



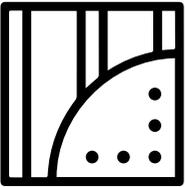
Technical conditions  
for construction and commissioning  
**of Drywall Partitioning  
Systems**



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Technical conditions  
for construction and commissioning  
**of Drywall Partitioning  
Systems**

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# 1 Introduction

The contents of this publication concern the actions performed during commissioning of finishing works completed with utilisation of drywall partitioning technologies, regardless of the manufacturer of the utilised plasterboards and Drywall Partitioning Systems available in Poland.

It must be stressed that each of the manufacturers/drywall system providers has the right to develop their own guidelines with respect to the system solutions offered by them, basing on their official documentation, obtained knowledge, experience, and regulations. In connection to this, it is recommended to get acquainted with any instructions provided by the manufacturers/ system providers, and the available technical documentation related to the selected set of products/system.

The technical parameters referring to drywall partitioning systems, e.g. light partition walls, suspended ceilings, drywall partitioning systems for pitched roofs, etc., are presented and described here as trade standards agreed upon by experts and representatives designated by the following companies: Knauf, Norgips, Rigips (Saint-Gobain) and Siniat. Additionally, the presented here surface finish levels developed by the Polish Gypsum Association, ranging from PSG 1 to PSG 4, are compliant with the guidelines compiled by the EUROGYPSUM European Gypsum

Industry and they correspond to the surface finish quality levels from Q1 to Q4.

This is the sixth, amended issue of the "Technical Conditions for Construction and Commissioning of Drywall Partitioning Systems". The previous issues of this publication (of 2010, 2013, 2015, 2018, 2019), were translated into six languages and published in the overall number of 15 000 copies. This document is connected with the nationwide advertising campaign coordinated by the Polish Gypsum Association promoting utilisation of Drywall Partitioning Systems, which was started in 2015 and continued in 2016.

This publication has become widely popular and is presently often utilised as an annex to agreements whose subject is performing finishing works with utilisation of drywall partitioning technologies. The set of questionnaires attached to this book are often considered by parties contracting agreements as basis for commissioning of construction works.

For a majority of construction works, including installation of drywall partitioning systems, all the stages of the performed construction works have impact on their final functioning. The final effect of works comprises all the drywall partitioning works, from the stage of tracing the localisation of construction elements to final jointing and skimming before painting, applying wallpapers, or finishing layers of other types.

This publication draws attention of construction bodies to the specific nature of finishing works performed with utilisation of plasterboards. The results of certain actions performed by drywall installers become covered up over the course of installation, which renders them hard to assess during the final commissioning procedure of a building. Improper location of walls or faulty positioning of ceilings is easily visible and possible to document over the course of such commissioning works, but imprecise construction of frames of steel profiles, or not precise assembly of insulation can become apparent much later,

during utilisation of a building. In order to perform a complete quality assessment of drywall installations it is necessary to assess both the quality of those works whose results become covered up, and their final effect.

Fragments of the 2004 version of this instructions manual (concerning partition walls) were included in publications of the Building Research Institute, and on web sites of services specialising in construction, but in Poland this publication is the first and only publication covering such a wide range of cases as presented here, which was compiled after consultations with manufacturers of drywall partitioning systems.



# 2 Basic information concerning drywall partitioning systems

## 2.1. Materials and tools

### 2.1.1. Plasterboards

Polish Standard No. PN-EN 520 presents data concerning plasterboards of the following dimensions:

- thickness: 6.5, 9.5, 12.5, 15.0, 18.0 mm.
- width: 600; 625; 900; 1200 and 1250 mm.

Their typical length is: from 2000 to 4000 mm, but other lengths are also acceptable.

**Type A** – standard plasterboards with surfaces enabling application of gypsum plasters, or decorative layers, designed for applications in areas with relative humidity not exceeding 70%.

**Type H** – plasterboards containing ingredients reducing water absorption, which improve their performance, designed for special applications. For identification purposes, those boards are marked as types H1, H2 and H3, characterised by various degrees of water absorption.

Type H2 boards are designed for applications in areas with a relative air humidity up to 70%, which temporarily (up to 10 hours a day) rises to 85%. The front sides of those boards are usually green.

**Type E** – plasterboards produced especially to be used as elements adding rigidity to external walls. They are not intended to be decorated. They must not be exposed to constant influence of weather conditions. Water absorption of this board type is reduced and those boards should have a minimal level of water vapour permeability.

**Type F** – plasterboards with cores containing mineral fibres and/or other additives which are intended to increase integrity of the cores in high temperatures. Those boards are intended for construction of partitions with fire resistance classifications. They are designed for utilisation in areas with a relative air humidity not exceeding 70%.

**Type D** – plasterboards with controlled density of their gypsum cores – min. 800 kg/m<sup>3</sup> (min. 10 kg/m<sup>2</sup>) for 12.5 mm thick boards. The front sides of those boards may be pink coloured. They are designed for utilisation in areas with a relative air humidity not exceeding 70%.

**Type R** – plasterboards with increased durability designed for special applications which require increased durability. They have increased resistance to destructive longitudinal and crosswise breaking loads.

Water absorption class	Total water absorption %
H1	≤5
H2	≤10
H3	≤25

Tab. 1. Water absorption classes of Type H plasterboards acc. to EN 520

**Type I** – plasterboards with increased surface hardness.

It is possible to manufacture boards with mixed configurations, e.g. DF, DFH2, DFH1IR.

### 2.1.2. Types of plasterboard edges

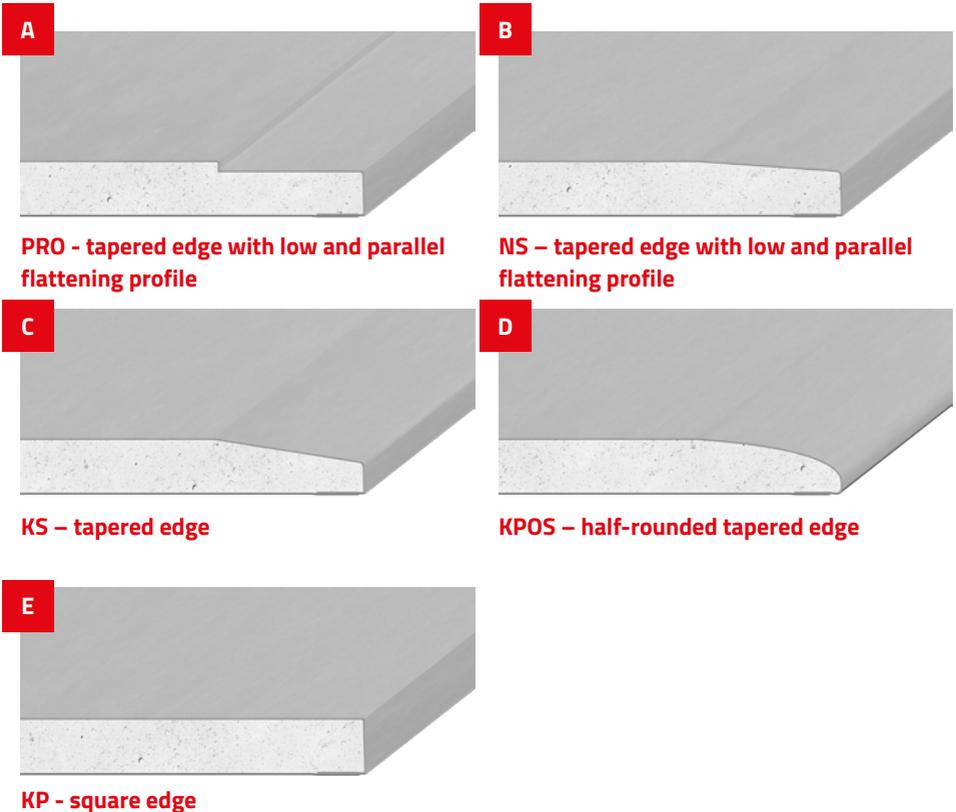


Fig. 1. Types of plasterboard edges

### 2.1.3. Trimmed edges

In the case of the edges formed by trimming of factory-made plasterboards their gypsum core is exposed. Before such plasterboards are installed the trimmed edges must be chamfered at an angle of about 45° (see fig. 8 in section 2.1.5.3).

