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Aerospace series — Dynamic testing of the locking behaviour of bolted connections under transverse loading conditions (vibration test)

Aéronautique et espace — Essai dynamique des caractéristiques de freinage des éléments de fixation, dans des conditions de charge transversale (essai de vibration)

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Foreword

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The committee responsible for this document is ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 4, *Aerospace fastener systems*.

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Aerospace series — Dynamic testing of the locking behaviour of bolted connections under transverse loading conditions (vibration test)

1 Scope

This International Standard applies to the dynamic testing of the locking behaviour of bolted connections in order to investigate the self-loosening behaviour of fasteners for aerospace applications and is mainly intended for development work.

As test apparatuses are different (e.g. stiffness distribution), testing in accordance with this International Standard, therefore, does not allow an absolute statement to be made on the locking behaviour of bolted assemblies under service loads.

Thus, the objective of this test is a comparative evaluation of locking elements under defined test conditions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16047, *Fasteners — Torque/clamp force testing*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16047 and the following apply.

3.1
clamp force
F
axial tension acting on the bolt shank or compression acting on the clamped member

[SOURCE: ISO 16047:2005, 3.1; modified — without restriction “during tightening”]

3.2
ultimate clamp force
F_u
theoretical maximum clamp force under combined stress condition potentially induced before bolt/nut failure

[SOURCE: ISO 16047:2005, 3.3, modified]

3.3
initial clamp force
F_M
clamp force after tightening of test specimen before test

3.4
relative clamp force loss
Y

$$Y = \left(1 - \frac{F}{F_M}\right) * 100\,\%$$

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