



QUALITY ASSURANCE
TECHNICAL DELIVERY CONDITIONS
FOR SUPPLY OF ROLLED / FORGED BARS APPLICABLE
TO BAP PRODUCTS

TDC : RTG : 500
Rev. No. 03
DATE: 02.04.2012

TECHNICAL DELIVERY CONDITIONS

FOR SUPPLY OF ROLLED / FORGED BARS APPLICABLE TO BAP PRODUCTS

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RECORD OF REVISIONS

REV. NO	CLAUSE NO	REVISION MADE	EFFECTIVE DATE
00	--	TDC : RTG : 057/02 is revised and re-numbered as RTG : 500	08-08-2001
01	5.2	UT incorporated for rod diameter equal to 50 mm and above instead of 63 mm	19-05-2009
	6.1	TDC : RTG : 500 revised by deleting IS : 3739 and including IS : 11185 Note: IS : 3739 gives tolerance only for rolled bars whereas IS : 11185 gives tolerance for both rolled and forged bars	
	6.2	Reduction Ratios Incorporated	
02	1.0	Various Specifications included for rolled / forged bars as applicable to Boiler Auxiliaries products.	01-03-2011
	3.0	Heat Treatment conditions elaborated for various specifications as applicable to intended purpose	
	4.0	Mechanical Properties included under clause 2.0 and hence other clause numbers re-numbered	
	5.2	Reduction Ratio modified as 4:1 minimum	
	8.1	Bars of diameter = and > than 32 mm shall be supplied as loose instead of equal to and more than 63 mm	
	8.2	Bars of diameter below 32 mm shall be supplied as bundles instead of less than 63 mm	
	8.3	Colour Coding specification added for supply of rolled / forged bars.	
11.0	End use of rolled/forged bars added		
03	2.0	Clause No. 2, Material - has been modified to include the process of making of steel and also the list of approved manufacturers for procurement of billets / blooms / Ingots for further operation were added.	02.04.2012
	3.1, 3.2	a) Diameter range for rolled bars and forged bars applicable to SA 193 B7 is added based on MM feedback and further technical deliberations had on PCM meeting of G&D held on 29.04.2011. b) Refer record notes of discussion held on 01.06.2011 and 15.11.2011 w.r.t rolled bars and forged bars diameter limitation expressed by vendors for SA 105 and SA 193 B7 materials.	02.04.2012

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REV. NO	CLAUSE NO	REVISION MADE	EFFECTIVE DATE
03	3.1, 3.2	c) Rolled / Forged bars – Diameter limitation details for SA 105 / SA 193 B7 rods received from various steel manufacturers viz., SAIL, Facor and Vikrant were taken into account and accordingly separate table for rolled bars and forged bars were introduced in this revision. d) For Rolled bars the reduction ratio changed to 6:1 min., in place of 4:1.	02.04.2012
	5.0	The dimensional tolerance for rolled bars as per IS:3739 is also included along with IS: 11185	02.04.2012
	9.0	Clause no. 9 Inspection & Certification has been renamed as Inspection Check List with more clarity for inspection purpose.	02.04.2012
	10.0	New clause added as <u>"Documentation"</u> taking care of new requirements as per this revision 03.	02.04.2012

1.0 SCOPE :

1.1 This Technical Delivery Conditions (TDC) specifies the requirement for supply of rolled / forged bars to various specifications mentioned below, as applicable to each of the products of BAP – Ranipet Viz., Air Pre Heater (APH), Utility Heavy Duty Fans (FAN), Electrostatic Precipitator (ESP or EP) and Guillotine Gates and Isolation Dampers (GAD).

- 1.2
- a) IS: 2062 Gr. A or Gr. B
 - b) SA 105
 - c) SA 193 B7
 - d) SA 479 Type 304
 - e) SA 276 Gr.420 / X20 Cr13 to EN 10088-3 (Matl. No.1.4021)

1.5 The rounds / rods raw material specification, sizes, diameter, length and Qty will be as per Purchase Order.

2.0 CHEMICAL COMPOSITION AND PROCESS:

2.1 The Steel shall be manufactured by open hearth basic oxygen or electric arc furnace followed by vacuum degassing process and shall be fully killed.



