgri / MTX)

Rhandry

Prüfung

51







1.3	The bending machine should be preferably 5 axes CNC, rotary-draw bending cum roll type, multi radius, Multi stack type, operated by electric/ electro hydraulic system. Vendor to provide one set of complete tools for all different types of tubes as per our requirement.	Vendor to confirm		
1.2	The pipe bending machine required to be Electrically/ electro-hydraulically operated and self contained & sturdy in construction. The machine to be designed to facilitate bending of complicated shapes without obstruction. The machine to be simple in design & easy to operate without undue fatigue of operator. The machine to be provided with liner scale calibrated in metric units & angular scale in degrees on body of the machine to show the angle of bend & length being bent.	Vendor to confirm		
1.3	Suitable lubrication points to be provided wherever necessary & displayed on the body of machine. Details with types and quantity of lubricants are to be given including their source of supply.	Vendor to confirm		
2.0	<b>SPECIFICATION</b>			
2.1	<b>Job Requirement:</b> Tube diameter (range)	6 mm to 65 mm		
2.2	<b>Job Requirement:</b> Tube thickness(range)	0.5 mm to 3 mm		
2.3	Max. tube bending capacity (Outer dia X Thickness) {(for Carbon Steel, SS 304, SS321 & Aluminium 5083 respectively)}	Vendor to specify		
2.4	Automatic compensation of springback & stretch as per material	Vendor to confirm		
2.5	Min. tube bending capacity (outside dia x thickness)	Vendor to specify		
2.6	Max. bend radius	Vendor to specify		
2.7	Min. bend radius (using bending die)	Vendor to specify		
2.8	Min. bend radius (using set of rolls)	Vendor to specify		
2.9	Bend angle range	0 to 180 degrees		
2.10	Direction of bending	Vendor to specify		
2.11	Bending speed	Vendor to specify		
2.12	Repetitive bend accuracy	±0.1 degrees		
2.13	Tube indexing facility (Rotary and linear)	Vendor to specify		
2.14	Rotary index stations ( for Plane of bend)	Vendor to specify		
2.15	Setting accuracy( for Plane of bend)	Vendor to specify		

Kapishwar  
KUMAR ARISHWAR  
21/06/24

Shubant K. Thakur  
Dy. Mgr / M TX

Rhandhary

Anil Kumar

21







2.16	Linear index station (For distance between bends)	Vendor to specify		
2.17	Setting accuracy(For distance between bends)	±0.1 mm		
2.18	Chuck arrangement	Hydraulic		
2.19	Motor capacity	Vendor to specify		
2.20	Power supply:3 phase AC, 415 V±6%, 50 hz ±3%, 4 wire	Vendor to confirm		
2.21	Machine lubrication:Centralised automatic( motorised) oil lubrication system	Vendor to confirm		
2.22	<b>Visual Defects:</b> It shall be free from harmful surface visual defects such as wrinkles, tool marks, humps and depressions etc	Vendor to confirm		
2.23	<b>Ovality at the Bend Section:</b> % Ovality = {(Max OD - Min OD)/Original OD}x100 Max allowed Ovality ≤ 10% of the Nominal Diameter	Vendor to confirm		
2.24	<b>Thinning at bend section:</b> % Thinning = {( t1 - t2 )/ t1}x100, where, t1–actual wall thickness before bending t2–actual wall thickness after bending Maximum allowed Thinning is 8%	Vendor to confirm		
3	<b>Job Prove-out criteria:</b>	Vendor to confirm		
3.1	The bend tubes should pass CNC 3D CMM machine test for 3D dimensional check.	Vendor to confirm		
4	<b>CNC Control system, PLC, Electrical drives and panel</b>	Vendor to confirm		
4.1	Machine operating control system shall be provided with latest CNC System - Details to be specified Vendor to use CNC Controller, PLC etc of reputed make preferably Siemens, FANUC or similar. Note: Both CNC Controller & PLC should be of same make to ensure compatability.	Vendor to confirm and provide details		
4.2	Electrical Control panel having PLC modules, electrical drives, switchgear, fuses, overloads, contactors etc..	Vendor to confirm		
5	<b>Hydraulic System</b>	Vendor to confirm		
5.1	Suitable hydraulic power pack of reputed make.	Vendor to confirm		
5.2	Hydraulic valves, pumps of suitable capacity for various operations	Vendor to confirm		
6	<b>GENERAL : The vendor should submit the following information:</b>			
6.1	Total connected load (KVA):	Vendor to furnish		
6.2	Total weight of the system	Vendor to furnish		

