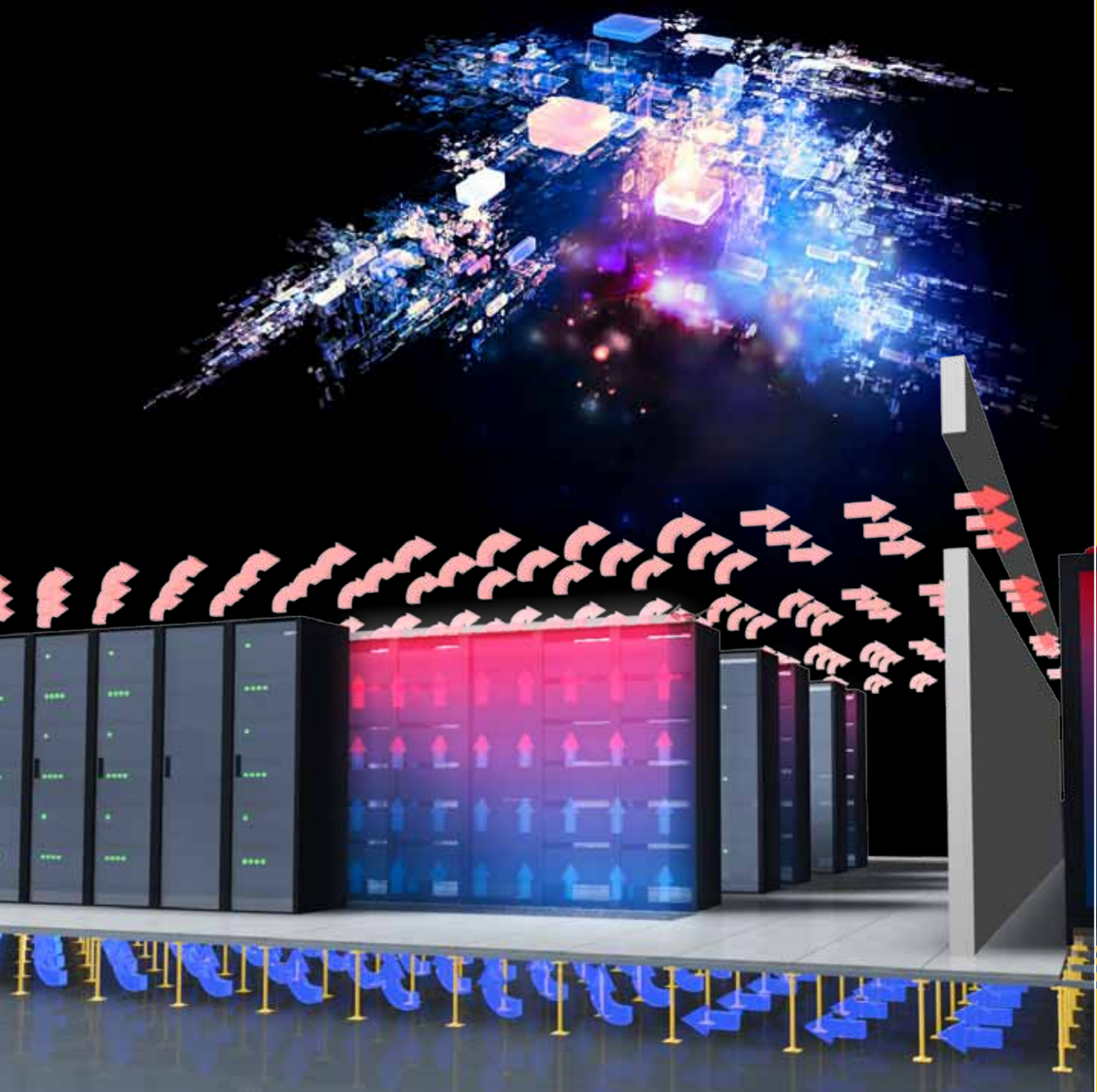
MERO Access Floor / Floor systems for data centers*

