SLOVENSKI STANDARD
SIST EN 3848:2002

01-januar-2002

Aerospace series - Semi-finished metallic products - Methods of measuring form deviations

Aerospace series - Semi-finished metallic products - Methods of measuring form deviations

Luft- und Raumfahrt - Metallisches Halbzeug - Messverfahren für Formabweichungen

Série aérospatiale - Demi-produits métalliques - Méthodes de mesure des défauts de forme

Ta slovenski standard je istoveten z: **EN 3848:2001**

ICS:

49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction

SIST EN 3848:2002 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 3848

September 2001

ICS 49.035

English version

Aerospace series - Semi-finished metallic products - Methods of measuring form deviations

Série aérospatiale - Demi-produits métalliques - Méthodes de measure des défauts de forme

Luft- und Raumfahrt - Metallisches Halbzeug - Meßverfahren für Formabweichungen

This European Standard was approved by CEN on 2 May 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 3848:2001 E

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries 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 AECMA, 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 March 2002, and conflicting national standards shall be withdrawn at the latest by March 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies the methods of measuring deviations from the nominal form of semi-finished metallic products for aerospace applications.

This standard does not apply to:

– extruded sections: see EN 2066;
– folded sections: see EN 2065.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 2065	Folded profiles - Aluminium alloys - General tolerances - Aerospace series
EN 2066	Aerospace series - Extruded sections in aluminium alloys - General tolerances
ISO 1101	Technical drawings, geometrical tolerancing; tolerances of form, orientation, location and runout; generalities, definitions, symbols of drawings

3 Measuring condition

The dimensions shall be measured using measuring instruments which are of the accuracy required by the dimensions and the dimensional tolerances.
All dimensions shall be checked at the ambient temperature of the workshop or laboratory, and, in the event of dispute, at a temperature between 15 °C and 25 °C.

Surface plates used for the measurement of form deviations shall be flat to within ≤ 1 % of the requisite product form deviation being measured.

4 Sheet and plate

4.1 Squareness

The squareness deviation shall be measured as the difference in length of diagonals *AA* and *BB* as shown in figure 1.

4.2 Lateral curvature

The lateral curvature (*F)* shall be measured as indicated in figure 2, with the sheet or plate resting on a horizontal surface plate.

4.3 Flatness

4.3.1 Flatness tolerance zone

See ISO 1101.

The tolerance zone is limited by two parallel planes a distance "t" apart.

The area shall be between two parallel planes with distance "t".

See figure 3.

4.3.2 Measurement

Deviation from flatness (*f*) resulting from arching, buckling or edge waves, shall be measured as shown in figures 4 to 6, using a lightweight straight-edge and a feeler gauge, dial gauge or scale, with the sheet or plate resting on a horizontal surface plate concave side upwards, except when the size of the product precludes this.

5 Round bar

5.1 Straightness

Deviation from straightness (Y_1) per metre of total length (X_1), expressed in mm/m, and (Y_2) on any length (X_2), as specified in the dimensional standard, shall be measured as shown in figure 7, with the bar placed on a surface plate so that its mass minimizes the deviation.

5.2 Roundness

Roundness deviation shall be measured as the difference between the maximum and minimum diameters at the same cross-section.

6 Hexagonal bar

6.1 Straightness

Deviation from straightness (Y_1) per metre of total length (X_1), expressed in mm/m, and (Y_2) on any length (X_2), as specified in the dimensional standard, shall be measured as shown in figure 7, with the bar placed on a surface plate so that its mass minimizes the deviation.

6.2 Twist

Twist (*v*) shall be measured as shown in figure 8, with the bar placed on a horizontal base plate so that its mass minimizes the deviation.

Twist is the maximum distance, at any point along the measuring length between the bottom surface of the bar and the surface plate.

6.3 Surface flatness

Surface flatness (*F*) shall be measured on all faces as shown in figure 9.

7 Square and rectangular bar

7.1 Straightness

Deviation from straightness (Y_1) per metre of total length (X_1), expressed in mm/m, and (Y_2) on any length (X_2), as specified in the dimensional standard, shall be measured as shown in figure 7, with the bar placed on a surface plate so that its mass minimizes the deviation.

