

## International Engineering

**MERO**  **TSK**  
MERO-TSK International GmbH & Co. KG  
**Floor Systems**

## Editorial

MERO-TSK International is a globally operating company. Its products can be subdivided into three groups: construction systems, floor systems, and exhibit systems.

MERO was founded in 1949 by the engineer Max Mengerlinghausen, PhD. Dr. Mengerlinghausen is regarded as a pioneer of modular construction methods and the space framework systems derived from it. The idea of prefabricating construction elements on an industrial basis was implemented with the development of false floor raised above an existing floor which, in the early 1960s, was a completely new line of products. Today, we are proud to say that our system floor business section has evolved into a successfully operating unit within the MERO-TSK group, not just in Germany but also on an international scale.

In this brochure, we would like to show you a number of selected projects we did in the past few months. Next to office buildings, all of which feature system floors by default, we had many other opportunities to prove what it means to implement sophisticated engineering ideas in our flooring systems division.

If you put in a access floor, you will enjoy a double-

portion of benefits. In addition to creating a hollow space or chase, which guarantees a very flexible use for using a given building, such floors take on ever-more functions which focus on the well-being of your staff. More and more employers recognise and acknowledge that a certain sphere is required for their staff to perform highly. In order to permanently generate a good climate in an office, a good room climate is necessary. The floor systems of MERO-TSK have heating and cooling capabilities (pages 6 and 7). In connection with this, ventilation systems are another component which our access-floors can accommodate. A particularly high-quality edition is our displacement flow floor, which is to be seen on pages 4 and 5. And you won't lose out on aesthetics either: you will find high-quality floor applications on pages 14 through 17.

In many of the projects, the floor had to be designed for very heavy loads. Next to computer centres and areas close to production (e.g. test stands), we would like to mention that we also manufacture floors for clean rooms. Even though heavy loads weigh the same in every country of the world, our flooring system engineers still had to learn the various "languages" of the respective

guidelines and directives that are spelled differently all over the globe. Now, we are not only able to meet European standards but also those of the Anglo-Saxon world with our certified MERO-TSK products.

In the area of fire safety, on the other hand, we have chosen a different path. Following numerous tests with the most varied products, we are convinced that the directives for fire control in place in Europe and Germany are the most effective. Therefore, we are aiming at establishing those guidelines for our floor systems worldwide (confer pages 12 and 13).

And, last but not least, with the ICC Tower project in Hong Kong we were able to prove that our products meet a high environmental standard.

So go ahead and enjoy looking the following pages



Owner MERO-TSK  
Günther Tröster



Manager & Head of Floor  
Systems division  
Martin Gillmeister

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## Special Floor For Technical Facilities

Technical Special Solution

# Ventilation Floor – Barmenia, Wuppertal



Expansion, refurbishment, and re-development of the headquarters of the Barmenia insurance company  
15.000 m<sup>2</sup> Special Combi-T-construction  
3.500 m<sup>2</sup> Type No. 6 NB38  
Client: Barmenia Wuppertal  
Architecture firm / Project steering / General planning by:  
alB agiplan Integrale Bauplanung GmbH  
Company for general conversion of the interior: Kaefer-Darmstadt, Germany

**In the year 2000, the Barmenia Versicherungen insurance company commissioned aIB agiplan Integrale Bauplanung with the expansion, refurbishment, and re-development of their head offices in Wuppertal. As part of a master plan, aIB drafted a new floor plan for the building, which joins the existing wings of the building in a compact way, thus optimising floor space requirements.**

For the office areas, MERO-TSK developed a completely new floor construction, based on MERO Combi T and MERO Type 2. Each of the three wings has 7 floors with 809 m<sup>2</sup> each of Combi T fitted on top of a substructure similar to that of Type 2. Due to

large number of installations and the fish-belly construction of the storey ceilings, a substructure matrix of 1,000 x 1,000 mm was chosen. As a result of the way in which the ceilings were constructed, the beams varied in length to counterbalance the incline of the base floor. In addition, on all floors, approx. 70 m<sup>2</sup> of Combi T with a panel matrix of 600 x 600 mm with suspended matrix braces were built into the inner cores.