*Ready for Cloud-Computing

Innovative solutions from one source

Development
Consulting
Planning
Manufacturing
Installation

Access floor
Hollow floor
Floor covering and
Installation
Services



MERO-TSK International GmbH & Co. KG

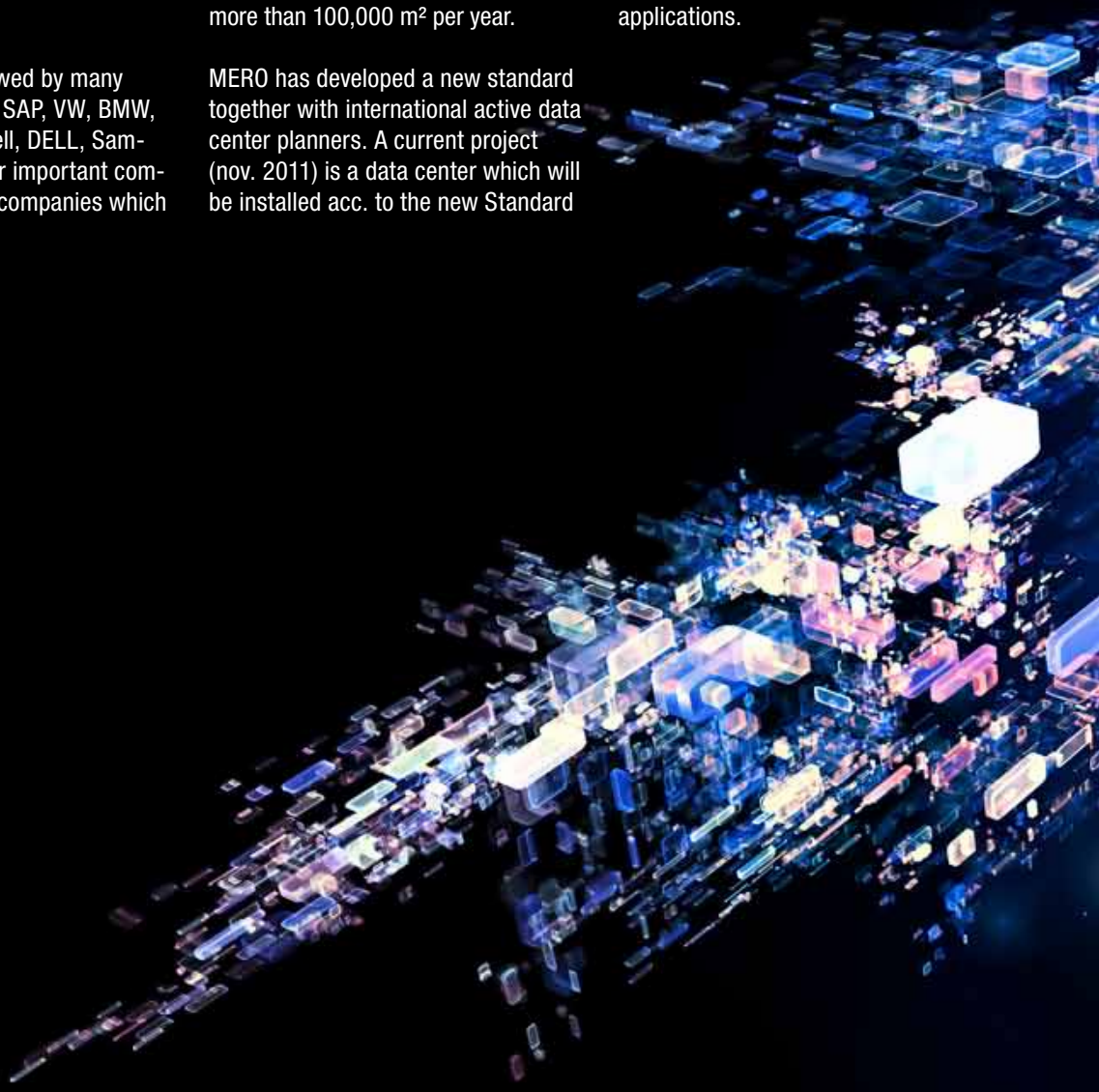
Floor Systems

Ready for the future

All started 50 years ago. At that time, MERO received the first order to construct an access floor for an IBM data center.