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- 2.2 The Billets / Blooms / Ingots supplied by the following manufacturers only acceptable to Quality and no deviation on this account is acceptable to Quality.
- 2.2.1 BHEL – Haridwar
 - 2.2.2 SAIL / Alloy Steel Plant - Durgapur
 - 2.2.3 SAIL / VISL - Bhadravathi
 - 2.2.4 RINL – Vizag
 - 2.2.5 Kalyani Steel – Pune
 - 2.2.6 Starwire - Ballabagh
 - 2.2.7 Mahindra UGINE Steel Co. Ltd - Khopoli
 - 2.2.8 Midhani - Hyderabad
 - 2.2.9 Arcvac - Kolkatta
 - 2.2.10 Facor – Nagpur
 - 2.2.11 Mukund Ltd
 - 2.2.12 Jindal Steel & Power Ltd., - Raigarh
 - 2.2.13 Noble Tech Industries Ltd – Chennai
 - 2.2.14 OPG Metal Industries - Mayawaram
- 2.3 The Chemical and Mechanical properties of the material shall be as per the respective specifications mentioned in clause no. 1.2 above.

3.0 HEAT TREATMENT & SUPPLY CONDITION FOR ROLLED / FORGED BARS :-

- 3.1 Following materials shall be supplied as either ROLLED or FORGED BARS with the Heat Treatment condition mentioned against each specification (Refer Notes given below) :-**

SL NO	MATERIAL	HEAT TREATMENT & SUPPLY CONDITION
1	a) IS : 2062 Less than 40 mm dia	As Rolled / Forged bars and without any Heat Treatment
	b) IS: 2062 Dia 40mm and above	As Rolled / Forged bars with Controlled Furnace Normalized condition (880°C to 920° C)
2	SA 105 – Up to and less than Dia 125mm	As Rolled / Forged Bars with controlled Furnace Normalized condition ((880°C to 920° C)
3	SA 193 B7 - Up to and less than Dia 125mm	As Rolled / Forged Bars with Quenched & Tempered Condition.
4	SA 479 Type 304 - Up to and less than Dia 125mm	As Rolled / Forged Bars with Solution Annealed Condition
5	SA 276 Gr.420 / X 20 Cr 13 to EN 10088-3 (Matl. No.1.4021) - Up to and less than Dia 125mm	As Rolled / Forged Bars with Quenched & Tempered Condition

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3.2 Following materials shall be supplied as **FORGED BARS ONLY** with the Heat Treatment condition mentioned against each specification (Refer Notes given below):-

SL NO	MATERIAL	HEAT TREATMENT & SUPPLY CONDITION
1	SA 105 - Dia more than 125mm	As Forged Bars with controlled Furnace Normalized condition (880°C to 920° C)
2	SA 193 B7 - Dia more than 125mm	As Forged Bars with Quenched & Tempered Condition.
4	SA 479 Type 304 more than 125mm	As Forged Bars with Solution Annealed Condition
5	SA 276 Gr.420 / X 20 Cr 13 to EN 10088-3 (Matl. No.1.4021) more than 125mm	As Forged Bars with Quenched & Tempered Condition

Note: 1. Rolled bars made through bottom poured vacuum degassed quality ingots/billets/blooms will have minimum reduction ratio 6:1 from start to final piece.

2. Forged bars made through bottom poured vacuum degassed quality ingots/billets/blooms will have minimum reduction ratio 4:1 from start to final piece.

4.0 NON DESTRUCTIVE TESTS :

4.1 The material shall be free from scales, laps, piping, cracks and any other injurious defects to raw materials.

4.2 All the bars of diameter equal to 50mm and above shall be Ultrasonic Tested (UT) by straight beam method as per ASTM A-388.

4.2.1 **ACCEPTANCE NORMS:** One or more discontinuities resulting in complete loss of back wall reflection to 10% of full scale height, not attributable to geometric configuration, when tested by back wall echo method are not acceptable.

5.0 DIMENSIONAL TOLERANCES :

5.1 The dimensional tolerances for the rolled bars shall be either as per IS: 11185 (latest) or IS: 3739 (latest) and for forged bars the same shall be as per IS: 11185 (latest).

6.0 REPAIR :

6.1 Surface defects can be removed by mechanical means. However the dimensions after repair shall be as per PO / Drawing requirement.

6.2 Repairs involving welding are fully prohibited.



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7.0 SURFACE FINISH :

7.1 All the bars of diameter equal to 50 mm and above shall have smooth surface finish providing uniform coupling of UT probe.

8 MARKING AND PACKING :

- 8.1 Bars of diameter equal to 50 mm and above sizes shall be supplied in loose and all these bars shall be hard stamped furnishing the melt number, specification and makers emblem / code and the same shall be framed with suitable painting/markings at any one end.
- 8.2 Bars of diameter below 50 mm sizes shall be packed in bundles not exceeding each bundle 1 MT weight along with metal tag, having details like melt number, specification and maker's emblem / code suitably punched on the metal tag and the same may be tagged on both ends.
- 8.3 The color code to be applied on the two faces of both ends of each bars of respective specifications shall be as per the table given below:-

SL. NO.	SPECIFICATION	COLOUR CODE
1	IS: 2062	GREY
2	SA 105	BLACK
3	SA 193 B7	RED
4	SA 479 TYPE 304	RED & WHITE (50/50)
5	SA 276 GR.420	BLACK & WHITE (50/50)

Note: No deviation on the color code is acceptable as it is applicable to our Plant standard Storage procedure.

