

Note

This leaflet is one of a set including :

Leaflet 812-4 : Technical specification for the supply of tyred wheels for tractive and trailing stock - Tyre fitting and tolerances.

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1 - Purpose and field of application

This technical specification applies to the supply of non-alloy flat and sectional steel for retention spring rings on tyres for tractive and trailing stock.

2 - Reference documents

ISO 6892 - Metallic materials - Tensile testing

ISO R85 - Bend test

ISO/R377 - Selection and preparation of samples and test pieces of wrought steels

ISO 630 - Structural steels.

3 - Information to be provided by the purchaser

When inviting tenders and placing orders, the purchasing railway must provide the following information :

- 1 - The number of this technical specification ;
- 2 - Whether chemical composition is to be checked by product analysis ;
- 3 - Whether a bend test is required.

4 - Classification

4.1 - Steel category

This technical specification requires category Fe 360 B steel as defined by ISO Standard 630 (see Table 1).

4.2 - State of metal on delivery

Flat and sectional steel for tyre retention spring rings is to be supplied in hot-rolled condition.

4.3 - Production finish on delivery

The production finish on delivery shall conform with as-rolled condition.

5 - Characteristics

5.1 - Chemical composition

The chemical composition must correspond with that of category Fe 360 B steel as defined by ISO Standard 630. Unless otherwise stipulated, chemical analysis shall be carried out by means of a cast analysis.

5.2 - Absence of faults

The flats and sections must be sound in all parts and show no cracks, surface flaws, shuts, inclusions, fins, or any faults which might impede their use.

They must be suitably straightened, and the ends must be cut square and be thoroughly burred.

5.3 - Mechanical properties

The mechanical properties of flats and sections must accord with those of category Fe 360 B steel as defined by ISO Standard 630.

5.4 - Dimensional characteristics and tolerances

The dimensions and tolerances of flats and sections must be shown in the purchasing order or its accompanying documents. Unless otherwise stated, longitudinal tolerance shall be + 200 mm.

5.4.1 - Straightness must conform to ISO Standard 1035, Part 4.

5.5 - Marking

Each batch of flats or sections shall be provided with a (metal) tag bearing the following information :

- 1 - Manufacturer's mark ;
- 2 - Casting number ;
- 3 - Section type.

6 - Production

6.1 - Steel production

The flats and sections shall be produced from solid steel castings, production method for which is left to the choice of the supplier, unless otherwise specified in the purchasing order.

6.2 - Elimination of defective parts

Defective parts which do not meet the standards indicated under point 5.2 must be eliminated before or during production.

6.3 - Finishing operations

6.3.1 - Approved finishing operations

With the agreement of the purchasing railway, surface flaws may be removed by metal cutting, machining, or soft grinding, provided that such processes do not cause fissuring due to heat and that dimensional tolerances are observed.

6.3.2 - Non-approved finishing operations

Any finishing operation whose purpose is to conceal a defect, by welding, use of a blowpipe, heating, electric descaling, surfacing by means of electroplating or chemical plating, etc., is not permitted and must entail rejection of the entire batch.

7 - Inspections and tests

7.1 - Nature of inspection

Inspection comprises production control and checking of characteristics.

The purchasing order or its accompanying documents must specify whether the inspection shall be carried out :

- a - By delegation to the appropriate department of the manufacturer ;
- b - Or in the presence of a representative from the purchasing railway.

Unless otherwise specified in the purchasing order or its accompanying documents, the provisions shown in Table 2, Column 4, shall apply.

Delegation of the inspection by the purchasing railway to the appropriate department of the manufacturer shall not preclude the right of the purchasing railway to supervise the effectiveness of production control, and if desired, to check in its own laboratories the effectiveness of inspection and testing methods.

For this purpose, the representative of the purchasing railway shall be authorized to attend all inspections made under the manufacturer's responsibility and to check the results recorded.

7.2 - Production control

The supplier shall inform the purchasing railway of the production processes used to fulfil the purchasing orders and ask for the railway's agreement for any changes it may make for various reasons.

The representative of the purchasing railway shall be permitted to check that the various production operations conform with the provisions of this specification and its accompanying documents.

7.3 - Checking of the characteristics of flats and sections

7.3.1 - Type of inspections and tests

Each batch of products shall when submitted undergo the compulsory or optional inspections and tests detailed in Table 2.

7.3.2 - Test unit and batching

The test unit for the various tests is shown in Table 2, Column 5.

For quality control, flats and sections shall be submitted grouped in batches. Each batch shall comprise products from the same casting.