7.2 Twist

Twist (v) shall be measured as shown in figure 10, with the bar placed on a horizontal plate so that its mass minimizes the deviation.

The twist is the maximum distance, at any point along the measuring length between the bottom surface of the bar and the surface plate.

7.3 Squareness

The squareness deviation (z) shall be measured as shown in figure 11.

7.4 Surface flatness

Surface flatness (F) shall be measured on all faces as shown in figure 12.

8 Circular tube

8.1 Straightness

Deviation from straightness (Y_1) per metre of total length (X_1), expressed in mm/m, and (Y_2) on any length (X_2), as specified in the dimensional standard, shall be measured as shown in figure 7, with the tube placed on a surface plate so that its mass minimizes the deviation.

8.2 Roundness

Roundness deviation shall be measured as the difference between the maximum and minimum outside diameters at the same cross-section, see figure 13.

8.3 Eccentricity

Eccentricity (t) shall be measured as half the difference between the maximum and the minimum wall thickness at the same cross-section, as shown in figure 14.

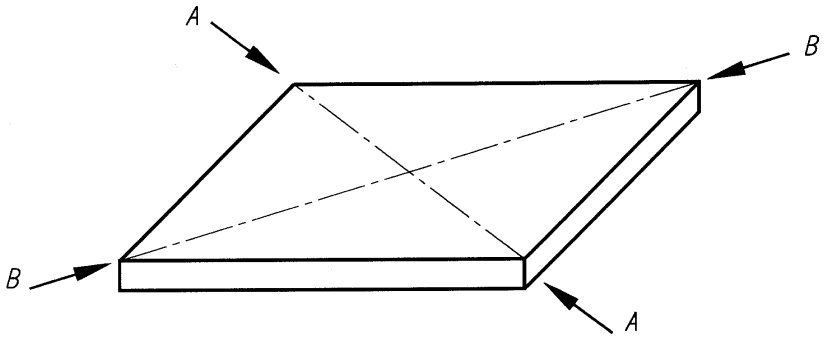
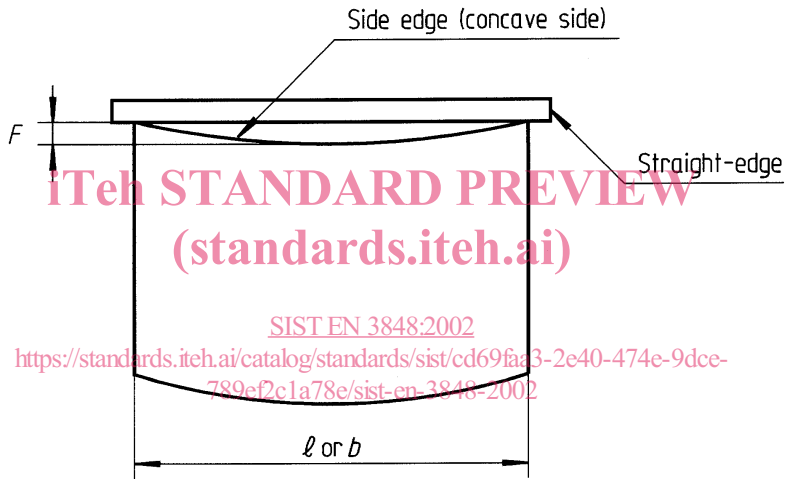


Figure 1 - Squareness of sheet and plate



F = lateral curvature
ℓ = length of the sheet or plate
b = width of the sheet or plate

