


INTER PLANT STANDARD – STEEL INDUSTRY		
 IPSS	SPECIFICATION FOR OIL RESISTANT NEOPRENE (CHLOROPRENE) RUBBER SHEETS, GASKETS ETC	IPSS: 1-02-024-18 <i>(Second Revision)</i>
	Corresponding IS does not exist	Formerly: IPSS: 1-02-024-85 (First Revision)

0. **FOREWORD**

0.1 This Interplant Standards activity in steel industry has been initiated under the aegis of the Indian Standards Institution (ISI) and the Steel Authority of India Ltd. (SAIL). This Interplant Standards, prepared by the Standards Committee on Basic Standards and Hydraulic, Pneumatic and Lubricating Equipment, IPSS 1:2, with the active participation of the representatives of all the steel plants, major consultants and established manufacturers of oil resistant nitrile rubber sheets, gaskets ETC. was adopted by the Approval Committee on Consumable stores and General Equipment in March, 1985. Thereafter standard was again revised in January, 2018.

0.2 Interplant Standards for steel industry primarily aim at achieving rationalization and unification of parts and sub-assemblies used in steel plant equipment and accessories and provide guidance in indenting stores or equipment for existing or new installations by individual steel plants. For exercising effective control on inventories, it is advisable to select a fewer number of sizes (or types), from those mentioned in this standard for the purpose of company standards of individual steel plants. It is not desirable to make deviations in the technical requirements.

1. **SCOPE**

This Interplant Standard covers the requirements of quality neoprene (chloroprene) rubber sheets and gaskets.

Note: - This is generally based on grade C 60o BS 2752:1982 'Vulcamised chloroprene rubber'.

2. APPLICATION

These are meant to be used as gaskets and mouldings in switchgear, team turbines, turbo generators, traction machines, oil coolers and hydraulic application. These compounds do not necessarily have good electrical insulating properties.

3. DIMENSIONS AND TOLERANCE

3.1 Sizes: The dimensions shall be as given in the order. Preferred thickness for sheets and gaskets are 1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 10, 12, 16 and 20 mm.

3.2 Tolerance – Unless otherwise stated on the order / drawing tolerance on length, width and thickness shall be as specified in 3.2.1 and 3.2.2.

3.2.1 On length shall be ± 10 mm and width ± 3 mm.

3.2.2 On thickness shall be as follows :

Thickness (mm)	Tolerance (+mm)
From 1 to 6	0.25
From 10 to 12	0.50
From 15 to 20	0.80

4. COMPOSITION

4.1 The compounds shall be based on a slow crystallization rate. Chloroprene polymer(s) reinforced only with carbon black, vulcanized with a metallic oxide and containing at least 2 phr (Parts per hundred of rubber by mass) of a suitable antioxidant.

4.2 and processing of the ingredients shall be such that the vulcanization is free from surface imperfections, blisters or porosity and show only minimal bloom.

4.3 The material when identified by infra-red spectrometer or by any other convenient method shall be chloroprene copolymer.

5. TEST SAMPLES

5.1 When mouldings are ordered three sample sheets each of size 150 x150x2.5 mm thick prepared from the same batch and vulcanized to the same degree as the consignment concerned shall be supplied free of cost for testing and approval.

- 5.2 When sheets are ordered three samples each of size 150 x 150 x 2.5 mm shall be supplied for testing free of cost.

6. **TECHNICAL REQUIREMENTS**

When tested in accordance with the Indian Standards/British Standards shown against each, the test samples shall conform to the properties given in 6.1 to 6.9.

- 6.1 Hardness conforming to IS: 2003 'Methods of test for vulcanized rubbers: Part 2 Hardness (Third Revision)
- 6.2 Tensile strength conforming to IS: 3400 (Part 1) – 2012 'Methods of test for vulcanized rubbers: Part 1 Tensile stress-strain properties (Third Revision).
- 6.3 Elongation at break [conforming to IS: 3400 (Part 1) – 2012.
- 6.4 Compression set at 70oC [conforming to IS: 3400 (Part 10) – 1977 "Methods of test for vulcanized rubbers: Part 10 Compression set at constant strain (first revision)] shall not exceed 25 percent.
- 6.5 Volume change conforming to BS 903 (Part A) 16: 1971 'Volumetric method liquid B 22 hours at 40 degree Celsius should not exceed 70 per cent.
- 6.6 Resistance to heat ageing for 168 hours at 70oC [BS 903 (Part A) 19: 1975] Method A or B:
- a) Change in hardness after ageing as above shall not be more than 7 IRHD over the values at 6.1 when measured on 2 plies each of 2 mm thick.
 - b) Change in tensile strength [IS: 3400 (Part 1) – 2012].
 - c) Change in elongation at break [IS: 3400 (Part 1) - 2012.
- 6.7 Adhesion to and corrosion of metals 168 h at 70oC. When tested in accordance with Part A 37 method A of BS: 703 using copper and carbon steel. There shall be no corrosion or pitting of the metals and the vulcanization shall not adhere to the metal surface or show any sign of liquid exudation. Discoloration of the metal surfaces shall not be considered a cause for rejection.
- 6.8 Ageing in Oil – Four test specimens 25 mm wide and of suitable length shall be cut from each sample sheet from widely separated positions. The specimens shall be aged in transformer oil for 72 hours at 70oC:

- a) Increase in weight (swelling) after 72 hours should not exceed 10 percent when tested in accordance with IS: 3400 (Part 6) – 2012 "Methods of test for vulcanized rubbers – Part-6 - Resistance to liquids".
- b) Change in volume after ageing for 72 hours at 70oC shall not exceed 10 percent.

6.9 Flex cracking resistance test in conformity with IS: 3400 (Part 7)-1985 "Method of test for vulcanized rubbers: Part 7 - Resistance to Flex cracking.

7. **FREEDOM FROM DEFECTS AND STORAGE**

7.1 Finished rubber items shall be free from surface imperfections, porosity, voids, inclusions, flow marks or faults arising from inadequate joint of moulding blank and other defects which could affect satisfactory performance. The material shall not develop excessive bloom on storage under normal temperature conditions.

7.2 Surface finish shall be smooth moulded.

8. **TEST CERTIFICATES**

Unless otherwise stated, three copies of test certificates shall be supplied giving the following information:

IPSS: 1-02-024-18 Neoprene rubber sheets, gaskets, etc.

Order No Date

Drawing No. Item No.

Supplier's Name and Trade-mark, if any

Date of manufacture

9. **PACKING**

Material shall be suitably packed to prevent damage from contamination and handling during transit. One set of test certificates as given in 8 shall be kept inside the package against each lot.

10. **MARKING**

Each package shall be legibly marked with the following information:

IPSS: 1-02-024-18

Order No

Date

Manufacturer's / Supplier's Name

Item No.

Trade-mark, if any

Batch No.

Size and Quantity