INSTALLATION INSTRUCTIONS HANG-IN SYSTEM WITH Z-HANG-IN-RAIL

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Suspension element installation

- Nonius hanger
- Universal mounting bracket
- Fastener spacing
  - According to respective system description
- Fastening materials:
  - Use only fasteners suitable for the type of substrate and, where appropriate, with the necessary building authority approval
- Tools:
  - Hammer drill (solid concrete), power drill
  - Depending on rawl plug and bolt types, hammer and / or spanners
- Installation procedure:
  - Check whether any inbuilt parts (such as ventilation ducts, etc.) are installed too low in the ceiling cavity – if so, discuss with site manager
  - First mark suspension element position on the raw ceiling with a chalk line or laser and tape measure
  - Drill hole and insert rawl plug, fasten suspension element with bolt in rawl plug
  - Adjust suspension elements roughly to the required height

Installation of Z-hang-in-rail and transverse structure

- Install upper grid profile (grid angle 30/30/2 mm or CD profile)
- Connect Z-shaped profile to upper grid profile (with M6 bolt). For grid angle, use FURAL Z-hang-in-rail H 50 mm with slots at the top (commercially available rails do not provide adequate adjustment options!)
- For CD profile, commercially available Z-hang-in-rail can be used with special retaining bracket (this allows the Z-shaped profile to be steplessly positioned on the CD profile)
- FURAL recommends 50 mm high Z-hang-in-rails, as the tiles in the middle of the section are then easier to remove.
- Normally in rooms, always install the Z-hang-in-rails parallel to the room long side
- Now adjust the suspension elements precisely to the ceiling height

Tile installation

- Unpack and install the tiles - always wear ceiling installer gloves when working in order to avoid soiling
- Always install the first complete row of tiles on the longer side of the room and check whether the tile edges are in line and run parallel to the wall. Mark the exact tile edge with a line tied from wall to wall or with a rotating laser, ensuring that the tiles do not interlock at the corners – install precisely corner to corner
- Install the cut tiles in the open space remaining between the wall and the first complete row of tiles, and then install the next complete row of tiles, etc.
- For the cut tiles, measure the distance from the edge of the tile to the front edge of the edge profile and add + 15 mm for the support - this is the cutting dimension
- Cut the tile to size using an electric nibbler or sheet metal shears
- Push in the cut tile at a slight angle from below between the upper edge of the edge bracket and the lower edge of the trimming, turn the front edge of the cut tile also to a slight angle relative to the front edge of the edge bracket to allow the tile to be pressed in more easily, then press the tile web into the Z-hang-in-rail
- In the corner of the room, always install the corner tile with two cut sides first, then the cut tile alongside the corner tile
- With an open joint to the wall, the first row of tiles can be installed directly at the wall – pay attention to the perpendicularity of the tile long side relative to the wall
- Always ensure the same bending direction of the end tabs (do not mix)

Tile removal

- For tiles in the hall area, simply lift them out without using tools
- For tiles in rooms, lift up the front end of the tile with rectangular edge-fold by approx. 40 mm and lift the tile with the hook edge-fold by approx. 10 mm then pull the tile in longitudinal direction away from the Z-shaped profile

Information

For variants of the different ceiling systems, see system descriptions in the ceiling manual or in the respective product data sheet. Please also note the information regarding the requirements of EN 13964 relating to the CE standard marking.

Important information regarding EN 13964

4.3 Mechanical strength and stability of supporting elements

4.3.2 Substructure

The substructure of suspended metal ceilings (suspended ceilings) normally consists of the anchoring of the suspension elements in the substrate (e.g. raw ceiling), the suspension elements and their fasteners, and the system supporting profiles and their connectors. All structural components have been tested in combination and the classification corresponds solely to their joint use in the system. As there are many possible fasteners, the choice can only be made by the company conducting the installation. The type and number of anchoring elements and edge profile fasteners are defined for each system in the ceiling manual. Observance of these specifications ensures that the load-bearing capacity of the fastener is not exceeded. Always ensure that the fastener selected is suitable for the base material of the supporting structure (raw ceiling/wall) in order to comply with the **requirements of Annex B** of EN 13964.

As there are many options beyond the sphere of influence of the manufacturer, the choice can only be made by the company conducting the installation. We recommend only using components whose suitability is certified by a European Technical Approval (ETA). If such approval is not available, the specifications in Annex B of EN 13964 must be observed.

