



U I C C O D E

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V - TRANSPORT STOCK

VIII - TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATION
FOR THE SUPPLY OF VOLUTE SPRINGS
FOR VEHICLES

Article 1

SCOPE

This Specification governs the supply of volute springs intended for use in the suspension, buffer gear or running gear of vehicles.

It is applicable also to bogie tension springs.

CHAPTER 1

CONDITIONS OF MANUFACTURE

Article 2

MATERIALS

Steel bars of rectangular section, non-grooved, used for the manufacture of volute springs, must comply with the conditions of Leaflet No. 820 and have satisfied the acceptance tests prescribed in this document.

Article 3

MANUFACTURE

a) The springs should be manufactured in accordance with the indications given on the drawings, standards or orders, which specify dimensions, direction of coiling, elasticity and flexibility characteristics, tolerances and the nature of the tests (See Article 9).

The ends of the bars should be prepared before coiling in accordance with the indications shown on the drawings.

The springs should be hot coiled.

After coiling, the springs should be left to cool slowly sheltered from draughts or in a place where cooling is controlled. They should then be subjected to heat treatment including an obligatory hardening in water or oil, according to the category of steel, and tempering.

The heating of the bars and springs shall be carried out in such a manner as to avoid any overheating, extensive superficial decarbonisation and any extensive formation of calamine.

The heating temperatures, before hardening and tempering should be controlled by means of standard registering apparatus; the temperature readings should be placed at the disposal of the inspector; if the supplier provides adequate guarantees in respect of the quality of his manufacture, this check may be waived.

The feet of the springs should be trued up before or after the heat treatment so as to effect a plane set perpendicular to the axis of the spring. All burrs produced by the truing up should be removed and the end of each terminal coil should have its crests slightly radiused in order to avoid accidents during handling operations.

Each finished spring should be subjected by the manufacturer to a short duration elasticity test under complete compression or with a test load, and should satisfy this test.

b) It is recommended, in addition, that the following procedure be adopted to ensure a well manufactured produce :

- Fixing of the heating temperature, before hardening and after tempering, in relation to the chemical composition of the steel. For hardening, the temperature should not exceed, at the most by 100° C, the upper transformation point of heating of the steel; in practice for type 50.S.7. steel, this is between 850 and 900°C.
- Heating of the springs before hardening, to an effective temperature not varying from the stipulated temperature by more than 10°C.
- Adoption, for the quenching bath, of temperatures between :
 - 20° and 40° C for hardening in water,
 - 40° and 80° C for hardening in oil,the capacity and feed supply of the bath being fixed so as to effectively maintain the temperature of the quenching liquid round the springs within these limits.
- After tempering, gradual cooling of the springs sheltered from draughts.

Article 4

MANUFACTURER'S BRANDS

The brands shall be prescribed on the drawings.

Each spring shall be hot stamped on the outer face of the end of the coil forming the large foot, by means of blunt edged stamps, with the manufacturers' brands and, in particular :

- the trademark ;
- the last two figures of the year of manufacture.

Example : XX - 54

Article 5

APPEARANCE

The springs shall show no crack, flaw, burr, lack of metal, fold or defect whatsoever likely to affect their use adversely.

The surface of the coiled bar shall be free from calamine.

The coiling of the springs shall be in the direction indicated on the drawing.

The generators of the spring coils shall be fairly rectilinear and perpendicular to the feet, and within the tolerances prescribed by article 7.

Article 6

REMOVAL OF SURFACE DEFECTS

Removal of defects is forbidden.

Article 7

DIMENSIONAL TOLERANCES

The dimensions stipulated by the documents necessary to manufacture and the tolerances on these dimensions shall be rigorously respected.

Unless otherwise stated on these documents, the following tolerances shall be respected:

Height of the spring (1).....	$\left\{ \begin{array}{l} + 4\% \\ - 2\% \end{array} \right.$
Verticality of one foot in relation to the other.....	$\leq 2\%$
Distance between the surfaces in relation to each coil	$\left\{ \begin{array}{l} + 0.5 \text{ mm} \\ - 0.5 \text{ mm} \end{array} \right.$

(1) The height shall be measured after having subjected the spring to compression in accordance with the conditions shown under Article 12.