

Tender Enquiry No	2122-059E
Enquiry date	17.11.2021
Last time and date of tender submission	15:00 Dt.30.11.2021
Tender opening time and date	15:30 Dt.30.11.2021
Quotation Parts	<i>Two-part</i>
Item Description	<i>Misc. FASTENERS</i>
Delivery schedule (In days)	Within 90 days from PO date
Validity of offer (In days)	<i>70 days from date of tender opening</i>
Counter Offer	<i>No counter offer is applicable</i>
Quantity Variation	<i>+/-10% may be acceptable with prior consent of BHEL in writing</i>
Documents required along with supply of material	
Test Certificate and other Quality related documents	<i>Required as per QP/BPS/IS /TDCs/Drawings mentioned in list of items</i>

Reverse auction will not be conducted in this tender. The Items are not reserved for MSE. There is no counter offer in this tender enquiry including /MSE counter offer clause. Minimum local content requirement is 50% for Class-1 local suppliers. Rates quoted should be F.O.R. BHEL Goindwal basis.

This is a two-part tender i.e. Part-1 and Part2. Part-1 is techno-commercial bid evaluation and Part-2 is price bid comparison. The Part-1 qualified bidders will only be eligible for part-2 opening.

Quotation Submission

This tender is through e-procurement mode for supply of “Misc. Fasteners” as per specifications mentioned in tender terms. Interested bidders / suppliers shall submit their offer through e-procurement mode at <https://eprocurebhel.co.in/>. Offers in any other mode will not be accepted. In case of any difficulty faced while registering on BHEL’s e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: support-eproc@nic.in. These details are also available on ‘Contact Us’ page of the portal.

Pre-Qualification terms for participating in the tender

Supplier can be manufacturer/trader. Supplier shall submit customer Purchase Orders for supply of fasteners with minimum cumulative value of Rs.2,00,000 (Rs. two Lakhs Only) as proof. Purchase Order/s date should be 01.11.2018 or afterwards and up to 10.11.2021. Start-ups shall be exempted from this criteria of Purchase order submission without any relaxation in quality standards or technical parameters as per D.O. No. 5(4)/2016-BE-I dated 15.02.2017. For claiming Start-Up exemption, vendors have to submit DPIIT (Dept. of Promotion of Industry and Internal Trade)/DIPP (Department for Industrial Policy and Promotion) recognition certificates.

BHEL may carry out evaluation of bidder’s capability. BHEL reserves the right to accept / reject any offer based on evaluation of bidder’s capability. For verification of data presented for pre-qualification bid, BHEL may decide to visit the bidder(s) works. Any fact found deviating from bids during evaluation shall make the bidder liable to be dis-qualified.

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Special Tender Terms

1. SCOPE OF SUPPLY:

Material shall be supplied as per the applicable latest Material Standard requirements/BPS/Drawing and other requirement as given in the Purchase Order/list of items. National & International material standards shall have to be arranged by vendors themselves. The bidders have to arrange latest applicable IS standards by their own.

Inspection will be done by BHEL.

2. LIST OF ITEMS:

Following items are there in this tender enquiry: -

Sl. No.	MATL_NO	DESCRIPTION	Qty in No.	DRG No/Rev No Or BPS No	TDC No/Rev No	Spec No/ Rev No	Industry Std Desc.
1	964657850000	ANCHOR BOLT-M12 (STAINLESS STEEL)	1,300.00				As per description
2	170430110000	BEEDED PLUG T9 - 1/2"	500.00				BPS 718501
3	412370807500	BOLT-M 8x75 -8.8-IS1364-P1	1,500.00	41237			IS-1364(P-1)
4	964521930000	BOLT-M10x16 -B7-0002	100.00	3V000220723/03	TDC:5:164/09		
5	412371605000	BOLT-M16x50 -8.8-IS1364P1	2,000.00	41237			IS-1364(P-1)
6	412371606000	BOLT-M16x60 -8.8-IS1364P1	400.00	41237			IS-1364(P-1)
7	412212008000	BOLT-M20x80 -4.6-IS1363P1	350.00	41221			IS-1363(P-1)
8	G96110010000	BRASS SHIM 20X16.5X1	1,500.00				IS410COMML/ASTMB36
9	G96110020000	BRASS SHIM 22X14X1	2,000.00				IS410COMML/ASTMB36
10	G96110030000	BRASS SHIM 25X16X1	4,500.00				IS410COMML/ASTMB36
11	G96110040000	BRASS SHIM 32X21X1	2,000.00				IS410COMML/ASTMB36
12	412010301000	CHS HD SCRU-M3x10 -4.8-IS1366	1,000	41201			IS-1366
13	412010491000	CHS HD SCRU-M4x10 -4.8-IS1366-	10,000	41201			IS-1366/ISO1207
14	412010691200	CHS HD SCRU-M6x12 -4.8-IS1366-	6,000	41201			IS-1366
15	411011296000	DE STUD-M12x60 -6.6-IS1862-A-T	500.00	41101			IS-1862
16	411011207000	DE STUD-M12x70 -6.6-IS1862-A-T	200	41101			IS-1862
17	417090302400	DRIVE PIN-3x24 -40C8-IS7368-FL	1,000.00	41709			IS-7368
18	417100602400	DRIVE PIN-6x24 -40C8-IS7385-HF	1,000.00	41710			IS-7385
19	419020001900	EXT CIRCLIP-A19 -IS3075P1-N-d1	1,000.00	41902			IS-3075(P-1)
20	419020002000	EXT CIRCLIP-A20 -IS3075P1-N-d1	500.00	41902			IS-3075(P-1)
21	419020002400	EXT CIRCLIP-A24 -IS3075P1-N-d2	500.00	41902			IS-3075(P-1)
22	419020003800	EXT CIRCLIP-A38 -IS3075P1-N-d3	1,500.00	41902			IS-3075(P-1)
23	419020007000	EXT CIRCLIP-A70 -IS3075P1-N-d6	500.00	41902			IS-3075(P-1)
24	412380801200	HEX HD SCRU-M 8x12 -8.8-IS1364	2,500	41238			IS-1364(P-2)
25	412380802000	HEX HD SCRU-M 8x20 -8.8-IS1364	10,000	41238			IS-1364(P-2)
26	412381006000	HEX HD SCRU-M10x60 -8.8-IS1364	4,500.00	41238			IS-1364(P-2)
27	412381096000	HEX HD SCRU-M10x60 -8.8-IS1364	4,500.00	41238			IS-1364(P-2)
28	412381203000	HEX HD SCRU-M12x30 -8.8-IS1364	2,500	41238			IS-1364(P-2)

TENDER TERMS AND CONDITIONS
Supply of Fasteners
[Enquiry No. 2122-059E dated 17.11:2021]

29	412381203500	HEX HD SCRU-M12x35 -8.8-IS1364	500	41238			IS-1364(P-2)
30	412381296500	HEX HD SCRU-M12x65 -8.8-IS1364	500.00	41238			IS-1364(P-2)
31	412162005000	HEX HD SCRU-M20x50 -6.8-IS1364	2,500	41216			IS-1364(P-2)
32	964657840000	HEX.BOLT-M12 X1.75X100-B8M	600	3V000125708/01			A193 B8M
33	210170490000	HEXAGONAL HEAD SCREW	1,000.00			TSB046/05	
34	964656960000	INDICATOR RING-F503	75.00	4VF50327192/00			
35	964656950000	INDICATOR RING-N790	450.00	4VN79027192/00			
36	964656890000	INDICATOR RING-S833	150.00	4VS83327192/00			
37	414060000400	MCN WASHER-M 4 -IS2016	400	41406			IS-2016
38	414060001600	MCN WASHER-M16 -IS2016	400	41406			IS-2016
39	414060002000	MCN WASHER-M20 -IS2016	1,000.00	41406			IS-2016
40	415011402500	PL KEY-14x9x25 -IS2048-A	1,000.00	41501			IS-1875
41	415010503200	PL KEY-5x5x32 -IS2048-A	1,000.00	41501			IS-2048
42	963536461000	PLAIN KEY 6X6X54-IS2048-A	1,000	42020103669/00			IS2048-A
43	415011202000	PLAIN KEY-12x8x20 -IS2048-A	1,000.00	41501			IS-2048
44	415010502500	PLAIN KEY-5X5X25 -IS2048-A	1,000	41501			IS-2048
45	170430240000	PLAIN PLUG-1/8-T8-IS1239 PART2	1,000.00	17043			BPS718515/IS1239
46	414080000800	PUN WASHER-M 8 -IS:2016-A	1,000	41408			IS-2016
47	963533370000	SCREW PLUG M33X2	1,000.00	0		TSB064/02	
48	417508001200	SELF LOCK NUT-M12 -SPR-GALV	1,000.00	417508			BPS 417508
49	417508002000	SELF LOCK NUT-M20 -SPR-GALV	500.00	417508			BPS 417508
50	412050400600	SLT CSK SCRU-M 4x6 -4.8-IS1365	500.00	41205			IS-1365
51	412020692500	SOC HD SCRU-M 6x25 -8.8-IS2269	1,000.00	41202			IS-2269
52	412020603000	SOC HD SCRU-M 6x30 -8.8-IS2269	1,000.00	41202			IS-2269
53	417042001600	SPLIT PIN-2x16 -IS549	1,000.00	41704			IS-549
54	417044002500	SPLIT PIN-4x25 -IS:549	1,000.00	41704			IS-549
55	417110251200	SPR DWL SLEEVE-2.5x12 -ISO 875	500.00	41711			IS-5988/ISO 8752
56	417110253200	SPR DWL SLEEVE-2.5x32 - ISO 87	500.00	41711			IS-5988/ISO 8752
57	417110302000	SPR DWL SLEEVE-3x20 ISO 8752	500.00	41711			IS-5988/ISO 8752
58	417110603200	SPR DWL SLEEVE-6x30 - ISO 8752	1,500.00	41711			IS-5988/ISO 8752
59	414050090800	SPRING WASHER-B 8 -IS3063-GALV	200	41405			IS-3063
60	414050001000	SPRING WASHER-B10 -IS3063	6,000	41405			IS-3063
61	414050001600	SPRING WASHER-B16 -IS3063	8,000.00	41405			IS-3063

3. **PACKAGING & SUPPLY**

All material has to be dispatched in packing boxes only i.e. wooden or carton or cardboards with material code, description, grade and quantity. Box must have TAG containing Purchase Order No., Material Code, Material Description (as mentioned in PO) along with Unit weight of each item and Total weight of Box and Total Quantity in Box. No cost for these boxes will be given separately and must be included in prices only.

4. **VALIDITY OF OFFERS AND CONTRACT:**

The offers shall be kept open for acceptance **for 70 days from** the date of opening of the tender. In case of extension of tender opening date, the validity shall be suitably revised.

5. DELIVERY SCHEDULE:

The material shall be supplied **within 90 days from** the date of purchase order. If supplier fails to supply items within PO delivery date, BHEL reserves the right to cancel the PO and initiate risk purchase against failed supplier as per BHEL risk purchase guidelines.

6. PREFERENCE TO MAKE IN INDIA

This procurement shall be governed by notification no. P-45021/2/2017-PP (BE-II) dated 16.09.2020 of Government of India issued by DPIIT and subsequent circulars issued afterwards. Accordingly, the minimum local content required for these fasteners is **50% for class-1 local** supplier and only class-1 suppliers are eligible to quote.

7. PART-I: TECHNO-COMMERCIAL BID should contain all the *documents/confirmations as per following details:*

- a) Duly filled and signed part-1 format.
- b) Documents as per pre-qualification terms.
- c) Duly filled Annexure-A (Declaration for RESTRICTIONS UNDER RULE 144(XI)).
- d) Duly filled Annexure-B (Non-Disclosure Agreement).

8. RISK PURCHASE CLAUSE:

BHEL at its option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the supplier either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as per contract delivery terms. The supplier shall be liable for losses, which BHEL may sustain by way of such risk purchases.

The value shall be calculated as follows:

$$\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$$

Where,

A= Value of Balance scope of Supply (*) as per rates of new contract

B= Value of Balance scope of Supply (*) as per rates of old contract being paid to the supplier at the time of termination of contract i.e. inclusive of PVC, if any.

H = Overhead Factor shall be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

* Balance Scope of Supply: Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Supply for calculating risk & cost amount.

Contract quantities are the quantities as per Original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

These Special terms & conditions and GCC collectively are the part of tender terms and conditions All Special terms will overrule GCC.



General Contract Conditions (GCC) of MM Tenders

BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,
Goindwal Sahib, Dist. Tarn Taran,
Punjab-143422 (INDIA)

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General Contract Conditions (GCC) of MM Tenders

BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,
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Punjab-143422 (INDIA)

1. INSTRUCTION TO BIDDER

Quotations shall be submitted before due date and time. Late offers are liable to be rejected, so please ensure to submit bid well within due date and time. Techno-commercial part will be opened on due date.

Based on evaluation of techno-commercial offers, Price bids of bidders who qualify from techno-commercial evaluation shall be opened. BHEL may decide to open the Price bid same day at 1700 hrs. If not opened on the same day, all qualifying bidders shall be notified for date of opening of Price bids by email/fax/post/courier/E-procurement system generated email.

1.1 Instruction to Bidder (In case of Non-E-Procurement / Paper/ Manual/ Hard Copy based tenders)

Sealed Tenders can be dropped in the tender box labeled as 'Tender box for MM contracts'. This tender box is located at the entrance of Admin block BHEL Goindwal. Fax (01859-222061) / E-Mail (tendermm_ivp@bhel.in) offers received in time shall be considered only when such offers are complete in all respects. In case of bulky tenders, please handover quotation to Sh. Rakesh Kumar/ SDGM - Head-MM or Sh. Sumeet Bansal / Sr. Manager - MM [Contact: 01859 224 615 / 628]. Bid can be send to following address:

**BHEL, Industrial Valve Plant,
#433, Industrial Complex,
Goindwal Sahib, Distt. Tarn Taran,
Punjab-143422.**

1.2 Instruction to bidder (In case of E-Procurement)

1. Interested bidders / suppliers shall submit their offer through e-procurement mode at <https://eprocurebhel.co.in/>.
2. Offers in any other mode will not be accepted.
3. Procedure for Submission of Tender is available in the "Bidder Manual Kit" at E-tender portal <https://eprocurebhel.co.in/> only.
4. In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: support-eproc@nic.in. These details are also available on 'Contact Us' page of the portal.
5. Before uploading scanned documents if any, the bidders shall sign on all the statements, documents, certificates uploaded by him, owning responsibility for their correctness / authenticity.
6. **Disclaimer clause:** Neither the Organization (Bharat Heavy Electricals Ltd.) nor the service provider is responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

2. SCOPE OF SUPPLY

Material shall be supplied as per the applicable latest Technical Delivery Conditions (TDC)/ Material Standard requirements/BPS/Drawing and other requirement as given in the Tender Enquiry. National & International material Standards shall have to be arranged by vendors themselves. Latest applicable revisions of standards/procedures to be referred.





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All required tests as called in referred material standard/BHEL/TDC/drawing etc. shall be carried out by vendor at no extra cost. Material Test Certificates (MTC), inspection reports and Compliance/Guarantee Certificate are to be provided along with the supplies.

3. PRICE BASIS

1. Order of enquiry item sl. no. shall be maintained in the quotation.
2. The rates quoted shall be firm and fixed. No price variation is proposed and allowed.
3. Rates quoted should be FOR BHEL Goindwal basis. The offers quoted on other than FOR Goindwal basis are liable to be rejected.

In case bidder has quoted Ex-works prices, then he/she will be given an opportunity to accept price basis as FOR Goindwal either by accepting delivery as FOR Goindwal in same quoted price or by providing loading factor on his/her quoted ex-works prices to make them FOR prices.

Variation in GST or any other statutory levies during contractual delivery period shall be to BHEL's account.

4. DISCREPANCY IN WORDS AND FIGURES

1. If, in the price structure quoted for the required goods/ services/ works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
2. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
3. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.
4. If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.
5. Bids should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else shall be liable for rejection.
6. All overwriting/cutting, etc will be numbered by bid opening officials and announced during bid opening.

5. EVALUATION IN CASE OF MORE THAN ONE L-1 BIDDER

In the course of evaluation, if more than one bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 bidders.





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In case more than one bidder happens to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

6. REVERSE AUCTION

In case, it is declared in special terms & conditions of tender enquiry that RA is applicable for the NIT, then RA will be conducted as per following clause:

BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on <https://www.bhel.com/>) for this tender. RA shall be conducted among the techno-commercially qualified bidders as per RA guidelines.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

7. VALIDITY OF OFFERS

The offers shall be kept open for acceptance 'for number of days mentioned in special terms and conditions' from the date of opening of the tender. In case of tender extension, the bid validity shall be considered from the date of tender opening.

8. SUPPLIED MATERIAL ADJUSTMENT

Item/s pending in previous PO has to be billed in previous PO only. Otherwise, BHEL will be free to adjust the supplies in previous PO. Any implication of tax will be on supplier's account. For this it is desirable that vendor should reconcile the pending PO statement every month/frequently with BHEL. Vendor can also view these details at Portal (<https://trichy.bhel.com/mm/index.jsp>).

9. DELIVERY SCHEDULE

Supplies shall be affected and completed as per schedule mentioned in special terms and conditions. **Further, BHEL may release delivery schedule from time to time based upon our requirement with mutual understanding.** Vendor shall be required to complete the order as per the BHEL schedule requested. Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.

10. LIQUIDATED DAMAGES (LD) FOR LATE DELIVERY

Time is the essence of the contract'. As such, delivery of goods specified in the Purchase Orders released under the scope of this contract shall be made within the time limit prescribed therein. Penalty for late delivery will be applicable @0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the undelivered portion.





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In case of Ex-works delivery terms for indigenous supplies, the document date (Invoice/Challan date) in Goods Receipt (GR) document shall be reckoned for LD deduction. In case of FOR Delivery terms for Indigenous supplies, the posting date in GR document shall be reckoned for LD deduction.

If any vendor does not accept LD $\frac{1}{2}\%$ of the supply for each week of delay subject to a maximum of 5%, their offer is likely to be rejected by BHEL and the price bid shall not be opened. Bidders accepting for 10% LD shall not be loaded on account of LD. However, bidders who offer any other % LD [between 5% to 10%] shall be loaded @ % deviation from 10% and their accepted %. e.g. If a bidder accepts for a max of 7% LD only, their offer would be loaded @ 3% (10 – 7 = 3).

BHEL reserves the right to receive or not receive the material after the due date of PO. Applicable GST shall also be recovered from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.

11. PAYMENT TERMS

1. Due payment against supplies received shall be due after 30 days of receipt and acceptance of material and shall be paid within next 15 days' period. In case of any deviation from standard payment term mentioned, BHEL at its discretion may load on the item price at "Base rate of SBI (as applicable on the date of bid opening; Techno-commercial bid opening) + 6% shall be considered for loading for the period of relaxation sought by bidders.
2. Documents to be submitted (if applicable)
 - i) Tax invoice (Invoice shall be GST compliant and should contains all the required information such as GST No, HSN code etc.)
 - ii) Transporter copy along with material/consignment.
 - iii) Material Test Certificates (MTC) and
 - iv) Compliance Certificate.
3. GST registration number is to be submitted by qualified vendor as per GST law.
4. It is mandatory to mention proper material codes in the invoices and separate invoices to be raised for different POs.
5. **BHEL releases payment through EFT mode ONLY. Necessary details may please be submitted by filling required format before release of payment.**

12. TAXES & DUTIES

Payment of GST portion will be released to vendor only upon completion of statutory requirement and further subject to following:

- a) Vendor declaring such invoice in his GSTR-1 and
- b) Receipt of goods and Tax invoice by BHEL and
- c) Confirmation of payment of GST thereon by vendor on GSTN portal.
- d) Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.

Following may please be noted for availing Input Tax Credit (ITC) by BHEL:



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1. Since ITC can be availed only when BHEL is in possession of GST Tax invoice and after receipt of goods. Thus, vendor to ensure timely dispatch of goods and Tax invoice. It may be noted that in case of any delay in receipt of Tax Invoice and/or receipt of goods, the ITC availment by BHEL will get delayed thus entailing additional cash outflow & may even get denied if ITC availment timelines are breached.
2. Further ITC can be availed only when vendor has declared such invoice in his outward supply Return GSTR-1 and after GST thereon has been paid by him at the time of filing of monthly Return.
3. If GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from vendor along with interest levied/leviable on BHEL.
4. Further, in case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/leviable on BHEL.

