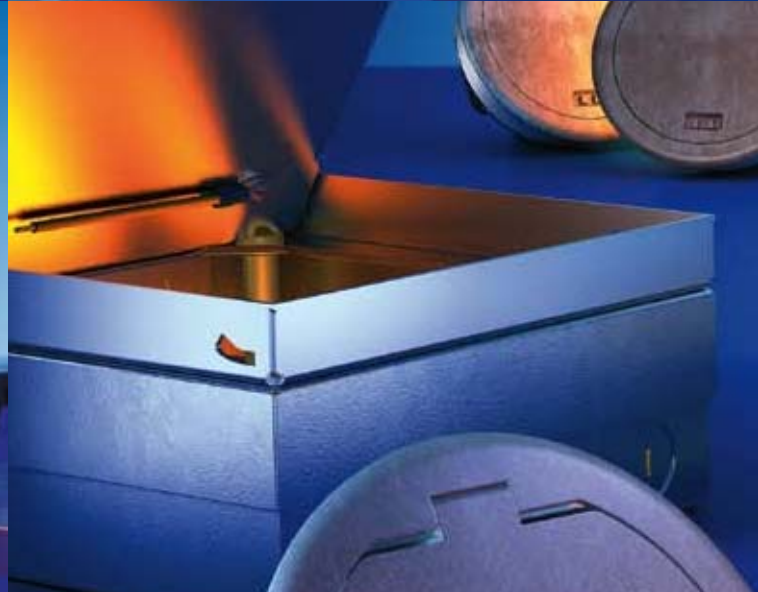


UFS Underfloor systems

The perfect combination
of design and function

UFS Underfloor systems



ACKERMANN
CABLE MANAGEMENT

OBO
BETTERMANN

OBO. Used by professionals.

OBO understands what professionals need: perfect solutions for all aspects of an electrical installation. User-friendly, practical products for fast, uncomplicated installation. Add to this a comprehensive training programme and the OBO expert hotline for on-the-spot assistance at the construction site. OBO, the brand with the hot wire to the customer.

Systems

Quality



Conducting electricity, routing data, controlling energy – carrying a complete range of over 30,000 articles, OBO offers user-friendly products and practical solutions for a professional data and electrical infrastructure in electrical installations. And as anyone working with OBO quality products knows, one goes hand in glove with the other. On the one hand, we can provide a wide range of products; on the other hand, we can offer networked thinking – something absolutely natural to us as a systems' manufacturer.

- ▶ Seamless and complete programme for all aspects of electrical installation
- ▶ Over 30,000 items in seven product units
- ▶ Ongoing product maintenance and further development
- ▶ Proprietary development and production facilities

Professionals demand quality. A quality offered by all OBO brand products and services:

- ▶ QA certification to DIN EN ISO 9001:2000
- ▶ Tested material and manufacturing quality
- ▶ Numerous national and international test seals and certificates: GS and VDE marks, UL approvals
- ▶ Active involvement in national and international standardisation bodies
- ▶ Perfect logistical solutions for packing and shipping applications
- ▶ All the products in this catalogue are CE-compliant. This also applies to standard parts such as screws and nuts, which are components of the respective product system.

