An ISO 9001 Company

Bharat Heavy Electricals Limited
(Seamless steel Tube Plant)
Tiruchirappalli – 620014, TAMIL NADU, INDIA

TITLE: **REQUEST FOR EXPRESSION OF INTEREST FOR REGISTRATION OF MANUFACTURERS for the SUPPLY OF 200 MM DIAMETER CONCAST / ROLLED CARBON / ALLOY STEEL BLOOMS.**	Phone: +91 431 257 85 02 Fax : +91 431 252 0464 Email : tpn@bheltry.co.in Web : www.bhel.com

Reference Number: SSTP / BLOOMS / 12-13 / 01	**Date: 27/08/2012**	**Due date for submission of application: 15/10/2012**

Seamless Steel Tube Plant / BHEL / Trichy is looking for Indigenous / Import suppliers for supply of **Carbon / Alloy Steel Con-cast blooms dia 200 mm as per our TDC: BAR:GEN:CA:02 REV 05 DATED 01/06/2012 required to make boiler quality seamless steel tubes for boiler applications.**

The details are as follows**:**

1	**Size of Blooms**	**:**	**200 mm Diameter , -2.8/+2.8mm ; Ovality: 2.8 mm**	
2	**Length of the blooms**	**:**	**Varies from 5.01 to 12.00 Meters.**	
3	**Process of manufacture**	**:**	**Con-cast / Rolled**	
4	**Specification – Carbon**	**:**	**As per ASME (latest on date of Purchase Order) SA 192, SA210 Gr A1, SA 210 Gr C, SA 106 Gr B & Gr C**	
5	**Specification – Alloy**	**:**	**As per ASME (latest on date of Purchase Order) SA 209 T1, SA213 T11, T12, T22, T23, T91 & T92**	
6	**Material source**		**Supply of Alloy steel grades shall be IBR approved overall creep resistance steel suppliers.**	
7	**Quantity in Metric TON**	**:**	**Carbon Steel Blooms**	**Alloy Steel Blooms**
			80,000 – 90,000 MT per Annum (Monthly 8000 MT Approx.)	**20,000 - 30,000 MT per Annum (Monthly 2500 MT Approx.)**

Interested steel manufacturers (Indigenous & Import) are requested to submit the following forms for registration as a blooms supplier. The respective vendor registration forms could be downloaded from our Web site (www.bhel.com).

List of Forms - Indigenous Suppliers	**List of Forms - Import Suppliers**
1. Vendor Registration Forms – Indigenous	1. Vendor Registration Forms - Foreign
2. Clause wise confirmation for TDC for supply of carbon / Alloy steel blooms as per Annexure –A	2. Authorisation letter for Representative
	3. Agency agreement between the Representative and Principals
	4. Clause wise confirmation for TDC for supply of carbon / Alloy steel blooms as per Annexure –A

Manufacturers alone need to be send their vendor registration formats for this requirement. Dealers/Marketing partner for a manufactures will be considered based on the authorization / agreement from the manufacturer.

Sr.Dy. General Manager / Purchase /SSTP
Phone: 0431-257 8502, Fax: 0431-252 0464.
Mail: tpn@bheltry.co.in.

Control No: Blooms/001
Dated 27/08/2012

Pre-Qualification Criteria for Carbon / Alloy Steel Blooms Suppliers

1. Latest version of Vendor Application form shall be downloaded from the BHEL web page www.bhel.com and submission of any old version of vendor registration forms shall not be considered.

2. Steel making process shall be as per the clause 2.0 specified in our TDC: BAR:GEN:CA:02 Rev:05 dated 01/06/2012. ie., Fully Killed, vacuum de-gassed bars in con-cast or rolled form.

3. The Furnace capacity shall be more than 30 MT so that in every despatch schedule, the lot quantity shall be at least 30 MT per Melt / Heat number.

4. In case of any representation by marketing Agents, the Blooms supplying steel mill shall also be evaluated for registration as a bloom supplier. In this case, SSTP requires vendor registration forms for both marketing channel & Steel supplying mill with all essential annexure as indicated in the clause No: 8.

5. Submission of Contract copy between Marketing Channel and bloom supplying mill is a must for marketing channel.

6. Similarly, the Indian representatives who are only doing liaison work shall also submit the Agent Agreement Copy between the Indian representative and the supplier.

7. For vendor application forms from the import sources, the Language used in all annexure shall be in ENGLISH only. BHEL shall not consider the application, if the details are given in any other language other than ENGLISH.