13. LIABILITY UNDER REVERSE CHARGE (RCM)

Any GST liability arising on BHEL under Reverse Charge (RCM) before actual receipt of goods and/ or Invoice thereof would be subject to recovery of Interest leviable for the period between the date of such liability and actual date of eligibility of ITC based on receipt of goods, receipt of Invoices and other conditions specified in GST Law as applicable.

14. ACCESS TO MANUFACTURING PREMISES

While Purchase Orders placed on the vendor are under execution, authorized representatives of BHEL shall be allowed free access to the manufacturing facilities for the purpose of inspection or monitoring the progress of purchase orders. This access will also be extended to representatives of BHEL's customers accompanying the authorized representative/s of BHEL (which shall be intimated in advance), if our contractual requirements with our customers call for the same.

15. INSPECTION

1. The seller shall give adequate notice, of 1 week or as mutually agreed period, in writing to the Purchaser about the date and place at which the goods will be ready for inspection/ testing, as provided for in the contract.
2. Purchaser or his authorized representative shall be entitled to carry out inspection of material and workmanship/Surveillance Audit at Seller's premises or at his sub-contractor's premises at all reasonable times during execution of contract; Such inspection, examination and testing, if made, shall not absolve the Seller from his obligations under the contract. No additional charges shall be claimed for such inspections. Moreover, all required infrastructure (testing, tools etc) have to be arranged by supplier.
3. Any inspection carried out before supply by vendor/incoming stage at BHEL notwithstanding, if any defect/non-conformity is noted during processing, the same shall be attended/replaced by vendor at no extra cost.
4. BHEL representative from unit or CQ is authorized to carry out audits along with TPIA at vendor's works before clearing the items for dispatch.





General Contract Conditions (GCC) of MM Tenders

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5. Necessary tooling including thread gauges etc. have to be arranged by vendor. Only in exceptional cases, based on BHEL discretions item/nature, BHEL may consider request to provide gauges if available with BHEL. But in no case this shall be linked with delivery of material.

16. GUARANTEE / WARRANTEE AND CORRESPONDING REPAIR / REPLACEMENT OF GOODS

Goods shall comply with the specifications for material, workmanship and performance. Vendor shall give a guarantee / warrantee of 18 months from the date of dispatch or 12 months from date of receipt, against manufacturing defects, whichever is earlier. In case of non-acceptance of this term, bid will be rejected.

If the material is rejected due to defective workmanship during inspection or at the time of actual use, within the guarantee / warrantee period, the rejected material shall be replaced by the supplier. Corresponding quantity shall be treated as unsupplied against respective purchase order till replacement is received at BHEL. If the material is found defective and rejected during use for which payment has already been released the rejected quantity shall be supplied free of cost by the vendor within a month of intimation of the rejection by BHEL.

Lifting of rejected material is under Supplier's scope. BHEL will inform related invoice, quantity etc. to supplier. Supplier is expected to give the plan to lift and advance intimation when visiting to lift the material. Material should be lifted within one month from date of intimation. After one-month BHEL will not be responsible for rejected material. BHEL may decide to send the rejected material on to Pay basis to supplier. Any leniency/ unresponsiveness/delay on part of supplier may lead to appropriate action by BHEL. Any request to postpone in written may be considered but replacement should not be linked with lifting of material.

17. LOI (LETTER OF INTENT)

BHEL may issue LOI prior to the PO for any reason whatsoever. The LOI in such cases is to be treated as PO for all practical purposes and all the Terms & Conditions of the tender shall be applicable from the date of issue of LOI.

18. SUB-CONTRACT

The purchase order or any part thereof shall not be sub-contracted, assigned or otherwise transferred without previously obtaining the BHEL's consent in writing.

19. RISK PURCHASE

BHEL at its option will be entitled for withdrawal of portion of balance supply or termination of the contract and to purchase elsewhere at the risk and cost of the supplier either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as per contract delivery terms. The supplier shall be liable for losses, which BHEL may sustain by way of such risk purchases.





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The value shall be calculated as follows:

$$\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$$

Where,

A= Value of Balance scope of Supply (*) as per rates of new contract

B= Value of Balance scope of Supply (*) as per rates of old contract being paid to the supplier at the time of termination of contract i.e. inclusive of PVC, if any.

H = Overhead Factor shall be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

* **Balance Scope of Supply:** Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Supply for calculating risk & cost amount.

Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

20. FORCE MAJEURE

If at any time during the continuance of the contract, the performance in which or in any part by either party of any obligations under the contract are prevented or delayed by reason of any war, hostilities, acts of public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine restrictions, or acts of God (hereinafter referred to "an events" then provided the notice of happening of any such event is given by either party to the other within 21 days of the occurrence thereof, neither party shall by reason of such event be entitled to terminate the contract nor shall either party have any claim for damages against the other in respect of such non-performance and delay in performance and delivery under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist. If the performance in whole or part of any obligation under the contract is prevented or delayed by reason of any such event, claims of extension of time shall be granted for periods considered reasonable by BHEL subject to prior notification by the vendor to BHEL of the particulars of the event and supply to BHEL, if required, of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed a waiver of time in respect of remaining deliveries.

21. CLARIFICATIONS

The correspondence exchanged against the tender from both tenderer and BHEL through email/e-procurement are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business. Any transaction pertaining to the tender from both the parties of business done round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.





General Contract Conditions (GCC) of MM Tenders

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22. PREFERENCES FOR MICRO AND SMALL ENTERPRISES (MSEs)

Preferences as mentioned in “Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012” & “Public Procurement Policy for Micro and Small Enterprises (MSEs) Amendment Order, 2018”, or as per latest guidelines issued by government shall be given to Micro and Small enterprises.

Main points which are mentioned in the above orders are as follows:

- 25% Procurement of the tender value shall be made from MSE (Micro, Small Enterprises) firms.
- 25% of the 25% quantity (i.e. 6.25% of the tender quantity) offered to the MSE's shall be reserved for MSE's owned by SC/STs. Failure to participate by any MSE owned by SC/ST's; this 6.25% quantity shall be procured from other MSEs.
- 3% from within the 25% quantity offered to the MSE's shall be reserved for women owned MSE's. Failure to participate by any MSE owned by women; this 3% quantity shall be procured from other MSEs.
- EMD shall be exempted for MSE's. All these benefits are subject to production of all statutory documents
- In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise and such Micro and Small Enterprise shall be allowed to supply up to 25 per cent of total tendered value. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).

MSE suppliers can avail the intended benefits only if they submit **Udyam Registration Certificate** along with the offer. No other document shall be considered for availing MSE benefits. Non-submission of such document will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is not cleared before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required document is to be uploaded on the portal.

23. PREFERENCE TO MAKE IN INDIA

This procurement shall be governed by notification no. P-45021/2/2017-PP (BE-II) dated 16.09.2020 of Government of India issued by DPIIT and subsequent circulars issued afterwards. Accordingly, the minimum local content, the margin of purchase preference and the procedure for purchase preference to make in India shall be adhered.

24. RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017

All provisions of Order No. F.No.6/18/2019-PPD of Department of Expenditure (DoE) shall be applicable for this tender enquiry (Order copy is available at <https://doe.gov.in/procurementpolicy-divisions>). Accordingly, any bidder from a country which shares a land border with India (except the countries to which the Govt. of India has extended lines of credit or in which the Govt. of India is





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engaged in development projects for which list is available at <https://www.mea.gov.in/>) will be eligible to bid in this tender only if the bidder is registered with the Competent Authority as specified in Annex I of the said Order of DoE.

Updated list of the countries to which lines of credit have been extended or in which development projects are undertaken are available on the Ministry of External affairs website (<https://www.mea.gov.in/>)

For the purpose of this order, definition of Bidder from a country which shares a land border with India shall be same as defined in the Annex III of the said order.

Registration with the competent authority as stipulated in the said order is responsibility of bidder. **Bidder has to submit a certificate certifying following along with offer:**

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that bidder (.... Name of Bidder) is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that bidder (.....Name of bidder) fulfils all requirements in this regard and is eligible to be considered"

If the bidder is from such country which shares a land border with India evidence of valid registration by the Competent Authority shall also be attached along with offer."

25. DISPUTES

In the event of any dispute and/or difference arising between the Vendor and BHEL as to interpretation and/or execution of the contract and/or the respective rights and liabilities of the parties, such disputes and/or differences shall be referred to the sole arbitrator nominated by BHEL. The provisions of the Indian Arbitration Act and the rules there under shall apply to such arbitration. The award passed by the arbitrator shall be final and conclusively binding on all the parties.

26. JURISDICTION

The court of the place from where the purchase order is issued during the contractual period shall alone have jurisdiction to decide any dispute arising out of or in connection with the purchase order.

27. BANNED FIRMS

The offers of the bidders who are on the banned list as also the offer of the bidders, who engage in the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website <https://www.bhel.com/>.

28. FRAUD PREVENTION POLICY

The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <https://www.bhel.com/> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.



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29. PREVENTIVE CHECKS TO ELIMINATE SUSPECTED CARTEL FORMATION

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

30. SUSPENSION OF BUSINESS DEALINGS WITH DEFAULTERS

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site <https://www.bhel.com/>.

1.0 Integrity commitment, performance of the contract and punitive action thereof:

1.1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

1.2. Commitment by Bidder/ Supplier/ Contractor:

1.2.1. The bidder/ supplier/ contractor commits to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

1.2.2. The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

1.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extant guidelines of the company available on <https://www.bhel.com/> and/or under applicable legal provisions





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31. GENERAL

1. BHEL will not be bound by any power of attorney granted by the vendors or by changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the vendor concerned.
2. BHEL reserves the right to extend the due date of opening, which shall be informed. Validity of offer shall be deemed to be revised accordingly.
3. BHEL reserves the right to accept or reject any part or whole of the tender of a bidder by assigning a valid reason thereof. BHEL reserves the right to cancel the tender without assigning any reason thereof and without any obligation before any commitment.
4. Acceptance of all terms and conditions, in the form of signed copy of T&C or confirmation separately written, shall be submitted along with quotation. If nothing is mentioned, it shall be concluded that terms and conditions are acceptable.
5. BHEL may increase/decrease item/s based on BHEL requirement before price bid opening. Suitable price implication may be asked from suppliers.
6. BHEL may drop item/items from tender at any stage of tender before placing PO. BHEL may also delete PO with consent with supplier within delivery date of PO.
7. After releasing PO, it is assumed that supplier has accepted PO if we do not receive acknowledgement from supplier within 5 days of date of PO.
8. In case of unscheduled holiday on opening day of tender, the next working day will be treated as scheduled prescribed day of opening of tender.
9. On the due date of tender opening, only technical bids will be opened. The opened technical bids will be evaluated by us and clarifications required, if any, will be called for from the bidders on technical and commercial points. If no reply is received from the vendor for the clarification raised by BHEL with in the final cut-off date, those vendors offer will be processed with the documents available / submitted against this tender. Offers not meeting the required specification and technical condition will be summarily rejected. The price bids of technically suitable bidders will be opened on a later date with prior intimation to techno-commercially suitable bidders.
10. Ranking L-1, L-2 etc. shall be done for individual item for the techno-commercially acceptable offers on landed cost to BHEL, IVP Goindwal basis and BHEL reserves the right to place order for individual items with different vendors.
11. BHEL reserves the right to negotiate with L1 vendor or re-float the tender for items where, L1 price is not the lowest acceptable price; BHEL reserves the right to increase or decrease the tender quantity.
12. If supplier is mentioning delivery destination within state/ outside state depending upon his location of factory, Free on Road etc. these are assumed as on FOR Goindwal. If supplier is wishing to give delivery on Ex works basis, then he has to clearly mention about it.
13. The bidder has to keep track of any changes by viewing the addendum / Corrigendum's issued by the Purchaser on time-to- time basis in the E-Procurement platform. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.
14. Any term in special tender terms and conditions will supersede the GCC.



ANNEXURE-A

RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017

(The bidders are required to print this on their company's letterhead & sign, stamp and submit with offer documents)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that bidder (... Name of Bidder) is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that bidder (.....Name of bidder) fulfils all requirements in this regard and is eligible to be considered.

If the bidder is from such country which shares a land border with India evidence of valid registration by the Competent Authority shall also be attached along with offer.”

With regards

Signature with company seal

Name –

Company / Organization

Designation within Company / Organization

Address of Company / Organization



BHEL –
GOINDWAL

THIRD PARTY NON-DISCLOSURE
AGREEMENT

(TENDER ENQUIRY NO. 2122-031E dated 26.08.2021)

ANNEXURE B: THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Goindwal on contract is confidential and that the nature of the business of the BHEL, Goindwal is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Goindwal. Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs / data / configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Goindwal all documents and property of BHEL, Goindwal, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL Goindwal's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Goindwal and are reasonable given the nature of the business carried on by the BHEL, Goindwal. I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name

Company

Signature



PLANT STANDARD

BPS 41101

Rev. No. 00

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HPBP TIRUCHIRAPPALLI

STUDS – TYPE A

(AS PER IS: 1862 - 1975)

1.0 SCOPE: Covers the requirement of STUDS - TYPE A in the size range M3 to M39x3

2.0 SPECIFICATION AND REFERENCE STANDARDS

MATERIAL	STEEL
DIMENSION AND PREFERRED SIZES	FIG 1 & TABLE 1 OF THIS STANDARD
PREFERRED LENGTH, SIZE COMBINATION	TABLE 2 OF THIS STANDARD
THREAD	PITCH AS PER TABLE – 1, TOLERANCE 6g, STANDARD IS: 4218 PART - 3,5&6
MECHANICAL PROPERTIES	CLASS 6.6, AS PER IS:1367 PART-3
TOLERANCE	PRODUCT GRADE- A, AS PER IS:1367 PART-2
SAMPLING AND ACCEPTIBILITY	IS:2614
GENERAL REQUIREMENTS	STUDS SHALL COMPLY WITH IS: 1862 IN RESPECT OF REQUIREMENTS NOT COVERED IN THIS STANDARD.

2.1 Referred standards (Only current versions are applicable)

IS: 1862	Specification for Studs.
IS: 1367	Technical supply conditions for threaded steel fasteners.
IS: 2614	Methods for sampling of fasteners.
IS: 4218	ISO Metric screw threads.

3.0 Designation

A Grade A Stud to this standard of thread size M10 and nominal length 25 mm shall be designated as:

3.1 On Drawings

i) Material Specification column	IS: 1862 - A
ii) Description column	STUD A GR. A 6.6 M10x25
iii) Drawing number column	BPS 41101
iv) Material Code Column	41101 10025 00

3.2 Order Description

For placing indents, issuing enquiries and on purchase order, ordering description given below shall be followed.

Stud A M10x25, IS: 1862 – A 6.6

Revisions

Approved

STANDARDS SECTION
ITSS, HPBP, TIRUCHIRAPPALLI

Rev. No.00

Amd. No.

Reaffirmed

Prepared

Issued

Dt of 1st Issue

Dt.

Dt.

Year

STANDARDS

STANDARDS

18.10.2013

4.0 ADDITIONAL INFORMATION

4.1 Property class 5.6 or 6.8 may also be accepted on agreement between the purchaser and supplier.

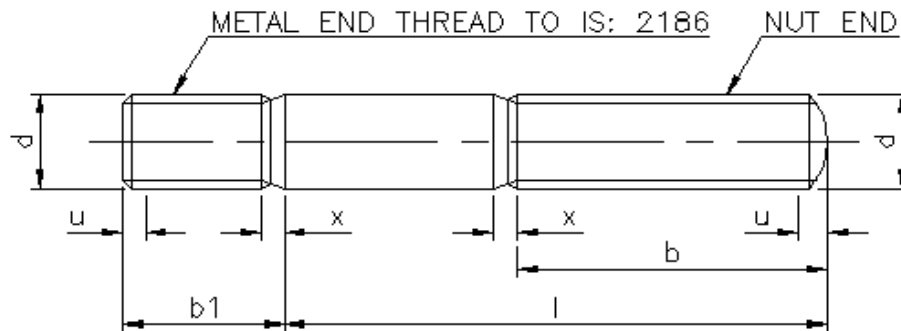
4.2 For Cadmium plated studs, refer BPS: 41141.

4.3 These studs are recommended for use in steel.

4.4 For studs for use in cast iron, refer BPS: 41102.

4.5 Studs with cut threads are also acceptable.

FIG. 1 DIMENSION FOR STUDS
(All dimensions are in millimeters)



u according to IS:1368 – Dimensions of ends of bolts and Screws

x according to IS:1369 – Dimensions of Screw thread runouts and undercuts

(Table 1. All dimensions are in millimeters)

Thread Size d (h13)	b + 2p *			b1 (js 16)		
	1≤125	125<1≤200	1>200	Nom	Max	Min
M3	12	-	-	3	3.3	2.7
M4	14	-	-	4	4.38	3.62
M5	16	-	-	5	5.38	4.62
M6	18	-	-	6	6.38	5.62
M8	22	-	-	8	8.45	7.55
M10	26	32	-	10	10.45	9.55
M12	30	36	-	12	12.55	11.45
M16	38	44	57	16	16.55	15.45
M20	46	52	65	20	20.65	19.35
M24	54	60	73	24	24.65	23.35
M30	66	72	85	30	30.65	29.35
M36x3 (M39x3)	78	84	97	36	36.8	35.2
	84	90	103	39	39.8	38.2

Note:

1. Sizes in brackets are non-preferred.

* 2. P is pitch of thread.



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS

41101

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Table 2 – Preferred length – size combinations for studs
(All dimensions are in millimeters)

Nominal Length 'l'	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30	M36X3	(M39x3)
14													
16													
20													
25						17.8							
30													
35						24.2							
40							41						
45						29.4							
50								92.7					
55													
60								108					
65													
70													
75													
80									224				
85													
90													
100									271				
110													
120													
130													
140													
150													
160													
170													
180													
190													
200													
225													
250													
275													
300													

NOTE:

1. Preferred lengths are between the bold stepped lines.
2. Weights are given in kg per 1000 numbers only.
3. For stocked sizes refer BPS components booklet.
4. For studs with length above the stepped bold line, thread length $b \sim 1 - (x+3)$



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 41201

Rev. No. 00

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SLOTTED CHEESE HEAD SCREWS

(AS PER IS: 1366 - 1982)

1.0 SCOPE: Covers the requirement of Slotted Cheese Head Screws in the size range M1.6 to M10

2.0 SPECIFICATION AND REFERENCE STANDARDS

MATERIAL	STEEL
DIMENSION AND PREFERRED SIZES	FIG 1 & TABLE 1 OF THIS STANDARD
PREFERRED LENGTH, SIZE COMBINATION	TABLE 2 OF THIS STANDARD
THREAD	PITCH - COARSE, TOLERANCE - 6g, STANDARD IS: 4218 PART - 3,5&6
MECHANICAL PROPERTIES	CLASS 4.8, AS PER IS:1367 PART-3
TOLERANCE	PRODUCT GRADE- A, AS PER IS:1367 PART-2
SAMPLING AND ACCEPTIBILITY	IS:2614
GENERAL REQUIREMENTS	SCREWS SHALL COMPLY WITH IS: 1366 IN RESPECT OF REQUIREMENTS NOT COVERED IN THIS STANDARD.

2.1 Referred standards (Only current versions are applicable)

IS: 1366	Specification for Slotted Cheese Head Screws.
IS: 1367	Technical supply conditions for threaded steel fasteners.
IS: 2614	Methods for sampling of fasteners.
IS: 4218	ISO Metric screw threads.

3.0 Designation

A Grade A Slotted cheese head screw to this standard of thread size M6 and nominal length 30 mm shall be designated as:

3.1 On Drawings

i) Material Specification column	IS: 1366
ii) Description column	SCRU SLT CHS GR. A 4.8 M6x30
iii) Drawing number column	BPS 41201
iv) Material Code Column	412010603000

3.2 Order Description

For placing indents, issuing enquiries and on purchase order, ordering description given below shall be followed.

Cheese Head Screw M6x30 IS: 1366 – 4.8

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Dt.

