

NON-METALLIC INCLUSION COUNT – SPRINGS

Application

This method is applied to hardened and tempered spring steel used in the manufacture of springs in order to evaluate the purity of the steel. A non-metallic inclusion rating will be obtained based on the modified Jernkontoret (J.K.) chart as described in Method A, ASTM E 45-63 (69).

Apparatus Required

Cutting, Grinding and Polishing Equipment

For taking and preparing microspecimens.

Microscope

With a magnification of X100.

Inclusion Classification Chart

ASTM E 45, Plate 1

Sampling

Coil and Single Leaf Springs

One item will be selected at random to represent the consignment.

Multi-Leaf Springs

One assembly will be selected at random to represent the consignment. Each leaf in that assembly will then constitute a single separate sample that has to be evaluated.

Coil Springs

The specimen used for microscopical evaluation shall be a longitudinal section cut from the sample as shown:

Date	Action	Revisions
2001 03 02	Revised	Editorial – no technical change A.Cockman
1994 02 28		

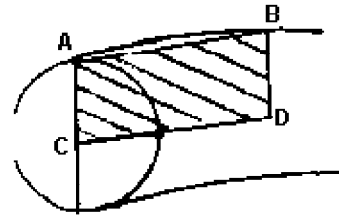
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Coil Springs

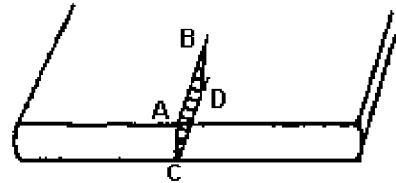
Side AB to be at least 20 mm
Area ABCD to be at least 200 sq-mm

The section shall be taken from an active coil.



Leaf Springs

A longitudinal section shall be taken from the position shown.
Side AB to be at least 20 mm
Area ABCD to be at least 200 sq mm



The section shall be taken at a position approximately midway between the centre of a leaf and one of its ends. Care shall be taken that the sections are cut at right angles to the relevant faces and sides.

The whole longitudinal surface ABCD shall be prepared for microscopical examination.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 ± 2 °C and 50 ± 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Preparation

The grinding and polishing must be carefully carried out to obtain a high quality surface preparation with the inclusions retained intact and not pitted, dragged or obscured. Light etching and repolishing is allowable in the final stages of preparation but the surface must be evaluated in the unetched condition.