

(ALL DIMENSIONS ARE IN mm.)

INVENTORY No.

 $(001)$ 

1. SCREW,(IT.001) TO BE NICKEL PLATED TO PR.S. AA 0673605 (0.010TK)  
THEN SILVER TIP ITEM 002 TO BE BRAZED FOR VAR.00.

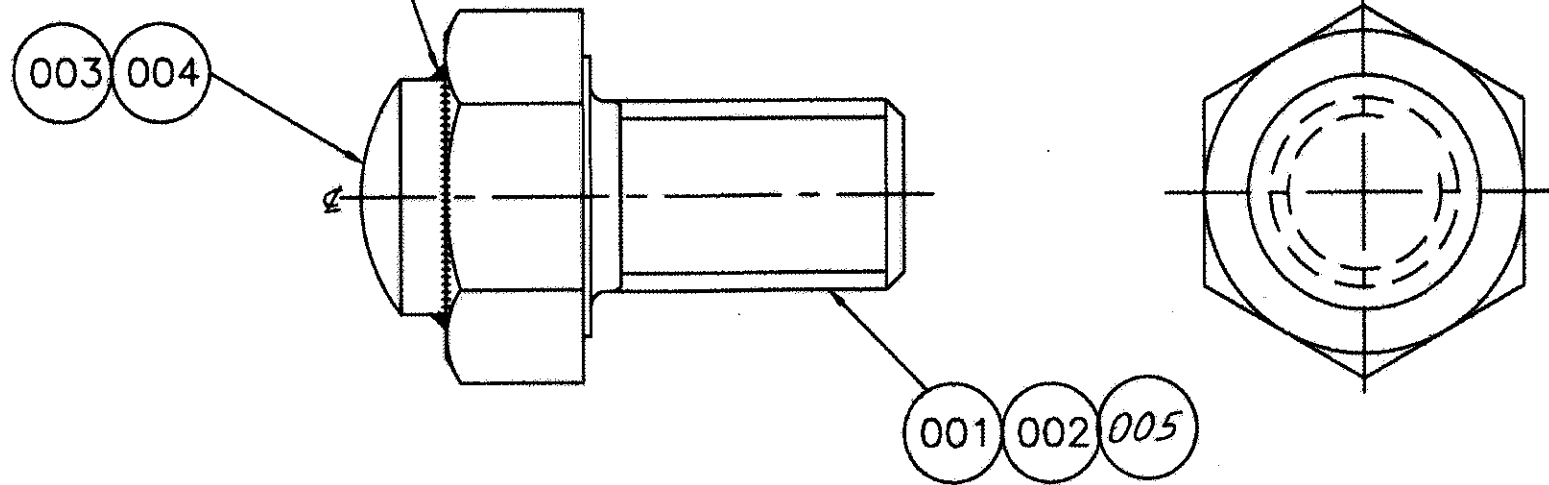
R/29/80

ADDITIONAL INFORMATION				उत्पाद का प्रकार या ग्राहक/परियोजना का नाम D.E. LOCOS									
STATUS OF DRAWING M				TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT INDIAN RAILWAYS									
DISTRIBUTION OF PRINTS				<div>बी.एच.ई.एल. भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHEL BHARAT HEAVY ELECTRICALS LTD. BHOPAL</div>				नाम /NAME		हस्ता./SIGN.	दि./DATE	पैरि की संख्या NO. OF VAR. 01	
OFFICE COPY	-	1	खनाया DRN.					A.S.E.	-SD-	30.08.80			
SWM	-	4	जाँचा CKD.					R.S.V.	-SD-	30.08.80			
TCX (SWM)	-	1	स्वीकृत APD.					M.B.S.	-SD-	10.10.80			
REV	DATE	ALTERED	V.J.	-SD-	विभाग DEPT.	अन.टोल.नाप की त्रुटि UNTOLE. DIMS. GR.		अनुपात SCALE	भार का ग्रा. WEIGHT (K.G.)	उसे. ड्राईंग का संदर्भ REF. TO ASSY.	सद संख्या ITEM NO.	सद संख्या NO. OF ITEM	
04	03.05.93	CHECKED	S.C.V.	-SD-	कोड CODE. 407	REF. CG06503		2:1	-	उसे. ड्राईंग का संदर्भ REF. TO ASSY.	सद संख्या ITEM NO.	सद संख्या NO. OF ITEM	
BRAZING ALLOY TO BRAZE IT. 001 & 002 WAS TO PS 14701. STYLE NO. WAS 6 DIGITS.				शीर्षक/TITLE ADJUSTABLE CONTACT SCREW					ड्राईंग क्र./DRAWING NO. 3 578 16 3 0001				पुन./REV. 06
E108									शीट क्र./SHT.NO 01 शीटों की सं./NO.OF.SHT. 01				

(ALL DIMENSIONS ARE IN mm.)

**INVENTORY No.**

BRAZE WITH BRAZING ALLOY TO PRS. CG 03002



FINISH:- SILVER PLATE VARS. 00 & 01.