### 2.1.4. Filling in joints – work stages

It must be kept in mind that the process of filling in of plasterboard edges should take place in a few stages – depending on the edges' type and shape.

### 2.1.5. NS and PRO type edges

Glass fibre reinforcement tape (self-adhesive mesh) must be embedded in

connections between the NS and Pro type edges, and then – depending on the system provider's recommendations – they should be covered with one, or two layers of a structural system joint filler.

Depending on the assumed PSG finish quality level (see section 4.3.1.2, PSG level 2), a joint constructed in this way can be additionally provided with a system finishing joint filler.

When a paper, or fliseline tape is used, first it is necessary to apply a layer of structural joint filler onto a joint between adjacent board edges, then a strip of reinforcement tape must be embedded. After the first layer of the applied joint filler cures, another layer of the system joint filler must be applied.

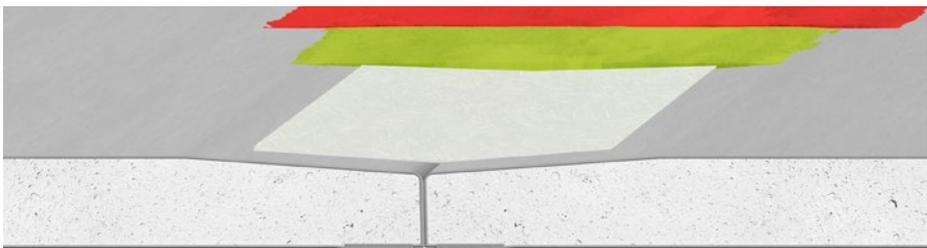


Fig. 2. Filling in joints between NS type edges with utilisation of self-adhesive tape



Fig. 3. Filling in joints between PRO type edges with utilisation of self-adhesive tape

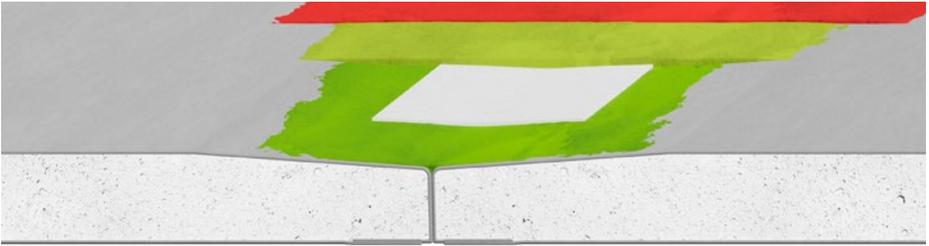


Fig. 4. Filling in joints between NS type edges with utilisation of fliseline, or paper tape



Fig. 5. Filling in joints between PRO type edges with utilisation of fliseline, or paper tape

### 2.1.5.1. KS type edges

For the KS type edges, with utilisation of reinforcement tapes of glass fibre (fliseline, or self-adhesive mesh), or paper, at first it is necessary to apply a layer of structural joint filler, and then reinforcement tape must be embedded in the applied joint filler. After the first layer of the applied structural joint filler cures with the embedded rein-

forcement tape, such joints must be subsequently skimmed again with the structural joint filler, once or twice (depending on the manufacturer's recommendations).

Depending on the assumed PSG finish quality level (see section 4.3.1.2, PSG level 2), a joint constructed in this way can be additionally provided with a finishing system joint filler.

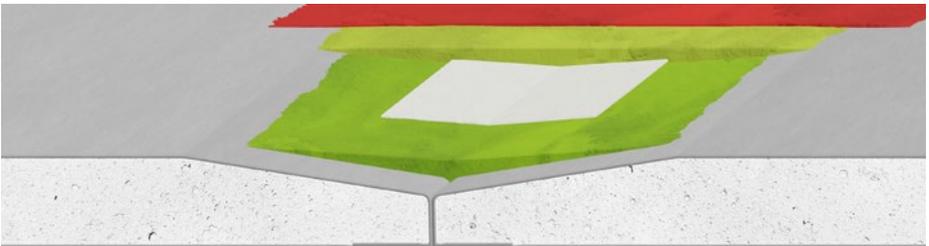


Fig. 6. Filling in joints between KS type edges with paper or glass fibre tape embedded in joint filler compound



Fig. 7. Filling in joints between KPOS type edges with paper or glass fibre tape embedded in joint filler compound

### 2.1.5.2. KPOS type edges

For the KPOS type edges, when reinforcement tapes of glass fibre (fliseline, or self-adhesive mesh), or paper are provided, at first it is necessary to apply a layer of structural joint filler, and then a strip of reinforcement tape must be embedded in the applied joint filler. After the first layer of the applied joint filler cures, the filled joints must be skimmed again twice (two layers) with the system joint filler.

For the KPOS edges it is possible to fill joints without utilisation of any reinforcement tapes. In this case it is necessary to utilise a special structural system joint filler for application without reinforcement tapes. Depending on the guidelines of the system provider, such joints must be skimmed two, or three times.

Depending on the assumed finish quality PSG level (see section 4.3.1.2, PSG level 2), a joint constructed in this way can be additionally provided with a finishing system joint filler.

### 2.1.5.3. Crosswise edges (factory-made, or trimmed)

For crosswise edges, it is necessary to apply reinforcement tapes of glass fibre, paper, or other, as recommended by the provider of a given system. For any systems with fire resistance requirements, a glass fibre tape must be used. First, a layer of a system joint filler must be applied on such edge joints, next a strip of reinforcement tape must be embedded in the joint filler. After the first layer of the applied joint filler cures, those joints must be skimmed once again with the system joint filler.

After the structural compound cures the joints must be finished with a finishing compound to the width of 20-30 cm on each side in order to make the surface smooth.

When multiple layers of the system jointing compound are applied, the following layers should be applied after the previous ones cure.

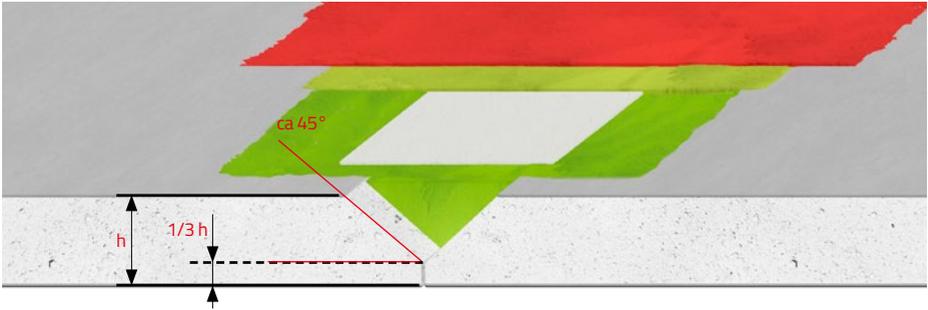


Fig. 8. Filling in trimmed joints with paper or glass fibre tape embedded in joint filler

### 2.1.6. Joint filler compounds

System joint filler compounds must be utilised for structural and finishing filling of joints between plasterboards and for filling of peripheral gaps between walls, or ceilings and building structure elements.

