

TAIM Quality Standard for Metal Ceilings: Abridged version

Technical Association of Industrial Metal Ceiling Manufacturers (TAIM) e.V., P. O. Box 1842, D-64608 Bensheim, www.taim.info

Refer to the THM (Metal Ceiling Handbook) for further information

Quality standard for Metal Cell Ceiling

1. Objectives

With the edition of this standard TAIM pursues the objective of redefining the technological developments and unifying the quality standard (thus defining the liability of the individual members of TAIM).

2. Applicability

The quality standard applies to industrially manufactured Metal Cell Ceiling for use in the interior of buildings without special requirements.

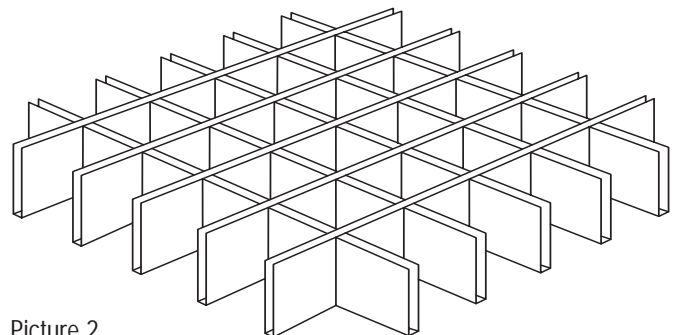
For applications with special requirements, as for instance in swimming pools or exterior use, applicable standards and regulations shall be applied.



