UIC CODE 830-2

4th edition, November 2003

Translation

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Technical specification for the supply of ring-shaped elastomer joints for brake coupling heads

Spécification technique pour la fourniture de joints annulaires en élastomères pour têtes d'accouplement de frein
Technische Lieferbedingungen für Elastomer-Dichtungsringe für Bremskupplungsköpfe

UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

Leaflet to be classified in Volumes:

V - Rolling Stock

VIII - Technical Specifications

Application:

With effect from 1 July 1986
All members of the International Union of Railways

Record of updates

3rd edition, July 1986

4th edition, November 2003	Retyped in FrameMaker and up-date of references to ISO standards following changes made between 1986 and 2003.

The person responsible for this leaflet is named in the UIC Code

Contents

Summary

This specification governs the supply of ring-shaped elastomer joints for brake coupling heads.

1 - Purpose

1.1 - Description of parts

This specification governs the supply of ring-shaped elastomer joints for brake coupling heads as defined in *UIC Leaflet 541-1, Appendix D, fig. 29*.

1.2 - Classification

A single category.

1.3 - Reference documents

ISO 37, ISO 48, ISO 188, ISO 471, ISO 815, ISO 2285 (see Bibliography - page 16)

2 - Characteristics

2.1 - Composition

Joints shall be made of compact moulded elastomers.

The choice of elastomer composition shall be left to the discretion of the manufacturer which shall inform the purchasing Railway of the materials used if so requested by the latter.

2.2 - Appearance

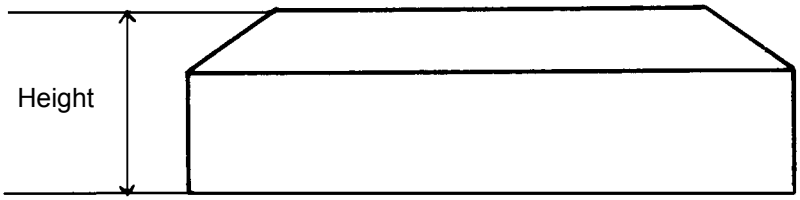
The surfaces of joints shall be smooth and free from visible defects which might be detrimental to their use (in particular, parting lines). The edges shall be clear-cut.

2.3 - Geometrical characteristics

Joints shall be supplied to the dimensions stipulated in the order or its associated documents.

The following tolerances shall be observed:

- ± 0,2 mm on diameters,
- ± 0,4 mm on the height.



2.4 - Mechanical properties

2.4.1 - Hardness

2.4.1.1 - Hardness as ready for submission (at 23°C ± 2°C)

65 IRDH with a tolerance of ± 5 IRDH.

2.4.1.2 - Hardness after ageing for 7 days at 70°C

Hardness recorded after ageing shall not deviate by more than 5 IRHD from the value recorded before ageing.

2.4.2 - Tensile characteristics

2.4.2.1 - As ready for submission

Ultimate tensile strength	≥	10 MPa
Elongation at break	≥	300%

2.4.2.2 - After ageing for 7 days at 70°C

Characteristics recorded after ageing shall not deviate from those recorded prior to ageing by more than:

- 20% for ultimate tensile strength,
- 30% for elongation at break.

2.4.3 - Deformation tests

Deformation tests shall be carried out at high and low temperature. The tests set out under point 2.4.3.1 or those specified under point 2.4.3.2 shall be performed with the purchasing Railway's approval.

2.4.3.1 - Deformation under tensile test

1. Tension set under 50% elongation for 24 hours at 70°C :

≤ 10%

2. Flexibility test at -25°C and under 50% compression, carried out on a joint as ready for submission:

≤ 8%

2.4.3.2 - Deformation under compression test

1. Compression set following compression for 22 hours at 70°C:

≤ 25%

2. Compression set following compression for 22 hours at - 30°C:

≤ 60%

2.4.4 - Water tightness

Two coupling heads, fitted with joints and joined together to simulate service conditions and immersed in water, must be watertight round the joints and allow no leak under the effect of 0,5 bar air pressure.

