



ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

STEEL, RETAINING AND SNAP RINGS

WSD-M1A82-B

1. SCOPE

The material defined by this specification is a flat or round spring steel wire suitable for the manufacture of snap rings.

2. APPLICATION

This specification was released originally for material used for retaining rings and snap rings of different types.

3. REQUIREMENTS

Material specification requirements are to be used for initial qualification of materials.

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 MATERIAL

Optional for different type of rings.

3.2.1 Annealed Wire

3.2.2 Oil Tempered Wire

3.2.3 Hot Rolled or Cold Drawn Annealed Spring Steel Strip

3.2.4 Hard Drawn Wire

Date	Action	Revisions
2002 09 30	Revised	Rev para 3.7, 3.8 & updated G. Hagler
2002 02 15	Reactivated	K. Thurgood, G. Hagler
1986 07 03	SM/ER 3662TC	Released J. P. C. Lines. EAO.

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3.3 CHEMICAL ANALYSIS (W/T %)

Carbon	0.50 - 1.00
Manganese	0.20 - 0.90
Silicon	0.10 - 0.50
Phosphorus	0.045 max
Sulphur	0.045 max

For full hard drawn wire, the following analysis is permitted:

Carbon	0.6 - 0.8
Manganese	0.75 - 1.15
Silicon	-
Phosphorus	0.045 max
Sulphur	0.05 max

3.4 HEAT TREATMENT

Rings produced from annealed material shall be oil hardened and tempered with optional austempering being allowed.

3.5 DIMENSIONAL STABILITY

All snap rings manufactured under this material specification shall be stress relieved as necessary to achieve dimensional stability at 200 °C. Snap rings when subjected to 200 °C for 2 hours, in a free state, must not have a dimensional change in the gap greater than 5% of the total tolerance of the gap.

3.6 HARDNESS
(ISO 6507/3, ASTM E 18)

Rings up to and including 38 mm shaft diameter at a thickness of:

up to 0.38 mm	84 - 87 HR15N
0.39 - 0.64 mm	65 - 70 HR30N
above 0.65 mm	40 - 51 HRC

Rings exceeding 38 mm shaft diameter at a thickness of:

up to 0.38 mm	82 - 85 HR15N
0.39 - 0.64 mm	63 - 68 HR30N
above 0.65 mm	40 - 51 HRC