Applications

The MTB is a heating and cooling system for commercial and industrial buildings. These structures are heated or cooled by MTB, as heat or cooling is directed directly at users such as fitters, warehouse clerks, churchgoers, department store customers, production staff. Hangars, workshops and warehouses require a homogeneous vertical temperature profile which can be implemented well with the MTB.

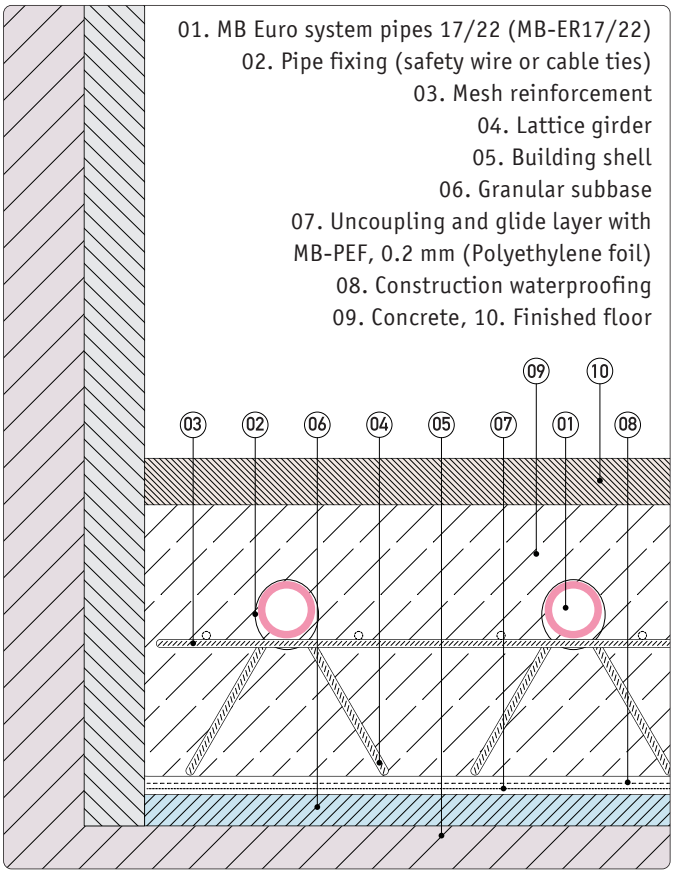
Load capacity and construction example

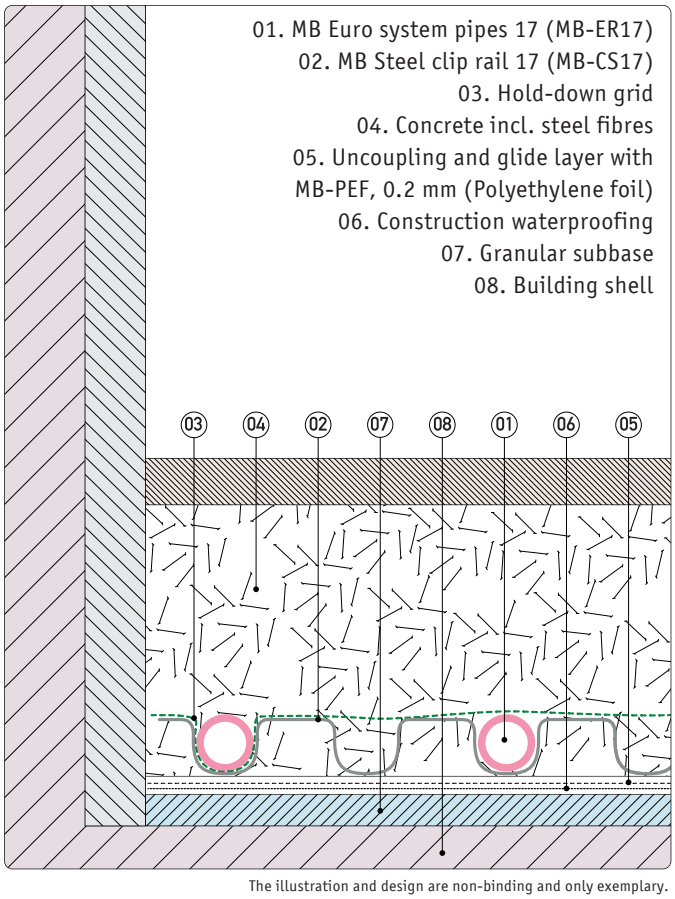
On principle, any traffic load can be implemented. The entire construction is determined by the structural engineer. The structural engineer assesses the requirements for the building's use. This includes e.g. concentrated loads of shelving in warehouses and even their dynamic loads from forklift traffic. The MTB can be installed in reinforced concrete, prestressed concrete, rolled concrete, steel fibre concrete or even vacuum concrete. The construction shown below is therefore merely an example. Both the placement of the MB Euro system pipes (MB-ER17/22) and the resulting fixation in the construction are always based on the specifications of the structural engineer. MULTIBETON offers structural engineers various (including custom) solutions for fixing the MB Euro system pipes (MB-ER17/22). The maximum temperature load of the concrete should normally not exceed 55 °C.

