



CEILING  
LIGHTING  
**AMBIENCE**

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# **S4.7 K-TS**

## INSTALLATION MANUAL

# GENERAL INFORMATION

## GENERAL NOTES

This assembly manual addresses all metal ceilings manufactured by durlum. The different sections describe the corresponding products.

durlum is a leading German manufacturer of metal ceilings and cladding elements, mainly made of galvanised sheet steel, aluminium and expanded metal.



The relevant products are described in the marketing and sales documents. They are both acoustically effective, and can also be used as design elements only.

Specifically, these products are:

- Acoustic ceilings
- Chilled ceilings
- CHARACTER products

durlum differentiates between a wide range of ceiling systems, for example S1. "S" stands for the system, "1" for clamping. In this system, there are different nomenclatures that allow a further subdivision of the systems.

All durlum systems are systems of modular design. This applies not only to the substructure but also to the ceiling parts that are suspended, locked into place or placed on the substructure.

durlum metal ceilings comply with the standard EN 13964:2007 and are CE-certified.

For special systems marketed by us and for which no general approvals are available, there are suitable static certificates available, and suitable designs compliant with EN 13964 have been constructed.

## GUIDELINES

These installation instructions have been structured in accordance with the requirement of EN 13964:2007. They describe a proper installation.

The description does not exempt the user from examining the structural conditions, implementing the building code regulations and observing the information given in the building permit prior to starting assembly. They have priority, but could not be included here.

It is advisable always to draw up assembly diagrams/drawings, to establish the location where assembly is to begin and to establish the required suspension points for the relevant ceiling system prior to starting assembly.

## STRUCTURAL PRECONDITIONS

Metal ceilings may usually be installed as soon as the building is swept clean and at the latest after all wet work in the interior has been completed and the building has been closed.

Prior to starting assembly, the suspension points must be checked for their usability, and load introduction into the building must be guaranteed.

When using wall mounting points, such as brackets or wall anchors, the load-carrying capacity of the wall in question must be checked.

If ceiling elements rest on brackets, possible wall movements must be taken into account.

Only dowels for which a general building supervisory approval is available may be used, and their minimum extraction force must be greater than 100kg. The dowels must be mounted as specified by the relevant dowel manufacturer. We recommend performing regular tensile stress tests, to verify that dowels have been set correctly.

durlum metal ceilings are dimensioned such that they carry their own weight of the system construction plus a surface load amounting to 40N/m<sup>2</sup>. Higher loads must be taken into account or suspended separately in the construction, and the measures must be adapted to the situation at hand. Usually, built-in components and loads must be suspended separately.

For ceiling systems that do not allow any tolerance compensation within a module, suitable material expansions must be taken into account.

Building expansion joints and tolerances customary in building construction must be taken into account accordingly.

durlum metal ceilings are, as a matter of principle, to be assembled by professional dry construction companies who are capable of assessing the overall conditions of the building, the metal ceiling and cladding, and can take the necessary precautions for correct, safe static mounting.

If parts from different manufacturers are used to assemble the ceiling, the relevant mounting company must provide the certificates required by EN 13964:2007 and must obtain suitable certificates of conformity itself.

Liability for proper selection of the products and system conformity can only be assumed for the systems delivered by durlum.

To prevent the parts from becoming dirty, gloves must be worn during assembly. If the ceiling products are delivered wrapped in a protective film, they must be protected from exposure to UV radiation [sunlight], the film must likewise have been removed from the goods no later than 4 weeks after delivery. The storage temperature must not exceed 30°C, since otherwise the adhesive on the panel may become hardened, and the protective film can no longer be removed.

## STORAGE

durlum metal ceilings are usually delivered on pallets. It is advisable to leave the metal panels on the pallets as long as possible. If the pallets have to be opened, the durlum metal panel should always be positioned on the long side, it can then be placed carefully against the wall, do not store flat.

Storage must be carried out such that damage is excluded. During storage, durlum ceiling panels have to be protected from all weather influences. Panels to be stored at a constant temperature between 10°C and 40°C.