OBO
BETTERMANN

Local Support & Advice

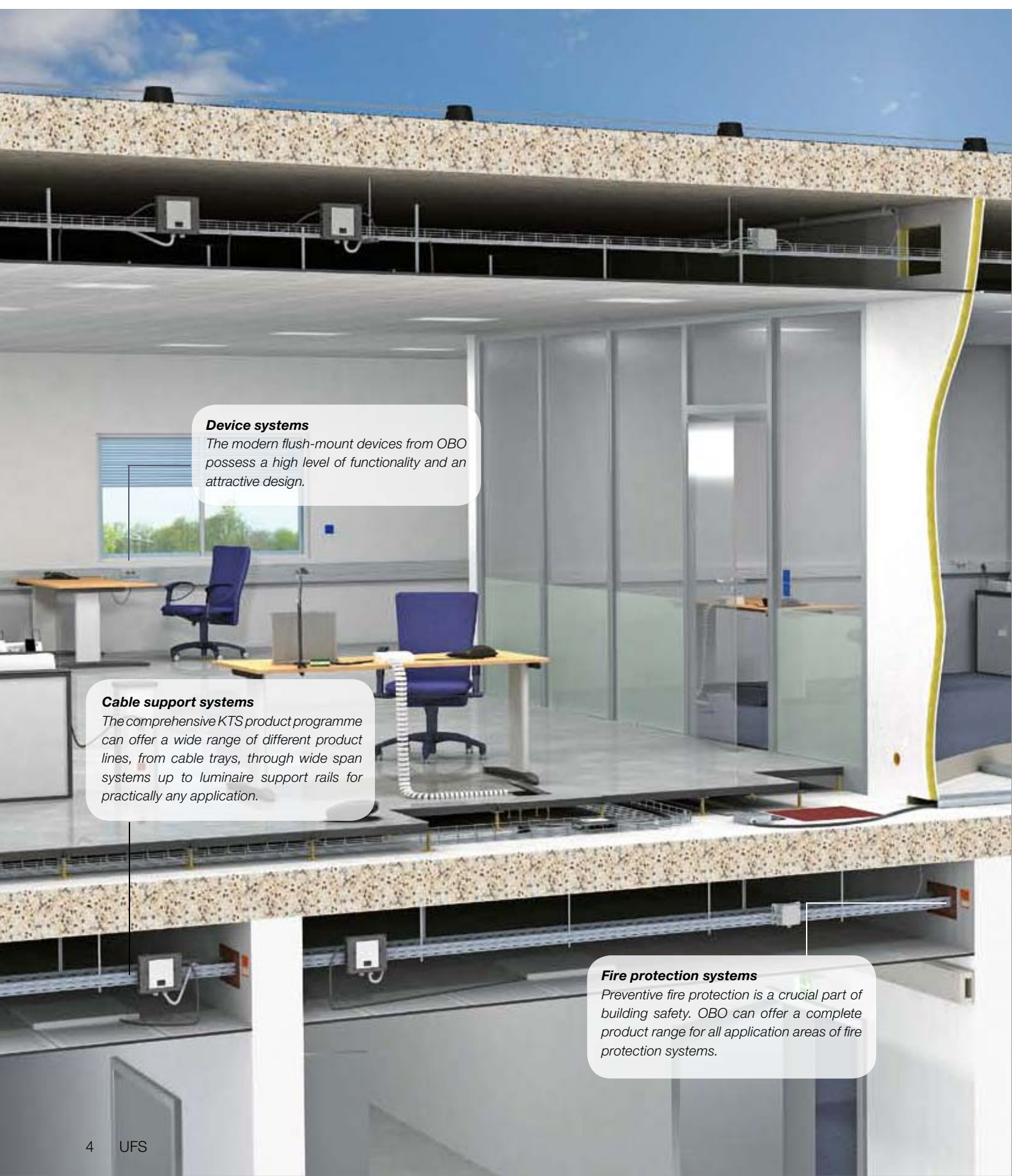


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Intelligent solutions for tomorrow's energy and data infrastructure

Cable Management by OBO® for housing and offices



Device systems

The modern flush-mount devices from OBO possess a high level of functionality and an attractive design.

Cable support systems

The comprehensive KTS product programme can offer a wide range of different product lines, from cable trays, through wide span systems up to luminaire support rails for practically any application.

Fire protection systems

Preventive fire protection is a crucial part of building safety. OBO can offer a complete product range for all application areas of fire protection systems.

Our integrated systems have tailor-made solutions for any task. Whether underfloor or device systems, service poles or components to make up the last few metres to the workstation – OBO can now offer a complete product range and perfectly matched accessories for any application and any requirements.

think orange.
think connected.

Cable routing systems

High-performance cable routing and device installation systems – OBO can offer a comprehensive programme of long-life solutions, which cannot be beaten in terms of flexibility and design and with regard to functionality and ease of installation.

Underfloor systems

Our systems can offer easy, safe access to power supplies, internal and external data networks and telecommunication systems.

Ready for your plans – OBO underfloor systems

We give you all the options: our underfloor series can offer tailor-made solutions for all application areas. This UFS catalogue can provide you with plenty of details and graphics on the special features and huge potential of the systems. In particular, you can find technical information to simplify planning and mounting:

- ▶ in the general planner section
- ▶ in the system-specific information at the beginning of the appropriate chapter
- ▶ in the mounting examples before the product lists



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We are here

Around the world, the OBO brand stands for innovative products, developed and manufactured in-house, and for certified quality. For many years, customers from the industrial,

systems and building management sectors have trusted the experience and knowledge of the globally active OBO Bettermann group. Countless references both in Germany and

abroad are an impressive testament to the performance and reliability of OBO systems – and for the cooperation between OBO professionals and OBO customers.