Notified  
(KUMAR BHASKAR)  
DABU

Substant K. Thakur  
By. Mgr / M TX

R. Chaudhary

Asst. Manager

SL

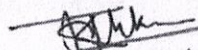


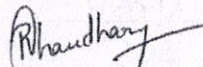


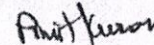


6.3	Detailed catalogues, sketch/ photographs of the M/C and accessories/ attachments should be submitted with the offer.	Vendor to furnish		
7	<b>ERECTION &amp; COMMISSIONING</b>	Vendor to confirm		
7.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment etc.	Vendor to confirm		
8	<b>GUARANTEE :</b>	Vendor to confirm		
8.1	24 months from the date of acceptance of the machine at BHEL works.	Vendor to confirm		
9	<b>COMPANY PROFILE/QUALIFYING CONDITIONS :</b>	Vendor to confirm		
9.1	<b>COMPANY PROFILE</b>			
9.1.1	The BIDDER has to provide the details pertaining to each clause in the table given below to understand the profile of the BIDDER's COMPANY.	Vendor to submit		
9.1.2	Number of years of experience of the BIDDER/ VENDOR in the field of Design, Manufacturing, & supply of similar machine or other SPMs (special purpose machines).	Vendor to submit		
9.1.3	Details of the Codes/Standards adopted for the machine design and manufacturing.	Vendor to submit		
9.1.4	Details of Manufacturing facilities available with the VENDOR for:	Vendor to submit		
	(a) Sourcing/Building large machine casting or fabricated components	Vendor to submit		
	(b) Heat treatment facilities	Vendor to submit		
	(c ) Machine assembly & testing Rigs	Vendor to submit		
9.1.5	Manufacturing capacity of company for such machines	Submit details		
9.1.6	Bidder shall have capacity to supply this machine within 4 months after LOL.	Vendor to confirm		
9.2	<b>QUALIFYING CONDITIONS</b>	Vendor to confirm		

K. Krishnakumar  
(KUMAR ABHISHEK)  
DABG

  
Sushant K. Thakur  
(DY. Mgr / WTX)











9.2.1	Only those vendors, who have supplied and commissioned at least one similar machine in the past ten years (on the date of opening of tender ) and such machine is presently working satisfactorily for more than one year after commissioning ( on the date of opening of tender ) should quote. However if such machine(s) has/had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of tender) in BHEL. The following information should be submitted by the vendor . This is required from all the vendors for qualification of their offer..	Vendor to confirm		
	1. Name of the customer / company where similar system is installed. (Copy of Purchase order should be furnished)	Vendor to submit		
	2. Complete postal address of the customer.	Vendor to submit		
	3. Year of commissioning. (Copy of commissioning report should be furnished)	Vendor to submit		
	4. Application for which the system is supplied with details of accuracies achieved on the job.	Vendor to submit		
	5. Name and designation of the contact person of the customer.	Vendor to submit		
	6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to submit		
	7. Performance certificate from the customers regarding satisfactory performance of system supplied to them	Vendor to submit		
9.3	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false/incorrect, the offer shall be rejected.	Vendor to confirm		

K. Prakash  
(KUMAR ABHISHEK)  
DABG

Sushant Kr. Thakur  
(Dy. Mgr / WTX)

For spare, maintainability & PDI.  
R. Chaudhary  
(ROHIT CHAUDHARY)  
(E2/WEX/BL2 & DABG)

only for spare, maintainability & PDI  
Anil Kumar  
(Anil Kumar)  
(E2/WEX-CAL/PBM & DABG)

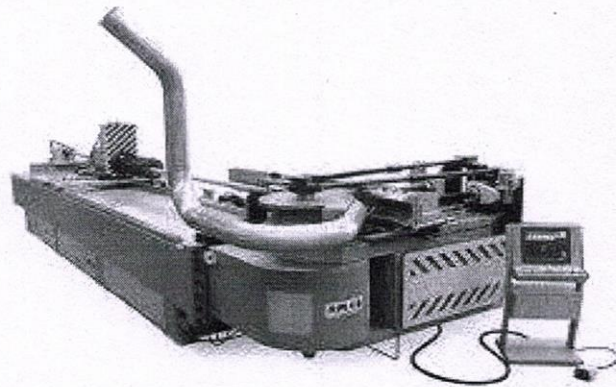
S. Kumar  
(S. Kumar / DABG - Tech)