Appropriate system joint fillers are offered by the providers of complete drywall systems. Those compounds are produced according to the requirements presented in Standard PN-EN 13963.

There are four joint filler compound types:

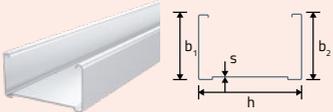
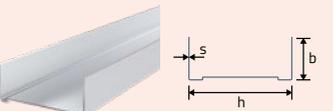
- structural joint fillers for utilisation with reinforcement tapes;
- finishing joint fillers;
- dual-purpose joint fillers (structural and finishing);
- structural joint fillers for utilisation without reinforcement tapes, for the KPOS type edges, according to the guidelines of the manufacturer.



### 2.1.7. Steel profiles

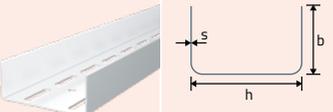
In order to build a wall, ceiling, or another partition it is necessary to construct an appropriate frame. To construct those frames it is necessary to use special system steel profiles made of cold bent steel sheet, pro-

vided with anti-corrosion protection (e.g. galvanised). Manufacturers who supply complete drywall systems offer various types of profiles. Those system profiles are produced following the requirements presented in Standards PN-EN 14195 or PN-EN 13964.

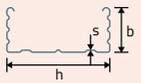
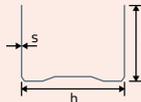
Profile appearance, cross-section, name and marking		Dimensions and dimensional deviations* [mm]		
		h	b	
	CW 50 (C50)	48,8±0,5	b1= 50,0-51,0±0,5 b2= 48,0-50,0	acc. to drywall partitioning system manufacturer's documentation
	CW 75 (C75)	73,8±0,5		
	CW 100 (C100)	98,8±0,5		
Horizontal wall profile (profiles with other dimensions are also available)  	UW 50 (U50)	50,0-51,0±0,5	40,0±0,5	acc. to drywall partitioning system manufacturer's documentation
	UW 75 (U75)	75,0-76,0±0,5		
	UW 100 (U100)	100,0-101,0±0,5		

\* Examples of wall-mounted steel profiles' dimensions.

Tab. 2. Wall-mounted steel profiles (h – profile height – width of C-profile, b – C-profile flange width – for „CW (C)“ profiles flange widths are not identical, s – metal sheet thickness)

Profile appearance, cross-section, name and marking		Dimensions and dimensional deviations [mm]		
		h	b	s
	UA 50	48,8±0,5	40,0±0,5	acc. to drywall partitioning system manufacturer's documentation
	UA 75	73,8±0,5		
	UA 100	98,8±0,5		

Tab. 3. Door frame steel profiles (h – profile height – width of C-profile interior, b – C-profile flange width, s – metal sheet thickness)

Profile appearance, cross-section, name and marking		Dimensions and dimensional deviations [mm]		
		h	b	s
Ceiling profile	 	CD 60	60,0±0,5	27,0±0,5
Horizontal wall profile				
 	UD	28,0±0,5	25,0-27,0±0,5	acc. to drywall partitioning system manufacturer's documentation

Tab. 4. Steel ceiling profiles (h – profile height – width of C-profile interior, b – C-profile flange width, s – metal sheet thickness)

System profiles are subdivided into three groups:

- wall-mounted profiles for constructing light structures of stud partition walls, wall sheathing, and pre-walls;
- ceiling profiles for constructing suspended ceilings, sheathing of walls and ceilings, and loft drywall partitioning systems. For both the types mentioned above, the nominal thickness of the sheet metal of which wall and ceiling profiles are made is 0.6 mm, or 0.55 mm, with tolerances as defined by the manufacturer of the system;
- door frame profiles intended for installing doors in partition walls and for providing reinforcement for wall frames with non-standard solutions. Usually made of min. 1.8 mm thick steel sheet.

When purchasing profiles it is necessary to pay close attention to the thickness of the metal sheet they are made of, and their supplier. Utilisation of non-system profiles results in loss of the technical characteristics declared by the system provider, such as the declared fire resistance, acoustic insulation,

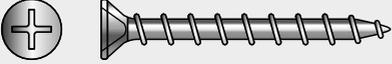
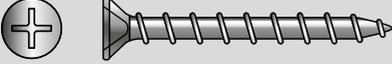
and mechanical durability of the whole solution (e.g. wall, or ceiling), and no possibility of application of the documentation supplied by the system provider.

### 2.1.8. Accessories

Any accessories used for those drywall partitioning systems must be manufactured by one of the following four manufacturers: Knauf, Norgips, Rigips and Siniat. Those accessories include, e.g.: rotary hangers, nonius hangers, cross connectors, longitudinal connectors, ES elements, etc.

### 2.1.9. Screws and sheet metal screws

Those include: sheet metal screws, self-drilling sheet metal screws, wood screws. Any screws used in the drywall systems must be manufactured by one of the following four manufacturers: Knauf, Norgips, Rigips and Siniat.

Sheet metal screws 3.5 mm						
	Diameter [mm]	3,5	3,5	3,5	3,5	
	Length L [mm]	25,0	35,0	45,0	55,0	
Sheet metal screws 4.2 mm						
	Diameter [mm]	4,2				
	Length L [mm]	70,0				
Self-drilling sheet metal screws 3.5 mm						
	Diameter [mm]	3,5	3,5	3,5		
	Length L [mm]	25,0	35,0	45,0		
Self-drilling sheet metal screws 3.5 mm						
	Diameter [mm]	3,5				
	Length L [mm]	9,5/11				
Wood screw 3.5 mm						
	Diameter [mm]	3,5	3,5	3,5	3,5	
	Length L [mm]	25,0	35,0	45,0	55,0	
Wood screw 4.2 mm						
	Diameter [mm]	4,2				
	Length L [mm]	70				
Wood screw 4.5 mm						
	Diameter [mm]	4,5	4,5			
	Length L [mm]	80,0	90,0			

Tab. 5. Screws for drywall partitioning systems

### 2.1.10. Necessary tools

Tools commonly used for work with dry-wall partitioning systems:

- plasterboards can be cut with:
  - utility knives with replaceable blades,
  - compass saws,
  - handsaws;
- the following tools are commonly used to achieve proper alignment of installed plasterboards: straight edge, laser or traditional levels, rubber mallets;
- screw guns with adjustable driving depth are the best choice for fixing plasterboards;
- the tools used for joint filling are: putty knives, metal plastering trowels, sandpaper, or abrasive mesh;
- the following might also be useful:
  - plasterboard planer (for chamfering plasterboard edges)
  - chalk reels (for marking).



## 2.2. Transport and storage of plasterboards and other materials

A high quality finish level of drywall interiors can be ensured by following appropriate principles relating to handling plasterboards during their transport and installation.

1. Plasterboards should be carried with the trimmed edges positioned vertically, or transported with utilisation of appropriately adapted forklift trucks, on pallets, or other transport carts.
2. Plasterboards should be stored on a flat surface, e.g. a pallet.
3. System plasterboards, glue, fillers and gypsum compounds should be protected against moisture. Wet or moistened plasterboards must not be used.
4. Metal system elements, such as steel profiles or screws, must be stored under a roof and protected against moisture.

# 3 Basic HSE rules

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The Minister of Infrastructure Regulation of 6th February 2003 on safety and hygiene of construction works (Journal of Laws of 2003 No. 47 item 401) defines the obligations of employers concerning ensuring safety and hygiene during manual transport works, the requirements concerning organisation and the way of performing manual transport works

(including the ergonomic requirements), the acceptable weight of transported items, loads, or materials, and the acceptable values of forces which are necessary to handle items.