Dubai airport



Dubai Silicon Oasis



The Center, Hong Kong



Chek Lap Kok airport, Hong Kong



Cathay Pacific, Hong Kong airport



Standard Chartered Bank





Citibank Shanghai, MOIA Qatar, Cruise Terminal Dubai



Hong Kong & Shanghai Bank, Hong Kong



Dubai Golf Club



Dubai airport



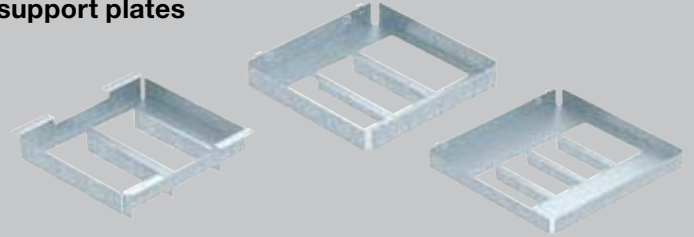
Sahara Center

Structure of the OBO underfloor systems

Device installation

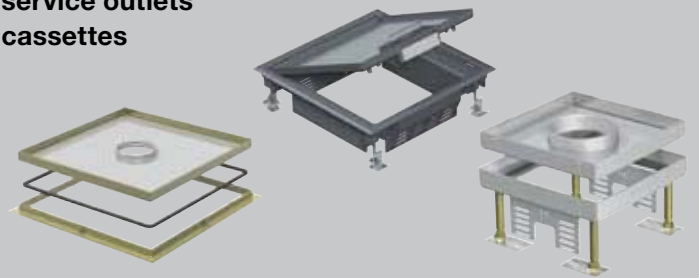
Support systems

System-specific
mounting support
support plates



Device installation

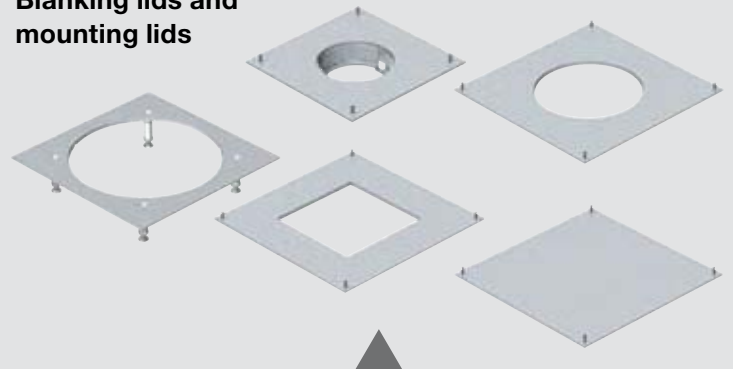
System-specific
service outlets
cassettes



