
British Standard

**Rubber used in preformed gaskets for
weather exclusion from buildings**

Part 1. Specification for non-cellular gaskets

Caoutchouc pour joints préformés d'isolation des bâtiments
Partie 1. Joints non alvéolaires – Spécifications

Kautschuk für vorgeformte Dichtungen zur Abdichtung von Gebäuden gegen
Witterungseinflüsse
Teil 1. Dichtungen aus nichtzellförmigem Werkstoff

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Specification

1 Scope

This Part of BS 4255 specifies requirements for the classification, physical properties and marking of solid (non-cellular) rubber used in preformed gaskets for sealing applications in buildings where resistance to weathering, ozone and permanent deformation under load are of prime importance.

This Part applies to chloroprene, butyl, halobutyl, ethylene propylene, chlorosulphonated polyethylene and silicone rubbers used in the gaskets.

Five classes of material, defined according to the hardness of the rubber, are specified.

NOTE. The titles of the publications referred to in this Part of BS 4255 are listed on the inside back cover.

2 Classification

The rubber shall be classified according to its hardness, as given in table 1. The hardness shall be determined in accordance with the appropriate method in BS 903 : Part A26. Method M shall be used for small components; otherwise method N or method H shall be used, according to the expected hardness value.

Class	Hardness
	IRHD
A	50 ⁺⁵ ₋₄
B	60 ⁺⁵ ₋₄
C	70 ⁺⁵ ₋₄
D	80 ⁺⁵ ₋₄
L	75 ± 4

NOTE. Classes A, B, C and D are used for U channel types of gasket. Class L is intended for lock-strip type ('zipper' type) structural gaskets but class D is normally used for the actual locking strip for such gaskets.

3 Testing

Tests shall normally be carried out on test pieces taken from the actual gasket. But if the gasket is too narrow for a particular test piece to be cut from it, that test shall be carried out using test pieces taken from a specially moulded sheet, vulcanized under conditions which shall achieve the same state of cure as that of the actual gasket; this shall be reported in the documentation that accompanies the gaskets supplied to the purchaser.

*Parts per hundred million by volume.

4 General requirements

4.1 Appearance and finish

When examined visually, all surfaces (including the cross sections) shall be homogeneous and free from porosity and grit. Gaskets shall be cut so that the cross section can be examined.

4.2 Accelerated ageing

After ageing in an air oven at 100 °C for a period of 70⁺²₋₀ h, in accordance with either of the methods described in BS 903 : Part A19, the rubber shall comply with the following requirements.

- The tensile strength, compared with the unaged value, shall not be reduced by more than 15 % of the unaged value when determined in accordance with BS 903 : Part A2.
- The elongation at break, compared with the unaged value, shall not be reduced by more than 40 % of the unaged value when determined in accordance with BS 903 : Part A2.
- The hardness shall not be below the unaged value and shall not be more than 10 IRHD above the unaged value when determined in accordance with BS 903 : Part A26.

4.3 Static ozone resistance

When tested in accordance with BS 903 : Part A43, at a test elongation of 20 % at 40 °C and at an ozone concentration of 100 p.p.h.m.* , the test pieces shall show no cracking after 96 h.

4.4 Low-temperature hardness change

When tested in accordance with BS 5294, the hardness after 166⁺²₋₀ h at -10 °C shall be not more than 12 IRHD above the initial value at -10 °C.

4.5 Staining

When tested in accordance with method A1 of BS 903 : Part A33, the rubber shall not cause migration staining. Test pieces shall be placed between two painted panels and the assembly shall be heated for 24⁺⁰₋₂ h at 70 °C in an air circulating oven. The panels, without the test pieces, shall then be exposed for 2 h under a mercury arc lamp and the presence of migration staining shall be assessed by visual examination.

5 Requirements for black and non-black rubber gaskets

5.1 Black rubber gaskets

5.1.1 *General.* The requirements given in table 2 shall apply to all rubbers listed in clause 1, with the exception of silicone rubber (see 5.2).

