

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

STEEL - WELDED TUBE, NORMALIZED, COLD DRAWN

WSD-M1A317-A2

1. SCOPE

The material defined by this specification is a welded precision steel tube. Grade A2 is normalized and cold drawn to obtain special dimension accuracy.

2. APPLICATION

This specification was released originally for material used for manufacturing driveshaft tubes.

3. REQUIREMENTS

3.0 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 CHEMICAL COMPOSITION (weight percent)

Carbon	0.18 – 0.25
Silicon, max.	0.35
Manganese	0.30 – 0.70
Phosphorus, max.	0.05
Sulphur, max.	0.05

3.3 MECHANICAL PROPERTIES (ASTM E8M)

Ultimate tensile strength MN/m2, min	540
0,2 % Proof strength MN/m2, min	490
Elongation, min %	8
Hardness HRB (ASTM E 18)	85-100

Date	Action	Revisions
2003 03 14	Revised	WSD-M1A317-A removed, para 3.0 inserted; para 3.1, 3.7 and 4 deleted
1989 10 16	SM/ER1615TC	Released O.Reeder, N.Riley

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- 3.4 DRIFTING TEST, min** 8 %
(ISO 166)

Test in normalized condition

- 3.5 FLATTENING TEST** no cracks
(ISO 202)

Test in normalized condition with weld seam at 3 o'clock position and final distance between pressure plates equal to 4 x tube thickness.

3.6 NONDESTRUCTIVE TESTING

The tubes must be 100 % tested for imperfections in the cold drawn condition. The test is carried out at an eddy current testing facility which conforms in design and calibration with B.S 3889 Part 2A.

Reference Standard:

An artificially produced imperfection of predetermined dimensions, usually a notch or a hole shall be used for the sole purpose of establishing the test sensitivity of the eddy current equipment. On tubes having an outside diameter greater than 63.0 mm, the calibration of the testing facility has to be undertaken with a reference standard containing a 2.0 mm drilled hole. Tubes are classified into acceptable or suspect categories. Tubes which indicate the presence of an imperfection must be sorted in accordance with BS 3889 Part 2A section 7.3.