

ALINVEST

**FORMED / TRAPEZOIDAL SHEETS
made of aluminium and aluminium alloys**

Effective as of: April 1, 2015

Version No.: 2

Formed Aluminium and Aluminium alloy plates.
FaConé tôle de aluminium et alliage de l'aluminium.
Profil Bleche aus Aluminium und Aluminiumlegierungen.

Introduction**Quoted standards**

ČSN EN ISO 6892-1 Metal materials – Tensile testing – Part 1: Test method at room temperature.

ČSN EN 485-4 Aluminium and aluminium alloys – Sheets, strips and plates – Part 4: Limit deviations for shapes and dimensions of cold-rolled products.

ČSN EN 508-2 Roofing materials from sheet metal – Requirements for self-supporting roofing materials made of steel, aluminium or stainless steel sheets – Part 2: Aluminium.

ČSN EN 573-3 Aluminium and aluminium alloys – Chemical composition and types of wrought products. Part 3: Chemical composition.

ČSN EN 10 204 Metal products. Types of inspection documents.

ČSN EN 14726 Aluminium and aluminium alloys – Chemical analysis – Guidelines for analysis by optical emission spectrometry with spark excitation

Related standards

ČSN EN 1396 Aluminium and aluminium alloys – Coated sheet and strip coils for general user – Specifications.

ČSN EN 14782 Self-supporting sheet metal products for roofing materials and external and internal cladding – Product specifications and requirements

ČSN EN 485-1 Aluminium and aluminium alloys – Sheets, strips and plates – Part 1: Technical delivery regulations.

ČSN EN 485-2 Aluminium and aluminium alloys – Sheets, strips and plates – Part 2: Mechanical properties.

ČSN EN 515 Aluminium and aluminium alloys – Wrought products – Temper designations.

ČSN EN 12258-1 Aluminium and aluminium alloys – Terms and definitions – Part 1: General terms.

ČSN ISO 80000-1 SI units and recommendations for using their multiples and certain other units.

ČSN EN ISO 9001 Quality management systems – Requirements.

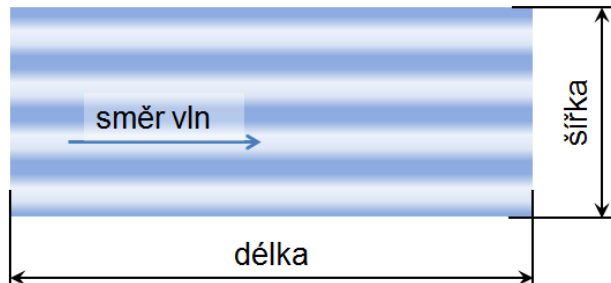
Replacement of previous standards

This standard supersedes PN 42 7307 from May 2004.

1 Subject-matter of the Standard

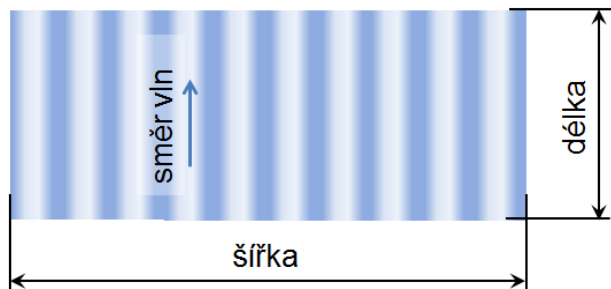
1.1 This standard applies to products with a profiled cross-section made by longitudinal, transverse or double forming of cold-rolled sheets made of aluminium and aluminium alloys.