5.1.2 Tensile properties. The tensile strength and elongation at break, when determined in accordance with BS 903 : Part A2, using type 2 dumb-bell test pieces, shall comply with the requirements given in table 2.

5.1.3 Compression set. When determined in accordance with BS 903 : Part A6, using type 1 test pieces maintained at 70 °C for 22 $\frac{+2}{-0}$ h, with lubrication of the faces of the compression plates, the compression set shall comply with the requirements given in table 2.

Class	Nominal hardness	Tensile strength (minimum)	Elongation at break (minimum)	Compression set (maximum)
	IRHD	MPa	%	%
A	50	8.5	300	25
B	60	8.5	250	25
C	70	10.5	200	25
D	80	10.5	150	25
L	75	12.0	150	25

5.2 White and coloured rubber gaskets and all silicone rubber gaskets

5.2.1 General. The requirements given in table 3 shall apply to all non-black gaskets and to all gaskets made of silicone rubber. Grey shall be regarded as a non-black colour.

5.2.2 Tensile properties. The tensile strength and elongation at break, when determined in accordance with BS 903 : Part A2, using type 2 dumb-bell test pieces, shall comply with the requirements given in table 3.

5.2.3 Compression set. When determined in accordance with BS 903 : Part A6, using type 1 test pieces maintained at 100 °C for 22 $\frac{+2}{-0}$ h for silicone rubber and at 70 °C for 22 $\frac{+2}{-0}$ h for all other rubbers, with lubrication of the faces of the compression plates, the compression set shall comply with the requirements given in table 3.

5.2.4 Tear strength. When determined in accordance with method C of BS 903 : Part A3, the tear strength shall comply with the requirements given in table 3.

6 Marking

Each gasket, or each container if it is not possible to mark the actual gasket, shall be marked in a suitable position with the following:

- the manufacturer's name or trademark;
- the month and year of manufacture;
- the class and type of rubber;
- the colour of the gasket;
- the number and date of this British Standard, i.e. BS 4255 : Part 1 : 1986*.

Class	Nominal hardness	Tensile strength (minimum)	Tear strength (minimum)	Elongation at break (minimum)	Compression set (silicone rubber) (maximum)	Compression set (rubbers other than silicone) (maximum)
	IRHD	MPa	kN/m	%	%	%
A	50	6.0	15	300	30	25
B	60	6.0	15	200	30	25
C	70	6.0	15	150	30	25
D	80	6.0	15	100	30	25
L	75	6.0	15	125	30	25

NOTE. The compression set requirements in table 3 differ in recognition of the use of silicone rubber in non-black gaskets. A minimum tear strength is specified because, in general, silicone rubber and non-black rubbers are weaker than rubbers containing carbon black.

*Marking BS 4255 : Part 1 : 1986 on or in relation to a product is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification should be addressed to the appropriate certification body.

Publications referred to

- BS 903 Methods of testing vulcanized rubber
Part A2 Determination of tensile stress-strain properties
Part A3 Determination of tear strength (trouser, angle and crescent test pieces)
Part A6 Determination of compression set after constant strain
Part A19 Heat resistance and accelerated air ageing tests
Part A26 Determination of hardness
Part A33 Methods of test for staining in contact with organic materials
Part A43 Determination of resistance to ozone cracking (static strain test)
- BS 3734* Specification for dimensional tolerances of solid moulded and extruded rubber products
- BS 4315* Methods of test for resistance to air and water penetration
Part 1 Windows and structural gasket glazing systems
- BS 5294 Method of test. Determination of crystallization effects in rubbers by hardness measurements
- BS 6093* Code of practice for design of joints and jointing in building construction
- BS 6262* Code of practice for glazing for buildings
- ISO 3934* Rubber building gaskets – Materials in preformed solid vulcanizates used for sealing glazing and panels – Specification
- ISO 5892* Rubber building gaskets – Materials for preformed solid vulcanized structural gaskets – Specification

*Referred to in the foreword only.