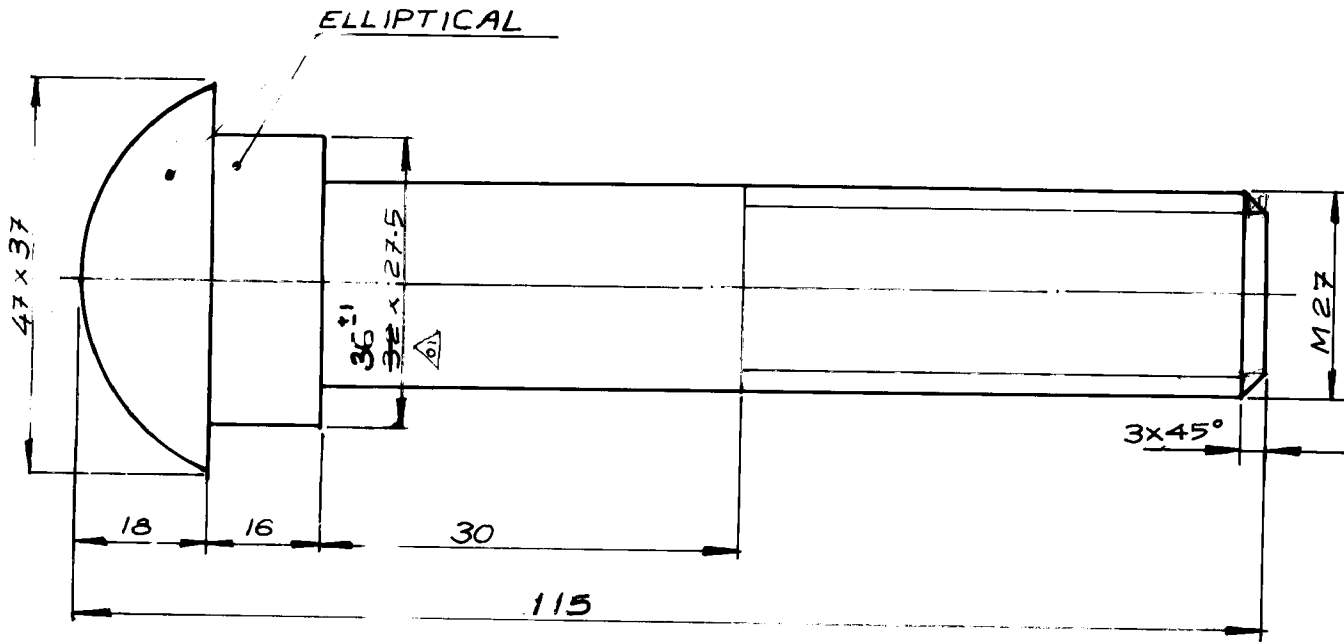


FIRST ANGLE PROJECTION (ALL DIMENSIONS IN MILLIMETRES)

REV	DATE	ALTERED	REV	DATE	ALTERED
01	3/6/88	CHECKED <i>Rmango</i>	02		CHECKED
Elliptical size changed. (2. 36 x 27.5)					

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1049332

	TRACK BOLT					0.68
			SA - 105			1
VARIANT No.	DESCRIPTION	STD	MATL CODE	A	UNIT	UNIT WT
			MATL SPEC	C		QTY



Bharat Heavy Electricals Ltd.,
BOILER PLANT UNIT
TIRUCHIRAPALLI-620 014

DRN	NAME	SIGN	DATE
CHD	P.S. Mani	<i>P.S. Mani</i>	22/07/87
APPD	R. Sesharajan	<i>R. Sesharajan</i>	22.07.87
	S. Nakkeeran	<i>S. Nakkeeran</i>	22-07-87.

DEPT. CC	GRADE OF UNTOL. DIM C/M/F	SCALE NTS	WEIGHT (kg) 0.680	REF TO ASSY / DRG 2-47-263-00556	ITEM NO. 03
CODE 123					
TITLE TRACK BOLT... M27 26"			CARD CODE U 01	DRAWING NO. 4-47-263-01210	REV 01

Revision Record:

Rev:01: Source of supply for AS included., Rev:02:12/11/96: Text re-written, Class.No.s introduced for Alloy steel. High temperature test removed. TDC:0: 306/00 merged into this. Rev:03: Cl. 4.0, 6.0, 9.0 modified. Rev 04: Cl 5.0 revised to include Impact test for Bars used for Valves Purchase Orders; Clarity brought in Cl 4.0

1.0 MATERIAL SPECIFICATION: ASME {Latest on date of Purchase Order (PO)}:

CS : SA 105

AS : SA 182 F11 Class 2, F12 Class 2 & F22 Class 3, SA 193 B7 & B16

SS : SA 182 Gr. F 316, SA 479 TP 410 Condition 2.