2.5 - Trade marks

During vulcanising, the joints shall be given the following indelible marks, in accordance with working documents:

- the manufacturer's mark,

- the last two figures of the year of manufacture.

No marks shall be placed on a surface of the joint used for sealing purposes under any circumstances.

3 - Approval and manufacture

3.1 - Approval of manufacturers

Manufacture of joints shall be entrusted only to manufacturers approved by the purchasing Railway.

3.2 - Approval of the finished product

All supplies shall be subject to prior approval by the purchasing Railway, in accordance with the conditions set out in point 4.2 - page 7.

The approval procedure shall be carried out whenever a modification made to the design, composition or manufacture of the joint is likely to alter its characteristics.

3.3 - Mass production of the joints

For mass production, the manufacturer shall not alter in any manner the composition and manufacturing processes it has selected for joints which have been subjected to approval procedure and accepted. Any minor repair intended to conceal a defect likely to be detrimental to the use of the joints is prohibited.

4 - Inspection

4.1 - Manufacturing inspection

For mass production, the purchasing Railway shall reserve the right to check by any means deemed appropriate that the manufacturer has not altered the manufacturing process or composition of the joints in relation to the sample approved.

4.2 - Approval inspection

4.2.1 - Batch of parts submitted for approval

When the approval procedure is to be carried out, a batch of at least 40 joints of the type to be certified, manufactured in accordance with the conditions stipulated for mass production shall be placed at the disposal of the purchasing Railway.

4.2.2 - Condition of the joints submitted for approval

Joints shall be submitted in finished condition.

4.2.3 - Execution of approval tests

The tests to which joints must be subjected are specified in the table under point 4.4 - page 8.

4.3 - Acceptance inspection

4.3.1 - Condition of joints when submitted for acceptance

New joints shall be submitted for acceptance as ready for delivery.

4.3.2 - Grouping into batches

Joints shall be submitted in batches containing the number of units specified in the order.

A batch shall include joints of the same type and same dimensions manufactured at the same time.

Each batch shall be given a consecutive serial number, starting at 1 (one) at the beginning of each year.

The number of a rejected batch shall not be re-used during the current year.

4.3.3 - Advice of submission

The representative of the purchasing Railway shall be advised in writing of the date of submission for acceptance; the advice shall be signed by the factory manager, or his authorised representative, and shall indicate the number of joints in each batch together with the references of the order.

4.4 - Description and number of tests and inspections

Joints shall undergo the tests and inspections specified in the table below.

These tests shall be carried out either at the time of approval or of acceptance. In both cases, tests and inspections shall be performed either in the manufacturer's laboratory or in the railway laboratory specified by the purchasing Railway.

Furthermore, the purchasing Railway's representative may at any time select some joints in the manufacturer's factory to subject them to tests either in the laboratory of the producing factory or in the laboratory of the purchasing Railway in order to check all or part of their characteristics again.

Description of tests and inspections	**Number of tests and inspections according to size of batch**			
	≤ 1 000	**between 1 000 and 3 000**	**between 3 000 and 10 000**	**≥ 10 000**
Appearance and marking:	Left to the choice of the representative of the purchasing Railway			
As ready for delivery:				
- hardness	1	2	3	4
- tensile test	1	2	3	4
After ageing:				
- hardness	1	2	3	4
- tensile test	1	2	3	4
Tension set:				
- flexibility	1	2	3	4
Compression set at 70°C	1	2	3	4
Compression set at - 30°C	1	2	3	4
Water tightness	1	2	3	4

4.5 - Sampling and preparation of test pieces

4.5.1 - Sampling

The representative of the purchasing Railway shall select at random from each batch submitted those joints from which test pieces are to be taken and shall mark them indelibly.

25 joints shall be selected per series of tests.