Year

STANDARDS

STANDARDS

18.10.2013

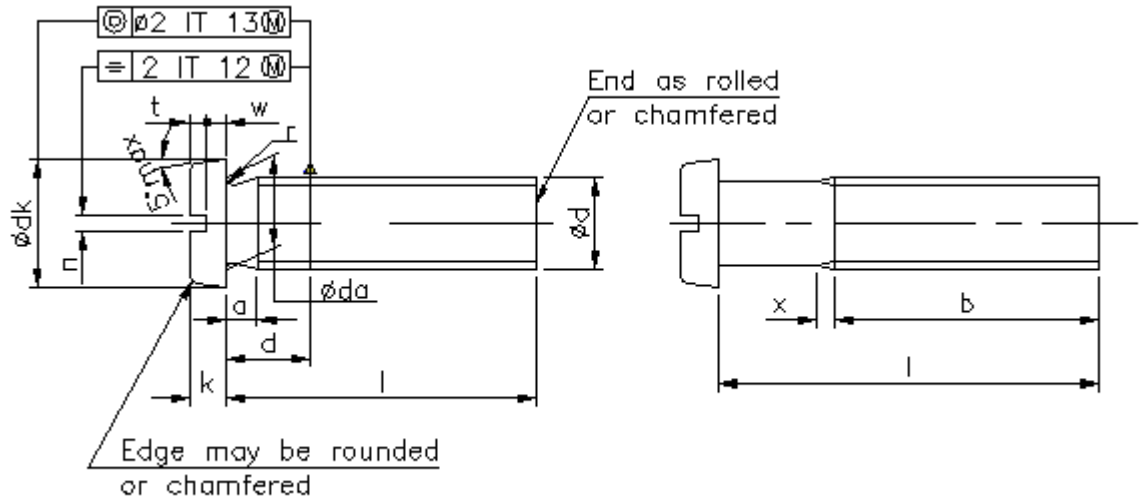
4.0 ADDITIONAL INFORMATION

4.1 Property class 6.6 is also acceptable.

4.2 For Cadmium plated slotted cheese head screws, refer BPS: 41241.

FIG. 1 DIMENSION FOR SLOTTED CHEESE HEAD SCREWS

(All dimensions are in millimeters)



(Table 1. All dimensions are in millimeters)

Thread Size d		M1.6	M2	M3	M4	M5	M6	M8	M10
b	Max	25.7	25.8	26	39.4	39.6	40	40.5	41
	Min	25	25	25	38	38	38	38	38
dk	Max	3	3.8	5.5	7	8.5	10	13	16
	Min	2.86	3.62	5.32	6.78	8.28	9.78	12.73	15.73
da	Max	2	2.6	3.6	4.7	5.7	6.8	9.2	11.2
k	Max	1	1.3	2	2.6	3.3	3.9	5	6
	Min	0.86	1.16	1.86	2.46	3.12	3.6	4.7	5.7
n	Max	0.6	0.7	1	1.51	1.51	1.91	2.31	2.81
	Min	0.46	0.56	0.86	1.26	1.26	1.66	2.06	2.56
r	Min	0.1	0.1	0.1	0.2	0.2	0.25	0.4	0.4
t	Min	0.4	0.55	0.8	1.1	1.3	1.6	2	2.4
w	Min	0.35	0.45	0.8	1.1	1.3	1.6	2	2.4

NOTE:

1. Shank dia~ pitch dia = Major dia permissible.
2. a and x according to IS: 1369 'Dimensions for screw thread run outs and undercuts'.
3. Thread run when chamfered shall be according to IS: 1368 "Dimensions for ends of bolts and screws".



PLANT STANDARD

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Table 2 – Preferred length – size combinations for slotted cheese head screws
(All dimensions are in millimeters)

Nominal Length 'l'			Thread Size d							
Nom	Max	Min	M1.6	M2	M3	M4	M5	M6	M8	M10
2	2.2	1.8								
2.5	2.7	2.3								
3	3.2	2.8								
4	4.3	3.7								
5	5.3	4.7								
6	6.3	5.7								
8	8.3	7.7								
10	10.3	9.7				0.7	1.3			
12	12.4	11.6							4.1	
(14)	14.4	13.6								
16	16.4	15.6								
20	20.5	19.5					2.2		5.5	
25	25.5	24.5				1.5				
30	30.5	29.5							7.3	
35	35.5	34.5								
40	40.5	39.5								
45	45.5	44.5								
50	50.5	49.5								
55	56	54				4.6				
60	61	59								
(65)	66	64				5.4				
70	71	69								
80	81	79								

NOTE:

1. Screws with nominal length above the dotted stepped lines are threaded up to the head (b=1-a)
2. Sizes in brackets are non-preferred.
3. Preferred lengths are between the bold stepped lines.
4. Weights are given in kg per 1000 numbers only.
5. For stocked sizes refer BPS components book-let.



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS:41202

PAGE : 1 OF 5

Based on IS: 2269

HEXAGONAL SOCKET HEAD CAP SCREWS

1.0 SCOPE:

Covers the requirements of Hexagonal Socket Head Cap Screws in the size range M3 to M30.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes		Table 1 of this standard
Preferred length-Size combination		Table 2 of this standard
Tolerance	Product grade	A
	Indian standard	IS: 1367(part2)
Thread	Pitch	Coarse
	Tolerance	6g
	Indian standard	IS: 4218(part3,5&6)
Material		Steel
Mechanical Properties	Property class	8.8
	Indian standard	IS: 1367(part3)
Sampling and Acceptability	Indian standard	IS: 2614
General requirements	Screw shall comply with IS :2269 in respect of requirement not covered in this standards	

2.1 Referred standards (only the relevant parts of current version are applicable)

IS: 1367 Technical supply conditions for threaded steel fasteners

IS: 2269 Specification for hexagon socket head cap screws

IS: 2614 Method for sampling of fasteners

IS: 4218 ISO Metric screw threads

Revisions			Approved Standing Committee		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt.	Dt.	Year	Standards	Standards	06.11.2013

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3.0 DESIGNATION:

A Grade A Hexagon Socket Head Cap Screw to this standard of thread size M10 and nominal length 60mm shall be designated as:

3.1 On Drawings:

- 1) material specification column : IS: 2269
- 2) Description column : SCRU CAP SOC GR A -8.8-M10X60
- 3) Drawing number column : 4120210060
- 4) Material code column : 4120210060

3.2 Ordering Description:

For placing indents, issuing enquiries and on purchase order, the ordering Description given below shall be followed:

Hexagon Socket Head Cap Screw M10X60-IS: 2269-8.8

4.0 ADDITIONAL INFORMATION:

- 4.1 Property class 10.9 is also acceptable
- 4.2 Cap screws supplied with knurled heads are acceptable
- 4.3 For cadium plated hexagon socket head cap screws, refer BPS: 41242.

Revisions			Approved		
			Engg.Deupt.Manager		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
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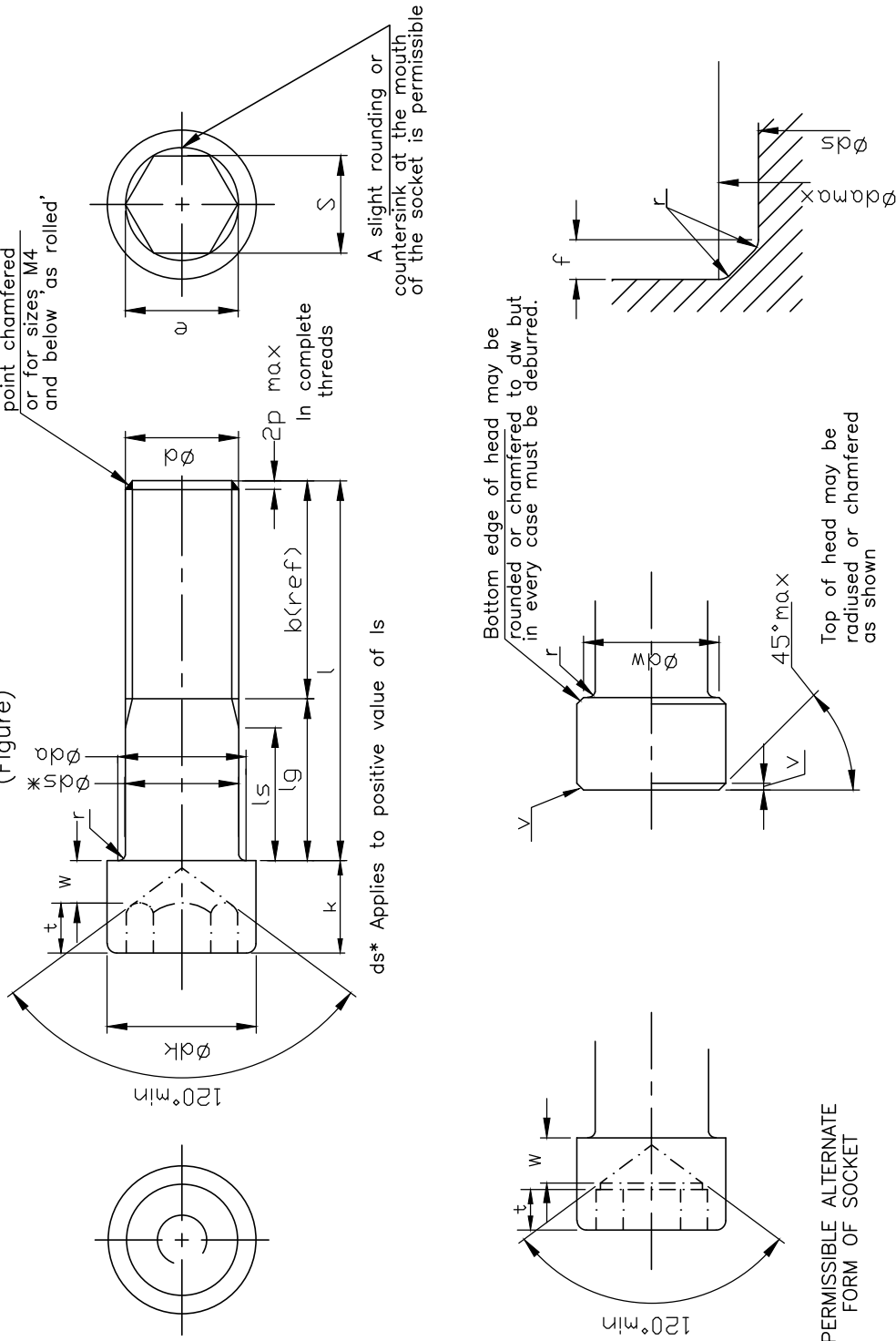
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HEXAGONAL SOCKET HEAD CAP SCREWS

(Figure)



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TABLE 1 – DIMENSIONS FOR HEXAGON SOCKET HEAD CAP SCREWS
(ALL DIMENSIONS ARE IN MILLIMETERS)

Thread size d	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
pitch p	0.5	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	3.5
b	18	20	22	24	28	32	36	44	52	60	72
* Max	5.5	7.0	8.5	10.0	13	16	18	24	30	36	45
** Max	5.68	7.22	8.72	10.22	13.27	16.27	18.27	24.33	30.33	36.39	45.39
Min	5.32	6.78	8.28	9.78	12.73	15.73	17.73	23.67	29.67	35.61	44.61
da	3.6	4.7	5.7	6.8	9.2	11.2	14.2	18.2	22.4	26.4	33.4
d _s h13	3	4	5	6	8	10	12	16	20	24	30
Min	2.86	3.82	4.82	5.82	7.78	9.78	11.73	15.73	19.67	23.67	29.67
e	2.87	3.44	4.58	5.72	6.86	9.15	11.43	16.00	19.44	21.73	25.15
f	0.51	0.60	0.60	0.68	1.02	1.02	1.87	1.87	2.04	2.04	2.89
k h13/h14	3	4	5	6	8	10	12	16	20	24	30
Min	2.86	3.82	4.82	5.70	7.64	9.64	11.57	15.57	19.48	23.48	29.48
r	0.1	0.2	0.2	0.25	0.4	0.4	0.6	0.6	0.8	0.8	1.0
s h13	2.5	3	4	5	6	8	10	14	17	19	22
Min	2.52	3.02	4.02	5.02	6.02	8.025	10.025	14.032	17.05	19.065	22.065
Max	2.58	3.071	4.084	5.084	6.14	8.175	10.127	14.159	17.216	19.275	22.275
t	1.3	2	2.5	3	4	5	6	8	10	12	15.5
v	0.3	0.4	0.5	0.6	0.8	1	1.2	1.6	2	2.4	3
d _w	5.07	6.53	8.03	9.38	12.33	15.53	17.23	23.17	28.87	34.81	43.61
w	1.15	1.4	1.9	2.3	3.3	4	4.8	6.8	8.6	10.4	13.1

* For plain head tol h13

** For knurled heads tol ± IT13

@ e Min= 1.14 s Min

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Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
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TABLE 2- PREFERRED LENGTH SIZE COMBINATION FOR
HEXAGON SOCKET HEAD CAP SCREWS
(ALL DIMENSIONS ARE IN MILLIMETERS)

size d			M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
Nom	Min	Max											
2.5	2.30	2.70											
3	2.80	3.20											
4	3.76	4.24											
5	4.76	5.24											
6	5.76	6.24											
8	7.71	8.29				4.4							
10	9.71	10.29											
12	11.65	12.35				5.1	9.5						
16	15.65	16.35			2.8	5.8	11.1						
20	19.58	20.42				6.5	12.7	21.3	32.4				
25	24.58	25.42						23.8					
30	29.58	30.42				8.8		26.3	41.1	81.7			
35	34.5	35.5					18.4		43.2				
40	39.5	40.5				10.9		32.7		100			
45	44.5	45.5					22.2	35.8	53.8		188		
50	49.5	50.5							57.9		182.2		
55	54.4	55.6					26.0						
60	59.4	60.6				13.2		44.9			224		
65	64.4	65.6							70.2				
70	69.4	70.6									266		
80	79.4	80.6						57.1			272		
90	89.3	90.7											
100	99.3	100.7											
110	109.3	110.7											
120	119.3	120.7											
130	129.2	130.8											
140	139.2	140.8											
150	149.2	150.8											
160	159.2	160.8											
180	179.2	180.8											

WEIGHTS

NOTE:

1. Preferred length are in between the stepped bold lines.
2. For stocked sizes and weights refer BPS components book-let.
3. Lengths above the dotted line are threaded to the head within 3xpitch lengths below the dotted line have values lg and ls according to the following

formulas:

$$lg \text{ Max} = l \text{ Nom} - b \text{ ref.}$$

$$ls \text{ Min} = lg \text{ Max} - 5P.$$

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PLANT STANDARD

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BPS: 41205

PAGE 1 OF 4

Based on IS: 1365-1978

SLOTTED COUNTERSUNK HEAD SCREWS

1.0 SCOPE

Covers the requirements of Slotted Countersunk Head Screws in the size range M3 to M20.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes	Table 1 of this standard	
Preferred length-size combination	Table 2 of this standard	
Tolerance	Product grade	A
	Indian Standard	IS: 1367 (Part 2)
Thread	Pitch	Coarse
	Tolerance	6g
	Indian Standard	IS: 4218 (Part 3, 5 & 6)
Material	Steel	
Mechanical properties	Property class	4.8
	Indian Standard	IS: 1367 (Part 3)
Sampling and Acceptability	Indian Standard	IS: 2614
General requirements	Screws shall comply with IS: 1365 in respect of requirements not covered in this standard.	

2.1 Referred Standards (Only the relevant parts of current versions are applicable).

- IS: 1365 Specification for slotted countersunk head screws
- IS: 1367 Technical supply conditions for threaded steel fasteners
- IS: 2614 Methods for sampling of fasteners
- IS: 4218 ISO Metric screw threads

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BPS: 41205

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3.0 DESIGNATION

A Grade A Slotted Countersunk Head Screw to this standard of thread size M6 and nominal length 12mm shall be designated as:

3.1 On Drawings:

- i) Material Specification column: IS: 1365
- ii) Description column : SCRU SLT CSK GR A 4.8 M6x12
- iii) Drawing Number column : 4120506012
- iv) Material Code column : 4120506012

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Countersunk Screw M6x12-IS: 1365-4.8

4.0 ADDITIONAL INFORMATION

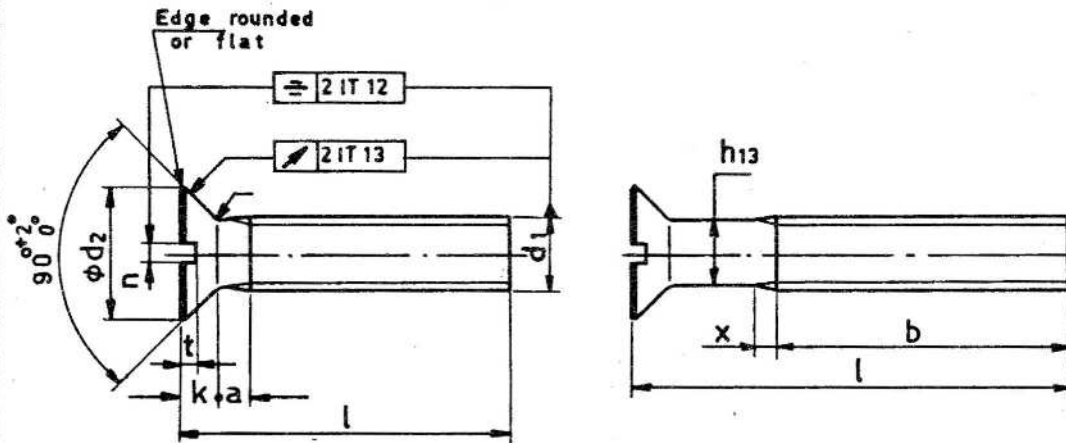
4.1 Property class 6.6 is also acceptable.

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TABLE-1 DIMENSIONS FOR SLOTTED COUNTERSUNK HEAD SCREWS



(All dimensions are in mm)

Thread size d	M3	M4	M5	M6	M8	M10	M12	M16	M20
d2	Nom 5.6 Max 5.60 Min 5.30	Nom 7.5 Max 7.50 Min 7.19	Nom 9.2 Max 9.20 Min 8.84	Nom 11 Max 11.0 Min 10.57	Nom 14.5 Max 14.5 Min 14.07	Nom 18 Max 18.0 Min 17.57	Nom 22 Max 22.0 Min 21.48	Nom 29 Max 29.0 Min 28.48	Nom 36 Max 36.0 Min 35.3
k	Max 1.65	Max 2.2	Max 2.5	Max 3	Max 4	Max 5	Max 6	Max 8	Max 10
n	Nom 0.8 Max 1.0 Min 0.86	Nom 1.0 Max 1.2 Min 1.06	Nom 1.2 Max 1.51 Min 1.26	Nom 1.6 Max 1.91 Min 1.66	Nom 2 Max 2.31 Min 2.06	Nom 2.5 Max 2.81 Min 2.56	Nom 3 Max 3.31 Min 3.06	Nom 4 Max 4.37 Min 4.07	Nom 5 Max 5.3 Min 5.0
t	Max 0.85 Min 0.6	Max 1.1 Min 0.8	Max 1.35 Min 1.0	Max 1.6 Min 1.2	Max 2.1 Min 1.6	Max 2.6 Min 2	Max 3.0 Min 2.4	Max 4.0 Min 3.2	Max 5 Min 4
r	≈ 0.3	≈ 0.4	≈ 0.5	≈ 0.6	≈ 0.8	≈ 1.0	≈ 1.2	≈ 1.6	≈ 2
b	+2P 19	+2P 22	+2P 25	+2P 28	+2P 34	+2P 40	+2P 46	+2P 58	+2P 70

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Note:

- a and x according to IS: 1369 - 'Dimensions of screw thread run-outs and under-cuts.'
- Shank diameter ≈ pitch diameter = major diameter.
- Chamfered end is also permitted.



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**TABLE 2 PREFERRED LENGTH-SIZE COMBINATION
FOR SLOTTED CSK SCREWS**

(All dimensions are in mm)

Nominal length l js 15	Thread size ϕ								
	M3	M4	M5	M6	M8	M10	M12	M16	M20
5									
6		0.8							
8									
10		1.1							
12				2.8					
14									
16									
(18)									
20			2.9	4.2					
22									
25									
(28)									
30						18.4	27.4		
(32)									
35					15.1				
40						23.4		66.7	
45									
50							49.6		
55				12.8	25.7				
60								103	
(65)								109.7	
70								118	
80									
90									
100									
110									
120									
130									
140									
150									
160									
170									
180									
190									
200									

WEIGHTS

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Note:

1. Screws with lengths above the dotted line are threaded up to the head.
2. Sizes in brackets are non-preferred.
3. Preferred lengths are in between the stepped bold lines.
4. Weights are given in Kg per 1000 numbers only.
5. For stocked sizes refer BPS components book-let.

