SLOVENSKI STANDARD
SIST EN 4662:2010

01-maj-2010

Aeronavtika - Specifikacija preskusa za komponente za zmanjšanje vibracij

Aerospace series - Test specification for vibration control components

Luft- und Raumfahrt - Prüfspezifikation für Bauteile zur Schwingungsminderung

Série aérospatiale - Spécification d'essais pour des composants de contrôle en vibration

Ta slovenski standard je istoveten z: **EN 4662:2010**

ICS:

17.160	Vibracije, meritve udarcev in vibracij	Vibrations, shock and vibration measurements
49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction

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ICS 17.160; 49.035

English Version

Aerospace series - Test specification for vibration control components

Série aérospatiale - Spécification d'essais pour des composants de contrôle en vibration

Luft- und Raumfahrt - Prüfspezifikation für Bauteile zur Schwingungsminderung

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 4662:2010) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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1 Scope

This standard specifies the procedure and the parameter for testing static and dynamic stiffness of vibration control components (e.g. shock mounts with bushes).

This standard applies to vibration control components all installed for aircraft applications. It may be applied when referred to in the product standard or in a design specification.

2 Definition and symbols

For the purposes of this document, the following definition and symbols apply.

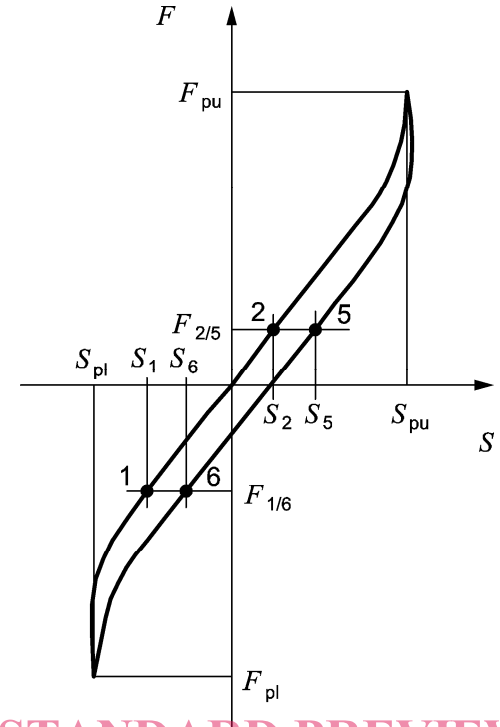
2.1 Coordinate system

The functional requirements shall be defined in a Cartesian coordinate system. The directions for translation and rotation shall be defined in the specifications of the relevant product standards.

2.2 Symbols

2.2.1 Static stiffness

Due to the material damping vibration control components can have a hysteresis load versus displacement curve as shown exemplary in Figure 1.



Key

F_{pu} Upper load
F_{pl} Lower load
S_{pu} Upper displacement
S_{pl} Lower displacement
F_1 Load value 1
F_2 Load value 2
F_5 Load value 5
F_6 Load value 6
S_1 Displacement value 1
S_2 Displacement value 2
S_5 Displacement value 5
S_6 Displacement value 6

Figure 1 — Load and displacement symbols for translation direction

The symbols and parameters for the translation directions can be analogy adapted to the rotational data (see Table 1).

Table 1 — Torque and angle symbols for rotation direction

Symbols for		
Translation direction	**Rotation direction**	
F_{pu}	M_{pu}	Upper torque
F_{pl}	M_{pl}	Lower torque
S_{pu}	α_{pu}	Upper angle
S_{pl}	α_{pl}	Lower angle
F_1	M_1	Torque value 1
F_2	M_2	Torque value 2
F_5	M_5	Torque value 5
F_6	M_6	Torque value 6
S_1	α_1	Angle value 1
S_2	α_2	Angle value 2
S_5	α_5	Angle value 5
S_6	α_6	Angle value 6

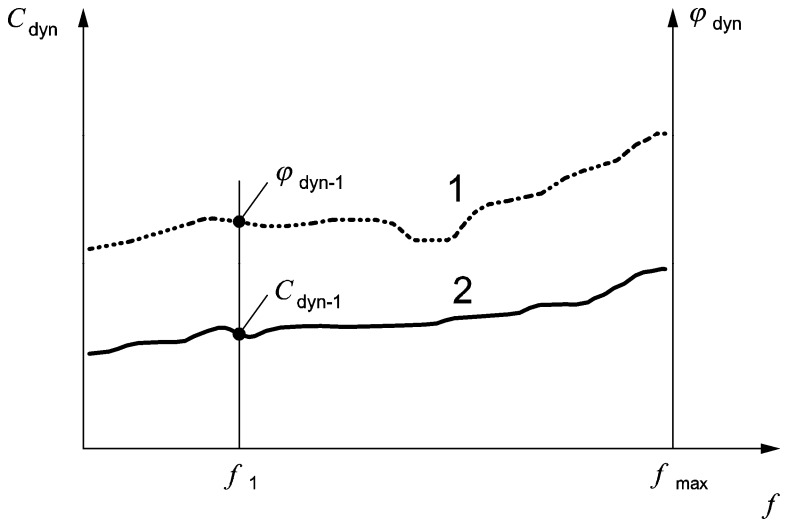
Further symbols are defined in Table 2.

Table 2 — General symbols for static test

Symbols	Static test
F_{pre}	Static constant load
M_{pre}	Static constant torque
S_{pre}	Static constant displacement
α_{pre}	Static constant angle
N	Number of load cycles
V	Test speed
$C_{1/2}$	Secant stiffness (see Figure 1)
$C_{5/6}$	Secant stiffness (see Figure 1)
$C_{1\text{-}6}$	Resulting stiffness
C_k	Correction stiffness
C_{stat}	Resulting static stiffness
T	Environmental test temperature

2.2.2 Dynamic stiffness

An exemplary curve for dynamic stiffness and loss angle is shown in Figure 2.



Key

1 Loss angle
2 Dynamic stiffness
f Frequency

$f_{max.}$ Limit test frequency
C_{dyn} Dynamic stiffness
φ_{dyn} Loss angle
f_1 Frequency value 1
C_{dyn-1} Stiffness value 1
φ_{dyn-1} Loss angle value 1

Figure 2 — General symbols for dynamic test

Further symbols are defined in Table 3.

Table 3 — General symbols for dynamic test

Symbols	Dynamic test
F_{pre}	Static constant load
A	Amplitude
T	Environmental test temperature

3 Test set up

The test set up shall be designed and manufactured ready to install and measure the specimens due to the specified stiffness directions. The test device shall reproduce the real aircraft installation as exact as possible and needed. If necessary surrounding original aircraft parts has to be integrated in the test set up.

The test set up shall be as rigid as possible and support the maximum test loads without significant deformation (specimen and original aircraft parts excluded) or failure.