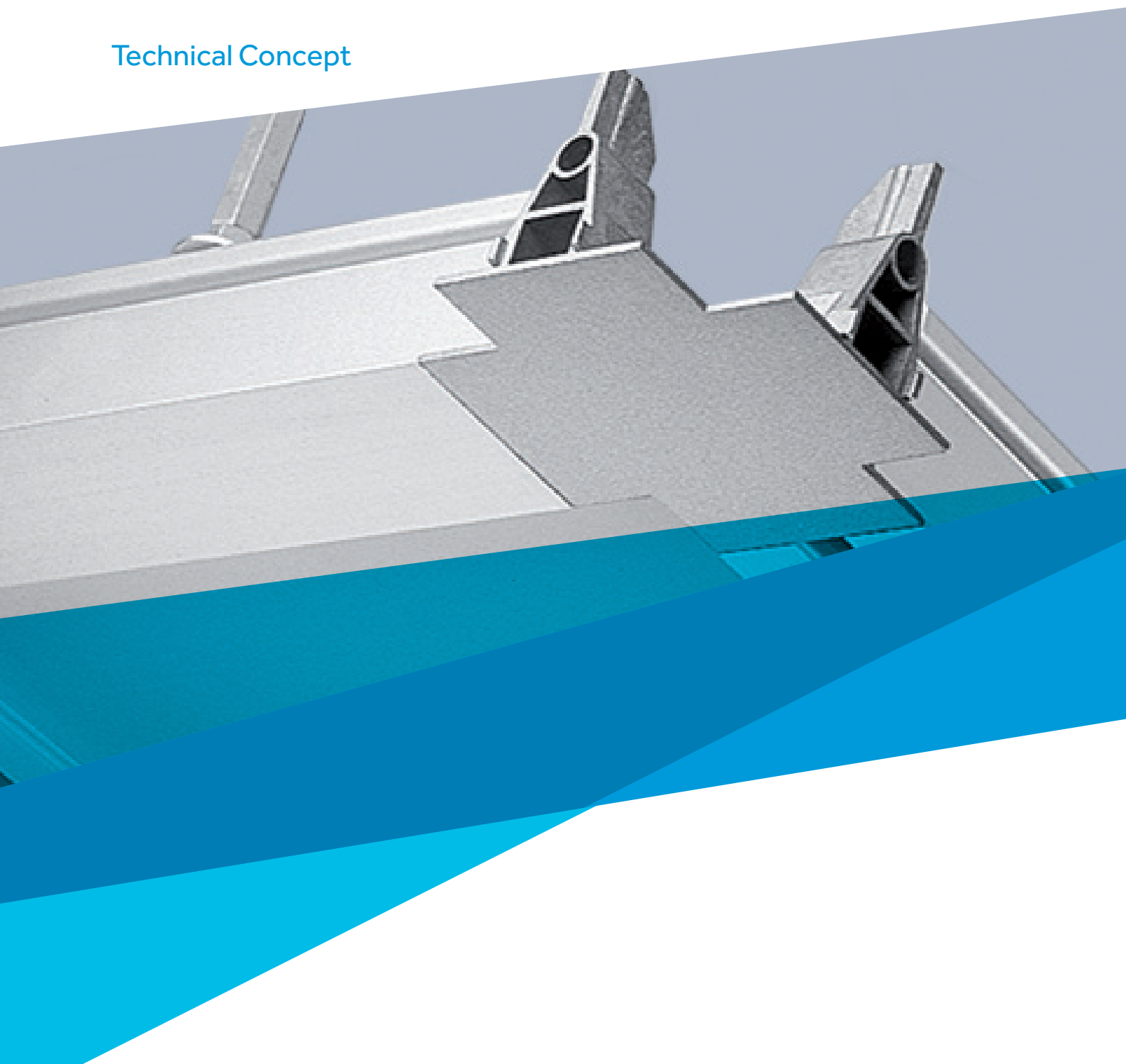# Ultraflex Ceiling Grid (UFR)
All Types
Cleanroom Ceiling Systems

Technical Concept

Product Description

The Ultraflex Ceiling Grid (UFR) by Exyte Technology is a ceiling system suspended from the bare ceiling or a support structure for use in cleanrooms. Load-bearing aluminum profiles form the basis of the UFR, allowing for the installation of standard elements such as filter units, cleanroom vents and fan units. All profiles ensure simple installation of lighting, partitions, air-guiding plates, sprinkler pipes and media cables.