The height reference point on the site which must be met must be checked to ensure the planned construction height is given throughout. When planning the construction layout, the relevant laws, regulations, directives and standards must always be observed.

System installation

Installation follows the MULTIBETON plan. Then follow the MULTIBETON installation and technical guidelines. In addition, planning and installing the MULTIBETON surface heating/cooling system must comply with the relevant laws, regulations, directives and standards. Additional instructions of manufacturers for other trades and the recognised rules of technology and proper trade workmanship must be observed.





The illustration and design are non-binding and only exemplary.

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State of construction
If the bottom slab is installed before the hall walls or ceiling, measures must be taken to protect it from the weather. Before installing the MTB, the foundation must be approved by the site manager.

Subfloor and base course
If the subfloor does not offer adequate load-bearing properties, an additional base course will be used. The base course absorbs load from the concrete slab and passes it on to the subfloor. The base course is over the subfloor and should have the same homogeneity and thickness. Base courses are typically gravel, aggregate or cellular glass gravel.

Granular subbase
The subfloor or base course is typically covered by a granular subbase consisting of a thin layer of concrete or even fine sand.

Construction waterproofing
Building parts in contact with the ground must be sealed in compliance with the standards. These are floors on the ground floor in buildings without basement, or basement floors. Construction waterproofing is typically strips of materials such as bitumen or PVC. Whether it is necessary and the type are typically determined by the building planner.

Joints
Concrete slabs expand and contract by nature. Floor and building joints must be placed to allow for this without damaging the concrete slab. A joint plan showing the type and location of expansion joints must be drawn. The joint plan is drawn by the building planner and must be submitted to the installer as part of the technical specifications. The heating contractor must install the heating circuits and supply lines based on the joint plan. Expansion joints are placed on one or both sides of the concrete, keeping concrete out of the expansion joints to ensure proper function of the expansion joint. If these floor and building joints cross, MB Euro system pipes (MB-ER17/22) must be installed inside conduit to compensate for the length differences. The bottom of the expansion joint butts straight up against the Uncoupling and glide layer and reaches to the top edge of the finished concrete construction. When planning the expansion joints, the general rules of technology, technical information and bulletins of the trade associations, the relevant laws, regulations, directives and standards must be observed.

Insulation
According to national energy laws for buildings, the minimum heat insulation applies to industrial buildings. Exceptions and exemptions for special cases must be coordinated with building authorities.

Uncoupling and glide layer
An uncoupling layer (MB-PEF, Polyethylene foil) is used to separate the concrete slab from the base course, the subfloor or the insulation. This ensures liquid concrete does not run into the lower layers and prevents thermal bridges. If the concrete slab has to bear high loads, a glide layer of two layers of polyethylene foils is used. This prevents horizontal friction between the layers.

Fixing building facilities
The heating contractor should be notified if fixing elements for building facilities protrude far enough into the concrete slab they could damage the MB Euro system pipes (MB-ER17/22). In this case, the heating contractor will leave out the corresponding areas during installation.

Functional heating
A functional test must be performed on concrete slabs. This heating is coordinated with the structural engineer and the concrete worker. When heating is turned on depends on the concrete construction type and thickness. For standard concrete thicknesses (10 to 30 cm), heating is turned on once the concrete area has been approved by the site manager (approx. 28th day). After this, the flow temperature will be kept 5 K above the concrete temperature. It is then raised 5 K per day until the delivery temperature is reached. The delivery temperature is maintained for one day. The temperature is then lowered 10 K per day until the operating temperature is reached. Functional heating must be documented.

Silent cooling
MULTIBETON underfloor heating is ideal as “Silent cooling”. These systems are inexpensive, as they only require a cooling unit or a reversible heat pump with the corresponding control unit. The maximum output (30 - 50 W/m²) of “Silent cooling“ comes from the dew point calculation, the calculated lowest cooling flow temperature and the user’s comfort level.
The design of the cooling components, including the insulation of the heating circuit manifolds, must be carried out in proper trade workmanship.

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