8. In case of import suppliers, the following documents / annexure are must for registration. If any of the following documents found missing / not attached with the vendor application form then application form will liable for rejection.

    a. Company catalogue / Brochure / Technical Literatures etc.,
    b. Approval from Indian Boiler regulation to produce steel meant for Boiler application.
    c. Authorisation letter in case of Indian representative and contract copy between marketing channel / Partner and the steel supplying mill.
    d. Banker's Certificate as to credit worthiness of the supplier.
    e. D & B / Credit form is must for both Marketing Channel / Supplier
    f. Valid ISO certificate for the steel supplying mill.
    g. Copy of audited annual Accounts for the last 3 years.
    h. Experience List / List of present customers with name & Address for product for which registration has been sought.

9. Expression of Interest from any Trading Agent / Traders shall not be considered and shall be rejected.

Sr.Dy.General.Manager / Purchase
Seamless Steel Tube plant

1.0 MATERIAL

a) Specification : ASME {Latest on date of Purchase Order (PO)}:
CS: SA 192, SA210 Gr.A1 & Gr.C, SA 106 Gr.B & Gr.C
AS: SA 209 T1, SA 213 T11, T12, T22, T23, T91 &T92

b) Additional Requirement : As listed below (Supplementary to Specification)

c) End Product : For Manufacture of Hot and Cold finished Seamless Steel Tubes / Pipes as per Indian Boiler Regulations (IBR)

d) Material Source : Supply of Alloy Steel grades shall be IBR approved overall Creep Resistance Steel Suppliers.

2.0 CHEMICAL COMPOSITION AND PROCESS OF MANUFACTURE :

Fully Killed, Vacuum de-gassed Bars in Concast or Rolled form**.** Ladle analysis to suit end product**.** Product analysis and maximum trace elements: Al: 0.02%, Cu: 0.25%, Total: 0.5% for CS and 0.3% for AS**.**SA 213 T12: Silicon : 0.2% max.

3.0 DIMENSIONS AND TOLERANCES :

a) Diameter : 200 mm. ± 2.8 mm ; Ovality : < 2.8 mm
b) Length : As per Enquiry /Purchase Order.
c) Straightness : Permissible deviation is 2.5 mm / meter to 15 mm on the entire length of the bars.
d) End Surface : 3.0 mm from the perpendicular

4.0 SUPPLY CONDITION :

As Cast / As Rolled:
In every despatch schedule, the lot Quantity shall be atleast 30 MT per Melt/ Heat Number.
Each consignment of Bloom despatches shall have the quantity bulked Melt/Heat Number wise.

5.0 FINISH AND REPAIR :

Free from mill scales and defects like laps, seams, folds, cracks, undue segregation, piping etc. Repairs by welding is prohibited. The Surface defects can be removed mechanically subject to meeting minimum diameter.

6.0 NON-DESTRUCTIVE TESTING :

Ultrasonic Test: NDE Procedure No.: 13 (Latest) shall be referred for testing and acceptance for Rolled Blooms only.

7.0 METALLURGICAL TEST :

7.1 MACRO ETCH TEST: (CONCAST & ROLLED BLOOMS)

1)One sample of complete cross-section of a Bloom (Bar) for each Heat / Melt Number shall be examined in accordance with ASTM E 381. The reference plates shall be as follows.
a) For the Blooms made by Concast Method (Plate – II &III**)** and
b) For the Blooms made by Rolled Method (Plate I & II).
c**)** The Macro structure shall be better than or equal to C2 R2 S2 of ASTM E381 (Plate I & II)

2) Injurious defects of any category like Surface cracks, Pipe/center void, Star crack, center unsoundness, Dark center, Pin holes, White bands, Chill structure, and Dendritic structure (strong) are not allowed.

3**)** Photo of Macrograph shall be provided along with Test Certificates per Heat / Melt Number.