The Ultraflex Ceiling Grid is suitable for cleanroom classifications 1.0 to 9.0 in accordance with EN ISO 14644-1 and the GMP guidelines.

The UFR was designed for use in conjunction with the following products by Exyte Technology:

– **SILENT Filter Fan Unit**
– **ECO Filter Fan Unit**
– **LIGHT Filter Fan Unit**
– **COMPACT Filter Fan Unit**
– **RETURN AIR Filter Fan Unit**
– **Ultraflex Cleanroom**

Applications

The industry differentiates between non-pressurized and pressurized ceilings. Non-pressurized ceilings are used in conjunction with fan units and filter hoods. Pressurized ceilings on the other hand are used in applications in which the plenum features a higher static pressure than in the cleanroom. Here, the right particle density is essential and is safely achieved using the UFR and a ceiling profile with fluid channel and sealant.

Structural Design

The basic structure of the Ultraflex Ceiling Grid consists of corrosion-resistant, anodized, extruded aluminum profiles, which are connected using high-precision intersections to create a high-quality ceiling grid. These are also available with a powder-coating (standard color similar to RAL 9010; coating also available in special colors). Profiles of varying length allow for grids of various sizes. The standard sizes are based on ceiling units measuring 1,200 x 1,200 mm, 1,200 x 900 mm and 1,200 x 600 mm, which are installed taking into account the cleanroom layout and any fixtures.

Available in cross piece, T-piece, corner piece and I-piece, the profile intersection **8** is manufactured using a die-casting process and comes standard in a color similar to RAL 9006. The profile connectors link the aluminum profiles using a front-end bolt connector **7**.

We recommend using retaining springs to secure the blank panels.

Each connector contains a PG21 duct **10** for threading supply lines or sprinkler downpipes up to 1/2" in diameter. The duct can accommodate cables up to PG13.5.

The ceiling system is connected to the ceiling at every intersection – depending on load requirements, with one or two suspensions **11**.
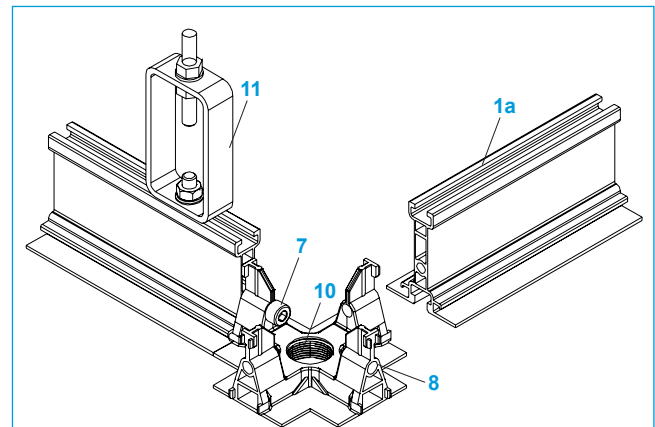

Fig. 1 UFR system profile connection, illustrated at an intersection **8**, and UFR-55/70-T-E profile
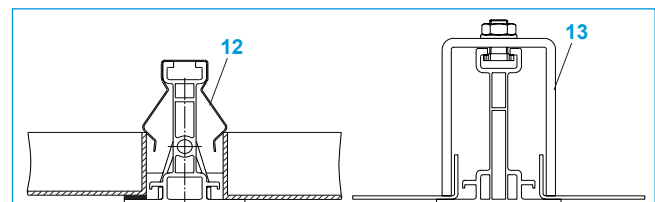