Later, IBM was followed by many famous names like : SAP, VW, BMW, DHL, Sony, Honeywell, DELL, Samsung and many other important companies worldwide – companies which rely on the high quality and the years of experience of MERO data center access floors. Nowadays we install more than 100,000 m² per year.

MERO has developed a new standard together with international active data center planners. A current project (nov. 2011) is a data center which will be installed acc. to the new Standard in Singapore. MERO has a separate technical division which is also in a position to carry out earthquake-proof applications.



From 1960 …

50 years innovative solutions for data centers

… til now.

Our know-how for an operational data center

Computer power needs air and cooling

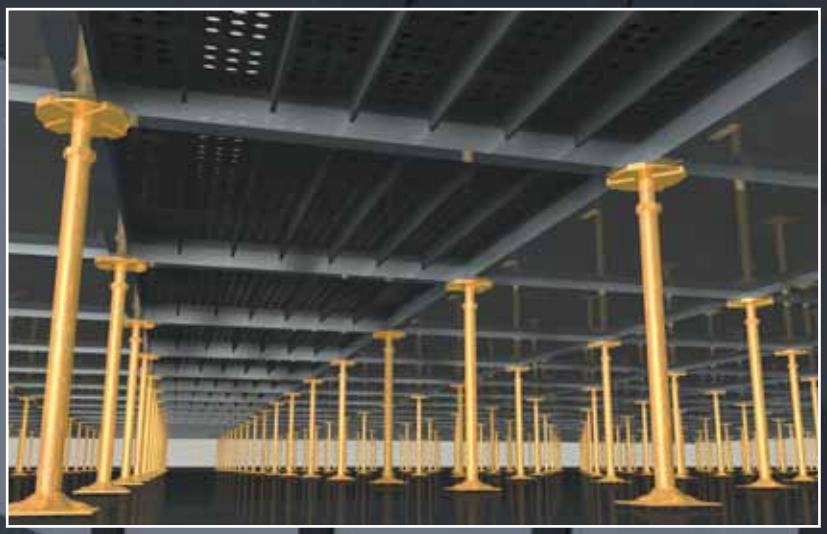
The heat which is generated during the operation of computers must be continuously, safely and cost-effectively removed whilst reducing any effect on our Natural Environment.

Data centers need suitable floor coverings

The specific requirements regarding use and conductivity are the basis for the choice of suitable floor coverings to withstand the movement of server racks, UPS and other equipment.

Our systems meet all your requirements

Computer power needs stability

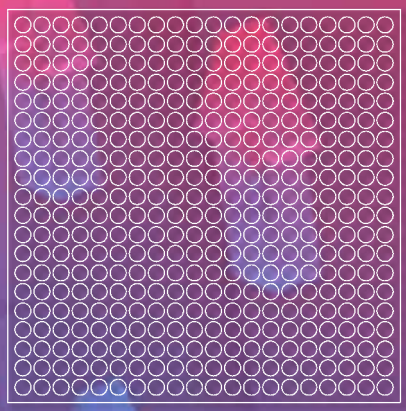


Larger floor heights, heavier racks and requirements for earthquake safety must be considered.

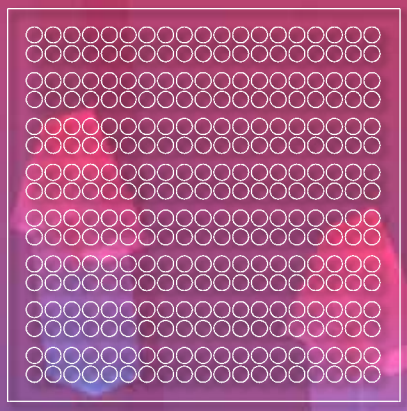
Data centers need fire protection

Data centers are huge, closed buildings where easy access to the emergency exits is very important.
The use of calcium sulphate core can bring enhanced fire-proofing and improve escape time for personel, also reduced ‘Insurance Loss’ is likely should a wet sprinkler system be in place.