The assembly of the ceiling panels must not start until all dust-producing work has been completed [swept clean].

durlum products are certified according to ISO 9001 for development, production, sales and also for service. Nonetheless, it is recommended as a matter of principle to inspect the delivered metal ceilings immediately and to report complaints immediately [as a rule immediately after delivery or within 3 days].

# GENERAL INFORMATION

## STANDARDS AND REGULATIONS

The relevant regulations applicable at the installation site must be determined by the assembly company in question. The ceilings marketed by durlum comply with EN 13964. This standard also regulates the classification of fire protection.

## APPLICATION

The application of durlum metal ceilings is restricted, unless agreed upon otherwise, to interiors, so that, pursuant to EN 13964, class of use 1, corrosion protection class A, has been defined here as standard.

Should it become necessary to adjust the metal ceiling panels to the building by cutting them, we recommend protecting the cutting edges from corrosion by means of paint in order to maintain the corrosion protection class A.

## QUALITY STANDARD

For material properties, dimensions, tolerances, colour deviations, the TAIM Directives [Technical Association of Industrial Metal Ceiling Manufacturers] applies.

## MOUNTING SEQUENCE

1. Create a ceiling layout plan or use the one from the architect.
2. Cross-check the ceiling layout plan against the on-site situation.
3. Prepare a bill of materials, including a suitable work plan and retrieval/order of the materials required.
4. Determine the required suspension points in accordance with the classes of use of EN 13964. The corresponding suspension distances for the different systems can be taken from the detailed descriptions of the individual ceiling systems.
5. Define which generally approved dowel is suitable.

Check the raw ceiling and the walls.

Mark the dowel mounting holes and drill them.

Mount the dowels as specified by the dowel manufacturer and carry out extraction tests using the device recommended by the dowel manufacturer, if necessary.

6. Follow the same procedure when

mounting the perimeter trim, mounting interval approx. 400-625 mm, check transmission of force into wall.

7. Shorten the provided fastening elements, such as the M6/M8 threaded rod to the intended length or order the correct length and mount it on the raw ceiling.
8. As a rule, arrangement of the panels should be from the centre of the room to compensate or halve the tolerances of the room/panels. The precise arrangement must always be done on the basis of the ceiling layout plan.
9. As a rule, durlum metal ceilings are provided with cross grids [primary profile].
10. Use the layout plan to determine in which direction the cross reinforcement profiles are laid, either in parallel to the façade [usually] or vertically to the façade. The cross-supporting profiles should be mounted using a wall anchor or anchor span to prevent shifting in the transverse direction.

The respective primary profiles are mounted at a right angle to the secondary profiles. To this end, the system-specific connecting elements are used, see system descriptions.

The position of the primary profiles is defined in the reflected ceiling plan.

11. The metal ceiling panels are often provided with a joint tape [9x3mm], to make for easier tolerance compensation.

Should a joint tape be used, the joints must also be re-aligned from time to time, since the joint tape also has tolerances.

However, owing to the high production precision, it is also possible to connect the panels without a joint tape by using butt joints or provide them with rubber spacer naps.

Always ensure that the joints are aligned.