STYLE LIST				
STYLE NO.	ITEM NO.	DESCRIPTION	RECORDED	
			SIGN	DATE
BP 9088555338	VAR.00	CONTACT SCREW	M.P.	14.07.99
BP 9088571783	VAR.02	CONTACT SCREW	DPV	25-3-07

001	—	—			005	SCREW HEX. M5X8,STAINLESS ST		DIN 933/BN 624		BP 9018571776						
001	—	001			004	CONTACT TIP		4 580 14 3 0003	001							
—	001	—			003	CONTACT TIP		B 8700388	001							
—	001	—			002	SCREW		4 578 16 3 0002	002							
—	—	001			001	SCREW		4 578 16 3 0002	001							
VAR.02	VAR.01	VAR. 00	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD.	DRAWING NO.	IT. NO. VAR	MATL. CODE. MATL. SPCN.	A C	UNIT	UNIT WT. QTY.	GS.		

R03 ~~68~~ R/17/81

पॉट क्र /SHT.NO 01 पॉटों की सं./NO.OF.SHE. 01

**F304**

**KANSARA/RAJ**

INVENTORY NO.

VAR.00

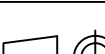
Ø5.1 & C'SK TO Ø6.5  
EACH SIDE

1. ITEM 001 IS TO BE NICKEL PLATED BEFORE SILVER SOLDERING TO ITEM 002.

ZINC PLATE & PASSIVATE TO PR.S. AA 0673603 & AA 0673604 (0.013 TK.) TO IT.003.

TOOL LIST		
ITEM	TOOL	DESCRIPTION
001	1488022	BENDING TOOL
001	1488965	DRILL JIG (AFTER BEND)

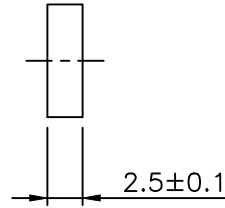
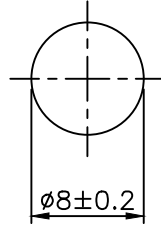
-			003	SPRING PIN 10 DIA. BRT. S. BAR	1			AA 1010212044		MM.	0.02 KG.		
								AA 10112			27		
002			002	CONTACT 1.6x8 99.9% PURE SILVER						MM.	2.56 Gm.		
											9.5		
001			001	FINGER 3.15 TK.x9.5 H.R.C. ST. SHT.	1			AA 1011713136		MM.	0.02 KG.		
								AA 10113			66.7		
VAR OO	REMARKS	VAR. NO.	ITEM NO	DESCRIPTION	STD.	DRAWING NO.	IT.NO	MATL.CODE		A C UNIT	UNIT WT.	G.S.	ZONE
							VAR	MATL SPECN.			QTY.		

ADDITIONAL INFORMATION			उत्पाद का प्रकार या ग्राहक/परियोजना का नाम		D.E. LOCOS INDIAN RAILWAYS					
STATUS OF DRAWING M			TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT							
DISTRIBUTION OF PRINTS OFFICE COPY 1 SWM 4 TCX(SWM) 1			<div>बी.एच.ई.एल. भोपाल</div> <div>BHEL</div> <div>भारत हेवी इलेक्ट्रिकल्स लिमिटेड BHARAT HEAVY ELECTRICALS LTD. BHOPAL</div>		<div>खनपा DRN.</div> ASE	<div>नाम /NAME</div> sd/-	<div>हस्ता/SIGN.</div>	<div>दि./DATE</div> 31.8.80	<div>वेरि क सैफ्टा NO. OF VAR.</div> 00	
			<div>जौचा RSV</div>	<div>स्वकृत APPD.</div> MBS				10.10.80		
REV.	DATE	ALTERED CKM CHECKED PTP APPROVED PTP	विभाग DEPT. CEE	अनु.लान्प की त्रेपी UNTOL. DIMS. GR.		अनुपात SCALE 1:1	भार कि. ग्रा. WEIGHT (K.G.) 1 578 16 30001	जसे. ड्रइंग का संदर्भ REF. TO ASSY.	मंद सैफ्टा ITEM NO.	मंद सैफ्टा NO. OF ITEM 003
ZONE	STYLE CODE NOS. FOR IT.003 & VAR.00 WERE 854902 & 855070 RESP'Y. FINISH WAS PRS.7608A & 7606A RESP'Y.	कोड CODE 407	शीर्षक /TITLE DETAIL OF INTERLOCK FINGER FOR ELECTRO PNEUMATIC REVERSER				ड्रइंग क्र./DRGAWING NO. 2 578 16 3 0004			पुन./ REV. 03
2							प्रक क्र./SHT NO. 01	प्रकी की संख्या / No.OF SHT 01		


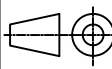
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	RKG	-SD-	REV.	DATE	ALTERED	K.L.J.	-SD-	ADDITIONAL	D.E. LOCO
02	10.08.96	CHECKED	A.S.A.	-SD-	01	22.04.93	CHECKED	S.C.V.	-SD-	INFORMATION	
		APPROVED	M.S.Q.	-SD-			APPROVED	S.C.V.	-SD-	STATUS OF	M
WEIGHT OF IT. 001 WAS 0.0013KG.					TOLERANCE ON THE DIM. WERE NOT ON.					DISTRIBUTION O/C -1 TCX (SWM)-1	
E712					E105					OF PRINTS SWM -4	



THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF **BHARAT HEAVY ELECTRICALS LIMITED.**  
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

REF. DRG. NO.	BP 9088558264		001	8 DIA. 99% PURE SILVER	STD	MATL. CODE	A C	UNIT	MM	1.320 GM
	REMARKS	ITEM NO.	DESCRIPTION	MATL. SPECN.					UNIT WT.	
SIGN. & DATE	R /80/ 87									
	COMPUTER FILE 45781030001		 <b>BHARAT HEAVY ELECTRICALS LTD.</b> BHOPAL		नाम / NAME P.K.S. जांचा / CKD. P.T.P. स्वीकृत / APPD. I.S.R.	हस्ता. / SIGN -SD- -SD- -SD-	दि. / DATE 27.09.87 27.09.87 29.09.87	वेरि की संख्या NO.OF VAR. -		
INVENTORY NO.	विभाग DEPT. CEE	अनु.टोल.नाप की त्रुटि UNTOL. DIMS. GR.	कोड CODE 407	REF. CG 06503	 अनुपात SCALE 2:1	भार (कि.ग्रा.) WEIGHT(KG)	असे.ड्राईंग का संदर्भ REF.TO ASSY.DRG. 3 578 10 3 0003 3 578 16 3 0001 3 580 14 3 0004	मद क्र. ITEM NO. 002 002 002	मद संख्या NO.OF ITEM 001	
	शीर्षक /TITLE <b>CONTACT TIP</b>						ड्राईंग क्र. /DRAWING NO. <b>4 578 10 3 0001</b>		पुन. /REV 02	
						शीट क्र /SHT.NO 01		शीटों की सं./NO.OF.SHT. 01		


(ALL DIMENSIONS ARE IN mm)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.																																																																																																																											
REV.		DATE		REV.		DATE		ADDITIONAL INFORMATION																																																																																																																			
		ALTERED				ALTERED		25KV AC BG EMU																																																																																																																			
		CHECKED		01		26.6.05		CHECKED																																																																																																																			
		APPROVED						APPROVED																																																																																																																			
				DRG. REDRAWN & COMPUTERISED.				STATUS OF DRAWING																																																																																																																			
								M																																																																																																																			
								DISTRIBUTION 0/C - 1 SWM - 4																																																																																																																			
								OF PRINTS TCX (SWM) - 1																																																																																																																			
<div><div></div><div></div><div><div>001</div><div>002</div></div></div>																																																																																																																											
<table><tr><td colspan="2"></td><td>002</td><td colspan="2">2 BAx3/8" LG SLOTTED HEX. HD. STEEL SCREW</td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td></tr><tr><td colspan="2"></td><td>001</td><td colspan="2">SCRU HEX. SLT. P. M5x10 - 4.8/R5</td><td colspan="2">1</td><td colspan="2">BP 7121105926</td><td colspan="2"></td></tr><tr><td colspan="2"></td><td></td><td colspan="2"></td><td colspan="2"></td><td colspan="2">BP 7121105</td><td colspan="2"></td></tr><tr><td colspan="2">REMARKS</td><td>ITEM NO.</td><td colspan="2">DESCRIPTION</td><td>STD</td><td colspan="2">MATL. CODE</td><td>A/C</td><td>UNIT</td><td>UNIT WT.</td></tr><tr><td colspan="2"></td><td></td><td colspan="2"></td><td></td><td colspan="2">MATL. SPECN.</td><td></td><td></td><td>QTY.</td></tr></table>												002	2 BAx3/8" LG SLOTTED HEX. HD. STEEL SCREW										001	SCRU HEX. SLT. P. M5x10 - 4.8/R5		1		BP 7121105926											BP 7121105				REMARKS		ITEM NO.	DESCRIPTION		STD	MATL. CODE		A/C	UNIT	UNIT WT.							MATL. SPECN.				QTY.																																																											
		002	2 BAx3/8" LG SLOTTED HEX. HD. STEEL SCREW																																																																																																																								
		001	SCRU HEX. SLT. P. M5x10 - 4.8/R5		1		BP 7121105926																																																																																																																				
							BP 7121105																																																																																																																				
REMARKS		ITEM NO.	DESCRIPTION		STD	MATL. CODE		A/C	UNIT	UNIT WT.																																																																																																																	
						MATL. SPECN.				QTY.																																																																																																																	
<table><tr><td colspan="5">INVENTORY NO.</td><td colspan="5">SIGN. &amp; DATE</td><td colspan="5">WSN. B 747 REF. DRG. NO.</td></tr><tr><td colspan="5">कम्प्यूटर ड्राइंग</td><td colspan="5">पहल कर्मक 45781630002</td><td colspan="5">BHARAT HEAVY ELECTRICALS LTD. BHOPAL</td></tr><tr><td colspan="2">DEPT. CEE</td><td colspan="2">UNTOL. DIMS. GR.</td><td colspan="2">SCALE</td><td colspan="2">WEIGHT(KG)</td><td colspan="2">REF. TO ASSY. DRG.</td><td colspan="2">ITEM NO.</td><td colspan="2">NO. OF ITEM</td></tr><tr><td colspan="2">CODE 407</td><td colspan="2">CG 06503</td><td colspan="2">5:1</td><td colspan="2">-</td><td colspan="2">001-35781630008</td><td colspan="2">001</td><td colspan="2">002</td></tr><tr><td colspan="8">/TITLE</td><td colspan="4">DRAWING NO.</td><td colspan="2">REV</td></tr><tr><td colspan="8">SCREW</td><td colspan="4">4 578 16 3 0002</td><td colspan="2">01</td></tr><tr><td colspan="8"></td><td colspan="2">SHT. NO</td><td colspan="2">01</td><td colspan="2">NO. OF SHT.</td></tr><tr><td colspan="8"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2">01</td></tr></table>										INVENTORY NO.					SIGN. & DATE					WSN. B 747 REF. DRG. NO.					कम्प्यूटर ड्राइंग					पहल कर्मक 45781630002					BHARAT HEAVY ELECTRICALS LTD. BHOPAL					DEPT. CEE		UNTOL. DIMS. GR.		SCALE		WEIGHT(KG)		REF. TO ASSY. DRG.		ITEM NO.		NO. OF ITEM		CODE 407		CG 06503		5:1		-		001-35781630008		001		002		/TITLE								DRAWING NO.				REV		SCREW								4 578 16 3 0002				01										SHT. NO		01		NO. OF SHT.														01	
INVENTORY NO.					SIGN. & DATE					WSN. B 747 REF. DRG. NO.																																																																																																																	
कम्प्यूटर ड्राइंग					पहल कर्मक 45781630002					BHARAT HEAVY ELECTRICALS LTD. BHOPAL																																																																																																																	
DEPT. CEE		UNTOL. DIMS. GR.		SCALE		WEIGHT(KG)		REF. TO ASSY. DRG.		ITEM NO.		NO. OF ITEM																																																																																																															
CODE 407		CG 06503		5:1		-		001-35781630008		001		002																																																																																																															
/TITLE								DRAWING NO.				REV																																																																																																															
SCREW								4 578 16 3 0002				01																																																																																																															
								SHT. NO		01		NO. OF SHT.																																																																																																															
												01																																																																																																															