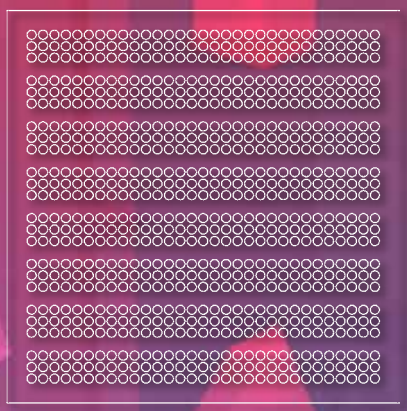
Air conditioning and cooling



53 %



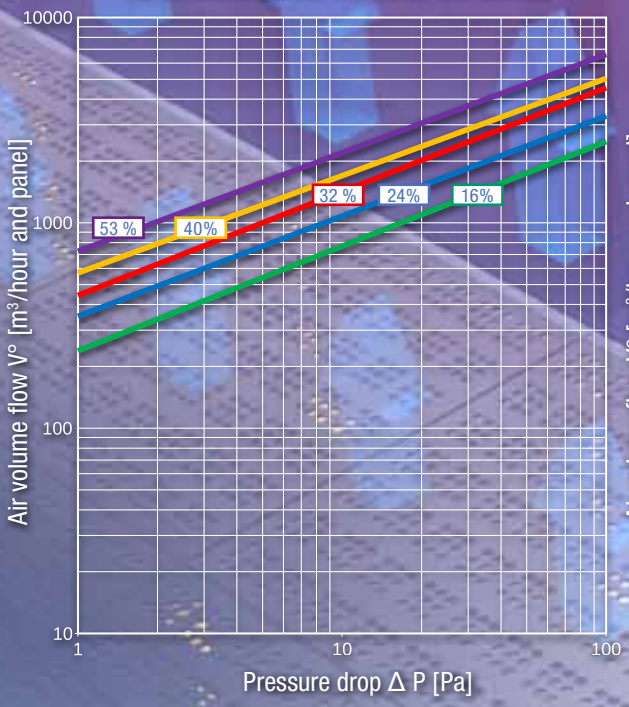
40 %



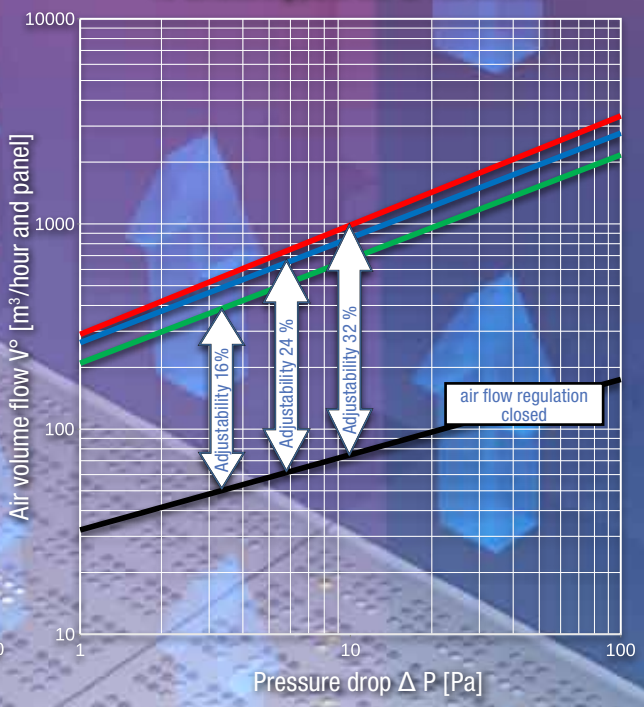
32 %

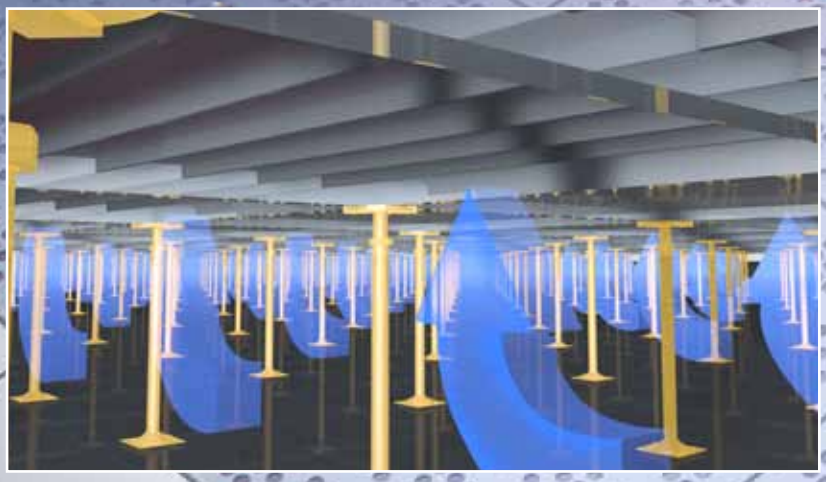
Volume pressure diagram

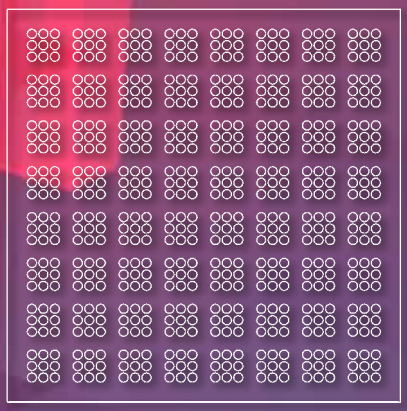
Air conditioning panel without air flow controls



