



CEILING
LIGHTING
AMBIENCE

DUR-SOLO® TYPE 2

INSTALLATION MANUAL

GENERAL INFORMATION

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This assembly manual addresses all metal ceilings manufactured by durlum. The different sections describe the related/relevant 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. "S1" stands for system 1 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 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.

Appropriate static certificates are available for special systems marketed by us and for which no general approvals are available, and appropriate designs compliant with EN 13964 have been constructed. durlum lamps comply with standard EN 60598-1 and are CE-certified.

GUIDELINES

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

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, but at least when 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 anchors for which a general building supervisory approval is available may be used, and their minimum extraction force must be greater than 100kg. The anchors must be mounted as specified by the relevant anchors manufacturer. We recommend performing regular tensile stress tests, to verify that anchors 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/m². 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 must always be assembled by expert dry building companies who are capable of assessing the overall situation in the building, the metal ceiling, the cladding surface, as well as the structural conditions and are able to take suitable precautions for ensuring proper assembly.

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 laminated with a protective film, they must be protected from exposure to UV radiation [sunlight], the film must likewise be removed from the goods no later than 4 weeks after delivery, and the storage temperature must not exceed 30°, 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 need to be opened, the durlum POLYLAM® should always be placed on its underside.

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. Nevertheless, it is recommended to always subject the metal ceilings immediately to an inspection and to report any complaints right away [usually immediately following delivery or within 3 days]. Visible damage must be noted on the delivery note.

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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 conform to EN 13964. This standard also governs fire behaviour in accordance with EN 13501.

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. The use of durlum lighting is restricted to interiors. The lighting complies with protection class IP 20, protection class 1 according to EN 60598-1.

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

QUALITY STANDARD

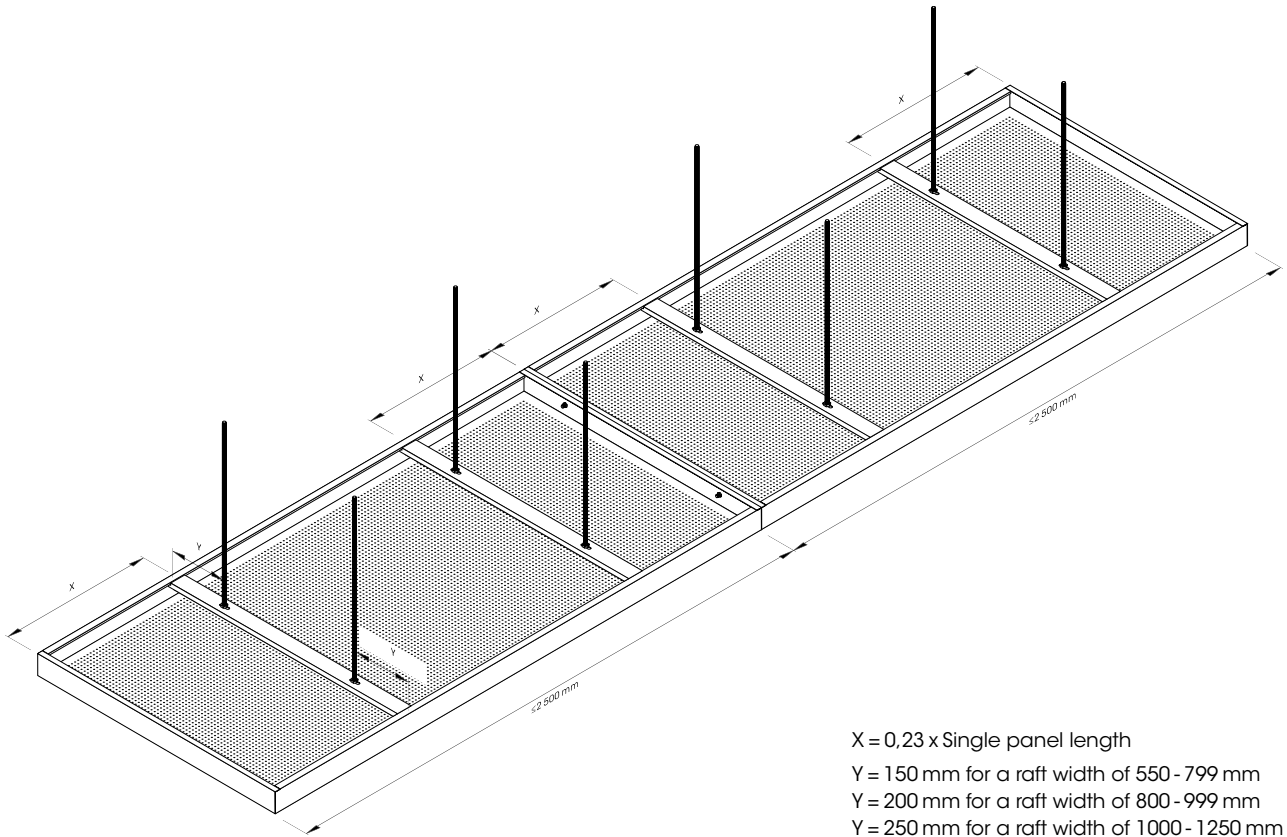
For material properties, dimensions, tolerances, colour deviations, the TAIM Directives [Technical Association of Industrial Metal Ceiling Manufacturers] applies.

