

**Enquiry items along with quantities:**

It. no	Size & Item description	Technical requirement	Quantity in kg
1	75 mm dia X 3000 mm to 6000 mm LG	1.5% Ni-Cr-Mo, hot rolled, hardened and tempered steel round bars to material specification AA10501 rev-14. material test certificate covering all the chemical and mechanical properties as per BHEL spec. AA10501 rev-14 shall be furnished along with supply. Inspection at source by BHEL/third party shall be done as per QAP/TSD/FMS/10501 only. all other details as per spec. AA10501 rev 14.	22550
TOTAL			22550 kg

Supplies quantity are to be restricted between 22550 kg & 18450 kg.

**Pre-qualification criteria:**

S. No.	Description of pre-qualification requirement	Vendor Response	
		Complied/ Not complied	Supporting Documents required to accept compliance
1	Manufacturer of steel bar / their authorized representative	YES / NO	Bidders may be either Manufacturers or dealer / reseller / channel partner / distributor etc. If the bidder is not Manufacturer, then he has to submit the valid Authorization dealer/vendor certificate from Manufacturer.
2	Offers of those parties will be considered who or their manufacturer has supplied "Steel Bar/Forgings" of minimum value INR 7.95 lacs during any one year in last 3 years from date of tender opening.	YES / NO	Relevant PO copies along with proof of supply (invoice copy / completion certificate etc.) to be submitted.

Note:

1. BHEL has right to verify information / confirmation furnished by asking additional documents, proof etc.

**ALL THE ABOVE POINT WISE PRE-QUALIFICATION REQUIREMENT ARE TO BE NECESSARILY ACCEPTED BY THE BIDDERS FOR THEIR OFFERS TO BE CONSIDERED FAILING WHICH OFFERS SHALL BE REJECTED.**

**BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL**  
**MATERIAL MANAGEMENT – STEEL DIVISION**

*For this Procurement, Government of India Public Procurement (Preference to Make in India), Order 2017 with its amendments and subsequent Orders issued by the respective nodal ministries shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.*

*As per the Provisions of this order, please submit **a self-certification complying with the conditions below on company letterhead duly signed by competent authority.***

I ....., hereby declare on behalf of M/s. .... that we are participating in the Enquiry No. .... floated by BHEL, Bhopal (MP), India and shall comply with following:

1. Public Procurement (Preference to Make in India), Order 2017 *with its amendments* and subsequent Orders issued by the respective nodal ministries shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

- (a) A supplier will be treated as “**Class-I Local Suppliers**”, if the items quoted by bidder have local content equal to or more than 50%.
- (b) ‘**Local Content**’ means the amount of value added in India, which shall be total value of item quoted (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, **in percent**.

2. I hereby declare that our firm qualifies as “**Class-I Local Suppliers**”.

**a. The Local Content in the items quoted under this Enquiry is ..... Percent**

**b. Details of location(s) in India where this value addition shall be done, is/are as follows:**

- (a) .....
- (b) .....
- (c) .....

(.....)

For M/s. ....

(Seal & Sign)



# CORPORATE PURCHASING SPECIFICATION

AA10501

Rev No.14

PREFACE SHEET

## 1.5% NICKEL-CHROMIUM-MOLYBDENUM HOT ROLLED/FORGED STEEL BARS- H & T

FOR INTERNAL USE ONLY

REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

### Comparable Standards:

- 1) INDIAN : IS: 5517 – 2004 Gr: 40Ni6Cr4Mo3, Type J, H&T

### Suggested/Probable Suppliers and Grades:

Refer Plant Vendors list

### User Plants References:

- 1) HEP, BHOPAL : PS10559  
2) HEEP, HARDWAR : ---  
3) HPEP, HYDERABAD : HY0210299  
4) HPBP, TRICHY : En 24

Revisions:  
Revised as per email dt 18.12.08 from Shri  
Gopal Bhatt from Bhopal.

**APPROVED:**  
INTERPLANT MATERIAL RATIONALISATION  
COMMITTEE – MRC(S&GPS)

Rev No.14	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 <sup>st</sup> Issue
Dt:18-12-2008	Dt:	Year:2020	HEP, Bhopal	Corp.R&D	April, 1977

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# CORPORATE PURCHASING SPECIFICATION

AA10501

Rev No. 14

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## 1.5% NICKEL-CHROMIUM-MOLYBDENUM HOT ROLLED/FORGED STEEL BARS- H & T

### 1.0 GENERAL:

This specification governs the quality requirements of 1.5% Nickel-Chromium-Molybdenum Hot rolled/forged Steel Bars, Gr: 40Ni6Cr4Mo3 in Hardened and Tempered condition.

### 2.0 APPLICATION:

For the manufacture of bolts, studs and various components of machines.

### 3.0 CONDITION OF DELIVERY:

Hot Rolled / Forged; Hardened and tempered.