Picture 1

U-shape

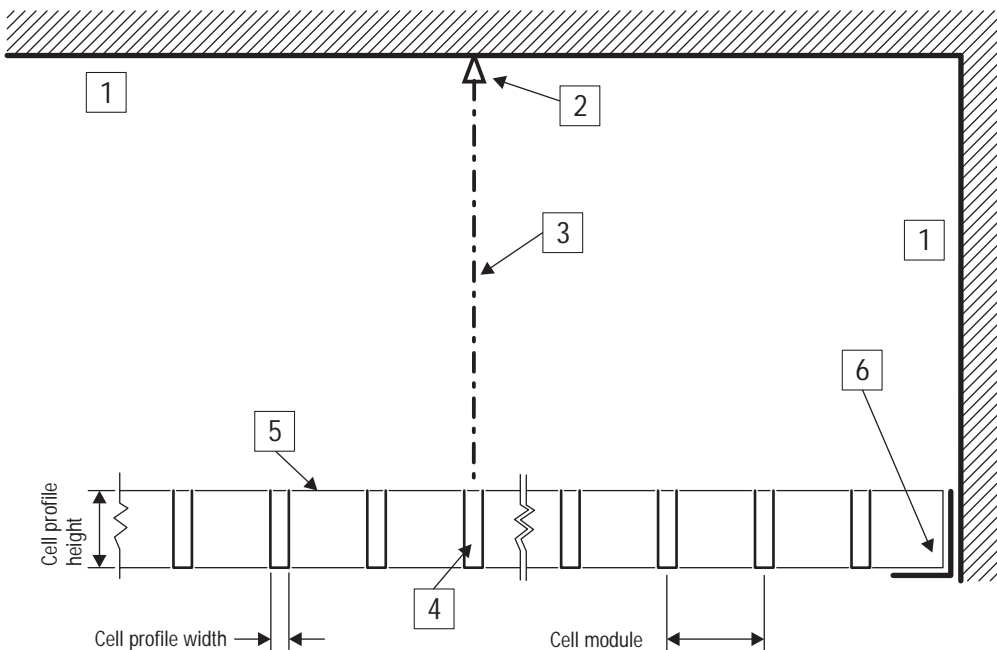
C-shape



Picture 2

2.1 Product definition:

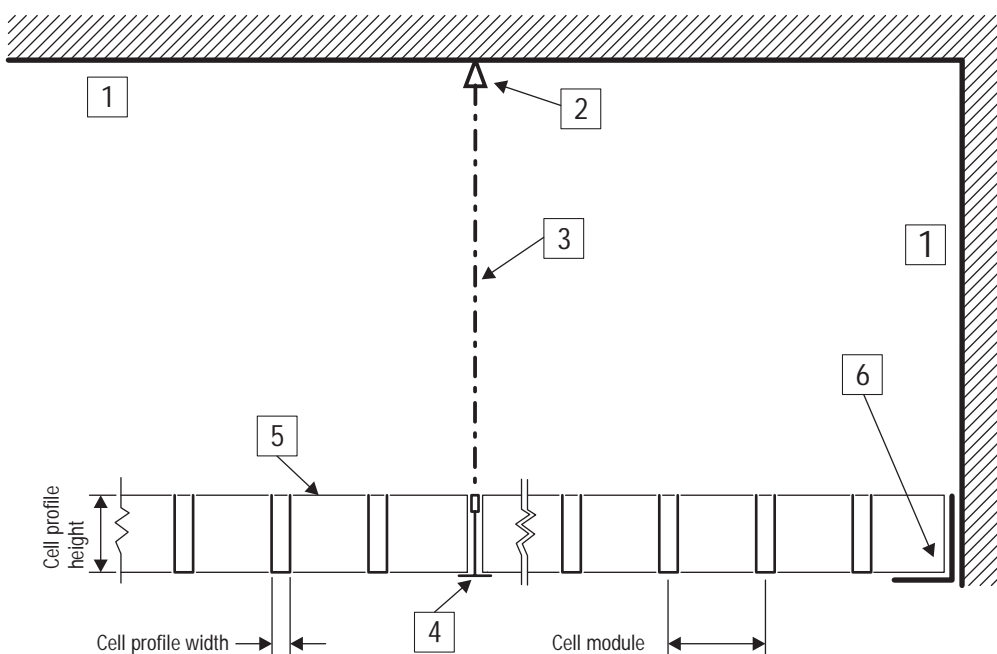
- U- or C-shaped, painted profiles, assembled in such a way that a square- or rectangular shaped continuous open cell ceiling membrane is formed.
- Cell Ceiling profiles are produced in a variety of widths (visible under side), profile heights and cell modules.
- The Cell module is defined as the centre-to-centre distance of two adjacent profiles.
- The assembled profiles form open cell elements that either:
 - are **hooked-in** onto grid profiles (main- and cross runners) that are identical in shape, material and finish,
 - or:
 - laid-on** onto a carrying grid made from other type(s) of profiles.
- The ceiling is either by lay-on on a perimeter trim connected to the wall or installed as a floating ceiling. Floating ceilings must always be finished with full cell-modules around the perimeter.



Hooked-in onto grid profiles

- 1 Load bearing structure
- 2 Top fixing
- 3 Suspension
- 4 Profile Cell Ceiling element
- 5 Profile Cell Ceiling grid
- 6 Perimeter trim

Picture 3



Laid-on onto carrying profiles

- 1 Load bearing structure
- 2 Top fixing
- 3 Suspension
- 4 Grid profile
- 5 Profile Cell Ceiling element
- 6 Perimeter trim

Picture 4

2.2 Construction parts - sub-construction, main-/cross runners and suspension

The sub-construction has to fit the Metal Cell Ceiling system. It is only allowed to use construction parts that are approved by the manufacturer.

2.3 Acoustic pads

with a maximum deadweight of 1.5 kg/m² are to be carried by the Metal Cell Ceiling system.

Additional loads have to be calculated separately and approved by the manufacturer.

3. Material - Metal Cell Ceiling elements

Material can be coil-coated aluminium strip according to EN 1396 or coil-coated steel strip according to EN 10169 Part 1 and 3 with continuous hot-dip metal coating minimum quality DX 51D according to EN 10327 or electroplated zinc coating DC 01 according to EN 10152.

