

15. 4.4 Revised to reuse of tube assembly samples.
16. 4.5 Removed section 4.5
17. 4.6 Removed section 4.6
18. 4.7 Removed section 4.7
19. 4.8 Removed section 4.8
20. 4.9 Removed section 4.9.
21. 4.10 Removed section 4.10.
22. 5.0 Revised to reference ISO 19879.
23. 5.1 Revised to repeated assembly test, added reference to ISO 19879 and removed all other verbiage.
24. 5.2 Revised to leakage test, added reference to ISO 19879 and removed all other verbiage.
25. 5.3 Revised to proof pressure test, added reference to ISO 19879, removed figure 1 and removed all other verbiage.
26. 5.4 Revised to burst test, added reference to ISO 19879 and removed all other verbiage.
27. 5.5 Revised to cyclic endurance test, added reference to ISO 19879 and removed all other verbiage.
28. 5.6 Revised to vacuum test, added reference to ISO 19879 and removed all other verbiage.
29. 5.6 Revised to overtightening test, added reference to ISO 19879 and removed all other verbiage.
30. Revised to vibration test, added reference to ISO 19879 and removed all other verbiage.
31. Removed figure 2.
32. Removed appendix A
33. Removed appendix B

FOREWORD

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. Carbon and steel alloy tube conductor assemblies must be designed to meet these requirements under varying conditions and should be produced per the guidelines established in SAE J2551 Recommended Practices for Fluid Conductor Carbon and Alloy Steel Tubing Applications while meeting the general specifications and performance requirements established in this standard. Testing of carbon and steel alloy tube conductor assemblies to meet performance requirements provides users a basis of assurance for determining design application and for checking compliance with their stated requirements. This standard also provides a means to evaluate functional requirements of new carbon and steel alloy tube conductor materials and end configuration manufacturing processes. This standard is primarily intended for mobile/stationary industrial equipment applications. Aircraft, Automotive and Aerospace applications were not considered during the preparation of this document.

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1. SCOPE

This SAE standard recommends the use of ISO 19879 to perform various types of tests to evaluate functional performance requirements for carbon and steel alloy tube conductor assemblies for hydraulic fluid power applications made from both standard and non-standard metallic tubing and components. See the appropriate listed SAE or ISO tubing and connector standard for chemical, mechanical and dimensional requirements for standard tubing, end components and tube end joint configurations for the standard tube assemblies being tested. See SAE J1065 and ISO 10763 for listed nominal reference working pressures and/or reference formula that may be used to calculate reference-working pressures for standard and non-standard metallic tube conductors.

1.1 Application

This standard is to be used to direct users to ISO 19879 to quantify the tests for the qualification of carbon and steel alloy hydraulic tube assemblies manufactured with various standard and non-standard tubing materials, tube end components and tube end joining processes, primarily intended for mobile/stationary industrial equipment applications. Aircraft, Automotive and Aerospace applications were not considered during the preparation of this document.

2. REFERENCES

2.1 Applicable Documents

The following standards contain provisions that, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent edition of the standards indicated as follows. Members of IEC and ISO maintain registers of currently valid International Standards.

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 724-776-4970 (outside USA), www.sae.org.

SAE J1065 Nominal Reference Working Pressures for Steel Hydraulic Tubing

SAE J2551 Recommended Practices for Fluid Conductor Carbon and Steel Alloy Tube Applications

2.1.2 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 5598 Fluid power systems and components

ISO 10763 Hydraulic fluid power—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

3. DEFINITIONS

For the purpose of this document, the definitions given in ISO 5598 shall apply.

4. GENERAL REQUIREMENTS FOR QUALIFICATION OF TUBE ASSEMBLIES

4.1 Standard Tests

Refer to ISO 19879 for information related to test blocks, seals, thread lubrication, torque and temperature. Test results are to be reported on the test data form found in Annex A of specification ISO 19879

WARNING: Some of the tests described in this document are considered hazardous; it is therefore essential that, in conducting these tests, all appropriate safety precautions are strictly adhered to. Attention is drawn to the danger of fine jets of high-pressure hydraulic fluid, which can penetrate the skin. To reduce the hazard to energy release, bleed air out of test specimens prior to pressure testing. Tests shall be set-up and performed by properly trained personnel. Also safety equipment such as safety glasses, hearing protection and metatarsal safety shoes, should be used when working around and on hydraulic test laboratories and equipment.

4.2 Typical Tube Assembly Samples

See Figure 1 for typical tube assembly samples, test configurations and test cabinet set up.