Cable routing

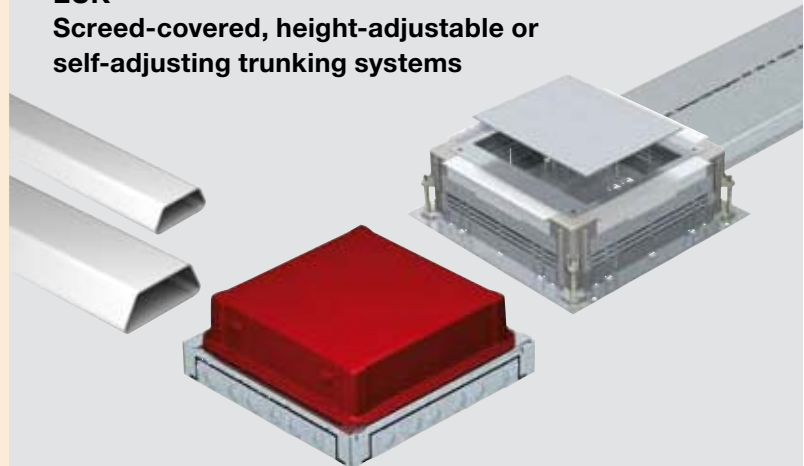
System components

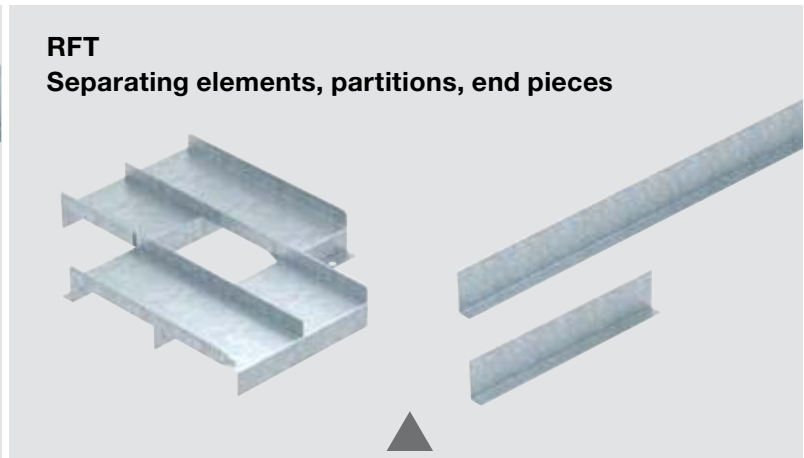
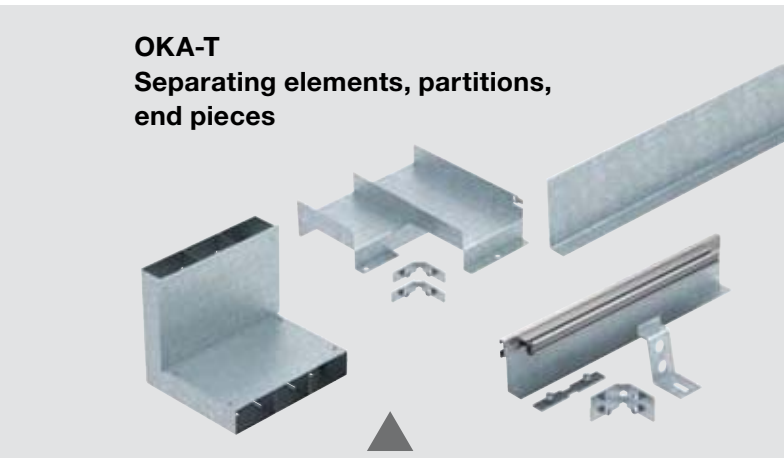
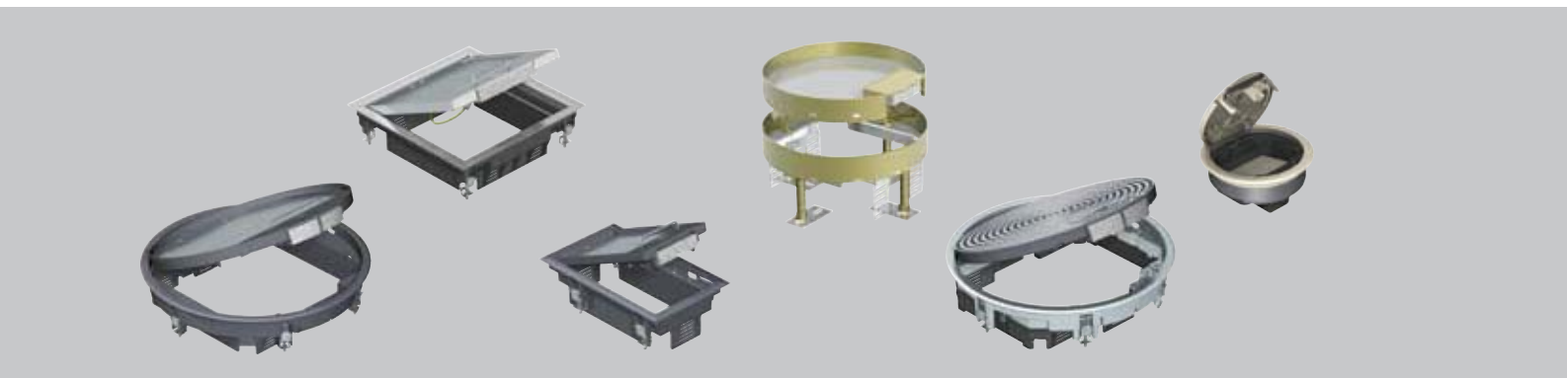
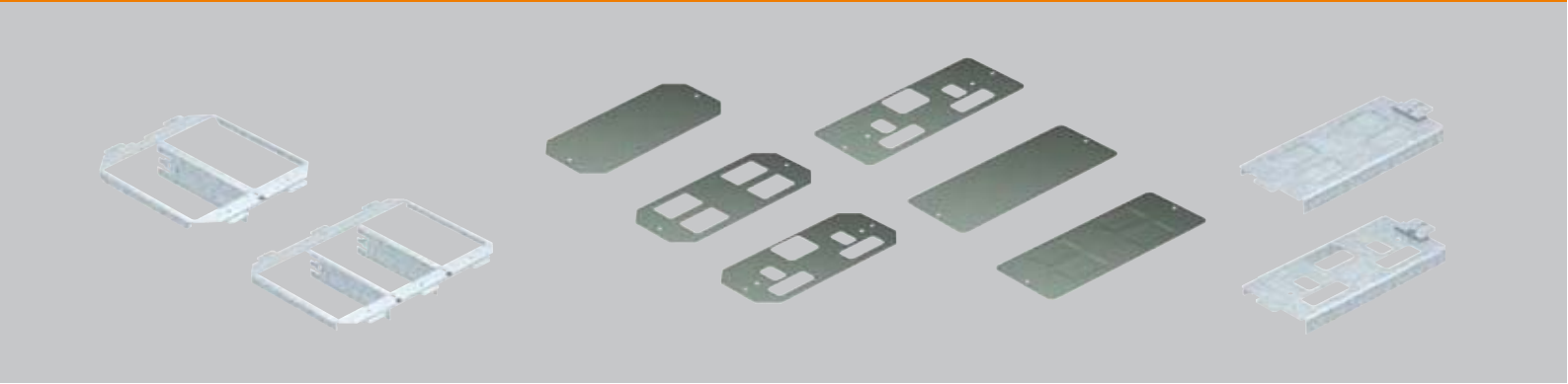
EÜK
Blanking lids and
mounting lids