A detailed description of the HSE rules can be found on [www.polskigips.pl](http://www.polskigips.pl) web page, in a work commissioned by the Polish Gypsum Associated.

# 4 Commissioning

## 4.1. Works which are covered up at subsequent stages

During commissioning it is necessary to check system correctness – application of the building materials as recommended by the system providers. During construction of drywall partitioning it is necessary to assess the following work results which become covered up during the subsequent steps of assembly: construction of the structure of steel profiles, placement of mineral wool, sheathing, application of reinforcement tapes and filling of joints.

**4.1.1.** Construction of the frame made of steel profiles prepared for application of sheathing with plasterboards is checked. Placement of the frame in relation to rigid elements of a given building must be checked very carefully. The quality and thickness of the sheet metal the applied metal profiles are made of must also be checked, as well as the way of fixing the outermost profiles of the structure to their adequate building elements. It is also necessary to check the spacing of the structure elements and the possibility of joining them, as well as application of sealing tape around the perimeter.

**4.1.2.** It must be checked whether the applied mineral, glass, or rock wool insulation is installed correctly and carefully, and whether the parameters declared by the mineral wool's manufacturer meet the parameters required for a specific drywall system (e.g. thermal conductivity index). It must be checked whether the

connections and filling of stud and horizontal profiles are executed correctly.

**4.1.3.** It must be checked whether the applied sheathing is installed appropriately, including the type of plasterboards, type and spacing of fasteners used for fixing the boards to their load-bearing structure, and whether the indicated distances from floors and ceilings are correct. Preparation of edges for filling joints is also assessed, including the possible chamfering of trimmed edges not covered with cardboard.

**4.1.4.** The applied type of reinforcement tape and its placement within joints must be checked.

**4.1.5.** The applied type of joint filler and the number of its layers are checked.

## 4.2. Assessment of final effects of works which are subsequently covered up

Assessment of the final effect of works is performed after completing assessment of the works which are covered up at further installation stages. When such assessment is performed (during the final commissioning process) the following must be taken into account:

- conformity of the location of walls, ceilings and encasements to the design. Assessment of conformity is performed with utilisation of measuring tapes, try squares, plumb bobs, or laser devices,

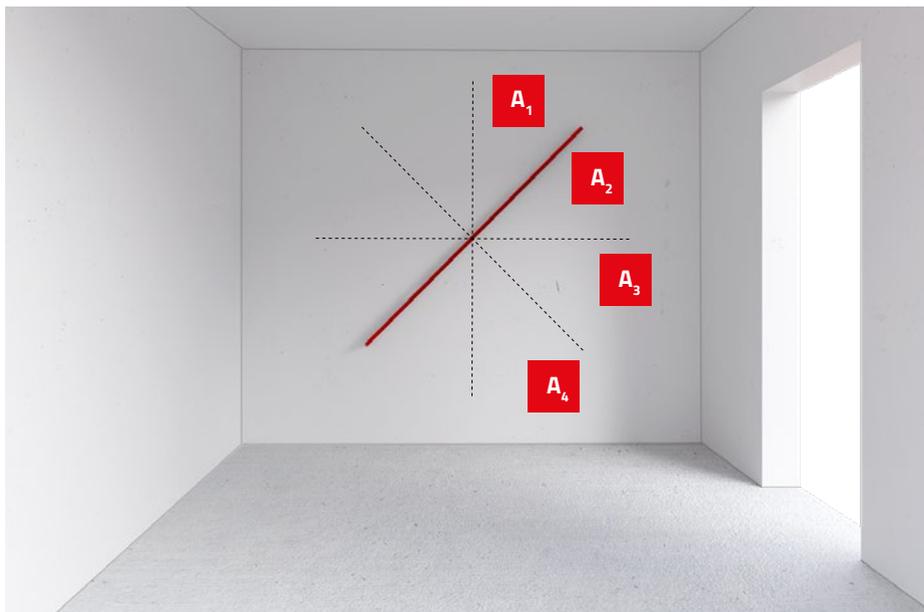


Fig. 9. The manner of taking measurements – deviations of surfaces from their plane

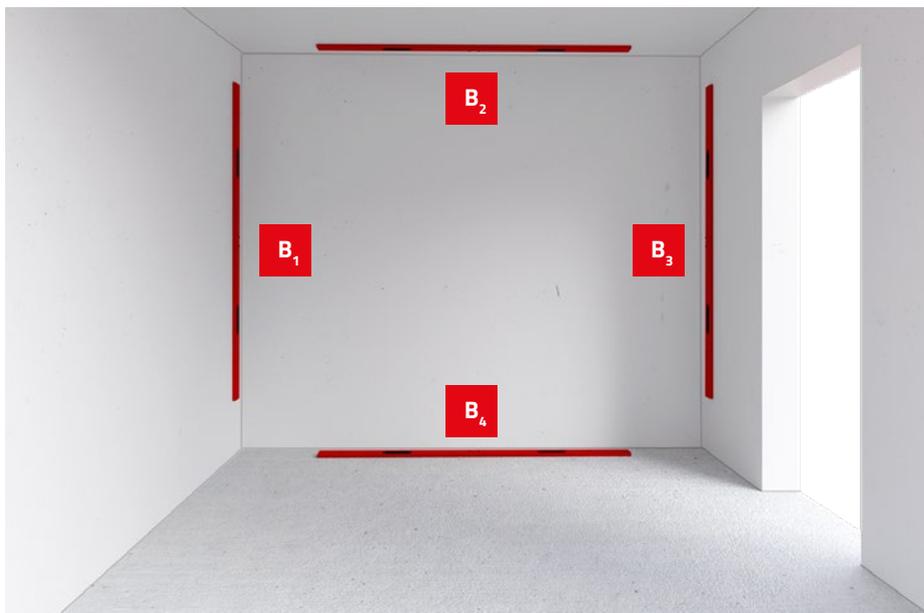


Fig. 10. The manner of taking measurements – deviations of plane edges from the straight line

by checking the localisation of drywall elements (walls – projection to the plane of the floor; ceiling – against permanent characteristic points of a building and defined reference points),

- dimensional tolerances of any constructed planes and edges.

#### 4.2.1. Taking measurements

##### 4.2.1.1. Deviations of surfaces from their plane

The following measurement instruments are necessary in order to perform those measurements:

- aluminium straight edge, length 2 m,
- tape measure with a millimetre scale.

How to perform the measurement: Place the straight edge against the measured wall (fig. 9), check how it interfaces with the wall. Evaluate visually whether there are gaps between the straight edge and the wall surface. If such gaps are present, measure their size in millimetres (fig. 11). Such measurements should be performed between any two points of support. At the same time the surface is checked for the number of surface irregularities along the straight edge length. It is advised to perform the measurements at the selected spot by orienting the batten in four directions (vertically – A1, horizontally – A3, 45° to the right – A2, 45° to the left – A4).

The obtained results should be compared to the requirements presented in table 8 (section 4.2.1.5).

##### 4.2.1.2. Deviations of surface edges from the straight line

The following measurement instruments are necessary in order to perform those measurements:

- aluminium straight edge, length 2 m,
- tape measure with a millimetre scale.

How to perform the measurement: this measurement is performed by placing the straight edge at the spot where two planes intersect (fig. 10), e.g. internal corners (vertical and horizontal), external corners of walls, or pilasters, and ledges, or edges of beams on ceilings.

Areas with gaps occurring between the straight edge and the examined surface are checked visually. Sizes of those gaps should be determined in millimetres (fig. 11). The number of edge deviations occurring along the length of the straight edge must be checked as well.