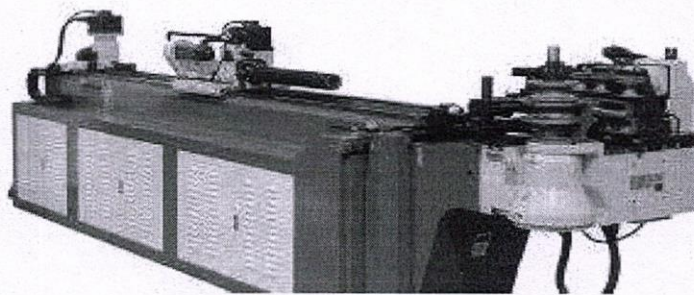




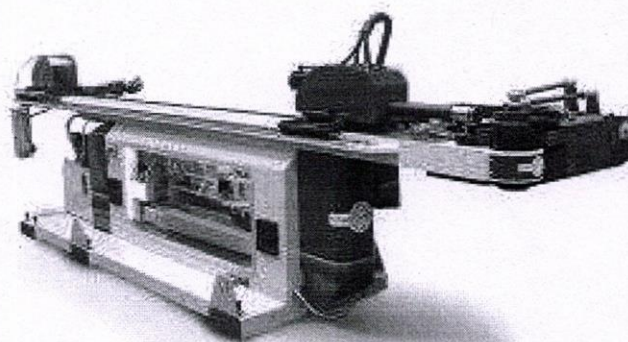
**ILLUSTRATIVE PICS OF THE CNC TUBE BENDING MACHINE**  
(For reference purpose only)



Pic1



Pic2



Pic3







**BHARAT HEAVY ELECTRICALS LIMITED**  
**HEAVY ELECTRICAL EQUIPMENT PLANT**  
Ranipur, Haridwar

**EXPRESSION OF INTEREST**

<b><u>SUBJECT:</u></b>	EXPRESSION OF INTEREST (EOI) FOR "SUPPLY, INSTALLATION, COMMISSIONING & PROVE OUT OF 5 Axis <b>CNC TUBE BENDING MACHINE</b> AS PER ATTACHED SPECIFICATION."
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Bharat Heavy Electricals Limited (BHEL), a leading Central Public Sector Enterprise of Govt. of India (www.bhel.com) catering to the core infrastructure sectors of energy, transportation, heavy engineering industry, renewable & non-renewable energy etc. is in process to diversify business verticals and to strengthen its value proposition and realign its global positioning, BHEL is in process of making strategic efforts to develop indigenous technological capabilities to fully tap and then leverage the potential opportunities of the Fourth Industrial Revolution.

To meet the emergent need of expansion and indigenization of operations, HEEP, a manufacturing Unit of BHEL established in Haridwar engaged in manufacturing of Power Plant Equipment, is interested to establish a **5 axis CNC Tube Bending machine** facility at its works.

In view of the above, an **EOI is requested for identification of prospective vendors and finalization of tender specifications for the CNC tube bending machine commensurate to our requirement.**

**Special Instructions:**

1. Technical offers and inputs are required from vendors for establishment of CNC tube bending facility at Heavy Electrical Equipment Plant, BHEL, Haridwar. Vendor to clearly describe their capabilities, deviations from specifications and should also suggest possible solutions.
2. This Expression of Interest (EOI) is for identification of prospective vendors and finalization of tender specifications only and not for procurement. There is no commercial aspects associated to this EOI.
3. BHEL reserves the right to evaluate the responses, based on technical merits, in the process of short-listing and identification of the participants for further discussions.
4. Vendor to submit compliance for fulfillment of PQR conditions. Documents regarding PQR conditions to be submitted at the time of final tender.

*K. K. Mishra*  
CKUMAR ABHISHEK  
DY. MANAGER  
SABG / PROD.

