

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1398

RUBBER SEALING RINGS FOR JOINTS
IN ASBESTOS-CEMENT WATER PIPING

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 1398, *Rubber sealing rings for joints in asbestos-cement water piping*, was drawn up by Technical Committee ISO/TC 45, *Rubber*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1398, which was circulated to all the ISO Member Bodies for enquiry in December 1967. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	India	Poland
Chile	Iran	Spain
Colombia	Ireland	Sweden
Czechoslovakia	Israel	Switzerland
France	Italy	U.A.R.
Germany	Japan	United Kingdom
Greece	Netherlands	
Hungary	New Zealand	

The following Member Body opposed the approval of the Draft :

U.S.A.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

RUBBER SEALING RINGS FOR JOINTS IN ASBESTOS-CEMENT WATER PIPING

1. SCOPE

This ISO Recommendation specifies the requirements for rubber rings used for joints in asbestos-cement water piping.

It defines the requirements of quality and the acceptance test limits applicable to rings of the basically circular section and lip-seal types of single hardness.

Annex A gives recommendations as to storage conditions after receipt.

Annex B outlines an optional supplementary requirement for inspection for homogeneity.

2. REQUIREMENTS AND TESTS

2.1 Required quality

In all cases the rings should conform to the requirements of this specification.

If the piping is to convey drinking water, substances capable of affecting the organoleptic properties of the water, or toxic materials such as extractable compounds of mercury, antimony, manganese, lead or copper, should not be included in the composition of the rings. This applies also to those substances which do not conform to the regulations established by the official public health services of the country in which the rings are used.

2.2 General requirements and finish

Each ring should be homogeneous in its whole mass and free from air marks or porosity. The surface and that of the test pieces should not show any grit. The fin or flash should be reduced as much as possible, and in any case its thickness should not exceed 0.4 mm or its width 0.8 mm.

2.3 Marking

Wherever practicable and unless otherwise specified each ring should be plainly and indelibly marked, in a suitable position acceptable to manufacturer and user, with the following information :

- (a) the manufacturer's name or trade mark;
- (b) the year of manufacture;
- (c) the class of ring.

In cases when the marking of the actual rings is not practicable or is likely to be detrimental to their effective use, the rings should be supplied, fastened together in parcels of suitable size, each bearing a label giving the above particulars.

2.4 Dimensions and tolerances

The dimensions and tolerances of the rings should be as specified by the manufacturer of the pipes.

2.5 Tests

Acceptance tests should be carried out by a laboratory approved by the interested parties. The number to be tested should be as specified in clause 3.2.2.

2.5.1 Preparation of test pieces. Wherever possible the test pieces should be cut from the finished ring. Where this is impracticable, the manufacturer should prepare appropriate test slabs from the same batch of rubber vulcanized to the same degree and in the same manner as the consignment concerned.

2.5.2 Hardness test. The hardness should be determined on the whole ring. If this is not possible an appropriate test slab should be used and the method described in ISO Recommendation R 48*, *Determination of hardness of vulcanized rubbers*, should be employed. The hardness so measured should not vary by more than ± 3 IRHD on any single ring or test slab.

2.5.3 Compression set test. The compression set test pieces should be prepared and tested in accordance with ISO Recommendation R 815, *Method of test for the compression set under constant deflection at normal and high temperatures of vulcanized rubbers*, using the test pieces having a diameter of 13 mm and a thickness of 6 mm. The test pieces should be cut from the ring in such a way that the compression during testing is applied in the same direction as in practical use.

Should it be impossible to obtain a test piece of standard size from the ring, the test should be made with a smaller test piece, but one not less than 9 mm in diameter, keeping the ratio between diameter and height approximately 2 : 1.

Test results should not exceed the values given in the Table, page 6.

2.5.4 Stress-strain test. This test should be carried out generally in accordance with ISO Recommendation R 37*, *Determination of tensile stress-strain properties of vulcanized rubbers*, using Type 1 or 2 dumb-bell test pieces.

Where the ring is too small to allow these test pieces to be prepared, Type 30 dumb-bell test pieces (see Annex C) should be used, and the rate of traverse of the grip should be 150 mm/min.

The values of tensile strength and elongation at break obtained by this test should comply with the values given in the Table.

2.5.5 Ageing tests. Test pieces as described in clause 2.5.2 and clause 2.5.4 should be aged by the oven or cell method at 70 ± 1 °C for a period of 168 hours, using the method described in ISO Recommendation R 188, *Accelerated ageing or simulated service tests on vulcanized natural or synthetic rubbers*.

The test results after ageing should comply with the requirements shown in the Table.

3. ACCEPTANCE

3.1 Test on all rings

Compliance with the general requirements and finish (clause 2.2) dimensions and tolerances (clause 2.4) should be verified on each item of the consignment, or according to a statistical method agreed between supplier and user.

* 2nd edition -- 1968.

3.2 Test by sampling

3.2.1 *Lots.* The number of units constituting a lot should be agreed upon between the supplier of the rings and the purchaser. Each batch should consist of rings of the same dimensions.

3.2.2 *Sampling.* The rings for submission to the tests should be selected at random from the lots in the proportion of

1/1000 for the compression set test (clause 2.5.3) and the hardness test (clause 2.5.2);

2/1000 for the stress-strain test (clause 2.5.4) and the ageing test (clause 2.5.5).

For lots of less than 1000 rings, at least one sample should be tested.

4. COMPLIANCE OF THE CONSIGNMENT

4.1 General requirements and finish dimensions and tolerances

Any ring which does not meet the requirements of clause 2.2 and clause 2.4 should be deemed not to comply with the requirements of this ISO Recommendation.

4.2 Tests

If a test sample fails to meet the requirements of one or more of the tests (clause 2.5), the test or tests in which it fails should be repeated on two further samples taken at random from the same batch as defined under clause 3.2.1. If one of these further samples does not satisfy one or more of the tests, the batch should be deemed not to comply.

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TABLE - Properties of rubbers for joint rings

Tests	Units	Requirements			
		Lip-seal type	Natural rubber		Synthetic rubber all types
			Basically circular section		
Agreed hardness range	IRHD	41 to 60	Under 55	55 to 65	41 to 60
Manufacturing tolerance (from nominal hardness)		± 5	± 5	± 5	± 5
Tensile strength, minimum	MN/m ²	14	19.5	17.5	12.5
Elongation at break, minimum	%	400	450	350	350
Compression set, maximum					
(a) at standard laboratory temperature	%	10	10	15	10
(b) at 70 °C	%	25	20	25	20
Ageing, maximum variations from original values					
- Hardness	IRHD	+ 8 - 5	± 5	± 5	+ 8 - 0
- Tensile strength	% change	± 25	± 25	± 25	± 25
- Elongation at break	% change	+ 10 - 25	+ 10 - 25	+ 10 - 25	+ 10 - 30

The limits quoted above represent the acceptable properties of the different compositions. They indicate a material which can be expected to give a satisfactory product performance in service.

When a hardness of less than 41 IRHD is required using synthetic rubber, the characteristics should be as agreed between customer and supplier.