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF <b>BHARAT HEAVY ELECTRICALS LIMITED.</b> IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.	REV.	DATE	ALTERED	MDS	02/11/21	REV.	DATE	ALTERED	RKG	01/10/96	ADDITIONAL INFORMATION	D.E. LOCO
	02	08.11.21	CHECKED	BSM	08/11/21	01	08.10.96	CHECKED	A.S.A.	08/10/96	STATUS OF DRAWING	M
			APPROVED	RV	08/11/21			APPROVED	M.S.Q.	08/10/96	DISTRIBUTION OF PRINTS	O/C -1 TCX (SWM)-1 SWM -4
	UNIT FOR WEIGHT (IN GRAM) ADDED IN BOM.					ST. NO. WAS 854404 & WEIGHT ADDED.					E712	
B 8700388, IT.001 REF. DRG. NO.	BP 9048544041		001	CONTACT TIP 6 DIA 99% SILVER							GM	0.742
											MM	2.5
SIGN. & DATE	REMARKS	ITEM NO.	DESCRIPTION		STD	MATL. CODE		A/C		UNIT	UNIT WT.	
						MATL. SPECN.					QTY.	
INVENTORY NO.	R/31/ 79											
			<b>भारत हेवी इलेक्ट्रिकल्स लिमिटेड</b> <b>BHARAT HEAVY ELECTRICALS LTD.</b> <b>BHOPAL</b>		बनाया DRN. जांचा CKD. स्वीकृत APPD.	नाम /NAME A.S.E. S.C.V. M.B.S.	हस्ता /SIGN Sd/- Sd/- Sd/-	दि. /DATE 08.11.79 08.11.79 27.11.79	वेरि की संख्या NO.OF VAR. -			
विभाग DEPT. CEE कोड CODE 407	अनु. टोल. नाप की त्रेणी UNTOL. DIMS. GR. REF. CG 06503		अनुपात SCALE 5:1	भार (कि.ग्रा.) WEIGHT(KG) 0.742(GM)	असे. ड्राईंग का संदर्भ REF.TO ASSY.DRG. 3 578 16 3 0008 3 580 14 3 0004	मद क्र. ITEM NO. 004 002	मद संख्या NO.OF ITEM 001					
शीर्षक /TITLE						ड्राईंग क्र. /DRAWING NO. 4 580 14 3 0003			पुन. /REV 02			
						शीट क्र /SHT.NO 01			शीटों की सं./NO.OF.SHT. 01			