The obtained results should be compared to the requirements presented in table 8 (section 4.2.1.5).

##### 4.2.1.3. Surface and edge deviations from vertical plane

The following measurement instruments are necessary in order to perform those measurements:

- plunge bob, or a laser device,
- tape measure with a millimetre scale.

How to perform the measurement: taking measurements with utilisation of a plunge bob requires a certain level of experience. For heights exceeding 3 m it can be burdened with a serious error, this is why utilisation of a laser device is recommended. The string of a plumb bob should be placed against the ceiling at a spot selected thus the side of the weight is as close to the wall as possible, with the tip of its cone slightly above the floor (the weight must hang freely: not touching the adjacent wall, or the floor). The distance from the string to the wall must be measured with a millimetre scaled measure at the top (a2) and at the bottom (a1) (fig. 12). The difference of the measurements represents the deviation of the measured surface, or edge, from the vertical plane, depending on the place where the measurements are taken. For assessment

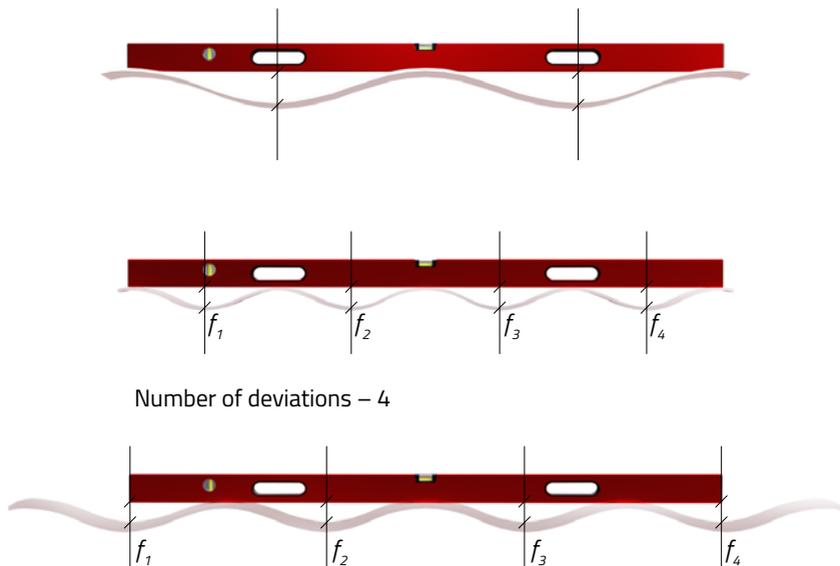


Fig. 11. A diagram of assessing gaps while measuring surface and edge deviations from the straight line

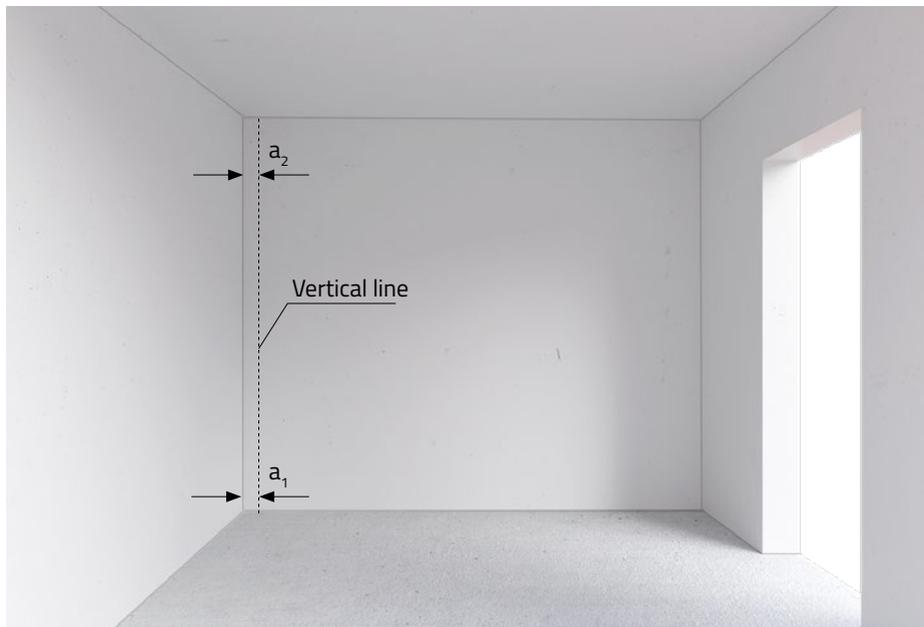


Fig. 12. The manner of taking measurements – deviations of surfaces from the vertical direction

of an edge deviation from the vertical plane of the measured wall, such measurements must be performed at minimum two spots (commonly at its two opposite corners).

The obtained results should be compared to the requirements presented in table 8 (section 4.2.1.5).

#### 4.2.1.4. Surface and edge deviations from horizontal plane

The following measurement instruments are necessary in order to perform those measurements:

- water level,
- leveller with a short target axis with a levelling staff, or
- laser level with a tripod and a rotary base,
- metre rule with a millimetre scale, length 2 m.

How to perform the measurement: the measurement is performed by levelling des-

ignated points. Measurements with utilisation of a water level are performed by holding its transparent pipe ends of the level. In order to measure the difference of height between the H3 and H4 points (fig. 13) it is necessary to place the pipes against the front wall at the height of ab. 40 cm below the surface of the ceiling and remove the plugs from the pipes. After the liquid in the pipe stabilises the placement of the horizontal plane can be marked under the ceiling. Deviation from the level of the two designated points can be established by measuring the distance from those markings to the two controlled points. When performing measurements with utilisation of the geodetic method, with an optical leveller, or a laser device which can be levelled, it is necessary to use a levelling staff, which can be easily replaced with a 2 m long rigid metre rule. The measuring staff is placed vertically at the designated spot, then the leveller, or laser device is targeted at the

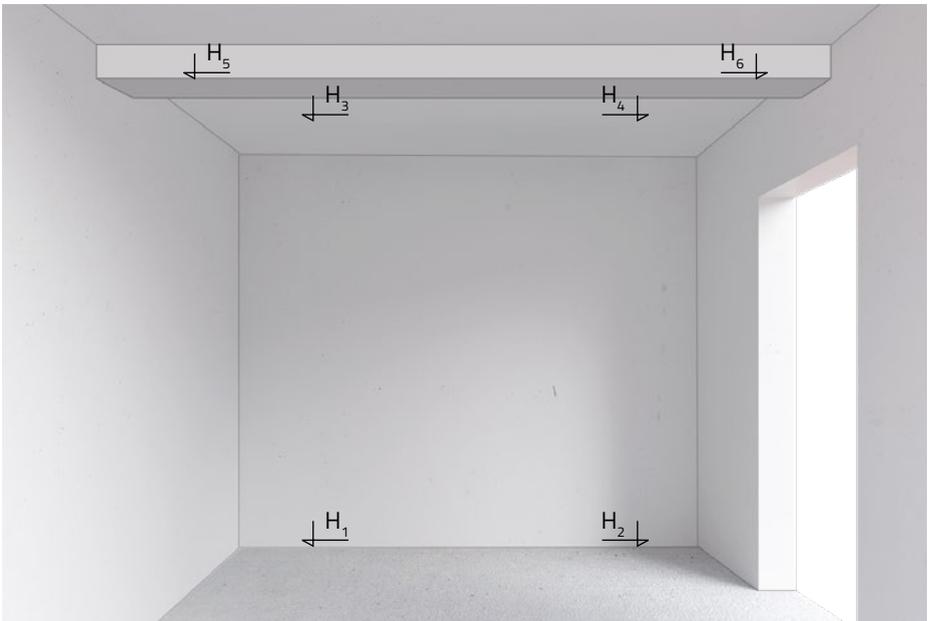


Fig. 13. The manner of taking measurements of deviations from the horizontal direction

staff, and a measurement is taken. The difference between the readings taken at the two points – depending on the place of measurement – is the deviation of a given surface, or edge, from the horizontal plane. The procedure is analogical for the dry screed floor (point H1 and H2) and encasements of joists H5 and H6.

