

Installation Instruction to BEKA Mats in Plaster Ceilings

1. General

BEKA mats can be fixed to the underside of any raw ceiling or suspended plasterboard ceiling and can be plastered with nearly any mineral plaster material. Rubbing plastering though is not allowed because of the danger that the capillaries could be damaged. Standard type plaster to be used are machine type MP 75 or ip 22 and also acoustic plaster.

The small diameter of BEKA capillary tubes allow thin layers of plaster (approx. 10 mm), through which high cooling capacities are reached. The supply lines and the mains of the mats are normally arranged in the hallway in wall slots or under cover (this could be baseboards or stepped plaster endings).

At beginning of the work a ceiling pattern with the lay-out for the mats positions and supply lines must be prepared. In this pattern all areas which will stay uncovered must be marked (positions of inner walls, light fixtures and other ceiling in-lays). The position of the dew point sensor must be outlined at the ceiling pattern.

2. Installation Steps at the Raw Ceiling

Preparation of the Raw Ceiling

- The raw ceiling must be dry and free of separating substances (observe cleaning directions).
- Close holes, smoothen the uneven parts
- Define the position of mats.
- Fix pipe clamps for the supply lines and collector pipes.
- Pre-drill dowel holes into the ceiling for the fastening of the mats.
- Install cable for smoke detector or lamps and fix the fasteners by means of rag bolts (protect thread with tapes).

Connect BEKA Mats to Water Lines, and perform a Pressure Test

- Install the supply lines
- Connect the BEKA Mats to the supply lines (see → M02 – Instructions for thermal welding of plastics)
- Pressure test of the installed system. (see → M07 – Test instructions for BEKA heating- and cooling systems)
- Set idle pressure to 3 bar (mats stay at 3 bar pressure for entire time of installation).
-Compressed air is recommended

Fixing of Mats to the Raw Ceiling

- Fix BEKA Mats to raw ceiling by means of:
 - Disc-dowels or plug -dowels
 - Butyl adhesive-tape and application of gypsum pads (see instruction M17)
- Align the mats and stretch the capillary tubes
- Fix and make electric connection for the BEKA dew point sensor for the plaster (see → M06 Instructions to the installation of BEKA dew point sensors)

Apply plaster and smoothen (obey Manufacturer's Instructions!)

- Apply primer for the plaster
- Apply plaster – assure that only a minimal plaster thickness is applied; normally 10 mm (the plaster thickness influences the expected cooling capacity decisively!)
- Smoothen plaster – definitely avoid any damage to the capillaries.
- Damages must be repaired at once (warm-up ends of damaged tubes with welding unit or soldering iron and press the end of the tubes together, if necessary replace the whole mat).

Ceiling Finish

- Apply layer of paint
- Trim the snuffing pipe of the sensor even with the ceiling surface, mark its location (dirt must be kept from the snuffing pipe openings to avoid that the sensor will not function!).

3. Installation Steps for the Suspended Plasterboard Ceiling

Prepare the Sub-construction

- Arrange the connection piping for the BEKA mats at the ceiling according to the lay-out plan
- Fix the CD – profiles firmly to the vernier suspension bars, according to manufacturer's instructions. The sub-constructions must be installed in such a way, that the supply- and return lines of the BEKA mats are on top of the plasterboards. Consider an additional load of nearly 15,5 kg/m².

Connect BEKA mats to water lines and do pressure test

- Hang BEKA mats with the mains according to the lay-out plan into the sub-construction – the mats are then hanging down into the room. If the mats are too long, they are rolled-up loosely and held together with wires.
- Connect the BEKA mats to the supply lines inside the ceiling cavity (see → M02 - Instructions for thermal welding of plastics)
- Pressure test of the installed system (see → M07 – Test instructions for BEKA heating- and cooling systems)
- Set idle pressure to 3 bar (this pressure stays applied to the mats for the entire time of installation until start of operation!) . It is advisable to use compressed air.

Installation of Plasterboards

- Fix plasterboards with rapid-fixing-screws to the sub-construction, according manufacturer's instructions – push the plasterboards from both sides to the BEKA mats to form gaps of approx. ca. 10 mm.