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PLANT STANDARD

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BPS: 41216

PAGE 1 OF 4

Based on IS: 1364 (Part 2) - 1983

HEXAGON HEAD SCREWS, PRODUCT GRADES A & B

(Property Class 6.8)

1.0 SCOPE

Covers the requirements of Hexagon Head Screws in the size range M20 to M30.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes		Table 1 of this standard
Preferred length-size combination		Table 2 of this standard
Tolerance	Product grade	A - for products with $d \leq M24$ and $l \leq 10d$ or 150mm whichever is shorter B - for products with $d > M24$ or $l > 10d$ or 150mm whichever is shorter
	Indian Standard	IS: 1367(Part 2)
Thread	Pitch	Coarse
	Tolerance	6g
	Indian Standard	IS: 4218(Part 3, 5 & 6)
Material		Steel
Mechanical properties	Property class	6.8
	Indian Standard	IS: 1367 (Part 3)
General requirements	Screws shall comply with IS: 1364 in respect of requirements not covered in this standard	
Sampling and Acceptability	Indian Standard	IS: 2614

2.1 Referred Standards (Only the relevant parts of the current versions are applicable)

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IS: 1364 Specification for hexagon head bolts, screws & nuts (Part 2) of product grade A&B. Part 2 Hexagon screws.

IS: 1367 Technical supply conditions for threaded steel fasteners

IS: 2614 Methods for sampling of fasteners

IS: 4218 ISO Metric screw threads

3.0 DESIGNATION

A Grade A Hexagon Head Screw to this standard of thread size M20 and nominal length 60mm shall be designated as:

3.1 On Drawings:

- i) Material Specification column : IS: 1364
- ii) Description column : SCRU HEX GR A 6.8-M20x60
- iii) Drawing Number column : 4121620060
- iv) Material Code column : 4121620060

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Hexagon head screw M20x60 IS:1364 (Part 2) - 6.8

4.0 ADDITIONAL INFORMATION

4.1 Property class 6.6 is also acceptable.

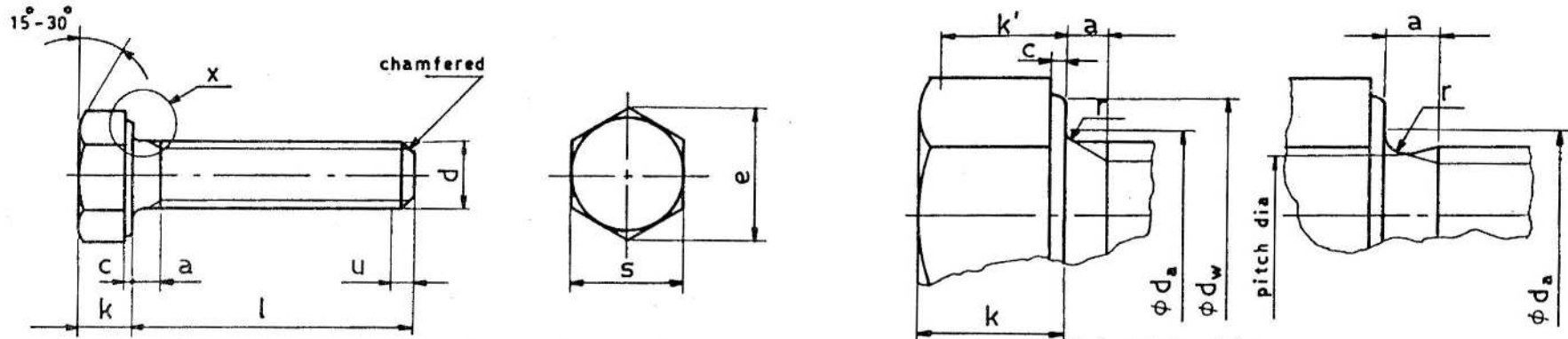
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TABLE-1 DIMENSIONS FOR HEXAGON HEAD SCREWS



u - according to 'CE' of IS:1368 - 'Dimensions of ends of bolts and screws'.

k' = Effective gauging height.

Alternate shape

(All dimensions are in mm)

Thread size d	a*	c		da	dw Min		e Min		k				k'	r	s			
		Min	Max		Max	+	++	+	++	+		++			Max	Min		
										Min	Max	Min				Max	Min	Max
M20	7.5	0.2	0.8	22.4	28.2	27.7	33.53	32.95	12.28	12.72	12.15	12.85	8.5	0.8	30	29.67	29.16	
M24	9	0.2	0.8	26.4	33.6	33.2	39.98	39.55	14.78	15.22	14.65	15.35	10.3	0.8	36	35.38	35	
M30	10.5	0.2	0.8	33.4	42.7	42.7	50.85	50.85	18.7	Nom	18.28	19.12	12.8	1	46	45	45	

* a Min - Not less than 1P (Pitch)
+ for $l \leq 10d$ or 150mm
++ for $l > 10d$ or 150mm



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BPS: 41216

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**TABLE-2 PREFERRED LENGTH-SIZE COMBINATIONS
FOR HEXAGON HEAD SCREWS**

(All dimensions are in mm)

Nom	Nominal length 'l'				Thread size d		
	≤10d or 150mm		>10d or 150mm		M20	M24	M30
	Min	Max	Min	Max			
6	5.76	6.24					
8	7.71	8.29					
10	9.71	10.29					
12	11.65	12.35					
16	15.65	16.35					
20	19.58	20.42					
25	24.58	25.42					
30	29.58	30.42					
35	34.5	35.5	33.75	36.25	151		
40	39.5	40.5	38.75	41.25	162		
45	44.5	45.5	43.75	46.25			
50	49.5	50.5	48.75	51.25	184	278	
55	54.4	55.6	53.5	56.5			
60	59.4	60.6	58.5	61.5	211		827.6
65	64.4	65.6	63.5	66.5			
70	69.4	70.6	68.5	71.5		357	
80	79.4	80.6	78.5	81.5			
90	89.3	90.7	88.25	91.75			
100	99.3	100.7	98.25	101.75		463	

WEIGHTS

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Note:

1. Preferred lengths are in between the stepped bold lines.
2. Weights are given in Kg per 1000 numbers only.
3. For stocked sizes refer BPS components book-let.



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 41221

Rev. No. 02

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HEXAGON HEAD BOLTS, PRODUCT GRADE 'C'

(Property Class 4.6)

1.0 SCOPE

Covers the requirements of Hexagon Head Bolts in the size range M36x3 and above.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes	Table 1 of this standard	
preferred length size combination	Table 2 of this standard	
Tolerance	Product Grade C	
	Indian Standard	IS 1367 (Part 2)
Thread	Pitch	Table 1 of this standard
	Tolerance	8g
	Indian Standard	IS 4218 (Part 3, 5 & 6)
Material	Steel	
Mechanical properties	Property class	4.6
	Indian Standard	IS 1367 (Part 3)
Sampling & Acceptability	Indian Standard	IS 1367 (Part 17)
General requirements	Hexagon Head bolts shall comply with IS 1363 (Part 1) in respect of requirements not covered in this standard.	

2.1 Referred Standards (Only the relevant parts of current versions are applicable)

IS 1363(Part 1)	Specification for hexagon head bolts, screws and nuts of product grade C. Part 1 Hexagon Head bolts.
IS 1367 (Parts 2,3)	Technical supply conditions for threaded steel fasteners.
IS 1367 Part 17	Industrial fasteners - Threaded steel fasteners-Technical supply conditions:Part 17 - Inspection, sampling and acceptance procedure.
IS 4218	ISO Metric screw threads

3.0 DESIGNATION

A Grade C, Hexagon Head Bolt to this standard of thread size M36x3 and nominal length 180 mm shall be designated as:

Revisions 02 Brought upto date			Approved STANDARDS SECTION PRODUCT ENGINEERING / FOSSILE BOILER HPBP, TIRUCHIRAPPALLI		
Rev. No. 02	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt. 31-07-2000	Dt.	Year	STANDARDS	STANDARDS	DEC 1986

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3.1 On Drawings:

- i) Description column : **BOLT HEX Gr C 4.6- M36x3 x 180**
- ii) Drawing Number column : **BPS 41221**
- iii) Material Code column : **4122136180**

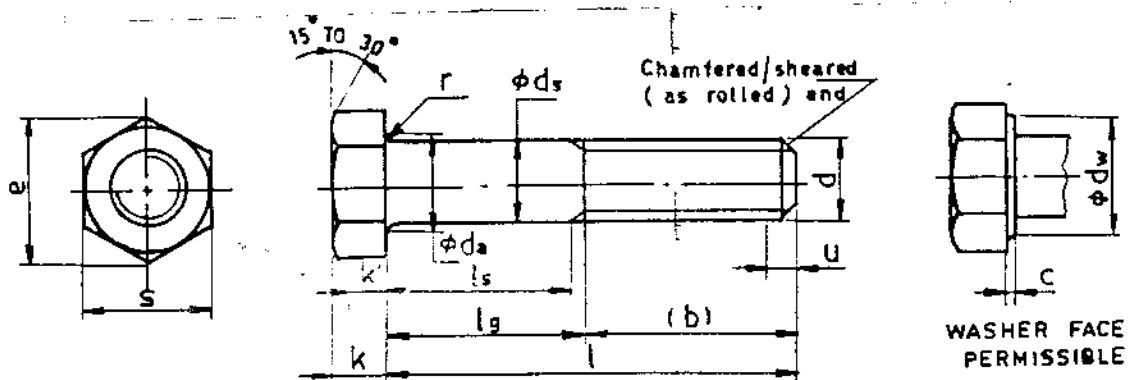
3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, ordering description given below shall be followed (typical examples).

Hexagon head bolt M36X3 x 180 - BPS: 41221-4.6

4.0 ADDITIONAL INFORMATION

- 4.1 Copies of this standard shall be enclosed along with the purchase order for thread sizes M36x3 and above.



k' = Effective gauging height.

Table - 1
DIMENSIONS FOR HEXAGON BOLT
(All dimensions are in millimetres)

Thread size d	Pitch P	b * ** ***	c	da	ds	dw	e	k	k'	r	s
			Max	Max	Max Min	Min	Min	Min Max	Min	Min	Max Min
M 36x3	3	78	0.8	42.4	37	51.1	60.79	21.45	15.0	1.0	55
		84			35			23.55			53.8
		97									
(M39x3)	3	84		45.4	40		66.44	23.95		1.0	60
		90			38			26.05			58.8
		103									

NOTE:

1. "u" according to "CE" of IS :1368- Dimensions of ends of bolts and screws.
2. * For nominal lengths 'l' ≤ 125 mm
 ** For nominal lengths 'l' > 125 and ≤ 200 mm
 *** For nominal lengths 'l' > 200 mm
3. lg Max (grip length) = l Nom - b
 ls Min (shank length) = lg Max - 5 x Pitch



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 41221

Rev. No. 02

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TABLE 2
PREFERRED LENGTH- SIZE COMBINATION
FOR HEXAGON HEAD BOLTS
(All dimensions are in mm)

Thread size d M36x3 (M39x3)

Nom. Length 'L'

Nom	Min	Max
110	108.25	111.75
120	118.25	121.75
130	128	132
140	138	142
150	148	152
160	156	164
(170)	166	174
180	176	184
(190)	186	194
200	195.4	204.6
220	215.4	224.6
240	235.4	244.6
260	254.8	265.2
280	274.8	285.2
300	294.8	305.2

Note:

1. Size in brackets are non-preferred.
2. Preferred lengths are in between the stepped bolt lines.
3. Weights are given in Kg per 1000 numbers only.



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS:41237

PAGE : 1 OF 4

Based on IS: 1364(part-1)

HEXAGONAL HEAD BOLTS, PRODUCT GRADE A (property class 8.8)

1.0 SCOPE:

Covers the requirements of Hexagonal Head Bolts in the size range M6 to M16.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes		Table 1 of this standard
Preferred length-Size combination		Table 2 of this standard
Tolerance	Product grade	A
	Indian standard	IS: 1367(part2)
Thread	Pitch	Coarse
	Tolerance	6g
	Indian standard	IS: 4218(part3,5&6)
Material		Steel
Mechanical Properties	Property class	8.8
	Indian standard	IS: 1367(part3)
Sampling and Acceptability	Indian standard	IS: 2614
General requirements	Bolts shall comply with IS :1364 in respect of requirement not covered in this standards	

2.1 Referred standards (only the relevant parts of current version are applicable)

IS: 1364 Specification for hexagon head Bolts,screws and nuts of (part-1) grade A&B. Part 1 Hexagonal bolts.

IS: 1367 Technical supply conditions for threaded steel fasteners

IS: 2614 Method for sampling of fasteners

IS: 4218 ISO Metric screw threads

Revisions			Approved Engg.Deupt.Manager		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt.	Dt.	Year	Standards /EDC	Standards /EDC	

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PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS:41237

PAGE : 2 OF 4

3.0 DESIGNATION:

A Grade A Hexagon Head Bolt to this standard of thread size M16 and nominal length 60mm shall be designated as:

3.1 On Drawings:

- 1) material specification column : IS: 1364
- 2) Description column : BOLT HEX GR A 8.8 M16X60
- 3) Drawing number column : 4123716060
- 4) Material code column : 4123716060

3.2 Ordering Description:

For placing indents, issuing enquiries and on purchase order, the ordering Description given below shall be followed:

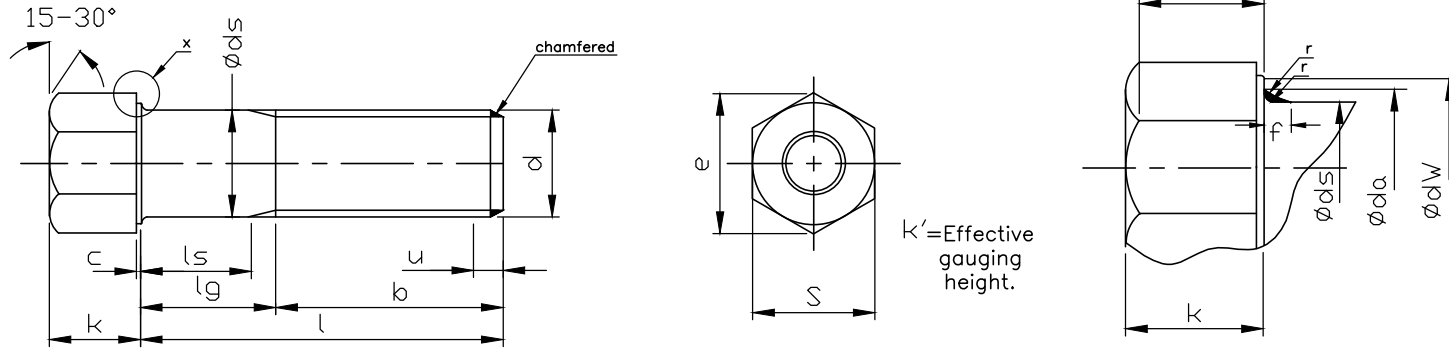
Hexagon Bolt M16X60 IS: 1364(part-1)-8.8

Revisions			Approved		
			Engg.Deupt.Manager		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt.	Dt.	Year	Standards /EDC	Standards /EDC	

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TABLE 1 DIMENSIONS FOR HEXAGONAL HEAD BOLTS



u according to CE of IS:1368 - ' Dimensions of ends of bolts and screws

lg Max=l Nom-b ; ls Min= l Max - 5xpitch

(ALL DIMENSIONS ARE IN MILLIMETERS)

Thread size d	b			C		da	ds		dw Min		e Min		f	k				k'	r	s		
	1	2	3	Min.	Max.	Max.	Max.	Min.	+	++	+	++	Max.	+		++				Min.	Min.	Max.
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
M6	18	-	-	0.15	0.5	6.8	6	5.82	8.9	8.7	11.05	10.89	1.4	3.85	4.15	3.76	4.24	2.63	0.25	10	9.78	9.64
M8	22	28	-	0.15	0.6	9.2	8	7.78	11.6	11.4	14.38	14.20	2	5.15	5.45	5.06	5.54	3.54	0.4	13	12.73	12.57
M10	26	32	-	0.15	0.6	11.2	10	9.78	14.6	14.4	17.77	17.59	2	6.22	6.58	6.11	6.69	4.28	0.4	16	15.73	15.57
M12	30	36	-	0.15	0.6	13.7	12	11.73	16.6	16.4	20.03	19.85	3	7.32	7.68	7.21	7.79	5.05	0.6	18	17.73	17.57
M16	38	44	57	0.2	0.8	17.7	16	15.73	22.5	22	26.75	26.17	3	9.82	10.18	9.71	10.29	6.8	0.6	24	23.67	23.16

1) For Nom length $l \leq 125$ mm; + for $1 < 10d$ or 150mm;

2) For Nom length $l > 125$ and ≤ 200 mm; ++ for $1 < 10d$ or 150mm;

3) For Nom length $l > 200$ mm



PLANT STANDARD
HPBP TIRUCHIRAPALLI

BPS:41237

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Revisions		Approved		Engg. Deupt. Manager
Rev. No.	Amd. No.	Prepared	Issued	
Dt.	Dt.	Standards /EDC	Standards /EDC	



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS:41237

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TABLE 2- PREFERRED LENGTH-SIZE COMBINATION FOR
HEXAGON HEAD BOLTS
(ALL DIMENSIONS ARE IN MILLIMETERS)

Nom	Length 'l'				Thread size d				
	For 1 ≤ 10 d or 150		For 1 > 10 d or 150		M6	M8	M10	M12	M16
	Min	Max	Min	Max					
20	19.58	20.42							
25	24.58	25.42							
30	29.58	30.42							
35	34.5	35.5	33.75	36.25					
40	39.5	40.5	38.75	41.25					
45	44.5	45.5	43.75	46.25	11.8				
50	49.5	50.5	48.75	51.25				58.7	
55	54.4	55.6	53.5	56.5				63.2	
60	59.4	60.6	58.5	61.5		28.2		67.6	123
65	64.4	65.6	63.5	66.5					
70	69.4	70.6	68.5	71.5			53.6		139
75	74.4	75.6	73.5	76.5		35.6			
80	79.4	80.6	78.5	81.5					155
90	89.3	90.7	88.25	91.75					171
100	99.3	100.7	98.25	101.75					
110	109.3	110.7	108.25	111.75					
120	119.3	120.7	118.25	121.75					
130	129.2	130.8	128	132					
140	139.2	140.8	138	142					
150	149.2	150.8	148	152					
160	159.2	160.8	158	162					
180	179.2	180.8	178	182					
200	199.08	200.92	197.7	202.3		WEIGHTS			
220	219.08	220.92	217.7	222.3					
240	239.08	240.92	237.7	242.3					
260	258.95	261.05	257.4	262.6					
280	278.95	281.05	277.4	282.6					
300	298.95	301.05	297.4	302.6					

NOTE:

1. Preferred length are in between the stepped bold lines.
2. Weights are given in Kg per 1000 numbers only.
3. For stocked sizes refer BPS components book-let.

Revisions			Approved Engg.Deupt.Manager		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt.	Dt.	Year	Standards /EDC	Standards /EDC	

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PLANT STANDARD

H P B P TIRUCHIRAPALLI

BPS : 41238

PAGE : 1 OF 4

Based on IS: 1364 (PART-2)

HEXAGON HEAD SCREWS, PRODUCT GRADE A

(Property Class 8.8)

1.0 SCOPE

Covers the requirements for Hexagon head screws in the size range M6 to M16.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes		Table 1 of this standard
Preferred length size combination		Table 2 of this standard
Tolerance	Product grade	A
	Indian Standard	IS: 1367 (PART 2)
Thread	Pitch	Coarse
	Tolerance	6g
	Indian Standard	IS: 4218 (Part 3,5 & 6)
Material		Steel
Mechanical properties	Property class	8.8
	Indian Standard	IS: 1367 (PART 3)
Sampling and Acceptability	Indian Standard	IS: 2614
General requirements		Screws shall comply with IS: 1364 in respect of requirements not covered in this standard

2.1 Referred standards (only the relevant parts of current versions are applicable)

IS: 1364 Specifications for hexagon head bolts, screws & nuts of (Part2) product grade A&B, Part 2 Hexagon screws.

IS: 1367 Technical supply conditions for threaded steel fasteners.