Installation systems

EÜK
Screed-covered, height-adjustable or
self-adjusting trunking systems





Overview of underfloor systems

EÜK Height-adjustable

Screed-covered trunking system from page 20



EÜK Self-adjusting

Screed-covered trunking system from page 98



OKA-T

Open flushfloor trunking system, from page 118



RFT

Raised floor trunking system, from page 150



Floor care types and the selection of the installation units

OBO underfloor systems contain various device installation units, intended to accept accessories (power sockets, etc.). A key criterion for the selection of the correct installation units is the type of floor covering. A distinction is made between care types, as the installation device – for example, the construction of the seal against moisture ingress – must be matched to the planned cleaning method.



Dry care

The criterion for “dry care” is primarily met by textile floor coverings, which are (“dry”) cleaned regularly by vacuuming up the dirt. Here, the standard talks of “water-free or low-water cleaning methods” and also defines that, should cleaning solutions be used, there should be so little used that no “pool formation or water penetration of the floor covering” is possible.

Damp care

The preconditions for the use of the “damp care” method are fulfilled by smooth floor coverings, such as linoleum, PVC, sealed wooden floors, polished stone floors, etc. The building cleaning profession defines this type of care as “dust-binding wiping using moistened or prepared cleaning textiles”.



Wet care

“Wet care” is used particularly in places where tough, difficult-to-clean stains need to be removed. This type of care is used especially for stone floor coverings, tiles and ceramic floors and for PVC coverings. Wet care is divided up into two methods:

- ▶ Wet wiping, single-level
(low degree of soiling or floor coverings which are sensitive to moisture, e.g. raised floors or in IT rooms)

According to the specifications, with this method the floor covering is cleaned in one action with more or

less dehydrated cleaning textiles (mop, washing cover, scouring or washing cloth, soft cloth). The remaining moisture is left to dry.

- ▶ Wet wiping, two-level
(greater degree of soiling)

The two-level method corresponds to the classic wet washing method: in the first stage cleaning textiles (cloths, mops, washing covers, wide cleaning apparatus, etc.) are used to apply sufficient cleaning agent so that tough soiling is softened or released. In the second stage, any fluid and soiling remaining on the floor covering is wiped up using cleaning textiles.

Sufficient protection of electrical installations

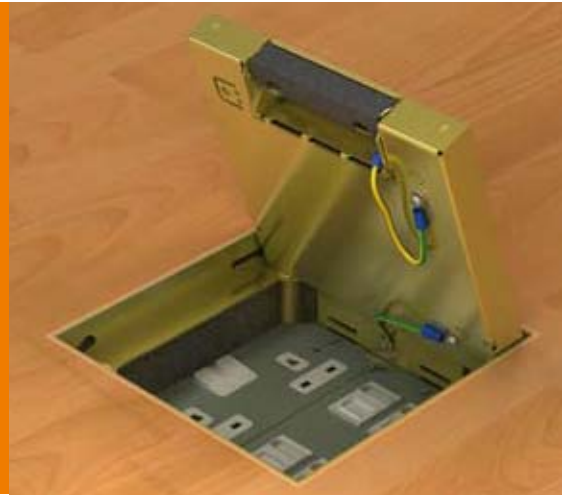
The right selection of the installation units, matched to the appropriate floor type, ensures that the electrical installation is protected against the ingress of moisture and dirt. All the UFS products released by OBO Bettermann for use in wet-care floors fulfil the standard without any restrictions of IEC requirements.



Mounting supports and cover plates

When devices are installed in service outlets, different support systems are used, depending on the application. These are made up of the mounting support and the appropriate

cover plates. An exception to this is the GES2 device installation system: here, the two parts are combined in a single component.



