International Standard ISO 7257

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Aircraft — Hydraulic tubing joints and fittings — Rotary flexure test

Aéronautique — Joints et raccords pour tubes hydrauliques — Essai de flexion rotative

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

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It has been approved by the member bodies of the following countries:

Australia	Egypt, Arab Rep. of	South Africa, Rep. of
Austria	France	Spain
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The member body of the following country expressed disapproval of the document on technical grounds:

USSR

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Aircraft — Hydraulic tubing joints and fittings — Rotary flexure test

0 Introduction

This International Standard describes a flexure fatigue test procedure which allows evaluation of various tube fitting designs or material combinations. This evaluation is performed by fatigue testing the tube joints over a spectrum of bending stresses and then plotting the cycles to failure. This test procedure is intended for comparative evaluation of fatigue characteristics only, the qualification test procedure for tube fittings being specified in ISO 7169. Other test methods may be used as long as they develop the same data as the rotary flexure test.

1 Scope and field of application

This International Standard specifies flexure test procedures to determine and classify the fatigue strengths of reconnectable or permanent hydraulic tube joints.

The procedure is intended for conducting flexure tests of fittings and joints with high strength hydraulic tubes of various alloys such as corrosion resistant steel, Nimonic, titanium and aluminum alloy hydraulic tube for use on commercial and military aircraft.

A mean stress is applied by holding system pressure in the specimens and then flexing in a rotary bending test machine.

2 References

ISO 2964, *Aircraft — Tubing outside diameters and thicknesses, metric dimensions.*

ISO 7169, *Separable tube fittings for fluid systems — General specification.*[1)]

3 Requirements

3.1 Flexure test device

The test device should be capable of testing in-line or bulkhead union test specimens and other configurations such as elbows and tees.

The rotary flexure test device should be similar to that shown in figure 1. Each rotary flexure test device should be capable of testing one specimen, but several specimens may be mounted on one plate.

The device should be capable of constantly maintaining the required operating pressure during the test. The test fluid shall be water or system fluid (working fluid) unless otherwise specified by the responsible authorities. A typical pressurization and automatic shutdown system is shown in figure 2. The shutdown should be automatic in the event of failure or pressure drop. The device should be capable of testing at controlled constant temperature, if specified by the procuring agency. The tailstock of the test device should be designed to permit alignment during initial installation and specimen mounting, and to serve as a pressure manifold. The rotating headstock should have a low-friction, self-aligning bearing and should be designed to permit total deflections of up to 25 mm, and a constant rotational frequency within the range of 1 500 to 3 600 min^{-1}. The base should be of rigid construction.

3.2 Flexure test specimen

The test specimen should consist of an adapter fitting (headstock end), a section of straight tubing, and a test fitting at the tailstock end. Typical test specimens are shown in figure 3. The tubing shall be of a size and wall thickness as specified by the user or procuring agency.

1) At present at the stage of draft.