7.4 - Submission for quality control to the representative of the purchasing railway

The representative of the purchasing railway shall be informed of the submission date in writing (see point 7.5.2). This written notification shall indicate the number of each type of flats and sections in each batch together with the relevant purchasing order number.

7.5 - Attestation of conformity

7.5.1 - Regardless of whether quality control is carried out by the purchasing railway or the appropriate department of the manufacturer, the manufacturer shall certify that the production conditions of this technical specification have been fully observed. The final test certificate shall also contain the results of the following tests :

- Chemical analysis ;
- Tensile test ;
- Bend test, if this is required.

7.5.2 - The manufacturer shall issue certificates at the following times for the tests and inspections for which he is responsible :

- a) At the time of delivery, if responsibility for all tests has been delegated to him ;
- b) At the time of the first submission for inspection (see point 7.4), if the delegation of responsibility covered only some of the tests.

7.6 - Number of inspections and tests

The number of flats and sections to be submitted to inspections per test unit and the number of tests per flat and section are indicated in Table 2, Column 6.

7.7 - Selection and preparation of samples and test pieces

7.7.1 - Selection

After having identified the batch, the inspector shall choose at random the flat(s) and section(s) to be tested and shall stamp them with an indelible mark.

On each of these flats and sections he shall mark the sample section from which the test pieces will be selected.

7.7.2 - Preparation of samples and test pieces

Unless otherwise specified, the preparation conditions for the samples and test pieces must satisfy the provisions of ISO Standard R 377.

The samples and test pieces must also carry identification marks as well as the inspector's stamps, and these may only be altered in his presence.

7.7.3 - Number and position of test pieces

Test pieces shall be selected from the samples previously identified and shall be stamped by the inspector.

7.7.3.1 - Chemical analysis

Unless otherwise specified in the purchasing order or its accompanying documents, the values to be applied shall be those of the cast analysis.

7.7.3.2 - Tensile test

The test piece must be prepared in accordance with the specification of ISO Standard 82, and preferably have a minimum diameter of 10 mm and a length between reference marks of 5 times the diameter.

7.7.3.3 - Bend test

The test piece shall be prepared in accordance with the specifications of ISO Standard R 85.

7.8 - Testing methods

7.8.1 - Chemical analysis

Chemical analysis must be carried out in accordance with the methods defined in the relevant ISO recommendations or in accordance with any other method approved by the purchasing railway.

7.8.2 - Tensile test

Tensile test must be carried out according to the specifications of ISO Standard 82.

7.8.3 - Bend test

The bend test must be carried out according to the specifications of ISO Standard 85.

7.8.4 - Checking of appearance

Checking of appearance is to be carried out by visual inspection before delivery.

7.8.5 - Checking of dimensions

Checking of dimensions is to be carried out according to the specifications in the purchasing order documents.

7.9 - Action arising from the inspections

Any defects in appearance or dimensions shall result in rejection of the flats and sections.

Any other result not conforming with the required standard shall entail rejection of the corresponding batch.

If the purchasing railway agrees to tests being repeated, the conditions for such tests must be specified by special agreement between the purchasing railway and the manufacturer.

Steel categories

- Chemical composition
- Mechanical characteristics

Table 1

Steel category	Thickness in mm	Chemical composition (max. content as %) Cast analysis				Mechanical characteristics			
		C max.	P max.	S max.	N ₂ max.	ReH N/mm ²	Rm N/mm ²	A % min.	Bending angle min. °
Corresponds to Fe 360 B according to ISO 630	≤ 16	0.18	0.050	0.050	0.009	235	360-460	25	180
	> 16	0.20				225			

Table 2

1	2	3	4	5	6
Serial number	Type of inspections and tests	Comments		Test unit	Number of batches = casting 3)
1	Chemical analysis	m	a	Batch	1
2	Tensile test	m	b	Batch	1
3	Bend test	o	b	Batch	1

1) m- Inspection and test compulsory.

o - This test should only be carried out if specified by the purchasing order or its accompanying documents.

2) a - Inspection to be carried out by the appropriate department of the manufacturer.

b - Test to be carried out in the presence of the purchasing railway or of one of its representatives or by the appropriate department of the manufacturer (see point 7.1).

3) The batches must come from the same casting.

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Application

With effect from 1 July 1990.

All UIC railways.

Record references

Heading under which this question has been examined :

— Question 5/SA/FIC - Leaflet 810-3 "Technical specification for the supply of non-alloy flat and sectional steel for tyre retention spring rings".

(Sub-Committee for Specifications : Paris, January 1990).