

MultiGips

Solid dry wall construction
with Gypsum Blocks





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Age-based living, an increasing number of single households, the newly awakened interest in urban living: the demand for leased and freehold apartments is clearly characterised by the dynamic of social and demographic upheavals. The situation is similar with office properties which, due to the rapid rate of development of the economy, make changes of lessee, conversions or even complete conversions necessary at ever shorter intervals.

Those who invest in the building of residential or office buildings must adjust to the demands and market conditions of tomorrow. Long-term leasing and sales successes are guaranteed only by properties which can react and be flexible to continuously changing conditions. A response to these challenges is given by MultiGips with interior partition walls made from light but solid gypsum blocks.

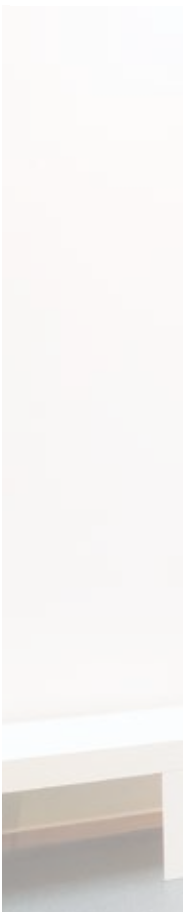
With MultiGips gypsum blocks, floor plans and room layouts are no longer rigid dimensions. Without expense and loss of time rooms can be divided into smaller spaces or put together to form larger ones. This is because, as modern dry mortarless constructions, the interior partition walls made from gypsum can be changed, added to or removed at any time. Thus properties continuously match the demand and market requirements. At the same time the value of the investment with solid compact walls remains protected in the long-term.





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Cost-effective partition walls

MultiGips gypsum blocks score several times over with building costs. They are put together without expensive sub-structure and are bonded together using gypsum-based adhesives. The complete work step of plastering can be saved, this reduces building costs. The non-productive waiting time for the drying of the plaster is dispensed with.

Using MultiGips gypsum blocks the building project is not only set up faster and more cost-effectively it can also be marketed more economically. The particularly slim walls require significantly less useful space than conventional masonry. In the calculation this means: more sales revenue through higher square meter figures.

As a rule, in residential building, 80 or 100 mm thick gypsum blocks are used. 80 mm thick walls are, for example, ca. 65 mm thinner than 11.5 cm thick masonry plastered on both sides. The small difference adds together, already with the average size of apartment to one to two square metres.



SYSTEM ADVANTAGES



Modern partition wall designs

Advantages for investors and owners

- Economic large-format gypsum blocks for building units with faster construction times
- Profit on useful and leased area through slimmer partition walls
- Late determination of division of space is possible in the building process in case no user is available
- Stable compact walls with high resistance capability against mechanical loads reducing repair and maintenance expense
- High value retention
- High economic efficiency through long useful life
- Simple dismantling with change of usage without incursion into the remaining building substrate

Advantages for lessees and users

- Homogeneous compact walls without sub-structure for uncomplicated fixture of furniture and domestic accessories or handles in sanitary areas using normal commercial anchors in any desired position
- High acoustic insulation for undisturbed living, dwelling and working
- Later changes to floor plan possible at any time
- High living comfort also in cold periods of the year due to low thermal conductivity of gypsum
- Mineral basic substance for potentially hygienic walls without microbiological infestation
- Recommended economically and building-biologically
- Without plasticizers and gas emitting substances

Advantages for architects and planners

- Ready-finished surface interiors walls without plaster ensure short construction times
- Barely any moisture input through dry components
- Particularly "quiet walls" in multi-storey residential building through coupled elastic edge mounting [optimised impact point damping]
- High demands on fire protection can be met and without special designs, through completely non-combustible gypsum [Building Material Class A1 in accordance with DIN 4102]
- Door openings or load carrying walls can be positioned freely regardless of support separations and spacing
- Alterations or changes made easy
- Perfect surface optic of the walls through high dimensional accuracy and plane level filling/-smoothing
- Variable surface finish

Advantages prime contractors and building supervision

- Highest execution security through certified working
- Rapid assembly sequence due to short drying periods
- Wall construction largely depending on weather conditions hydrophobised gypsum blocks [first row] and/or hydro-pedestals against rising damp should be used
- Simple quality control visually [no covered building units]
- Homogeneous partition walls made from only four or five components
- Onsite storage advantage due to Pallet and block sizes
- First fixing (Electrics etc.) reduced costs due to easy chasing of walls
- Quality levels for surface finishes regulated



Efficient building

Gypsum blocks are high quality building elements for the efficient erection of non-load-bearing internal partition walls. The boards in thicknesses of 60, 80 and 100 mm consist through and through of solid gypsum. They form very stable, but with this light, partition walls. Gypsum blocks combine the advantages of masonry and dry mortarless construction assembly walls in one system. As in compact construction they are put together to form homogeneous walls without sub-structure. The large format of the gypsum blocks (666 x 500 mm) allows for the rapid construction. Already known from dry mortarless construction is the extensively water-free assembly technique, with which working is with gypsum adhesive alone, not with mortar. The groove and tongue profile of the elements ensures a snug assembly. The result is absolutely smooth, level plane wall surfaces which are not plastered but only filled/-smoothed in the area of joints or over the complete surface. Finally, a surface structuring using contemporary techniques is possible.

Today the separation between supporting framework and room layout has in general established itself as rapid, economic and flexible construction method. On every floor there are large free areas which in a second step are first divided into individual rooms and spaces using non-load-bearing interior partition walls.

In addition to straight walls it is also easily possible to produce polygonal, angular or round forms by sawing of the boards. Large creative free spaces are opened to the planner for unconventional structuring without having to fall back on cost-intensive special design changes.

Robust, because they are solid

Partition walls made from gypsum blocks require no sub-structure, equally no door supports, connecting angles or profiles for the transfer of loads. They consist of high quality plaster of Paris and have the same properties over the whole surface as well as the complete cross-section.

Openings or loads to be attached can therefore be arranged as desired regardless of spacing. Even heavy loads such as kitchen cupboards or wash basins can be secured simply and securely at any point using normal commercial anchors.

The stable walls possess the high resistance to mechanical loads, which is expected and appreciated in solid construction. Should there be damage to the surface due to the effect of violence or vandalism these can be rapidly and simply repaired.

Planning freedom through little weight

Partition walls made from gypsum blocks enable optimised bearing structures and flexible floor plans. Depending on the wall thickness and type, the grammage is between 50 and 150 kg/m². The system therefore can be considered a light weight partition wall within the specifications of DIN 1055-3 and recognised by BBA and IAB certifications. The system can be used under normal floor loading conditions without additional reinforcing. Also walls can be added at any time – if required onto floating floorscreed. This is because, for ceilings which carry the light partition walls, a simplified static verification in accordance with DIN 1055-3 can be carried out. With this the partition wall is not taken into account as individual load but, together with global surcharges, as working load of the ceiling according to the table below. Through this the walls can be erected at any desired point. Equally, walls can be later added at any time – if required, also on floating floor screed.

Comfortable surface warmth

The raw gypsum of blocks consists, up to 60 %, of the smallest macropores, which ensure the very low thermal conductivity and thus the outstanding thermal insulation of the material, reduces the cold effect of the wall surface.

Solid gypsum blocks increase the thermal storage mass of the building and through this improve its thermal performance. The thermal resistance of the walls therefore does not have to be calculated. Exceptions are possible if gypsum blocks serve as supplementary shell of the outer walls or they separate heated rooms from regularly unheated rooms, for example of doorways or open passages. In these cases the boards with their thickness and thermal conductivity λ according to the table are calculated with the heat insulation calculations.

Thermal conductivity von MultiGips gypsum blocks:

- medium gross density according to DIN EN 12859: $\lambda = 0.41 \text{ W/mK}$
- high gross density according to DIN EN 12859: $\lambda = 0.58 \text{ W/mK}$

PARTITION WALLS (ALLOWANCE/SURCHARGE) LOADING FOR LIVE OF A FLOOR ACCORDING TO DIN 1055-3

Linear distributed load of partition wall	Allowance/surcharge/loading to the working load of the ceiling (partition walls allowance/surcharge/)	Conditions
$\leq 3.0 \text{ kN/m}$	0.8 kN/m ²	generally allowed
$> 3.0 \text{ and } < 5.0 \text{ kN/m}$	1.2 kN/m ²	Floor with sufficient shearing force distribution

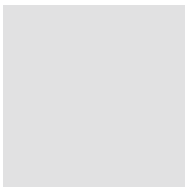
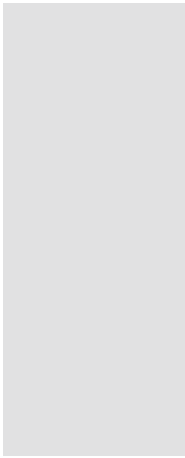
LINEAR DISTRIBUTED LOAD OF PARTITION WALLS MADE WITH MULTIGIPS GYPSUM BLOCKS AT EXEMPLARY WALL HEIGHTS

Wall thickness and construction type	Gross density of gypsum blocks approx. [kg/m ³]	Grammage approx. [kg/m ²] ¹⁾	Linear distributed load per meter wall height [kN/m]	Linear distributed load at a wall height of 2.5 m [kN/m]	Linear distributed load at a wall height of 3.0 m [kN/m]	Linear distributed load at a wall height of 3.5 m [kN/m]
Thickness 60 mm, single-leaf, blocks with medium gross density	850	54	0.53	1.32	1.59	1.75
Thickness 80 mm, single-leaf, blocks with medium gross density	850	72	0.71	1.77	2.12	2.33
Thickness 100 mm, single-leaf, blocks with medium gross density	850	90	0.89	2.21	2.65	2.91
Thickness 100 mm, single-leaf, blocks with high gross density	1,200	120	1.18	2.94	3.53	3.89
160 mm double-leaf firewall according to test certificate	850	150	1.47	3.68	4.41	4.86

The linear distributed load of the stated wall heights does not exceed 3.0 kN/m. The walls do not have to be as considered as concentrated load when the floor is measured with a partition wall [allowance/surcharge/]loading of 0.8 kN/m².

The linear distributed load of the stated wall heights is between 3.0 and 5.0 kN/m. The walls do not have to be as considered as concentrated load when the ceiling is measured with a partition wall [allowance/surcharge/]loading of 1.2 kN/m² and a sufficient distribution of the shear(-ing) force is ensured.

1) Weight of the finished wall including all components such as filling etc.



Regulated air humidity

Due to the high proportion of macropores and to the open-pore structure MultiGips blocks can take up a large quantity of water without becoming wet themselves. In the extreme case the gypsum stores more than half of its own volume of water. The water vapour diffusion resistance coefficient μ with 5 to 10 is extraordinarily low.

The ability to take up water is shown by a series of building materials – not always to the advantage of the building. The procedure is turned into something useful by gypsum as it again, under changed room climatic conditions, releases the moisture previously taken up. This regulates effectively the living climate in interior rooms. The extremes of too moist or too dry room air are tempered, the humidity of the air remains comfortable living. The gypsum surfaces feel dry and warm which influences the temperature positively and promotes domestic comfort.

Building materials for healthy living

Gypsum is a proven material for centuries building-biological and harmless to healthy living has been examined and confirmed many times. And its biological and less harmful term components lead to a healthy living environment. The long term use of Plaster of Paris in medicine confirms the compatibility for humans. The pH value of the gypsum with 7 lies in the neutral range and corresponds with that of human skin.

Gypsum is odour neutral, contains no gas emitting substances and possesses an extremely low own radiation value, which is even lower than that of the earth's crust. Its low conductivity prevents electrostatic discharges at the surfaces, which leads to gypsum attracting no dust. As pure inorganic material gypsum can prevent mould growth.

ACOUSTIC
INSULATION

As homogeneous solid building material MultiGips gypsum blocks guarantee an outstanding acoustic insulation for partition walls. The direct transmission of sound from one room to another is strongly reduced. An optimum acoustic insulation concept, nevertheless, takes into account also the undesirable acoustic transmission via adjacent building units. This problem is solved by gypsum blocks using the elastic connector MultiGips AkustikPro 120 to adjacent walls, ceilings and floors. The building units are acoustically decoupled and cannot mutually stimulate each other. The disturbing acoustic transmission via adjacent paths is thus effectively reduced.

Acoustic insulation

The solid gypsum blocks provide excellent acoustic insulation using edge strips optimised through acoustic technology. Particularly high requirements on acoustic insulation, for example with apartment partition walls or corridor separating walls in hotels and hospitals, can be met securely using double-leaf walls.

In addition to requirements between single- and double-leaf walls the gross density of the gypsum blocks as well as the design of the wall connection to adjacent walls, ceilings and floors influence the quality of the acoustic insulation. If an increased acoustic insulation is to be achieved with airborne sound insulation, gypsum blocks marked in red of higher gross density in accordance with EN 12859 are used. The gross density of these gypsum blocks is ca. 1,200 kg/m³.

Planning details for acoustic insulation

Gypsum blocks can be connected to adjacent walls, ceilings and floors rigidly,

sliding or elastically. With walls with acoustic insulation requirements the elastic connection should always be chosen. All sound insulation values given in this brochure refer to this type of design. The elastic connection strips consist preferably of PE low expansion foam, compressed cork, bituminous felt or mineral rock wool [with fire protection requirements]. They reduce flank transmission and offer an optimum acoustic insulation. In order that the given sound insulation values are achieved, the following constraints are to be taken into account with the planning and implementation. Secure adhesion through keying

- All boards and connection joints must be free of hollow spaces and filled completely with gypsum.
- The strips must be laid without gaps and lie close to the adjacent building units. They may in no case be plastered over with filler, if required the filler coating

from adjacent building units is to be separated using a trowel cut. The plaster of adjacent walls or ceilings is also to be separated from the partition wall using a trowel cut.

- The use of connection strips which are wider than the wall is ideal. The excess width is cut off after filling and, through this, each acoustic bridge eliminated. Edge strips made from PE low expansion foam are particularly recommended.
- Pipes may not directly touch the wall but should be secured using acoustic insulating fixtures.
- The insulation in double-layer walls must be attached adhesive plaster using gypsum.



Depending on the situation with regard to the installation of the partition wall four different technical acoustic insulation effects are to be considered:

- Gypsum blocks as partition walls
- Gypsum blocks as adjacent walls
- Installation walls
- Installation noises

Gypsum blocks as partition walls

The airborne sound insulation between two adjacent rooms in compact construction is determined above all by the surface related mass of the separating wall. Walls made from gypsum blocks belong acoustically to rigid walls. The rated sound insulation mass $R'_{w,P}$ for single-leaf walls can be taken from Table 1 in Supplement 1 to DIN 4109. With the execution using elastic wall connection Footnote 3 of the table allows an additional bonus of 2 dB. For a large number of single- and twin-skin wall structures there are, additionally, test certificates available which, in part, prove

sound insulation values considerably above the standard and which can be employed for the evaluation of the acoustic insulation. According to this, single-leaf walls made from gypsum blocks, already with mean gross density, achieve a rated sound insulation mass $R_{w,P}$ of up to 40 dB with 100 mm wall thickness; with higher gross density and the same thickness it is 44 dB. For double-leaf walls values up to 68 dB have been determined whereby the proposals for an increased acoustic insulation in accordance with Supplement 2 to DIN 4109 can certainly be achieved.

The values given apply for undisturbed walls without doors, channels or other openings. With walls with openings as a rule the doors are the weakest link whereby the quality determines the acoustic insulation of the complete wall.

Gypsum blocks as adjacent walls

The acoustic insulation of a partition wall actually realised, in addition to its own surface-related mass, depends also on the type and bonding of all adjacent building units. Through the elastic connection of gypsum blocks the flank transmission to adjacent building units is considerably reduced. Or put in another way: as opposed to rigidly integrated adjacent building units, partition walls do not or only slightly stimulate themselves or adjacent building units acoustically when elastically connected together. Various practical construction measurements and expert reports confirm that elastically attached gypsum blocks as flanks of partition walls or ceilings ensure an optimum acoustic insulation.



Installation walls

In accordance with DIN 4109, Para. 7.2.2.4 single-leaf walls to which or in which water installation fittings are secured, must possess a surface-related mass of at least 220 kg/m². With lighter partition walls it is to be verified with a suitability test that, referred to the transfer of installation noises, they do not have a more unfavourable behaviour than heavy walls.

For partition walls made from gypsum blocks with elastic connections this verification could take place in investigations by the Institute for Acoustic Insulation for Testing and Research into Building Matters in Hildesheim. The partition walls behave in the main more favourably, at least, however, no more unfavourably than heavy adjacent walls and can therefore be used as installation walls in accordance with DIN 4109.

