

3rd edition, January 2004

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Technical specification for the supply of brake-shoes made from phosphoric iron for tractive and trailing stock

Spécification technique pour la fourniture de semelles de frein en fonte phosphoreuse pour le matériel moteur et remorqué

Technische Lieferbedingungen für Bremsklotzsohlen aus Phosphorgußeisen für Triebfahrzeuge und Wagen



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

Leaflet to be classified in Volumes:

V - Rolling Stock

VI - Traction

VIII - Technical Specifications

Application:

With effect from 1 January 1993

All members of the International Union of Railways

Record of updates

2nd edition, January 1993 with its erratum dated 1.7.93

3rd edition, January 2004 Retyped in FrameMaker

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

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Summary

This specification governs the supply of brake-shoes made from phosphoric iron for tractive and trailing stock as specified in *UIC Leaflet 542* for international services. These brake-shoes belong to the category identified as P10.

1 - Purpose and scope

This specification governs the supply of brake-shoes made from phosphoric iron for tractive and trailing stock as specified in *UIC Leaflet 542* (see Bibliography - page 23) for international services. These brake-shoes belong to the category identified as P10. Brake-shoes in category P14, defined in Appendix C - page 21, may continue to be used by Railways which have been granted an exemption by UIC for a limited period of time.

This specification defines requirements covering brake-shoe manufacture and inspection conditions.

Any other type of brake-shoe used by each individual Railway in domestic traffic must be the subject of a special agreement between the purchasing Railway and the supplier.

2 - Reference documents

In this specification, reference is made to the following documents:

- *UIC Leaflet 542*,
- ISO Standards: 945, 6506-1, 7438, 7799 and 9002 (see Bibliography - page 23).

3 - Chemical properties of the product

3.1 - Brake-shoes made of cast iron grade P10

The phosphorus content of the iron must be between:

$$0,80\% \text{ and } 1,10\%$$

The manganese content of the iron must be such that:

$$(1,72 \text{ S } \% + 0,30) < \text{Mn } \% < 1,00 \%,$$

where S % is the sulphur content of the iron.

The recommended total carbon and silicon contents are:

$$2,90 \% < \text{TC } \% < 3,30 \% \text{ and } 1,20 \% < \text{Si } \% < 2,00 \%$$

3.2 - Steel support

The carbon, sulphur and phosphorus contents of the constituent steel of the brake-shoe support shall be such that:

- C % < 0,13 %,
- S % < 0,062 %,
- P % < 0,062 %.

4 - Characteristics of parts

4.1 - Geometrical characteristics

The shape, dimensions and tolerances for brake-shoes and supports shall be as laid down in *UIC Leaflet 542* (brake-shoes 250 mm and 320 mm in length).

4.2 - Mechanical characteristics

4.2.1 - Brinell hardness - Brake-shoes

Both the surface and core of the iron must have the following Brinell hardness: $197 < HB < 255$.

4.2.2 - Brake-shoe impact strength and support resistance

The brake-shoes must be able to withstand the initial impact of the test laid down in point [8.5.4 - page 15](#).

Following a subsequent impact or impacts designed to break the shoes, their steel supports must remain intact and attached to the iron pieces. The bridges may possibly become detached but should not show any soundness defects.

4.2.3 - Bend test for brake-shoe supports

The supports, separate from the shoes, must be able to withstand the bend test laid down in point [8.5.5 - page 16](#) without cracking or breaking.

This test is only prescribed in the following four cases: approval of a new supplier; certification of brake-shoes; lapse in quality discovered during manufacture or while in service; a change in manufacturing processes or in the product for the protection of supports.

4.3 - Physical characteristics

4.3.1 - Appearance, soundness and texture of brake-shoes

The brake-shoes must be suitably scraped and cleaned, freed from all gate, riser and dead-head, and possess no defect, whether visible or not, which is likely to be prejudicial to assembly or use.

All flashes must be under 2 mm in height and must not present any risks for handling.

The brake-shoe bridge, which comprises the recess for the cotter to connect with the brake-shoe holder, must not have any blowholes, underfilling, finning or cracks.

Casting defects (contraction cavities, blowholes, etc.), whether or not metallic inclusion is excluded, shall be allowed on the friction surface of the brake-shoe (apart from its middle third) and in the break after the impact test, within the following limits:

- one single defect with maximum dimension of 10 mm at most,