



**PRODUCT MANUAL FOR
FASTENERS – THREADED STEEL FASTENERS –
STEP BOLTS FOR STEEL STRUCTURES
ACCORDING TO IS 10238: 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 10238: 2001
	Title	:	Fasteners – Threaded Steel Fasteners – Step Bolts for Steel Structures
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	As per clause 5 of IS 10238: 2001 read in conjunction with clause 6, Table 2 of IS 1367 (Part 3): 2017
b)	Grouping guidelines	:	Only one variety (M16X 175 NN, property class – 4.6) as per Fig. 1 is covered in the Standard.
c)	Sample Size	:	Eight sets of Bolts with mating Nuts and Washers
3.	List of Test Equipment	:	Please refer ANNEX – A
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – B
5.	Possible tests in a day:		
	All Tests		
6.	Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 10238: 2001 with the following scope:		
	Name of the product	Step Bolts for Steel Structures	
	Designation	M16X 175 NN	
	With/without Washers		

ANNEX A**List of Test Equipment***Major test equipment required to test as per the Indian Standard*

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Dimensions and Tolerances (Clause 3)	(i) Micrometer (ii) Scale (iii) Vernier Callipers
2	Thread Requirements (Clause 3)	(i) Angle Gauge (ii) Go-No Go Thread Gauges (iii) Radius Gauge (iv) Thread Gauge (v) Thread Pitch Gauge
3	Mechanical Properties (Clause5)	(i) Hardness Tester (ii) UTM
4	Test	Cantilever Test Apparatus Arrangement as per Fig. 2
5	Finish (Clause 8)	(i) Analytical Balance (ii) Coat meter (iii) Arrangement for adhesion test, uniformity test

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

ANNEX B

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 equipments.

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

3. LABELLING AND MARKING – As per the requirement of IS 10238: 2001.

4. CONTROL UNIT – All Step Bolts manufactured during a day from the same cast of raw material shall constitute a control unit.

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 Standards 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)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Raw material (Chemical)	6, Table 2	IS 1367(Part 3)	S	One	Each Consignment	No further testing is required, if accompanied with test certificate or ISI marked.
3	Dimensions	Fig. 1	IS 10238	R	As per sampling plan given at Note 1		#
	Threads Requirement	FIG. 1	IS 10238	R			
5	Mechanical Property						
	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		R			
	Head Soundness Test	9.8		R			
	Yield strength	9.7		R			
	Strength under wedge loading	9.1		R			
	Hardness Test	9.9	IS 1367 (Part 3) / ISO 898 (Part 1)	R	Three	Every heat treatment batch	##
6.1	Nuts		IS 14394	S	As per Table 2		No further testing is required, if accompanied with test certificate or ISI marked
6.2	Washers	6.2, 6.2.1	IS 10238 IS 2016	S	As per Table 3		
7	Surface discontinuities		IS 1367 (Part 9/ Sec 2)	R	Five	Every heat treatment batch	--

8	Finish						
	Mass of coating	4.1	IS 1367 (Pt 13)	R	As per sampling plan given at Note 2	Each Control Unit	In case of failure, twice the number of samples shall be tested. If any sample fails, the batch represented by the samples shall be rejected or the batch may be re-galvanized and retested.
	Uniformity of coating	4.2		R			
	Adhesion	4.3		R			
	Appearance and defects	5		R			
10	Test	10.1, 10.1.1	IS 10238	R	Two	Each Control Unit	

TABLE 2***Levels of Control for Nuts as per IS 14394***

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
3	Dimensions		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	IS 1367 (Part 6) / ISO 898 (Part 2)		Two	Every 7 th Control unit	#
		5	IS 14394				
	Hardness	9.2	IS 1367 (Part 6) / ISO 898 (Part 2)		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*(Levels of control for washers as per IS 2016)*

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			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	Each washer		
4	Dimensions	4	IS 2016	R	Five	Every hour	
	Finish	6.2, 8.2, 8.3	IS 10238 IS 4759	R	As per Sampling plan given in Note 2.		

In case of any failure, twice the number of samples 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 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 samples 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 selection of specimens for Testing of Finish

Total number of fasteners in batch	Number of test samples
Up to and including 500	3
501 up to and including 35,000	5
Over 35,000	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.