Installation noises

For the meeting of the permitted noise pressure level from domestic facilities in accordance with DIN 4109, Table 4, there are test certificates available from the North Rhine Westphalia State Material Testing Office. With the certified test arrangement on walls made from gypsum block [80 mm] with facing, the requirements in accordance with DIN 4109, Table 4, Line 1, using fixtures from Fixture Group I, were met, i.e. the permitted noise pressure level of $L_{AF} \leq 35$ dB[A] was not exceeded in vertically or diagonally adjacent rooms requiring acoustic insulation. With testing using an on-wall San-Tro 2000 installation, the requirements were not exceeded even with the employment of fixtures from Fixtures Group II.

The tested double-leafed wall construction made from gypsum blocks in thicknesses of 80 and 100 mm with insulation material, met the requirements, in addition using fixtures from Fixtures Group II, also in the horizontal direction [for apartment partition walls]. The measurements were carried out using a flow pressure of 0.3 mPa.

Thickness (mm)	Gross density class EN 12859 ¹⁾	Grammage of the wall (kg/m ²)	Acoustic insulation with designs with edge strips of AkustikPro 120 R _{W,P} (dB) ²⁾	Acoustic insulation with designs with edge strips of compressed cork, 5 mm R _{W,P} (dB) ²⁾	Acoustic insulation with designs with edge strips of rock wool, 13 mm R _{W,P} (dB) ²⁾
SINGLE-LEAF WALLS					
60	Medium gross density mR	54	33		
80	Medium gross density mR	72	37		
100	Medium gross density mR	90	40	37	38
100	High gross density hR	120	46 ³⁾	40	

Thickness (mm)	Wall design ¹⁾	Wall thickness (mm)	Grammage of the wall (kg/m ²)	Acoustic insulation with designs with edge strips of AkustikPro 120 R _{W,P} (dB) ²⁾	Acoustic insulation with designs with edge strips of bitumen felt 3 mm R _{W,P} (dB) ²⁾
DOUBLE-LEAF WALLS					
100	Gypsum block hR [120 kg/m ²] and attached composite board made from:	150	136	52	
12.5	Gypsum sandwich type plasterboard				
30	Mineral wool				
80	Gypsum block mR	175	128	61	
25	Mineral wool Heralan-TP or glass wool				
10	Air film				
60	Gypsum block mR				
80	Gypsum block mR	210	146	60	
40	Mineral wool Heralan-DPF or glass wool				
10	Air film				
80	Gypsum block mR				
80	Gypsum block mR	260	148		68
80	Mineral wool > 12 [kPa s/m ²]				
20	Air film				
80	Gypsum block mR				
FACING IN FRONT OF SOLID WALL					
	Solid wall		185		+ 18 dB
			330		+ 7 dB
			460		+ 13 dB
	Facing made from mineral wall	40			
	Gypsum blocks mR	60			
MULTIGIPS BRANDWAND ⁴⁾					
160	Gypsum plaster with glass lattice fabric	18	150		44 ⁵⁾
	Gypsum block mR	60			
	Gypsum plaster with glass lattice fabric	4			
	Gypsum block mR	60			
	Gypsum plaster with glass lattice fabric	18			

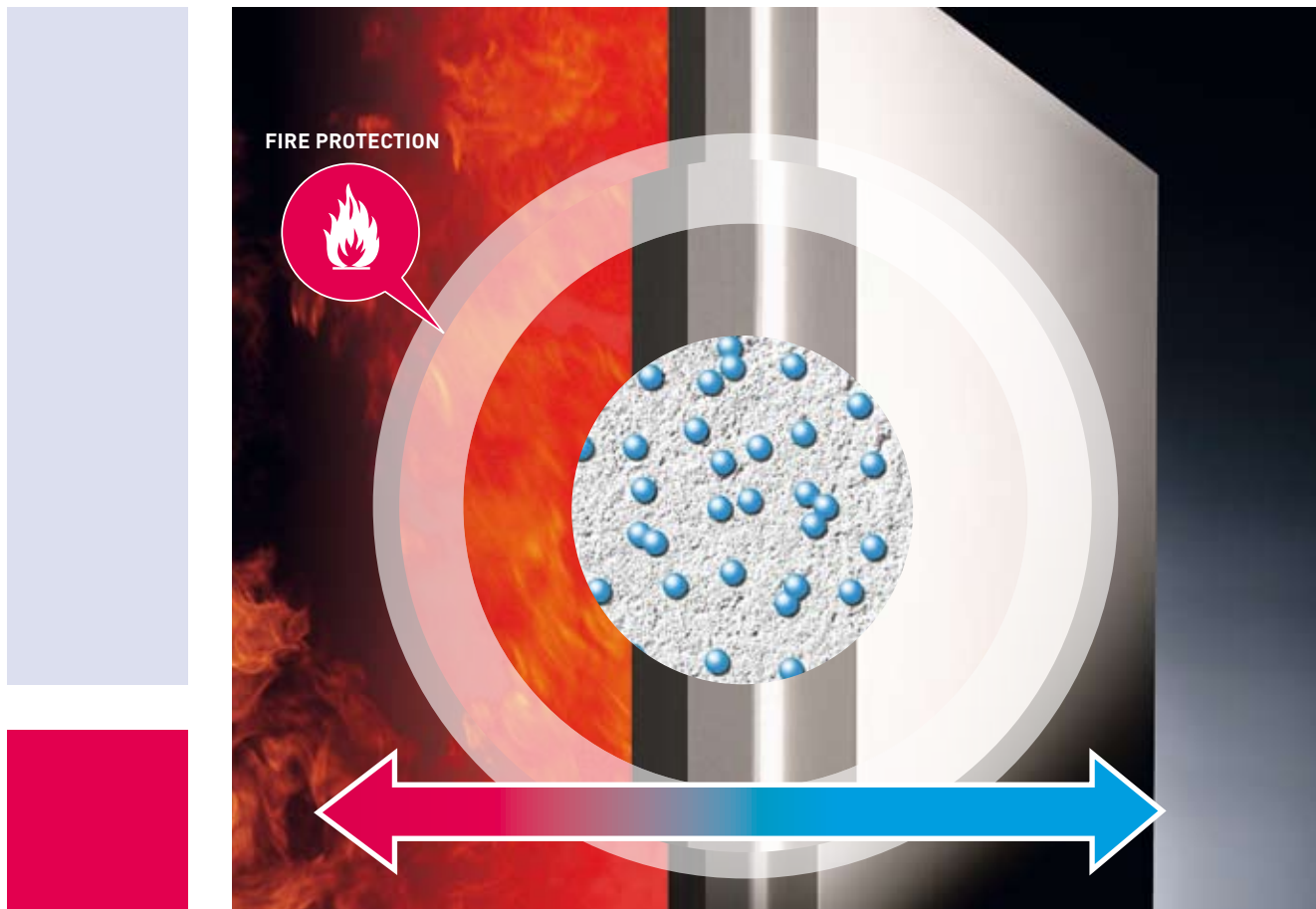
1) Average gross density: 800kg/m³ ≤ ρ < 1,100 kg/m³, , high gross density 1,100 kg/m³ ≤ ρ < 1,500 kg/m³

2) Acoustic insulation values with execution iaw. Proof Certificate. R_{W,P}: acoustic insulation measured in the test stand; calculated value R_{W,R} = R_{W,P} - 2 dB. Without longitudinal transmission via adjacent building unity

3) With elastic connection iaw. Test report with bituminous felt strips

4) With execution iaw. abP 3668/484/07 MPA Braunschweig

5) Acoustic insulation with execution using rock wool edge strips, 12 mm iaw. Test report



Structural fire protection

Gypsum is a mineral and non-combustible building material [Building Material Class A1 in accordance with DIN 4102]. In a case of fire, with gypsum building units, the flames find no support – or in technical terms: gypsum does not increase the thermal load in buildings. With its special crystal structure it provides even an additional active contribution against the spread of fire and has therefore proven itself as highly effective fire protection.

Gypsum as fire protective building material

Gypsum is a mineral building material with the chemical formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, consisting of calcium sulphate and water [dihydrate]. The two water molecules are not chemically bonded but are stored in the interstices of the structure and form a share of up to 20 % of the total building unit. Under the effect of heat of a fire the gypsum is dehydrated. The crystal water vaporises and with this draws energy from the fire.

In addition it forms a protective vapour veil. The surface temperature on the side away from the fire increases only slightly. The fire protection effect is the more pronounced the thicker the layer of the solid gypsum is. The homogeneous gypsum blocks consisting of gypsum with 100 mm thickness can, for example, resist the fire for three hours, without the electrical sockets also tested in parallel even for four hours.

Partition walls with fire protection requirements

For interior partition walls, certain fire protection requirements can be laid down in the respective [German] Federal State Building Ordinances [LBO], especially if they border on corridors and stair wells, which serve as escape routes in case of fire. With this the LBO use building supervision designations such as fire-retarding or fire-resistant. These terms can be assigned to the fire resistance classes of DIN 4102-2. The figure indicates how many minutes the building unit prevents the progress of the fire in cases of fire, without failing. In addition

the details of the reaction to fire of the various building materials is possible using subsequent letters [with gypsum blocks always Building Material Class A].

Partition walls and facings made up from gypsum blocks are, classified in accordance with DIN 4102-4 and can, without further verification, be allocated to the fire resistance classes in accordance with the table. A test certificate or approval is not required. The values given are respectively achieved without plaster layers. Electrical installations such as switches or sockets can be installed in the wall without limiting the fire protection; however, they may not be directly opposite to each other on both sides of the wall.



Symbol	Building supervisory designation
FIRE RESISTANCE CLASS IN ACCORDANCE WITH DIN 4102-2	
F 30	Fire retardant
F 60	Very fire retardant
F 90	Fire resistant
REACTION TO FIRE	
F 30-A	Building unit of Fire Resistance Class F 30 which consists exclusively of non-combustible materials
F 30-AB	Building unit of Fire Resistance Class F 30 which consists of non-combustible materials in all main components
F 30-B	Building unit of Fire Resistance Class F 30 which consists of combustible materials in all main components

Shaft walls

Gypsum blocks are extremely suitable to close off installation shafts on the room side, for which the (German) Model Building Ordinance demands implementation with non-combustible building materials. Frequently there are additional conditions with regard to the duration of the resistance to fire, which can be met securely up to F 180-A with appropriately dimensioned walls made from gypsum blocks.

The fire resistance can be required from inside outwards, outside inwards or in both directions. For gypsum blocks this differentiation is, however, immaterial as they offer the resistance to fire in both directions without work on the very inaccessible shaft interior side being necessary.

Fire protective cladding for supports

Steel and wood supporting formwork can be protected simply and effectively against fire and the danger of failure using gypsum blocks. For this the blocks are bonded together offset on the fire endangered side of the supports. Up to four-sided cladding

is possible. Wood supporting formwork achieve a fire resistance of F 60-B, structures made from steel up to F 180-A depending on design. The cladding can be produced rapidly and particularly economically as no reinforcing of the gypsum blocks and also no anchoring of the cladding to the supports are necessary. Fire protection is guaranteed without additional plastering.

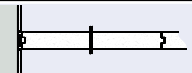
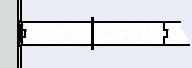

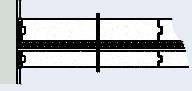
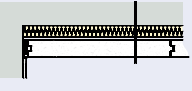
Connections with fire protective requirements

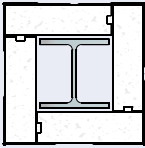
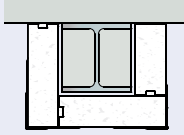
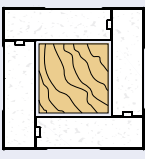
Elastic wall connections may be executed insofar as rock wool strips in accordance with DIN 18165, Part 2 [Heralan edge strips or glass wool, 13 mm, in accordance with the Specialist Report of the MPC, Braunschweig, Document No. 1247-022-07] are incorporated. They must correspond to Building Material Class A1 and have a melting point $\geq 1,000^{\circ}\text{C}$. The gross density at the ceiling and sides must be $\geq 40 \text{ kg/m}^3$ and at the floor $\geq 65 \text{ kg/m}^3$. In accordance with the statements of the MPA, Braunschweig in the specialist report, the connections may also be produced using max. 5 mm thick cork strips [Building Class at least B2], if the cork strips are covered with at least 2 mm coating of plaster. The classi-

fications of walls in this case are: F 30-AB, F 60-AB, F 120-B and F 180-AB.

With fire protection requirements for sliding ceiling connections, angle steel of at least 2 mm thickness is to be used on both sides. U-sections are not permitted. The wall must be inserted at least 20 mm. the remaining hollow space is to be filled completely using rock wool insulation material in accordance with DIN 18165-2 Building Material Class A1, gross density $\geq 30 \text{ kg/m}^3$, melting point $\geq 1,000^{\circ}\text{C}$. If the hollow space is larger than 30 mm the gross density must be $\geq 100 \text{ kg/m}^3$.

→ *Fire resistance classes of walls made from gypsum blocks in accordance with DIN 4102 and permitted wall heights with walls with fire protective requirements in accordance with DIN 4103-2 on page 56*

Wall configuration	Thickness (mm)	Fire resistance class
SINGLE-LEAF PARTITION AND SHAFT WALLS		
	60	F 30-A
	80	F 120-A
	100	F 180-A
DOUBLE-LEAF PARTITION AND SHAFT WALLS		
	80 + 60	F 120-A
	100 + 60	F 180-A
	80 + 80	F 120-A
FACINGS		
	60	F 30-A
	80	F 120-A
	100	F 180-A

Wall configuration	Cladding thickness (mm)	Fire resistance class of the clad support
STEEL SUPPORTS IAW. DIN 18800-1-2 ¹⁾		
	60	F 60-A
	80	F 90-A
	100	F 120-A
STEEL SUPPORTS AS ABOVE, HOWEVER AS HOLLOW SECTION FILLED WITH CONCRETE ²⁾		
	60	F 90-A
	80	F 120-A
	100	F 180-A
HOLLOW SUPPORTS IAW DIN 1052-1 ³⁾		
	60	F 60-B
	80	F 60-B
	100	F 60-B

Light internal firewalls

Interior firewalls can be produced very easily and economically using gypsum blocks. The firewalls have a double-leaf configuration of, in each case, 60 mm thick blocks. To increase the mechanical stability a special glass fibre lattice is embedded in the construction. A double-sided gypsum plaster additionally increases the fire resistance. Compared with other types of solid construction the walls with a thickness of 160 mm are extraordinarily slim. Depending on the material, masonry materials are usually of a size 240 to 300 mm. Firewalls made from gypsum blocks enable an optimised planning of supporting formwork as, with a room height till approx 3,30 m it belongs to the light partition walls within the sense of DIN 1055-3. Thus the firewalls can be arranged freely and flexibly at the storey ceilings – additional wall carriers, sub-structures or other reinforcement do not have to be taken into account. The bare ceilings are to be executed with Fire Resistance Class F 90 and to be calculated statically using a surcharge of 1.25 kN/m² to the live load as well as a sufficient

lateral distribution. Elastic connections with rock wool strips ensure the connection to the adjacent building materials which satisfy the fire protection.

Planning standards

The necessity and the arrangement of firewalls in residential building are regulated by the respectively appropriate. The Model Building Ordinance [MBO] on which in this point most of the LBOs orient, requires firewalls for the completion of buildings as well as for the sub-division of extensive buildings into spacings of not more than 40 m [interior firewall]. The fire sectors resulting from this should not have a floor area of more than 1,600 m². Firewalls as building completion are built up through all storeys without offset. Interior firewalls within a building may also be offset if the ceiling meets the condition F 90-A. Openings in the firewalls are in general not permitted, but can be admissible for interior firewalls if self-closing fire-resistant doors are installed. The spread of the fire within the

building is to be prevented and the damage limited locally using interior firewalls and the formation of fire sectors. In order that firewalls fulfil this function securely, they must consist of non-combustible material and be fire resistant (F-90). In addition, it is to be verified that the walls remain fire resistant even under mechanical load. A layout made from gypsum blocks has to pass successfully the necessary test I accordance with DIN 4102-3 including the triple shock loading with 3,000 Nm shock force (lead shock sack, 200 kg), and can with this be employed as interior non-load-bearing firewall.