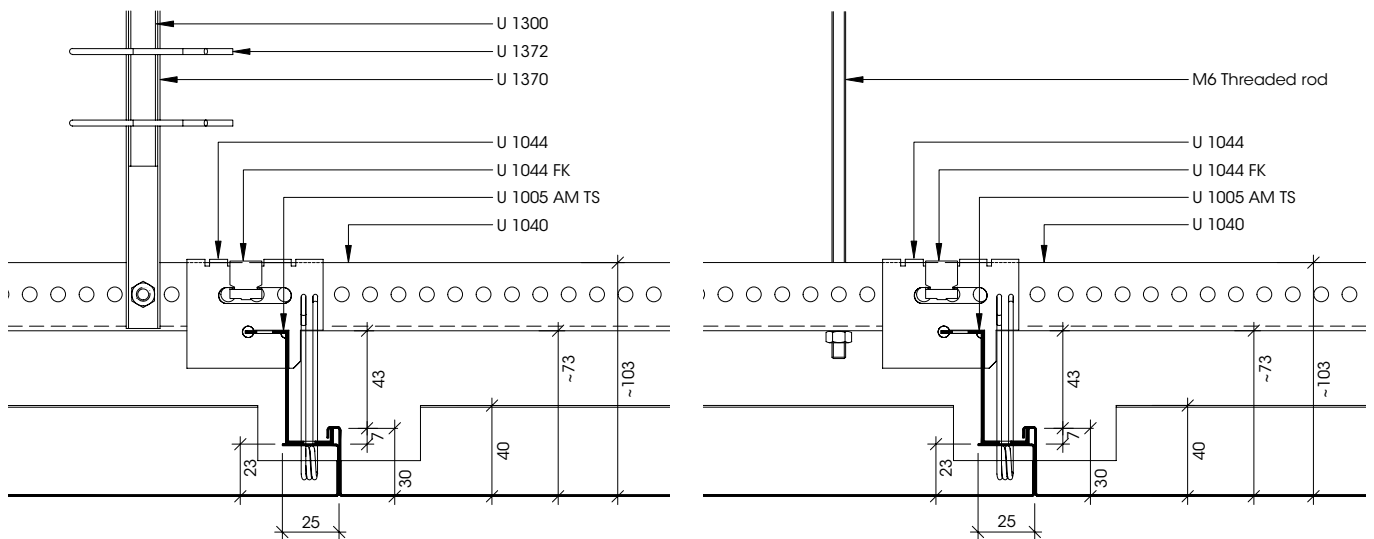
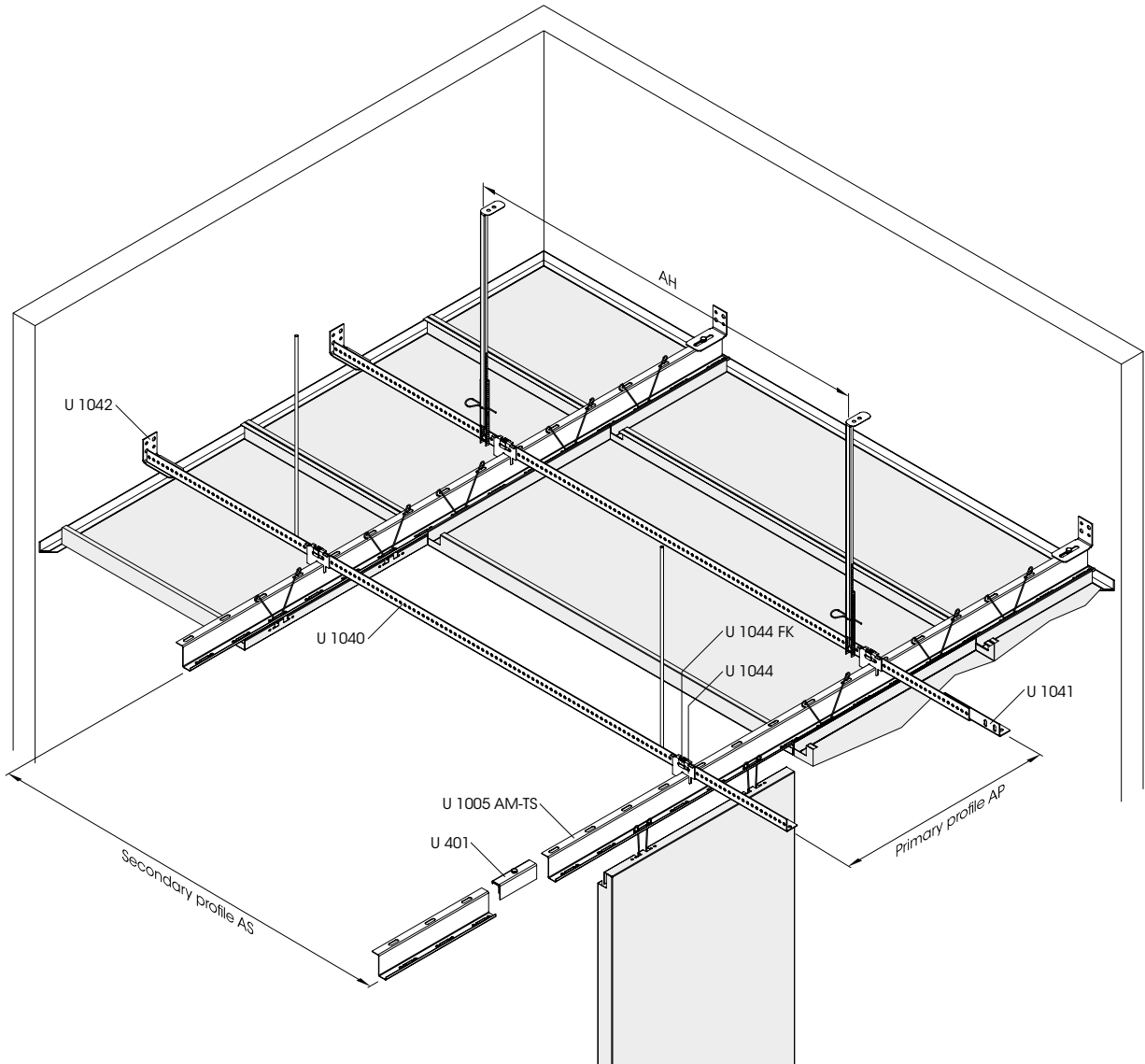
12. If the panels are placed on a perimeter trim, we recommend our F-bracket as bracket or as stepped F-bracket. The bracket secures the panel and protects it against lifting. The ceiling panel is cut with electric sheet shears [i.e. Treco shears] and adapted to the prevailing room dimensions.

