



SURFACE VEHICLE STANDARD

J2613™**OCT2017**Issued 2002-10
Revised 2017-10

Superseding J2613 OCT2002

(R) Welded Flash Controlled, High Strength (500 MPa Tensile Strength) Hydraulic Tubing, for Bending, Double Flaring, Cold Forming, Welding, and Brazing

RATIONALE

This SAE standard has been revised as part of a Five-Year Review to reflect changes in available steels and newly developed processes used to produce this product. Document changes include revisions to the Scope, Applicable and Related Publications list, Section 8.8 Pressure Proof Test information and the addition of J2613 Type-A material. Verbiage has been updated throughout the standard to align the document with other recently revised tube standards.

1. SCOPE

This SAE Standard covers sub-critically annealed or normalized electric resistance welded flash controlled single-wall high strength steel tubing intended for use in hydraulic pressure lines and in other applications requiring tubing of a quality suitable for bending, double flaring, cold forming, welding and brazing. Material produced to this specification is not intended to be used for single flare applications due to the potential leak path caused by the ID weld bead. Nominal reference working pressures for this tubing are listed in ISO 10763 for metric tubing and SAE J1065 for inch tubing.

This specification also covers SAE J2613 Type-A tubing. The mechanical properties and performance requirements of standard SAE J2613 and SAE J2613 Type-A are the same. The designated differences of Type-A tubing do not imply that Type-A tubing is in anyway inferior to standard SAE J2613. The Type-A designation is meant to address the unique manufacturing differences between sub-critically annealed and normalized tubing.

CAUTION: Sub-critically annealed steels are often produced using anneal temperatures below the Lower Critical Temperature (AC1) of the given steel to achieve the desired strength levels. Welding, brazing, or other processing methods that subject the tube material or assembly to temperatures near or above AC1 might initiate isothermal transformation of the tube microstructure and compromise the strength of the tube in the heat affected zone by further annealing the tube. Therefore, ISO 10763 and SAE J1065 nominal reference working pressures might not be applicable. It is recommended that the user and the fabricator validate and agree that the tube assembly design and pressure ratings are not compromised beyond system design from these processes. Performance testing as described in SAE J2551-2 will facilitate appropriate test recommendations.

Tube assembly configurations made to specific geometry and components requiring thermal attachment methods in association with the sub-critically annealed material, may require qualification testing in accordance with ISO 19879. The use of Type-A material avoids this systemic testing as thermal processes will not compromise the structural integrity of the Type-A tube material.

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Documents
Document Sharing Hub

In an effort to standardize within a global marketplace and ensuring that companies can remain competitive in an international market it is the intent to convert to metric tube sizes which will:

- Lead to one global system
- Guide users to preferred system
- Reduce complexity
- Eliminate inventory duplications

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J409	Product Analysis - Permissible Variations from Specified Chemical Analysis of a Heat or Cast of Steel
SAE J533	Flares for Tubing
SAE J1065	Nominal Reference Working Pressures for Steel Hydraulic Tubing
SAE J1677	Tests and Procedures for Carbon Steel and High Strength Low Alloy Steel Tubing
SAE J2551-2	Recommended Practices for Fluid Conductor Carbon, Alloy and High Strength Low Alloy Steel Tubing Applications-Part 2: General Specifications and Performance Requirements

2.1.2 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 10763	Plain-end, seamless and welded steel tubes - Dimensions and nominal working pressures
ISO 19879	Metallic tube connections for fluid power and general use - Test methods for hydraulic fluid power connections

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J514	Hydraulic Tube Fittings
SAE J518	Hydraulic Flanged Tube, Pipe, and Hose Connections, Four-Bolt Split Flange Type

SAE J1453-1	Specification for O-Ring Face Seal Connectors: Part 1 - Tube Connection Details and Common Requirements for Performance and Tests
SAE J1453-2	Specification for O-Ring Face Seal Connectors: Part 2 - Requirements, Dimensions, and Tests for Steel Unions, Bulkheads, Swivels, Braze Sleeves, Braze-on Tube Ends, Caps, and Connectors with ISO 6149-2 Metric Stud Ends and ISO 6162 4-Bolt Flange Heads
SAE J1453-3	Specification for O-Ring Face Seal Connectors: Part 3 - Requirements, Dimensions, and Tests for Steel Unions, Bulkheads, Swivels, Braze Sleeves, Caps, and Connectors with SAE J1926-2 Inch Stud Ends
SAE J2551-1	Recommended Practices for Fluid Conductor Carbon, Alloy and High Strength Low Alloy Steel Tubing Applications-Part 1: Design and Fabrication
SAE J2551-3	Recommended Practices for Fluid Conductor Carbon, Alloy and High Strength Low Alloy Steel Tubing Applications - Part 3: Procurement
SAE J2614	Welded and Cold-Drawn, High Strength (500 MPa Tensile Strength) Low Alloy Steel Hydraulic Tubing, Sub-Critically Annealed for Bending and Flaring

2.2.2 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>

ISO 3304	Plain end seamless precision steel tubes - Technical conditions for delivery
ISO 3305	Plain end welded precision steel tubes - Technical conditions for delivery
ISO 4200	Plain end steel tubes, welded and seamless - General tables of dimensions and masses per unit length
ISO 4397	Connectors and associated components - Nominal outside diameters of tubes and nominal inside diameters of hoses
ISO 4399	Connectors and associated components - Nominal pressures
ISO 5598	Fluid power systems and components - Vocabulary
ISO 6162	Four-screw split-flange connections
ISO 6163	Round flange, 8 and 12 screw connections
ISO 6164	Four-screw, one-piece square-flange connections
ISO 6605	Tests and test procedures
ISO 8434	Metallic tube connections for fluid power and general use
ISO 10583	Test methods for tube connections

2.2.3 EN Publications

Copies of these documents are available online at <http://webstore.ansi.org/>

EN 10305-2	Steel tubes for precision applications - Technical delivery conditions - Part 2: Welded cold drawn tubes
EN 10305-3	Steel tubes for precision applications - Technical delivery conditions - Part 3: Welded cold sized steel tubes