4.5.2 - Preparation of test pieces

The number, shape and dimensions of test pieces are specified in the table below.

Test pieces removed from joints as ready for submission shall be conditioned for 24 hours in accordance with *ISO Standard 471* (at 23°C ± 2°C and 50 ± 5% relative humidity).

Pieces to be tested after accelerated ageing shall be cut and then subjected to a temperature of 70°C under oven conditions for 7 days. Following this, they shall be conditioned for 24 hours in accordance with *ISO Standard 471* (at 23°C ± 2°C and 50 ± 5% relative humidity).

The above procedures shall be conducted in accordance with *ISO Standard 188*.

Description of tests and inspections	Number of test pieces	Shape and dimensions of test pieces
Appearance and marking	Left to the choice of the representative of the purchasing Railway	The entire joint
Hardness test:		
- as ready for submission	3	Test pieces in the form of plates in accordance with *ISO Standard 48*
- after ageing	3	
Tensile test:		Dumb-bell shaped test pieces in accordance with *ISO Standard 37 - type 2* ("b" dimension reduced to 8,5 ± 0,5 mm)
- as ready for submission	3	
- after accelerated ageing	3	
Tension set	3	Test pieces identical to those used for the tensile test
Compression set at 70°C	3	Test pieces in the form of plates measuring 10 x 20 mm x thickness (stack to obtain 6,3 ± 0,3 mm thickness)
Compression set at 30°C	3	
Flexibility test	3	The complete joint
Water-tightness test	4	2 x 2 joints

4.6 - Test procedures

4.6.1 - Hardness test

This test shall be carried out in accordance with *ISO Standard 48*.

4.6.2 - Tensile strength test

This test shall be carried out in accordance with *ISO Standard 37*.

4.6.3 - Tension set

This test shall be carried out in accordance with *ISO Standard 2285*. The following conditions shall apply:

- 50% elongation,
- length of test: $24\,^{0}_{-2}$ hours,
- test temperature: 70°C ± 1°C.

4.6.4 - Flexibility test

Measure the outside diameter of the joint as ready for submission following three hours conditioning at 23°C ± 2°C and 50 ± 5% relative humidity.

Place the joint and test assembly (see Appendix A - page 14) in a test chamber for three hours at a temperature of - 25°C.

Compress the joint radially 50% for 30 minutes in the chamber at a temperature of - 25°C.

Maintain the joint and test assembly in the test chamber, remove the compression force and measure the diameter of the joint after a period of ten minutes.

Express the permanent deformation as follows: $DRC = \frac{D0 - D1}{D0} \times 100$

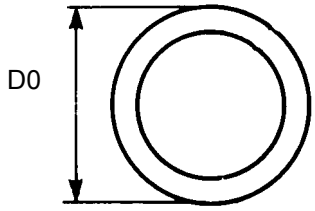


Fig. 1 - D0 = initial diameter

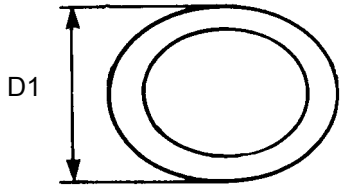


Fig. 2 - D1 = residual diameter

4.6.5 - Compression set

1. Test at + 70°C

   This test shall be carried out in accordance with *ISO Standard 815* amended as follows:

   - stack test pieces to obtain 6,3 ± 0,3 mm thickness,
   - length of test: 22 hours.

2. Test at - 30°C

   This test shall be carried out in accordance with *ISO Standard 815* amended as follows:

   - stack test pieces (see test at + 70°C),
   - length of test: 22 hours,
   - measure d_2 after three minutes at - 30°C.

4.6.6 - Water-tightness test

See point 2.4.4 - page 4.

4.7 - Inspection findings

Any defect in appearance or any variation in dimensions which is detrimental to their proper use shall lead to rejection of those joint(s).

Any findings inconsistent with any one of the tests specified shall lead to rejection of the relevant batch.