1.1.1 Longitudinal forming – length and width are determined by the direction of waves



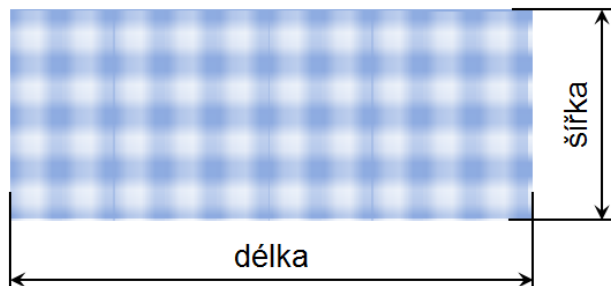
Délka – length
Šířka – width
Směr vln – wave direction

1.1.2 Transverse forming – length and width are determined by the direction of waves



Délka – length
Šířka – width
Směr vln – wave direction

1.1.3 Double forming – length is determined by the longer side



Délka – length
Šířka – width

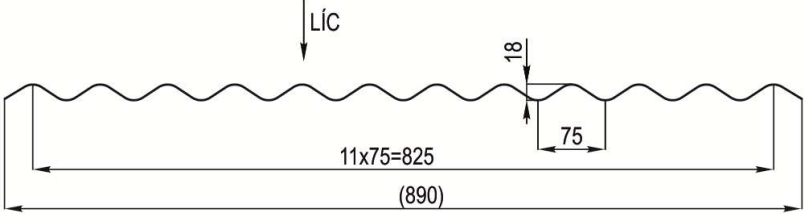
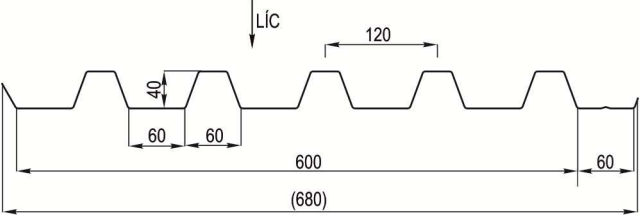
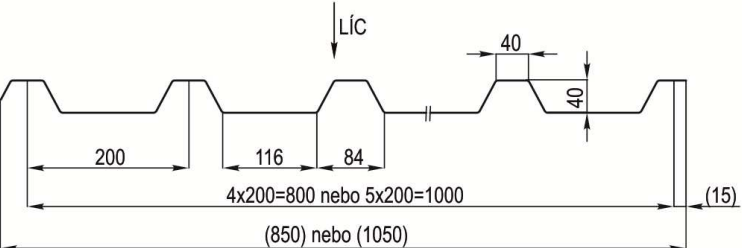
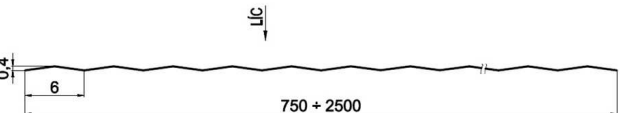
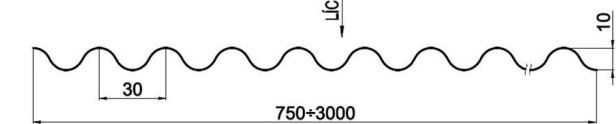
2 Designation

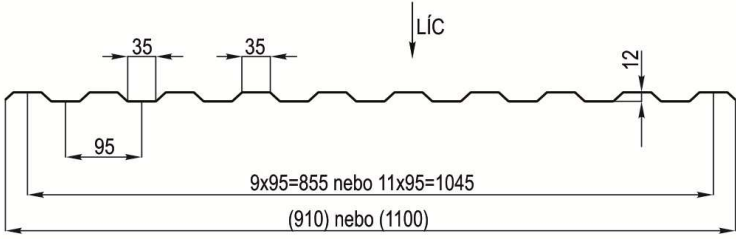
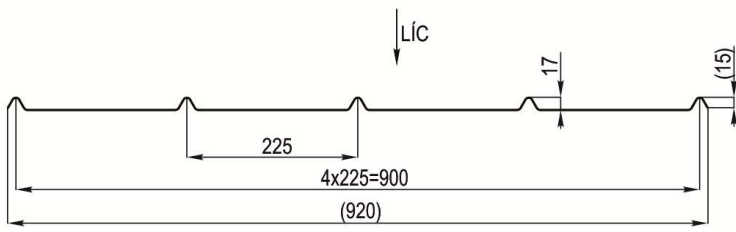
2.1 Manufactured shapes are designated by a four-digit number following the designation KOB, according to the Table 1.

2.2 Formed/trapezoidal sheets KOB 1001, KOB 1003, KOB 1004, KOB 1006, KOB 1012 and KOB 1017 can be combined with the longitudinal or transverse shape KOB 1005 or KOB 1014.