Fig. 1a Retaining spring   **Fig. 1b** Retention bracket
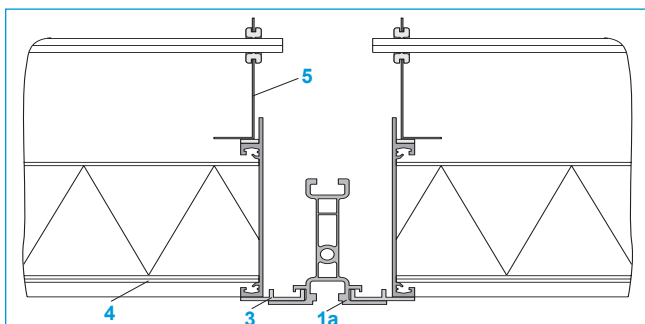
Non-Pressurized Ceilings (Dry Ceilings)
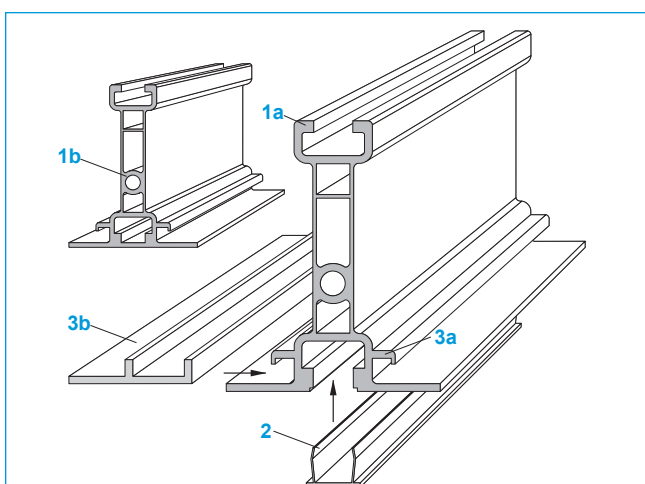
Ceiling Grid Joint
The UFR-55/70-T profile is recommended for the installation of FFUs, in conjunction with a bearing rail **3b**, which is secured using the counter support **3a** on the side of the profile. The filter unit **4** and fan unit housing **5** can be installed horizontally and removed independently of each other from the cleanroom side (Fig 2).

The underside of the UFR-55/70-T/E profile **1a** (Fig. 3) contains a groove for installing lighting, partitions, etc. The section of the groove not used can be concealed with an aluminum cover strip **2**, which is easy to install and remove. The UFR-55/70-T/P profile **1b** (Fig. 3) is designed for use in the pharmacy sector. The profile underside is closed, preventing hollow spaces that are difficult to clean and bacteria growth in inaccessible spots.
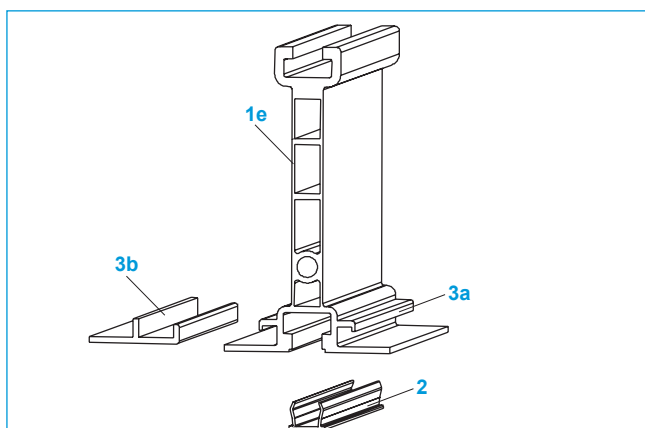
The UFR-55/100L-T/E profile **1e** (Fig. 4) fulfills all the same criteria as the UFR-55/70-T/E profile, yet it was designed for use with the high loads associated with transport systems. This ceiling grid is compatible with the UFR-55/70-T/E profile.

Fig. 2 The UFR-55/70-T/E ceiling grid **1a** with attachable bearing rail **3b**; filter unit **4** and fan unit housing **5**

Fig.3 Lower right-hand corner: the UFR-55/70-T/E profile **1a** with covering strip **2** and attachable bearing rail **3b**; upper left-hand corner: the UFR-55/70-T/P profile **1b** with concealed groove
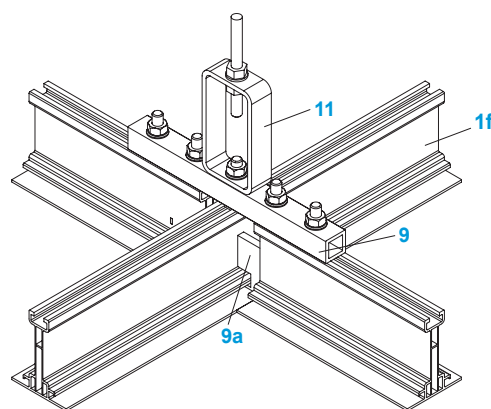