The rooms are also ventilated by means of displacement flow diffusers from the floor cavity through the perforated cavity floor panels.

In order to prove its fire safety, the construction was tested in a certified material testing lab.



# Heating And Cooling – Bayer, Leverkusen

Noble granite called “Nero Assoluto” was chosen for the entrance hall, which is approx. 1,000 m<sup>2</sup>. The foyer temperature is regulated by means of MERO Type 4, a combined floor heating and cooling system. This construction utilises the high heat-conductivity of metal tubs which are filled with anhydrite.

As a result of choosing this design, the highest possible degree of flexibility is guaranteed: additional low-lying bearing pads for a thermo-cassette are hung into the bearings of the pedestal heads. At the top, this cassette is covered with a metallic thermo-sheet with longitudinal swages. The synthetic pipes of the heating

system are clipped into those swages. For maintenance works and upgrading purposes, the heating pipes can thus be unclipped so that the thermo-cassettes underneath can be taken out or removed. This easy access makes it possible to keep the heater circuit units in the hollow space of the access floor. In the project at hand, this led to a significantly lower loss of heat and a high cooling performance of 40-42 W/m<sup>2</sup> which, in relation to the entire space, is equivalent to a total cooling capacity of 32 KW. The porter’s office with people coming and going all the time was equipped with its own heating circuit, featuring higher flow temperatures and a separate cooling system.





MERO's access floors create plenty of space on a total of 12,000 m<sup>2</sup>, for installing telecommunication equipment and HVAC.

Foyer : Approx. 1,000 m<sup>2</sup> of integrated floor heating and cooling system. "Nero Assoluto" - granite for the finishing surface.  
Office: Approx. 11,000 m<sup>2</sup> fitted with high-quality textile SL tiles.

Client: Bayer Leverkusen, Germany  
Architect: Helmut Jahn, Chicago, IL (USA)

# Clean Room – Bosch, Reutlingen



Expansion of the production area in Building No. 121, an industrial building under the conservation act, erected between 1901 and 1903.

2,250 m<sup>2</sup> of steel floor Type 3 RR 44 by MERO with a DLW Royal LG2-finish, suitable for clean rooms

Client: Bosch Reutlingen  
Co-ordination, Planning and Site  
Engineer: Bosch REP + Bosch FCM



Since the middle of the 1990s, MERO-TSK has been supplying the Bosch company site in the city of Reutlingen, Germany with access floors for its production area. In this division, Bosch manufactures semiconductors and sensors for engine management systems and security systems for the automotive industry. The respective testing centres are joined to these production divisions.

Up until now, approx. 10,000 m<sup>2</sup> of access steel floors with clean room characteristics have been used. In individual cases, the requirements for the surface integrity, abrasion resistance, and their resistance to chemicals had to be proven. Also, the structural and dynamic load on the floors called for specific designs for each project.

In the project shown here, perforated access floor panel was used. About 44 percent of their cross section was free. For the finishing, DLW Royal LG2, a clean-room-compatible edition was used.

Due to the special matrix beams in the floor which are equipped with pedestal legs, MERO's access floors are characterised by extreme stability and rigidity even for dynamic loads, e.g. material transporters. The design also guarantees the available free hollow space for the installations is not limited by the profiles of the matrixes.

Due to their additionally adapted design, the steel floor panels can withstand the greatest concentrated loads with regards to transport paths.





**While outside of Europe one concentrates mainly on the characteristics of the materials to optimize fire protection, the European approach takes it one step further.**

In addition to the building material class, the fire resistance value or factor is a second important criteria used to determine the fire safety of a given component. In connection with this MERO-TSK had commissioned several material testing labs to carry out comprehensive tests in their facilities. They found out that the European fire protection concept with fire-proof panel materials on the one hand and designs where the grooves of the access floor panels are closed, on the other hand, provide the greatest protection in case of a fire.