*[Signature]*  
(Sushant Kr. Thakur)  
Dy. Manager / WTX

*[Signature]*  
(ROHIT CHAUDHARY)  
E2/WEX/BL2 & DABG

*[Signature]*  
(Amit Kumar)  
E2/WEX-CAC / FBMR DABG

*[Signature]*  
(Sumit Kumar)  
E2/WEX  
DABG - Tech







5. Vendors are advised to conduct a pre-bid meeting for any technical clarifications and site visit (if required). In case any clarification, parties may contact the following persons over phone or e-mail:

- i) Sh. Sushant Kumar Thakur, Dy. Manager, Email: [sushantkumar.thakur@bhel.in](mailto:sushantkumar.thakur@bhel.in), Mobile: +91 8859777704
- ii) Sh. Kumar Abhishek, Dy. Manager, Email: [kabhishek@bhel.in](mailto:kabhishek@bhel.in), Mobile: +91 8004939859

Enclosures:

- 1. Technical Specifications
- 2. Annexure-1

For Spares, maintainability  
& PDI.

*Kabhishek*  
KUMAR ABHISHEK  
DY. MANAGER  
SABG/PROD.

*[Signature]*  
(Sushant Kr. Thakur)  
Dy. Manager  
WTX

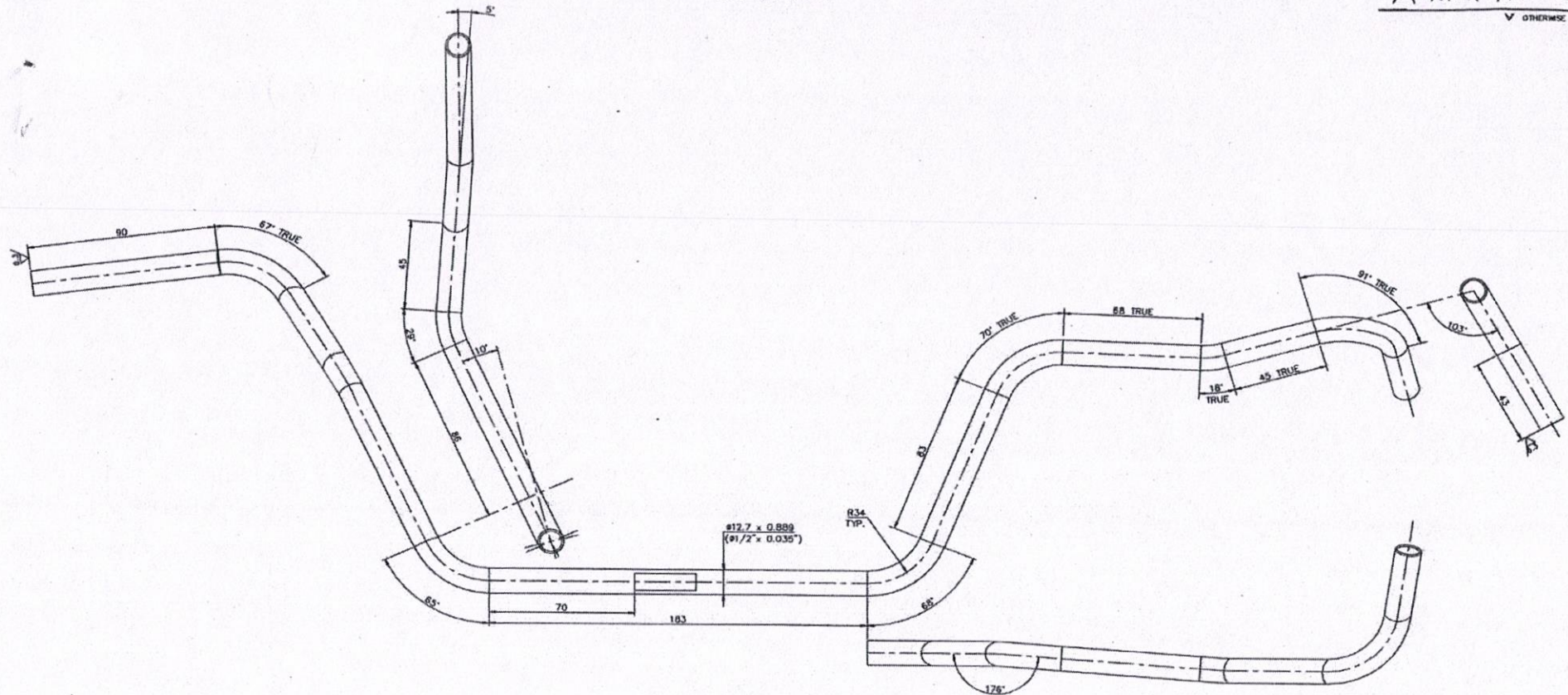
*[Signature]*  
(Rohit Chaudhary)  
(E2/WEX/ABG & DABG)