Additional Requirement: As listed below (supplementary to Specification)

Size and Qty.: As per Purchase order & Drawing.

2.0 CHEMICAL COMPOSITION & PROCESS

Melting: CS & AS: Fully killed. SS: hot finished. Product analysis per heat: CS: C $\leq$ 0.25%.

Steel for making bars to be inspected at Mill & test certificate countersigned by IBR approved Inspecting Authority, if the mill is not approved under IBR as well known steel maker.

Steel for SA 182-F11, F12 and F22 if indigenously procured, to be from following manufacturers approved under IBR for creep resistant steels: i) Alloy Steel Plant, Durgapur, ii) Tata Iron & Steel Company, Jamshedpur & iii) Mahindra Ugine Steel Company, Bombay.

3.0 DIMENSIONS AND TOLERANCES

Dimensional Tolerances : CS & AS: as per SA 29. SS: as per SA 484.

4.0 HEAT TREATMENT(HT)

CS: Normalised at temp 880-920 deg C. AS(SA 182): Normalised and tempered,

SA 193: Quenched and tempered.

5.0 MECHANICAL TESTS

Extent of test: for each size/heat/HT batch.

Additional requirements of tests: Bend test: CS: 1 Sample 19mm. thick(t) x 25.4mm width to be bent 180 deg. around mandrel of radius 6.35 mm. AS(SA 182 only): Sample 25.4mm width to be bent 180 deg. around mandrel of radius =1.5 x t.

Bars meant for Valves Purchase Orders of SA105 and SA182 F22 Cl 3 materials shall be impact tested. 1 / HT batch: SA 370, 2mm. Charpy-U notch, at Room temperature: Acceptance: Avg of 3 specimens: 36J, single Min: 24J.

6.0 NON DESTRUCTIVE TEST

Extent of test: for each product. Stage of test : After heat treatment.

UT: Dia $\geq$ 50mm.: 100% : SA 388. Acceptance: AM 203.2, ASME Sec.VIII Div. 2.

7.0 WORKMANSHIP AND FINISH

Items to be free from scales & defects like laps, seams, folds, cracks, etc. SS to be Pickled & passivated as per ASTM A 380 or machined.

8.0 REPAIR

Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum dimension after repair to meet drawing / Specification.

9.0 MARKING AND PACKING

Details of stamping on each item: dia $\geq$ 25 mm.: with low stress stamps and bordered by paint: Heat number, Specification & grade, Size, Maker's emblem/code & Inspection Authority's seal.
Dia < 25 mm: All above details to be painted. Bars to be supplied in bundles < 1 ton, secured suitably for rough handling. Metal tags with details of specification, melt number and maker's emblem to be secured to the bundles.

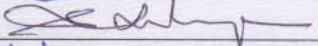
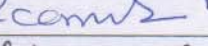
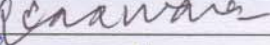
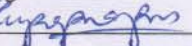
10.0 INSPECTION AND CERTIFICATION

For IBR items, inspection and tests to be witnessed by an IBR approved inspecting agency, in case the shop is not recognised as a "Well known Forger/Steel maker" under IBR. Test certificate in English language countersigned by applicable inspection agency for each product with following details shall accompany the product (in format approved by Boiler inspectorate for IBR items).

1. Purchase Order No.(BHEL), TDC No. & Test certificate number
2. Specification, grade, class, applicable year of code, Heat Number, Drawing No., Quantity & Size
3. Melting & forging/rolling process, Chemistry including incidental elements - Heat wise.
4. Heat treatment details of the material and test bars.
5. Mechanical test results, NDE test results with reference & acceptance standard.
6. Certified copy of TC for starting material if applicable.
7. Cleaning & Surface treatment details.

11.0 END USE

SA 105, SA 182 & SA 479 are for Pressure part components in Boilers & Valves of high temperature service meeting IBR and ASME Section I. SA 193 is for high temperature bolting and for drive shafts.