9 INSPECTION CHECK LIST :

- 9.1 The Original Mother TC / Mill TC of the respective billet / bloom / Ingot used for the successive hot rolling / hot forging has to be shown to BHEL / BHEL's Authorized Inspection Agency (AIA) for verification and a copy of the same has to be submitted along with other TCs.
- 9.2 BHEL / BHEL's AIA will witness two samples per heat number for the finished product against the respective material specification for its chemistry / mechanical properties and the same shall be submitted along with other internal Test Certificates.
- 9.3 The respective reduction ratio for rolled bars / forged bars – as applicable shall be calculated and recorded on IR (Inspection Report) itself by BHEL / BHEL's AIA.
- 9.4 During the course of rolling / forging BHEL / BHEL's AIA shall be witnessing the process for which the rolling plan program has to be submitted to Quality Department thro' purchase within three weeks time after the acceptance of the BHEL PO.
- 9.5 All the Bars either rolled or forged shall be offered for physical verification at the place of manufacturing of works only before HT Cycle to verify the process / method of manufacture to BHEL / BHEL's Authorized Inspection Agency.
- 9.6 The source of HT and UT shall be NABL approved / BHEL approved vendors only.

 RANIPET	QUALITY ASSURANCE TECHNICAL DELIVERY CONDITIONS FOR SUPPLY OF ROLLED / FORGED BARS APPLICABLE TO BAP PRODUCTS	TDC : RTG : 500
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- 9.7 After the HT cycle, the bars which are to be UT tested shall be offered for BHEL / BHEL's AIA witness during the time of UT checking for which suitable advance information has to be given thro' purchase to Quality.
- 9.8 The Final Inspection of Rounds / Rods shall be carried out only at the place of manufacturing of rolling / forging at works by BHEL /BHEL's AIA .

10 DOCUMENTATION :

- 10.1 The entire test specified under respective specifications shall be carried out at works or at NABL approved Labs or BHEL Units and the test results shall be furnished in the test certificate.
- 10.2 The supplier shall send the test certificates in English only to reach BHEL before the physical receipt of materials at BHEL stores and it shall contain the following documents /information's:
- Purchase Order Number and Date
 - TDC Number with rev.no and Date
 - Material Specification and Grade
 - Size, Number, Qty and Weight
 - Chemical Composition for Billet / Bloom / Ingot – MILL TC – Each Melt wise
 - Chemical Composition for finished product – Each Melt wise
 - Mechanical Properties – Each Melt wise / Heat Treatment Batch wise
 - Ultrasonic Testing Report
 - Heat Treatment Cycle Charts in Original.

11 AUDIT CHECK AT BHEL :

- 11.1 BHEL reserves the right, at their discretion to carry out audit checks for billet / bloom/ingot raw material for its chemistry, finished product chemistry, heat treated condition, mechanical testing and NDT on the supplied bars.
- 11.2 If any bar is found to be defective during audit check test as per clause 11.1 or during subsequent processing at BHEL works, such bars supplied against the respective PO are liable for rejection at the cost of supplier.

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(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 2 MONTHS FROM THE DATE OF COMPLETION OF SUPPLIES)

CONTRACT EXECUTION BANK GUARANTEE

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "BHEL House", SIRI Fort, New Delhi 110 049) through its Boiler Auxiliaries Plant located at Ranipet – 632 406, (hereinafter called 'the Company') having entered into a contract with M/s.....
..... hereinafter called 'the said contractor' which term includes 'suppliers' for the purpose of this Bond and under the terms and conditions of the Contract No.....Dt.....between BHEL, Ranipet and as per the Contract, the Contractor / Supplier is to furnish a Contract Execution Bank Guarantee for Rs.....in words.....
.....for the due performance of the contract and for the fulfillment of all the terms and conditions of the contract.

Sign and seal of issuing bank
Please affix Non Judicial Stamp
here, as per Stamp Act

Bank Guarantee No.....Date.....Banker Name.....
Bank Guarantee Value Rs.....

1. We.....
.....
.....(Bank's name, Branch, Place – address to be mentioned [herein after referred to as the Bank) at the request of.....
.....(Contractor(s)] do hereby undertake to pay the company an amount not exceeding Rs.....in words
.....
.....against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said Contractor(s) of any of the terms and conditions contained in the said agreement.