MOUNTING SEQUENCE

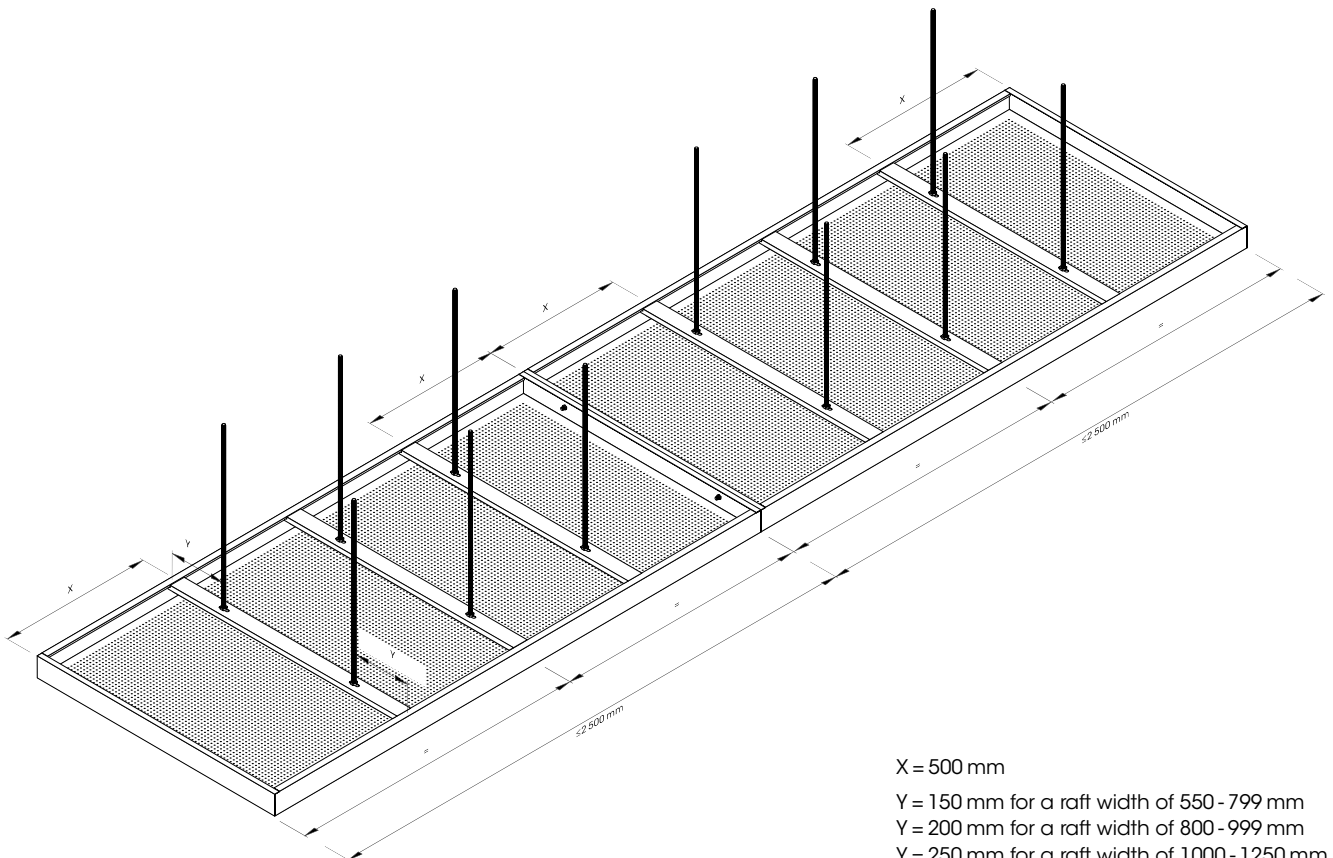
1. Prepare ceiling- and lighting installation plan or adopt architect's plan.
2. Check ceiling lighting installation plan versus structural conditions.
3. Prepare a bill of materials, including a suitable work plan and retrieval/order of the materials required.
4. Determine the required suspension points 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. Establish which generally approved anchor is suitable. Check the raw ceiling and the walls. Mark the anchor mounting holes and drill them. Mount the anchors as specified by the anchor manufacturer and carry out extraction tests using the device recommended by the anchor manufacturer, if necessary.