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Reviewed	S.Selvarajan (Product QA)	
	V.Jayaraman (QA)	
	P.Loganathan (Engg)	
	N.Karuppusamy (Purchase)	
	R.Easwaran (QA)	
Approved	V Thyagarajan (QA& Labs)	



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 41301

Rev. No. 02

PAGE 1 OF 2

HEXAGON NUTS, PRODUCT GRADE 'B'

(Property Class 6 & 22H)

1.0 SCOPE

Covers the requirements of hexagon nuts in the size range M27, M33 and above.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes	Fig. 1 & Table 1 of this standard	
Tolerance	Product grade	B
	Indian Standard	IS 1367 (Part 2)
Thread	Pitch	Table 1 of this standard
	Tolerance	6H
	Indian Standard	IS 4218 (Part 3, 5 & 6)
Material	Steel	
Mechanical Properties	<u>Property class</u> 6 H for nuts with $d \leq M39 \times 3$ 22H for nuts with $d > M39 \times 3$	
	<u>Indian Standard</u> IS: 1367 (Part 6) for nuts with $d \leq M39 \times 3$ IS: 1367 (Part 7) for nuts with $d > M39 \times 3$	
	Indian Standard	IS: 1367 Part 17)
Sampling and Acceptability	Nuts shall comply with IS: 1364 (Part 3) in respect of requirements not covered in this standard.	

2.1 Referred standards (Only current versions are applicable)

IS 1364 Part 3	Specification for Hexagon head bolts & nuts of product grade A&B Part 3 Hexagon nuts.
IS 1367 Part 2,6,7 & 17	Technical supply conditions for threaded steel fasteners
IS 4218 Part 3,5 & 6	ISO metric screw threads
IS 3138	Hexagonal bolts and nuts

3.0 DESIGNATION

A Grade 'B' hexagon nut to this standard of thread size M36x3 shall be designated as :

3.1 On Drawings

i) Material Specification column	-----
ii) Description Column	HEX NUT M36x3-6
iii) Drawing Number Column	BPS 41301
iv) Material Code column:	4130100036

Revisions

Brought upto date

Approved

STANDARDS SECTION
CONTRACT ENGINEERING AND CO-ORDINATION
HPBP, TIRUCHIRAPPALLI

Rev. No. 02

Amd. No.

Reaffirmed

Prepared

Issued

Dt of 1st Issue

Dt. JUN. 1997

Dt.

Year

STANDARDS

STANDARDS

DEC 1986

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, Ordering Description given below shall be followed. (Typical examples)

Hex Nut M27 to BPS : 41301 (for nuts with d=M27 & M33)

Hex Nut M36x3 to BPS : 41301 (for nuts with d=M36x3 & M39x3)

Hex Nut M42x3 to BPS : 41301 (for nuts with d=M42x3 & M48x3)

4.0 ADDITIONAL INFORMATION

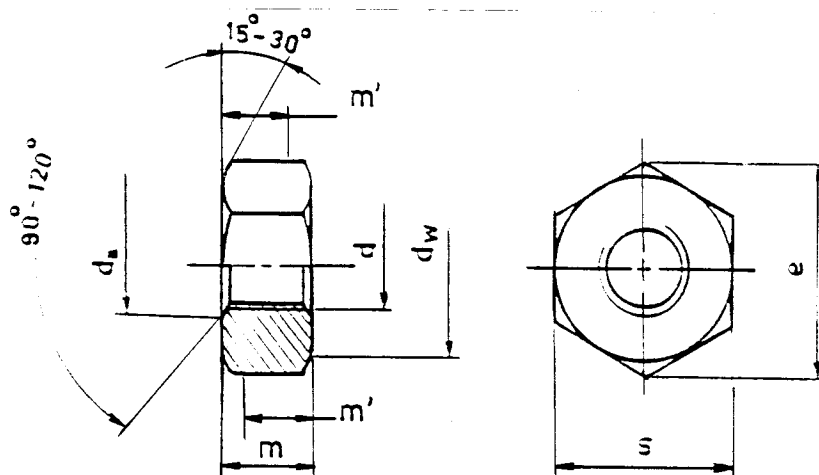
4.1 The hardness values in Table 4 of IS: 1367 Part 6 (for coarse pitch series) shall be applicable for thread sizes M36x3 and M39x3 also.

4.2 The overall dimensions for thread sizes M42x3 and above are based on IS: 3138.

4.3 Copies of this standard shall be enclosed along with the purchase order.

FIG.1, DIMENSIONS FOR HEXAGON NUTS

(All dimensions are in millimetres)



'm' = Effective gauging height

TABLE 1

(All dimensions are in millimetres)

(All dimensions are in millimetres)											
Thread Size d	d _a		d _w	e		m		m'	s		Weight
	Min	Max		Min	Max	Min ¹	Max		Min	Min	
(M27)					45.20	22.0	20.7		41	40.0	166
(M33)					55.37	26.0	24.74		50	49.0	299
M36x3	36	38.9	51.1		60.79	31.0	29.4	23.52	55	53.8	364
(M39x3)					66.44	31.0	29.4		60	58.8	485
M42x3				75		34.0	33.0		65	63.8	569
M48x3				86.5		38.0	37.0		75	73.8	935

Note:

- Sizes in brackets are non-preferred
- Weights are given in Kg per 1000 numbers only