2. We.....
.....
.....(name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the Contractor(s) 'failure to perform' the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.....in words.....

Sign and seal of issuing bank

Bank Guarantee No.....Date.....Banker Name.....
Bank Guarantee Value Rs.....

3. We undertake to pay conditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We.....(name of Bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till Purchase Department of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (i) Unless a demand or claim under this guarantee is made on us in writing on or before(date) (After 2 months from the date of completion of supplies) we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date. (ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack. Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the Bank personally.

Sign and seal of issuing bank

Bank Guarantee No.....Date.....Banker Name.....
Bank Guarantee Value Rs.....

6. We.....(name of the Bank), further agree with the company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the company or any indulgence by the company to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating would, but for this provision, have effect of not so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. The guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency of or change in the constitution of the Contractor, but shall in all respects and for all purpose be binding and operative until all payments of all moneys due or that may hereafter become due to the said company or settled irrespective of any liability or obligation of the Contractor under the said Contract.

9. It shall not be necessary for the company to proceed against the Contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained from the Contractor shall, at the time when proceedings are taken against the Guarantor hereunder be outstanding or unrealized.

10. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Ranipet, Tamilnadu Jurisdiction.

11. The Bank declares that it has powers to issue this Guarantee under the Bank's Memorandum and Articles of Association and the undersigned has full powers to do so on its behalf under the power granted to him by the proper authorities of the Bank.

12. We(name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we.....
(name of Bank) have hereunto setout Bank Seal the.....
day of.....month 2014.

Sign and seal of issuing bank.

Payment Mechanism at BHEL, Ranipet

(Effective for all tenders issued by BHEL Ranipet from 01 July 2011 onwards unless otherwise notified of change/s in writing given by an authorized official of BHEL, Ranipet)

BHEL, Ranipet's payment mechanism will be as follows: (All Bidders are requested to read this carefully and take note of it before submitting their offer)

All bills of Suppliers processed for payment by BHEL, Ranipet shall pass through the following milestones:

(1) Receipt of materials at BHEL, Ranipet Stores (evidenced by the Day-Book Number and Date generated at BHEL Stores, Ranipet) or Receipt of materials at Project Site / Destination specified in the Purchase Order (as evidenced by the acknowledgement given by the Consignee).

(2) Acceptance of the supplied materials at BHEL Stores, Ranipet. (Proof of evidence: Stores Receipt voucher - Short form "SRV", raised by BHEL Stores, Ranipet referenced by the SRV Number and Date)

(3) Receipt and Registration of the Bills / Invoices of the Supplier at BHEL, Ranipet Accounts Department. (evidenced by the ABS Number and Date)

(4) Receipt of clarifications, if any that may be required by BHEL, Ranipet Accounts or Purchase Department, from the Supplier. (As evidenced by the IOM Inward Date)

(5) Bill processing and passing.

(6) Payment release.

All these events are transparently available in the SCM web-site of BHEL, Ranipet,

{<http://bapscm.bhelrpt.co.in/purc>} which can be viewed by all registered supplier with a password.

Allowed Time frames:

A] From DB to SRV: 10 Days

B] From SRV to ABS: 15 Days

C] From ABS to Bill Pass: 07 Days (if Stage 4 above is not applicable)

OR

From IOM to Bill Pass: 07 Days (if Stage 4 above is applicable)

D] From Bill Pass to Payment Release: As per payment terms of the Purchase order.

All Suppliers payment/s would be released based on seniority of receipt of the processed bills at the payment section of BHEL, Ranipet Accounts Department.

The seniority would be based on the sequence of milestone events listed above.

In the sequence of the bill processing the preceding mile-stone seniority will be void, if the subsequent event occurs beyond the permitted time frame between two successive events.

Thus for example:

Start seniority would be with the DB date.

If the SRV date is greater than 10 days of the DB date, then the seniority of the DB date would be replaced by the SRV date.

If the ABS date is greater than 15 days of the SRV date, then the seniority would be reckoned by the ABS date.

If the Bill pass date is greater than 07 days of the ABS date then the seniority would be the date of inward receipt of the IOM.

The logics of these sequence is that SRV, ABS, IOM inward entry are dependent entirely on submission of correct documentation by Suppliers, as called for in the Purchase Order. If the documents are correctly submitted each of the milestone listed above will occur within BHEL, Ranipet within the timelines specified above.

Hence, in their own interest all Suppliers are requested to take note of this process and comply with the same.

Caution: Suppliers' payments would get delayed / affected if they fail to adhere to the submission of the documents specified in the Purchase Order / Contract, since the listed milestone events occurrence are contingent upon the availability of the requisite documents.