Any further tests can only be carried out at the request of the supplier subject to prior approval of the purchasing Railway.

5 - Delivery

Conditioning shall be specified in the purchase order.

Joints forming part of the same delivery shall have been manufactured less than three months prior to that time.

6 - Guarantee

Joints for brake coupling heads shall be guaranteed against any manufacturing defect not detected at the time of factory acceptance for a period of three years following the period of delivery.

For joints fitted to new vehicles, the delivery date of the vehicles to which they are fitted shall be regarded as the date of the start of the guarantee.

During the guarantee period, joints which show manufacturing defects rendering them unfit for use or which will reduce their service life shall be rejected.

Defective joints may however be submitted to counter inspection by the purchasing Railway and the supplier at the request of the latter, prior to final rejection.

Should the counter inspection confirm that the defects are indeed due to manufacture or to defective conditioning, the defective joints shall be rejected definitively.

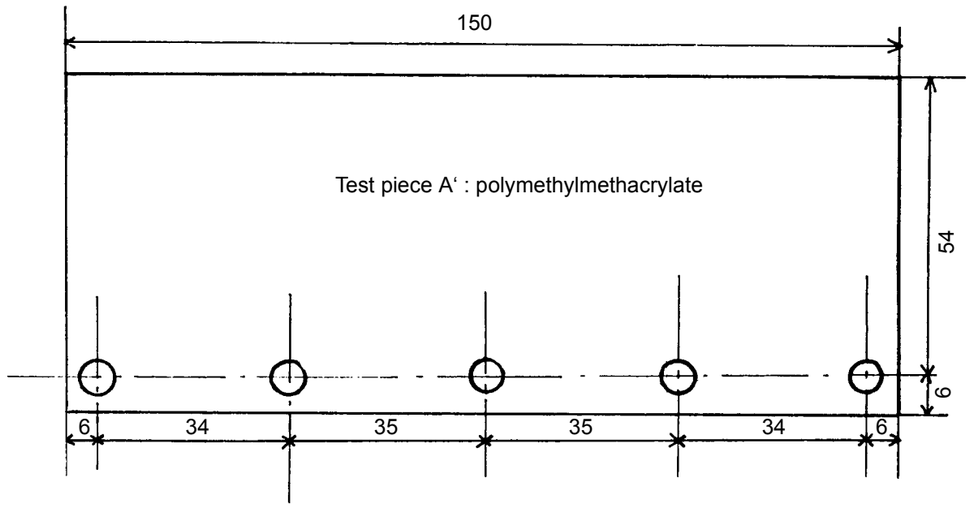
Should the purchasing Railway and the supplier be unable to reach agreement on the basis of the outcome of counter inspection, inspectors approved by the two parties shall be called upon to settle the matter. Costs shall be borne by the party found to be liable.