7.2 MICRO EXAMINATION FOR ROLLED BLOOMS:

The Specimen for Testing shall be taken on longitudinal plane, midway between the center and surface of the material. The 'Inclusion content of the steel," measured as per ASTM E 45 shall not exceed the following

Classification							
Type 'A"		Type 'B"		Type 'C'		Type 'D	
Thin	Heavy	Thin	Heavy	Thin	heavy	Thin	Heavy
2	1	2	1	2	1	2	1

8.0 MARKING :

a) On each Bar, longitudinal colour coding to be done by paint for entire length by a band of 50.0 mm width and also both End faces**.**

b) Melt number & Specification shall be paint stenciled with white colour on both the faces**.**

SA 192	WHITE	SA 209 Gr. T1	BROWN, RED
SA 210 Gr. A1	YELLOW	SA 213 Gr. T11	BROWN, WHITE
SA 210 Gr. C	BLUE	SA 213 Gr. T12	BROWN, YELLOW
SA 106 Gr. B	RED	SA 213 Gr. T22	GREEN, RED
SA 106 Gr. C	BLUE	SA 213 Gr. T23	RED, WHITE
		SA 213 Gr. T91	GREEN, YELLOW
		SA 213 Gr. T92	BROWN, BLUE

9.0 INSPECTION AND CERTIFICATION :

FOREIGN SUPPLIERS :

a. IBR Well known steel makers:

Product shall be inspected at works and Certification shall be in IBR Form IV signed by both maker & maker's representative.

b. Other Steel Makers:

Product shall be inspected at works and Certification shall be in IBR Form IV countersigned by Inspecting authority approved by IBR for the country of origin (To be concurred by BHEL before placing PO).

INDIAN SUPPLIERS :

a. IBR Well Known Steel Makers:

Product shall be inspected at works and Certification shall be in IBR Form IV signed by both maker & maker's representative.

b. Other Steel Makers:

Product shall be inspected at works and Certification shall be in IBR Form IV countersigned by Boiler Inspectorate / Directorate of respective State.

TC Shall essentially contain:

1. BHEL Order No., TDC No. & Test Certificate number, Size & Quantity- Heat / Melt No wise
2. Specification and Grade with year of code, Heat Number, Steel & Bar making process.
3. Chemistry including trace elements - Ladle and Product analysis.
4. Metallurgical Test results, NDE results with reference and acceptance standards as applicable.
5. Identification Mark on the Product.
6. Photo of Macro Etch Test.

S. Manojikumar Engineer/QA&C	**A. Natarajan** Sr. Manager/QA&C	**A. Rajendra Prasad** Sr. Manager/OP & C	**L. N. Sekar** Sr. Manager/Purchase	**R. Dharmar** AGM/QA&C
Prepared By	Reviewed By			Approved By

Revision Record: rev:00: Re-numbered and re-written from TDC:E :S: 04//00
Revision Record: rev:01: Modified: Cl. 1.0, 3.0, 4.0 **,** 7.0**,** 8.0 & 9.0 .
Revision Record rev 02; Modified: Cl 1.0, 3.0, 4.0,5.0, 6.0, 7.0, 8.0 & 9.0..
Metallurgical Test introduced .in Cl no 7 instead of Mechanical Test
Revision Record rev 03; Deleted: Cl 3.0(d)
Revision Record: Rev. 04: Modified Cl.: 1.a), 2.0, 3.0 a), c) & 8.0 to included SA 213 T23 & T91 & T92
Revision Record: Rev. 05: Modified Cl.: 1.d), 3.0, 4.0, 8.0 & 9.0 Included Cl.: 3(d)

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ANNEXURE - A

TDC Clause wise confirmation for Supply of 200 mm outside dia carbon / alloy steel blooms

TDC ref: TDC:BAR:GEN:CA: 02 REV :05 dtd 01/06/2012

Buyer : SEAMLESS STEEL TUBE PLANT / BHEL / TIRUCHIRAPPALLI -14, TAMILNADU, INDIA

SL NO	TDC CLAUSE NO	DESCRIPTION	SSTP /BHEL REQUIREMNT		Supplier's Acceptance / Remarks
1	1.0 a	Material - As per ASME (Latest on date of Purchase Order)	Carbon	SA192	
				SA 210 Gr A1	
				SA 210 Gr C	
				SA 106 Gr B	
				SA 106 Gr C	
			Alloy	SA 209 T1	
				SA 213 T11	
				SA 213 T12	
				SA 213 T22	
				SA 213 T23	
				SA 213 T91	
				SA 213 T92	
	1.0 b	Material source	Supply of Alloy steel grades shall be IBR approved overall creep resistance steel suppliers.		
2	2.0	Chemical Composition and Process of Manufacture	Fully Killed Vacuum de-gassed bars in concast or Rolled Form. Ladle Analysis to suit end product.		
			Product Analysis and maximum trace elements : Al: 0.02%, Cu: 0.25%, Total : 0.5% for Carbon Steel and 0.3% for Alloy Steel		
			For SA 213 T12: Silicon :0.2% min		
3	3.0 a	Diameter	200 mm -3 / +2 mm , Ovality : < 1.4%		
	3.0 b	Blooms Length - 12 MTR	11.01 to 12 .00 meters in length.		
		Supply of short length blooms - 5.1 to 11.0 Meters long	Short length blooms having length 5.01 to 11.00 meters will also be acceptable up to 5% of order quantity		
	3.0 c	Straightness	Permissible deviation is 2.5 mm / Meter to 15 mm on the entire length of the bars.		
4	4.0	Supply Conditions	With out Heat Treatment .		
			In every Despatch schedule, the lot quantity shall be at least 30MT per Melt / Heat Number		
			Each consignment of bloom despatches shall have the quantity bulked melt / Heat wise.		
5	5.0	Finish and Repair	Free from mill scales and defects like laps, seams, folds cracks, undue segregation, piping etc. Repairs by welding is prohibited. The surface defects can be removed mechanically subject to meeting minimum diameter.		