Please contact **FURAL** for any further information or advice. As the manufacturer, however, we can only accept responsibility solely for the components supplied, not however, for the overall responsibility for the installed system.

4.3.2.1. Load-bearing capacity – see also section 5

The load-bearing capacity of the substructure is verified by testing both of each individual component and of components in combination. All system supporting profiles have been tested in accordance with EN 13964 and conform to Class 1 in Table 6. Due to the large number of possible profile spacings (tile lengths) and for optimum use of the system, the relevant values must be taken from the respective system diagrams. If further additional loads need to be borne, the planner must be notified accordingly. Only then can a special validation, differing from the standard, be carried out. This can then be performed in accordance with the requirements of the standard (assuming that the costs are met).

4.3.4 Resistance to fasteners

The substructure components and covering layer components are designed for the inherent load-bearing capacity without additional loads. No additional punctual or areal load can be borne without further evaluation.

4.3.5 Resistance to wind loads (special ceiling area)

The installing company is responsible for securing covering layers inside the building in areas where suction or pressure loads due to wind pressures (e.g. near doors and windows) can be expected using suitable components. If the planner requires a windproof design, this must be specified on ordering, together with an indication of the wind loads.

4.3.6 Impact resistance

see product data sheets ball-proof ceiling systems

4.3.7 Resistance to seismic effects

If suspended ceilings will be exposed to seismic vibration, this must be indicated separately by the planner.

4.4 Safety in the event of fire

4.4.2 Fire classification

The fire classification has been verified in accordance with EN 13501-1 and certified by classification reports from „MPA Stuttgart" (Notified Body No. 0672).

4.5 Hygiene, health and environment — toxic gases and hazardous substances

4.5.1 Release of asbestos (content)

Metal components do not contain asbestos and are therefore marked with „No asbestos content. Any additional substances, such as coating materials, acoustic inlays, etc. are also free from asbestos.

4.5.2 Release of formaldehyde and/or formaldehyde content

All components of the metal ceiling are free from formaldehyde and are therefore assigned to Class E1. Note: The requirements of the standard still apply as the standard is also applicable to wood and wood materials.

4.5.3 Other hazardous substances

The manufacturer declares that no substances have been used in manufacturing the metal ceilings which cause hazardous emissions, so no initial test is required. Furthermore, substructure components and covering layers have been tested for compliance with

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the reference values for volatile organic compounds (VOC) according to the assessment system of the German Committee for Health-Related Evaluation of Building Products (AgBB).

4.5.4 Susceptibility to the growth of micro-organisms hazardous to health
When used for their intended purpose, the metallic materials employed are not susceptible to the growth of micro-organisms and are therefore assigned to Class A according to Table 7.

4.6 Safety of use
4.6.1 Splinter resistance
Metal covering layers are not subject to the requirement for determining the behaviour in the event of splintering or breakage. Consequently, the „NPD" (no performance determined) option is used and no initial test was conducted.

4.6.2 Bending tensile strength
The classification indicated applies to the basic variant of the covering layer without additional weight or openings and is determined on a test specimen representative of the covering layer material under consideration of the span length.
The allowance for deflection of the substructure component stipulated in Table 6 has been neglected, because this is of negligible significance for the method used for fastening metal ceilings. The standard prescribes that the load class according to Table 8 is also specified under this item. If further additional loads need to be borne, the planner must be notified accordingly. Only then can a special validation, differing from the standard, be carried out. This can then be performed in accordance with the requirements of the standard (assuming that the costs are met).

4.6.4 Electrical safety
The requirements of the CENELEC HD 384 standards are so extensive that the manufacturer of the suspended ceiling cannot accept responsibility for comprehensive observance. It is the duty of the planner to draw attention to any requirements in this context and of the installation company to observe these accordingly. If electric cables are routed through visible or concealed ducts connected to the substructure of the ceiling, this must be indicated accordingly by the planner for structural reasons. If the suspended ceiling needs to be earthed, this must be conducted by a licensed specialist company in accordance with national standards.
If any modifications to the suspended ceiling are required for this purpose, then this must be indicated separately by the respective planner.