**Note:** Sizes up to 100mm in hot rolled  
>100 to 180mm in hot rolled or forged  
above 180mm in forged

The ends of bars shall be reasonably square and true.

The bars shall be supplied in straight lengths without twists and bends.

### 4.0 COMPILANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirements of the following National standard and also meet the requirements of this specification.

IS: 5517 – 1993 Gr: 40Ni6Cr4Mo3, Type: J | Steels for Hardening and Tempering -  
Hardened & Tempered | Specification

### 5.0 DIMENSIONS AND TOLERANCES:

**5.1 Sizes:** Bars shall be supplied to the dimensions specified on the order.

**5.1.1 Length:** Unless otherwise specified, hot rolled bars shall be supplied in 3 to 6 metres length or in multiples with maximum 10%, shorts down to 1 metre.

Forged bars shall be supplied in lengths of 1.5 to 3.0 metres

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It must not be used directly or indirectly in any way detrimental to the Interest of the company.

Revisions:  
Revised as per email dt 18.12.08 from Shri Gopal Bhatt from Bhopal.

**APPROVED:**  
INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(S&GPS)

Rev No.14	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 <sup>st</sup> Issue
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# CORPORATE PURCHASING SPECIFICATION



## 5.2 Tolerance:

**5.2.1 Hot rolled bars:** The bars shall not vary from specified diameter or distance across flats by more than  $\pm 2\frac{1}{2}$  %.

**5.2.2 Forged bars:** The tolerance on the forged bars shall be as follows.

<u>Diameter, mm</u>	<u>Tolerance, mm</u>
50 mm to 175 mm	+ 8.0 mm
Above 175 mm	+ 12.5 mm

**Note:** (Hot rolled & forged bars).

Insignificant surface defects in the form of dent and ripple marks are permissible provided their depth does not exceed half the tolerance on each size.

## 6.0 MANUFACTURE:

Material shall be manufactured from fully killed steel.

## 7.0 HEAT TREATMENT:

The recommended heat treatment is as follows:

Harden in oil / water from a temperature of 830 – 850°C.

Temper at a suitable temperature between 550 – 660°C.

## 8.0 FREEDOM FROM DEFECTS:

The bars shall be sound, straight and free from internal and surface defects, such as seams, laps, cracks or any other defects which may impair the end use.

## 9.0 CHEMICAL COMPOSITION:

The melt analysis of steel and the permissible variation in the composition of the finished product from the melt analysis shall be follows:

Element	Melt analysis percent		Permissible variation, percent, in product analysis
	Min.	Max.	
Carbon	0.35	0.45	$\pm 0.02$
Silicon	0.10	0.35	$\pm 0.03$
Manganese	0.40	0.70	$\pm 0.04$
Nickel	1.25	1.75	$\pm 0.05$
Chromium	0.90	1.30	$\pm 0.05$
Molybdenum	0.20	0.35	$\pm 0.03$
Sulphur	---	0.035	+ 0.005
Phosphorus	---	0.035	+ 0.005



# CORPORATE PURCHASING SPECIFICATION

AA10501

Rev No.14

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## 10.0 TEST SAMPLES:

10.1 One sample shall be taken from each melt for chemical analysis.

10.2 One sample shall be taken from each heat treatment batch for testing of mechanical properties. Test pieces for mechanical tests shall be taken in the longitudinal direction of the piece.

For ruling section up to & including 40mm, the test piece shall be machined coaxially from the test bars. For ruling section above 40mm the longitudinal axis shall be at least 12.5 mm from surface of the test bars.

Test methods for determining mechanical properties shall be as per IS: 1598 (For IZOD impact test)/IS: 1757 (For impact test in ISO-V Charpy) and IS: 1608 (For tensile test) or any other reputed International Standard.

10.3 For ruling section above 200mm, tensile test samples can be taken in tangential or transverse direction.

## 11.0 MECHANICAL PROPERTIES (In Hardened and Tempered Condition):

Ruling section, mm	Tensile strength, N/mm <sup>2</sup>	0.2%/PS/YS N/mm <sup>2</sup> min	%E $5.65\sqrt{S_0}$ min	* IZOD impact J, min	Hardness ** BHN
up to 30	1200, min	1000	10	30 (25)	360 – 420
> 30 to = 63	1100 – 1250	880	11	41 (35)	330 – 390
> 63 to = 100	1000 – 1150	800	13	48 (42)	300 – 350
>100 to = 150	900 – 1050	700	15	55 (50)	270 – 300
>150	800 – 950	600	16	55 (50)	240 – 285

\* Average of 3 samples applicable for sizes above 16 mm ruling section only. Values in bracket are in ISO - V Charpy.

\*\* Hardness shall be reported for information only.

## 12.0 ULTRASONIC TEST:

12.1 Each bar above 100 mm shall be tested ultrasonically in accordance with BHEL standard AA0850118 to ensure freedom from internal defects.

The norms of acceptance shall be as per category 2 of the above standard.