4. Tolerances of Metal Cell Ceiling elements

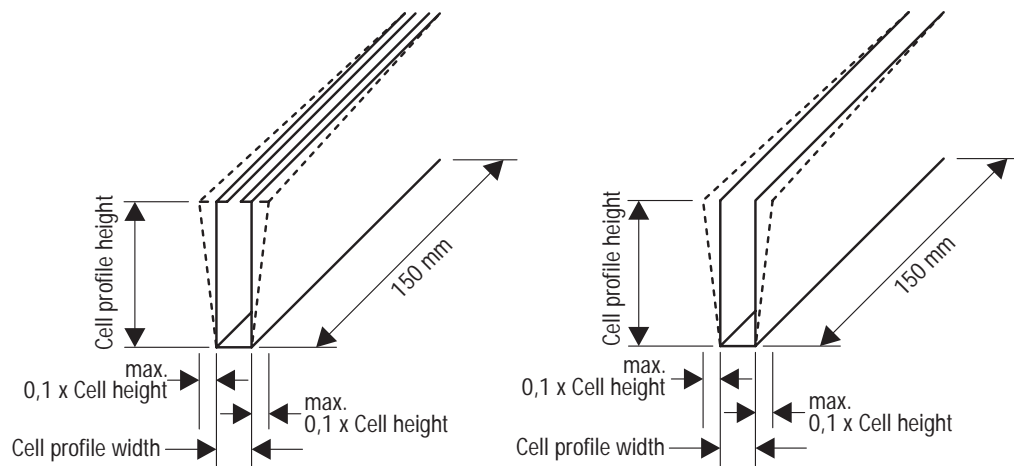
4.1 Dimensions

Cell profile height (both sides)	20 - 60 mm	+/- 0,30 mm
Element - length / width	600 - 3600 mm	+ 0,8 -1,0 mm
Cell profile width (underside)	3 - 20 mm	+ 0 -0,50 mm
Cell module	50 - 200 mm	+/- 0,10 mm

Above dimensions cover the product range of reputed and well-known manufacturers of Metal Cell Ceiling.

Depending on manufacturers' specifications the U- or C-shaped Metal Cell Ceiling profiles can have a slight V-shape. Due to material- and production properties additional dimensional tolerances occur because of spring back at the profile ends (see Picture 5).

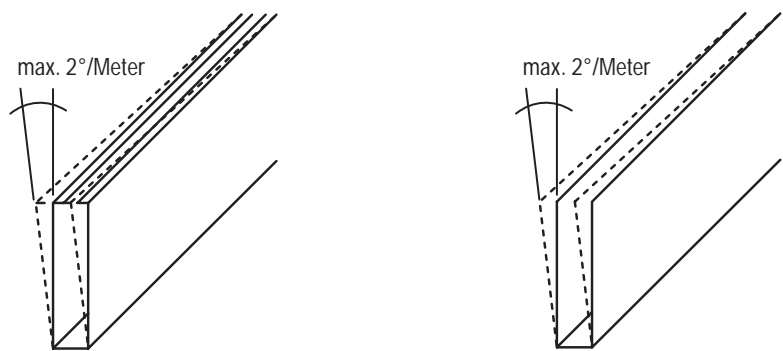
The spring back is up to a maximum of $0,1 \times$ Cell profile height, but not more than 5 mm over the total width.



Picture 5

4.2 Twist

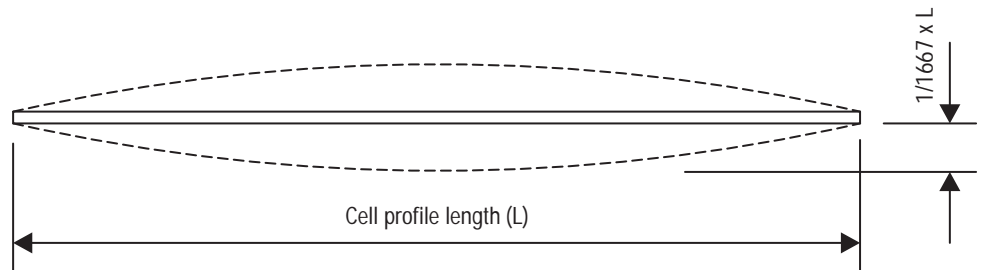
The maximum allowable twist in the Cell profiles is $2^\circ / \text{m}$, but not more than 3mm over the total length.



Picture 6

4.3 Camber

The deviation is maximal $1/1667 \times$ profile length measured in the middle of the length of the profile (equals 0,6 mm over 1,0 m profile length).



