INTER PLANT STANDARD – STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR OIL RESISTANT NITYRILE RUBBER SHEETS AND GASKETS** Corresponding IS does not exist	**IPSS: 1-02-023-18** *(First Revision)* *Formerly :* *IPSS: 1-02-023-85*

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 Limited (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 and gaskets was adopted by the Approval Committee on Consumable Stores and General Equipment, IPSS 1, on March, 1985. Thereafter standard was first 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 nitrile rubber sheets and gaskets.

Note: - This is generally based on BS 2751: 1982 Vulcanised acrylonitrile butadiene rubber grade BA 60.

2. APPLICATION

These are to be used in the form of sheets, gaskets, items cut or puncher from sheets in places in which resistance to certain organic liquids, in particular hydrocarbon fuels and oils, is a necessary property.

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 Tolerance on length shall be ±10 mm and width ± 3 mm.

3.2.2 Tolerance on thickness shall be as follows :

Thickness mm	Tolerance ± mm
UP to 2.0	0.25
3.0 to 7.0	0.40
10.0 to 12.0	0.60
Over 16 o	0.80

4. COMPOSITION

All ingredients of the mix shall be from grit and extraneous material. The selection and processing of the ingredients shall be such that the vulcanizates are free from surface imperfections, blisters, porosity, voids, inclusions, flow marks inadequate joint of and other defects which would impair the satisfactory performance. The material shall not develop excessive Sulphur / accelerator bloom on storage under normal temperature conditions.

5 IDENTIFICATION

The material when identified by infrared spectrometer or by any other convenient method shall be of butadiene acrylonitrile copolymer.

6. TEST SAMPLES

6.1 When mouldings are ordered three sample sheets each of size 150 x 150 x 2.5 mm thick prepared from the same batch and vulcanized to the same degree as the consignment concerned shall be supplied free of cost to the purchaser for testing and approval.

6.2 When sheets are ordered, three samples of 150 x 150 x 2.5 mm shall be cut from the sheets supplied for testing and approval.

7. PROPERTIES

When tested in accordance with the Indian Standard/ British Standards shown against each the test samples shall conform to the properties specified in 7.1 to 7.5.

7.1 Hardness as per IS: 3400 (Part 2) – 2003 ‘Methods of test for vulcanized rubbers: Part 2 Hardness *(Third Revision)*’

7.2 Tensile strength as per IS: 3400 (Part 1) – 2012 “Methods of test for vulcanized rubbers: Part 1 ‘Tensile stress-strain properties *(Third Revision*)’

7.3 Elongation at break { IS: 3400 (Part 1) – 2012 }

7.4 Compression set 24 hours at 70 º C {IS: 3400 (Part 10) – 1977 “Methods of test for vulcanized rubbers: Part 10 Compression set at constant strain (first revision)’}

7.5 Adhesion to and corrosion of metals: 168 hrs at 70ºC.

There shall be no corrosion or pitting of the metals and the material shall not adhere to the metal surface or show any sign of liquid exudation. {when tested in accordance with BS 903 : Part A37: Method A using copper and carbon steel }. Discoloration of the metal surface shall not be considered to be objectionable.

7.6 Accelerated Ageing

7.6.1 Ageing in Air – 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 air for 168 hours at 125 + 5º C.

After ageing in air, when tested in accordance with IS: 3400 (Part-2) – 2003 the change in hardness shall not be more than 10 IRHD over the values in 7.1.

7.6.2 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 insulating oil conforming to IS: 335 - 1993‘ Specification for new insulating oils for transformers and switchgear (Fourth Revision) for 168 hours at 100ºC.

After the oil is removed from the sample by blotting paper the specimens shall show the following properties:

a) Oil absorption (calculated on the original weight of the specimen) + 10 percent, Max.
b) Change in dimensions :

Thickness- 4 percent, Max.

Length and width- 6 percent, max.

7.7 Flex cracking resistance test according to IS: 3400 (Part 7) –1985‘ Method of test for valcanized rubbers: Part 7 ‘Resistance to flex – cracking may be carried out and minimum grade E may be accepted after subjecting the sample to about 20, 000 reversals.

8. FREEDOM FROM DEFECTS AND STORAGE

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 impair satisfactory performance. Surface finish shall be smooth moulded. Finished rubber items prior to being put to use should be packed properly ad stored preferably in an air-conditioned store to avoid any deterioration.

9. Unless otherwise stated three copies of test certificates shall be supplied along with the consignment giving the following details:

Interplant Standard No. IPSS: 1-02-023-18

Nitrile rubber sheets

Order No Date

Drawing No. Item No.

Width x length x thickness

Supplier's name and trade-mark

Test results of 5 and 7

Date of manufacture

10 **MARKING**

Each package shall be legibly marked with the following information :

IPSS: 1-02-023-18

Order No Date

Drawing No. Item No.

Manufacturer's / Supplier's Name

Trade-mark, if any

Batch No.

Quantity

11. **PACKING**

Material shall be suitably packed to prevent damage from contaminator and handling during transit. One set of test certificates as given in 9 shall be kept inside the package of each lot.