12.2 **Optional tests:** If specified on order, each bar > 40 to 100 mm shall be tested ultrasonically in accordance with BHEL standard AA0850118 to ensure freedom from internal defects and the norms of acceptance shall be as per category 2.

# CORPORATE PURCHASING SPECIFICATION



## 13.0 TEST CERTIFICATES:

Three copies of test certificates shall be supplied, unless otherwise stated on the order. In addition, the supplier shall ensure to enclose one copy of the test certificate along with their dispatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:

### **BHEL References:**

AA10501, Rev.No.14: 1.5% Nickel-Chromium-Molybdenum Hot Rolled/Forged Steel Bars- H&T  
BHEL order No,

### **Supplier's References:**

Name:

Identification No:

Melt No:

Details of heat treatment:

### **Result of Tests:**

Dimensional inspection.

Results of chemical analysis, mechanical and & Ultrasonic tests.

## 14.0 PACKING AND MARKING

The bars shall be suitably packed in bundles to prevent corrosion and damage during transit.

Each bar equal to or greater than 50 mm in diameter or of equivalent cross sectional area shall be stamped with 'AA10501' and melt number on the side near the end or on the face.

Bars below 50 mm shall be bundled together and tied with wire at 3 to 4 places along the length of the bars.

A metal label shall be securely attached to each bundle and shall bear the following information:

AA10501: 1.5% Nickel-Chromium-Molybdenum Hot Rolled/Forged Steel Bars- H & T.

BHEL Order No.:

Consignment/Identification No.:

Melt No.:

Size and Weight:

Supplier's Name:

## 15.0 REFERRED STANDARDS (Latest Publications Including Amendments):

1. IS: 1598

2. IS: 1608

3. IS: 1757

4. IS: 5517

5. AA0850118

## STANDARD QUALITY PLAN

<b>QAP NO:</b>		<b>QAP/TSD/FMS/10501</b>		<b>REV.00</b>	<b>Date: 02/01/2018</b>					
<b>CUSTOMER:</b>		<b>BHEL BHOPAL</b>			<b>VENDOR NAME:</b>					
<b>DESCRIPTION MATERIALS:</b>		<b>1.5% Ni-Cr-Mo HOT ROLLED/ FORGED STEEL BARS - H&amp;T</b>								
<b>SPECIFICATION</b>		<b>AA10501</b>		<b>Rev. No.</b>	<b>14</b>					
<b>P.I./ENQ.NO. /P.O. NO.</b>				<b>Date:</b>						
<b>Sr. No.</b>	<b>Characteristics</b>	<b>Class</b>	<b>Quantum of check</b>	<b>Reference Document</b>	<b>Acceptance Norm</b>	<b>Type of record</b>	<b>Inspection Agency</b>			<b>Remarks</b>
							<b>P</b>	<b>W</b>	<b>V</b>	
01	<b>Chemical composition</b>	Maj	Each melt	AA 10501	As per spec	TC	2	1	-	
02	<b>Grain Size</b>	Maj	Each melt	ASTM E112	ASTM E112	TC	2	-	1	
03	<b>Nonmetallic Inclusion</b>	Maj	Each melt	ASTM E45 Method A	ASTM E45 method A	TC	2	-	1	
04	<b>Macro</b>	Maj	Each melt	ASTM E381	ASTM E381	TC	2	-	1	
05	<b>Visual Examination</b>	Maj	100% of each lot/Melt	AA 10501	Free From surface defect & shall be smooth	TC	2	1	-	10% Witness by TPIA
06	<b>Dimensional Inspection</b>	Maj	10% of each lot/Melt	AA 10501	As per Spec	TC	2	1	-	
07	<b>Heat Treatment</b>	Maj	100% of each lot/Melt	AA 10501	As per spec	TC	2	-	1	HT Charts review per batch each melt
08	<b>Identification of test sample</b>	Maj	10% of each lot/Melt	AA 10501	As per spec	TC	2	1	-	As per Sample Requirement
09	<b>Ultrasonic Test</b>	Maj	100% of Bars	ASTM A388/BHEL Spec (Dia. 40 mm above)	As per spec	TC	2	1	-	
10	<b>Mechanical properties (Tensile strength, Yield, Elongation hardness etc.)</b>	Maj	Each Heat	AA 10501	As per spec	TC	2	1	-	Random Sample as per Spec.
11	<b>Stamping &amp; Marking</b>	Maj	100% of Bars	AA 10501	As per spec		2	-	1	
12	<b>Documentation: TC &amp; Inspection Report</b>	Maj	Verification	AA10501	As per spec		2	-	1	TC & Reports Endorsed by TPIA

## STANDARD QUALITY PLAN

Legends: Maj = Major, V= Verification, P=Perform, W=Witness, TC= Test Certificate. 1=BHEL/BHEL appointed TPIA, 2= Vendor/Sub/Vendor

Prepared By

*Anandk*

~~Checked By~~

*12*  
*21/18*  
Approved By

जी. एस. नेताम / G. S. NETAM  
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