Table 1 – Designation and shapes

Dimensions in mm

Designation	Shape and indicative dimensions
<p>KOB 1001 18/75 (longitudinal)</p>	
<p>KOB 1003 40/120 (longitudinal)</p>	
<p>KOB 1004 40/200 (longitudinal)</p>	
<p>KOB 1005 0.4/6 (longitudinal, transverse)</p>	
<p>KOB 1006 10/30 (transverse)</p>	

Designation	Shape and indicative dimensions
KOB 1012 12/95 (longitudinal)	
KOB 1014 (double)	Formed sheet KOB 1005 formed vertically to the direction of the original wave by the shape KOB 1005
KOB 1017 18/225 (longitudinal)	

Translator's note - Tab 1: LIC - front side, nebo - or

3 Terms and Definitions

3.1 Self-supporting product

A product that due to the material from which it is made and its shape intercepts all applied loads (such as snow, wind, walking), and transmits them to the individual structural aids.

4 Technical Documentation

4.1 In the technical documentation, the designation of formed sheets includes the following data:

- a) Name of the product;
- b) Thickness x width x length in mm;
- c) Designation of the material including temper designation;
- d) Designation of this standard including shape designation;

4.2 The order will further include:

- e) Weight in kilogrammes, or the number of metres or the number of units;
- f) Special requirements.

5 Material

Formed/trapezoidal sheets are normally made from the material EN AW-1050 [Al 99.5], or EN AW-3103 [Al Mn1] (according to ČSN EN 573-3).

Material condition for self-supporting roofing materials must be such that the proof strength Rp0,2 is at least 165 MPa.

6 Dimensions

6.1 Formed/trapezoidal sheets are made in dimensions according to the Table 2.

Table 2 – Dimensions

Designation module	Dimensions					Dimensions in mm	
	Input width before forming	Covering width	Thickness	Total width (indicative)	Length	Indicative weight per running metre (kg)	Indicative weight of 1 m ² of covering width (kg/ m ²)
KOB 1001 18/75	1 000	825	0.60 0.70 0.80	890	According to requirement from 1 600 to 10 000	1.620 1.890 2.160	1.964 2.291 2.618
KOB 1003 40/120	960	600	0.60 0.70 0.80	680	According to requirement from 1 600 to 10 000	1.555 1.814 2.074	2.592 3.024 3.456
KOB 1004 40/200	1 045 or 1 285	800 or 1 000	0.60 0.70 0.80	850 or 1 050	According to requirement from 1 600 to 10 000	1.693 or 2.082 1.975 or 2.429 2.257 or 2.776	2.116 or 2.082 2.469 or 2.429 2.822 or 2.776
KOB 1005 0,4/6	754 to 2 512,5	2 494 (for width 2 500)	0.50 0.60 0.70 0.80	According to requirement from 750 do 2 500	According to requirement from 750 transverse up to 1 000 longitudinal up to 6 000	3.392 4.070 4.749 5.427 (for width 2 500 mm after forming)	1.360 1.632 1.904 2.176
KOB 1006 10/30	900 to 3 600	2 970 (for width 3 000)	0.60 0.70 0.80 1.00	According to requirement from 750 do 3 000	According to requirement from 750 do 1 000	5.832 6.804 7.776 9.720 (for width 3 000 mm after forming)	1.964 2.291 2.618 3.273
KOB 1012 12/95	1 000 or 1 200	855 or 1 045	0.60 0.70 0.80	910 or 1 100	According to requirement from 1 600 to 10 000	1.620 or 1.944 1.890 or 2.268 2.160 or 2.592	1.895 or 1.860 2.211 or 2.170 2.526 or 2.480
KOB 1014 0,4/6	750 to 1 005	994	0.60 0.70 0.80	According to requirement from 750 do 1 000	According to requirement from 750 do 4 000	1.636 1.909 2.182 (for width 1 000 mm after forming)	1.646 1.920 2.195
KOB 1017 18/225	1 000	900	0.60 0.70 0.80	920	According to requirement from 1 600 to 10 000	1.620 1.890 2.160	1.800 2.100 2.400

Note: The calculated weight values apply for natural aluminium Al 99.5 (2.7 kg/dm³).