For spares, maintainability  
& PDI only  
*Amit Kumar*  
Amit Kumar  
(E2/WEX-CX/ABG & DABG)


*[Signature]*  
(Sushant Kumar)  
Sr. Eng. / DABG-Tech

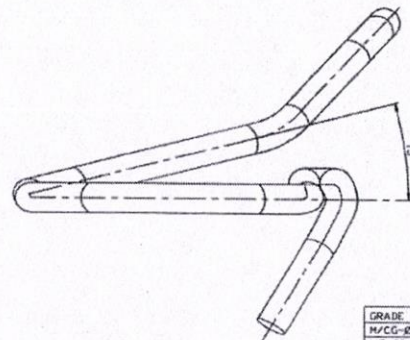







## TECH. REQUIREMENTS

1. WORKING PRESSURE 250 BAR (MAX).
2. ENGRAVE PART NO. IN TUBE ZONE MARKED 
3. ROUGHNESS ACCORDING TO SPEC. ASME/ANSI B46-1.
4. IDENTIFICATION OF COMPONENT AS PER HW 0400397.
5. DEVELOPED LENGTH : 961
6. TUBE SIZE - #12.7 x 0.889 (#1/2" x 0.035")



CDRM NO. 17821818002/00		STATUS OF 3RD	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		SRGM 76/62
GRADE OF UNTO. BSH --	NAME B.S. ARORA	SIGN B.S.	DATE 23.6.2007	SHARAT HEAVY ELECTRICALS LTD. HARDWAR	
WELDING-A/B/C/D-AAGG21104			NAME S.K.S./S.S.		
			SIGN M.S.		
			DATE 17.8		

Kapishesh  
(KUMAR ABHISHEK)  
DABG

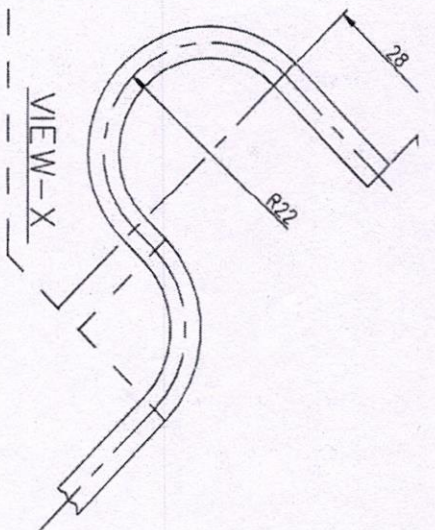
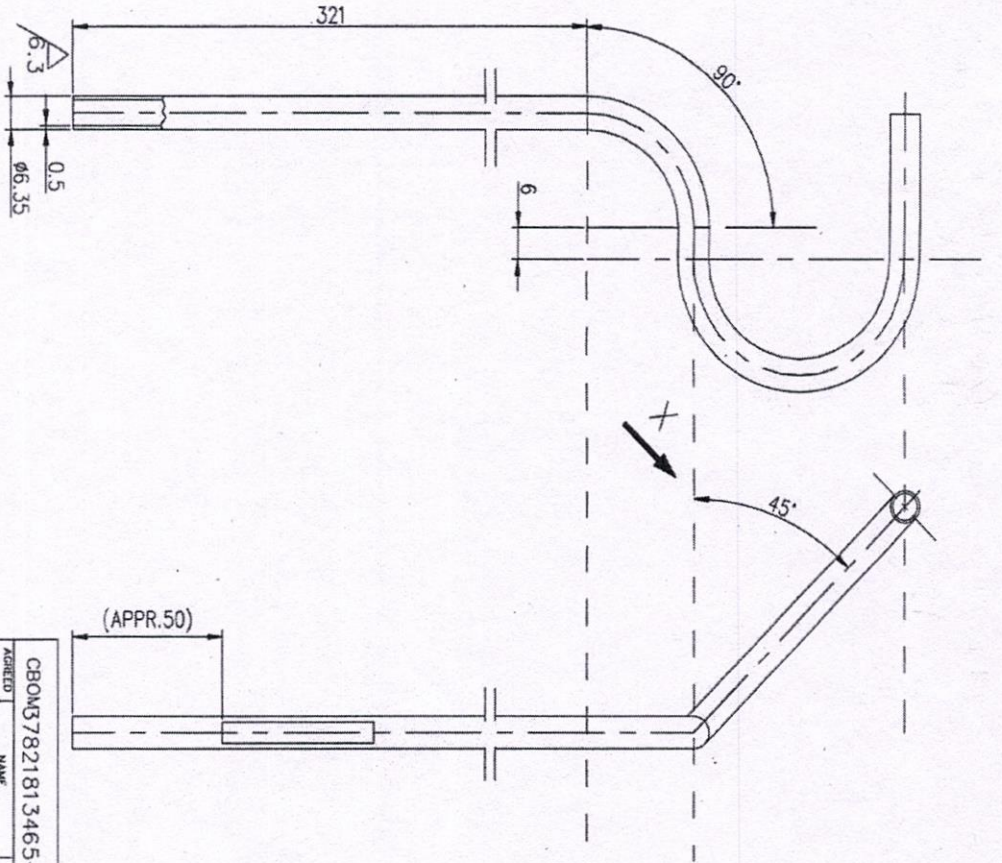
  