4.7 Acoustics
4.7.2 Sound absorption
see manual test values sound absorption or in the product data sheet with the respective perforation

4.7.3 Sound insulation
See separate documents.

4.8 Durability
4.8.2 Moisture
The thermal insulation and dew point calculations required by the standard cannot be performed by the manufacturer, as none of the necessary information is available and this requirement would extend far beyond the manufacturer's sphere of activity. The manufacturer takes the view that these calculations and any necessary measures derived from them must be performed by the planner. Any additional corrosion protection required according to Table 8 would, in this context, have to be indicated by the planner.

4.8.3 Service life
Depending on how the room is used and the conditions therein, cleaning for visual reasons is recommended at pre-determined intervals. This is not required for functional reasons, in order to maintain fitness for use at any time throughout the entire service life.
Cleaning of visible surfaces, dry cleaning:
- Wipe clean with a dry, soft cleaning cloth
- Use a vacuum cleaner with soft brush attachment

Cleaning of visible surfaces, wet cleaning:
- Use commercially available, non-abrasive cleaning agents diluted with clean water -> the mixing ratio depends on the degree of soiling of the ceiling tiles; all common glass cleaning agents have proven to be effective
- Use special cleaning agents (evaporative – e.g. diluted white spirit) for stubborn, greasy soiling.

Painting of the ceiling with commercially available paints is possible. It should be noted, however, that painting can be detrimental to the fire characteristics of the product. Furthermore, it is not advisable on perforated ceiling panels, because this impairs the acoustic properties. Also note that ugly cracks may occur in the joint area.

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4.8.4 Classification of the loading conditions for the suspended ceiling and
4.8.5 Corrosion protection
Ceiling panels: In the standard version, these are made fromsheet steel with continuous hot-dip surface finish Z100 to EN 10346, thereby assuring the corrosion protection required in Table 8 for Class B according to Table 7. Substructure parts in the standard variant are made of sheet steel with a hot-dip galvanised surface of at least Z100 to EN 10346 or higher, thereby assuring the corrosion protection required for load class B.
Special materials: If components are made from other materials, the minimum corrosion protection is provided according to Table 8, depending on the required load class.

4.8.6 Protection from contact corrosion
If the design or load class indicates that contact corrosion can occur between different materials, this must be pointed out by the planner. Suitable protection measures can then be taken in accordance with EN ISO 12944-3, section 5.10. Depending on the application, the coating must be applied to at least the more precious metal, or to both metals.

4.9 Colour, light reflection and gloss factor for suspended ceiling components
The substructure components and covering layer components provided with a decorative coating (powder coating, PARZIFAL hydro stove enamelling) in the visible area have the order-specific colour (e.g. RAL or NCS). In standard cases (RAL 9010, smooth), light reflection value R is approx. 80-85% and is determined according to ISO 7724-2 and ISO 7724-3. In standard cases (RAL 9010), the gloss factor measured at an angle of 60° is approx. 20%, by PARZIFAL hydro stove enamelling at approx. 10% and is determined according to EN ISO 2813.

4.10 Thermal insulation
If thermal insulation is required, this must be indicated separately by the planner. The planner must also draw attention to measures required to prevent the formation of condensation. On request, proof of this is furnished in accordance with EN ISO 6946 and EN ISO 10211-1 on the basis of reference design values to EN 12524 by an approved testing institute (assuming that the costs are met).

5.0 Load-bearing capacity of the substructure components – test methods
5.1 General
Test methods have been applied for metal substructures and suspension and connecting elements if their load-bearing capacity could not be calculated. The components to be tested were tested both individually and in combination as they are used in practice. A safety factor of 2.5 was observed.

5.2 Bending test of metal substructure profiles
Primary and secondary profiles:
The deflection of the primary and secondary profiles of each system was tested by testing institute „ITB - INSTITUT FÜR BAUTECHNIK" (Notified Body No. 1488) on behalf of FURAL or its profile suppliers. Deflection class 1 to Table 6 was taken as the basis for the specification. Consequently, the suspension element spacings of the supporting rails have been defined for the dead weight of the ceiling including substructure, but without additional load. In view of the large number of options, reference is made on the product label to the specifications and diagrams in the ceiling manual and/or to the performance declaration instead of the classification.
Edge bracket profiles:
The deflection of the edge bracket profiles was also tested by the testing institute.

5.3 Testing of the metal suspension and connecting elements
All substructure components were tested individually and in combination as they are used in practice. This allowed the weakest point of a system to be determined. We strongly recommend that only such parts intended for a particular system are used. An incorrect combination of substructure parts can result in the system collapsing.
The numbering refers to the list in EN 13964 and is explained here in excerpts.

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