1) With C/A < 300m -1 with up to four-sided exposure to fire

2) Or filled with concrete, mortar or bricked up as open section

3) At least sorting class S 10 or MS 10 iaw. DIN 4074-1



Preparation of gypsum adhesive bed on the rock wool strips



Work gypsum blocks into the bond



The uppermost row of blocks ends, bevelled, ca. 4 cm below the ceiling



Fill the ceiling joint



Embed the glass fibre lattice



Apply the wall plaster

10 steps to the finished firewall

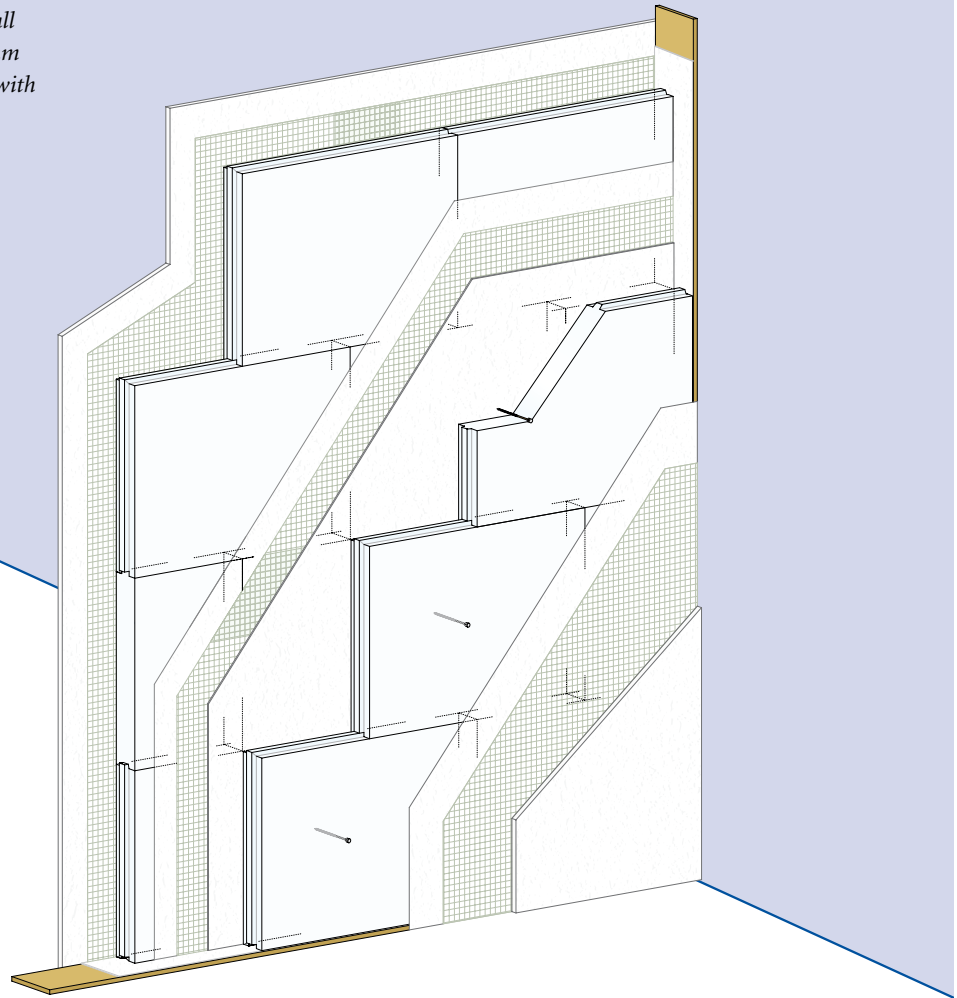
- 1.** Mark the line of the wall on the floor with a chalk line and plumb the line-up on the connecting walls. Apply stirred MultiGips adhesive to the floor and the connecting walls. Set 12 mm thick and 120 mm wide connecting strips made of rock wool [e.g. Rockwool RST or glass wool] into this adhesive bed.
- 2.** Once the gypsum is sufficiently firm apply gypsum adhesive thinly to the rock wool strips and set the gypsum blocks in the adhesive bed. With the following rows of blocks, apply gypsum adhesive respectively to butt and horizontal joints and join using groove and tongue.
- 3.** Smooth off swelled out gypsum adhesive and close the joints. The blocks achieve a closer bond and at the same time are aligned using blows of a rubber hammer.

- 4.** Every second row in the build-up of the wall starts with half a block in order that a bracing results. Avoid cross-joints. Before fixing the uppermost row of blocks it is bevelled off inwards and the space between it and the ceiling is filled using gypsum adhesive made from 2 parts MultiGips RotWeiss adhesive plaster and 1 part MultiGips adhesive. Before this fix the rock wool strips to the ceiling using gypsum adhesive.
- 5.** The glass fibre lattice is fixed using MultiGips adhesive, overlapping on the inner side of the first wall leaf with the widths running horizontally.
- 6.** The second wall leaf is principally produced like the first one. The first block height is, however, only 250 mm high in order that there is an offset of joints.
- 7.** The space between both leaves is continuously filled with MultiGips adhesive

with the progress in height.

- 8.** Following completion join both wall leaves using three screws per square metre, without involving a joint.
- 9.** Fix the glass fibre lattice for the reinforcing of the wall vertically on the outside of the first leaf with 200 mm overlap and plaster 18 mm thick. A mixture of 2 parts MultiGips RotWeiss adhesive plaster and 1 part MultiGips adhesive is used.
- 10.** Apply the outside of the second leaf identically to the first that is with vertically running glass fibre lattice bedded in 18 mm plaster.

Airborne sound insulation of a wall made from gypsum blocks, 160 mm (firewall), medium gross density, with rock wool strips, 44 dB (Investigation report)

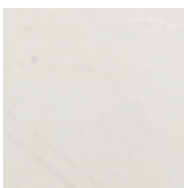
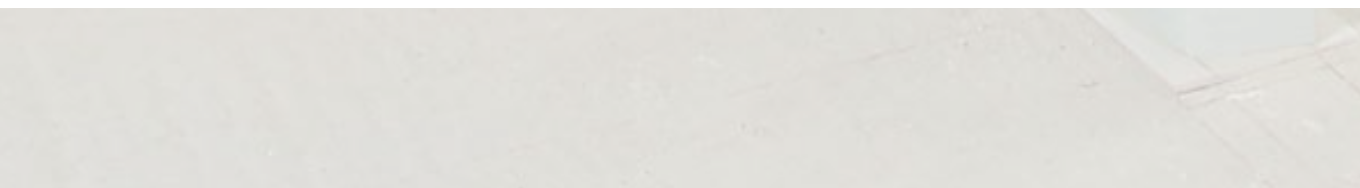
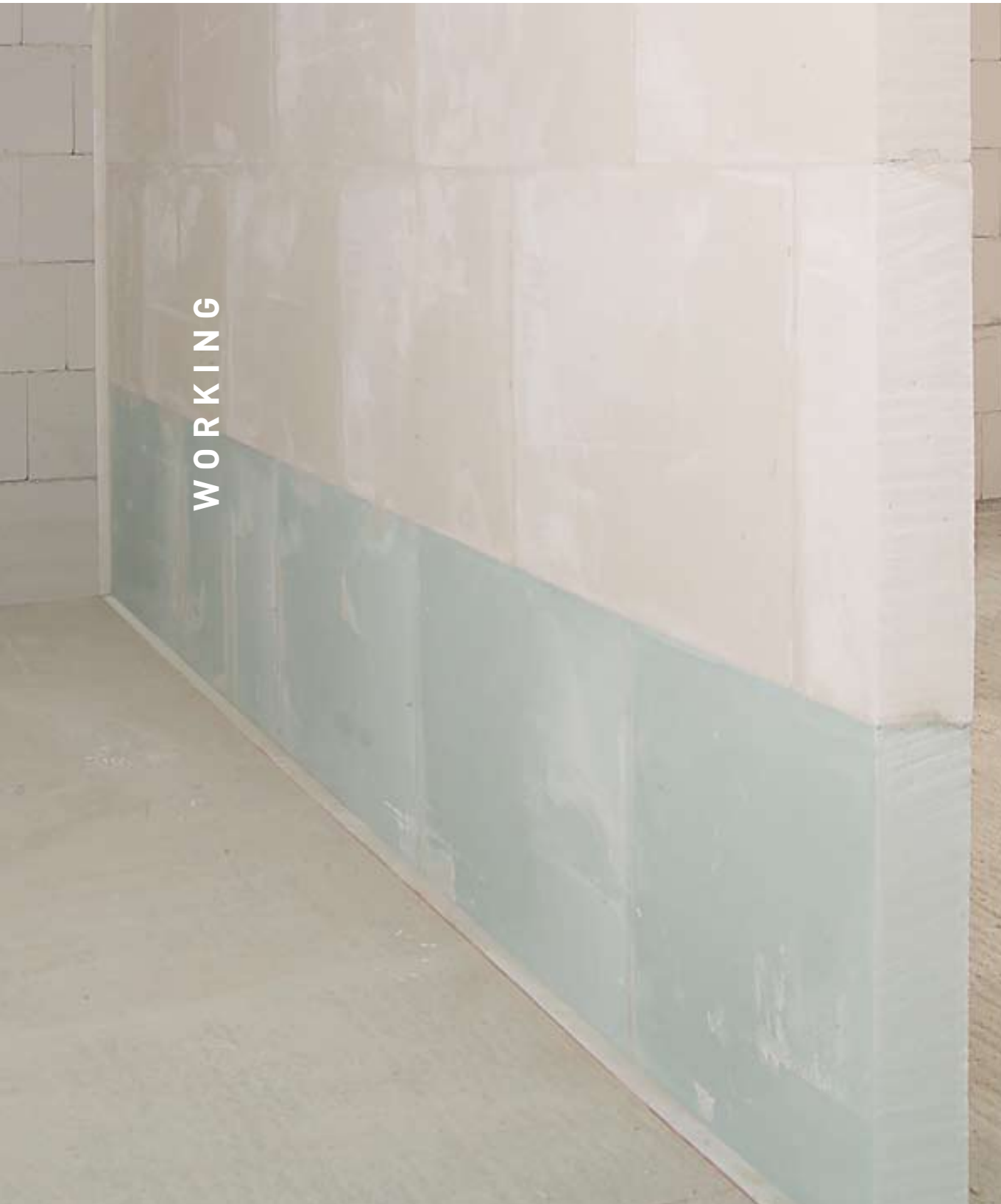


MULTIGIPS FIREWALL – TECHNICAL DATA ¹⁾

Material	Gypsum blocks EN 12859, gypsum adhesive and gypsum plaster
Building Material Class	A1, non-combustible
Block thickness	2 x 60 mm
Block format	500 x 666 mm
Gross density Class	Medium gross density ca. 850 kg/m ³
Wall thickness	160 mm
Grammage, total	150 kg/m ²
Max. wall height	6.50 m
Plaster	Gypsum mortar made from MultiGips RotWeiss adhesive gypsum plaster and MultiGips adhesive ; ratio 2:1
Reinforcing	Glass fibre lattice, breaking load $\geq 4,000$ N/5 cm, mesh width $\geq 5 \times 5$ mm, overlapping 200 mm. P-D glass fibre, Type BGG 09 or glass wool
Reinforcement	Rock wool strips, non-combustible A1, melting point $\geq 1,000^\circ\text{C}$, variable, 120 x 12 x 1,000 mm, Rockwool-RST or glass wool
Screwing	Dry wall screws, course thread, 6 x 100 mm, 10 mm countersunk
Fire protection	Non-load-bearing room closing firewall made from solid gypsum blocks in accordance with DIN 4102-3 with single-leaf exposure to fire: Test Certificate Number P3668/484/07-MPA-BS
Fire resistance class	F 90-A in accordance with DIN 5102-2
Acoustic insulation	$R_{w,p} = 44$ dB

¹⁾ In accordance with DIN 4102-3 as interior fire wall in buildings [F 90-a] as double-leaf non-load-bearing structure made from gypsum blocks

WORKING





Qualitätsgemeinschaft

Massiver

Trockenbau

Professional with or without certificate

Construction using MultiGips gypsum blocks represents an almost unbeatable advantage of a combination of solid and dry mortar construction. Its economic, technical and building-physical trumps, however, only come into full play with professional working. For this reason the interior partition walls should be erected by qualified specialist firms only, which have the know-how and experience with the handling of high quality gypsum products as well as the professional filling/smoothing of the surfaces. Above all working using the trade of stucco and or dry mortarless construction. Developer constructors and their architects can, however, use other firms, which have sufficient specialist knowledge and experience (training provided).

To ensure the quality of workmanship is offered by certified firms of the quality association "Solid dry mortar construction". Its aim: mature and verifiable technical solutions for non-load-bearing partition walls made from solid gypsum blocks, in the long-term is better value for the customers.

The quality association "Solid dry mortar construction" is made up of respected specialist firms who, together with experienced technicians from industry, have defined the quality-oriented design of non-load-bearing solid partition walls made from gypsum blocks on the basis of valid standards and have committed themselves to its observance. In order that the promise of quality is

also honoured an independent organisation for quality control has been tasked with the certification and monitoring of the firms. Thus, inter alia, the firms' building sites are visited, unannounced, twice a year. Execution, system conformity, building site logistics: the results must correspond with the assessment guidelines of the quality association.

With certification, the specialist firms of the quality association "Solid dry mortar construction" have created a recognised standard within the building industry. Quality assurance is an important factor in all economic procedures. Also and precisely in the implementation of construction, this argument carries weight. The high quality level leads to a higher credibility of the certified specialist firms. They are also involved in the scientific-technical further development of wall systems.

Certified specialist firms reduce execution errors right from the start. As employees such as subcontractors have to meet quality criteria consistently. Additional work and expense and additional costs are dispensed with for the correction of deficiencies in construction.



Addresses of certified specialist firms



1. Mark partition wall position using a chalk line



2. Repeat marking using chalk line on fixed MultiGips AkustikPro 120 s-a edge strip



3. Apply gypsum adhesive bed



4. Apply gypsum adhesive to the face of the gypsum block and work force-fit

Design of partition walls

Single-leaf wall

Mark line of the walls on the floor using the chalk line and plumb the gap on the connecting walls. A sufficient number of templates for adjacent building units, wall corners and door openings ensure the perpendicular run of the wall. Apply stirred MultiGips adhesive to the floor and, with this, even out possible unevenness of the floor [not required with the employment of MultiGips AkustikPro 120 s-a)! On this place edge connection strips and align using straight edge and level. Proceed in the same manner with lateral walls. It can be freely selected whether the gypsum blocks are offset with the groove or tongue uppermost. If the groove is to be at the top the tongues of the bottom row of gypsum blocks must be removed. With lateral wall connections the procedure is the same.

If the gypsum between floor and strips is sufficiently firm apply gypsum adhesive thinly to the edge strips and set the gypsum blocks in the adhesive bed. It is recom-

mended that the last row of gypsum blocks ends ca. 3 to 4 cm below the ceiling. For protection against moisture the first row can be built using hydrophobised gypsum blocks.

With all following gypsum blocks the following simple operations are repeated:

- Apply sufficient adhesive to butt and horizontal joints
- Place gypsum blocks together using groove and tongue
- Produce tight groove and tongue connection using blows of a rubber hammer (use support profiles where required)
- Align gypsum blocks using straightedge, level and rubber hammer
- After slight hardening scrape off projecting adhesive, close joints

The second row starts with half a gypsum block. After this continue the bonding. As far as possible avoid cross joints. Corners are bonded alternating in layers.

Production of ceiling connections.

Before the installation of the last row of gypsum blocks fix the edge strips to the ceiling using gypsum adhesive [dispensed with using self-adhesive variants]. In order that joints can be well-filled, the separation between row of gypsum blocks and edge connection strips is to be at least 3 to 4 cm. If the gypsum blocks of the top row have been beveled off, clean the cut surfaces of gypsum dust thoroughly. Completely fill connection joints with MultiGips FG 70 Füllgips (Filler gypsum) and with this as far as possible do not plaster over the edge strips. Otherwise the strips are to be freed directly at the ceiling using the edge of a trowel. MultiGips AkustikPro 120 made up from 12 mm wide PE low expansion foam, which after filling/smoothing is cut flush to the surface, has proved successful.



5. Correction of position using rubber hammer and straightedge/level



6. Remove projecting gypsum adhesive after it has dried slightly



7. Completely fill the ceiling connection joint



8. Cut off overhang of edge strip

Filling/smoothing

After laying electrical installations, close all holes and gaps in the wall using MultiGips FG 70 Füllgips. Depending on the required quality, fill/smooth surfaces in the area of the joints only or full-surface using MultiGips adhesive, MultiGips CasoFill® Super 50 or MultiGips CasoFill® Uni. Walls that are to be tiled may not be filled/smoothed! Here only the gypsum adhesive which has swelled out is removed after hardening.