6.2 Dimensional deviations

6.2.1 Dimensional deviations for trapezoidal sheets (KOB 1003, KOB 1004, KOB 1012, KOB 1017)
 - The provisions of ČSN EN 508-2, Appendix A (normative), Limit dimensional deviations, apply.

Note: The tolerance on thickness of the wide profile of KOB 1004 is set for the width of 1250 mm, although its rolled out width is greater (a more strict value).

Note: ČSN EN 508-2 does not give dimensional deviations for corrugated sheets.

6.2.2 Dimensional deviations for corrugated sheets (KOB 1001, KOB 1005, KOB 1006, KOB 1014)
 - are defined in the Table 3 a Table 4.

Table 3 – Dimensional Deviations

Widths mm		Lengths	Wave heights	Wave pitches
Up to 1000	Over 1000	mm	%	%
± 15	± 20	± 20	± 10	± 5

Table 4 – Shape and Position Deviations

Squareness deviation		Flatness deviation	
For sheet lengths up to 3 000 mm	For sheet lengths over 3 000 mm	Roughness height	Roughness of the edge being cut
Within the limit of maximum allowable dimensional deviations	max. 3 mm/m	max. 22 mm	max. 3 mm

6.2.2 The tolerance on thickness for formed/trapezoidal sheets is set according to ČSN EN 485-4 (or according to ČSN EN 508-2, which refers to the above-stated standard) and applies to the input width before forming.

7 Natural Surface (After Cold-Rolling)

7.1 The product must be without defects that would prevent its appropriate and proper use.

7.2 It must have a smooth and clean surface. However, small surface defects such as e.g. fine lines, scratches, visible layers, colouring and uneven surface appearance after the heat treatment etc., which cannot always be completely prevented, are generally acceptable on both sides of the product.

7.3 Although no measures to conceal defects are allowed, it is permitted to remove surface defects, provided that the limit dimensional deviations and material properties still meet the specifications.

8 Test Methods

8.1 For chemical analysis of aluminium and aluminium alloys, the standard ČSN EN 14726 applies.

8.2 For tensile testing, the standard ČSN EN ISO 6892-1 applies.

8.3 Flatness deviation is determined so that the sheet is pressed onto a horizontal flat surface and the greatest perpendicular distance from the outer surface of the sheet from the flat surface is measured. Height is calculated by subtracting the actual thickness of the sheet detected at the measuring point.

8.4 Squareness is measured by placing a steel square and measuring the deviation.

8.5 A surface check is carried out visually.

9 Accompanying Documents

9.1 Every delivery must be accompanied by a document that includes:

- a) Manufacturer's designation
- b) Name of the product (KOB xxxx)
- c) Designation of this standard
- d) Dimensions
- e) Material designation
- f) Net weight and gross weight, or number of meters or number of units
- g) Contract number

9.2 According to the customer's requirements, the formed/trapezoidal sheets are supplied with an inspection document according to ČSN EN 10 204.

10 Packaging

Formed/trapezoidal sheets are stored on pallets, to which they are fixed with steel straps. Standard package is intended for suspension handling.

11 Packaging Data

The packaging or label must contain the following information:

- a) Manufacturer's designation
- b) Name of the product
- c) Designation of this standard
- d) Dimensions
- e) Net weight and gross weight, or number of meters or number of units

12 Transportation

12.1 Formed/trapezoidal sheets are transported while covered.

12.2. When transported, the sheets must be fixed in a way preventing their mutual displacement.

13 Storage

Storage is carried out in covered, dry areas non-suspect to rapid changes of temperature and condensation of water vapour.

14 Amendment

According to the customer's requirements, the formed/trapezoidal sheets are supplied with coil coating surface finish.

Surface finish is normally done on the front side of the metal sheet, while the reverse side is usually fitted with protective coating.

In case of coated sheets unprotected by a plastic foil, in the bending points there might be continuous traces left by forming rollers, which appear as opaque strips with the width of 10 mm.