Fixing of Mats to the Sub-ceiling

- Align the BEKA mats at the sub-ceiling, fix with double sided adhesive tape – stretch the capillary tube mats. Alternative: Fix with staples; check-up the compliance of the staples quality with the plaster manufacturer (see → M19 Installation instructions to BEKA mats with staples)
- Installation and electrical connection of the BEKA dew point sensor (see → M06 Instruction for the installation of the BEKA dew point sensor)

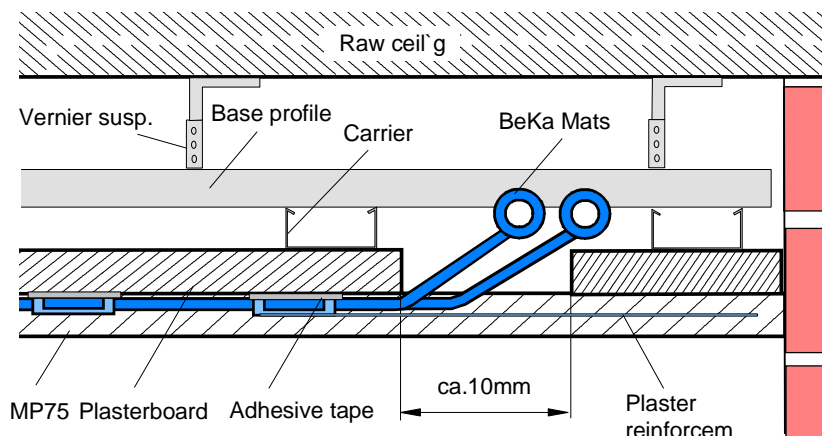
Apply plaster and smoothen (obey manufacturer's instructions!)

- Close installation slots with joint filling material by adding fibre cloth strengtheners into the plaster.
- Apply primer for the plaster
- Apply plaster – assure only a minimal plaster thickness: normally 10 mm (the plaster thickness influences the expected cooling performance decisively!)
- Smoothen the plaster - definitively avoid any damage of the capillaries; Damages must be repaired at once. If necessary replace the whole mat.

Ceiling Finish

- Apply paint
- Trim snuffing pipe of the dew point sensor even with the surface of the ceiling. (Dirt must be kept from the snuffing pipe to avoid that sensor will not function!)

Principle of a BEKA mat positioned below a plasterboard ceiling imbedded in plaster



4. *Alternative Installation of BEKA Mats through embedding directly into Plaster**

ATTENTION ! This installation is only possible when the installation work is closely coordinated between the installer and the plasterer. Instructions and special advice for plastering are to be obtained from the plaster producer.

Preparation of the Raw Ceiling

- The raw ceiling must be dry and free of separating substances (observe cleaning directions)
- Close holes, smoothen the uneven parts
- Apply plaster base
- Define the position of mats
- Fix pipe clamps for the supply lines and collector pipes.
- Pre-drill dowel holes into the ceiling for the fastening of the mats.
- Install cable for smoke detector or lamps and fix the fasteners by means of rag bolts (protect thread with tape)

Connect BEKA mats to waterlines and execute pressure test

- Install the supply lines
- Connect BEKA mats to the supply lines inside the ceiling cavity (see → M02 - Instructions for thermal welding of plastics) – the mats should hang loosely rolled up, even better though, straight down from the ceiling
- Pressure test of the installed system (see → M07 – Test instructions)
- Drain the System
- Set idle pressure to 3 bar (this pressure stays applied to the mats for the entire time of installation until start of operation!)
- Place cable of dew point sensor loosely into pre-determined position

Apply Plaster and smoothen (follow manufacturers instructions)*

- Apply plaster in a thin caterpillar in the width of the mats, in the total length – DO NOT SMOOTHEN YET! - apply in sections! Set plaster to a sturdy consistency!
- Unroll the BEKA mats below the ceiling and stretch the capillary tubes in installation direction.
- Do not push the capillary tubes into the moist plaster - DO NOT PLANE THE PLASTER! DO NOT USE SHARP - EDGED

TOOLS! (similar to embedding reinforcement fabric)

- Afterwards (within 15 minutes after first application) apply a second thin layer of plaster (normally 10 mm is enough) (the plaster thickness influences the expected cooling performance decisively!) - Set plaster to the usual consistency!
- Position dew point sensor above the capillary tubes in the moist plaster.
- Embedding of reinforcement fabric 80 x 80 mm at the mats ends and in critical spots is recommended.
- After settling smoothen the plaster - definitely avoiding any damage of the capillaries; damages must be repaired at once (warm-up ends of damaged tubes with welding unit or soldering iron and press ends of tubes together, if necessary replace the whole mat)
- Smoothen the plaster - definitely avoiding any damage to the capillary tubes.

Ceiling Finish

- Apply paint
- Trim snuffing pipe of the dew point sensor even with the surface of the ceiling. (Dirt must be kept from the snuffing pipe to avoid that sensor will not function!)

*The installation steps have been established coordination with the Firm:
Maxit Baustoff- und Kalkwerk Mathis GmbH