Erection of double-leaf walls

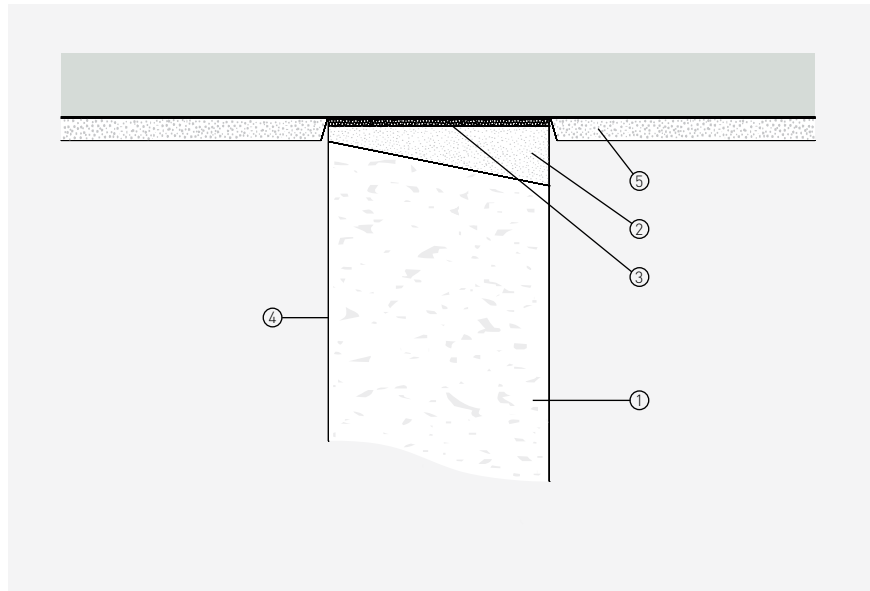
With increased requirements for acoustic insulation and/or installation walls, partition walls made from gypsum blocks can also be designed double-leaf. With this, each leaf is an independent wall without connection to another [exception: interior firewalls]. After the first leaf of a double-leaf wall has been completely executed, optionally the installations and/or insulating material can be put in place. Pipelines should not be secured in or directly on

walls, but on acoustically dampened brackets. Insulating material in intermediate spaces is compacted and secured against slipping to the first wall leaf using gypsum adhesive.

The wall structure is subsequently closed with the erection of a second leaf whereby the necessary separation between both leaves is to be maintained. The insulation material may not be buckled and the installations must run free of contact in the intermediate space. Transverse walls made from gypsum blocks abutting on to a double-leaf partition wall are bonded only with one leaf.

Elastic connection

An elastic ceiling connection carried out optimally from a technical acoustic aspect. The edge connection strips MultiGips AkustikPro 120 consist of PE low expansion foam (120 kg/m³). The light partition wall can transfer no solid-borne sound to adjacent building units. The adjacent ceiling plaster is separated from the partition wall using a trowel cut. Also through this, the adjacent transmission [sound series performance] is effectively reduced. The blocks of the topmost row are slightly beveled in order to enlarge the bonding surface between filling plaster and block, and at the same time to make the complete filling of the joint more easy. The ceiling connection joint, with 3 to 4 cm height is sufficiently large and is completely closed without hollow expansion foam low space using filling plaster.



- 1 MultiGips gypsum block
- 2 MultiGips FG 70 Füllgips
- 3 MultiGips AkustikPro 120 self-adhesive, alternatively with MultiGips adhesive applied with slight bonding
- 4 MultiGips adhesive alternatively MultiGips CasoFill® Uni for filling/smoothing on both sides
- 5 Interior plaster separated from partition wall using trowel cut

Selection of the connection/interface

Interior partition walls made from gypsum blocks can be connected to all fixed building units, for example to concrete, masonry of all types, wood and steel formwork as well as load-bearing plaster. Depending on the structural situation and required acoustic insulation there are three types of connection for selection:

- elastic connection
- sliding connection
- rigid connection

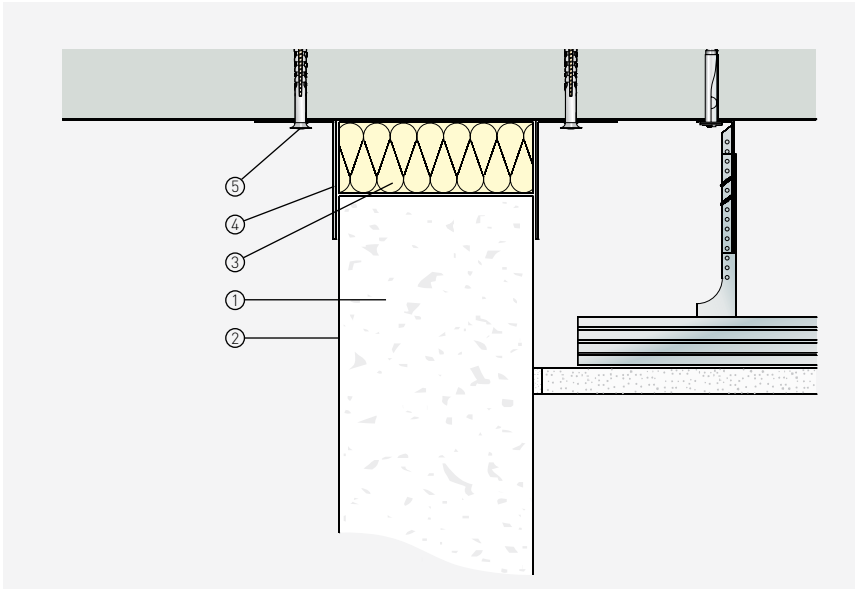
The elastic connection is the recommended standard design because it can compensate smaller structural deformation (e.g. bending of the ceiling) and, through the high damping of structure-borne noise offers the best acoustic insulation. If larger and repeated deformation of the adjacent building units is to be reckoned with, particularly with a more serious bending of the ceiling, then a sliding connection should be implemented. The sliding design is in particular to be recommended with connections to wooden beam ceilings or to the

undersides of roofs as well as with ceilings with large span widths, if necessary also with lateral connections to wooden support constructions. The rigid connection using gypsum adhesive alone should be used in exceptional cases only, when no or only extremely small structural deformation is to be expected and no acoustic insulation requirements are to be met.

Optimum: elastic connection

The most important components of the elastic connection are the edge connecting strips. They consist of polyethylene low expansion foam, compressed cork, bitumen felt or rock wool and are, in part, supplied as ready-to-work accessory with the gypsum blocks. Strips made from PE low expansion foam (120 kg/m³) have proved themselves as universal and economic standard solution. The MultiGips Akustik-Pro edge strip was developed especially for the elastic connection of gypsum blocks. Its special suitability has been certified in comprehensive tests by a material testing institute. If the partition wall has to consist

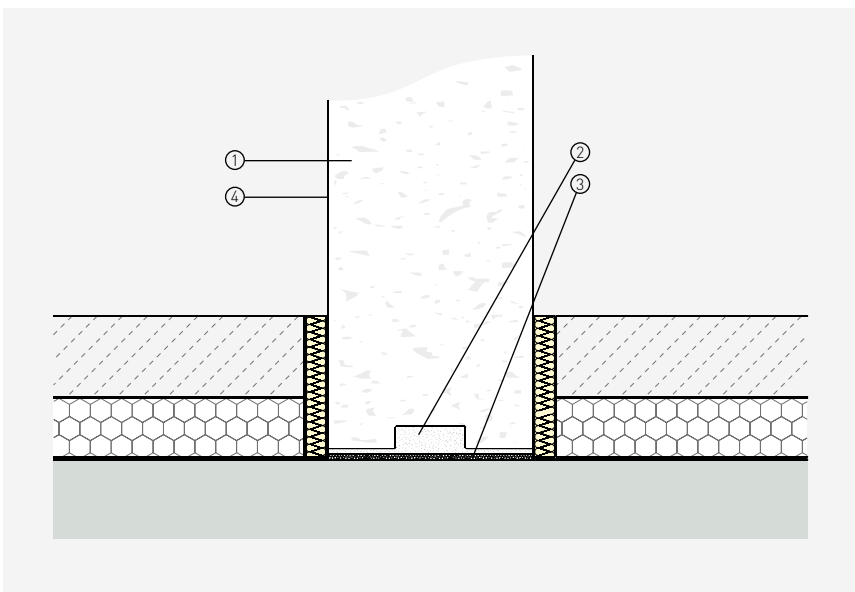
entirely of non-combustible materials due to fire protection, then rock wool strips (Building Class A in accordance with DIN 4102) can be employed. The edge connection strips are secured continuously on all sides to the adjacent building units [exception: self-adhesive strips]. The gypsum blocks are then adjoined closely using a further layer of gypsum adhesive and are then to be set on (floor) or against (wall). The use of MultiGips FG Füllgips is recommended at the ceiling connection. Its special composition prevents cracks due to too rapid deflagration and through this ensures a crack-free connection. For technical acoustic reasons the edge connection strips should not be plastered over. Otherwise the filling/smoothing should be separated again close to the ceiling using a trowel cut. Broad edge strips (12 cm), which after filling/smoothing are to be cut off to match the surface, have in particular proved themselves. With this, any rigid bonding between wall and ceiling is excluded.



- | | |
|-----------------------------------------------------------------------------------------------|---------------------------------|
| 1 MultiGips gypsum blocks | 3 Rock wool insulation material |
| 2 MultiGips adhesive, alternatively MultiGips CasoFill® Uni for filling/smoothing, both sides | 4 L-profile 60 x 40 x 2 mm |
| | 5 Anchor |

Sliding connection

The sliding connection ensures a free movement between partition wall and adjacent building unit. With this, the lateral purchase for the partition wall is taken over by U or double-L metallic profiles. Wooden strips are also possible. The gypsum blocks must engage at least 15 mm deep into the profile, with requirements for fire protection at least 20 mm. the remaining hollow space is filled with rock wool at the wall and ceiling connections.



- | | |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1 MultiGips gypsum blocks | 4 MultiGips adhesive, alternatively MultiGips CasoFill® Uni for filling/smoothing, both sides |
| 2 MultiGips adhesive | |
| 3 MultiGips AkustikPro 120, self-adhesive, alternatively set using MultiGips adhesive | |

All CAD available in the planning-relevant formats DWG and DXF or also as PDF



CAD: connections without fire protective requirements
www.multigips.com → service

Openings in partition walls

Openings in partition walls made from gypsum blocks can be left with the erection of the walls or can be cut out [Not knocked out!] of the finished wall later. Larger openings, for example for doors, should be laid out already when building up the walls. With small openings, e.g. hatchways or viewing windows in the walls, the most economic solution is often later sawing, boring or cutting.

The freedom of choice of immediate or later design of the openings is an important contribution to the flexibility of planning and conversion-friendliness of building units made from gypsum blocks. Within the scope of rehabilitation, after many years use, new doors can be installed or closed at any desired point without, with this, having to consider spacing or standard widths. With new structures the precise positioning of doors can still be corrected far into the building phase. For the layout of the openings and the installation of the doors

the most frequent situations in building practice are described below:

- door openings up to 1 m width
- larger door openings
- installation of a single-piece steel frame during build-up of the wall
- installation of a single-piece steel frame after build-up of the wall using frame anchors
- multi-piece wooden frames

Openings up to 1 m wide

Openings in building units made from gypsum blocks up to 1 m wide require no door lintel and no reinforcing. They are covered in the continuous gypsum block bond. Here, both edge gypsum blocks, if possible, should overlie the opening by 20 to 30 cm. For the possible remaining width an adjusting piece is cut to shape, which is

installed between the edge gypsum blocks. As far as it is practical due to the height of the room the upper or lower row of blocks can be offset edgewise.

If the frame is installed at a later point and an assembly aid can be placed over the opening and removed once again after the gypsum adhesive has bonded, the shoulder of the wall next to the opening [remaining width of the wall] should be at least 10 mm.



Larger door openings

With larger openings, depending on their size and position, further measures, e.g. special reinforcing, can be necessary. For openings over 1 m width galvanized slotted steel strip [width 20 mm, material thickness 1.5 mm] has proved itself as lintel reinforcement. Other suitable profiles are also possible. The slotted steel strip is laid edge-on in machined or cut joints a few centimetres above the opening in the covering block layer. Both sides of the wall are to be reinforced and the joints offset in height by ca. 5 cm from each other. The reinforcement should bond into the wall some 50 cm on both sides of the opening.

With larger room heights it is recommended that the block row lying above should also be reinforced. In practice it has been proved that already cutting and, if required, also offsetting the lower row of blocks edge-on so that the required height of the opening agrees exactly with a horizontal joint.

Installation of a single-piece steel frame during build-up of the wall

Single-piece steel all-around frames can be installed very economically and elegantly together with gypsum blocks. For this the frame is to be aligned to the planned position and supported against the ceiling using battens as well as braced using wooden cross bars. With the building-up of the wall the gypsum blocks are fed into the mouth of the frame and the remaining hollow

space filled with gypsum mortar in layers. For solidly fixed frame anchors the blocks receive cut-to-match slits.

Work with adjustable frame anchors, which grip into the horizontal joints of the gypsum blocks, is simpler. Above the frame both edge blocks should overlay the opening by 20 to 30 cm. If necessary an adjusting piece is to be installed in the middle. Openings over 1 m wide are to be reinforced as described above.

Installation of a single-piece steel frame after build-up of the wall, using frame anchors

The door opening is left out during build-up of the wall or sawed out or corrected at a later time. With an installation using anchors the dimensions of the opening correspond with the frame dimensions. The reveals are bevelled on one side of the wall and above and have gaps for the frame anchors. Finally, install the frame vertically and horizontally true, brace and fix. Fill gaps and hollow spaces on the sides and above with gypsum mortar, preferably MultiGips FG 70.

→ *Description of build-up in picture for, on the following double page*

Installation of a single-piece steel frame after build-up of the wall, cast frame

The door opening is left out during build-up of the wall or sawed out at a later time. Its width and height, depending on the frame

profile, is to be designed up to 15 mm larger than the basic dimensions. Gaps are to be cut out in the corners of the lintel for the plugging of the frame. Subsequently, install the frame vertically and horizontally true, brace and fix. Secure piling boards or similar to each side of the wall next to the frame using clamps. Fill hollow space from above with gypsum mortar, e.g. MultiGips FG 70 Füllgips. Hit the frame lightly with a rubber hammer during pouring, so that no hollow places remain. Finally close gaps again, e.g. using MultiGips FG 70 Füllgips.

Multi-piece wooden frames

Wooden frames are basically installed subsequently in partition walls made from gypsum blocks. In the normal cases this is the work of the carpenter or joiner. He can, as with other walls, fix the frame using polyurethane foam or straddling dowels. Using polyurethane foam the pre-treatment of the background [gypsum] with primer or bonding bridges is recommended. Using straddling dowels the expansion force must work both upwards and downwards.

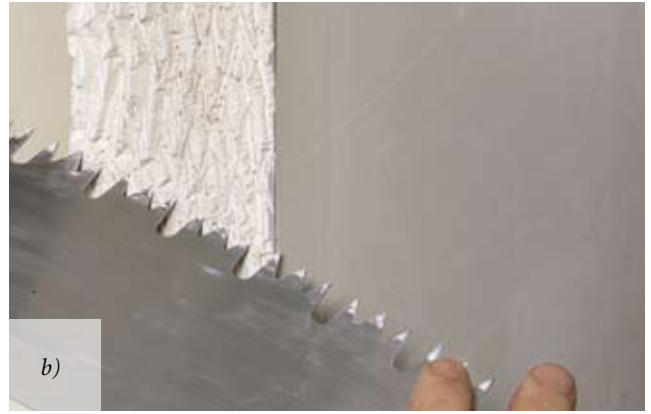
Door sill reinforcement made of flat steel

Openings in partition walls made from gypsum blocks can be produced securely and without further measures as described. Through the installation of a door sill reinforcement made from flat steel, in particularly critical conditions, for example with large ceiling span widths or anticipated large structural movements, security against cracks can be increased. Through this measure the tension zone of the wall is transferred from the area of the door supports to the foot of the wall. The nominal tensile stress is taken over by the door sill reinforcement.

Apply MultiGips adhesive to the edge connection strips in the area of the door and place reinforcing in the adhesive bed. Press the two edge blocks into the metal spikes of the flat steel.