IS: 2614 Methods for sampling for fasteners.

IS: 4218 ISO Metric screw threads.

Revisions			Approved		
Rev. No.	Amd. No.	Reaffirmed	Prepared HPBP TIRUCHY	Issued STANDARDS ENGG.	Dt of 1st Issue
Dt.	Dt.	Year			



PLANT STANDARD

H P B P TIRUCHIRAPALLI

BPS : 41238

PAGE : 2 OF 4

3.0 DESIGNATION

A grade A Hexagon head screw to this standard of thread size M16 and Nominal length 35mm shall be designated as:

3.1 On drawings:

- i) Material specification column : IS: 1364
- ii) Description column : SCRU HEX. GR. A 8.8 M16x35
- iii) Drawing Number column : 4123816035
- iv) Material code column : 4123816035

3.2 Ordering description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Hexagon head screw M16x35 IS: 1364 (Part 2) – 8.8.

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Revisions			Approved		
Rev. No.	Amd. No.	Reaffirmed	Prepared HPBP TIRUCHY	Issued STANDARDS ENGG.	Dt of 1st Issue
Dt.	Dt.	Year			



PLANT STANDARD
H P B P TIRUCHIRAPALLI

BPS : 41238

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TABLE-2 PREFERRED LENGTH SIZE COMBINATION
FOR HEXAGON HEAD SCREWS

(All dimensions are in mm)

Nom.	Length 'l'				Thread size d				
	≤ 10d or 150mm		>10d or 150mm		M6	M8	M10	M12	M16
	Min.	Max.	Min.	Max.					
6	5.76	6.24							
8	7.71	8.29							
10	9.71	10.29							
12	11.65	12.35				10			
16	15.65	16.35					21.4		
20	19.58	20.42			6.3	12.5	23.4		
25	24.58	25.42				14.3	25.9	37	
30	29.58	30.42					28.9	41	78.4
35	34.5	35.5	33.75	36.25				45.4	85.1
40	39.5	40.5	38.75	41.25				49.9	92.2
45	44.5	45.5	43.75	46.25			38.20		100
50	49.5	50.5	48.75	51.25					108
55	54.4	55.6	53.5	56.5					
60	59.4	60.6	58.5	61.5					123
65	64.4	65.6	63.5	66.5					
70	69.4	70.6	68.5	71.5					
80	79.4	80.6	78.5	81.5					
90	89.3	90.7	88.25	91.75					
100	99.3	100.7	98.25	101.75					

WEIGHTS

Note:

1. Preferred lengths are in between the stepped bold lines.
2. Weights are given in kg. per 1000 numbers only.
3. For stocked sizes refer BPS components book-let.

Revisions				Approved		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue	
Dt.	Dt.	Year	HPBP TIRUCHY	STANDARDS ENGG.		

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SPRING WASHERS – TYPE B

1.0 SCOPE

COVERS THE REQUIREMENTS FOR SINGLE COIL RECTANGULAR SECTION SPRING WASHERS, TYPE-B (WITH FLAT ENDS) IN THE SIZE RANGE 2 TO 100mm

2.0 SPECIFICATION & REFERENCE STANDARDS

DIMENSIONS & TOLERANCES	TABLE-1 OF THIS STANDARD
MATERIAL	SUITABLE SPRING STEEL OF TENSILE STRENGTH 700 MN/m ² Min. ACCORDING TO IS: 4072
MECHANICAL PROPERTIES	HARDNESS 43-50 HRC
FINISH	NATURAL FINISH
SAMPLING & ACCEPTABILITY	ACCORDING TO IS:6821
GENERAL REQUIREMENTS	WASHERS SHALL COMPLY WITH IS:3063 IN RESPECT OF REQUIREMENTS NOT COVERED IN THIS STANDARD

2.1 REFERRED STANDARDS (ONLY THE CURRENT VERSIONS ARE APPLICABLE)

- IS:3063 SINGLE COIL RECTANGULAR SECTION SPRING WASHERS FOR BOLTS, NUTS AND SCREWS.
- IS:4072 STEEL FOR SPRING WASHERS.
- IS:6821 METHODS FOR SAMPLING NON-THREADED FASTENERS.

Revisions			Approved Standing Committee		
Rev. No.	Amd. No.	Reaffirmed	Prepared Standards	Issued Standards	Dt of 1st Issue 06.11.2013
Dt.	Dt.	Year			

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PLANT STANDARD
HPBP TIRUCHIRAPALLI

BPS : 41405

PAGE 2 of 3

Based on IS : 3063

3.0 DESIGNATION

A SPRING WASHER TO THIS STANDARD FOR BOLT/SCREW SIZE
M6 SHALL BE DESIGNATED AS

3.1 ON DRAWINGS -

- i) MATERIAL SPECIFICATION COLUMN : IS:3063-B
- ii) DESCRIPTION COLUMN : WASHER SPRING SC 6
- iii) DRAWING NUMBER COLUMN : 4140506000
- iv) MATERIAL CODE COLUMN : 4140500006

3.2 ORDERING DESCRIPTION

FOR PLACING INDENTS, ISSUING ENQUIRIES AND ON PURCHASE
ORDER, THE ORDERING DESCRIPTION GIVEN BELOW SHALL BE
FOLLOWED

SPRING WASHER B6 IS:3063

4.0 ADDITIONAL INFORMATION

4.1 FOR CADMIUM PLATED SPRING WASHERS REFER BPS:41445

4.2 THESE WASHERS CAN BE USED FOR RIGHT HAND THREADED
FASTENERS ONLY

4.3 FOR SCREWS WITH CYLINDRICAL HEADS INTENDED FOR USE IN
COUNTER BORES, REFER SPRING WASHERS TO BPS:41412

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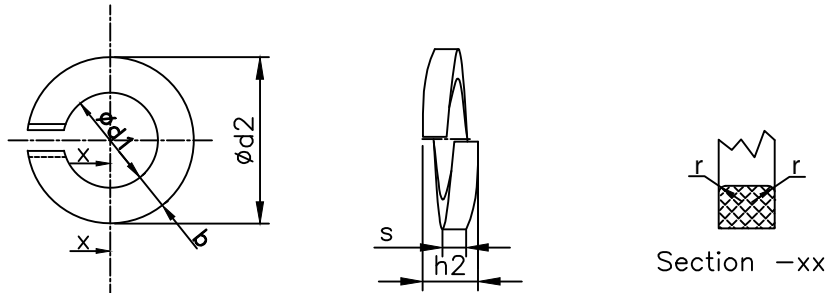
PLANT STANDARD
HPBP TIRUCHIRAPALLI

BPS : 41405

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TABLE-1 – DIMENSIONS FOR SPRING WASHERS

Based on IS : 3063



$h=2s$

All Dimensions are in millimeters

Nominal Size	d1		d2 Max	b		s		r Nom	Weight	For Bolt / Screw Size
	Basic	Tol		Basic	Tol±	Basic	Tol±			
2	2.1	0.3	4.4	0.9	0.1	0.5	0.1	0.1	0.033	M2
3	3.1	0.3	6.2	1.3	0.1	0.8	0.1	0.2	0.112	M3
4	4.1	0.3	7.6	1.5	0.1	0.9	0.1	0.2	0.18	M4
5	5.1	0.3	9.2	1.8	0.1	1.2	0.1	0.2	0.36	M5
6	6.1	0.4	11.8	2.5	0.15	1.6	0.1	0.3	0.83	M6
8	8.2	0.4	14.8	3.0	0.15	2.0	0.1	0.5	1.60	M8
10	10.2	0.6	18.1	3.5	0.2	2.2	0.15	0.5	2.53	M10
12	12.2	0.8	21.1	4.0	0.2	2.5	0.15	1.0	3.82	M12
16	16.2	0.8	27.4	5.0	0.2	3.5	0.2	1.0	8.91	M16
20	20.2	1.0	33.6	6.0	0.2	4.0	0.2	1.0	15.20	M20
24	24.5	1.0	40.0	7.0	0.25	5.0	0.2	1.6	26.20	M24
(27)	27.5	1.0	43.0	7.0	0.25	5.0	0.2	1.6	28.70	(M27)
30	30.5	1.2	48.2	8.0	0.25	6.0	0.2	1.6	44.3	M30
(33)	33.5	1.2	55.2	10.0	0.25	6.0	0.2	1.6	63.00	(M33)
36	36.5	1.2	58.2	10.0	0.25	6.0	0.2	1.6	67.3	M36
(39)	39.5	1.2	61.2	10.0	0.25	6.0	0.2	1.6	71.7	(M39)
42	42.5	1.2	68.2	12.0	0.25	7.0	0.25	2.0	111	M42
(45)	45.5	1.2	71.2	12.0	0.25	7.0	0.25	2.0	117	(M45)
48	49.0	1.5	75.0	12.0	0.25	7.0	0.25	2.0	123	M48
52	53.0	1.5	83.0	14.0	0.25	8.0	0.25	2.0	182	M52
56	57.0	1.5	87.0	14.0	0.25	8.0	0.25	2.0	193	M56
60	61.0	1.5	91.0	14.0	0.25	8.0	0.25	2.0	203	M60
64	65.0	1.5	95.0	14.0	0.25	8.0	0.25	2.0	218	M64
72	73.0	1.5	103.0	14.0	0.25	8.0	0.25	2.0	240	M72
76	77.0	1.5	109.0	14.0	0.25	8.0	0.25	2.0	253	M76
80	81.0	1.5	111.0	14.0	0.25	8.0	0.25	2.0	262	M80
90	91.0	1.5	121.0	14.0	0.25	8.0	0.25	2.0	290	M90
100	101.0	1.5	131.0	14.0	0.25	8.0	0.25	2.0	318	M100

NOTE:--

1. WEIGHTS ARE GIVEN IN KG/1000 NUMBERS ONLY
2. SIZES IN BRACKETS ARE NON-PREFERRED
3. FOR STOCKED SIZES, REFER BPS COMPONENT BOOKLET

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PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS:41406

PAGE 1 of 4

Based on IS: 2016

1.0 SCOPE: MACHINED WASHERS

Covers the requirements for machined washers in the size range 1.7 to 155mm.

2.0 SPECIFICATION AND REFERENCES STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Material	Suitable Steel	
Finish	Natural finish	
Sampling and Acceptability	Indian standard	IS: 6821 & IS: 5369
General requirements	Washers shall comply with IS: 2016 in respect of requirements not covered in this standards	

2.1 Referred standards (only the current versions are applicable).

- IS: 2016 Specification for Plain washers
- IS: 5369 General requirements for plain washers and lock washers
- IS: 6821 Methods for sampling non-threaded fasteners

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Revisions		Approved STANDARDS SECTION ENGINEERING AND DEVELOPMENT CENTER HPBP TIRUCHIRAPALLI			
Rev. No.	Amd. No.	Reaffirmed	PREPARED HPBP TIRUCHY	Issued Standards /EDC	Dt of 1st Issue
Dt.	Dt.	Year			



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41406

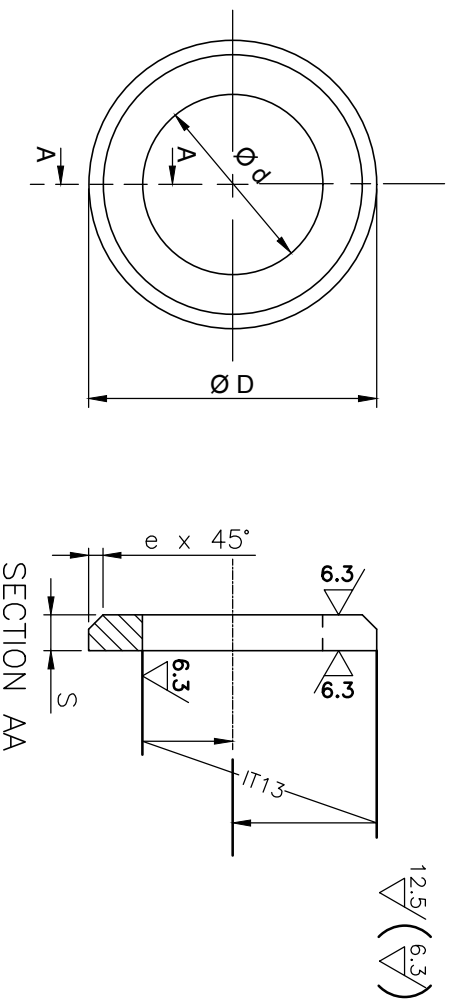
PAGE 2 of 4

- 3.0 DESIGNATION
A machined washers to this standard for bolt/screw size M10 shall be designated as:
- 3.1 On Drawings
- 1) Material Specification column : IS: 2016
 - 2) Description Column : WASHER MCD 10
 - 3) Drawing Number column : 4140610000
 - 4) Material code Column : 4140600010
- 3.2 Ordering Description
For placing indents, issuing enquiries and on Purchase order, the Ordering Description given below shall be followed:
Machined Washer 10. 5* IS: 2016 – steel
- 4.0 ADDITIONAL INFORMATION
- 4.1 These washers can be used for product grades A and B of general purpose bolts and screws.
- *4.2 While preparing ordering Description only the actual hole size (corresponding to bolt/screw size) shall be filled in referring to Table.

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TABLE 1 – DIMENSION FOR MACHINED WASHERS



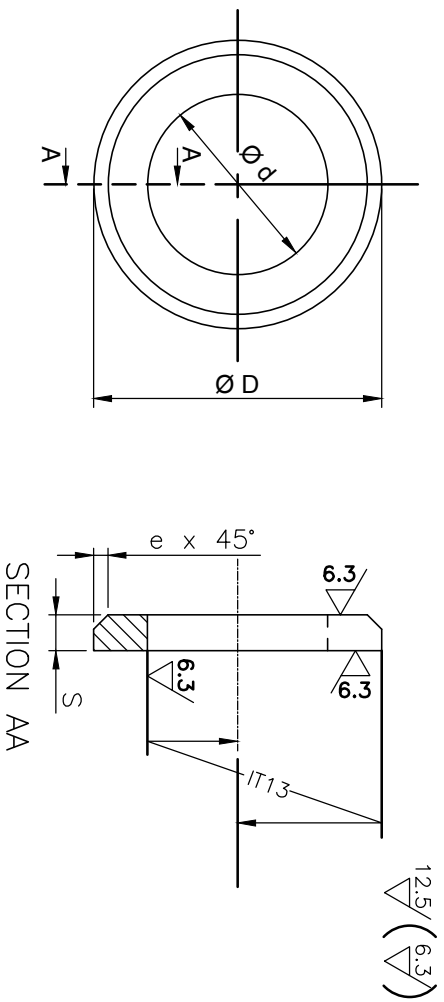
(All dimension are in millimeters)

d H12	D		S		e	For bolt/ screw size	weight
	Basic	Tol	Basic	Tol			
1.7	4	0 -0.3	0.3	±0.1	0.1	M1.6	
2.2	5	0 -0.3	0.3	±0.1	0.1	M2	
3.2	7	0 -0.3	0.5	±0.1	0.2	M3	
4.3	9	0 -0.3	0.8	±0.1	0.3	M4	0.3
5.3	10	0 -0.3	1.0	±0.1	0.4	M5	
6.4	12.5	0 -0.4	1.6	±0.2	0.6	M6	1.1
8.4	17	0 -0.4	1.6	±0.2	0.6	M8	
10.5	21	0 -0.5	2	±0.2	0.6	M10	4
13	24	0 -0.5	2.5	±0.3	0.6	M12	6.2
17	30	0 -0.5	3	±0.3	0.6	M16	11.1
21	37	0 -0.8	3	±0.3	1.0	M20	16.7
25	44	0 -0.8	4	±0.3	1.0	M24	31.7
(28)	50	0 -0.8	4	±0.3	1.0	(M27)	41.7
31	56	0 -1.0	4	±0.3	1.0	M30	52.9
(34)	60	0 -1.0	5	±0.6	1.0	(M33)	

NOTE:

1. Sizes in brackets are non-preferred.
2. Weights are given in kg per 1000 numbers only.
3. For stocked sizes refer BPS components booklet.

TABLE 1 – DIMENSION FOR MACHINED WASHERS (Contd.)



(All dimension are in millimeters)

d H12	D		S		e	For bolt/ screw size	weight
	Basic	Tol	Basic	Tol			
37	66	0 -1.0	5	±0.6	1.6	M36	89.9
(40)	72	0 -1.0	6	±0.6	1.6	(M39)	
43	78	0 -1.0	7	±1.0	1.6	M42	180
(46)	85	0 -1.5	7	±1.0	1.6	(M45)	243
50	92	0 -1.5	8	±1.0	1.6	M48	291
(54)	98	0 -1.5	8	±1.0	1.6	(M52)	
58	105	0 -1.5	9	±1.0	1.6	M56	
(62)	110	0 -1.5	9	±1.0	2.0	(M60)	
66	115	0 -1.5	9	±1.0	2.0	M64	486.5
74	125	0 -1.8	10	±1.0	2.0	M72	
82	140	0 -1.8	12	±1.2	2.5	M80	
93	160	0 -1.8	12	±1.2	3.0	M90	
104	175	0 -1.8	14	±1.2	3.0	M100	
(124)	210	0 -2	16	±1.2	3.0	(M120)	
(155)	250	0 -2	18	±1.2	4.0	(M150)	

NOTE:

- Sizes in brackets are non-preferred.
- Weights given are in kg per 1000 numbers only.
- For stocked sizes refer BPS components booklet.



PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 41408

Rev. No. 02

PAGE 1 OF 2

PUNCHED WASHERS - TYPE A

1.0 SCOPE

Covers the requirements for punched washers Type A in the size range 61 to 78 mm.

2.0 SPECIFICATION AND REFERENCE STANDARDS

<i>Dimensions and tolerances</i>	Figure 1 and Table 1 of this standard	
<i>Material</i>	Suitable steel	
<i>Finish</i>	Natural finish	
<i>Sampling and acceptability</i>	Indian Standard	IS 6821 and IS 5369
<i>General Requirements</i>	Washers shall comply with IS 2016 in respect of requirements not covered in this standard.	

2.1 Referred Standards (Only current versions are applicable)

IS 2016	Specification for plain washers.
IS 5369	General requirements for plain washers and lock washers.
IS 6821	Methods for sampling non-threaded fasteners.

3.0 DESIGNATION

A punched washer of size 61 to this standard for bolt/screw size M56 shall be designated as :

3.1 On Drawings

i) Material Specification column	:
ii) Description column	:	PUNCHED WASHER A 61
iii) Drawing Number column	:	BPS 41408
iv) Material Code column	:	4140800056

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, ordering description given below shall be followed (typical examples).

Punched Washer A61 to BPS 41408

Revisions 02
Brought upto date .

Approved
STANDARDS SECTION
CONTRACT ENGINEERING AND CO-ORDINATION
HPBP, TIRUCHIRAPPALLI

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4.0 ADDITIONAL INFORMATION

- 4.1 These washers can be used with Product Grade C general purpose bolts and screws.
- 4.2 Copies of this standard shall be enclosed alongwith the purchase order.

Figure - 1

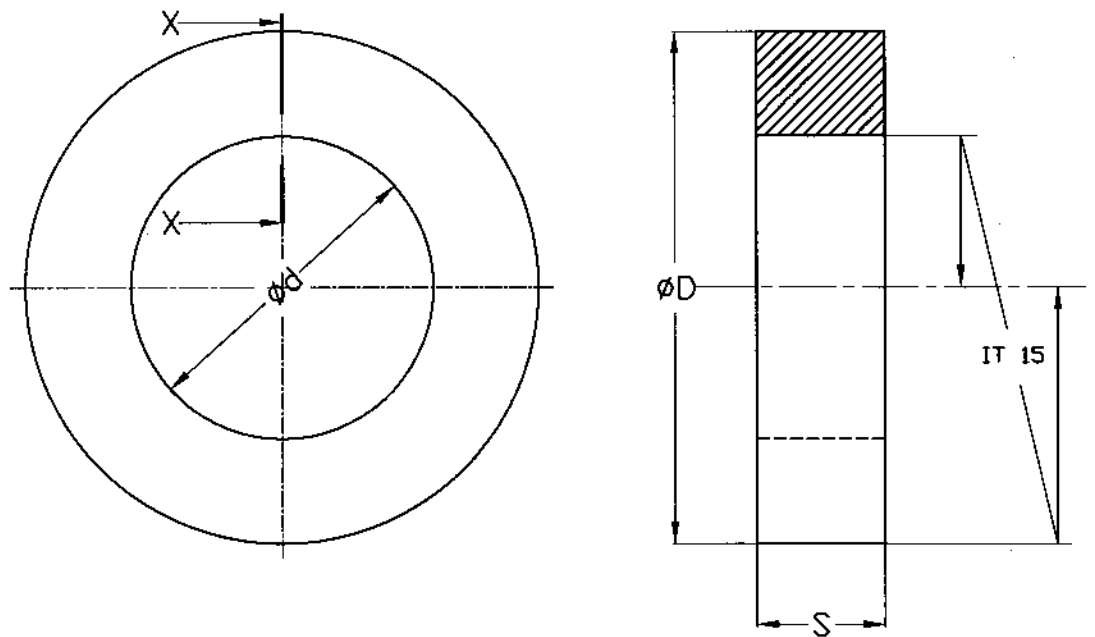


Table - 1

(All dimensions are in millimetres)

Size ϕd	ϕD Nom	s Nom	For bolt/screw size	Weight
61	105	9.0	M56	405.0
78	122	10.0	M72	543.0

NOTE :

- Weights are given in Kg per 1000 numbers.