Picture 7

4.4 Perforation

Metal Cell Ceiling profiles can be perforated. Therefore differently cut perforation holes can occur at the ends of the profiles.

5. Construction

5.1 Metal Cell Ceiling grid

The grid consists of main runners and cross runners. Variations without cross runners are possible.

The grid shall enable the fitting of the Cell Ceiling elements in a modular way (see Picture 3 and Picture 4).

The shape of the grid profiles is manufacturer specific. The grid enables the fixing of the Cell Ceiling elements either by hook-in or lay-on.

Longitudinal connections of the main runners are realised by manufacturer-approved elements (modular main runner splices) or by way of a manufacturer-approved installation method.

5.2 Material - Metal Cell Ceiling grid

Material can be coil-coated aluminium strip according to EN 1396 or coil-coated steel strip according to EN 10169 Part 1 and 3 with continuous hot-dip metal coating minimum quality DX 51D according to EN 10327 or electroplated zinc coating DC 01 according to EN 10152.

For grids made from aluminium EN 13964, Clause 4.3.2.2.2 applies.

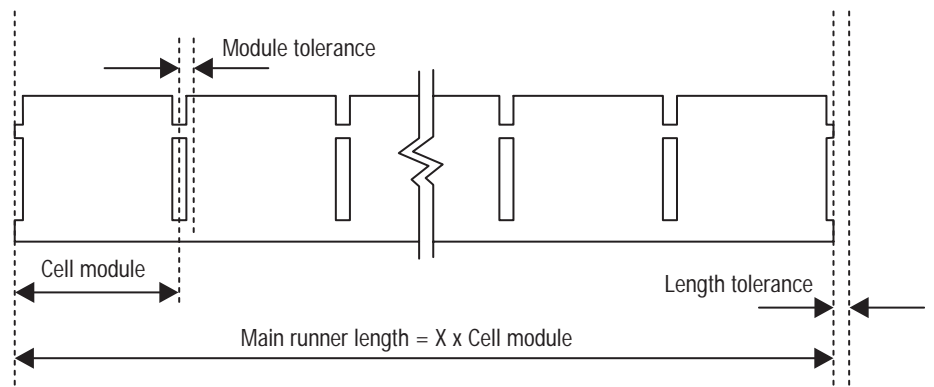
For grids made from steel EN 13964, Clause 4.3.2.2.1 applies.

5.3 Tolerances of the grid profiles

5.3.1 Grids for lay-on systems

EN 13964, Table 1 and Table 2 applies.

5.3.2 Grids with modular punches for hook-in systems



Picture 8

5.3.2.1 Module tolerance of the grid profiles

The module of the grid (main- and cross runners) shall be the same as the Cell module or a multiple of the Cell module. The tolerance of the main-/cross runner module is $\pm 1/10$ of the Cell module. The module tolerances shall not add up.

5.3.2.2 Length tolerance

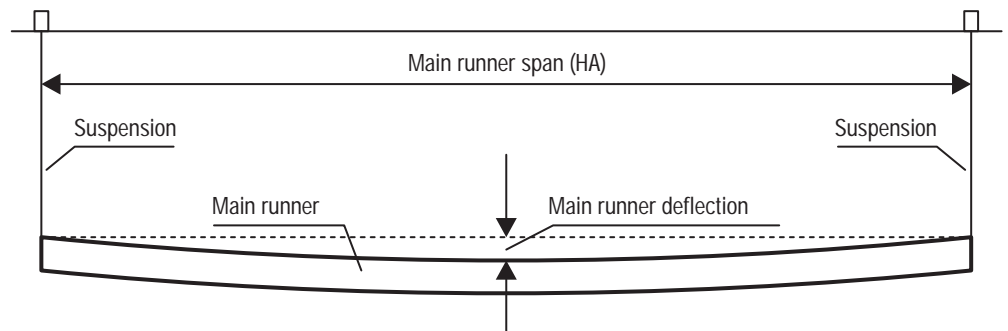
The length of the main-/cross runner is a multiple of the main-/cross runner module. The tolerance for the length of the main-/cross runner is $\pm 2\text{mm}$.