Developed and tested by the Material Test Institute for Building Matters MPA Braunschweig.





Installation of a single-piece steel frame after build-up of the wall using frame anchors

The door opening is left out during build-up of the wall or sawed out at a later time. The dimensions of the opening correspond with the dimensions of the frame with an installation using anchors (a).

The reveal are bevelled on all sides using a saw, roughened and freed of gypsum dust (b).

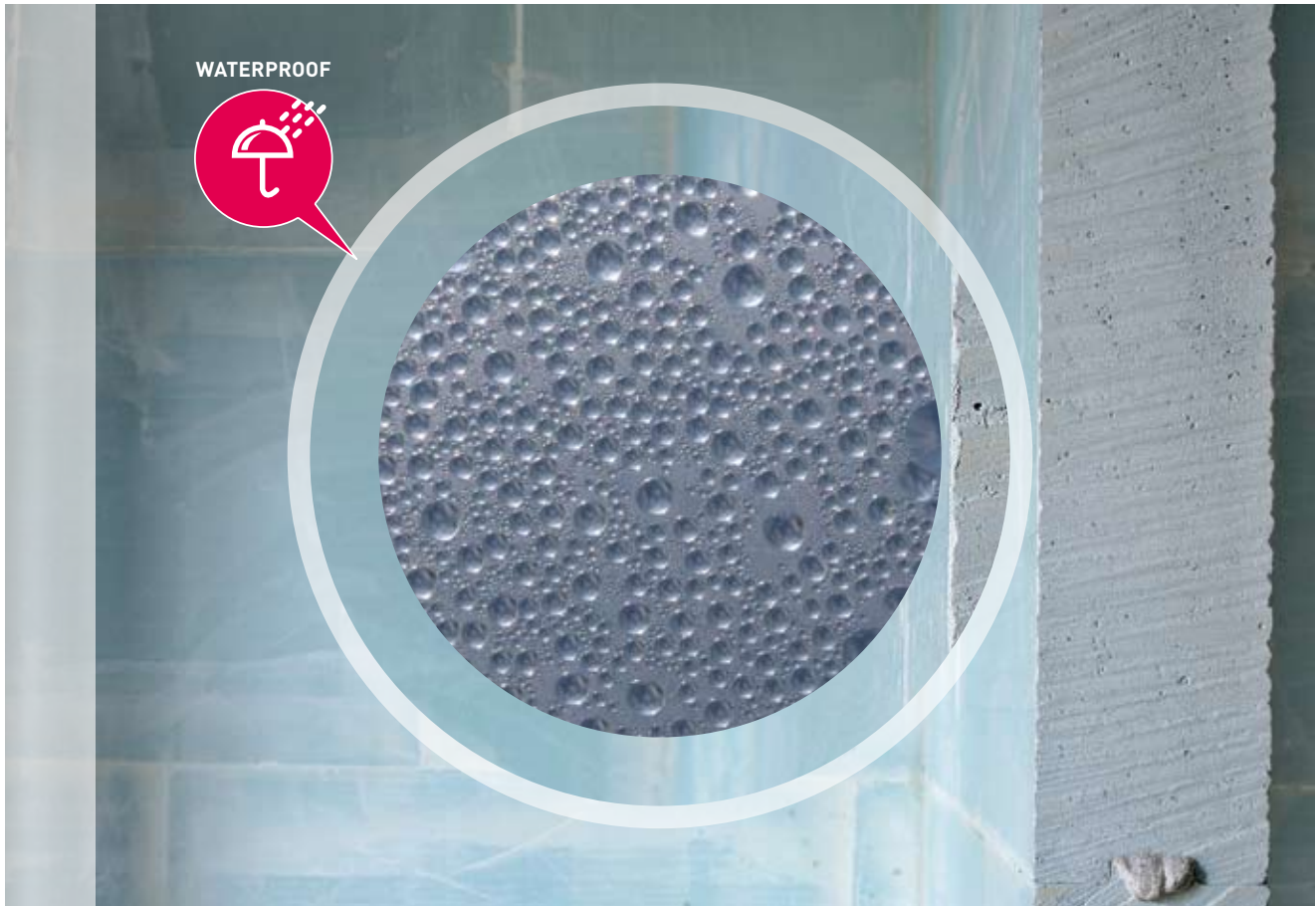
Saw out gaps for the flexible frame anchor and also remove cutting dust. Frames with fixed anchors define the position of the gaps (c,d).

Moisten reveal and gaps thoroughly. Place frae vertically and horizontally true. (e,f).

Fix and brace frame in agreement with the one metre marking (g).

Close gaps and hollow spaces at the side and above using MultiGips FG 70 Füllgips (h).





Wet rooms

Gypsum blocks can be used as interior partition walls in all rooms of apartments, administrative and commercial buildings. They are also suitable for use in kitchens and bathrooms. Only in areas with continuous and regular heavy moisture loading should blocks not be used for example in large commercial kitchens or public swimming pools. For use in domestic kitchens and bathrooms a water repellent gypsum block is recommended. As they consist of hydrophobised plaster of Paris, they protect better than any applied primer. The diffusion capability of the blocks is not prejudiced through the hydrophobisation. For a simple and foolproof handling on the building site water repellent gypsum blocks are marked in blue. Their water absorption after 2 hours total storage in water is less than 5 % by weight. The functional security of partition walls can be increased further if MultiGips adhesive Hydro 90 is also used for offset and the filling/smoothing of blocks.

Hydrosockets (Hydro-footings) for thermal insulation and protection against damp

MultiGips Foamglass protect the walls against rising damp with water penetration during building and with subsequent water damage. They are resistant to water penetration and rising damp. The footings are laminated on two sides using special glass fibre and can be ordered as accessory.

Tile adhesive or MultiGips adhesive are suitable for fixture to the floor. Further build-up of the partition wall follows the normal procedure. Preferably an elastic connection should be implemented. MultiGips Hydrosockel also ensures an improved thermal insulation at the foot of the partition wall. With installation on bedplates or above unheated rooms thermal bridges can be avoided.



MultiGips Hydrosockel made from foamed glass



Attachment of loads

Apartments and offices as well as social or sanitary room today are equipped with numerous fixtures and fittings secured to the wall. In addition to classical wall cupboards and bookshelves washbasins, television sets and heavy UE facilities or a display cabinets in showrooms as well as medical equipment in hospitals. The precise position of the fittings is not always known in the building phase, in addition modifications to arrangements can occur later due to conversion and changes of usage. Flexibly used interior rooms must therefore enable the attachment – even of heavy loads – on all walls and at any desirable position.

Due to the design and their solid cross-section light and heavy console loads can be attached, in position and securely, on partition walls made of gypsum block various as desired. Spacing or separation need not be taken into account here, also no load reducing crossbeams or similar are required. There must only be suitable attachment means selected and the constraints described below have to be observed.

Light console loads

Light console loads up to 0.4 kN/m (40 kp/m) may be attached to walls made of gypsum blocks using normal commercial expansion and screw anchors without further verification. This loading case applies for small bookshelves or small wall cupboards.

Heavy console loads

Heavy console loads over 0.4 to 1.0 kN/m, whose vertical line of action (lever arm) is removed from the wall surface by a maximum of 0.5 m, may be attached to walls made of gypsum blocks so far as the wall thickness is at least 80 mm and the height of the wall does not exceed $\frac{2}{3}$ of the maximum permitted wall height. This load group as a rule corresponds to wash basins or large wall cupboards. The maximum wall height is, for example, 4.50 m for 80 mm thick walls with openings (Installation Area 1). From this results a $\frac{2}{3}$ value of 3 m, which lies clearly above the normal room heights in

residential building. The walls can take on the normal console loads up to 1.0 kN/m and 50 cm lever arm without further verification. With 100 mm thick apartment partition walls even wall heights under loading up to 4.66 m are possible.

The securing of console loads of more than 1.0 kN/m or with a lever arm of more than 0.5 m is permitted if the structural safety of the wall with the existing wall dimensions is sufficient. The structural safety can be verified mathematically in accordance with DIN 4103-1.

→ *Permitted wall dimensions on page 57*

Dowels

Numerous commercial dowels and anchors can be employed for mounting fixtures in gypsum blocks. To be taken into account in each case are the values given by the manufacturer of the dowel for the depth of the drilling and the recommended working load.

Drillings

The drilling should be carried out using HSS drills in the normal drilling procedure (without impact), so that the drilling hole is not too large. For the same reason, with plastic straddling dowels, the drill diameter should be selected 1mm smaller than the dowel diameter. After drilling the boring dust should be removed carefully from the drill hole. Too large and/or an unclean drilling hole reduce the holding value of the dowel.

Edge separations

In order to prevent spalling, there is to be sufficient separation between the drilling hole and the edges of the wall (at the wall connection or at the door opening). In the case that this is not possible, for example with frontal fixtures within the door frame, the straddling dowel and thus the expansion force of the dowel must run parallel to the edge. For these cases straddling dowels without pressure are recommended.

Screws

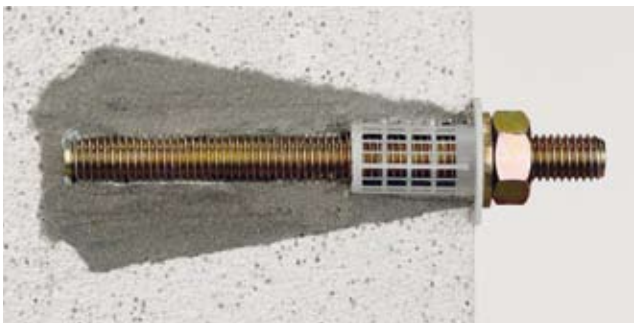
The maximum load-bearing capability given by the manufacturer of the dowels is achieved only by using screws with the largest possible diameter. Therefore as far as possible always use the respectively largest given screw diameter, never a smaller one. The use of particle board screws can reduce the holding value in comparison with wood screws.

Sanitary attachment

Secure purchase for washbasins is provided by bolts with holding plates on the rear side of the partition wall. With single-leaf walls, a recess cut on the rear side of the wall are to be cut or machined out for the flush reception of the holding plate or bar. Following insertion of the dowel the recesses are filled up with gypsum.

With wall-suspended WCs uncontrolled and high impact type loading at a relatively long lever arm can occur. Despite the high breaking loads of individual types of dowel in walls made from gypsum blocks basically the attachment of these sanitary objects to carrier supports is recommended. The carrier supports can be integrated in double-leaf installation walls or facing formwork made from gypsum blocks. Pre-assembled systems made up from carrier supports and wall-installation flushing tanks are recommended, e.g. see

page no. 33. They are secured according to manufacturer's details on the bear floor and to the rear wall leaf. They are secured according to manufacturer's details on the bare floor and to the rear wall leaf. The front leaf of gypsum blocks should be at least 80 mm thick and must lie full-face on the assembly element. They have precisely fitting drillings for the threaded rods for the securing of the WC as well as for the outflow pipe.



With tension tests, a gypsum block with high gross density ($\geq 1,100 \text{ kg/m}^3$) first tears with a load of 12.9 kN. The failure of the injection core is an indication for the optimum bonding with the block. The recommended load with an anchoring depth of 75 mm is 3.0 kN.

FISCHER ATTACHMENT SYSTEMS		
Manufacturer's anchor designation	Anchoring depth (mm)	Manufacturer's recommended max. working load kN/anchor *
S 8	40	0.15
S 10	50	0.23
S 12	60	0.37
S 14	75	0.60
SX 8	40	0.26
SX 10	50	0.37
SX 12	60	1.00
SX 14	70	1.00
Metal tiling anchor KM 10	100	1.75
FIS V 360 + FIS G M8	75	1.50 (3.00) **
FIS V 360 + FIS G M10	75	1.50 (3.00) **
FIS V 360 + FIS G M12	75	1.50 (3.00) **
UX 8	50	0.15
UX 10	60	0.35
UX 12	70	0.45
UX 14	75	0.50
Turbo FTP K 8	60	0.29
Turbo FTP K 10	70	0.54
Turbo FTP M 8	60	0.45
Turbo FTP M 10	70	0.65
TOX ANCHOR TECHNIQUE		
Manufacturer's anchor designation	Drilled hole depth (mm)	Manufacturer's recommended max. working load kN/anchor *
VLF S2 8/80	90	0.40
TRI 8/51	60	0.15
TRI 10/61	70	0.25
TRI 12/71	80	0.40
KD-D 10		2.00
Washbasin attachment WB-D		2.00
Spring tilting anchor O 10		1.30
MULTI-ANCHOR TECHNIQUE		
HUD-1 8 x 40	55	0.15
HUD-1 10 x 50	65	0.25
HUD-1 12 x 60	80	0.40
HUD-1 14 x 70	90	0.55
HGN 12	95	0.80
HGN 14	110	1.00
MEA ATTACHMENT SYSTEMS		
F 6	40	0.20
F 10	70	0.40
F 14	90	0.55
GB 12	70	0.45
GB 14	90	0.60

* The recommended working loads are guidance figures from the anchor manufacturer at the time of printing. They include, depending on the manufacturer, multiple safety factors of different amounts. There is no surety for the details. If this is required it is to be obtained directly from the manufacturer. they apply in gypsum blocks with mean gross density in accordance with EN 12859.

** The values in brackets apply for gypsum blocks with high gross density.

Installations

Electrical and data lines or similar installations can be installed very easily and discretely in gypsum blocks, both immediately after erecting the wall and also subsequently with later reconstruction or conversion.

Preparation, laying and covering of lines

Routing for cables are made using a scoring tool or pipes or by machining out. A drill bit is used for electrical sockets. Under no circumstances chisel out slits and socket holes. With the placing of the installations only corrosion protected securing fixings are to be used. Subsequently the slits are so closed using gypsum mortar that there is a sufficient covering of the component, which should be at least 1 cm. Suitable gypsum mortars for closure are, for example, MultiGips adhesive, MultiGips RotWeiss haftputz or MultiGips FG 70 Füllgips.

They do not prejudice the stability of the wall so far as they correspond with the geometric constraints.

→ *Geometric constraints, see page 35*

Pipes

Taking into consideration the constraints for the pipes can also be laid in partition walls made from gypsum blocks. In each case metal pipes must be protected against corrosion. In order to avoid condensed water and the formation of cracks as a result of heat expansion, the pipes should be suitably lagged.

Pipes within the cross-section weaken the acoustic insulation of the partition wall therefore laying using sound dampening fixtures on the wall is usually more favourable. It is then recommended to implement the partition wall as double-leaf installation wall made from gypsum blocks with or without a facing. This solution should always also be examined with a large number of installations – independent of their type.

Fire protection

Even when partition walls made from gypsum blocks have to meet fire protection requirements, electrical sockets, switches and distribution boxes can be installed at any desired position, which may not, however, lie immediately opposite each other. Individual electrical lines may be fed through the wall whereby the remaining cross-section is to be filled completely with gypsum mortar.

If several electrical lines are passed through the wall at one position or other penetrations are planned, these openings, as for door openings, must have closures which satisfy fire protection requirements. These can, for example, be fire protected doors, fire protection or access covers, fire retarding sealing of lines or fire protection glazing.

Certified (German) installation items for fire protection approved closure of openings or penetrations with gypsum blocks

Manufacturer	General national technical approval or test certificate	Approval for gypsum blocks
FIRE DOORS		
Herholz	Z-6.20-1842	✓
Schörghuber	Z-6.20-1934	✓
FIRE PROTECTION COVERS/ACCESS HATCHES		
Air Fire Tech	P-2005-6-0182/05	✓
Alutop	P-2395.2366	✓
Roth	P 3080-8866	✓
RUG	P-3307/1979	✓
Schako	Z.41.3-309	✓
Trox	Z-41.3-318	✓
	Z-41.3-321	✓
FIRE RETARDIUNG SEALINGS		
Wichmann	Z-19.15-202	✓
	Z-19.15-1022	✓
Zapp Zimmermann	Z-19.15-1182	✓
FIRE PROTECTION GLASS / WINDOWS		
Hero	Z-19.14-1646	Applied for
	Z-19.14-1723	Applied for



Geometric constraints: arrangement and size of installation slits

- Horizontal slits which in their depth are half the thickness of the wall may not be longer than 1 m.
- Longer horizontal cuts may not be deeper than 1/3 of the wall thickness.
- Parallel, horizontal cuts with separation less than 50 cm are to be avoided.
- Vertical pipelines are to be laid singly in slits.
- The separation of two slits on the same side of the wall is to be equivalent to the wall thickness.
- Vertical slits, whose depth does not exceed half the wall thickness may be any length.
- Deeper slits should not be longer than 1 m.
- All installed components are to be closed off with at least 1 cm of covering.
- If slits are executed in another manner this is to be taken into account with the dimensioning of the wall.
- With slits, which are not closed off only the remaining thickness may be applied as wall thickness.