(Sushant K. Thakur  
Dy. Mgr/WTX)

SI  
(Sunit Kumar  
Sr. Egr/DAB-Tech)





✓ ALL OVER EXCEPT  
OTHERWISE STATED



### TECH. REQUIREMENTS

1. WORKING PRESSURE 250 BAR (MAX).
2. ENGRAVE PART NO. IN TUBE ZONE MARKED  .
3. ROUGHNESS ACCORDING TO SPEC. ASME/ANSI B46.1.
4. IDENTIFICATION OF COMPONENT AS PER HW 0400397.
5. DEVELOPED LENGTH : 458mm.
6. TUBE SIZE -  $\phi 6.35 \times 0.5$  ( $\phi 1/4" \times 0.020"$ )

GENERAL TOLERANCES		CASTING TOLERANCES		FORGING TOLERANCES		UNLESS OTHERWISE SPECIFIED ROUND DIMES 0.3 AND CHAMFER 0.5x45° SURFACE MARKED "-"- REQUIRE STOCK MATERIAL TO BE REMOVED AT ASSEMBLY
LINEAR DIMENSIONS UP TO 18	±0.15	LINEAR DIMENSIONS ±(0.52+1.04)	±0.4	LINEAR DIMENSIONS UP TO 18	±0.3-0.3	
> 18 TO 80	±0.25	THICKNESS ±0.85 (MIN. ±0.5mm)	±0.4	> 18 TO 80	±0.4	
> 80	±0.4	ANGLES	±2°	> 80	±0.5	
ANGLES	±30°			ANGLES	±1°	

