



SURFACE VEHICLE STANDARD

J2832™**FEB2019**Issued 2009-08
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Superseding J2832 AUG2009

(R) Welded Flash Controlled, High Strength (690 MPa Tensile Strength)
Low Alloy Steel Hydraulic Tubing, Stress Relieved, Annealed for
Bending, Double Flaring, Cold Forming, and Brazing

RATIONALE

This SAE Standard has been revised as part of a Five-Year Review. Document changes include: revisions to the scope, applicable documents, and related publications lists; updated thermal process warning; new verbiage in 5.2; clarified 5.3 requirement; and revised or added notes to 8.8 and 8.9. Verbiage has been updated throughout the standard to align the document with other recently revised tube standards.

1. SCOPE

This SAE Standard covers stress relieved electric resistance welded flash controlled single wall high strength low alloy steel tubing intended for use in high-pressure hydraulic lines and in other applications requiring tubing of a quality suitable for bending, double flaring, cold forming 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. The grade of material produced to this specification is of micro-alloy content. Nominal reference working pressures for this tubing are listed in ISO 10763 and SAE J1065.

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.

Brazed and/or welded tube assembly configurations made to specific geometry and components in association with this material may require qualification testing in accordance with ISO 19879. Cold forming the tube end configurations avoids this systemic testing by not compromising the structural integrity of the tube material.

In an effort to standardize within a global marketplace and ensure 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

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SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

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2. REFERENCES

2.1 Applicable Documents

The following documents form a part of this specification to extent specified herein. Unless other specified, the latest issue of the 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 J518-1	Hydraulic Flanged Tube, Pipe, and Hose Connections, 4-Screw Flange Connection - Part 1: 3.5 MPa to 35 MPa (Code 61)
SAE J518-2	Hydraulic Flanged Tube, Pipe, and Hose Connections, 4-Screw Flange Connection - Part 2: 42 MPa (Code 62)
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 Practice for Fluid Conductor Carbon, Alloy and High Strength Low Alloy Steel Tubing Applications - Part 3: Procurement
SAE J2833	Welded and Cold-Drawn, High Strength (690 MPa Tensile Strength) Low Alloy Steel Hydraulic Tubing, Stress Relieved Annealed for Bending, Flaring, Cold Forming, and Brazing

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 6162-1	Hydraulic Fluid Power - Flange Connections with Split or One-Piece Flange Clamps and Metric or Inch Screws - Part 1: Flange Connectors, Ports and Mounting Surfaces for Use at Pressures of 3.5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127
ISO 6162-2	Hydraulic Fluid Power - Flange Connections with Split or One-Piece Flange Clamps and Metric or Inch Screws - Part 2: Flange Connectors, Ports and Mounting Surfaces for Use at a Pressure of 42 MPa (420 bar), DN 13 to DN 76
ISO 6164	Hydraulic Fluid Power - Four-Screw, One-Piece Square-Flange Connections for Use at Pressures of 25 MPa and 40 MPa (250 bar and 400 bar)
ISO 6605	Hydraulic Fluid Power - Tests Methods for Hoses and Hose Assemblies
ISO 8434-2	Metallic Tube Connections for Fluid Power and General Use - Part 2: 37 Degree-Flared Connectors
ISO 8434-3	Metallic Tube Connections for Fluid Power and General Use - Part 3: O-Ring Face Seal Connectors
ISO 10583	Aerospace Fluid Systems - Test Methods for Tube/Fitting Assemblies