

Information concerning application of the design tables for trapezoidal profiles

1. Designation of trapezoidal profiles

The designation of trapezoidal profiles consists of three important components: designation of the profile range, nominal height of the trapezoidal profile and the number of the version. For instance:

T 150.1	T	designation of the profile range
	150	nominal height of the trapezoidal profile
	1	version no. 1
T 100.1 A	A	acoustic profile. Combined with sound absorbing material this is a sound-absorbing building component
T 40.1 S	S	indicates bead in the upper flange, only for T 40 S

The cross section and design values for the trapezoidal profiles are available upon request in German language.

2. Roof and wall Design of trapezoidal profiles

Base for the design tables of ThyssenKrupp Hoesch Bausysteme for trapezoidal profiles is the German DIN 18 807

2.1 General

The load tables have been prepared for trapezoidal profiles in the positive position and up to T 85 also in the negative position for loads acting vertically on the laying surface. The most frequently occurring case of a constant surface load q must be considered. In the case of two- and three-span girders, a constant supporting width with constant surface load q on all fields is assumed.

Two criteria must be observed in the load tables:

- multiple internal forces are not higher than the internal forces that can be accommodated.
Taking account of the adaptation directive to DIN 18 800 Steel Structures part 1-4/11.90 (07.95) the following safety coefficients apply:

Safe load-bearing capacity: $\gamma = 1.5 \cdot 1.1 = 1.65$

Serviceability: $\gamma = 1.15 \cdot 1.1 = 1.265$

In the load tables, this requirement is complied with in the line marked*.

- Maximum deflection does not exceed a defined limit.
This requirement is often put forward in the form of $f \leq L/D$, for instance $f \leq L/300$.

In cases where deflection is the determining factor, the permissible loads q specified in lines L/D are lower than those quoted in line* .

2.2 Limitation of deflection

2.2.1 Specified deflection factors

DIN 18 807 specifies the following limitations of deflection, which are also usual in other countries:

L/300	for roofs with sealing on the top (insulated roof with foil)
L/150	for roofs with roofing elements on the top. The upper water-bearing sheet consists of trapezoidal sheets.
L/150	for walls.

2.2.2 Deflection factors in the design tables

In the load tables you will find:

line*:

Permissible load q without any limitation of deflection.

The γ -multiple internal forces are smaller than or equal to the internal forces that can be accommodated.

Following lines:

Different deflection factors from L/150, L/200, L/300 to L/500.

2.3 Design

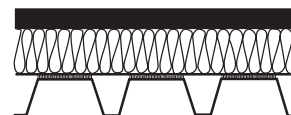
The following information must be available for designing the trapezoidal profile:

- span (corresponds to the spacing of the supporting structure)
- structural system
- single-span, two-span or three-span girder. Multiple-span girders are designed as three-span girders in most cases.
- In the case of continuous girders, the intermediate supporting width b corresponds to the width of the supporting structure.
- Existing load
- Limitation of deflection

2.3.1 Design using the load tables

The load values of all trapezoidal profiles and the related material thicknesses, taking account of various deflection factors and supporting widths, can be taken from the load tables.

Example of design:



Three-span girder, span	L	=	6.0 m
Intermediate supporting width	b	=	200 mm
Required deflection	f	=	L/300
Load, example	exist. q	=	1.34 kN/m ²

T 135.1 - 0.75 three-span girder $b \geq 160$ mm, line L/300
 $L = 6.0$ m, which is permissible $q = 1.37$ kN/m²
 \geq exist. q

Compare load tables T 135.1