The obtained results should be referred to the requirements presented in table 8 (section 4.2.1.5).

**4.2.1.5.** Deviation of intersecting planes' angles from the angles designed in the documentation.

In practise, horizontal angles at intersections of two walls and vertical angles at intersections of walls and ceilings must be checked.

Deviations of intersecting planes from the angles designed in the documentation must be checked by placing a template of

min. arms' length 1 m flush to the board surface in a measured corner. Subsequently, the maximum distance from the other board surface to the other arm of the template must be measured with accuracy of up to 0,5 mm. The obtained results should be compared to the requirements presented in the following table.

If owing to the existing technical conditions it is not possible to use a template of the aforementioned dimensions, it is acceptable to take such measurements at the distance of 0.5 m with utilisation of a template with arm lengths of 1 m/0.5 m.

For measuring right angles it is recommended to use ready-made triangle rules, or laser devices.

Class	Deviations of surfaces from plane and surface edges from straight line	Surface and edge deviations from appropriate direction		Deviations of intersecting planes from angle determined in documentation
		Vertical	Horizontal	
1	Not exceeding 2 mm in a number not exceeding 3 per one straight edge (2 m)	Not exceeding 1.5 mm per 1 m and generally no more than 3 mm in rooms up to 3.5 m of height and not exceeding 4 mm in higher rooms	Not exceeding 2 mm per 1 m and generally no more than 5 mm on the whole length between vertical partitions (beam walls) max. distance 10 m and not exceeding 10 mm for any other	Not exceeding 2 mm per 1 m or 1 mm per 0.5 m
2	Not exceeding 3 mm in a number not exceeding 3 per one straight edge (2 m)	Not exceeding 2 mm per 1 m and generally no more than 4 mm in rooms up to 3.5 m of height and not exceeding 6 mm in higher rooms	Not exceeding 3 mm per 1 m and generally no more than 10 mm on the whole length between vertical partitions (beam walls) max. distance 10 m and not exceeding 20 mm for any other	Not exceeding 4 mm per 1 m or 2 mm per 0.5 m

Tab. 8. Table presenting the maximum acceptable deviations

### 4.3. Assessment of surface smoothness level (assessment of finish level)

#### 4.3.1. Finish levels for plasterboards

When assessing the level of drywall surface preparation the following should be taken into account:

1. intended use of a given room (e.g. technical area, warehouse, office, flat, hotel room, showroom, hotel lobby, other);
2. intended surface finish (e.g. ceramic coating, painting with structural paints, plastering, wallpapering with thick, thin and structural wallpapers, painting with matte, silky, or glossy paints);
3. lighting (e.g. lighting with stray light, direct light, with a light source placed at least 40 cm from a given wall, or ceiling,

lighting with focused light parallel to the surface).

In order to specify and catalogue all the possible requirements the following four surface finishing levels were characterised for drywall partition structures. Those descriptions give investors an opportunity to specify their expectations on the stage of ordering services and might be an element used for commissioning of works, just like the descriptions for performing measurements presented in section 4.2.1.

The experts of the Polish Gypsum Association distinguish the following surface finish levels, which are equivalents to the Quality Standards classification developed by EUROGYPSUM, and regard them as a trade standard:

Assessment of surface finish smoothness should be performed in natural lighting, with a naked eye, from a min. distance of



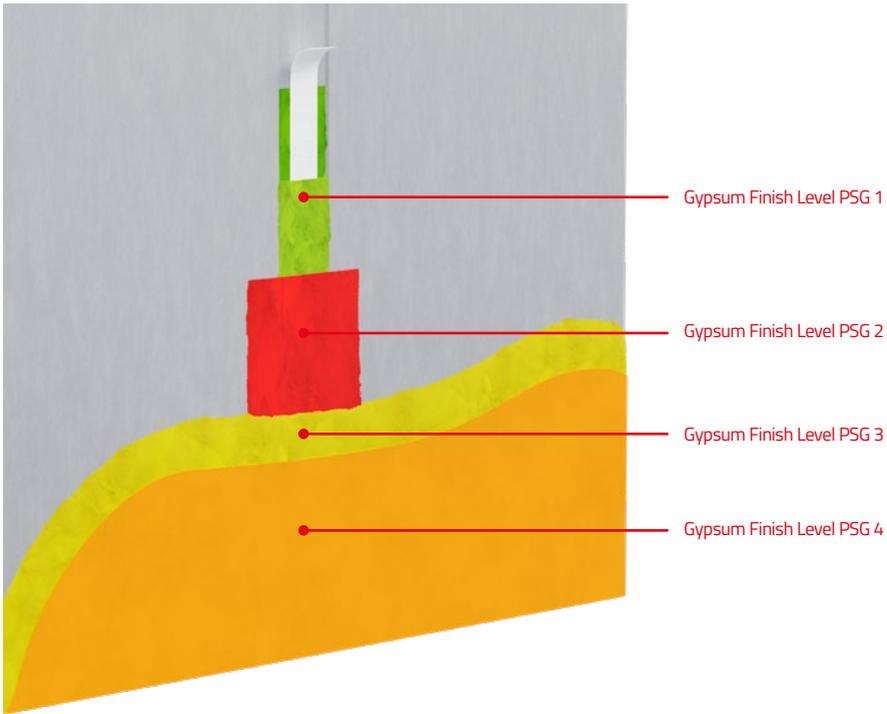


Fig. 14. PSG Gypsum Finish Levels

1 m, or with a lighting type which was determined for the standard utilisation of a given area. In special cases the type, manner, direction and intensity of the light cast on the assessed surfaces should be strictly defined in the technical design and adopted for the surface smoothness assessment procedure.

#### 4.3.1.1. PSG 1 Gypsum Finish Level [Quality Level 1 (Q1)]

The PSG 1 Gypsum Finish Level deals with drywall surfaces for which no requirements concerning aesthetics were defined (e.g. substrates for installation of ceramic

tiles). It is sufficient to apply basic plastering, which includes:

- filling in joints between plasterboards,
- covering visible fixing and finishing elements with a layer of a skimming compound.

On this basic skimming level it is assumed that a reinforcement tape of glass fibre (self-adhesive mesh) is stuck and embedded over the NS and PRO types of plasterboard edges, and covered with one or two layers of a system structural jointing compound – as advised by the provider of a given system.

If a drywall installer applies a paper, or fliseline tape, it is necessary to check whether a layer of system joint filler was first ap-

plied on such joints, and if subsequently the tape was embedded in the joint filler. After curing of the first layer of the structural compound with the embedded reinforcement tape, such a joint should be filled once again with one layer of the system structural joint filler.

Jointing of boards with the KS edge type should take place in a slightly different manner. In this case, with application of a paper, or a glass fibre mesh tape, as the first stage a layer of a system structural joint filler should be applied on a joint, subsequently the reinforcement tape should be embedded in the joint filler. It should be checked whether the joint was covered with another layer of the system structural joint filler after curing of the first layer with the embedded reinforcement tape.