Mounting support for GES2 device installation systems

Mounting support for BS socket



Mounting support for data technology



Mounting support for square and rectangular device installation systems

Mounting support for GES4



Mounting support for GES6



Mounting support for GES9



Mounting support for round device installation systems

Mounting support for GESR4

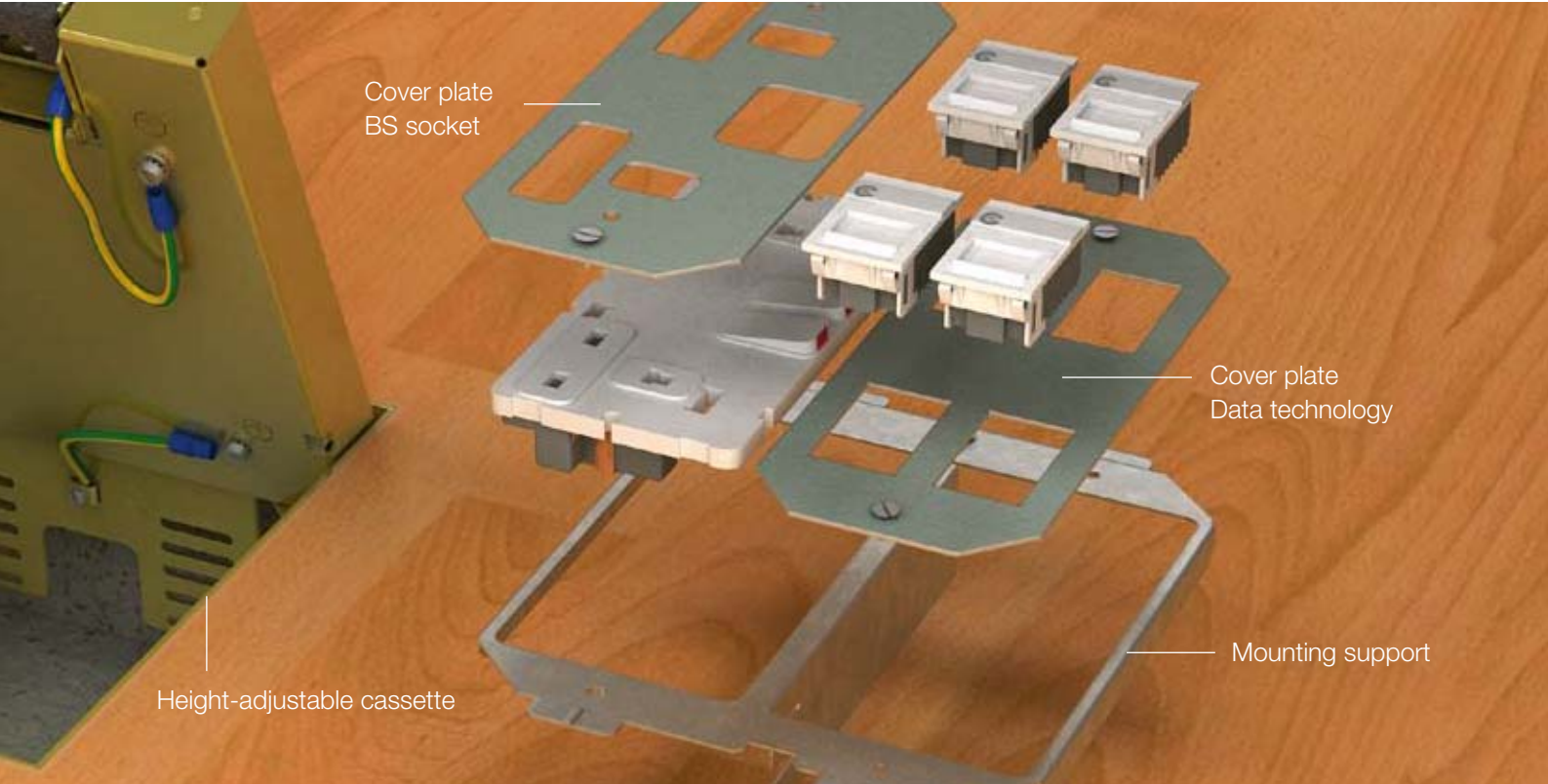


Mounting support for GESR7



Mounting support for GESR9





Mounting support for height-adjustable cassettes

Mounting support for R4 and RKN4 cassettes and UDHome4



Mounting support for R7 cassettes



Mounting support for R9 and RKN9 cassettes

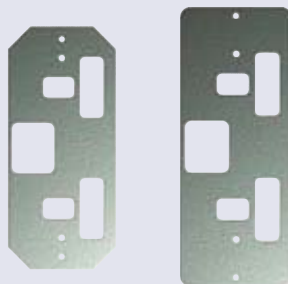