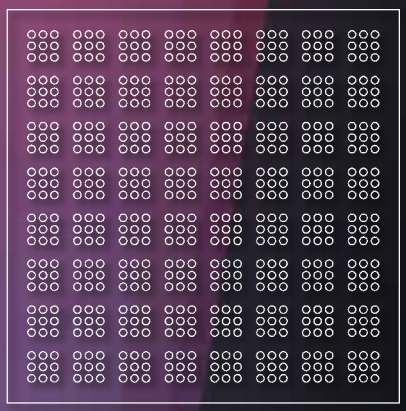
Air conditioning panel with air flow controls



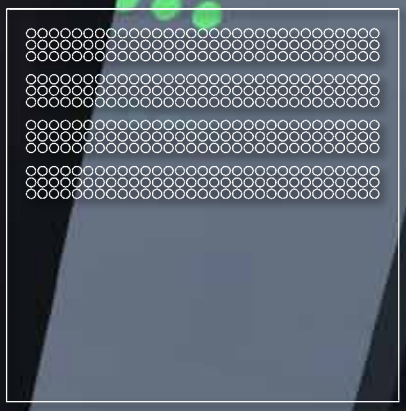




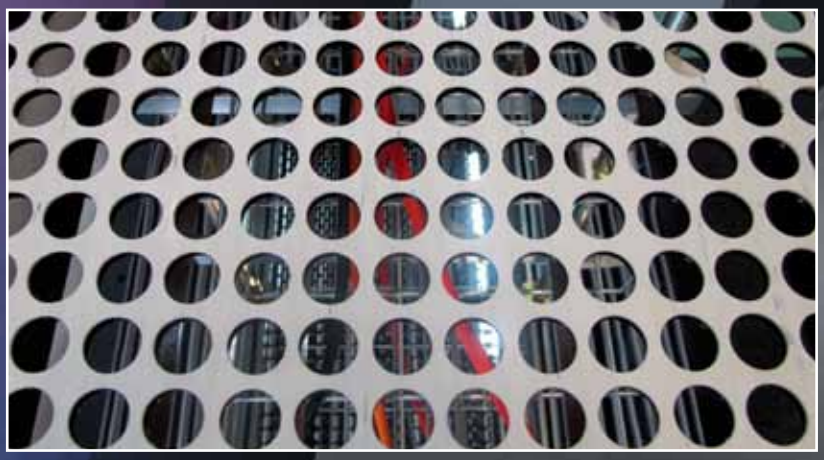
24 %



16 %



Partial perforation

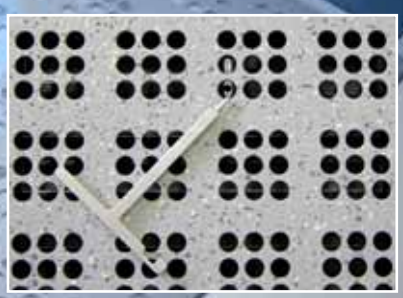


The ventilation / cooling are essential for the operation safety of the data center.