MERO-TSK is in the position to offer designs that would withstand a fire for over 60 minutes. The fitness of the floors is regulated by the German and European DIN standards, DIN 4102 and DIN EN 13501 respectively. The following functions of the flooring are thereby guaranteed:

- Fully equipped fire-fighting units can walk on the access floor even with heavy loads for 60 minutes.
- In case of a fire, the panels surface materials are not subject to heating up extremely fast since the panels do not feature complete steel frames or steel reinforcements. The European regulations limit the average permissible increase in temperatures at the surface to 140° Kelvin. As a result, in case fire does break

out, the access floors are available as escape routes for a longer period of time.

- The accurately manufactured edges with a special edge veneer prevent toxic gases, which emerge in case of a fire, from spreading quickly. The required low ratio of leakage air can only be achieved with panels that do not feature a steel frame or steel reinforcement.

MERO-TSK is aiming at establishing these benefits and advantages in all markets.

## European Safety Standards



# Fire Safety Standards



MERO-TSK complies with and trusts German and European fire safety standards.

Building material class and fire resistance are factors which, in case of a fire, are to significantly improve the safety of administrative buildings.

**Due to special ecological requirements, the MERO access floor was tested for product emissions pursuant to ASTM D5116-97. The entire panel and pedestal system was examined:**

Panel:

Mero-TSK Type 6 GBB 30, calcium sulphate core 30 mm, galvanised steel sheet underneath and above the panel; veneered panel edges

pedestal: Mero-TSK steel pedestal, galvanised and passivated yellow, with bearing pads.

The test result showed a TVOC value of less than 500  $\mu\text{g}/(\text{m}^2\text{h})$ . Hence, the categorisation criteria of the Hong Kong Green Label Scheme – Product Environmental Criteria for Flooring Materials GL-008-002 were fully met.

Test report number.

210734D-71-181

Testing lab: Eurofins Danmark A/S

Smedeskovvej 38, DK-8464 Galten

Accreditation: The DANAK testing methods pursuant to ISO 17025-1 were accredited (No. 168).

## Green Label – ICC Tower, Hong Kong



# Emission Protection



The International Commerce Centre is a 118-floor skyscraper which is currently being built; it'll be 484 m high when it is finished.

Its 160,000 m<sup>2</sup> floor was fitted with MERO's access floor Type 6 GBB 30.

General contractor: Sun Hung Kai Prop.

Architecture firm:  
Wong & Ouyang, Hong Kong

Engineering company:  
Ove Arup Partners, Hong Kong



The Qatar Science & Technology Park is a centre for companies from all over the world, where they can develop and market their technologies. MERO-TSK was commissioned with the construction of the so called "Shadow Roof" as well as the fitting of the 38,000 m<sup>2</sup> of access floors, 6,000 m<sup>2</sup> of which were fitted with "Travertin 40 mm" rock floor panels. Total order value: Euros 50 million. Client: Qatar Petroleum

# Natural Stone Travertin



The Qatar Science & Technology offers technology companies suitable office space, services and support as well as serving as some kind of a "germ cell for business" which creates a platform for business men to face new technological challenges. This science park is a free trade zone where foreign companies settle down and enjoy the benefit of freedom from taxes. Companies such as EADS, ExxonMobil, GE, Microsoft, Rolls-Royce, Shell, and Total have moved there.

and businesses of the Gulf region, triggering innovations which will benefit both the industry as well as the society of the country.

The challenge for MERO-TSK was gluing "Travertin", a 40 mm rock surface, onto MERO-TSK calcium sulphate panels (MERO Type 6). For this purpose, the edge band goes all the way up to the upper edge of the rock surface. This required a special gluing and manufacturing technique. The weight of each panel was 53 kg, a particularly tall order for the workers mounting them.

QSTP is also one of Qatar's first free trade zones featuring simple and attractive possibilities for starting a business of one's own in the country. By fostering technological developments right there, QSTP creates the conditions for researchers

## Science & Technology Park, Doha Qatar



The Westraven Tower belongs to the highest state building authority for structural engineering (Rijksgebouwendienst), which sublets the building to the road and hydraulic engineering authorities (Rijkswaterstaat).

