

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

STEEL, ROUND WELDED TUBE, HYDROFORMING, HOT ROLLED.

WSS-M1A349-A

1. SCOPE

The materials defined by these specifications cover round electric resistance welded steel tubing, produced in straight lengths from uncoated low carbon and HSLA hot rolled steels, to be used in bending and hydroforming operations. This material shall exhibit properties related to strength, formability, weldability, and paintability.

2. APPLICATION

These materials are used primarily for hydroformed automotive structural components. (e.g. cross-members, frame parts, etc.)

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 DIMENSIONS AND DIMENSIONAL TOLERANCES

3.2.1 Thickness and Thickness Tolerances (ASTM A568)

The wall thickness tolerances shall conform to three-quarter (0.75) tolerances, unless otherwise stated in the Engineering Drawing.

3.2.2 Length

The standard tube length tolerance shall be specified as nominal +/- 2.05 mm for tubes cut to length in the range 914-3657 mm. Length tolerances for tubes outside this range shall be negotiated between the appropriate stamping engineering body and the tube supplier and shall be included in the Engineering Drawing.

Date	Action	Revisions
2002 08 19	Revised	Updated and renumbered
2001 11 27	Activated	J. Burke

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3.2.3 Outside Diameter

Outside Diameter Tolerances are as follows, unless otherwise stated in the Engineering Drawing.

Outside Diameter Range (mm)	Wall Thickness Range (mm)	Outside Diameter Tolerances (+/-)
Over 50.8 to 63.5 (inclusive)	Over 1.6 to 8.0 (inclusive)	0.152 mm
Over 63.5 to 76.2 (inclusive)	Over 1.6 to 6.5 (inclusive)	0.203 mm
Over 63.5 to 76.2 (inclusive)	Over 6.5 to 8.0 (inclusive)	0.254 mm
Over 76.2 to 88.9 (inclusive)	Over 1.6 to 6.5 (inclusive)	0.229 mm
Over 76.2 to 88.9 (inclusive)	Over 6.5 to 8.0 (inclusive)	0.305 mm
Over 88.9 to 101.6 (inclusive)	Over 1.5 to 6.5 (inclusive)	0.254 mm
Over 88.9 to 101.6 (inclusive)	Over 6.5 to 8.0 (inclusive)	0.381 mm
Over 101.6 to 152.4 (inclusive)	Over 1.5 to 8.0 (inclusive)	0.508 mm
Over 152.4 to 203.2 (inclusive)	Over 3.0 to 8.0 (inclusive)	0.635 mm

Diameter measurements are to be taken at least 51mm from the ends of the tubes. The Outside Diameter Tolerance (+/-) specified above is for individual measurements taken, not averages.

3.2.4 Mean Outside Diameter

Requirements for the Mean Outside Diameter (ref para 4.3) shall be stated in the Engineering Drawing.

3.2.5 Ovality

Requirements for ovality (ref para 4.3) shall be stated in the Engineering Drawing.

3.3 WELD INTEGRITY

3.3.1 Non Destructive Testing (ASTM A513 S8)

100% on-line inspection of the weld area shall be conducted.