The most common system is the access floor with air plenum where the cold air is transported specifically to the racks by means of perforated panels. Higher and changing computing capacity requires larger free cross-sections and adjustment for the air volume.

In order to meet the specific requirements, MERO offers a range of air conditioning panels with free cross-sections from 16% to 53%. This makes a pressure drop of 10 Pa air volumes up to 2.200 m3 per panel and hour possible. In addition, we provide a continuously adjustable air flow control which allows the fine-tuning from above. Contrary to aluminium bar type air grills, racks etc. can be moved safely on the MERO air conditioning panels.

The access floor also provides a physical barrier if water-cooled systems are being used with CRAC units, all supply and waste lines as well as any condensation are contained under the cavity formed by the access floor, so that the data processors will not endangered in case of water leakage.



Statics

Total seismic force

$F_b = S_d(T_1)*m*\lambda$

T_1 Self-oscillation of the building for horizontal

m Total mass

λ Corrective value for MERO access floor

Design spectrum for linear analysis

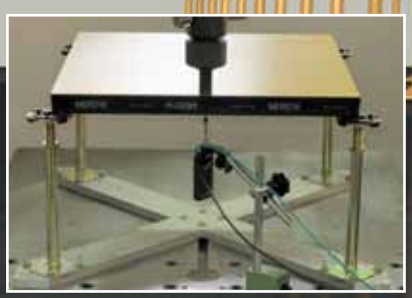
$0 \le T \le T_B \quad S_d(T) = a_{vg}*S[2/3+T/T_B(2.5/q - 2/3)]$

$T_B \le T \le T_C \quad S_d(T) = a_{vg}*S*2.5/q$

$T_C \le T \le T_D \quad S_d(T) = a_{vg}*S*2.5/q*[T_C/T] , \ge \beta*a_g$

$T_D \le T \quad S_d(T) = a_{vg}*S*2.5/q*[T_C*T_D/T^2], \ge \beta*a_g$

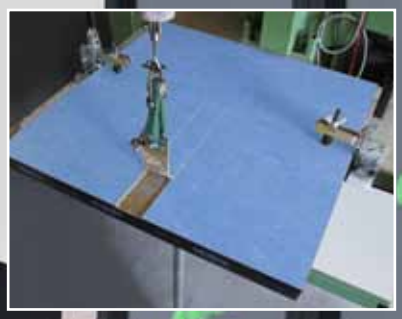
$S_d(T)$ Ordinate of the design spectrum



Increasing load capacity due to the development of racks with “drawer-system” (can be retrofitted on request at place of location), serial installation (always 2 load applications in one field) and higher construction height (buckling length of pedestals) must be considered during the planning stage.

MERO-TSK meets load requirements up to 15 KN by means of system testing acc. to DIN EN 12825 and certificate of conformity. Higher load requirements can be provided with further calculations. Specific customer requests such as calculation of seismic safety can be provided by our technical department. Depending on the seismic zone in which the project shall be executed, additional static requirements must be met.

Floor coverings

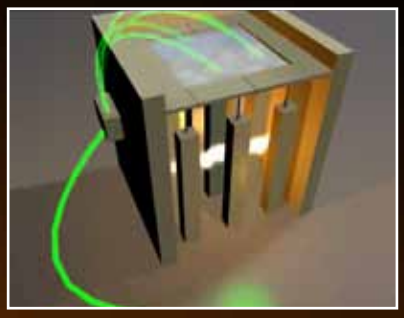


Standard panels of steel, calcium sulphate and chipboard as well as steel air conditioning panels are provided with durable floor coverings which meet the required conductivity values.