ANNEXURE - A

TDC Clause wise confirmation for Supply of 200 mm outside dia carbon / alloy steel blooms

TDC ref: TDC:BAR:GEN:CA: 02 REV :05 dtd 01/06/2012

Buyer : SEAMLESS STEEL TUBE PLANT / BHEL / TIRUCHIRAPPALLI -14, TAMILNADU, INDIA

SL NO	TDC CLAUSE NO	DESCRIPTION	SSTP /BHEL REQUIREMNT		Supplier's Acceptance / Remarks
6	6.0	Non-Destructive Testing	Ultrasonic Test: NDE Procedure : 13 (latest) Shall be referred for testing and acceptance for rolled blooms only.		
7	7.0	Metallurgical Test			
	7.1	7.1 (1) Macro ETCH TEST	One Sample of complete cross -section of a bloom (Bar) for each Heat / Melt number shall be examined in accordance with ASTM E 381. The reference plates shall be as follows.		
			a. For blooms made by concast method - Plate II & III		
			b. For blooms made by Rolled method (Plate I & II) and B1. The Macro Structure shall be better than or equal to C2 R2 of ASTM E381 (Plate I & II)		
			b1. The Macro Structure shall be better than or equal to C2 R2 of ASTM E381 (Plate I & II)		
		7.1 (2)	Injurious defects of any category like surface cracks, Pipe / Centre void, Star Crack, Centre unsoundness, Dark Centre, Pin holes, White bands, Chill structure and Dendritic Structure (Strong) - are not allowed.		
		7.1 (3)	Photo of Macrograph shall be provided along with test certificates per Heat / Melt		
	7.2	MICRO EXAMINATION - For ROLLED BLOOMS	The Specification for testing shall be taken on longitudinal plane, midway between the centre and surface of the material. The "Inclusion content of the Steel" measured as per ASTM E 45 shall not exceed the following.		
			Type 'A'	Thin 2 / Heavy 1	
			Type 'B'	Thin 2 / Heavy 1	
			Type 'C'	Thin 2 / Heavy 1	
			Type 'D'	Thin 2 / Heavy 1	

ANNEXURE - A

TDC Clause wise confirmation for Supply of 200 mm outside dia carbon / alloy steel blooms

TDC ref: TDC:BAR:GEN:CA: 02 REV :05 dtd 01/06/2012

Buyer : SEAMLESS STEEL TUBE PLANT / BHEL / TIRUCHIRAPPALLI -14, TAMILNADU, INDIA

SL NO	TDC CLAUSE NO	DESCRIPTION	SSTP /BHEL REQUIREMNT		Supplier's Acceptance / Remarks
8	**8.0**	**MARKING**	On each bar longitudinal colour coding to be done for entire length by a band of 50 mm width and also both end faces.		
			SA192	White	
			SA 210 Gr A1	Yellow	
			SA 210 Gr C	Blue	
			SA 106 Gr B	Red	
			SA 106 Gr C	Blue	
			SA 209 T1	Brown, Red	
			SA 213 T11	Brown, White	
			SA 213 T12	Brown, Yellow	
			SA 213 T22	Green, Red	
			SA 213 T23	Red, White	
			SA 213 T91	Gree,, Yellow	
			SA 213 T92	Brown, Blue	
9	**9.0**	**Inspection & Certification**			
		Foreign Suppliers of Indian Boiler Regulations (IBR) Approved Well Known Steel Maker.	**Mill Inspection with TC as per Form IV of IBR**		
		Others	**Inspection, test and clearance by Third party Inspection agency (TPI) approved by IBR for the region with TC as per Form IV of IBR countersigned by TPI.**		
		Indian Suppliers of Indian Boiler Regulations (IBR) Approved Well Known Steel Maker.	**Mill Inspection with TC as per Form IV of IBR**		
		Others	**Inspection and test witnessed and cleared by Directorate of Boilers (DB) of the respective region with TC as per FORM IV of IBR countersigned by DB.**		
		TC Shall essentially contain	**1. BHEL Order No, TDC NO & Test Certificate Number, Size & Quantity - Heat / Melt No. Wise**		
			2. Specification and Grade with year of Code, heat Number, Steel & Bar making process.		
			3. Chemistry including incidental elements - Ladle and Product analysis.		
			4. metallurgical test results, NDE results with reference and acceptance standards as applicable		
			5. Identification mark on the product		
			6. Photo of Macro Etch Test		