Fig. 4 The UFR-55/100L-T/E profile **1e** with attachable bearing rail **3b**

Legend

1a	UFR-55/70-T/E	**5**	Fan unit housing
1b	UFR-55/70-T/P	**6**	Fluid channel
1c	UFR-55/60-FL/E	**7**	Bolt connector
1d	UFR-55/60-FL/P	**8**	Profile connector (joint)
1e	UFR-55/100-T/E	**9**	Cross profile connector
1f	UFR-55/70L-T	**9a**	Insert for cross profile
2	Covering strip	**10**	Duct
3a	Counter support	**11**	Suspension bracket
3b	Attachable bearing rails	**12**	Retaining spring
4	Filter units	**13**	Retention bracket

Line Ceiling Grid

The UFR-55/70L-T profile is used to create the adjustable grid and comes with main profile and cross profile connectors (figure 5). The cross profiles slide back and forth, making it simple to customize grids even after installation. All the component dimensions are identical with those of the cross section ceiling grids. For walkability, only one suspension bracket is required for each joint. Blank panels used in conjunction with the line ceiling grid must be secured with four retention brackets (figure 1b).
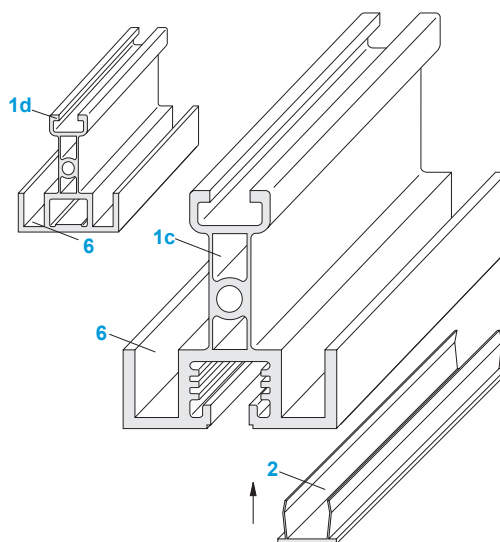

Fig. 5 UFR-55/70L-T line ceiling grid profile connector **1f**, cross profile connector **9** and insert for cross profile **9a**

Pressurized Ceilings (Fluid Ceilings)

Pressurized-ceiling profiles have a square fluid channel (6) on each side to hold the sealing gel. The UFR-55/60-FL profile is primarily designed to frame particle-tight filter units.

The underside of the UFR-55/60-FL/E profile (1c, figure 6) contains a groove to hold lighting, partitions and other ceiling fixtures. The section of the groove not used can be concealed with a covering strip (2). The underside of the UFR-55/60-FL/P profile (1d, figure 6) is closed, simplifying cleaning and preventing germ growth.

Fig. 6 Lower right-hand corner: the UFR-55/60-FL/E profile **1c** with covering strip **2**; upper left-hand corner: the UFR-55/60-FL/P profile **1d** with concealed groove

Technical Data

Sizes	Unit	55/60	55/70	55/70L	55/100	55/100L
Grid dimensions	mm			1200×1200		
Width	mm	55	55	55	55	55
Height	mm	60	70	70	100	100
Weight	kg/m²	5.7	4.1	3.7	9.4	5.4
Permissible surface load [1]	N/m²	2000	2000	2000	8500	6000
Permissible point load [1][2]						
– Profile length 500 mm	N	1000	1000	1000	7000 [3]	5500
– Profile length 1100 mm	N	1000	1000	1000	6500 [3]	5000
– Directly under suspension	N	2200	2200	2200	8000	6500

1) with two suspension brackets per intersection
2) attached at the middle of the profile
3) deflection 3 mm, two HALFEN bolts per bracket on the room side

Optional Fixtures and Components

– HEPA/ULPA filter
– Filter Fan Units
– Vents for particulate filters
– Recessed light fixtures, surface-mounted light fixtures
– Smoke alarms, sprinklers
– Partition wall systems
– Air-guiding plates, hanging systems
– Minienvironments
– Ionization equipment
– Transport systems
   (AMHS: automated material handling system)

Wesentliche Merkmale

Electronic Model with Groove at the Underside
– Simple installation of lighting, cleanroom walls, transport systems, etc. in the groove
– Concealing the groove with the easy-to-install covering strip