	<b>CORPORATE PURCHASING SPECIFICATION</b>	AA10112 Rev No. 07 PAGE 1 of 4																		
<b>BRIGHT STEEL BARS AND SECTIONS (STANDARD QUALITY)</b>																				
<p><b>1 GENERAL:</b></p> <p>This specification governs the quality requirements of Bright Steel Bars and Sections of standard quality, such as I-beams and equal angles required in very small sections.</p> <p><b>2 APPLICATION:</b></p> <p>Bars are used in the manufacture of threaded and machined components for general engineering purposes. Sections are used as stator spacer plate vents in generators.</p> <p><b>3 CONDITION OF DELIVERY:</b></p> <p><b>3.1</b> Round Bars - Class 4, surface quality. Up to 50 mm diameter - Cold drawn. Above 50mm diameter - Cold drawn or Hot rolled, turned and polished</p> <p><b>3.2</b> Rectangular/Square/Hexagonal Bars - Class 3, surface quality. All sizes - Cold drawn.</p> <p><b>3.3</b> Sections - Class 4, surface quality. All sizes - Cold drawn</p> <p><b>3.4</b> Bars and sections shall be straight, with their ends sheared, square and true and shall have a smooth surface.</p> <p><b>3.5</b> The bars and sections shall be given a clear temporary rust preventive (TRP) coating to avoid corrosion during transit and storage. Black TRP coating is not acceptable. Clear TRP used shall be free from pungent smell. The following clear TRP's are suggested:  a) Servo RP 150 - M/s Indian Oil Corporation  b) HE - 1612 - M/s. BHEL, Bhopal  c) Rustilo DW-901 - M/s. Indrol Lubricants and Specialties Ltd.  d) Rustpro Special - M/s. Tide water oil co.  e) Any other clear TRP conforming to IS: 1154</p> <p><b>4 COMPLIANCE WITH NATIONAL STANDARDS:</b></p> <p>The material shall comply with the requirements of the following National standards and also meet the requirements of this specification.</p> <p style="margin-left: 40px;">IS: 9550-2001 : Bright steel bars</p>																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="3" style="padding: 5px;"> <b>Revisions:</b>  CI 27.2.d of MOM of MRC-S&amp;GPS </td> <td colspan="3" style="padding: 5px; text-align: center;"> <b>APPROVED:</b>  INTERPLANT MATERIAL RATIONALISATION  COMMITTEE – MRC(S&amp;GPS) </td> </tr> <tr> <td style="width: 20%; padding: 5px;">Rev No.07</td> <td style="width: 20%; padding: 5px;">Amd No.</td> <td style="width: 20%; padding: 5px;">Reaffirmed</td> <td style="width: 20%; padding: 5px;">Prepared</td> <td style="width: 20%; padding: 5px;">Issued</td> <td style="width: 20%; padding: 5px;">Dt. of 1<sup>st</sup> Issue</td> </tr> <tr> <td style="padding: 5px;">Dt:15-06-2005</td> <td style="padding: 5px;">Dt:</td> <td style="padding: 5px;">Year:2019</td> <td style="padding: 5px;">HEP, Bhopal</td> <td style="padding: 5px;">Corp.R&amp;D</td> <td style="padding: 5px;">September 1976</td> </tr> </table>			<b>Revisions:</b> CI 27.2.d of MOM of MRC-S&GPS			<b>APPROVED:</b> INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(S&GPS)			Rev No.07	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 <sup>st</sup> Issue	Dt:15-06-2005	Dt:	Year:2019	HEP, Bhopal	Corp.R&D	September 1976
<b>Revisions:</b> CI 27.2.d of MOM of MRC-S&GPS			<b>APPROVED:</b> INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(S&GPS)																	
Rev No.07	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 <sup>st</sup> Issue															
Dt:15-06-2005	Dt:	Year:2019	HEP, Bhopal	Corp.R&D	September 1976															



## 5 DIMENSIONS AND TOLERANCES:

### 5.1 Sizes:

Bars shall be supplied to the dimensions specified in BHEL order.

### 5.2 Tolerances:

#### 5.2.1 Rectangular/Square/Hexagonal/Flat Bars:

Unless otherwise specified, tolerances on dimensions shall be as follows:

For drawn round bars and turned bars h10 to table 2 of IS:9550

For hexagonal and square drawn bars upto and including 80mm h11 and above 80mm h12 according to table 2 of IS:9550

For drawn flats in accordance with table 3 and 4 of IS:9550

For ground products in accordance with table 1 and 2 of IS:9550

#### 5.2.2 Sections:

As specified in BHEL order/drawing.

### 5.3 Length:

Bar and sections shall be supplied in lengths of 2.5 to 4.5 meters with maximum 10% of shorts of not less than 1.5 meters.

### 5.4 Straightness:

Unless otherwise agreed to, the permissible deviation shall not exceed 1.5mm in any one meter length. Bars and sections shall be free from twists and bends.

## 6 MATERIAL:

The rolled bars used for purpose of producing the bright bars shall be such, so as to ensure freedom from segregation, piping and other harmful defects.

## 7 MANUFACTURE:

Steel shall be manufactured by the open-hearth, electric, basic oxygen or a combination of these processes.

## 8 FREEDOM FROM DEFECTS:

All finished steel bars and section shall be sound and free from internal and surface defects. They shall be bright and clean.

## 9 SURFACE CONDITION:

### 9.1 Round Bars and Sections:

Shall be entirely free from cracks and other surface defects.

### 9.2 Rectangular/Square/Hexagonal Bar-Type '3' Finish:

Shall comply with IS: 9550, Class 3 of table 5.