Small openings, whose clear dimensions are smaller than $\frac{1}{4}$ of the storey height or the wall length or their complete area is smaller than $\frac{1}{10}$ of the wall area, are permitted without reduction of the dimensions in accordance with DIN 4103-2, Table 2 or 3. They may be sawed out, machined out or drilled. Accordingly, for example with the installation of a heating circuit distributor for floor heating, the opening for the housing is to be dimensioned according to the thickness of the wall.



MultiGips gypsum block can be easily worked and precisely cut according to specifications using straight-back, chain or alligator saw. Thanks to the groove and tongue profile as well as the simple working using gypsum adhesive, half blocks can, for example, be used further. Through this, Multi-Gips gypsum blocks are particularly economical; waste material and disposal costs are saved.



General information on design

All cut surfaces of matched or bevelled gypsum blocks are to be cleaned thoroughly of gypsum dust. Do not chisel out openings, breaches or slits but produce them using saws, cutters or scoring tools.

Doors and other openings can be omitted with the erection of the wall or subsequently sawed out of the finished wall. All metal items built into the wall, e.g. supporting reinforcements or door frames, must be protected against corrosion.

Mortar containing cement may under no circumstances be used in the walls, not even with the installation of door frames.

Gypsum blocks can be worked and securely connected so far as the adjacent surfaces are sufficiently firm and free of frost. The recommended level is 5 °C. The roof should already be closed in order to avoid moisture loading in building phase.

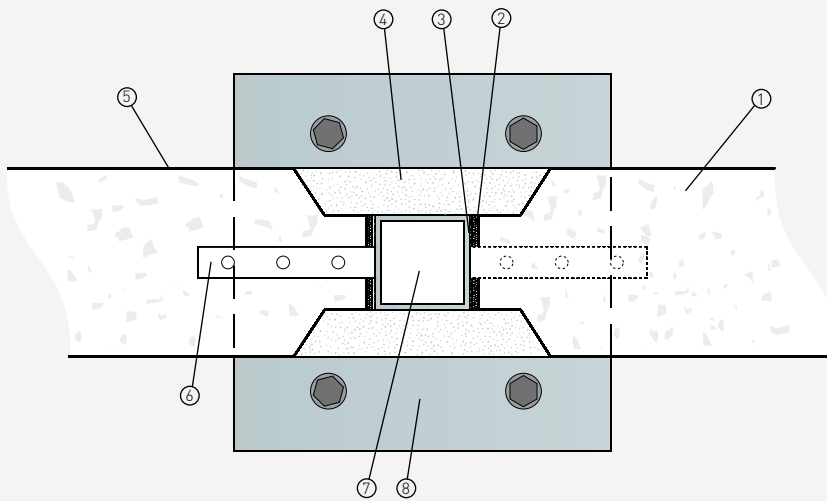
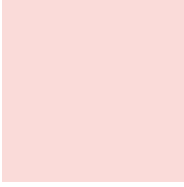
Cement or anhydrite floor covering, respectively as liquid flooring, can be applied subsequently so far as the covering

(screening layer) is laid correctly up the walls and the projecting material is cut off after hardening.

With poured asphalt flooring a good cross-ventilation is to be ensured so that the heat released can escape. In interior rooms without sufficient ventilation one should avoid using poured asphalt.

One-sided wall gypsum blocks attached only at the bottom are to be anchored using suitable profiles on the floor.

→ *Design example of a freely standing gypsum block made from MultiGips gypsum blocks structurally attached to the floor using steel plate profiles, see page 37*

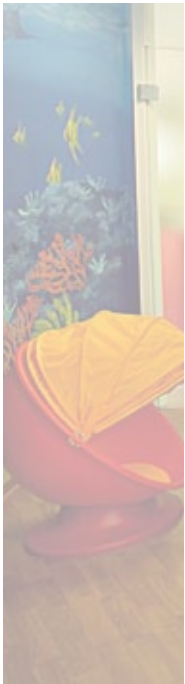


- 1 MultiGips gypsum bloc
- 2 MultiGips AkustikPro 120
- 3 MultiGips adhesive
- 4 MultiGips FG 70 Füllgips
- 5 MultiGips CasoFill® Uni for filling/smoothing on both sides

- 6 Anchor strap
- 7 Steel pipe 50 x 50 x 1,250 mm
- 8 Steel base plate
200 x 200 x 10 mm

All CAD is available in the planning-relevant formats DWG and DXF or also as PDF

 CAD: Connections, special forms of building unit
www.multigips.com → service



Surfaces and wall finish

Gypsum blocks are set into each other precisely using groove and tongue. A smooth and even finish picture already results with the erection of the wall. The surface requires no plaster, neither for the requirements of acoustic insulation and fire protection nor for aesthetic reasons [except for MultiGips firewalls]. Gypsum blocks are filled/smoothed completely only in the area of joints or with very high optical demands. Through this, with sufficient cross-ventilation, the walls are dry in a few days and ready for the wall finish.

Filling/smoothing

Before the start of filling/smoothing all slits and gaps, which were necessary for the insertion of doors or for the laying of installations, are closed. Suitable gypsum mortars for this are, for example, MultiGips adhesive, MultiGips FG 70 Füllgips or MultiGips RotWeiss Haftputz.

Adhesive swelling out of the joints is to be wiped off in a slightly hardened condition already during the working of the blocks.

Ridges, possibly still present after hardening are to be knocked off before smoothing. Subsequently, depending on the surface quality required in the performance specification, either the joints alone or the complete wall surface are filled/smoothed. For this the following are suitable: MultiGips CasoFill® FK2, MultiGips CasoFill® Super 50, MultiGips CasoFill® Uni or MultiGips adhesive. Surfaces which subsequently are tiled or covered using natural stone need not be filled/smoothed.

Coating using paints or wallpapers

In order to achieve an even absorbency of the wall surface the walls are to be primed before coating with paint or covering with wallpaper. Fluctuation is not required and not permitted. All normal dispersion, latex, oil and enamel paints are suitable as coatings. Water paints should be used in accordance with manufacturers specification. Depending on the surface quality of the filling/smoothing carried out all commercial smooth and structured wallpapers or painter's fabrics can also be used.

Surface covering using tiles or natural stone

Walls which receive a facing of tiles or natural stone need not be filled/smoothed, not even in the area of joints. Only gypsum adhesive swelling out of joints is to be knocked off.

The tiles or blocks can then be applied to the primed wall surfaces using thin-bed adhesive. Water-repellent gypsum blocks already possess a reduced absorbent behaviour and therefore require no priming. Tile joint mortar with sealant additive increases the water repellent effect of ceramic top surfaces. A further improvement can be achieved through joint filling using joint mortar epoxy resin.



Characteristics and quality of surfaces

For the evenness and optical characteristics of a filled/smoothed surface very often very different and very subjective standards are used. In performance specifications there is then little help as undefined terms such as "smooth, painter finished, free of highlights" do not describe sufficiently precisely which requirements the customer requires of the surface quality. As a result, differences in opinion occur about whether the quality satisfies the requirements. In order to improve the quality level of finish for wall surfaces, the German Association of Gypsum Industries has developed an advisory leaflet on surface quality with gypsum blocks in accordance with EN 12859.

The advisory leaflet describes four levels of quality Q1 to Q4 and assigns them objective and comprehensible criteria. It is recommended to planners and those carrying out the work to use these quality levels in performance specifications and tenders.

If further criteria are to be introduced for the assessment or acceptance of filled/smoothed surfaces, specially determined light conditions such as highlights as natural light or artificial lighting, it is up to the customer to ensure that, already during the execution of the filling/smoothing work, comparable light conditions are available. With planning and acceptance there must be, in addition, the building materials which are employed whose dimensional tolerances and technical possibilities for execution are taken into account.

Quality Levels Q1 to Q4

Quality level Q1



For surfaces on which no optical (decorative) requirements are placed, the full cementing of the butt and horizontal joints as well as the correction of faulty points is sufficient. Surface damage such as scratches, scoring and ridges are permitted. With Quality Level 1 the surface may not be smoothed or plastered.

Filling/smoothing in accordance with Quality Level Q1 covers:

- the complete filling of block joints
- the closing of faulty points
- the knocking off of projecting gypsum adhesive
- the formation of internal and external corners as well as connections without profiles.

Quality Level Q1 is, for example, suitable for:

- wall coatings such as ceramic blocks (tiles) as well as for natural and artificial stones

Quality level Q2



Filling/smoothing in accordance with quality Level Q2 is valid as standard trowel application and satisfies the normal requirements on wall and ceiling surfaces. Aim of the trowel application is the alignment of the area of joints through stepless intersection of the block surfaces. The same applies for interior and exterior angles as well as connections. With coatings and surface coverings, visible distinguishing marks depending on the light effects are not to be excluded.

Filling/smoothing in accordance with Quality Level Q2 covers:

- the tasks of Quality Level Q1
- the later filling/smoothing (fine troweling) of butt and horizontal joints up to the achievement of a stepless intersection of block surfaces
- marks of working, surface damage or filler ridges should not be visible.

Quality Level Q2 is, for example, suitable for:

- medium and coarsely structured wall coverings, e.g. wood-chip papers (wood-chip medium 32,40 or wood -chip coarse 52,70,79,80)
- matt, priming coatings or coverings, e.g. dispersion coatings which are applied using a lambs' wool or structured roller
- ceiling plaster and top plaster greater than 1.00 mm grain size so far as they are released by manufacturers of plaster for gypsum blocks (note information of the manufacturer of the plaster)



Quality Level Q3



If increased requirements are placed on the surface, additional measures beyond the standard filling/smoothing are required. These are designated as special filling/smoothing Q3. With this special filling/smoothing also, visible signs are not completely eradicated under highlights. Degree and scope of the visible signs are, however, in comparison with the standard filling/smoothing Q2, smaller.

Filling/smoothing in accordance with Quality Level Q3 covers:

- the tasks of standard filling/smoothing Q2
- the additional full-surface covering and smoothing of the complete surface using a suitable filler/smoothing material in a further work step
- As required, the sanding down and re-filling/re-smoothing of the surfaces.

Quality Level Q3 is, for example, suitable for:

- finely structured wall surface coverings (e.g. wood-chip fine 20)
- matt, non-structured paints or coatings
- top plaster with grain sizes up to a maximum of 1.00 mm so far as they are released for gypsum blocks by the manufacture of the plaster stones

Quality Level Q4



Quality Level Q4 corresponds with the highest requirements on the surface and can be achieved only through measures beyond Q3. The surfaces of the blocks are smoothed using an additional continuous filler/smoothing layer or using a white plaster which has the same surface quality.

Filling/smoothing in accordance with Quality Level Q4 covers:

- the tasks of standard filling/smoothing Q2
- the complete covering and smoothing of the complete surface using a suitable filling/smoothing material in accordance with Q3
- re-filling/re-smoothing of the complete surface.

Quality Level Q4 is, for example, suitable for:

- smooth or structured wall coverings with gloss, e.g. metal or vinyl wallpapers, glass fibre fabric, glass fleece, silk wallpapers
- glazes, paintwork or coatings up to medium gloss
- stucco lustro or other high quality smooth techniques

A surface design of Quality level Q4, which meets the highest requirements, minimises the possibilities of visible signs on the blocks and/or joints. So far as light effects such as highlights influence the appearance of the finished surface, undesired effects (e.g. changing shadowing on the surface or minimum punctual marks) are extensively avoided.

They cannot, however, be excluded completely as light effects vary over a wide range and cannot be recorded and evaluated clearly. For practical purposes the lighting conditions, such as planned for later usage, are already to be established at the time of filling/smoothing and/or agreed contractually. A clear evaluation of the surface quality can be undertaken only by taking into account the light situation defined before filling/smoothing is carried out. Furthermore, the practical building limitations of execution on-site are to be taken into account. Surfaces, which also with the effects of highlights, appear to be absolutely even and free of shadow are incapable, technically, of being carried out! In individual cases it is necessary that, in connection with coating and cementing tasks, further measures beyond Quality Level Q4 are required. To be considered are above all, repeated filling/smoothing and sanding down, which can be necessary for the preparation of surfaces for particularly high quality final coatings. For example for

- shiny surface coatings
- lacquering
- lacquer wallpapers

Such additional treatment of the surface is to be carried out by the same specialist firm which also carries out surface covering or cementing tasks.

If increased requirements on the evenness with surface filling/smoothing of gypsum blocks, then these are to be written into the performance specifications and are to be specially agreed contractually. If no agreements for the evenness tolerances are made, standard requirements apply. For the execution in Quality Level Q3 and higher, the contractual agreement on evenness tolerances with increased requirements is recommended.



General information on surfaces

As filling/smoothing material for gypsum blocks only those MultiGips filling/smoothing gypsums, which meet the standards, should be used. The background must be dry, absorbent and clean and must have sufficient stability. Filling/smoothing work may be carried out only with temperatures of at least 5°C and with a relative humidity of maximum 70 %. To achieve the surface quality in accordance with Quality Levels Q2, Q3 and Q4 the necessary drying times between individual work steps are to be observed.

Further surface treatment such as paintwork, wall papering or final rendering may first be carried out if wall and filling/smoothing material have bonded and are dried out. A priming matched to a background and the subsequent coating or wall surface covering must be produced by the successor contractor [BFS Advisory Leaflet No. 17]. This is also to be noted with later improvements of the filling/smoothing and/or repairs.

For wallpapering normal commercial wallpaper glue on a methyl cellulose basis

is to be used [BFS Advisory Leaflet No. 16]. In particular, after hanging paper and fibre glass wallpapers, and also after application of artificial resin and cellulose plasters, sufficient ventilation for a rapid drying is to be ensured.

Information on requests for tender

The surface qualities desired by the planner are to be laid down clearly using Quality Levels Q1 to Q4 and are to be agreed contractually. If required the type and execution are to be described in more detail. The quality level must always be given together with the type of execution, for example: "Q2 – standard filling/smoothing". In addition, the subsequent wall surface covering, paintwork or coatings are to be given explicitly. A general description is insufficient!. If no details on the surface quality are contained in the performance specification, Quality Level Q2 always applies as agreed. A performance specification which contains terms such as "painter finished, read-to-paint, ready for paintwork, surface finished, ready for wallpapering" or similar

for the description of the desired surface quality, is not suitable for the description of the performance to be carried out.

The quality Levels Q1 to Q4 presented in this brochure serve as examples for the description of the desired surface. In individual cases, with planning and requests for tender, the special characteristics of the planned final coating and the appearance in the usage condition are to be taken into account. The person carrying out the work must check the details for their clear comprehensibility and the technical feasibility. If necessary, doubts about the type of execution are to be reported and/or an amendment is to be agreed.



Dimensional tolerances

Minor deviations of the planned length, height and angular dimensions as well as small unevenness are in practice basically unavoidable and have to be accepted. These signify no limitation of the function or design of building units. The scope in which deviations from the design dimensions have to be accepted is determined by the respective standard on the tolerances.

In Germany this is DIN 18202, Tolerances in construction - structures. The set of rules and standards apply with the same contents as ÖNORM DIN 18202 in Austria. For Switzerland the tolerance values are laid down in Recommendation SIA V414/10. The observation of tolerances is to be examined only when required. This means that the dimensional tolerances with implementation in accordance with Q1 and Q2 are only to be monitored where this appears practi-

cal or necessary due to requirements, e.g. for subsequent crafts. Building units whose deviations in dimension do not prejudice the technical function or the optical form of the structure are not necessarily faulty and should be no reason for arguments only because the accuracy does not meet the standard precisely.

ANGLE TOLERANCES IAW. DIN 18202, TABLE 2

Wear measuring device as boundary values in mm with nominal dimensions (m)							
	to 0.5	over 0.5 bis 1	over 1 to 3	over 3 to 6	over 6 to 15	over 15 to 30	over 30 ¹⁾
Vertical, horizontal and sloped surfaces	3	6	8	12	16	20	30

EVENNESS TOLERANCES IAW. DIN 18202, TABLE 3

Wear measuring device as boundary values in mm with measuring point separations (m) up to					
	0.1	1	4	10	15
Surface-finished walls and undersides of ceilings ²⁾	3	5	10	20	25
Building units as before, however with increased requirements ³⁾	2	3	8	15	20

1) These variations in limits can be applied with nominal dimensions up to ca. 60 m. With larger dimensions special consideration is required.