When calculating the minimum support area [10mm], the dimensions of possible wall movement should be taken into account.

13. Attachments or other loads are to be mounted separately. For logical reasons these parts are integrated during the mounting process.

14. After completion and pre-acceptance of the ceiling, the sequence of joints should be re-aligned. Soiled ceiling panels should be cleaned to give a perfect result for assembly.

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## ABBREVIATIONS

AP: Distance of the primary profiles U 1040

AS: Distance of the secondary profiles U 1005 AM-TS

AH: Distance of the suspension hangers in the axial direction of the primary profile

## DISTANCE OF THE SUSPENSIONS ETC.

The following recommendation for the distances of the primary profiles and the suspension points refers only to the standard ceilings in the indoor applications without additional loads.

### Distance of the primary profiles AP according to EN 13964:

- Class 1: <1 000mm
- Class 2: <1 200mm

### Distance of the secondary profiles AS according to EN 13964:

Depending on the panel length

### Distance of the suspensions points AH:

The distance of the suspension points AH is determined by the corresponding panel length. The L-shaped primary carrier serves mainly for the cross bracing.

The maximum force applied to the suspension point may be 200N. The corresponding suspension parts and dowels must be considered.

If it is not possible to specify in advance where the secondary profiles will run, select the following distances of the suspension points AH:

- Class 1: <1 000mm
- Class 2: <1 200mm

### Load-carrying capacity of the suspension points [tensile loads]:

- Maximum load per vernier suspension: 200N
- Maximum load per M6 threaded rod: 500N
- Other loads must be verified statically.

### Class of use according to EN 13964:

Class of use A according to table 7

## PLEASE NOTE

- Use only officially approved dowels.
- The fastening base must be suitable in terms of statics. It must be able to reliably absorb the forces introduced into the building.

## ASSEMBLY SUB-CONSTRUCTION

### Assembly wall connection:

The general distance for mounting the pe-

rimeter trim is max. 500mm. This general distance is less, depending on additional loads, the type of wall and special requirements.

1. Level and outline the given ceiling height.
2. Outline the upper edge of the perimeter trim.
3. Mark the drill hole.
4. Drill a hole for the dowel.
5. Secure the perimeter trim with a dowel.
6. Cleanly mitre cut the edges of the perimeter trim profiles.

