



**PRODUCT MANUAL FOR
FASTENERS – THREADED STEEL FASTENERS –
HEXAGON HEAD TRANSMISSION TOWER BOLTS
ACCORDING TO IS 12427:2001**

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	Product	:	IS 12427:2001
	Title	:	FASTENERS – THREADED STEEL FASTENERS – HEXAGON HEAD TRANSMISSION TOWER BOLTS
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Five samples
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Requirements which can be tested in a day :		
	(a) Dimensions, Threads (b) Tensile test, Elongation, Yield stress, Proof load, Wedge load, Shear strength (c) Hardness, Head soundness		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 12427:2001 with the following scope:		
	Name of the product	HEXAGON HEAD TRANSMISSION TOWER BOLTS	
	Type	Thread size (M12 to M24) Property Class	

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEX A

Grouping Guidelines

1. IS 12427:2001 specifies the requirements for hot-dip galvanized Hexagon Head Transmission Tower Bolts with thread size range from M 12 to M 24 with Property Class 5.6, 5.8 and 8.8.
2. Considering the above, the following grouping guidelines for GoL/CSoL shall be followed:

One sample each of lowest thread size, any intermediate thread size and highest thread size of a property class shall be tested for all requirements in order to cover the complete range of thread sizes of a particular property class.
3. The Firm shall declare the varieties of Bolts they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the manufacturer.
4. During operation of licence, BOs shall ensure that all the property classes/thread sizes covered in the licence are tested in rotation, to the extent possible.

ANNEX - B**List of Test Equipments**

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1.	Dimensions as per Clause 3	a) Micrometer b) Scale c) Dial Gauge
2.	Thread and Tolerances as per Clause 3	a) Go-No Go gauges b) Radius gauge, angle gauge c) Thread gauge
3.	Mechanical Properties as per Clause 6	a) UTM b) Hardness Tester c) Impact Tester d) Hammer
4.	Finish as per Clause 7	a) Coat meter b) Knife c) Copper Sulphate crystal solution

The above list is indicative only and may not be treated as exhaustive.

ANNEX - C

Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipment.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING AND MARKING – As per the requirements of IS 12427:2001.

4. CONTROL UNIT – All Bolts of same property class and designation manufactured in a day shall constitute a control unit.

HEAT TREATMENT BATCH: All the Bolts of same property class and designation heat treated together at the same time shall constitute a heat treatment batch.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of [Table 1](#) and the levels of control in column 3 of [Table 1](#), shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

6. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1

(1) Test Details			(2) Test equipment requirement	(3) Levels of Control			
Cl.	Requirement	Test Methods		R: required (or) S: Sub-contracting permitted	No. of Sample	Frequency	Remarks
		Clause	Reference				
3.	Dimensions	3.1,3.2	IS 12427	R	As per sampling plan given at Note 1.		#
	Threads	3.3	IS 4218 (Part 1 to Part 4)				
5.1	Nuts		IS 14394	S	As per Table 2		No further testing is required, if accompanied with test certificate or ISI marked.
5.2	Washers	5.2	IS 12427 IS 2016	S	As per Table 3		
6.1	Material	6.1 Table 2	IS 12427 IS 1367 (Part 3) / ISO 898 (Part 1)	S	One	Each consignment	No further testing is required, if accompanied with test certificate or ISI marked.

6	MECHANICAL PROPERTIES						
	Tensile Test	9.1 to 9.5, 9.7	IS 1367 (Part 3) / ISO 898 (Part 1)	R	Two	Every 7 th control unit	#
	Proof Load Test	9.6	IS 1367 (Part 3) / ISO 898 (Part 1)	R	Two	Every 7 th control unit	#
	Head Soundness Test	9.8					
	Torsion Test	9.13					
	Impact Test	9.14					
	Hardness Test	9.9	IS 1367 (Part 3) / ISO 898 (Part 1)	R	Three	Every Heat treatment batch	##
	Decarburization Test	9.10					
	Carburization Test	9.11					
	Retempering Test	9.12					
7	Finish	7.1, 7.2	IS 12427	R	As per Sampling plan given at Note 2.		
8	General Requirements	8	IS 12427	R	All	Only visual check	

TABLE 2
(Level of Control for Nuts as per IS 14394)

(1)			(2)	(3)			
Test Details			Test equipment requirement	Levels of Control			
Cl.	Requirement	Test Methods		R: required (or) S: Sub-contracting permitted	No. of Sample	Frequency	Remarks
		Clause	Reference				
3.	Dimensions	3	IS 14394 IS 1367(Part2)	R	As per sampling plan given at Note 1.		
4	Material	4 Table 3	IS 1363 (Part 3) IS 1367 (Part 6) / ISO 898 (Part 2)	S	One	Each consignment	No further testing is required, if accompanied with test certificate or ISI marked
	Threads requirement		IS 4218 (Part 2) IS 4218 (Part 6)	R	As per sampling plan given at Note 1.		
TESTS							
	Stress under proof load	9.1 5	IS 1367 (Part 6) / ISO 898 (Part 2) IS 14394	R	Two	Every 7 th control unit	#
	Hardness	9.2	IS 1367 (Part 6) / ISO 898 (Part 2)	R	Three	Every Heat treatment batch	##

	Surface Integrity inspection	9.3	IS 1367 (Part 6) / ISO 898 (Part 2)	R	Every half hour samples to be checked	#
	Hot Dip Galvanizing		IS 1367 (Part 13)	R	As per Sampling plan given in Note 2.	

TABLE 3
(Level of Control for Washers as per IS 2016)

(1)				(2)	(3)		
Test Details				Test equipment requirement	Levels of Control		
Cl.	Requirement	Test Methods		R: required (or) S: Sub-contracting permitted	No. of Sample	Frequency	Remarks
		Clause	Reference				
2	Material	2.1	IS 2016	S	One	Each consignment	No further testing is required, if accompanied with test certificate or ISI marked
	Workmanship	2.2	IS 2016	R	All		
4	Dimensions	4	IS 2016	R	Five washer	Every hour	

In case of any failure, twice the number of sample shall be tested from the same control unit for those characteristics in which failure has occurred. In case of any further failure the control unit shall be rejected and shall not be marked with BIS standard mark. Further each control unit corresponding to the property class in which the failure had occurred shall be tested till samples from three consecutive control units pass after which the earlier frequency can be restored.

In case of any failure, twice the number of sample shall be tested from the same heat treatment batch for those characteristics in which failure has occurred. In case of any further failure the heat treatment batch shall be rejected and shall not be marked with BIS standard mark. Further twice the sample from each heat treatment batch corresponding to the property class in which the failure had occurred shall be tested till samples from three consecutive heat treatment batch pass after which the earlier frequency can be restored.

NOTE 1: SAMPLING PLAN FOR DIMENSIONAL CHECK:

Total number of fasteners in batch	Number of test samples	Acceptance Number
Upto and including 1000	5	0
1001 upto and including 3000	8	0
3001 upto and including 10000	13	0
10001 upto and including 35000	20	0
Over 35000	32	1

NOTE 2: SAMPLING PLAN FOR FINISH/COATING TEST:

Total number of fasteners in batch	Number of test samples
Upto and including 500	3
501 upto and including 35000	5
Over 35000	8

NOTE-3: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

NOTE-4: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.