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS:41501

PAGE : 1 OF 5

Based on IS: 2048

PARALLEL KEYS - TYPE-A

1.0 SCOPE:

Covers the requirements for keys with bolt ends round (type A)

2.0 SPECIFICATION AND REFERENCES STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Preferred length and Size combination	Table 2 of this standard	
Material	Steel of tensile strength not less than 600 MPa	
Finish	Natural finish	
Sampling and Acceptability	Indian standard	IS: 6821
General requirements	Keys shall comply with IS :2048 in respect of requirement not covered in this standards	

2.1 Referred standards (only the current version are applicable)

IS: 2048 Specification for parallel keys and keyways

IS: 6821 Methods for sampling non-threaded fasteners

Revisions			Approved Standing Committee		
Rev. No.	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt.	Dt.	Year	Standards	Standards	06.11.2013

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PLANT STANDARD

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BPS:41501

PAGE : 2 OF 5

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3.0 DESIGNATION:

A parallel key to this standard of width 12mm, height 8mm and length 56mm shall be designated as:

3.1 On Drawings:

- 1) material specification column : IS: 2048-A
- 2) Description column : KEY PRL RND END 12X8X56
- 3) Drawing number column : 4150108056
- 4) Material code column : 4150112056

3.2 Ordering Description:

For placing indents, issuing enquiries and on purchase order, the ordering Description given below shall be followed:

parallel key A 12x8x56

4.0 ADDITIONAL INFORMATION:

- 4.1 for keyways to these keys refer IS: 2048 or AA 023 15 08.

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PLANT STANDARD

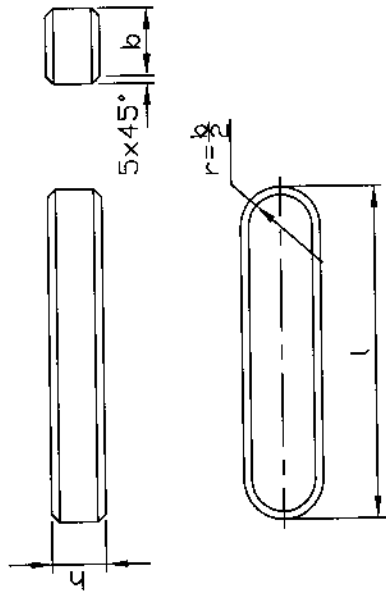
HPBP TIRUCHIRAPALLI

BPS:41501

PAGE : 3 OF 5

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TABLE 1 - DIMENSIONS FOR PARALLEL KEYS



NOTE:

- * 1. Tolerance on 'h': square section - h9 rectangular section - h11

ALL DIMENSIONS ARE IN MILLIMETRES

WIDTH	b	2	3	4	5	6	8	8	10	12	14	16	18	20	22	25	28	32	36	40	45	50	56	63	70	80	90	100
TOL ON	b	H9	-0.025	-0.030	-0.036	-0.043	-0.052	-0.062	-0.074	-0.087																		
HEIGHT	h	2	3	4	5	6	7	8	8	9	10	11	12	14	14	14	16	18	20	22	25	28	32	32	36	40	45	50
TOL ON	h*	see note-1	-0.025	-0.030	-0.036	-0.043	-0.052	-0.062	-0.074	-0.087																		
s	Min	0.16	0.16	0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.40	0.40	0.40	0.60	0.60	0.60	0.60	0.60	0.60	1.00	1.00	1.00	1.00	1.60	1.60	2.50	2.50	2.50
	Max	0.25	0.25	0.40	0.40	0.40	0.40	0.60	0.60	0.60	0.60	0.60	0.80	0.80	0.80	0.80	1.20	1.20	1.20	1.20	1.20	1.20	2.00	2.00	2.00	3.00	3.00	3.00
RANGE OF KEY LENGTH 'l'	Min	6	6	8	10	14	18	22	28	36	45	50	56	63	70	80	90	100	110	125	140	160	180	200	220	250	280	
	Max	20	36	45	56	70	90	110	140	160	180	200	220	250	280	320	360	400	400	400	400	400	400	400	400	400	400	400

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PLANT STANDARD

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BPS:41501

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TABLE 2 - PREFERRED LENGTH-SIZE COMBINATION FOR PARALLEL KEYS

(ALL DIMENSIONS ARE IN MILLIMETERS)

Preferred length (l)	2x2	3x3	4x4	5x5	6x6	8x7	10x8	12x8	14x9	16x10	18x11	20x12	22x14	25x14
10														
12			1.402											
14														
16														
18														
20				3.709	5.286		13.1							
22														
25				4.719		10.245			21.6					
28			3.412											
32					8.676			22.16						
36										41.0				
40					7.639	10.936			36.63		56.7	66.0		
45						19.045								
50										58.49				
56					15.436									
63									59.33					
70														
80									76.13					205.3
90														
100														
110														
125														
140														

WEIGHTS

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BPS:41501

PAGE : 5 OF 5

TABLE 2-- PREFERRED LENGTH-SIZE COMBINATION FOR PARALLEL KEYS (CONT.)

(ALL DIMENSIONS ARE IN MILLIMETERS)

Preferred length (l)	22X14	25X14	28X16	32X18	36X20	40X22	45X25	50X28	56X32	63X32	70X36	80X40	90X45	100X50
63														
70														
80		205.3												
90														
100														
110														
125														
140														
160														
180														
200														
220														
250														
280														
320														
360														
400														

WEIGHTS

NOTE:

1. weights are given in kg per 1000 numbers only.
2. for stocked sizes refer BPS components book-let.
3. Preferred length are in between the stepped bold lines.

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PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41704

PAGE 1 OF 4

Based on IS: 549-1974

SPLIT PINS

1.0 SCOPE

Covers the requirements for Split Pins in the diameter range 0.6 to 20mm.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Preferred length and size combination	Table 2 of this standard	
Material	Mild Steel Wire (Half round)	
Finish	Bright self colour finish	
Sampling and Acceptability	Indian Standard	IS: 6821
General requirements	Pins shall comply with IS: 549 in respect of requirements not covered in this standard	

2.1 Referred Standards (Only the current versions are applicable)

IS: 549 Specification for Split Pins.

IS: 6821 Methods for sampling non-threaded fasteners

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PLANT STANDARD

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BPS: 41704

PAGE 2 OF 4

3.0 DESIGNATION

A Split Pin to this standard of nominal diameter 5mm and nominal length 56mm shall be designated as:

3.1 On Drawings:

- i) Material Specification column: IS: 549
- ii) Description column : PIN SPLIT 5x56
- iii) Drawing Number column : 4170405056
- iv) Material Code column : 4170450056

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Split Pin 5x56 IS: 549

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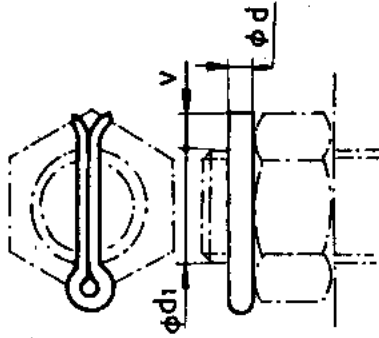
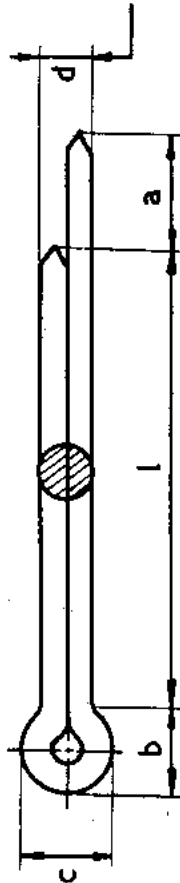
PLANT STANDARD

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BPB: 41704

PAGE 3 OF 4

TABLE 1 - DIMENSIONS FOR SPLIT PINS
(All dimensions in millimetres)



Dimensions	Nominal size																
	0.6	0.8	1.0	1.2	1.6	2.0	2.5	3.2	4.0	5.0	6.3	8.0	10	13	16	20	
d	Max	0.5	0.7	0.9	1.0	1.4	1.8	2.3	2.9	3.7	4.6	5.9	7.5	9.5	12.4	15.4	19.3
	Min	0.4	0.6	0.8	0.9	1.3	1.7	2.1	2.7	3.5	4.4	5.7	7.3	9.3	12.1	15.1	19.0
a	Max	1.6	1.6	1.6	2.5	2.5	2.5	3.2	4.0	4.0	4.0	4.0	4.0	6.3	6.3	6.3	6.3
	≈	2.0	2.4	3.0	3.0	3.2	4.0	5.0	6.4	8.0	10	12.6	16	20	26	32	40
c	Max	1.0	1.4	1.8	2.0	2.8	3.6	4.6	5.8	7.4	9.2	11.8	15	19	24.8	30.8	38.6
	Min	0.9	1.2	1.6	1.7	2.4	3.2	4.0	5.1	6.5	8.0	10.3	13.1	16.6	21.7	27.0	33.8
Corres-ponding dia-meter d1	Over	--	2.5	3.5	4.5	5.5	7.0	9.0	11	14	20	27	39	56	80	120	170
	Up to	2.5	3.5	4.5	5.5	7.0	9.0	11	14	20	27	39	56	80	120	170	--
v	Over	--	2	3	4	5	6	8	9	12	17	23	29	44	69	110	160
	Up to	2	3	4	5	6	8	9	12	17	23	29	44	69	110	160	--
		3	3	4	5	5	6	6	8	8	10	12	14	16	20	25	32



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41704

PAGE 4 OF 4

**TABLE 2 - PREFERRED LENGTH-SIZE COMBINATION
FOR SPLIT PINS**

(All dimensions in millimetres)

l Nom ±½ IT 17	Nominal size															
	0.6	0.8	1.0	1.2	1.6	2.0	2.5	3.2	4.0	5.0	6.3	8.0	10	13	16	20
4																
5																
6																
8																
10																
12																
14																
16						0.4										
18																
20																
22																
25									2.7							
28																
32										5.5						
36									3.6							
40										6.5						
45									4.6		11.4					
50																
56									5.6	8.4	13.4					
63										9.2						
71											17.2					
80																
90																
100																
112																
125																
140																
160																
180																
200																
224																
250																
280																

NOTE:

- 1 Weights are given in kg per 1000 numbers only
- 2 For stocked sizes refer BPS components booklet
- 3 Preferred lengths are in between the stepped bold lines

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PLANT STANDARD

HPBP TIRUCHIRAPPALLI

BPS 417508

Rev. No. 03

PAGE 1 OF 2

SELF LOCKING HEXAGONAL NUT WITH SPRING STEEL STRIP INSERT

1.0 SCOPE

This standard covers the requirements of self locking hexagonal nut with spring steel strip insert in the size range M8 to M20.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred size	Fig 1 and Table 1 of this standard	
Tolerance	Product Grade	A
	Indian Standard	IS 1367 Part-2
Thread	Pitch	Coarse
	Tolerance	6H
	Indian Standard	IS 4218(Part 3,5 & 6)
Material of Nut	Steel	
	Property class	6
	Indian Standard	IS 1367 (Part 6)
Insert Material	Suitable spring steel	
Surface protection	Cadmium plating (Thickness 10-15 microns)	
Sampling and acceptability	According to IS 1367 (Part 17)	
Fitting of spring insert	Vendor shall design and supply the nut with spring insert in such a way that the spring insert shall prevent unscrewing under screwed and tightened condition.	
General requirements	Nuts shall comply with relevant parts of IS 1367 in respect of requirements not covered in this standard.	

2.1 Referred Standards (Only current versions are applicable)

IS 1367 (Part 2, 6 & 17) Technical supply conditions for threaded steel fasteners.
 IS 4218 (Part 3, 5 & 6) ISO metric screw threads.

3.0 DESIGNATION

A Grade A self locking hexagonal nut with spring insert of thread size M10 shall be designated as :

Revisions 03			Approved		
Brought upto date			STANDARDS SECTION CONTRACT ENGINEERING AND CO-ORDINATION HPBP, TIRUCHIRAPPALLI		
Rev. No. 03	Amd. No.	Reaffirmed	Prepared	Issued	Dt of 1st Issue
Dt. JUNE 1997	Dt.	Year	STANDARDS	STANDARDS	JUNE 1976

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3.1 On drawings

- i) Material spec column
- ii) Description column
- iii) Drawing number column
- iv) Material code column

SELF LOCKG HEX NUT M10
BPS 417508
417508 0010

4.0 ORDERING DESCRIPTION

4.1 For placing indents, issuing enquiries and on purchase order, the ordering description given below shall be followed.

SELF LOCKING HEX. NUT WITH SPRING INSERT M10 to BPS 417508

5.0 ADDITIONAL INFORMATION

5.1 Copies of this standard shall be sent along with the purchase order.

FIGURE - 1

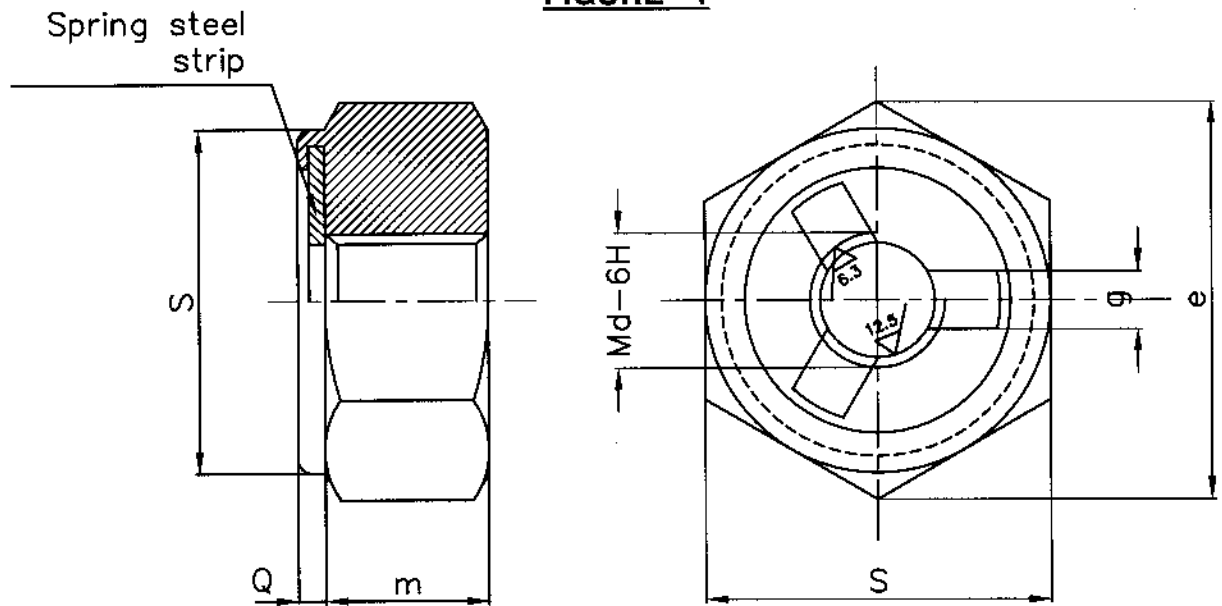


TABLE - 1

(All dimensions are in millimetres)

	M8	M10	M12	M16	M20
S	13.00	17.00	19.00	24.00	30.00
Min	14.38	18.90	21.10	26.75	33.53
Max	--	--	--	--	--
m	6.50	8.00	10.00	13.00	16.00
Q	2.00	2.00	2.00	3.00	3.00
g	3.00	3.00	4.00	5.00	6.00
Weight (Kg)	5.71	13.09	20.00	40.00	75.76

NOTE :

1. Weights given in Kg per 1000 numbers.



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41709

PAGE 1 OF 4

Based on IS: 7368-1974

GROOVED TAPER PINS

1.0 SCOPE

Covers the requirements for grooved taper pins in the diameter range 1.5 to 25mm.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Preferred length and size combination	Table 2 of this standard	
Material	Cold drawn steel bar of grade 40 C 8	IS: 1570 (Part II)
Finish	Natural finish	
Sampling and Acceptability	Indian Standard	IS: 6821
General requirements	Pins shall comply with IS: 7368 in respect of requirements not covered in this standard	

2.1 Referred Standards (Only the current versions are applicable)

- IS: 1570 Schedules for wrought steels (Part II) Part II Carbon steels (unalloyed steels)
- IS: 6821 Methods for sampling non-threaded fasteners
- IS: 7368 Specifications for grooved taper pins

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PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41709

PAGE 2 OF 4

3.0 DESIGNATION

A Grooved Taper Pin to this standard of nominal diameter 3mm and nominal length 24mm shall be designated as:

3.1 On Drawings:

- i) Material Specification column: IS: 7368
- ii) Description column : PIN GROOVED TAPER 3x24
- iii) Drawing Number column : 4170903024
- iv) Material Code column : 4170903024

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Grooved Taper Pin 3x24 IS: 7368

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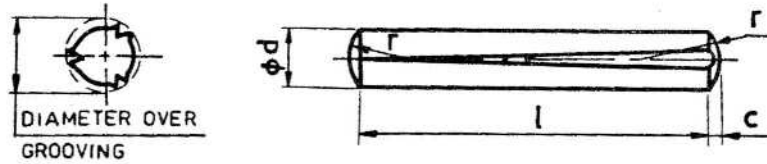
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BPS: 41709

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TABLE 1 - DIMENSIONS FOR GROOVED TAPER PINS



NOMINAL DIAMETER	d	1.5	2	2.5	3	4	5	6	8	10	12	(13)	14	16	20	25	
Tol		h ₉					h ₁₁										
C max		0.23	0.3	0.4	0.45	0.6	0.75	0.9	1.2	1.5	1.8	2	2	2.5	3	4	
r APPROX		1.6	2	2.5	3	4	5	6	8	10	12	12	16	16	20	25	
LENGTH	l	DIAMETER OVER GROOVING															
Tol on l																	
4																	
5																	
6	+0.3	1.63															
8			2.20		3.25												
10						4.30	5.30										
12				2.70				6.30									
(14)					3.30												
16		1.60				4.35			8.35								
(18)							5.35			10.40							
20											12.40						
(22)			2.15		3.25							13.45					
24				2.65					6.35				14.45				
(26)	+0.5									8.40					16.55		
28						4.30											
(30)							5.30				10.45	12.45					
32					3.20								13.50	14.50			
36									6.30						16.60		
(45)										8.35							
50						4.25	5.25				10.40	12.40			20.60	25.60	
(55)																	
60									6.25				13.45	14.45			
(65)										8.30					16.55		
70																	
80	+0.8										10.35						
90												12.30					
100									8.25				13.40	14.40			
(110)															16.50		
120										10.30							
TOLERANCE ON DIAMETER OVER GROOVING		+0.05		± 0.05						± 0.10							

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PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41709

PAGE 4 OF 4

**TABLE 1 - PREFERRED LENGTH-SIZE COMBINATION
FOR GROOVED TAPER PINS**

(All dimensions are in millimetres)

Nom length 'l'	Diameter d														
	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10	12	(13)	14	16	20	25
4															
5															
6															
8															
10	0.1														
12															
(14)															
16															
(18)															
20							4.4								
(22)															
24			1.3												
(26)															
28															
(30)															
32						4.9									
36															
40															
(45)															
50															
(55)															
60															
(65)															
70															
80															
90															
100															
(110)															
120															

WEIGHTS

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NOTE:

1. Sizes in brackets are non preferred
2. Weights are given in kg per 1000 numbers only
3. Preferred lengths are in between the stepped bold lines
4. For stocked sizes refer to BPS components booklet.