6. Shorten intended fastening elements, such as the M6 threaded rod to the intended length or order the correct length and mount it on the raw ceiling.
7. Attachments or other loads are to be mounted separately. For logical reasons these parts are integrated during the assembly process.
8. After completion and pre-acceptance of the ceiling, the sequence of joints should be re-aligned. Dirty ceiling panels should be cleaned, to obtain a perfect appearance of the finished ceiling.

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$X = 0,23 \times \text{Single panel length}$
 $Y = 150 \text{ mm}$ for a raft width of 550 - 799 mm
 $Y = 200 \text{ mm}$ for a raft width of 800 - 999 mm
 $Y = 250 \text{ mm}$ for a raft width of 1000 - 1250 mm



$X = 500 \text{ mm}$
 $Y = 150 \text{ mm}$ for a raft width of 550 - 799 mm
 $Y = 200 \text{ mm}$ for a raft width of 800 - 999 mm
 $Y = 250 \text{ mm}$ for a raft width of 1000 - 1250 mm

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The following recommendation for the number of transverse braces refers only to assembly in indoor applications without additional loads.

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 construction.

ASSEMBLY OF THE TRANSVERSE BRACE

1. Establish position of the raft ceilings according to the reflected ceiling plan
2. Level and outline the given ceiling height.
3. Establish axis grid for the transverse braces:
 - 3.1. At a single panel length of ≤ 2500 mm 2 transverse braces will be used. For the distances of the transverse braces, the following formula can be used as recommended value: $X = 0.23 \times$ single panel length [X = distance of the transverse brace from the outer edge of the single panel].
 - 3.2. At a single panel length of > 2500 mm 3 transverse braces will be used. When using 3 transverse braces, one transverse brace is mounted in the raft centre and the two outer transverse braces are mounted at an edge spacing of $X = 500$ mm from the outer edge of the raft ceiling.
4. Define the suspension points.
5. Drill the holes for dowels.
6. Mount the dowels according to the manufacturer's instructions.
7. Cut the threaded rod M6 to the required suspension height.
8. Screw in the threaded rod M6 all the way according to the manufacturer's instructions.
9. Screw the hexagon nut M6 onto the threaded rod.
10. Fasten the transverse brace above the threaded rods with a rigid and self-securing screw connection M6.
11. Place the transverse braces horizontally, vertically and aligned for the specified ceiling height.
12. When adjusting the height, observe the permissible height tolerances according to EN 13964; readjusting it, if necessary.

RAFT CEILING ASSEMBLY

1. The raft ceiling must always be mounted by two persons.

2. Wear clean cotton gloves.
3. Remove the protective film from the ceiling panels, if available.
4. Lift left single panel with its upper long side diagonally above the transverse braces and introduce it with its lower long side into the suspension slot of the transverse braces.
5. Lower the upper long side of the single panel and introduce it into the suspension slot of the transverse braces.
6. Lift right single panel with its upper long side diagonally above the transverse braces and introduce it with its lower long side into the suspension slot of the transverse braces.
7. Lower the upper long side of the single panel and introduce it into the suspension slot of the transverse braces.
8. Slide the two single plates of the raft ceiling towards each other edge to edge and align the position of the raft ceiling according to the reflected ceiling plan.
9. If desired, the two abutting faces can be joined by a screw connection.

RAFT CEILING DISASSEMBLY

1. The raft ceilings must always be dismounted by two persons.
2. Wear clean cotton gloves.
3. Disconnect the screw connected at the two abutting faces [if present].
4. Lift the left single panel and lower it with one long side moving it past the transverse braces.
5. Then lower the other long side.
6. Put the single panel down and store it protected against damage.
7. Lift the right single panel and lower it with one long side moving it past the transverse braces.
8. Then lower the other long side.
9. Put the right single panel down and store it protected against damage.

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