MANUAL ULTRASONIC TESTING OF ROUND ROLLED STEEL BLOOMS

Prepared By	Reviewed & Approved By
R.PARAMESHWARAN MANAGER / NDT LEVEL II	R.J.PARDIKAR AGM / NDT Sr. LEVEL III

EFFECTIVE FROM 09-08-2008

1.0 SCOPE:

1.1 This procedure deals with the ultrasonic testing of Round Rolled Steel blooms by contact pulse-echo method .

2.0 REFERENCE

2.1 ASME Section V Article 5

2.2 ASTM A 388

3.0 PERSONNEL QUALIFICATION:

3.1 Personnel performing examinations shall be qualified in accordance with NDE 01 to at least one of the following levels.

1) Operator	**Minimum Level-1**
2) Evaluation / Report issue	**Level-II**

4.0 EQUIPMENT and SEARCH UNIT

4.1 The examination shall be done with an ultrasonic pulse echo system generating frequencies of 1 MHz to 5 MHz and equipped with a stepped gain control of 2 dB.

4.2 Contact testing with manual scanning shall be done with 2 MHz frequency using longitudinal wave Straight beam probe with a crystal size of 20 to 25mm and 35 degree shear wave with crystal dimension 8x9 mm.

5.0 COUPLANT

5.1 Oil or Oil and grease mix shall be used as couplant.

6.0 SURFACE PREPARATION

6.1 The testing can be carried out on the Blooms as drawn condition . The surface shall be free from scales and deep pits and other foreign materials that may interfere with interpretation of test results.

7.0 EQUIPMENT CALIBRATION

7.1 The Screen height linearity and amplitude control linearity shall be performed in accordance with ASME Sec V Article 4 Appendix I, at the beginning of each period of extended use or every 3 months whichever is less.

8.0 PROCEDURE

8.1 CALIBRATION REFLECTORS

8.1.1 STRAIGHT BEAM TESTING

8.1.1.1 For Calibration purpose the mid portion of the bloom shall be taken .

8.1.1.2 The calibration reflector shall be the first back wall echo from the opposite side of a sound area of the bloom.

8.1.1.3 The gain shall be adjusted to get the back wall reflection to 80% of the FSH and this is taken as reference echo (RE)

8.1.2. ANGLE BEAM TESTING

8.1.2.1 For Angle beam, reference block with same curvature and material shall be used with side drilled hole of diameter 2.0 mm at 50 mm depth and the gain shall be adjusted to get a height of 80% of FSH and taken as Reference echo(RE)

8.2 SCANNING

8.2.1 The scanning shall be performed at a gain setting +6dB of the Reference echo(RE).

8.2.2 During inspection, the entire bloom shall be scanned circumferentially through 360 degree.

8.2.3 During inspection, areas showing complete loss of back reflection shall be rechecked to determine whether the loss of back reflection is due to poor coupling and contact.

8.2.5 The rate of probe movement for examination shall be less than 150 mm/sec.

8.2.6 Minimum 10% overlap between successive scanning shall be maintained.

8.3 CALIBRATION CHECK

8.3.1 When any part of the examination system is changed, a calibration check shall be made on the basic reflector at the finish of each examination, every 4 hours during the examination and when examination personnel are changed.

9.0 ACCEPTANCE STANDARD

9.1 Ultrasonic acceptance or rejection criteria for blooms shall be on a realistic appraisal of the end use.

9.2 Any signal greater than 20% of the FSH in the chill depth area shall be identified as defective in normal and angle beam.

9.3.1 For normal beam Central portion being an area of segregation, the defect echo shall be permitted up to 50% of FSH.

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