CBOM37821813465-00	STATUS U
NAME	DATE
SIGN	

TYPE OF PRODUCT  
OR

SRGM 76/67

K. Prasad  
KMPR ASHES (10K)  
2A84

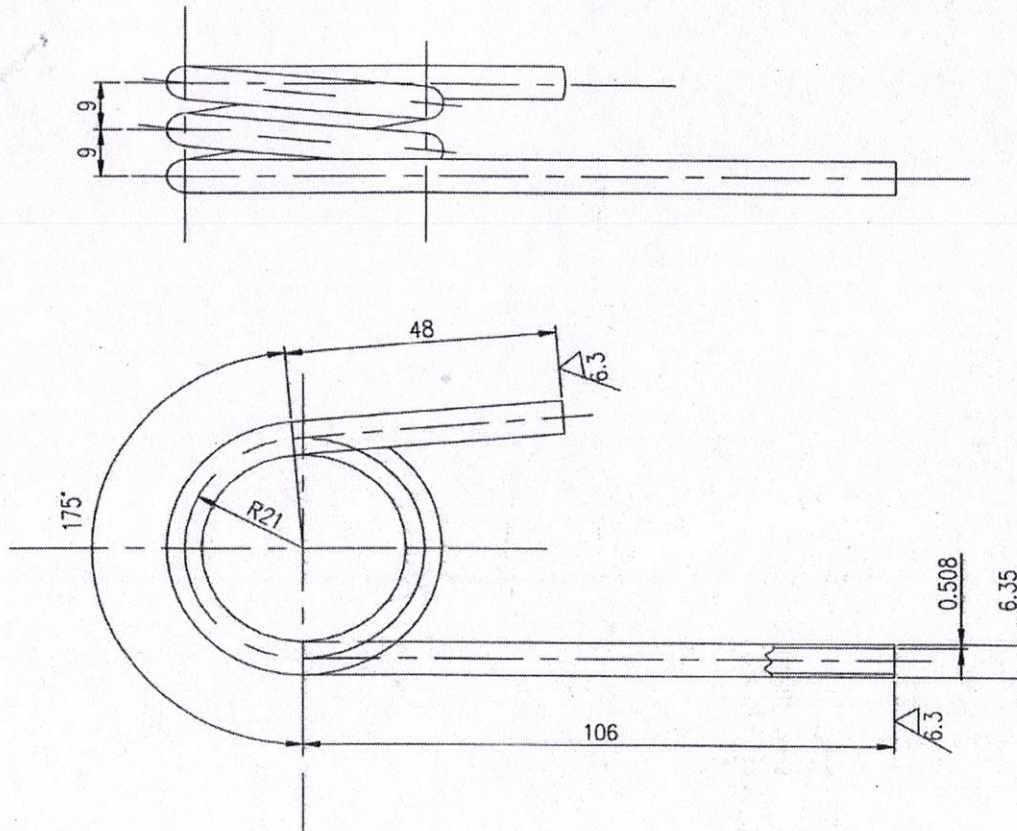
Subant Ka. Thakur  
(Dr. Mgn/MTX)

et









## TECH. REQUIREMENTS

1. WORKING PRESSURE 250 BAR (MAX).
2. ENGRAVE PART NO. IN TUBE ZONE MARKED
3. ROUGHNESS ACCORDING TO SPEC. ASME/ANSI B46.1.
4. IDENTIFICATION OF COMPONENT AS PER HW 0400397.
5. DEVELOPED LENGTH : 482mm.
6. TUBE SIZE-  $\phi 6.35 \times 0.508$  ( $\phi 1/4" \times 0.020"$ )

