



**PRODUCT MANUAL
FOR NATURAL RUBBER COMPOUNDS -SPECIFICATION
PART 2 FOR EXTRUDED PRODUCTS
ACCORDING TO IS 5192 (PART 2): 1994**

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 5192 (PART 2) :1994
	Title	:	Natural Rubber Compounds - Specification Part 2 For Extruded Products
	No. of Amendments	:	--
2.	Sampling Guidelines:		
a)	Raw material	:	As per clause 3.2 of IS 5192 (Part 2)
b)	Grouping guidelines	:	NA
c)	Sample Size	:	2 no. of test sheet as per Cl 5.2, 3 no. large cylinder disk (diameter- 29.0±0.5mm, thickness- 29.0±0.5mm), 3 no. small cylinder disk (diameter-8 to 10mm, thickness- 10 to 15mm)
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:	:	Hardness after vulcanization (IRHD), Density (Mg/m ³), Minimum tensile strength (MPa), Minimum elongation at break (percent)
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 5192 (PART 2) : 1994 with the following scope:		
	Name of the product	Natural Rubber Compounds – Specification Part 2 For Extruded Products	
	Grade Designation	R40/S40/T40/R50/S50/T50/R60/S60/T60/R70/T70/T80	

ANNEX-A

List of Testing Equipment

S.No	Test Used In With Clause Reference	Test Equipment / Chemicals And Identification Numbers(where Applicable)
1.	(CLAUSE 3.3, table 2) S. NO. (i) Hardness After Vulcanization	<p>For Methods N, H, L and M: Hardness Testing Apparatus as per Cl 5.2 of IS 3400 (Part 2) comprising:</p> <ul style="list-style-type: none"> • Vertical plunger • Means for applying a contact force and an additional indenting force to the plunger, • Means for measuring the increase in depth of indentation of the plunger caused by the indenting force • Flat annular foot, • Means for gently vibrating the apparatus • Chamber for the test piece <p>For Methods CN, CH, CL and CM: Hardness Testing Apparatus essentially same as for Methods N, H, L and M with certain differences in the following respects as detailed in Cl 5.3 of IS 3400 (Part 2):</p> <ul style="list-style-type: none"> • Cylindrical surfaces of radius greater than 50 mm • Surfaces with double curvature of large radius greater than 50 mm • Cylindrical surfaces of radius 4 mm to 50 mm or small test pieces with double curvature • Small O-rings and articles of radius of curvature less than 4 mm
2	(CLAUSE 3.3, table 2) S. NO. (ii) Density	<p>Ordinary laboratory apparatus and the following as per IS 3400 (Part 9):</p> <ul style="list-style-type: none"> • Analytical balance, accurate to ± 1 mg. • Balance pan straddle, of convenient size to support the beaker and permit determination of the mass of the test piece in water (for method A). • Beaker, 250 cm³ capacity (or smaller if necessitated by the design of the balance) (for method A). • Density bottle (for method B).
3.	(CLAUSE 3.3, table 2) S. NO.(iii) & (iv) Minimum Tensile Strength and Elongation at Break	<ul style="list-style-type: none"> - Dies and Cutters - Thickness Gauge, Cone gauge - Vernier Caliper - Tensile Testing Machine <p>(As per Cl. 7 of IS 3400 (Part 1))</p>

4	(CLAUSE 3.3, table 2) S. NO. (v) Maximum Compression Set	AGEING OVEN with count hour meter. - Dies - Compression Apparatus - Thickness Gauge, - Vernier Caliper
5	(CLAUSE 3.3, table 2) S. NO. vi. (a & b) Resistance to accelerated ageing	AGEING OVEN with count hour meter - Tensile Machine - Dies and Cutters - Thickness Gauge - Vernier Caliper

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

b) The least count, range, and other specifications of the equipment, reagents etc shall be as specified in the standard

ANNEX-B

**SCHEME OF INSPECTION AND TESTING
FOR CERTIFICATION OF
FOR NATURAL RUBBER COMPOUNDS -SPECIFICATION,
PART 2 FOR EXTRUDED PRODUCTS
ACCORDING TO IS 5192 (PART 2): 1994**

1. **LABORATORY** – A laboratory shall be maintained which shall be suitably equipped (as per requirement given in Standard) 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. **PACKING AND MARKING** – The Standard Mark, as given in the Schedule of the license, shall be printed using suitable ink **on the packaging of the product**, provided, always that the product so marked conform to requirements of the specification.

3.1 Packing and marking shall be done as agreed between purchaser and supplier. In addition, the following details shall be permanently marked on each package:

- i) BIS licence no. CM/L-
- ii) Details of BIS website shall be marked as follows: “For details of BIS certification please visit www.bis.gov.in”

4. **CONTROL UNIT** - For the purpose of this scheme, the entire quantity of rubber compound of the same grade designation manufactured from the same batch of raw materials in a single cycle of mixing and vulcanized at a time shall be constitute a control unit.

5. **LEVELS OF CONTROL** - The tests, as indicated in Table 1 and at the levels of control specified therein, shall be carried out on the whole production of the factory covered by this scheme and appropriate records and charts maintained in accordance with paragraph 2 above.

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

6.0 **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. A separate record providing the detailed information regarding the rejected control units and mode of their disposal shall be maintained, such material shall in no case be stored together with that conforming to the specification.

Table 1 LEVELS OF CONTROL
(Para 5 Scheme of Inspection and Testing)

(1)			(2)	(3)		
Test Details			Test equipment required R : required (or) S: sub - contracting permitted	Level of Control		
CL.	Requirement	Test Method Clause Reference		No. of Sample	Frequency	Remarks
3.2	Composition	IS 5190 Part 2	S	One	Each consignment of rubber and reinforcement material (non-black filler, zinc oxide, carbon black etc)	No testing is required if consignment is accompanied with Supplier or Manufacturer's Test Certificate indicating conformity to the specified requirement
3.3	Physical properties of the vulcanized test sheet					
(i)	Hardness after vulcanised (IRHD)	IS 3400 (PART 2) 1980	R	2	EACH CONTROL UNIT	
(ii)	Density (Mg/m ³)	3400 (Part 9) : 1978	R	2	EACH CONTROL UNIT	
(iii)	Minimum tensile strength	IS 3400 (PART 1) 1987	R	2	EACH CONTROL UNIT	
(iv)	Minimum elongation at break	IS 3400 (PART 1) 1987	R	2	EACH CONTROL UNIT	
(v)	Maximum compression set	IS 3400 (PART 10) 1977	R	2	EACH CONTROL UNIT	
(vi)	Resistance to accelerated Ageing	IS 3400 (PART 4) 1987	R	1	Every Fifth Control unit	See Note 3

a)	Maximum change in tensile strength					
b)	Maximum change in elongation at break					

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled 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.

Note-3: In case any of the samples fail to meet the relevant requirements the entire material in the control unit shall be considered unfit for the purposes of marking. In case of any failure each control unit shall be tested till 5 consecutive control units are found to be passing. Thereafter, frequency suggested in this table may be followed.