Pharmaceutic Model without Groove at the Underside
– Suitable for the pharmaceutical and food industries thanks to smooth underside
– No space for germ growth

Bearing Rail[1]
– Attachable bearing rails allow for all installations from the cleanroom side
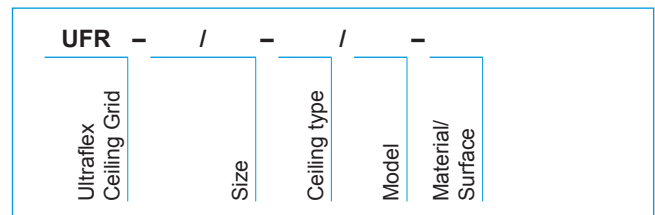
Suspension Bracket
– Level regulation thanks to regulation profile up to 60 mm
– Vibration decoupling can be integrated

Fluid Ceiling with Sealing Gel
– Sealing fixtures with a special gel in the fluid channel
– A preformed profile seal acts as a seal between the profile and intersection

1)   Protected by a patent (EP 0 783 092 B1)

Type Designation

UFR – / – / –

| Ultraflex Ceiling Grid | Size | Ceiling type | Model | Material/ Surface |

Size
55/60   W 55 mm × H 60 mm
55/70   W 55 mm × H 70 mm
55/70 L   W 55 mm x H 70 mm
55/100   W 55 mm × H 100 mm
55/100 L W 55 mm × H 100 mm

Ceiling Type
T   Dry ceiling (only 55/70, 55/70L, 55/100 and 55/100L)
FL   Fluid ceiling (only 55/60)

Model
E   Electrical (with groove)
P   Pharmacy (without groove; excl. 55/100)

Material/Surface
AE   Anodized aluminum
PB   Powder-coated steel in a color similar to RAL 9010

Additional Cleanroom Ceilings

Exyte Technology offers additional cleanroom ceilings, including the → GMP-certified Ultraflex Cassette Ceiling (figure 7) for the pharmaceutical and food industries with the following features:

– Metal blank panels screwed together without gaps for efficient, pharmacy-appropriate cleaning and disinfection of the ceiling surface, defined borders
– A variety of grid dimensions up to 1,200 mm × 1,200 mm
– With optional catwalk
– Affordable, flexible solution

Fig. 7 Ultraflex Cassette Ceiling with recessed light fixture and filter fan unit

Submittal Text

_____ m² ceiling system

This ceiling grid system is suitable for cleanrooms with classifications up to 0.1 (federal standard 209E) and primarily consists of anodized aluminum profiles and die-casted intersections.

The profiles are anodized or powder-coated and the intersections (cross piece, T-piece, corner piece and I-piece) are lacquered. The aluminum profiles are bolted with the intersections at the front. The connection elements of the line ceiling grid have a bare aluminum surface.

The intersections feature a PG21 duct to accommodate sprinklers and supply lines up to 1/2".

Additional reductions to PG13.5 are necessary for threading the cables required for lighting.

The aluminum profiles for electrical applications feature a groove at the underside for integrated and mounted fixtures. The underside of aluminum profiles for pharmaceutical applications and line ceiling grids are smooth.

A fluid channel ensures airtight installation of fixtures in profiles and intersections. Shaped plastic gaskets ensure an airtight seal between the profile and the intersection.

Profile (Size)
☐ 55/60
☐ 55/70
☐ 55/70L
☐ 55/100
☐ 55/100L

Ceiling Type
☐ T (dry ceiling; only 55/70, 55/70L[3], 55/100 and 55/100L)
☐ FL (fluid ceiling; only 55/60)

Model
☐ E (electronic with groove)
☐ P (pharmaceutic without groove)
☐ B (line ceiling grid without groove)

Surface
☐ AE (anodized aluminum)
☐ PB (powder-coated steel)
  ☐ RAL 9010 (standard color)
  ☐ RAL _____ (special color)

Blank Panels
Ceiling units without technical fixtures feature blank panels.
For grid dimensions:
☐ 1 200 mm × 1 200 mm
☐ 1 200 mm × 600 mm
☐ Special dimensions
  _____ mm × _____ mm