K. Ashish  
(KUMAR ASHISH)  
-SABG

S. M.  
(Sushant Kr. Thakur)  
DY. MGR / WTX

ST







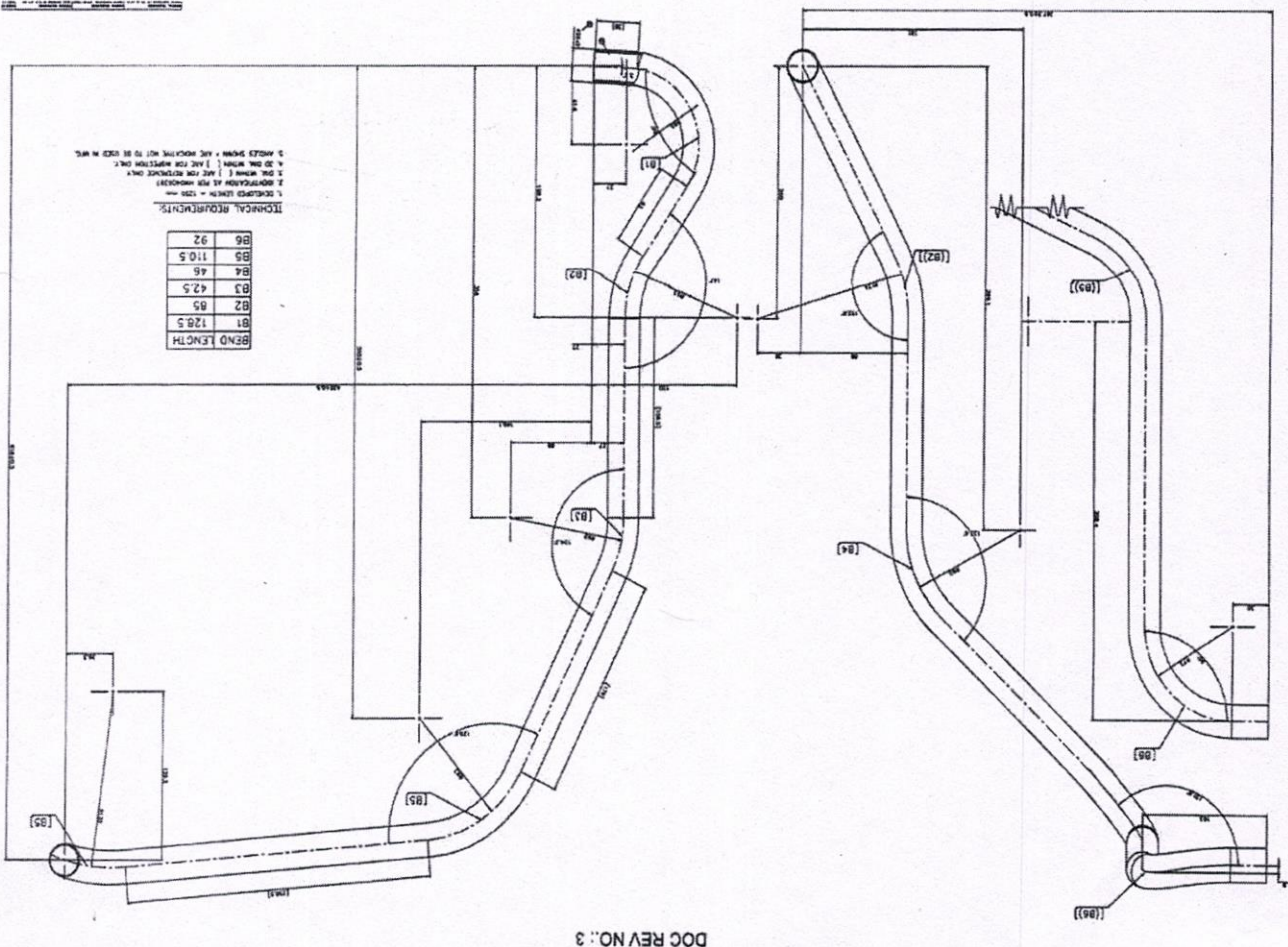




5348  
(Kunze 9000000)  
Trennung

~~Dr. M. G. M. T. X~~  
(Dr. M. G. M. T. X)  
Dr. M. G. M. T. X

51







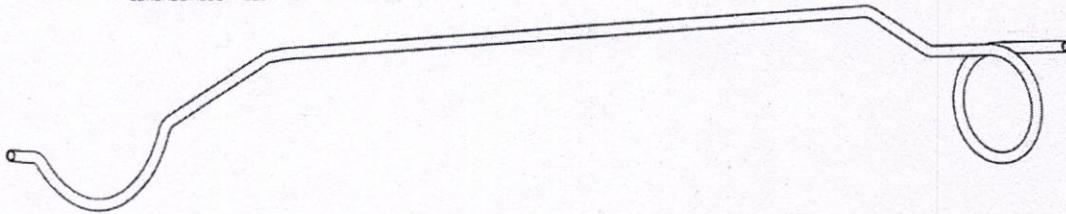
Kejriwal  
(Kumar Singh)

Shant K. Thakur  
(Dy. Mgr / WTX)

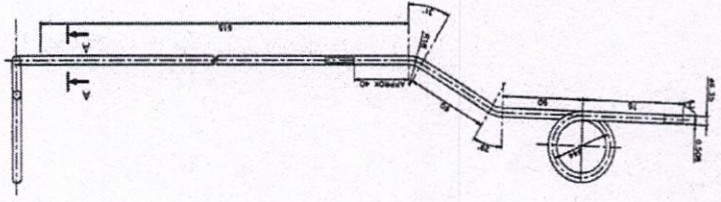
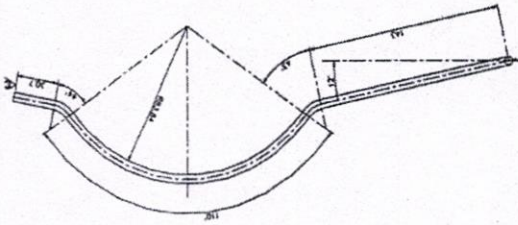
S.T.  
(Savit Kumar  
Sr. Eng / WTX-104)

TECH. REQUIREMENTS  
1. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
2. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
3. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
4. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
5. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
6. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
7. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
8. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
9. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:  
10. EXHAUST SYSTEM SHALL BE DESIGNED TO MEET THE FOLLOWING REQUIREMENTS:

3D VIEW



SECTION A-A



DOC REV NO.: 3