2) E.g. plastered walls, wall surface coverings, suspended ceilings [Standard requirement in Germany and Austria].

3) In accordance with Recommendation SIA V414/10. This is standard application in Switzerland.



Time-saving: from HGV through window directly to point of installation



Alternative: depositing on balconies or terraced storeys



Practical: transport within the building using special trolleys

Efficient building site logistics (in Germany only)

MultiGips gypsum blocks are supplied in foil-packed, water-protected packets on Euro-pallets. If block packets only are unloaded, the pallets remain on the HGV. Prerequisite for an economic transport of the building material is manoeuvrability on the building site with HGVs of 40 t gross vehicle weight. Already when placing the order, details are to be given as to how unloading is to take place in order that the HGV has the correct unloading equipment.

With at ground level unloading the blocks must be protected from moisture effects. In order to ensure this also against moisture from below the block packets should remain on the pallets or stand on wooden slates. As opposed to ground level storage, high crane unloading directly into the building is a significant time-saving building site procedure and energy-minimising transport expenditure.

With the packet directly to the point of installation

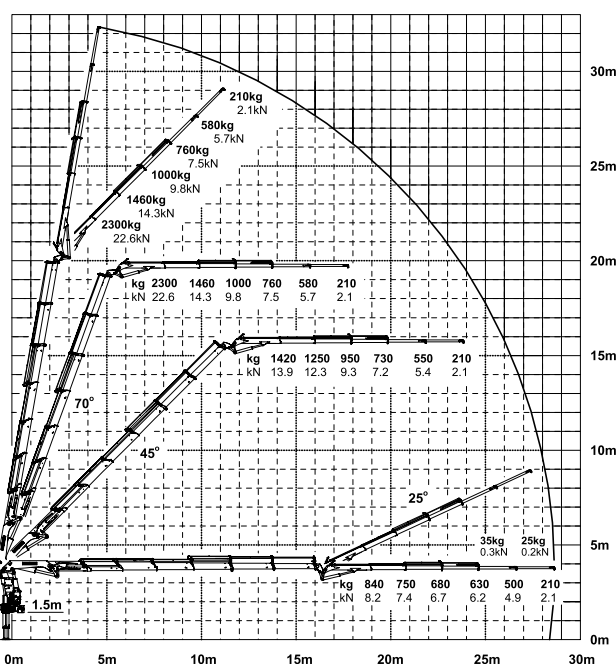
Through the special high crane logistics for gypsum blocks, it is ensured that the block packet is unloaded directly to the respective storey planned for working. Special hydraulic grippers lift the block packets and feed them through the window opening and place them on the transport trolley. As a rule, a transport trolley is also carried and made available for the period of unloading. Depending on the unloading height, the separation between HGV and the building is to be between 3 and 7 m. The window opening through which packets are to be passed must be at least 0.85 m wide and

1.30 m high [1.45 m with mechanical grippers]. In addition, with ordering, the height of the upper edge of the window parapet is to be given for the highest window [max. 20.50 m].

So far as transport vehicles can be driven sufficiently close to the building, complete Euro-pallets can also be deposited on the balconies in the 1st storey. With this, however, it is absolutely necessary to observe the permitted live load of the ceilings.

Maximum depositing height for Euro-pallets: 4.50 m
Minimum opening height for Euro-pallets: 2.80 m

UPPER EDGE OF WINDOW PARAPET WITH PACKET UNLOADING	
Crane (m)	Max. height (m)
14	9.00
18	15.50
22	17.50
27	20.50



Ultimate load diagram of a 27 m long-arm crane



PRODUCT AND SYSTEM DATA



Components

MultiGips gypsum blocks

Solid gypsum block with average gross density in accordance with EN 12859 for the economic erection of light non-load-bearing partition walls

Designation	Natural white
Gross density	ca. 850 kg/m ³
Thickness	60, 80 und 100 mm
Standard format	666 x 500 mm
Block requirement with standard format	3 blocks per square meter
Delivery units	Packets, water-protected in foil, welded Pallets with 2 or 3 packets, depending on block dimensions
Fitted blocks	On request [special dimensions]
Characteristics	Groove and tongue, all around
Thermal conductivity λ	0,41 W/mK
Water vapour diffusion resistance μ	5-10
Reaction to fire	Non-combustible Building material Class A1 iaw. DIN 4102
Working	Drill, saw or cut, under no circumstances chisel out!
Surfaces	Completely fill/smooth in the area of joints or full-surface
Finish	Paintwork, wallpaper, to plaster, or block covering (tiles)

BLOCK DIMENSIONS AND PACKAGING UNITS MULTIGIPS GYPSUM BLOCKS WITH AVERAGE GROSS DENSITY IAW. EN 12859

Thick-ness (mm)	Format (mm)	Surface weight of finished wall (kg/m ²)	Packaging units			
			Pallet		Packet	
			No. of items	Wall sur-face (m ²)	No. of items	Wall surface (m ²)
60	666 x 500	54	40	13.33	20	6.66
70	500 x 640	56	51	16.32	17	5.44
80	666 x 500	72	30	10.0	15	5.0
100	666 x 500	90	24	8.0	12	4.0

* Also obtainable hydrophobised



MultiGips gypsum blocks, high gross density

Solid gypsum block with high gross density in accordance with EN 12859 for the economic erection of light non-load-bearing partition walls, e.g. with special acoustic insulation requirements

Designation	Reddish
Gross density	ca. 1,200 kg/m ³
Thickness	100 mm
Standard format	500 x 500 mm
Block requirement with standard format	3 blocks per square meter

Delivery units	Packets, water-protected in foil, welded Pallets with 2 packets
----------------	-----------------------------------------------------------------------

Characteristics	Groove and tongue, all around
Thermal conductivity λ	0.58 W/mK
Water vapour diffusion resistance μ	5-10
Reaction to fire	Non-combustible Building material Class A1 iaw. DIN 4102

Working	Drill, saw or cut, under no circumstances chisel out!
Surfaces	Completely fill/smooth in the area of joints or full-surface
Finish	Paintwork, wallpaper, to plaster, or block covering (tiles)

BLOCK DIMENSIONS AND PACKAGING UNITS MULTIGIPS GYPSUM BLOCKS WITH AVERAGE GROSS DENSITY IAW. EN 12859 *

Thick-ness (mm)	Format (mm)	Surface weight of finished wall (kg/m ²)	Packaging units			
			Pallet		Packet	
			No. of items	Wall sur-face (m ²)	No. of items	Wall sur-face (m ²)
70	500 x 450	84	34	7.65	17	3.83
100	500 x 500	120	24	6.0	12	3.0



MultiGips gypsum blocks, hydrophobised high gross density

Solid gypsum block with high gross density in accordance with EN 12859 for the economic erection of light non-load-bearing partition walls, water-repellent throughout, preferred for employment in domestic kitchens and bathrooms

Gross density, average	ca. 850 kg/m ³ [Bluish marking]
Gross density, high	ca. 1,200 kg/m ³ [Bluish marking]



MultiGips Adhesive ClassicWeiss 90

MultiGips ClassicWeiss 90 is a factor premixed gypsum plaster in accordance with EN 12860 for the bonding and filling/smoothing of partition walls made from solid gypsum blocks. Also well-suited for subsequent filling/smoothing of rendered surfaces, for the placing of stucco elements as well as repair filling/smoothing plaster. Bonding time to fit practice of ca. 90 minutes depends on the firm working conditions.



MultiGips Adhesive ClassicWeiss 120 MultiGips Adhesive ClassicWeiss 200

MultiGips ClassicWeiss 120 as well as MultiGips ClassicWeiss 200 is a factor premixed gypsum plaster in accordance with EN 12860 for the bonding and filling/smoothing of partition walls made from solid gypsum blocks. Also well-suited for subsequent filling/smoothing of rendered surfaces, for the placing of stucco elements as well as repair filling/smoothing plaster. Comfortable bonding time ca. 2 hours (SuperWeiss 120) or extra long 3 to 3.5 hours (SuperWeiss 200) depends on the firm working conditions.



MultiGips Adhesive Hydro 90

MultiGips Hydro 90 is a factor premixed gypsum plaster in accordance with EN 12860 for the bonding and filling/smoothing of hydrophobised gypsum blocks made from solid gypsum blocks. Also well-suited for subsequent filling/smoothing of rendered surfaces, for the placing of stucco elements as well as repair filling/smoothing plaster. Bonding time to fit practice of ca. 90 minutes depends on the firm working conditions.

TECHNICAL DATA	
Quality	Gypsum adhesive iaw. EN 12860
Application thickness	0-3 mm
Bulk density	ca. 650 kg/m ³
Gross density	ca. 900 kg/m ³
Graining	0.20 mm max.
Material requirement *	ca. 1.50 - 3.00 kg/m ² wall
Flexural strength	≥ 1,9 N/mm ²
Compressive strength	≥ 3,2 N/mm ²
Water vapour diffusion resistance coefficient μ	ca. 10
Thermal conductivity λ	0,30 W/mK
Reaction to fire	Non-combustible
Building material class iaw. DIN 4102	A1

TECHNICAL DATA	
Quality	Gypsum adhesive iaw. EN 12860
Application thickness	0-3 mm
Bulk density	ca. 800 kg/m ³
Gross density	ca. 980 kg/m ³
Graining	0.20 mm max.
Material requirement *	ca. 1.50 - 3.00 kg/m ² wall
Flexural strength	≥ 1,9 N/mm ² [≥ 1,5 N/mm ²] **
Compressive strength	≥ 3,7 N/mm ² [≥ 3,5 N/mm ²] **
Water vapour diffusion resistance coefficient μ	ca. 10
Thermal conductivity λ	0,33 W/mK
Reaction to fire	Non-combustible
Building material class iaw. DIN 4102	A1

TECHNICAL DATA	
Quality	Gypsum adhesive iaw. EN 12860
Application thickness	0-3 mm
Bulk density	ca. 700 kg/m ³
Gross density	ca. 980 kg/m ³
Graining	0.20 mm max.
Material requirement *	ca. 1.50 - 3.00 kg/m ² wall
Flexural strength	≥ 1,7 N/mm ²
Compressive strength	≥ 3,3 N/mm ²
Water vapour diffusion resistance coefficient μ	ca. 10
Thermal conductivity λ	0,33 W/mK
Reaction to fire	Non-combustible
Building material class iaw. DIN 4102	A1

* Values can vary depending on thickness of filling/smoothing plaster, background, ambient temperature and working conditions.

** Values in brackets apply for MultiGips SuperWeiss 200.



MultiGips FG 70 Füllgips (Filling/smoothing plaster)

With MultiGips FG 70 Füllgips there is available a secure solution for perfect ceiling connections with walls made from MultiGips gypsum blocks. The high water retention capacity prevents deflagration. At the same time special adhesive additives ensure outstanding adhesive tensile strength. Through this the Füllgips forms a connection free of cracks between the uppermost row of the gypsum blocks and the elastic ceiling connection strips. MultiGips FG 70 is in addition suitable for the closure of joints or openings in gypsum blocks.

Edges and cut surfaces of gypsum blocks must be free of dust and frost. Remove residues and contamination of any type. No working of the Füllgips below +5°C.

Sprinkle 1.4 parts MultiGips FG 70 Füllgips in 1 part water allow to soak and mix homogeneous. Clean cut surfaces of the bevelled uppermost block row. Fill connection joints completely using Füllgips, with this do not plaster over edge strips otherwise separate filling/smoothing plaster immediately below the ceiling using a trowel cut. Duration of working ca. 70 minutes.

TECHNICAL DATA

Quality	Hand gypsum plaster iaw. EN 13279
Bulk density	ca. 600 kg/m ³
Gross density	ca. 870 kg/m ³
Graining	0.20 mm max.
Material requirement with employment as Filling/smoothing plaster*	ca. 2.00 kg/m ²
Flexural strength	≥ 1,0 N/mm ²
Compressive strength	≥ 2,0 N/mm ²
Water vapour diffusion resistance coefficient μ	ca. 10
Thermal conductivity λ	0.28 W/mK
Reaction to fire	Non-combustible
Building material class iaw. DIN 4102	A1



MultiGips CasoFill® Super 50 (Super adhesive smoothing plaster)

MultiGips CasoFill® Super 50 is a high quality plastic modified joint filler for the working of gypsum blocks for the closing of slits and for the filling/smoothing of joints or surfaces. In addition, for the filling/smoothing of gypsum blocks with half-round edges without reinforcing strips and sloped edges with reinforcing strips as well as gypsum fibre blocks. Also as gypsum filling/smoothing mass for the filling/smoothing of weak to normal absorbent, rough and uneven backgrounds, of the joints of concrete prefabricated parts, of joints and holes, for the complete surface filling/smoothing of concrete surfaces, gypsum blocks or rendering in interior areas. As filling/smoothing plaster for surface qualities Q3 and Q4 [smoothed] in dry mortarless construction and with plastering. Also for the creation of high quality possible single colour, decorative surfaces in interiors.

TECHNICAL DATA
Quality
Filling/smoothing plaster iaw. EN 13963
Type
3B/4B
Application thickness
0-4 mm
Bulk density
ca. 875 kg/m ³
Gross density
ca. 975 kg/m ³
Graining
0.20 mm max.
Wet mortar yield from 100 kg
ca. 125 l
Material requirement *
0.80 kg per mm layer thickness
Flexural strength
≥ 4.0 N/mm ²
Compressive strength
≥ 8.0 N/mm ²
Water vapour diffusion resistance coefficient μ
ca. 8
Thermal conductivity λ
0.32 W/mK
Reaction to fire
Non-combustible
Building material class iaw. DIN 4102
A1

MultiGips CasoFill® Uni (Surface smoothing plaster)

Filling/smoothing plaster for hand and machine working in interior areas, which combines the advantages of plaster and filling/smoothing plaster. Outstanding working properties with full-surface filling/smoothing of MultiGips gypsum blocks. The filling smoothing plaster which can be drawn out to zero enables perfectly smooth surfaces with faultless optics. Employment also possible on porous concrete or concrete precision blocks as well as for smoothing and covering of old and new plasters. Also suitable for filling of joints, cracks and joints.

Do not use for filling/smoothing of gypsum and gypsum blocks but use MultiGips Superhaftspachtel super adhesive filling/smoothing plaster for these backgrounds.

TECHNICAL DATA
Quality
Surface filling/smoothing plaster
--
--
Application thickness
0-4 mm
Bulk density
ca. 800 kg/m ³
Gross density
ca. 850 kg/m ³
Graining
0.20 mm max.
Wet mortar yield from 100 kg
ca. 130 l
Material requirement *
0.75 kg per mm layer thickness
Flexural strength
≥ 1.3 N/mm ²
Compressive strength
≥ 2.2 N/mm ²
Water vapour diffusion resistance coefficient μ
ca. 5
Thermal conductivity λ
0.28 W/mK
Reaction to fire
Non-combustible
Building material class iaw. DIN 4102
A1

* Values can vary depending on thickness of filling/smoothing plaster, background, ambient temperature and working conditions.



MultiGips AkustikPro

MultiGips AkustikPro is an edge strip for the technically correct elastic connection of solid gypsum blocks to adjacent walls, ceilings and floors.

The user-friendly strips made from PE low expansion foam [120 kg/m³] is characterised by outstanding acoustic insulation characteristics. In particular the sound transfer to adjacent building units is traceable reduced. The technically correct installation of the strips reduces the solid-borne transfer by a factor which, with rigid connection of the walls, would otherwise only be achieved through the almost three-times surface-related mass.

With a width of 120 mm the MultiGips AkustikPro 120 can be applied for gypsum blocks of each thickness [60, 80 and 100 mm]. The strip is always wider than the wall and thus effectively prevents accidental over-plastering. Following filling/smoothing of the walls overlay can be cut off without problem. The edge of the cut is white throughout as is the gypsum itself so

that the strip in the finished wall can barely be seen. Every subsequent treatment of the connection joint with acrylic is unnecessary with normal requirements. The connection joints are optically exemplary and ready for structural acceptance.

MultiGips AkustikPro 120 is available in two versions. The double-sided, fleece pasted design guarantees a strong and secure bonding of the gypsum adhesive on both sides of the connection joint. Even more rapid is manual working with the single-sided self-adhesive AkustikPro 120 s-a variant. The strip can be fixed comfortably to smooth adjacent building units. The ceiling connection joints between edge strips and block are, as normal, closed using MultiGips FG 70 Füllgips.

The PE low expansion foam nestles extremely well to the background, smaller unevenness is compensated. The background must be clean, dry and frost-free and may have no dusty or greasy residues.



