



SURFACE VEHICLE STANDARD

J1131™

OCT2025

Issued 1976-01
Revised 2021-05
Reaffirmed 2025-10

Superseding J1131 MAY2021

(R) Performance Requirements for SAE J844 Nonmetallic Air Brake Tubing
and SAE J246 Compression
Fitting Assemblies Used in Vehicular Air Brake Systems

RATIONALE

The modifications to this document are to harmonize the requirements of SAE J1131 and SAE J2494-3 where applicable.

SAE J1131 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This SAE Standard is intended to establish uniform performance criteria and methods of testing compression tube fittings with SAE J844 air brake tubing as used in vehicular air brake systems.

This document also establishes minimum qualifications for tensile and pressure capabilities, vibration durability under cyclic temperatures, serviceability, and fitting compatibility requirements. The specific tests and performance criteria applicable to the tubing are set forth in SAE J844.

NOTE: The test values contained in this performance standard are for test purposes only. For environmental and usage limitations, refer to SAE J844. For fittings, a type of fitting for use with SAE J844 nonmetallic tubing is included in SAE J246; however, it is not intended to restrict or preclude the use of other designs of fittings that comply with this document.

1.1 General Requirements

- a. Test temperature shall use ± 3 °C as the test tolerance range.
- b. Ambient temperature shall be 24 °C.
- c. All test times are minimum times unless otherwise specified.
- d. Dry air shall be a minimum of -50 °C dew point.
- e. Tubing shall be cut square at 90 degrees $\pm$ 7 degrees.
- f. New specimens shall be used for all tests.

SAE Executive Standards Committee Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

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.

Copyright © 2025 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, or used for text and data mining, AI training, or similar technologies, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 1-877-606-7323 (U.S. and Canada only)
Tel: 1-724-776-4970 (outside U.S. and Canada)
Fax: 724-776-0790
Email: CustomerService@sae.org
http://www.sae.org

SAE WEB ADDRESS:

Full document details: SAE J1131_202510

For more information on this standard, visit https://www.sae.org/standards/content/J1131_202510/

Documents

Standard, visit Sharing Hub

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 J246 Spherical and Flanged Sleeve (Compression) Tube Fittings

SAE J844 Nonmetallic Air Brake System Tubing

3. TENSILE TESTS (TEN SPECIMENS)

3.1 Description

Both hot and cold tensile tests shall be conducted with different unaged assemblies (fittings attached within 30 days of test date). Tests consist of subjecting the assembly to increasing tensile load in a suitable testing machine until the specified force value or elongation percentage has been obtained.

3.2 Apparatus

A tensile test machine with suitable indicating device shall be used for the tensile test. The fixtures for holding the test specimens shall be arranged so the tubing and fittings have a straight centerline corresponding to the direction of the machine pull. The lower part of the fixture shall be equipped with a container of sufficient dimensions to submerge the required length of tubing in water. A means of heating the water to boiling shall be provided. A cover shall not be used on the container. This allows the steam to dissipate into the environment. If a fan is used in this test, then take precautions to direct the air away from the test specimen.

3.3 Test Specimens

The tubing specimens (a minimum of ten) shall be obtained from current production stock and cut to a length sufficient to obtain 150 mm $\pm$ 6 mm of tubing between end fittings after assembly. Assemble fittings to the tubing using the manufacturer's recommendations.

3.4 Procedure (Ten Specimens)

3.4.1 High Temperature Tensile Test (Five Specimens)

Place the test specimen in the tensile machine with the lower fitting and 102 mm (+6/-0 mm) of tubing submerged below the surface of the boiling distilled water such that the outside diameter is exposed to the water. Continue boiling for 5 minutes (+0.5/-0.0 minutes). Apply load at a rate of pull of 25 mm/min.

3.4.2 Conditioned Tensile Test (Five Specimens)

Condition test specimen at -40 °C for 30 minutes (+0.5/-0.0 minutes), normalize at ambient temperature then submerge in boiling water for 15 minutes. Repeat for a total of four complete cycles. Allow the test specimen to normalize at ambient temperature for 30 minutes. Conduct the tensile test within 30 minutes after the normalizing period while at ambient temperature of 24 °C. Apply load at a rate of 25 mm/min.