### Assembly of the primary profile [U 1040]:

7. Outline the axis grid for the primary and secondary profiles.
8. Define the suspension points.
  - 8.1. The suspension hangers of the primary profile should be mounted as close as possible to the crossing point of the primary and secondary profiles. The maximum distance between the suspension hanger and the secondary profile is 100mm [also see "Distance of the suspension points AH"].
  - 8.2. Module adapters [cross connectors] may not be mounted at the joint of the primary profiles.
  - 8.3. Keep at least 400mm distance to the joint of the primary profiles.
  - 8.4. The maximum distance of a suspension point from the wall is 500mm.
9. Drill a hole for the dowel.
10. Mount the upper part of vernier scale U 1300 or threaded rod M6 with dowel according to manufacturer's instructions.
11. Cut the L-shaped primary carrier U 1040 to the required length.
12. Fasten the lower part of vernier scale U 1370 at the suspension points with self-securing screw connection M6.
13. Place L-shaped primary carrier U 1040 horizontally, vertically and aligned for the given ceiling height.
14. Fasten the lower part of vernier scale U 1370 on the upper parts of vernier scale U 1372. When using the threaded rod suspension, the threaded rod is guided through the horizontal shank of the L-shaped primary carrier and rigidly fastened with the self-securing M6 screw connection.
15. U 1041 connector of the L-shaped primary carrier is connected to the joint of the L-shaped primary carrier using a self-securing M6 screw connection. Arrange the longitudinal connections of the profiles in an offset manner.
16. When adjusting the height, observe the permissible height tolerances according to EN 13964, readjust if necessary.

17. The primary profiles must be connected to the wall at one point at least with the wall bracket U 1042 to preclude any shift in the axial direction.

### Assembly of the secondary profile

#### [U 1005 AM-TS]:

18. Outline the predefined axis grid for the secondary profiles at the L-shaped primary carriers.
19. Cut the hook-on carriers U 1005 AM-TS for the border area to the required length.
20. Mount the hook-on carriers with the module adapter U 1044 and the fixing clip U 1044 FK at the L-shaped primary carriers U 1040.
21. Align the hook-on carriers and snap the fixing clip U 1044 FK into place completely.
22. Centre the connector U 401 above the joint of the hook-on carriers U 1005 AM-TS and secure with drilling screws. Required longitudinal connections should be arranged in an offset manner.

## ASSEMBLY OF THE CEILING PANELS

1. Wear clean cotton gloves.
2. Remove protective foil from ceiling panels, if available.
3. Press the individual torsion springs of the ceiling panel together [check the position of the spring whilst doing this, it has to be in the middle of the clamp holding it] and insert them into the provided punched slots of the hook-on carrier U 1005 AM-TS.
4. Place the ceiling panel on the other short side with the Z-edges [AS5] onto the hook-on carrier U 1005 AM-TS.
5. Push the panel side with the torsion springs facing upwards until the torsion springs snap into place with an audible click.
6. Check the perpendicularity of the joint and its even width; if necessary, readjust the hook-on carrier to the required axis pitch.
7. Determine the length of the pre-cut shim in the border area. While doing so, consider both different types [panels with torsion springs AS41 or with Z-edges AS5].
8. Cut the pre-cut shim using electric sheet shears and deburr the cutting edges.
9. Insert the pre-cut shim and the cutting edge into the F-lip of the perimeter trim profiles.

## DISASSEMBLY OF THE CEILING PANELS

1. Wear clean cotton gloves.
2. Insert the demounting tool through the short-side joint upwards.

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3. Carefully pull the demounting tool down - hold the panel during the procedure - until the torsion springs unlatch.
4. Lift up the ceiling panel on the other short side and swivel it down past the hook-on carrier U 1005 AM-TS.
5. Hold the ceiling panel, press the individual torsion springs of the ceiling panel together and remove it from the provided punched slots of the hook-on carrier U 1005 AM-TS.
6. Put the ceiling panel down and store it protected against damage.

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