UFR-55/70-T, UFR-55/70L-T,
UFR-55/100-T and UFR-55/100L-T profiles
Length × width . . . . .1 165 mm × 1 165 mm [1]
Length × width . . . . .1 165 mm × 565 mm [2]
Height . . . . .33 mm
☐ Standard Model
  Powder-coated, 1× bending edge,
  non-welded corners
    ☐ Panel thickness 1.5 mm (walkable)
    ☐ Retaining springs
    ☐ Retention brackets
UFR-55/60-FL profile
Length × width . . . . .1 167 mm × . . 1167 mm [1]
Length × width . . . . .1 167 mm × . . 567 mm [2]
Height . . . . .20 mm
☐ Standard Model
  Powder-coated, 1× bending edge,
  corners welded for an airtight seal,
  not flush with ceiling grid
☐ Optional Model
  Powder-coated, 3× bending edges,
  corners welded for an airtight seal,
  flush with ceiling grid

Material
Profile .Anodized aluminum
Intersections . . . . .Die-casted
Adjustable grid connectors . . . .Bare aluminum

Manufacturer **Exyte Technology GmbH**
Type UFR–___/____–___/__–___
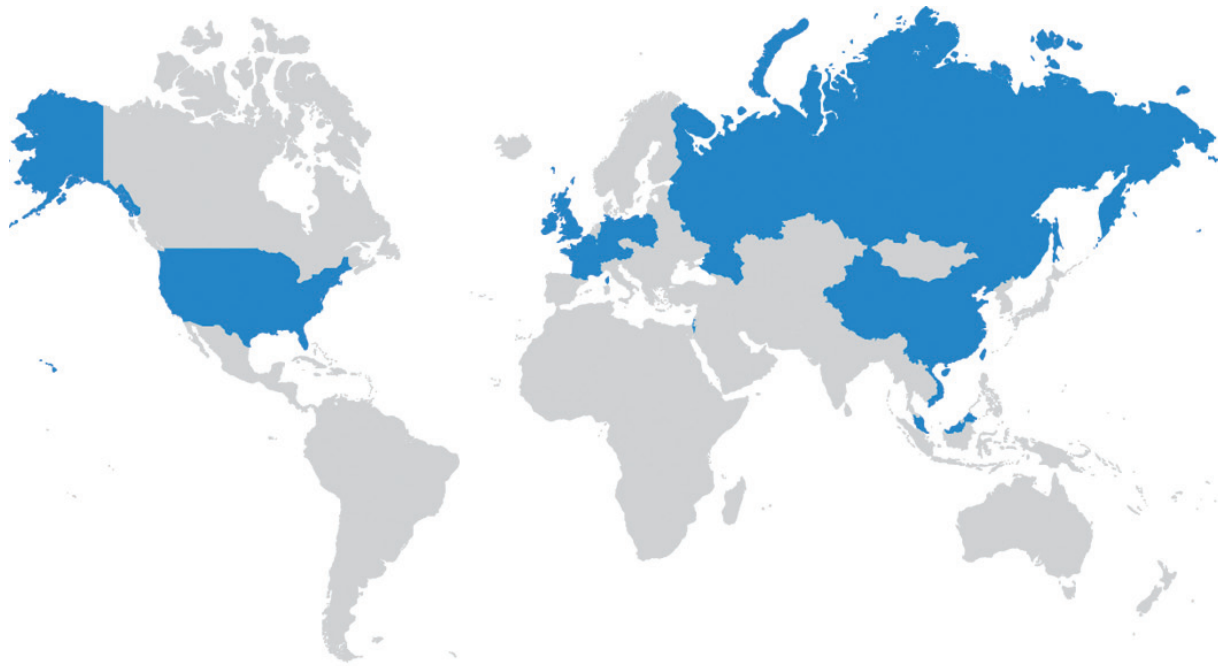
Integrated and mounted fixtures to be considered

☐ HEPA / ULPA filter
☐ Filter Fan Units
☐ Vents for particulate filters
☐ Recessed lighting fixtures, surface-mounted light fixtures
☐ Smoke alarms, sprinklers
☐ Partition wall systems
☐ Air-guiding plates, hanging systems
☐ Minienvironments
☐ Ionization equipment
☐ Transport systems
  (AMHS: automated material handling system)

1) For ceiling grids 1,200 × 1,200 mm
2) For ceiling grids 1,200 × 600 mm
3) 55/70L is only available without a groove

exyte

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