Depending on the requirements, it can be PVC, linoleum, rubber or high pressure laminate. In peripheral areas even textile floor coverings can be used.

For the load application of dynamic loads not only the floor covering but also the used adhesives are of decisive importance in order to prevent “wave formation” of the floor covering caused by the rolling loads. A personal consultation is absolutely necessary.

Fire protection



The building material class requirements must be met by the installed floor systems. This applies also to the fire resistance classes.

Technical data*: **Data center**

System accessories:
Continuous air flow control 0 - 32 %
Panel screwing

*For further technical data
please ask for our product data sheets.

Panel:

Dimensions:	600 x 600 mm
Panel thickness:	(without covering) from 28 mm The air conditioning panel is compatible with all MERO floor systems
System weight:	~ 47 – 64 kg/m²
Panel weight:	~ 14 – 21 kg/pc
Panel material:	Steel construction, conductive powder coating, screwed on request

Understructure:

Grid:	600 x 600 mm
Pedestal material:	galvanized steel
Construction height (without covering):	up to 2000 mm
Recommendation:	Use stringers generally from a floor height of > 500 mm; If high concentrated loads are required use switch gear substructure

Load values:

Point load:	up to 15.000 N possible
Element class acc. to DIN EN 12825:	class 2 – 6
Ultimate Load:	up to 30.000 N
Safety factor:	≥ 2,0

Ventilation:

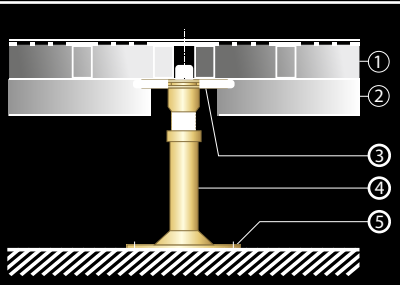
Free cross section:	16%; 24%; 32%; 40%; 53%
Air volume:	up to 2200 m^3 per hour and panel at pressure drop of 10 Pa
Air flow control:	possible

Electrostatic: > 10^5 Ohm (depending on system and covering)

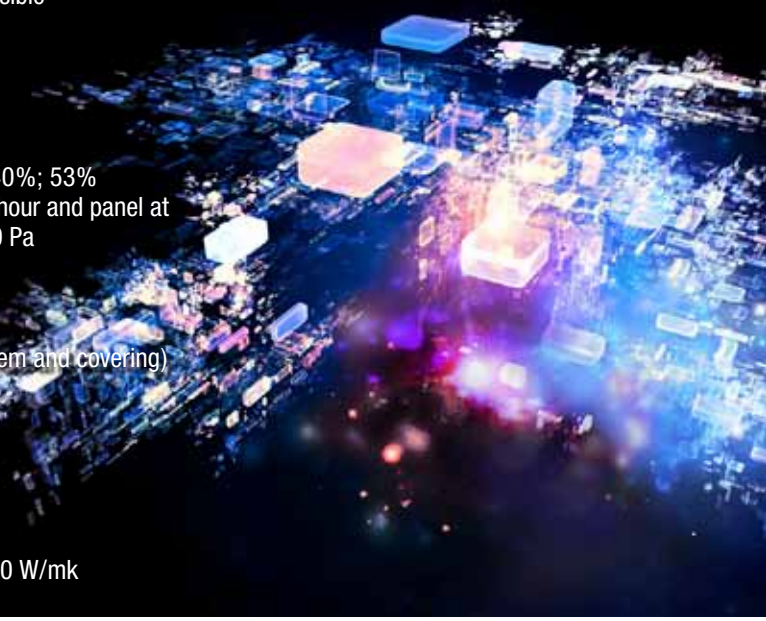
Fire protection:

Building material class supporting panel acc. to DIN EN 13501 T1:	A1
acc. to DIN 4102 T1:	A1
F30 stability:	possible

Thermal conductivity: (base material) ~ 50 W/mk



1. Floor panel (with or without covering, panel conductive powder coated)
2. Stringer or switch gear substructure
3. Gasket
4. Pedestal (type of construction depending on floor height)
5. Base plate glued to subfloor



TÜV-certified since 1997

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