Self-adhesive or fleece-pasted



Simply cut off



Optically

TECHNICAL DATA

Function	Elastic edge strips for acoustic decoupling of internal walls made from solid gypsum blocks
Material	MultiGips AkustikPro 120: Polyethylene low expansion foam with double-sided fleece lamination MultiGips AkustikPro 120 s-a: Polyethylene low expansion foam, one-sided self-adhesive with protective strips, one-sided fleece lamination
Application	To floors, walls and ceilings
Gross density	120 kg/m ³
Thickness	3 mm
Width	120 mm
Material structure	Airtight, closed cell foam
Colour	White
Reaction to moisture	Water vapour retarding, moisture resistant, unrottable
Reaction to fire	Normally flammable, Building Material Class B2 iaw. DIN 4102 in installed condition

Material requirement
 (room height ca. 2.50 m)

Floor connection	0.4 m/m ²
Wall connection	0.5 m/m ²
Ceiling connection	0.4 m/m ²
All around	1.3 m/m ²

AIRBORNE SOUND INSULATION OF PARTITION WALLS MADE FROM MULTIGIPS GYPSUM BLOCKS

Edge strips for the implementation of elastic connections	Estimated sound insulation qty $R_{w,P}$ of a 100 mm thick partition wall made of Multi-Gips gypsum blocks, average gross density iaw. EN 12859 ¹⁾
AkustikPro 120 / 120 s-a	40 dB ²⁾
Cork	37 dB

1) The test stand value must be reduced by the lead dimension 2 dB [Malus], in order in order to achieve the applicable calculated value $R_{w,P}$
 Without longitudinal transmission via adjacent building units

2) In accordance with available Test Report No. 2029/889/07 of the MPA Braunschweig dated 07 March 2007



Edge connection strips made from cork

For the elastic connection of gypsum blocks to other building units in accordance with DIN 4103, Part 2. Suitable for floor, wall and ceiling connections. Good acoustic insulation through decoupling of building units. Also conditionally employable if the partition walls have to meet fire protection requirements. Depending on the wall thickness the resistance to Fire Resistance Classes F 30-AB to F 180-AB are achieved, insofar as the strips are covered with a filler of at least 2 mm thickness [see appraisal report]. For optimised acoustic insulation at the ceiling connection it is recommended that the width of the edge connection strips should be selected wider than the wall thickness. After filling the ceiling joint the overlay can be cut off. The acoustically unfavourable covering of the wall connection strips with filling/smoothing plaster can be excluded securely.

TECHNICAL DATA
Thickness
5 mm
Width
80, 100, 120 mm
Consumption
1.3 m/m ²
Delivery unit
50 m/packet
Building material Class
B1

Edge connection strips made from bitumen felt

For the elastic connection of gypsum blocks to other building units in accordance with DIN 4103, Part 2. Preferred for floor and wall connections. Good acoustic insulation through decoupling of building units.

TECHNICAL DATA
Thickness
3 mm
Width
80, 100 mm
Consumption
1.3 m/m ²
Delivery unit
50 m/packet

The material requirement for all edge connection strips can be determined per square meter, overlapping, according to the following guidance values:

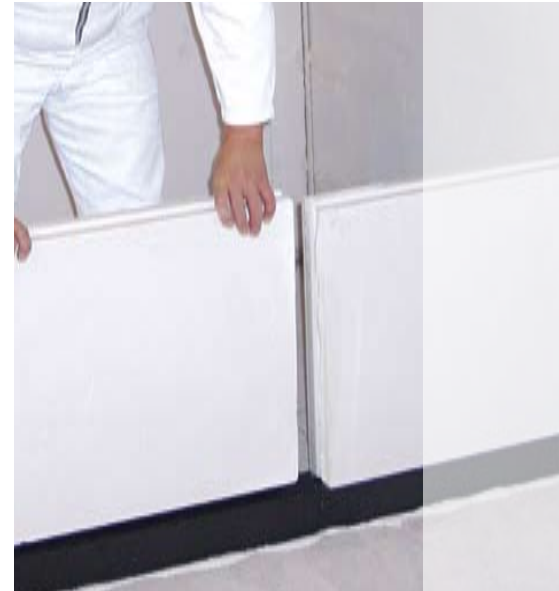
<i>Floor connection</i>	<i>0.4 m/m²</i>
<i>Wall connection</i>	<i>0.5 m/m²</i>
<i>Ceiling connection</i>	<i>0.4 m/m²</i>
<i>All around</i>	<i>1.3 m/m²</i>

Edge connection strips made from rock wool

Rock wool edge strips in accordance with EN 13162 for the elastic connection of gypsum blocks to other building units in accordance with appraisal reports. Suitable for floor, wall and ceiling connections. Non-combustible material of Building Material Class A1 in accordance with EN 13501-1, Melting point $\geq 1,000^{\circ}\text{C}$. Preferred for partition walls with fire protection requirements. [Fire Resistance Classes F 30-A to F 180-A depending on wall thickness].

MultiGips HydroSocket

Footing made from foamed glass against rising damp with water intrusion during the building phase or with subsequent water damage. Also suitable as thermal insulation for the avoidance of thermal bridges.



TECHNICAL DATA	
Product	Heralan edge strips
Thickness	13 mm
Width	80, 100, 120 mm
Consumption	1.3 m/m ²
Delivery unit	Obtained via dealer
Building material Class	A1

TECHNICAL DATA	
Material	Foamed glass, purely inorganic and without bonding additives
Lamination	Double-sided with special glass wool
Building material class	non-combustible, Building Material Class A1 iaw. DIN 4102 (unlaminated)
Stability of shape	constant (does not quilt, shrink, warp or dish)
Permitted compression strength	0.23 N/mm ²
Thermal conductivity λ	0.040 W/mK
Formats	40 x 80 x 600 mm 40 x 100 x 600 mm
Material requirement	0.4 m/m ²

Technical data

Thickness (mm)	Gross density class EN12859 ¹⁾	Grammage of the wall [kg/m ²]	Acoustic insulation with designs with edge strips of AkustikPro 120 R _{W,P} (dB) ²⁾	Acoustic insulation with designs with edge strips of compressed cork, 5 mm R _{W,P} (dB) ²⁾	Acoustic insulation with designs with edge strips of rock wool ³⁾ , 13 mm R _{W,P} (dB) ²⁾	Fire resistance class with design iaw. DIN 4102-4 ⁵⁾	Maximum permitted wall height DIN 4103-2 (cm)
SINGLE-LEAF WALLS							
60	Med. gross density (mR)	54	33			F 30-A	400
80	Med. gross density (mR)	72	37			F 120-A	550
100	Med. gross density (mR)	90	40	37	38	F 180-A	700
100	High. gross density (hR)	120	46 ⁴⁾	40		F 180-A	700

Thickness (mm)	Wall design ¹⁾	Wall thickness (mm)	Grammage of wall (kg/m ²)	Acoustic insulation with designs with edge strips of Akustik-Pro 120 R _{W,P} (dB) ²⁾	Acoustic insulation with designs with edge strips of bitumen felt 3 mm R _{W,P} (dB) ²⁾	Fire resistance class with design iaw. DIN 4102-4 ⁵⁾	Maximum permitted wall height DIN 4103-2 (cm)
DOUBLE-LEAF WALLS							
100	Gypsum block hR [120 kg/m ²] and attached composite board made from:	150	136	52		F 180-A	700
12,5	Plasterboard						
30	Mineral wool						
80	Gypsum block mR	175	128	61		F 120-A	400
25	Mineral wool Heralan-TP or rock wool						
10	Air film						
60	Gypsum block mR	210	146	60		F 120-A	550
80	Gypsum block mR						
40	Mineral wool Heralan-DPF-50 or rock wool						
10	Air film	260	148		68	F 120-A	550
80	Gypsum block mR						
80	Mineral wool > 12 [kPa s/m ²]						
20	Air film					F 30-A	400
80	Gypsum block mR						
60	Gypsum block mR						
FACING IN FRONT OF SOLID WALL							
	Solid wall		185		+ 18 dB		
			330		+ 7 dB		
			460		+ 13 dB		
40	Facing made of mineral wool						
60	Gypsum block mR					F 30-A	400
MULTIGIPS FIREWALL ⁶⁾							
18	Gypsum plaster with glass lattice fabric	160	150		44 ⁷⁾	F 90-A ⁸⁾	650
60	Gypsum block mR						
4	Gypsum plaster with glass lattice fabric						
60	Gypsum block mR						
18	Gypsum plaster with glass lattice fabric						

1) Average gross density: 800kg/m³ < ρ < 1,100 kg/m³, high gross density 1,100 kg/m³ < ρ < 1,500 kg/m³

2) Acoustic insulation values with execution iaw. Proof Certificate. R_{W,P}: acoustic insulation measured in the test stand; calculated value R_{W,R} = R_{W,P} - 2 dB. Without longitudinal transmission via adjacent building unity

3) For example Heralan edge strips or similar

3) With elastic connection iaw. Test report with bituminous felt strips

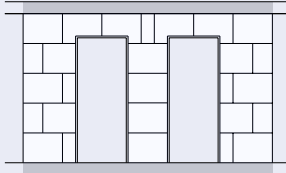
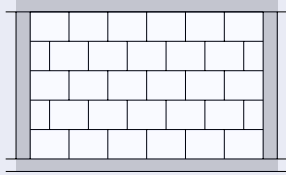
[5 6] 5) Heralan edge strips (rock wool strips), thickness 13 mm, allowed in accordance to the certificate of MPA BS

6) With execution iaw. P-3497/8366 MPA Braunschweig

5) Acoustic insulation with execution using rock wool edge strips, 12 mm iaw. Test report

8) Interior fire wall, verified in accordance with DIN 4102-3

Permitted wall dimensions

WITHOUT FIRE PROTECTION REQUIREMENTS						
Installation area ¹⁾		Permitted wall heights with thickness of blocks of (mm)			Double-sided edge bedding	
		60	80	100		
Installation area 1		3,500	4,500	7,000		
Installation area 2		Only possible with verification	3,500	5,000		
Installation area ¹⁾		Permitted wall length with thickness of blocks of (mm)			Four-sided edge bedding	
		60	80	100		
Installation area 1		3.000	Wall lengths as desired			
		3.500				
		4.000	8.000			
		4.500				
		5.000	12.500			
		5.500	13.750			
		6.000				
		6.500	Possible only with verification			
Installation area 2		3.000	4.500	Wall lengths as desired		
		3.500				
		4.000	10.000			
		4.500				
		5.000	Possible only with verification			
		5.500	16.500			

Permitted wall heights for walls made from MultiGips gypsum blocks iaw. EN 12859, which are at least attached top and bottom, have any desired wall length and may have large openings.

Permitted wall lengths depending on the wall height with walls made from MultiGips blocks iaw. EN 12859, which have no large openings and are attached on all four sides.

WITH FIRE PROTECTION REQUIREMENTS						
Type of construction in accordance with	Wall height (m)	Minimum wall thickness (mm) for the fire resistance classes				
		F 30	F 60	F 90	F 120	F 180
DIN 4102-4	≤ 5.00 ²⁾	60	80	80	80	100
Test certificate	= 5.53	100	100	100	100	100
	≤ 7.00 ³⁾	100	100	100	100	--
	≤ 9.00 ⁴⁾	100	100	100	--	--

Permitted wall heights for walls made from MultiGips gypsum blocks iaw. with EN 12859. With wall heights > 5.00 m the ceiling connections are to be made iaw. test certificate.

1) Installation area 1 iaw. DIN 4103-1: areas with low gatherings of people such as, for example, apartments, hotel, office hospital rooms and similarly used spaces including the corridors must be assumed.

Installation area 2 iaw. DIN 4103-1: areas with high gatherings of people such as, for example, assembly rooms, schoolrooms, lecture halls, exhibition and sales rooms and similarly used spaces must be assumed. to these count also always partition walls between rooms with a height difference to the floors < 1.00 m

2) Wall heights iaw. DIN 4103-2 may not be exceeded (see permitted wall dimensions without fire protection requirements)

3) Maximum permitted wall height iaw. DIN 4103-2

4) For special cases which go beyond the details of DIN 4103-2

Concimitant standard specifications

RULE/STANDARD	TITLE	VALIDITY	ISSUE
Gypsum blocks and accessories			
EN 12859 ¹⁾	Gypsum blocks –Definitions, requirements and test methods	EU ²⁾	2001-11
EN 12860	Gypsum based adhesives for gypsum blocks - requirements and test methods	EU ²⁾	2002-07
SN EN 12859; SIA 242.101	Gypsum blocks –Definitions, requirements and test methods (Swiss version)	Switzerland	2002-01
SN EN 12860; SIA 242.001	Gypsum based adhesives for gypsum blocks - requirements and test methods (Swiss version)	Switzerland	2002-01
Draft EN 15318	Draft standard -Design and application of gypsum blocks	Currently draft only	2005-11
Non-load-bearing interior partition walls			
DIN 4103-1	Internal non-load-bearing partitions; requirements, testing	Germany	1984-07
DIN 4103-2	Internal non-load-bearing partitions; gypsum wallboard partitions	Germany	1985-12
ÖNORM B 3358-5	Non-load-bearing interior wall systems – Part 5: Systems made from gypsum blocks	Austria	2006-08
General construction technical standard specifications			
DIN 1055-3	Action on structures – Part 3: Self-weight and imposed load in building	Deutschland	2006-03
DIN 18202	Tolerances in building construction - structures	Germany; in Austria as ÖNORM DIN 18202 with same content	2005-10
Recommendation SIA 414-10; SN 510414-10	Dimensional tolerances – in buildings (Not available in English)	Switzerland	1987
General building-physical standard specifications			
DIN 4102-1	Reaction to fire of building materials and building components – Part 1: Building materials; concepts, requirements and tests	Germany	1998-05
DIN 4102-2	Reaction to fire of building materials and building components – Part 2:	Germany	1977-09
DIN 4102-3	Reaction to fire of building materials and building components – Part 3:	Germany	1977-09
DIN 4102-4	Reaction to fire of building materials and building components – Part 4: Synopsis and application of classified building materials, components and special components	Germany	1994-03
DIN 4109	Sound insulation in buildings; requirements and testing	Germany	1989-11
DIN 4109 Supplement 1	Sound insulation in buildings; construction examples and calculation methods	Germany	1989-11
DIN 4109 Supplement 2	Sound insulation in buildings; guidelines for planning and execution; proposals for increased sound insulation; recommendations for sound insulation in personal living and working areas	Germany	1989-11
DIN 4109 Amendment 1	Sound insulation in buildings; requirements and verifications; Amendment 1	Germany	1992-08
DIN 4109 Supplement 3	Sound insulation in buildings; calculation of R' _w ,R for accessing suitability as designed I DIN 4109 on the basis of the sound reduction index R _w determined in laboratory tests	Germany	1996-06

¹⁾ The previous nation standard specification DIN 18163 on gypsum blocks was withdrawn as a result of the introduction of the European standard

²⁾ The European standards apply in all Member Countries of the EU, that is Germany also and, for example, Austria or in The Netherlands. They are, however,

Certifications

As manufacturer we take our obligation to the protection of the environment very seriously and invest in resource-sparing, low emission product processes as well as in sustained recultivation measures with the degradation of the raw material, gypsum.

Our products are classified by the "Transferstelle ökologisch orientiertes Bauen" [Transfer agency for ecologically oriented building] in Dresden, under Red. No. 1.3-

98L004 "Ecologically recommended". In addition the certifications in accordance with KOMO [BV Kawaliteitsverklaringen Bouw. BKB] and DIN EN ISO 9001.

An Environmental System in accordance with EN ISO 14001 and EMAS-II Ordinance applies for the VG-ORTH Works in Hundelhausen. The compliance of our gypsum blocks with the European Standard EN 12859 is documented on all delivery notes

and all packaging with the CE Mark. It is the legal basis for the fact that MultiGips products may be handled and put into circulation in member countries of the European Union.



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Florian Schreiber, München 2007 [1 3]

Fischerwerke, Waldachtal 2006 [3 2]

With this publication we impart our state of knowledge on the working and areas of application of our building products on site. As very different working conditions are always to be found there we can only reflect general working guidelines. Persons carrying out the work are obliged to examine technically the practicality and areas of use of our products in definite building projects taking into account valid standard specifications. Our expert advisers support those involved in decision making in situations which cannot be covered through this brochure.

Errors, printing mistakes or incompleteness with technical details or diagrams excepted. The respective current issue applies. Updated publications will be sent to you free of charge on request. Info to aktuell@multigips.de plus address suffices.

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