The mathematical relation between the module tolerance of the main-/cross runner and the length of the main-/cross runner is manufacturer specific and shall be observed by the manufacturer. If required the module tolerance shall be set smaller than the under 4.1 stated value of $\pm 0,10\text{mm}$.

Main runner splices or manufacturer's installation instructions ensure the modular dimensions over the length of more main runners.

5.3.2.3 Deflection of the main runners between two suspension points

The allowable deflection of the main runner between two suspension points is $1/500 \times \text{main runner span (HA)}$ measured in the middle between two suspension points but not more as 4mm. This corresponds with EN 13964, Table 6, deflection Class 1.



Picture 9

6. Finishes

Due to variations in the shape of profiles and the materials of the various Cell Ceiling elements on one hand and the profiles for the grids on the other hand, deviations in colour and gloss between these components are possible and unavoidable.

The following specifications are only applicable for identical profile shapes, materials and finishes.

Measurement of colour differences

According to EN 1396 (aluminium) or EN 10169-1 and -3 (steel)

Coating thickness

According to EN 1396 (aluminium) or EN 10169-1 and -3 (steel)

Gloss

According to EN 1396 (aluminium) or EN 10169-1 and -3 (steel)

Allowable deviations in shade of colour

According to EN 1396 (aluminium) or EN 10169-1 and -3 (steel)

Mechanical properties / resistance

Metal Cell Ceiling elements and grids fulfil the requirements for exposure to conditions of EN 13964, Table 7, Class A and Class B (for abridged version see Table 1):

Class	Conditions
A	Building components generally exposed to varying relative humidity up to 70% and varying temperature up to 25 °C but without corrosive pollutants
B	Building components generally exposed to varying relative humidity up to 90% and varying temperature up to 30 °C but without corrosive pollutants

Table 1

Metal cell ceiling elements and grids fulfil the requirements for corrosion protection of EN 13964, Table 8, Class A and Class B (for abridged version see Table 2).

Class of Table 1	Profiles, suspensions ^{a)} , connecting elements and membranes	
	Components made of steel	made of aluminium
A	Products with a continuously hot-dip metal coating Z100, ZA095 or AZ 100 according to EN 10327 ^{b) c)} Products with electroplated zinc coating flat ZE25/25 according to EN 10152 ^{d)} Continuously organic coated (coil-coated) products of corrosion protection (interior) category CPI2 for the exposed side according to EN 10169 part 1 und 3 ^{e)} (e.g. coating system ZE15/15-HDP25-2T-CPI2)	No additional corrosion protection required
B	Products with a continuously hot-dip metal coating Z100, ZA095 or AZ 100 according to EN 10327 ^{b) c)} Products with electroplated zinc coating flat according to EN 10152 with or without an additional organic coating ^{d)} as follows ^{d)} : ZE25/25 + 40 µm per face ^{e)} , ZE50/50 + 20 µm per face ^{e)} or ZE100/100 without organic coating Continuously organic coated (coil-coated) products of corrosion protection (interior) category CPI2 for the exposed side according to EN 10169 part 1 und 3 ^{e)} (e.g.. coating system ZE15/15-HDP25-2T-CPI2)	No additional corrosion protection required or coil-coating according to EN 1396 corrosion index 2a

Table 2

a) Round steel wires used as suspension or part of a suspension shall meet the requirements of EN 10244-2 (zinc or zinc alloy coating on steel wire).

b) EN 10327 replaces EN 10142 (zinc), EN 10214 (zinc-aluminium) and EN 10215 (aluminium-zinc).

c) Any equivalent corrosion protection leading to a similar level of protection is permitted.

d) Coating of exposed parts with zinc compatible organic coating according to EN ISO 12944-3 applied by a post-painting process or equivalent coil coating according to EN 10169-3.

e) Applies only to membrane components.

f) Applies only to "capping" material for substructure components.

Any special requirements going beyond the above shall be agreed on separately.

7. Installation

EN 13964 as well as regulations in the country of use e.g. DIN 18168 Part 1 and Part 2, are mandatory

The instructions for installation and application as published by TAIM e.V as well as the installation instructions of the manufacturer apply.