Cover plates for mounting support

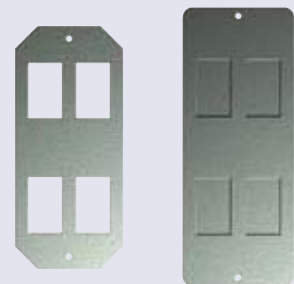
Cover plates, blank
163 mm/181.5 mm



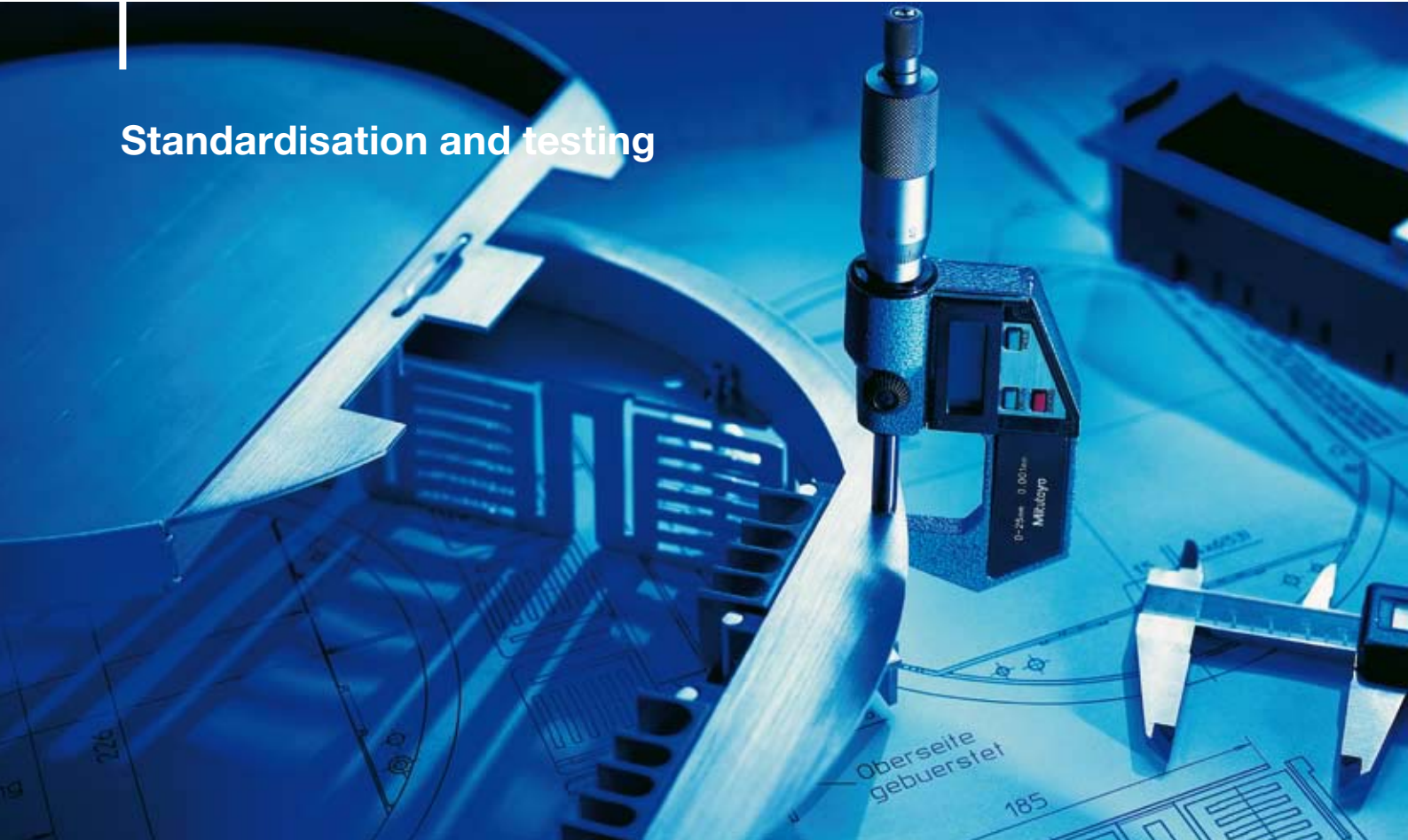
Cover plates, BS socket
163 mm/181.5 mm



Cover plates, data technology
163 mm/181.5 mm



Standardisation and testing



Materials used

All the metallic parts are made from electro-galvanised sheet steel to EN 10142, FE P02 GZ 275 with a zinc coating of 275 g/m². The zinc coating corresponds to a zinc layer thickness of 18 to 24 µm on each side.

Powder coatings

Painted parts are supplied with a RAL powder coating of at least 100 µm.

Trunking systems

The trunking systems correspond to the requirements of DIN VDE 0634 Part 1 and Part 2.