## 10 CHEMICAL COMPOSITION:

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





## CORPORATE PURCHASING SPECIFICATION

AA10112

Rev No. 07

PAGE 3 of 4

Element	Melt analysis percent, max	Permissible variation percent
Carbon	0.25	± 0.02
Sulphur	0.040	+ 0.005
Phosphorus	0.040	+ 0.005

### 11 TEST SAMPLES:

One sample for chemical and tensile test shall be selected from finished steel for every 20,000 kg or part thereof, with a minimum one per heat.

### 12 MECHANICAL PROPERTIES:

When tested in accordance with IS:1608, the test pieces shall show the following properties:

#### 12.1 Rectangular/Square/Hexagonal/Section - Cold Drawn:

Tensile Strength : 440 N/mm<sup>2</sup>, min

Elongation on  $5.65\sqrt{S_0}$  gauge length : 8 – 20%

#### 12.2 Round Bars:

##### 12.2.1 Bars upto 50mm Diameter – Cold Drawn

Tensile Strength : 440 N/mm<sup>2</sup>, min

Elongation on  $5.65\sqrt{S_0}$  gauge length : 8 – 20%

##### 12.2.2 Bars above 50mm Diameter:

Cold drawn or hot rolled, turned and polished.

Property	Hot rolled, turned and polished		Cold drawn
Tensile strength, min.	: 410 N/mm <sup>2</sup>		440 N/mm <sup>2</sup>
Elongation on $5.65\sqrt{S_0}$ gauge length	: 23%, min	OR	8-20%

### 13 TEST CERTIFICATES:

Three copies of test certificates shall be supplied, unless otherwise stated on the order.

In addition, to the above, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:

AA10112; Rev. No. 07 :

BHEL order No,

Supplier's Reference:

Name

Identification No.

Melt No.

Results of Tests:

Dimensional inspection.

Results of Chemical analysis and mechanical tests.

**14 PACKING AND MARKING**

The material shall be suitably packed in bundles – polythene wrapped to prevent sagging, corrosion and damage during transit. A suitable clear temporary rust preventive shall be applied all the bars as per clause 3.5 above and finally dispatched in wooden boxes.

Each bar over 50mm shall be stamped at one end with 'AA10112'. Bars 50mm and below shall be bundle together and tied with wire at 3 to 4 places along the length of the bar.

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

AA10112: BRIGHT STEEL BARS AND SECTIONS (STANDARD QUALITY)

BHEL Order No.

Consignment/Identification No.


Melt No.

Size and Weight.

Supplier's Name.

**15 REFERRED STANDARDS** (Latest Publications Including Amendments):

- 1) IS: 1154                      2) IS: 1608                      3) IS: 9550

	<h1 style="margin: 0;">CORPORATE PURCHASING SPECIFICATION</h1>	<div style="border-bottom: 1px solid black; padding: 2px;">AA10113</div> <div style="border-bottom: 1px solid black; padding: 2px;">Rev No. 07</div> <div style="padding: 2px;">PAGE 1 of 5</div>
---	--	---

## HOT ROLLED CARBON STEEL SHEET (330 N/mm<sup>2</sup> Tensile)

**1.0 GENERAL:**

This specification governs the quality requirements of Hot Rolled Carbon Steel Sheet of thickness of 2.5 mm to 4.0 mm (both inclusive).

**2.0 APPLICATION:**

Suitable for cold forming / drawing / fabrication by welding.

**3.0 CONDITION OF DELIVERY:**

Sheets shall be supplied in hot rolled, decaled and oiled condition. Imported sheets shall be supplied in straight lengths. The edges shall be flattened and sheared. Mill edges are not acceptable. Sheets shall be free from waviness and shall have a uniformly dull (matt) finish.

Oil used for rust prevention should be free from pungent smell. The following oils are suggested:

- a) SERVO RP 125 of M/s. IOC.
- b) RUSTOP 387/388 of M/s. HPC
- c) Bharat TCPF of M/s. Bharat Petroleum
- d) Any other TRP conforming to IS : 1154

**4.0 COMPLIANCE WITH NATIONAL STANDARDS:**

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

IS: 5986 – 2011, Gr.: 205: Hot rolled steel flat products for structural forming and flanging purposes - Specification.

**5.0 DIMENSIONS AND TOLERANCES:**

**5.1 Sizes:**

Hot rolled carbon steel sheets shall be supplied to the dimensions in BHEL order.

**5.2 Tolerances:**

The tolerances on sheets shall comply with the following:

**5.2.1 Thickness (IS: 1852):**

Thickness, mm	Tolerance, mm
2.50	± 0.20
3.15	± 0.22
4.0	± 0.25

Revisions: As per Cl.No.38.1 of MOM of MRC– S&GPS			<b>APPROVED:</b> INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(S&GPS)		
Rev No.07	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 <sup>st</sup> Issue
Dt:22-02-2014	Dt:	Year:	HEP, Bhopal	Corp.R&D	July, 1976

# CORPORATE PURCHASING SPECIFICATION



## 5.2.2 Width (IS: 1852):

Width, mm	Tolerance, mm
Upto & incld. 1250 mm	+ 6 mm - 0 mm
Over 1250 mm & upto and incld. 1550 mm	+ 0.5 percent - 0.0 percent
Over 1550 mm	+ 0.6 percent - 0.0 percent