If joints of the KPOS board edge type were filled – just like in the case of the KS type edges – with application of a paper or fliseline glass fibre mesh reinforcement tape, the first thing to be checked is whether a system structural joint filler in which reinforcement tapes should be embedded were used. After the first layer of the applied joint filler cures, another layer of the system joint filler must be applied.

It is worth remembering that for the KPOS type edges it is possible to fill their joints without utilisation of a reinforcement tape. In such cases it must be checked whether special system structural joint fillers, designed for utilisation without reinforcement tapes, were used. Such plasterboard joints – depending on the system provider's recommendations – should be filled with two, or three layers.

When the applied drywall sheathing consists of more than one layer of plasterboards, it is necessary to fill the joints of the plasterboard layers located underneath with

a system structural joint filler. However, covering screw heads of any layers located underneath is not necessary.

On this surface finish level occurrences of local indentations resulting from shrinkage, and marks left by tools is acceptable. Skimming with additional layers of finishing skimming compounds is not performed.

Drywall structures finished according to the guidelines of the PSG 1 finishing level are treated as substrates which are to be covered with various finishing layers (ceramic tiles, panels, etc.) and finishing for temporarily utilised and technical areas.

#### **4.3.1.2. PSG 2 Gypsum Finish Level [Quality Level 2 (Q2)]**

Finishing of structures constructed of plasterboards according to the PSG 2 Gypsum Finish Level is also known as the standard finish and it meets the typical requirements regarding aesthetics of wall and ceiling surfaces.

For the PSG 2 Gypsum Finish Level the aim of works performed by a drywall fitter is levelling and smoothing of joints to make them form a uniform surface with their surrounding board surfaces. Such "smoothing" applies to any fixing elements, both internal and external corners, as well as any connections.

The PSG 2 finish level includes:

- basic finish on the PSG 1 level,
- secondary plastering with system joint fillers: a structural filler, when it is required, and a finishing filler in order to smoothen the boundaries between joint surfaces and plasterboard surfaces.

Leaving local indentations and scratches resulting from the use of tools is unacceptable. Surfaces covered with skimming compounds must be sanded if necessary.

Surfaces prepared in this way are prepared for:

1. covering with medium- and coarse-grained structural wallpapers, e.g. medium- or coarse-grained ingrain wallpaper;
2. covering with structural paints;
3. covering with matte paints, emulsion and acrylic paints applied with utilisation of paint rollers and brushes;
4. covering with decorative plaster.

During the quality assessment procedure it must be taken into account that for the PSG 2 Gypsum Finish Level visibility of transitions between joints covered with a joint filler and plasterboard surfaces not covered with a skimming compound on completely finished surfaces (e.g. walls) is not excluded. This phenomenon takes place owing to the existing differences of structures and textures, as well as the different absorption factors of the utilised materials (cardboard on plasterboard surfaces and gypsum itself), this phenomenon gets more intensive in the case special types of lighting and when dark paints are utilised.

#### **4.3.1.3.** PSG 3 Gypsum Finish Level [Quality Level 3 (Q3)]

When higher aesthetics of skimmed surfaces are required, it is necessary to undertake additional actions, reaching beyond the basic and standard skimming procedures.

The PSG 3 level of finish includes:

- standard finish on the PSG 2 level;
- skimming of the whole surface of a partition element (both joints and cardboard) with system compounds, skimming compounds, or system finish coats, which are supposed to smoothen out any surfaces, close micro pores and unify the texture and absorption of those surfaces.

The thickness of the applied layers is limited and it usually does not exceed 1 mm. Reaching this effect is possible on the condition that plain floats with polished working surfaces and perfectly straight edges are utilised. Any potential irregularities should be carefully sanded down with 200 grit abrasive mesh, or sandpaper.

Surfaces prepared in this way are ready for:

1. covering them with thin wallpapers of delicate structure;
2. covering with thin-layered matte paints;
3. covering with silk sheen and glossy paints;
4. covering with plasters with grit below 1 mm, on the condition that the manufacturer of such a plaster type accepts its utilisation on this particular type of substrate.

In the case of the PSG level finish it is also not possible to eliminate the side-effects of processing which are especially visible when lighting is unfavourable. However, in comparison to the standard PSG 2 finishing level, the intensity and range of such occurrences are negligible.

#### **4.3.1.4.** PSG 4 Gypsum Finish Level [Quality Level 4 (Q4)]

If it is necessary to meet the highest possible aesthetic requirements with regard to skimmed plasterboard surfaces, providers of drywall solutions assume the need for covering their whole areas with an additional thin layer of a finishing compound.

For the PSG 4 Gypsum Finish Level it is assumed that a thin-layer plaster, or special gypsum finishing compound must be applied on the whole drywall structure surface (thickness up to 3 mm). Apart from smoothening, it is often necessary to polish the applied layer as a whole.

Surfaces prepared in this way are ready for:

1. applying smooth, or structural glossy wall veneers, e.g. self-adhesive metal, or vinyl foil;
2. covering with glossy paints;
3. obtaining polished alabaster gypsum surfaces imitating marble.

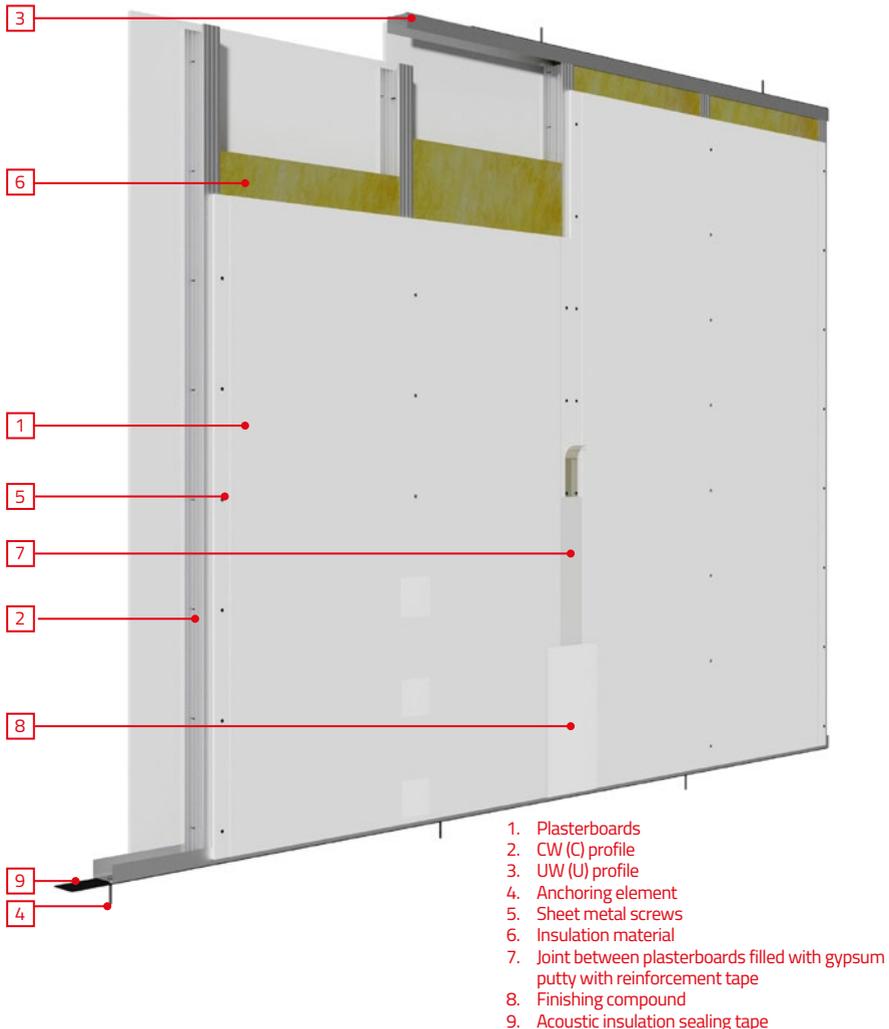
Such whole-surface layering which – according to the subdivision presented in this section – meets the highest quality requirements eliminates visibility of joints – regardless of the utilised type of lighting.