OBO certifications

OBO is QA-certified according to ISO 9001.

Material thicknesses of flushfloor trunking systems (OKA-T)

The material thicknesses are designed for load requirements of 1.5 kN. Therefore, all the lids have a material thickness of 3 mm.

Separation of different services

The cables laid in the trunking are separated safely using separating retainers in the underfloor boxes and

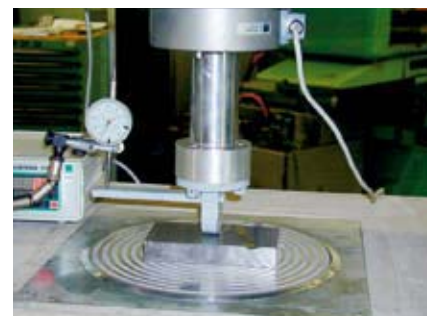
within the trunking. In the case of branches, separating elements in the form of cable bridges are used.

Equipotential bonding

Metallic parts of the trunking system are – as far as is possible – interconnected during mounting (e.g. separating retainers).

Elements added later, e.g. separating elements, have a connection lug for the PE connection.

Earth conductor clamps can be used in underfloor connection boxes and open trunking systems, in order to set up a connection to the PE.



Determining the cable volume

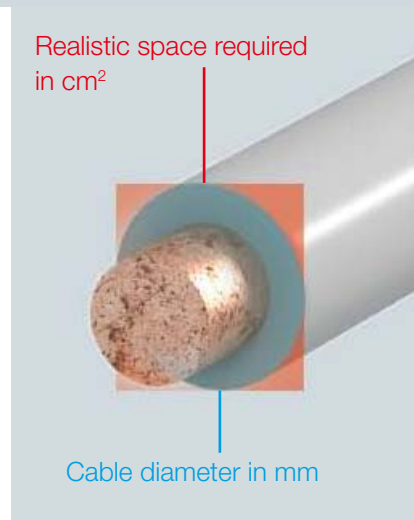
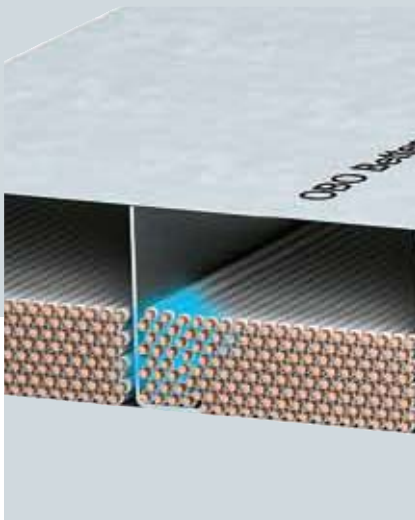
An important criterion for the selection of the required trunking size of the underfloor system is the cable volume. As the cables are never packed tightly together or are absolutely parallel, it is not enough to base the volume calculation solely on the cable diameter.

Calculation using the formula $(2r)^2$

The formula $(2r)^2$ offers a realistic basis for measurement. This value reflects the realistic space requirements, including the gaps.

Tables with average values

To simplify your work, we have created a list of the diameters and space requirements of the most important cable types. Important: the values are average values, which may vary between manufacturers. Please consult the manufacturer's data for the exact values.



Cable diameter
Single-core cable, PVC-insulated

Nominal cable cross-section in mm ²	Maximum diameter in mm
1.5*	3.2
1.5	3.3
2.5*	3.9
2.5	4.0
4.0	4.6
6	5.2
10	6.7
16	7.8
25	9.7
35	10.9

IT cables
Type Cat...

Type	Diameter in mm	Space required cm ²
Cat. 5 Cat. 6	8	0.64

Telecommunications cables

Type	Diameter in mm	Space required cm ²
2 x 2 x 0.6	5.0	0.25
4 x 2 x 0.6	5.5	0.3
6 x 2 x 0.6	6.5	0.42
10 x 2 x 0.6	7.5	0.56
20 x 2 x 0.6	9.0	0.81
40 x 2 x 0.6	11.0	1.12
60 x 2 x 0.6	13.0	1.69
100 x 2 x 0.6	17.0	2.89
200 x 2 x 0.6	23.0	5.29
2 x 2 x 0.8	6.0	0.36
4 x 2 x 0.8	7.0	0.49
6 x 2 x 0.8	8.5	0.72
10 x 2 x 0.8	9.5	0.9
20 x 2 x 0.8	13.0	1.69
40 x 2 x 0.8	16.5	2.72
60 x 2 x 0.8	20.0	4.0
100 x 2 x 0.8	25.5	6.5
200 x 2 x 0.8	32.0	10.24