## 5.2.3 Length (Continuous mill) IS: 1852:

Length, mm	Tolerance, mm
Upto & incld. 2500 mm	+ 25 mm - 00 mm
Over 2500 mm	+ 1 percent subject to a maximum of 70 mm - 0 percent

## 5.2.4 Flatness (for cut lengths):

Thickness, mm	Width, mm	Flatness tolerance, mm
From 2.5 to 4.0	Upto & incld. 1200	15
	Over 1200 & upto incld. 1500	20
	Over 1500	25

## 5.2.5 Edge camber IS: 5986:

The edge camber (i.e. lateral departure of the edge of the material from a straight line forming a chord) of sheets in cut lengths and coil shall not exceed the following values:

### 5.2.5.1 For Cut Lengths:

Length in meters		Tolerance, mm
Over	Upto & incld.	
--	1.25	5
1.25	1.80	6
1.80	2.50	8
2.50	3.15	10
3.15	3.55	12
3.55	4.00	16
4.00	5.00	19

### 5.2.5.2 For Coils:

25 mm in any 5000 mm length.



# CORPORATE PURCHASING SPECIFICATION

AA10113

Rev No.07

PAGE 3 of 5

## 6.0 MANUFACTURE:

Process of manufacture is left to the discretion of the manufacturer except Bessemer process.

Material shall be manufactured from semi killed or killed steel.

## 7.0 FREEDON FROM DEFECTS:

The sheets shall be free from harmful defects, twists, buckle, rust, scale and waviness and shall be reasonably smooth, flat and square.

## 8.0 CHEMICAL COMPOSITION:

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

Element	Melt analysis, percent, max.	Permissible variation, percent, max.
Carbon	0.15	0.03
Manganese	0.80	0.05
Sulphur	0.040	0.005
Phosphorus	0.040	0.005

## 9.0 TEST SAMPLES:

### 9.1 Tensile Test:

One sample shall be taken per thickness per consignment from each melt.

As far as possible test pieces shall be cut transverse to the direction of rolling and shall be of full thickness of the sheet rolled.

### 9.2 Bend Test:

One sample shall be taken per thickness per consignment from each melt.

Bend test pieces shall be cut so that the axis of the bend is parallel to the direction of rolling viz. transverse.

**Note:** When more than one thickness is rolled from the same melt, one additional test piece for each thickness shall be taken.

## 10.0 MECHANICAL PROPERTIES:

### 10.1 Bend:

When tested in accordance with IS: 1599, the test pieces shall be capable of being bent cold through 180° close. The outer convex surface of the test piece shall be free from cracks.

### 10.2 Tensile:

When tested as per IS: 1608, the test pieces shall show the following properties:

# CORPORATE PURCHASING SPECIFICATION



Tensile strength	: 330 – 440 N/mm <sup>2</sup>
Yield strength	: 205 N/mm <sup>2</sup> , min.
Elongation:	
For sheets up to & Incl. 3 mm, thick	: 20 %, minimum on 80 mm gauge length
For sheets above 3 mm, thick	: 28 %, minimum in 5.65 √So gauge length

## 11.0 HARDNESS (VICKERS):

When tested in accordance with IS: 1501, the material shall show a Vickers hardness in the range of 100 – 140 HV.

**Note:** Hardness test shall be conducted only when tensile test cannot be performed.

## 12.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied.

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:

AA10113, Rev 07: HOT ROLLED CARBON STEEL SHEET (330 N/mm<sup>2</sup> Tensile)

BHEL Order No,

Supplier's name,

Identification No

Melt No,

Process of manufacture

Details of pickling, descaling and oiling

Results of dimensional inspection

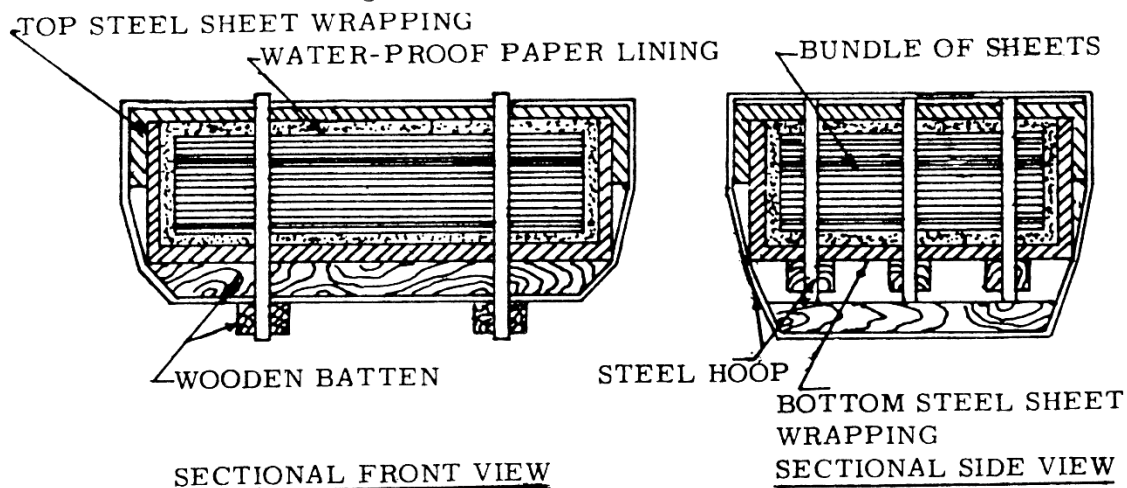
Results of Chemical analysis and Mechanical tests,

**Note:** Material procured, supplied and certified as AA10113 / IS: 5986, Gr.:205 and comply with the requirements of this specification is acceptable.