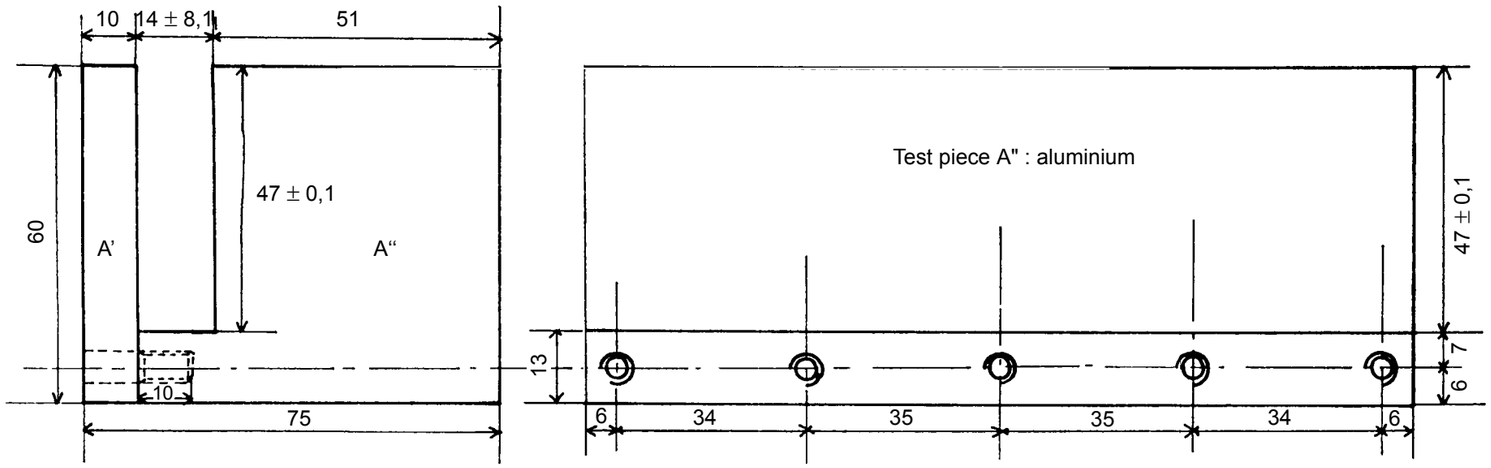
Rejected joints shall be kept at the disposal of the supplier with a view to their replacement or reimbursement at their value in new condition at the time of withdrawal.

Appendix A - Test assembly

A.1 - Test piece A

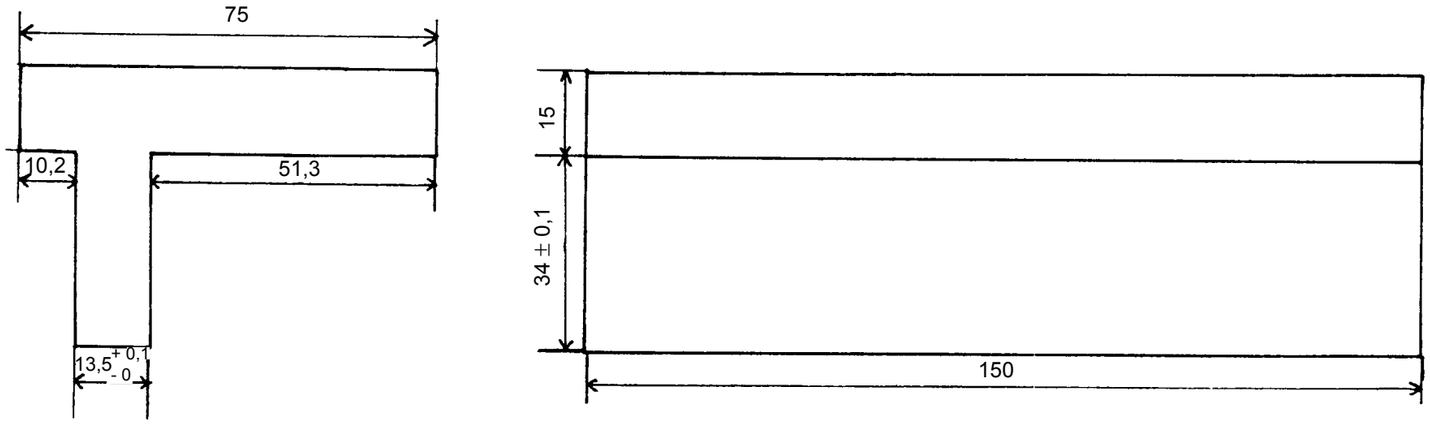
Test piece A = A' + A"





A.2 - Test piece B

Test piece B : aluminium



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Warning

Printed by the International Union of Railways (UIC)
16, rue Jean Rey 75015 Paris - France, November 2003
Dépôt Légal November 2003

ISBN 2-7461-0584-5 (French version)
ISBN 2-7461-0585-3 (German version)
ISBN 2-7461-0586-1 (English version)