The existing building was cored and completely remodelled. In doing so, special design requirements for the interior decoration had to be met. The high aesthetic expectations with regards to the floors were met through a special surface top.

Following thorough sampling inspections, a stainless steel sheet with a special grinding surface pattern was chosen. In order to guarantee a uniform surface, a special grinding technique was developed for this project. MERO's Type 6 based on a calcium sulphate material served as a mounting plate.

## Westraven, The Netherlands



Special Surfaces  
**Stainless Steel**



**Project:** New office building in  
Westraven, Utrecht, The Netherlands

**Client:** Rijksgebouwendienst,  
Ministerie van VROM

**Architecture firm:** Architecture bureau  
Cepezed B.V., Phoenixstraat 60B, Delft,  
The Netherlands

**Mero-TSK Partner in The Netherlands:**  
PBS-Holland B.V.  
Griekenweg 8 – 10  
5342 Oss, The Netherlands

# Data Centre

Even in the planning stages, intensive meetings took place between the planners, users and experts to discuss the wishes of the user, i.e. SAP, and the technical possibilities there are that can be carried out. In the implementation of the thus optimised plans, approx. 14,200 m<sup>2</sup> of MERO's access floor Type 6 NB were used with screwed-on matrix beams and pedestal elements that were doubly dowelled in the base floor. In spite of the floor height of 80 cm, fire safety-compatible bridging elements of up to 2 metres could still be used due to the high installation density. For the refrigeration of compu-

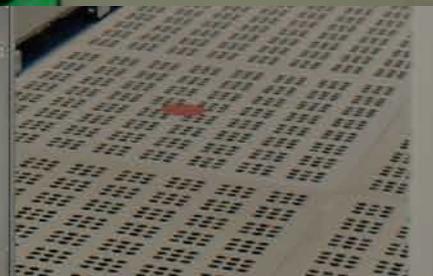
ters and computer rooms the access floors were designed as pressure floors. The air is diffused into the rooms via 7,900 perforated steel panels with a continuously variable volume regulation. In order to achieve an optimised placing of the computers, half of the perforated panels were designed and fitted in a special format. Factory-made caoutchouc rubber for protection from ESD was used on 11,500 m<sup>2</sup> of access floors in the corridors and computer rooms. More than 500 m<sup>2</sup> of computer cabinet frames guarantee the stability of the computers cabinets standing on MERO's Type 2.

## SAP Walldorf

Project: New building of computer centre in St. Leon Rot

14,000 m<sup>2</sup> Type 6

Client: SAP AG, Germany  
Planning and site engineer:  
Architecture firm Vorfelder,  
Walldorf, Germany



## IBM Ballerup, Denmark



Project: Computer Centre in Ballerup, 1,600 m<sup>2</sup>, special construction

Client: IBM, Denmark

It has been several years, since access floors by MERO-TSK were prepared to hit the Anglo-Saxon markets. For this purpose the management of the floor system division presented the MERO engineers in the research and development department with demanding requirements. Next to "simple" office space, they were also to come up with the most complex designs. Based on this development in Scandinavia, IBM has already carried out several projects with the access floors of MERO.

In the project shown, there is a special, 1,600 m<sup>2</sup> computer centre with a floor height between 400 and 850 mm.

Hence, the load requirement which was to be met pursuant to MOB PSA was an "Extra Heavy Grade". The special matrix beams used for this purpose were screwed together with the pedestal. In addition to that, extraordinarily high anti-corrosion requirements had to be met. All steel components were provided with a special coating.

At last, the efforts of MERO's engineers were crowned with success: the system was tested by the British testing institute B.I.T.S. and as certified as "Extra Heavy Grade" pursuant to MOB PSA.

The following mounting plate was used:

Panel:  
Calcium Sulphate Type 6,  
ventilation panels free cross  
section 32 %  
Top:  
PVC Forbo Colorex SD, 2mm  
conductivity



TÜV-certified since 1997



**DGNB**

Deutsche Gesellschaft für Nachhaltiges Bauen e.V.  
German Sustainable Building Council

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