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41710

PAGE 1 OF 4

Based on IS: 7385-1974

GROOVED DOWEL PINS

1.0 SCOPE

Covers the requirements for grooved dowel pins in the diameter range 1.5 to 25mm.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Preferred length and size combination	Table 2 of this standard	
Material	Cold drawn steel bar of grade 40 C 8	IS: 1570 (Part II)
Finish	Natural bright finish	
Sampling and Acceptability	Indian standard	IS: 6821
General requirements	Pins shall comply with IS: 7385 in respect of requirements not covered in this standard	

2.1 Referred Standards (Only the current versions are applicable)

IS: 1570 Schedules for wrought steels (Part II) Part II Carbon steels (unalloyed steels)
IS: 6821 Methods for sampling non-threaded fasteners
IS: 7385 Specification for grooved dowel pins

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3.0 DESIGNATION

A Grooved Dowel Pin to this standard of nominal diameter 6mm and nominal length 24mm shall be designated as

3.1 On Drawings:

- i) Material Specification column : IS: 7385
- ii) Description column : PIN GROOVED DOWEL 6x24
- iii) Drawing Number column : 4171006024
- iv) Material code column : 4171006024

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Grooved Dowel Pin 6x24 IS: 7385

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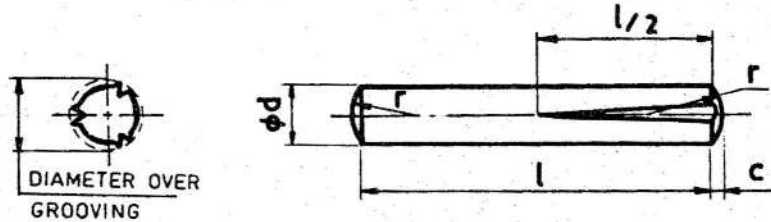
PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41710

PAGE 3 OF 4

TABLE 1 - DIMENSIONS FOR GROOVED DOWEL PINS



(All dimensions are in millimetres)

NOMINAL	d	1.5	2	2.5	3	4	5	6	8	10	12	(13)	14	16	20	25		
DIAMETER Tol		h 9					h 11											
C max		0.23	0.3	0.4	0.45	0.6	0.75	0.9	1.2	1.5	1.8	2	2	2.5	3	4		
r approx		1.6	2	2.5	3	4	5	6	8	10	12	12	16	16	20	25		
LENGTH	Tol on l	DIAMETER OVER GROOVING																
6																		
8	+0.3		2.15	2.65	3.20													
10						4.25	5.25	6.25										
12		1.63																
(14)																		
16			2.20			4.30			8.25									
(18)										10.30								
20				2.70			5.30				12.30	13.30						
(22)								6.30	8.30									
24					3.30					10.35								
(26)	+0.5										12.35	13.40	14.40					
28			2.15			4.35			8.35									
(30)																		
32							5.35			10.40					16.50			
36											12.40	13.45	14.45		20.50	25.50		
40					3.25													
(45)								6.35										
50						4.30			8.40						16.55			
(55)							5.30											
60										10.45	12.45							
(65)												13.50	14.55					
70								6.30							16.50			
80																		
90	+0.8								8.35						20.60	25.60		
100										10.40	12.40							
(110)												13.45	14.45					
120														16.55				
140										10.35	12.35							
160																		
TOLERANCE ON DIAMETER OVER GROOVING		+ 0.05			± 0.05						± 0.10							

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PAGE 4 OF 4

**TABLE 2 - PREFERRED LENGTH-SIZE COMBINATION
FOR GROOVED DOWEL PINS**

(All dimensions are in millimetres)

Nom Length 'l'	Diameter d														
	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10	12	(13)	14	16	20	25
6															
8															
10															
12															
(14)															
16															
(18)															
20															
(22)															
24															
(26)															
28															
(30)															
32															
36															
40															
(45)															
50															
(55)															
60															
(65)															
70															
80															
90															
100															
(110)															
120															
140															
160															

WEIGHTS

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NOTE:

1. Sizes in brackets are non-preferred
2. Preferred lengths are in between the stepped bold lines
3. Weights are given in kg per 1000 numbers only
4. For stocked sizes refer BPS components booklet



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41711

PAGE 1 OF 4

Based on IS: 5988-1970

SPRING DOWEL SLEEVES (Light Pattern)

1.0 SCOPE

Covers the requirements for Light Pattern Spring Dowel Sleeves in the diameter range 2 to 50mm.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Preferred lengths size combination	Table 2 of this standard	
Tolerance on lengths	Acc. to Table 4 of IS:5988	
Material	Spring steel 55Si2Mn90	IS: 1570
Mechanical properties	Hardness 445-515 HV Tensile strength 150-190 kgf/mm ²	
General requirements	Spring dowel sleeves shall comply with IS: 5988 in respect of requirements not covered in this standard	

2.1 Referred Standards (Only the current versions are

IS: 1570 Schedules for wrought steels

IS: 5988 Specification for spring dowel sleeves

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BPS: 41711

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3.0 DESIGNATION

A Spring Dowel Sleeve to this standard of nominal diameter 3mm and nominal length 20mm shall be designated as:

3.1 On Drawings:

- i) Material Specification column: IS: 5988
- ii) Description column : PIN SPRING LIGHT 3x20
- iii) Drawing Number column : 4171103020
- iv) Material code column : 4171103020

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Spring Dowel Sleeve Light 3x20 - IS: 5988

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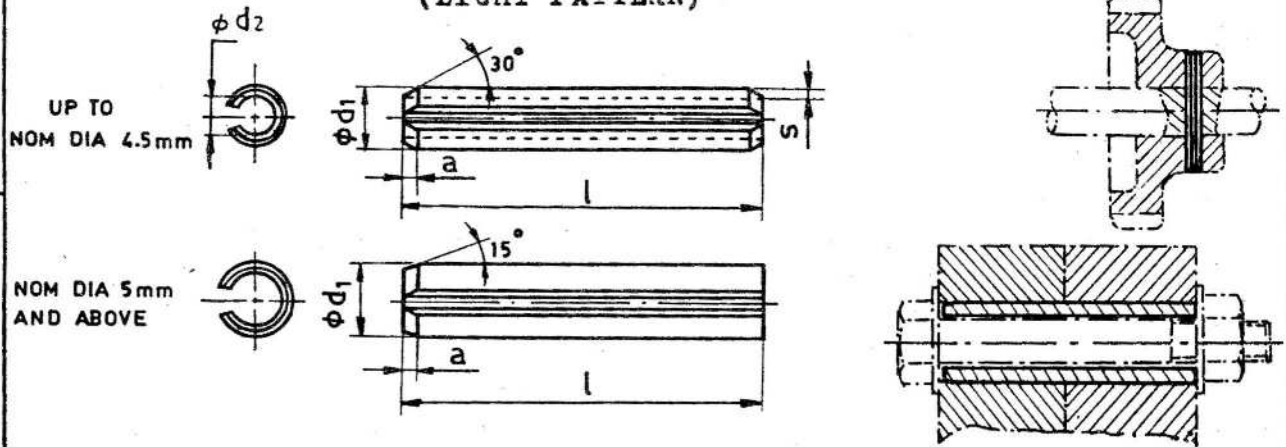
PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41711

PAGE 3 OF 4

**TABLE 1 - DIMENSIONS FOR SPRING DOWEL SLEEVES
(LIGHT PATTERN)**



(All dimensions in millimetres)

Nom dia	s	a	Before fitting			For bolt size	Corresponding washer size (IS:2016)
			d ₁	Tol on d ₁	d ₂		
2	0.2	0.35	2.3	+0.1	1.9	--	--
2.5	0.25	0.45	2.8		2.3	--	--
3	0.3	0.5	3.3	+0.2	2.7	--	--
3.5	0.35	0.6	3.8		3.1	--	--
4	0.5	0.7	4.4		3.4	--	--
4.5	0.5	0.8	4.8		3.8	M3	3.2
5	0.5	1.6	5.4	+0.3	4.4	--	--
6	0.75	1.6	6.4		4.9	M4	4.3
7	0.75	1.6	7.5		6.0	M5	5.3
8	0.75	2	8.5		7.0	M6	6.4
10	1	2	10.5		8.5	--	--
11	1	2	11.5		9.5	M8	8.4
12	1	2	12.5		10.5	--	--
13	1.25	2	13.5		11.0	M10	10.5
14	1.5	2	14.5	11.5	--	--	
16	1.5	2	16.5	13.5	M12	13	
18	1.75	2	18.5	+0.4	15.0	M14	15
20	2	2	20.5		16.5	--	--
21	2	2	21.5		17.5	M16	17
23	2	3	23.5		19.5	M18	19
25	2	3	25.5		21.5	M20	21
28	2.5	3	28.5		23.5	M22	23
30	2.5	3	30.5		25.5	M24	25
35	3.5	3	35.5		28.5	M27	28
40	4	4	40.5		32.5	M30	31
45	4	4	45.5		37.5	M36	37
50	5	4	50.5	40.5	M39	40	

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PLANT STANDARD

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BPS: 41711

PAGE 4 OF 4

TABLE 2 - PREFERRED LENGTH-SIZE COMBINATION FOR
SPRING DOWEL SLEEVES

(All dimensions are in millimetres)

NOM LEN- GTH 'l'	Nominal diameter																						
	2	2.5	3	3.5	4	4.5	5	6	7	8	10	11	12	13	14	16	18	20	25	28	40	50	
4																							
5																							
6																							
8																							
10																							
12		0.1																					
14																							
16																							
18																							
20			0.2																				
22																							
24																							
26																							
28																							
30																							
32		0.2																					
36																							
40																							
45																							
50																							
55																							
60																							
65																							
70																							
75																							
80																							
85																							
90																							
95																							
100																							
120																							
140																							
160																							
180																							
200																							

WEIGHTS

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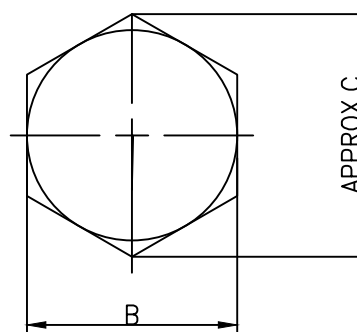
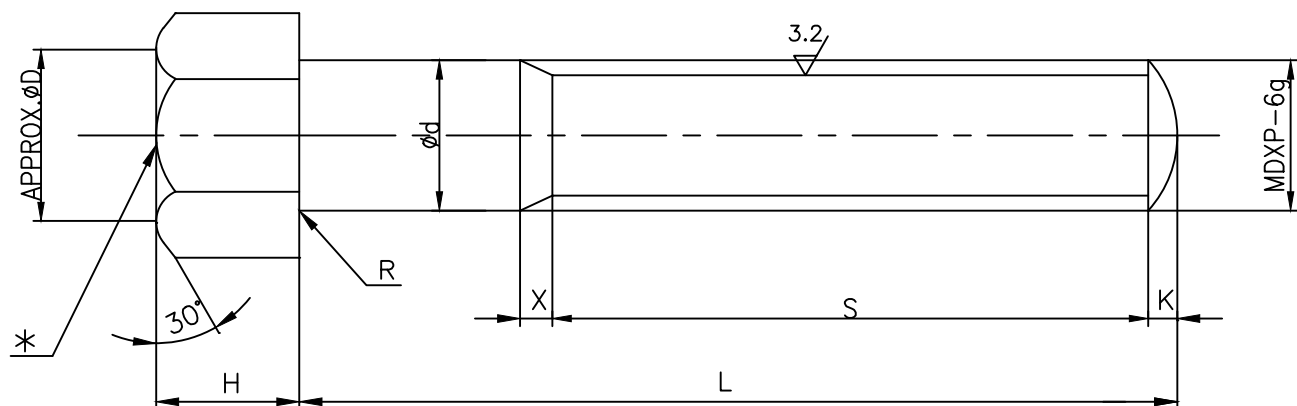
1. Preferred lengths are in between the stepped bold lines
2. Weights are given in kg per 1000 numbers only
3. For stocked sizes refer BPS components booklet.

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3-V-0000-20723/8
DRAWING NO.

12.5 / 3.2

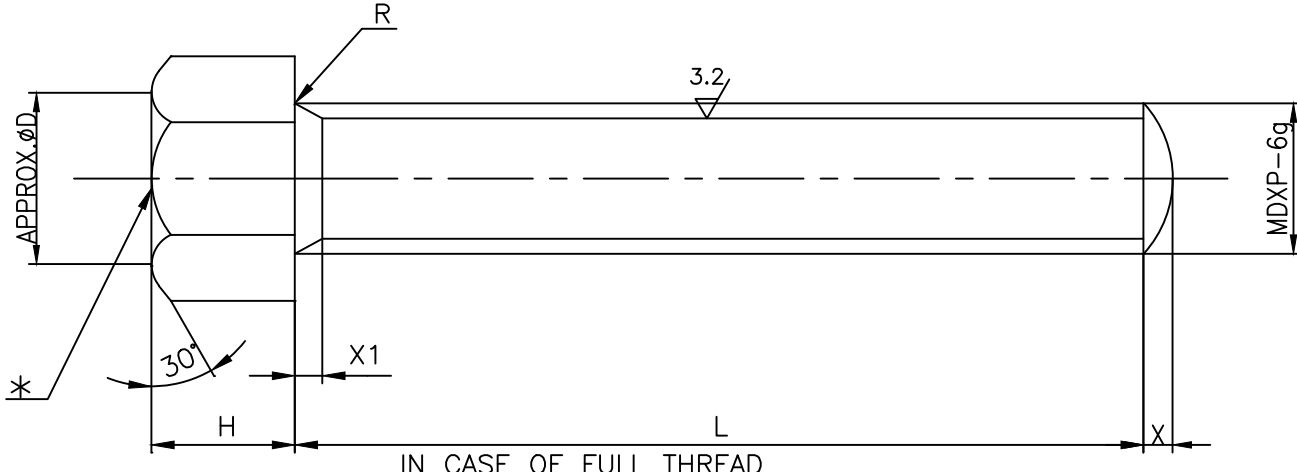
SL No.	DRAWING NO.	COMP. CODE	MATL. SPECN.	DIMENSIONS												FINISHED WT IN KGS	
				Md	P	L	S	H	K	X	X1	R	ød	øD	B		C
01	3-V-0001-20723/3	964521920000	ASTM A193 B7, CERTIFY	M8	1.25	30	30	5.5	-	2.5	3.5	0.4	8	12.6	13	15	0.02
02	3-V-0002-20723/3	964521930000		M10	1.5	16	16	7	-	3	4.5	0.4	10	16.5	17	19.6	0.02
03	3-V-0003-20723/3	964521940000		M10	1.5	20	20	7	-	3	4.5	0.4	10	16.5	17	19.6	0.02
04	3-V-0004-20723/3	964521950000		M12	1.75	20	20	8	-	3.5	5	0.6	12	18	19	21.9	0.03
05	3-V-0005-20723/3	964521960000		M20	2.5	60	46	13	5	5	-	0.8	20	29	30	34.6	0.23
06	3-V-0006-20723/3	964521970000		M24	3	90	54	15	6	6	-	0.8	24	34	36	41.6	0.45
07	3-V-0007-20723/3	964521980000		M30	3.5	110	66	19	7	7	-	1.0	30	44	46	53.1	0.88
08	3-V-0008-20723/3	964522410000		M16	2	50	38	10	4	4	-	0.6	16	23	24	27.7	0.10
09	3-V-0009-20723/3	964523140000		M20	2.5	55	46	13	5	5	-	0.8	20	29	30	34.6	0.22
10	3-V-0010-20723/2	964533300000		M16	2	90	60	10	4	4	-	0.6	16	23	24	27.7	0.16
11	3-V-0011-20723/2	964568210000		M20	2.5	85	46	13	5	5	-	0.8	20	29	30	34.6	0.31
12	3-V-0012-20723/2	964533560000		M20	2.5	126	70	13	5	5	-	0.8	20	29	30	34.6	0.43
13	3-V-0013-20723/1	964535750000		M30	3.5	120	76	19	7	7	-	1.0	30	44	46	53.1	0.95
14	3-V-0014-20723	964655090000		M16	2	75	38	16	4	4	-	0.6	16	23	24	27.7	0.14
15	3-V-0015-20723	964655100000		M24	3	141	40	15	6	6	-	0.8	24	34	36	41.6	0.64
16	3-V-0016-20723	964655120000		M20	2.5	70	25	14	5	5	-	0.8	20	26	30	34.6	0.27



NOTES:

- * PUNCH MATERIAL MARK B7 FOR A193-B7.
- QUALITY REQUIREMENTS SHALL BE AS PER LATEST TDC 5:164.

REDRAWN WITH REV.7 ON 12.04.08



IN CASE OF FULL THREAD

REV 8	DATE 04.03.13	ALTERED DEEPAKRAJ CHD & APPD M.RAJAKUMAR	REV 7	DATE 12.04.08	ALTERED VB CHD & APPD KRS & M.R.K
SL.No.15 AND 16 INCLUDED.			DRAWING CONVERTED AS SOFT COPY		
			DCP No.800813		

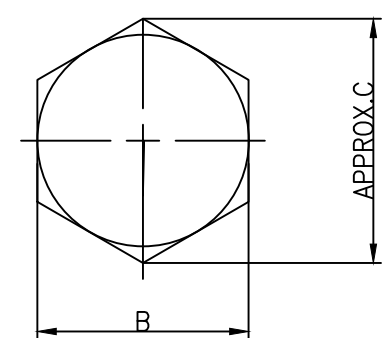
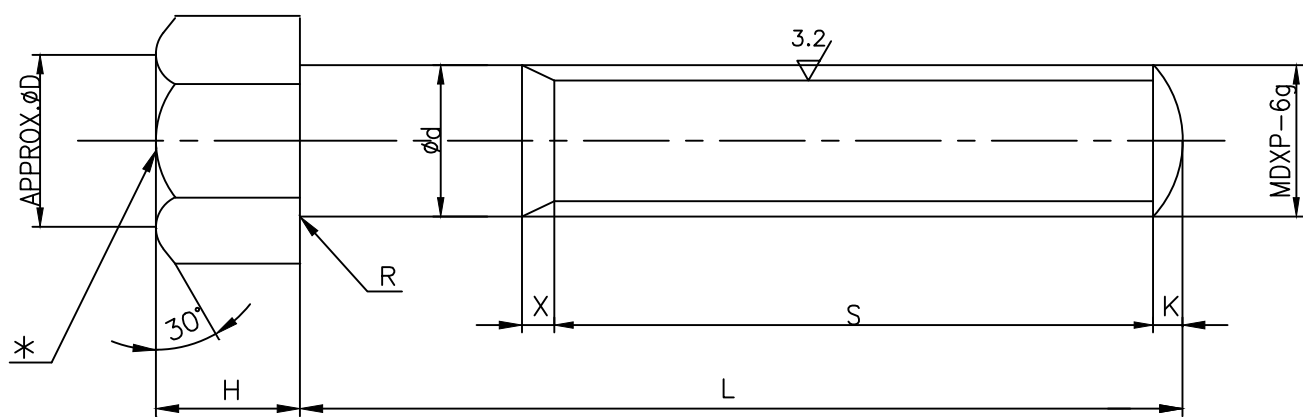
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NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT								
	BHARAT HEAVY ELECTRICALS LTD. UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.	DRN	V.BAIRAVAN	SIGN		DATE	12.04.08	NO.OF VAR.	
		CHD	M.RAJASEKARAN			DATE	12.04.08		
		APPD	M.RAJAKUMAR			DATE	12.04.08		
DEPT VL	365-121	SCALE	NTS	WEIGHT (KG).	-	REFERENCE INFORMATION	PT-42	NO. OF ITEMS	
CODE	320								
TITLE	BOLT			CARD CODE	U 01	DRAWING NO.	3-V-0000-20723	REV	8

80757-0000-V-3
DRAWING NO.