Figure 2 - Lateral curvature of sheet and plate

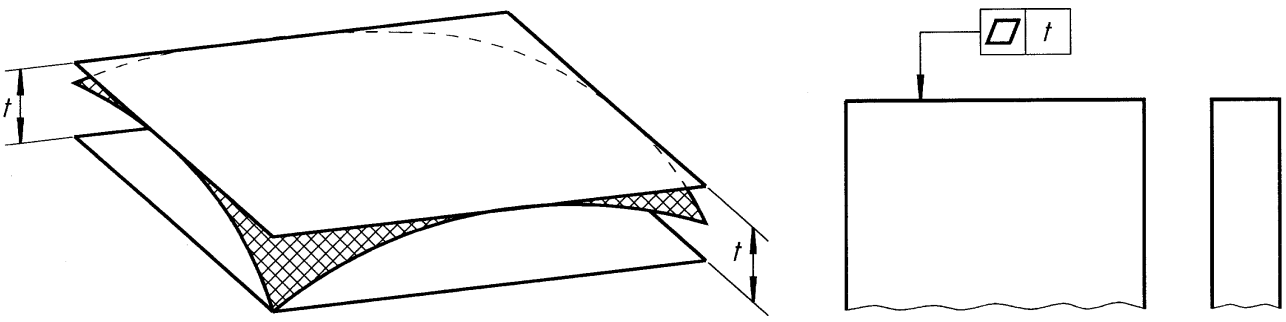
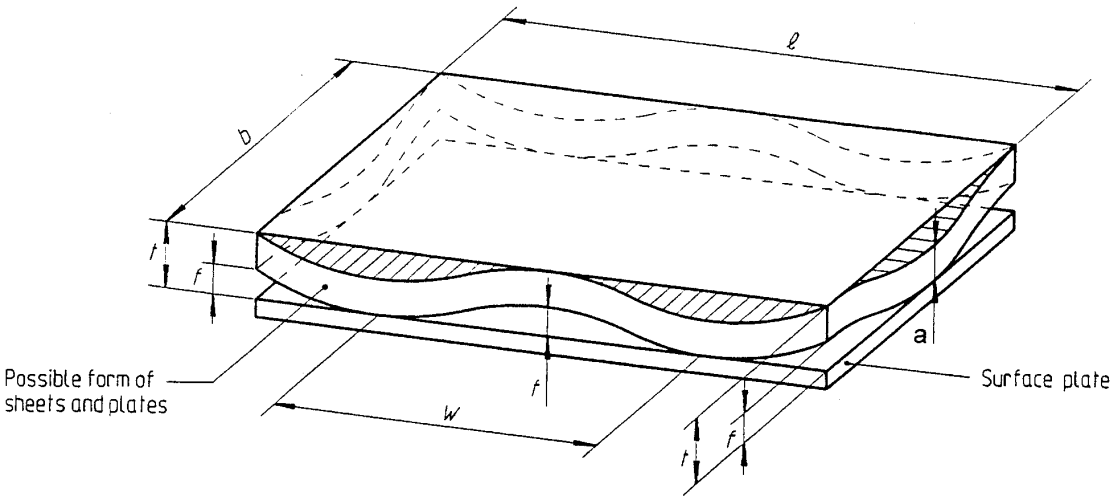
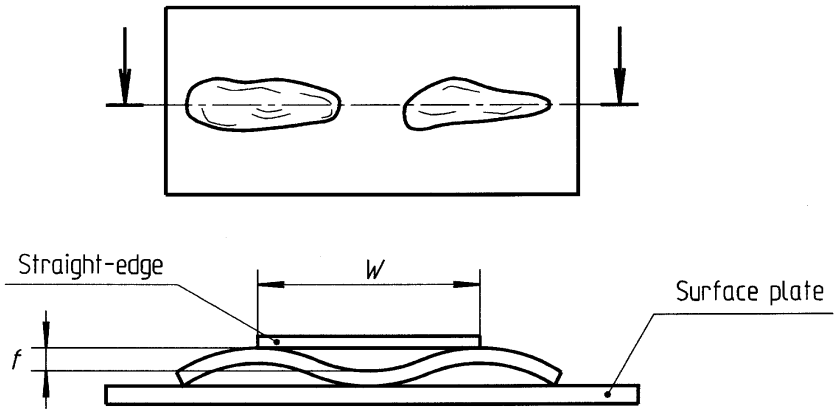


Figure 3 - Definition of flatness



a	=	thickness of the sheet or plate
b	=	width of the sheet or plate
l	=	length of the sheet or plate
w	=	length of the wave
f	=	deviation from flatness
t	=	tolerance zone (space between two parallel planes)
$f_{max.}$	=	maximum acceptable deviation from flatness
t	=	$a + f_{max.}$

Figure 4 - Arching of sheet and plate



f	=	deviation from flatness
W	=	length of buckle (chord)

Figure 5 - Buckling of sheet and plate