



**PRODUCT MANUAL FOR
HARDENED AND TEMPERED WASHERS FOR
HIGH STRENGTH STRUCTURAL BOLTS AND NUTS
ACCORDING TO IS 6649: 1985**

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 6649 : 1985
	Title	:	Hardened and Tempered Washers For High Strength Structural Bolts and Nuts
	No. of Amendments	:	1
2.	Sampling Guidelines:		
a)	Raw material	:	As per Clause 5 of IS 6649:1985
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	40 nos.
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Possible tests in a day :		
	All Tests		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 6649 : 1985 with the following scope:		
	Name of the product	Hardened and Tempered Washers For High Strength Structural Bolts and Nuts	
	Type		
	Nominal Size		

ANNEX A

Grouping Guidelines

1. Hardened and Tempered Washers for High Strength Structural Bolts and Nuts as per IS 6649: 1985 are classified as follows:
 - (i) **Type:** Type A, Type B and Type C
 - (ii) **Nominal Size:** M16, M20, M22, M24, M27, M30 and M36
2. One sample each of lowest size, any intermediate size and highest size, from each type shall be tested for all requirements to cover the complete range of sizes of that particular type.
3. The Firm shall declare the varieties of Washers 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 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) Divider/ Profile Projector (ii) Feeler Gauge (iii) Flat Table (iv) Measuring Scale (v) Protractor (vi) Straight Edge (vii) Vernier Calipers
2	Hardness (Clause 7)	Rockwell Hardness Tester
3	Galvanising (Clause 8.1)	(i) Antimony Trichloride (ii) Antimony Trioxide (iii) Hydrochloric Acid (iv) Weighing Balance

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 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 6649: 1985.

4. CONTROL UNIT – All Washers of same type and nominal size manufactured in a day 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	Material	5	IS 6649	S	One	Each consignment	No further testing is required if accompanied with test certificate or ISI marked
3	Dimensions and Tolerances	3	IS 6649	R	Please see Sampling Plan – Note 3		
7	Hardness	7	IS 6649	R	Three	Every heat treatment batch	--
8	Finish	8	IS 6649	R	All		Visual only
8.1	Galvanising	8.1	IS 6649	R	Three	Every heat treatment batch	--
9	General Requirements	9.1	IS 6649	R	Three	Every heat treatment batch	--
	Bolt (if provided)	9.2	IS 6649	R	Three	--	No testing is required in case Bolt is ISI Marked.
	Nut (if provided)	9.3	IS 6649	R	Three	--	No testing is required in case Nut is ISI Marked.

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note- 2: 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.

Note-3: Sampling Plan shall be as per TABLE 2

TABLE 2

Sampling Plan

Lot Size	Sample Size	Acceptance Number
(1)	(2)	(3)
Upto 1000	2	0
1001 to 3000	8	0
3001 to 10000	13	0
10001 to 35000	20	0
Over 35000	32	1