## 13.0 PACKING AND MARKING:

Steel sheets shall be supplied in bundles and shall be suitably packed in bundles to prevent corrosion and damage during transit.

The recommended packing for imported material shall be as shown below.





# CORPORATE PURCHASING SPECIFICATION

AA10113

Rev No.07

PAGE 3 of 5

**Note:**

- a) Water proof paper lining shall be preferably Volatile Corrosion Inhibitor (V.C.I.) Coated Paper with an additional polythene (100 micron) enveloped.
- b) Approximate weight of each bundle shall be 2 to 3 tonnes. Bundle weighing 2 metric tonnes is however preferred.

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

AA10113:HOT ROLLED CARBON STEEL SHEET (330 N/mm<sup>2</sup> Tensile)

BHEL Order No,

Supplier's Name & Identification No,

Size & Thickness of sheets

Weight

**14.0 REFERRED STANDARDS (Latest publications including amendments):**

- 1) IS: 1154      2) IS: 1501      3) IS: 1852      4) IS: 1599      5) IS: 1608

**Pre-Qualification requirements**

**ATC FOR INDENTED ITEMS**

<b>S. No</b>	<b>Description of requirement</b>	<b>Document to be attached</b>
1	Quoted items SL Nos.	Indicate Quoted item sl nos.
2	Bidder should submit a self-declaration stating that, "Offered item is exactly same as per enquiry and there is no deviation".	Self-declaration on letterhead of firm.
3	If bidder is not OEM, then authorisation certificate from OEM to be submitted.	Valid OEM authorisation to be submitted.
4	<p><b><u>Experience Criteria:</u></b></p> <p>Contract shall be awarded to such vendors who have supplied minimum 10 Nos required respective PI items-</p> <p>i) For item #1 &amp; #2: Either Any one of item #1 or #2 or #3 or similar of item #1, #2, #3.</p> <p>ii) For item #3: Item#3 or similar.</p> <p>In last 15 years (before tender due date) to BHEL or any Central / State Govt. Organization / PSU / Private/ Public Listed Company.</p>	PO COPY/Invoice Copy for other than BHEL BHOPAL PO (PO no for BHEL Bhopal PO)

**Terms Other than PQR to be compiled during Bidding:**

<b>Terms</b>	<b>Complied/Not Complied</b>
Quoted SL NO.	
OEM Declaration/Authorization Certificate to be submitted by vendor	
Delivery accepted as per Tender	
Mobile no of concerned Person	
Email ID	

Note: Bidders providing above documents and not meeting above criteria essential for Offer Consideration.



ITEM SL NO	Quoted/ Not-Quoted
1	
2	
3	

**NO DEVIATION CERTIFICATE**

**Reference:** Bid No. \_\_\_\_\_ Dated: \_\_\_\_\_

**Subject:** Self-Declaration for No Deviation

This is to certify that the items/services offered by us against the above-referred enquiry are **fully compliant** with the specifications, terms, and conditions mentioned in the bid document.

We hereby confirm that **there are no deviations** from the stipulated specifications, commercial terms, conditions, and other requirements of the enquiry.

For \_\_\_\_\_  
(Authorized Signatory)

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

Seal:

**OEM SELF-DECLARATION (FOR OEM)**

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

Subject: **OEM Self-Declaration**

Ref: Bid No. \_\_\_\_\_

We certify that:

1. The bidder **M/s** \_\_\_\_\_ is the OEM\*\* itself.
2. The product(s) offered are **new, genuine, and comply** with all specifications mentioned in the tender.
3. We shall provide full **warranty support, technical assistance, and spare parts** availability as required.

For **(Name of OEM)**

---

**Authorized Signatory**

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Seal:

OEM address:

**\*\* OEM refers to (Original Equipment Manufacturer)**

**B. OEM AUTHORIZATION CERTIFICATE (FOR BIDDER AS DEALER)**

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

Subject: **OEM Authorization Certificate**

Ref: Bid No. \_\_\_\_\_

We, (**Name of Original Equipment Manufacturer – OEM**), hereby authorize:

**M/s** \_\_\_\_\_  
(Address: \_\_\_\_\_)

We confirm that:

1. Bidder is **authorized partner / dealer / distributor / bidder** for participating in the above-mentioned tender
2. The bidder is authorized to **quote, supply, install (if any), and support** our products.
3. The products offered will be **genuine, brand-new, and manufactured by us (OEM)**.
4. We will provide full **warranty support, technical support, and spare parts (wherever applicable)** for the supplied equipment throughout the warranty/AMC period.

For (**Name of OEM**)

---

**Authorized Signatory**

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Seal:

**\*\* OEM refers to (Original Equipment Manufacturer)**