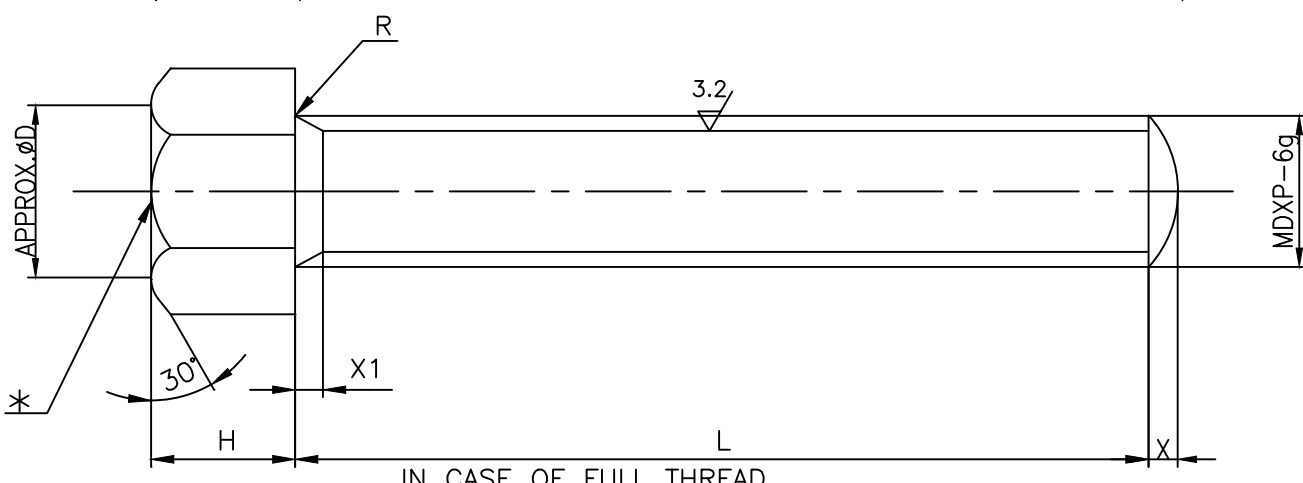
12.5 / 3.2

SL No.	DRAWING NO.	COMP. CODE	MATL. SPECN.	DIMENSIONS													FINISHED WT IN KGS
				Md	P	L	S	H	K	X	X1	R	∅d	∅D	B	C	
01	3-V-0001-25708/1	964657840000	ASTM A193-B8M CL.2; CERTIFY	M12	1.75	100	65	8	-	3.5	5	0.6	12	18	19	21.9	0.1
02	3-V-0002-25708/1	964658920000		M12	1.75	60	30	8	-	3.5	5	0.6	12	18	19	21.9	0.07



NOTES:

- * PUNCH MATERIAL MARK B8M FOR A193-B8M.
- QUALITY REQUIREMENTS SHALL BE AS PER LATEST TDC 5:164.



REV 02	DATE 26.06.20	ALTERED CHD & APPD SAMEER & SSK	R.P.SINGH	REV 01	DATE 31.08.18	ALTERED CHD & APPD SSK & KRS	R.P.SINGH
MATL. SPECIFICATION UPDATED.				SL. No. 2 INCLUDED.			

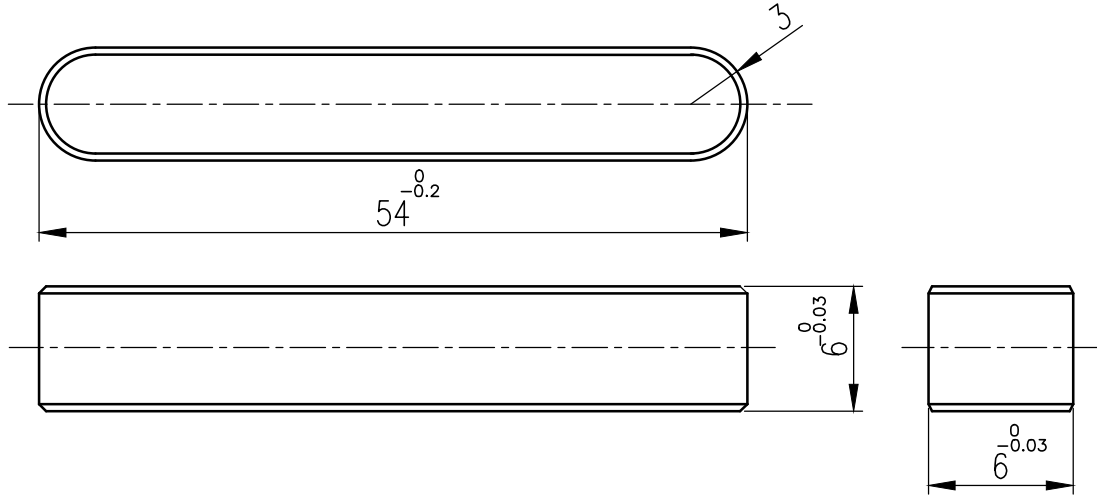
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NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT								
	BHARAT HEAVY ELECTRICALS LTD. UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI_620014.								
		DRN	T.SANGEETHA	SIGN		DATE	02.02.17	NO.OF VAR.	
		CHD	S.SATHEES			DATE	02.02.17		
		APPD	K.RAJASEKARAN			DATE	02.02.17		
	DEPT VL			SCALE	WEIGHT (KG).	REFERENCE INFORMATION			NO. OF ITEMS
	CODE 320			NTS	-	PT-42			
	TITLE					CARD CODE	DRAWING NO.	REV	
						U 01	3-V-0000-25708	02	

ALL DIMENSIONS ARE IN MILLIMETRES.

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED
		CHD & APPD


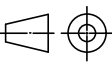


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NOTES:

1. KEY IS PARALLEL & TYPE 'A' OF IS:2048.
2. KEY SHOULD COMPLY TO STANDARD IS:2048.
3. FOR SAMPLING METHOD IS:6821 TO BE FOLLOWED.
4. FOR QUALITY REQUIREMENTS REFER APPLICABLE LATEST QUALITY PROCEDURE.

PART CODE: 963536461000

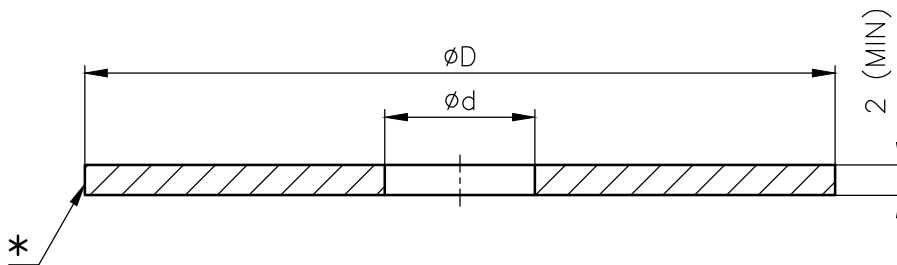
01	PARALLEL KEY (TYPE 'A') (6X6X54)	-	-	-	-	0.015	-	-	-
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
 BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.					DRN	NAME	SIGN	DATE	NO. OF VAR
					CHD	J.SANKAR	J.S	01.10.20	
					APPD	R.RAKESH	R.R	01.10.20	
DEPT SB		SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS				NO. OF ITEMS	
CODE 330		NTS	0.015	BPS-41501					
TITLE	PLAIN KEY (TYPE A)			CARD CODE	DRAWING NO.			REV	
				U 01	4-20-201-03669			00	

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS

ALL DIMENSIONS ARE IN MILLIMETRES.
DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED	R.ANITHA
01	06.01.17	CHD & APPD	SSK & KRS

FOR TYPE NO N248 & F503 DIMENSIONS
ø71 WAS ø74



NOTES: -

- * 1. APPLY RED ENAMEL PAINT ON OUTSIDE DIAMETER.
- 2. MATERIAL - STAINLESS STEEL
- 3. SURFACE FINISH: 12.5 MICRONS OR BETTER.

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08	4-V-F503-27192/01	96 465 696 0000	71	13	0.07			
07	4-V-N790-27192	96 465 695 0000	51	17	0.03			
06	4-V-N628-27192	96 465 694 0000	52	21	0.03			
05	4-V-N645-27192	96 465 693 0000	87	21	0.09			
04	4-V-N248-27192/01	96 465 692 0000	71	17	0.06			
03	4-V-N244-27192	96 465 691 0000	87	17	0.09			
02	4-V-S837-27192	96 465 690 0000	87	9	0.09			
01	4-V-S833-27192	96 465 689 0000	51	9	0.03			

SL No.	DRAWING No.	COMP.CODE	øD	ød	NET WT(KG)			
			DIMENSIONS					

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
--------	-------------	-----------	------------	----------------	------------	-------------	---------------	------------	---------



BHARAT HEAVY ELECTRICALS LTD.,

UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI 620014.

365-122

DRN	NAME	SIGN	DATE	NO.OF VAR
CHD	M.SELVAM		28.08.15	
APPD	M.SRINIVASAN		28.08.15	
	S.SATHEES		28.08.15	

DEPT VL	/		SCALE	WEIGHT (KG).	REFERENCE INFORMATION	NO. OF ITEMS
CODE			NTS	REF. TABLE		

TITLE	CARD CODE	DRAWING NO.	REV
INDICATOR RING	U 01	4-V-0000-27192	01



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41902

PAGE 1 OF 4

Based on IS: 3075-1965

EXTERNAL CIRCLIPS (Type A, Light Series)

1.0 SCOPE

Covers the requirements for Light Series External Circlips (type A), suitable for shaft diameter range 8 to 300mm.

2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and tolerances	Table 1 of this standard	
Material	High Carbon Steel C80	IS: 1570 Part II
Mechanical properties	(Hardness after tempering)	
		<u>Min</u> <u>Max</u>
	Upto and including 38mm	480HV 558HV
	Above 38mm upto 200mm	440HV 510HV
	Above 200mm	392HV 453HV
Finish	Sharp edges shall be removed, free from burrs, cracks, laminations and other defects. Chemically or thermally blackened.	
Sampling and Acceptability	Indian Standard	IS: 6821
General requirements	Circlips shall comply with IS: 3075 in respect of requirements not covered in this standard.	

2.1 Referred Standards (Only the current versions are applicable)

IS: 1570 Part II	Schedule for wrought steels Part II Carbon steels (unalloyed steels)
IS: 3075	Dimensions for circlips
IS: 6821	Methods for sampling non-threaded fasteners.

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REVISIONS

DATE

APPROVED

STANDARDS SECTION
ENGINEERING AND DEVELOPMENT CENTRE
HPBP TIRUCHIRAPALLI

PREPARED

HPBP TIRUCHY

ISSUED
STANDARDS
ENGG.

DATE

DEC 1986



PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41902

PAGE 2 OF 4

3.0 DESIGNATION

A Circlip to this standard suitable for shaft diameter 20mm shall be designated as:

3.1 On Drawings:

- i) Material Specification column : IS: 3075-A
- ii) Description column : CIRCLIP LIGHT A 20
- iii) Drawing Number column : 4190202000
- iv) Material Code column : 4190200020

3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Circlip A 20x1.2* IS: 3075

4.0 ADDITIONAL INFORMATION

- *4.1 While preparing Ordering Description, the corresponding thickness for shaft diameter shall be filled in referring from Table.

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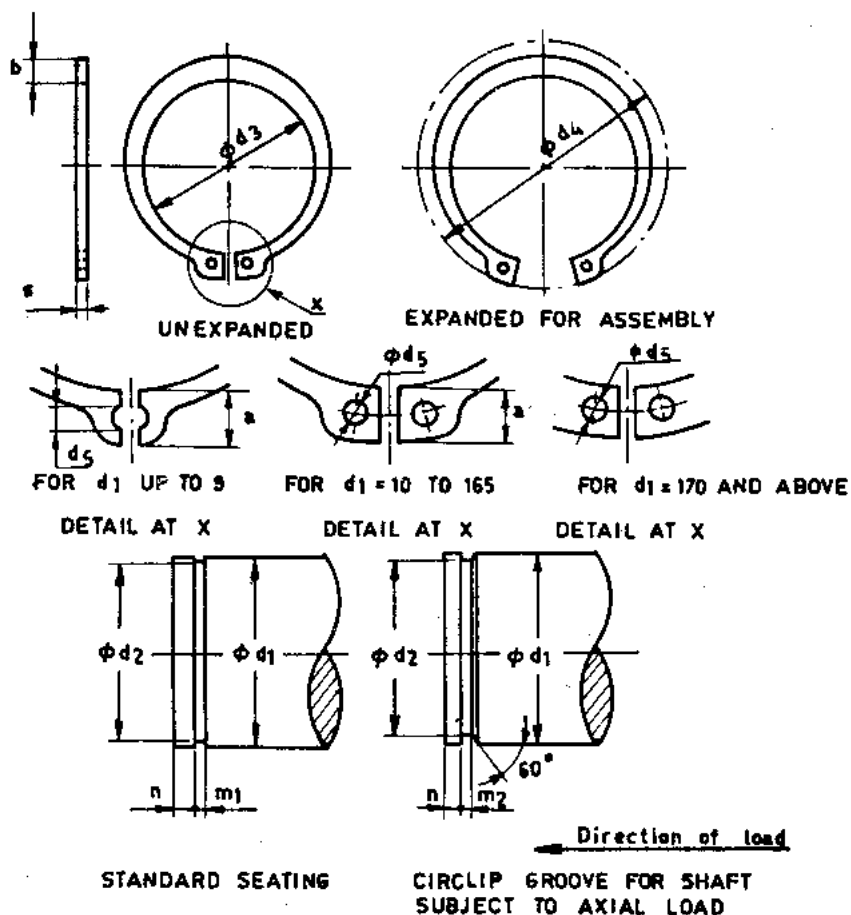
PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41902

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TABLE 1 - DIMENSIONS FOR INTERNAL CIRCLIPS, TYPE B - LIGHT SERIES



(All dimensions in millimetres)

Bore dia d_1	Circlip							Bore groove					Axial force kgf		
	s Min	a Max	b	d_3	Tol on d_3	d_4 Com- pres- sed	d_5 Min	d_2	Tol on d_2	m_1 H13	m_2 Min	n Min			
8	0.8	3.2	1.5	7.4	+0.09	15.2	1.2	7.6	h11	0.9	1.0	0.6	120		
9			1.7	8.4	-0.18			16.4					8.6	138	
10			1.8	9.3	+0.15			17.6					1.5	9.6	153
12	1.0	3.5	1.8	11.0	+0.18	19.6	1.7	11.5	h11	1.1	1.2	0.75	230		
14			2.1	12.9				-0.36					22.0	13.4	325
15			2.2	13.8				23.2					14.3	400	
16			2.2	14.7				24.4					15.2	490	
19			2.5	17.5				27.8					18.0	725	
20	1.2	4.0	2.6	18.5	+0.21	29.0	2.0	19.0	h12	1.3	1.4	1.5	770		
22			2.8	20.5				-0.42					31.4	21.0	845
24			3.0	22.2				33.8					22.9	1010	
25			3.0	23.2				34.8					23.9	1060	
28	1.5	4.7	3.2	25.9	-0.25	38.4	2.5	26.6	h12	1.6	1.7	2.1	1500		
30			3.5	27.9				41.0					28.6	1620	
32			3.6	29.6				43.4					30.3	2100	
35	3.9	32.2	+0.25	47.2	33.0	3.0	2670								

DEC 1986

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PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41902

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38		5.8	4.2	35.2	+0.25	50.6		36.0						
40	1.75	6.0	4.4	36.5	-0.50	53.0		37.5		1.85	2.0	3.0	2910	
45		6.7	4.7	41.5	+0.39	59.4		42.5				3.8	3810	
50		6.9	5.1	45.8	-0.78	64.8	2.5	47.0					4300	
56	2.0	7.3	5.5	51.8		71.6		53.0		2.15	2.3		5700	
60		7.4	5.8	55.8		75.8		57.0				4.5	6400	
70		8.1	6.6	65.5	+0.46	87.2		67.0	b12				6900	
78	2.5	8.6	7.3	73.5	-0.92	96.2	3.0	75.0		2.65	2.8		8050	
80		8.6	7.4	74.5		98.2		76.5					9000	
85		8.7	7.8	79.5		104.0		81.5					10700	
90	3.0	8.8	8.2	84.5		109.0		86.5		3.15	3.3	5.3	11400	
95		9.4	8.6	89.5	+0.54	115.0	3.5	91.5					12100	
100		9.6	9.0	94.5	-1.08	121.0		96.5					12800	
110		10.1	9.6	103.0		132.0		106.0					13500	
120		11.0	10.2	113.0		143.0		116.0					17000	
130		11.6	10.7	123.0		155.0		126.0				6.0	18500	
140		12.0	11.2	133.0		165.0		136.0					20100	
150	4.0	13.0	11.8	142.0	+0.63	177.0		145.0		4.15	4.3		21700	
160		13.3	12.2	151.0	-1.26	188.0		155.0					28900	
170			12.9	160.5		197.0	4.0	165.0				7.5	31000	
180			13.5	170.5		208.0		175.0	b13				32900	
190				180.5		219.0		185.0					34800	
200			14.0	190.5	+0.72	229.0		195.0					33500	
220				208.0	-1.44	249.0		214.0				9.0	31900	
240				228.0		269.0		234.0					51200	
260	5.0			245.0		293.0		252.0		5.15	5.3		52900	
280		16.0		265.0	+0.81	313.0	5.0	272.0				12.0	54400	
300				285.0	-1.62	333.0		292.0					50800	
													47300	

Notes

1. For stocked sizes and weights refer BPS component book-let.



**PRODUCT ENGINEERING / V & SB
TECHNICAL DELIVERY CONDITIONS FOR
SUBDELIVERY COMPONENTS OF SOOT BLOWERS**

TSB : 046

Rev. 05

SHEET No. 01 of 01

HEXAGONAL HEAD SCREW

1. Component : Hexagonal Head Screw
2. Material Code : 21 017 049 0000
3. Application : Used in Wall Deslagger for mounting SQ-'D' Limit Switch with limit switch mount.
4. Specification : Hexagonal Head Screw 1/4" – 20 UNC, 3/4" long (OVER ALL) cadmium plated.
Material : Steel conforming to property class 8.8 according to IS:1367–1967.
5. Inspection : Inspection to be carried out by BHEL Inspectors at BHEL works – For dimensions as per specification above.
6. Quantity : 2 nos. per wall Deslagger.
7. Spares : 5% extra to be added as manufacturing reserve
8. Packing : To be packed and despatched in card board boxes
9. Approximate weight : 0.006 kg/piece

Rev:05 Dt.20/09/2008.

HEX. HEAD SCREW WAS HEX. HEAD CAP SCREW.

Prepared (K.SRIDHARAN)

Date:
20 / 09 / 2008.

Approved (S. NATARAJAN)



**PRODUCT ENGINEERING / V & SB
TECHNICAL DELIVERY CONDITIONS FOR
SUBDELIVERY COMPONENTS OF SOOT BLOWERS**

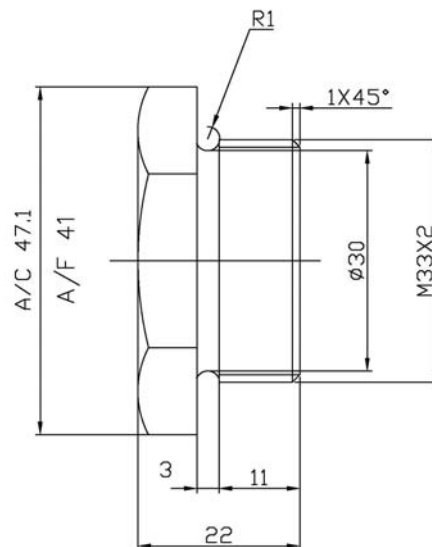
TSB : 064

Rev. 02

SHEET No. 01 of 01

PLASTIC SCREW PLUG

- 1.0 Component : Plastic Screw Plug.
1.1 Material Code : 96 353 337 0000
1.2 Application : It is used in Terminal Box of wall Deslagger for plugging the cable entry.
2.0 Specification : Hex head Plastic Screw Plug. M33 x 2.
2.1 Material : STYRON
2.2 Dimensions : As per sketch shown below.
3.0 Quantity : 4 Nos. per wall deslagger.
4.0 Inspection : Inspection to be carried out by BHEL Inspectors at BHEL works, for dimensions, material etc.,
5.0 Packing : To be packed and dispatched in card board boxes.
6.0 Weight : No.01 kg/piece.



Rev:02 Dt.01/10/2011

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Prepared (J SANKAR)

Checked & Approved (K.SRIDHARAN)