However, it must be kept in mind that complete elimination of those phenomena is not possible as hand-made surfaces will never be perfect, and a focused beam of light directed parallel to the surface will always disclose even its slightest irregularities. When performing the commissioning procedure for works completed according to the requirements of the PSG 4 Gypsum Finish Level those limitations of this performance conditioning must be taken into account.



# 5 Basic parameters essential for commissioning of works performed according to drywall partitioning system technologies

## 5.1. Partition wall systems



Partition walls are constructed of galvanised steel structures with plasterboard sheathing installed on both their sides. The wall structure is constructed of horizontal UW profiles, which are fixed to the floor and ceiling, and vertical CW posts which are inserted into UW profiles. The sheathing of such partition walls can consist of one, two, or three layers.

### **5.1.1.** Commissioning of the structure

**5.1.1.1.** During the commissioning procedure of such structures it is necessary to pay attention to the following technical parameters:

- type,
- thickness of the metal sheet they were made of,
- external dimensions,
- surface quality,
- markings acc. to PN-EN 14195, which must be cross-referenced with the recommendations of the supplier and the specifications of a given system.

Those steel profiles are usually marked with the construction mark B, or the CE marking. The nominal thickness of the steel sheet utilised for production of the profiles, their reference document number, and the thickness, or mass, and anti-corrosion layer type (e.g. Z275, AZ100) are also must be stated, as well.

**5.1.1.2.** During the commissioning procedure it is necessary to pay attention to the technical parameters and spacing of the construction elements located around the wall perimeter. Particularly, the maximum spacing and type of fasteners must be checked and cross-referenced with the recommendations of the supplier and the specification of a given system. Usually, expansion plugs, or dowels of a diameter and length depending on the substrate

type are utilised for fixing the profiles, but they must not be smaller than 6x40 mm, their max. spacing is 100 cm.

**5.1.1.3.** Subsequently, the technical parameters of the sealing tape placed around the wall perimeter must be checked. Polyethylene foam tape of min. thickness 3 mm is usually used. Its minimum width is respectively:

- 50 mm for CW (C)/UW (U) 50 profiles;
- 70 mm for CW (C)/UW (U) 75;
- 95 mm for CW (C)/UW (U) 100 profiles;

**5.1.1.4.** Special care should be taken as far as proper placement of the sealing tape around the wall perimeter is concerned. System suppliers recommend placing the tape along the whole wall perimeter, i.e. between the substrate and the vertical CW (C) and horizontal UW (U) peripheral profiles. The tape should adhere tightly at the joints of the individual sections, i.e. it should remain in contact. And it should be in tight contact with the substrate and the profiles on the whole length, with no easily visible gaps between the tape, the profiles, and the substrate.

**5.1.1.5.** The length and spacing of CW (C) post profiles are also checked. According to supplier's recommendations and system specification, this length should be shorter by 1.5–2.0 cm from the height of the room, when measured between the webs of the top and bottom UW (U) profiles. And the maximum spacing between those profiles should be – depending on the system – 60, 40, or 30 cm.

**5.1.1.6.** It is necessary to pay attention to the type of connections between the CW (C) and UW (U) profiles. System's providers do not accept constructing permanent and rigid connections between CW (C) profiles and UW (U) horizontal profiles made with utilisation of fixing screws, or other, or with utilisation of a crimping tool.

**5.1.1.7.** The way of fixing CW (C) profiles along their length is also important and must be checked. According to the system provider's recommendations, and the system specification, such connections should be be constructed by forming an overlap on CW (C) profiles, of the following lengths:

- u=50 cm for CW (C) 50 and UA 50 profiles,
- u=75 cm for CW (C) 75 and UA 75 profiles,
- u=100 cm for CW (C) 100 and UA 100.

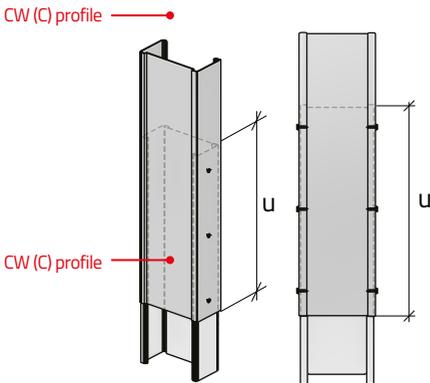


Fig. 15. Diagram of profile extension constructed by sliding CW (C) profiles onto each other

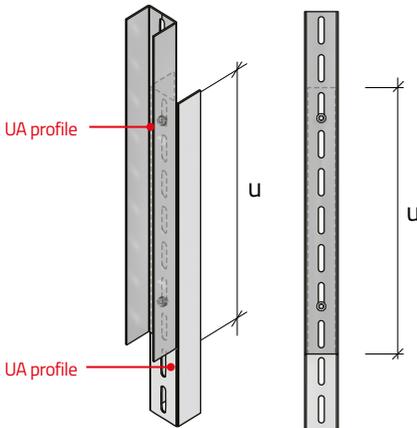


Fig. 16. Diagram of UA frame profile extension constructed by screwing two UA profiles together

Another acceptable way of extending CW (C) profiles is application of overlays made of an additional pieces of CW (C), or UW (U) profile, of the following lengths:

- CW (C) 50 profile:  $2 \times u$  (50 cm) = 100 cm,
- CW (C) 75 profile:  $2 \times u$  (75 cm) = 150 cm,
- CW (C) 100 profile:  $2 \times u$  (100 cm) = 200 cm.

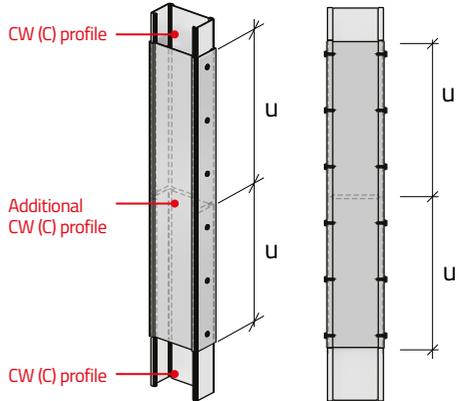


Fig. 17. Extending two CW (C) profiles by sliding another CW (C) profile onto them

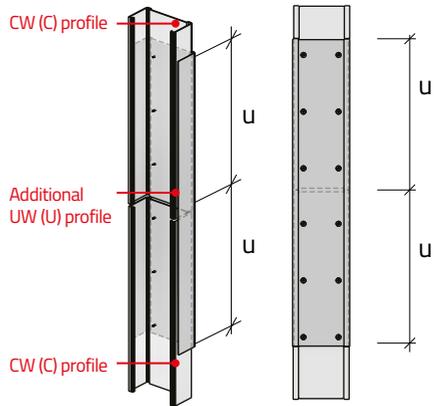


Fig. 18. Extending two CW (C) profiles by sliding another UW (U) profile onto them

Analogically, it is possible to extend UA profiles by screwing additional UA profiles of the following lengths:

- UA50 profiles:  $2 \times u$  (50 cm) = 100 cm,
- UA75 profiles:  $2 \times u$  (75 cm) = 150 cm,
- UA100 profiles:  $2 \times u$  (100 cm) = 200 cm.

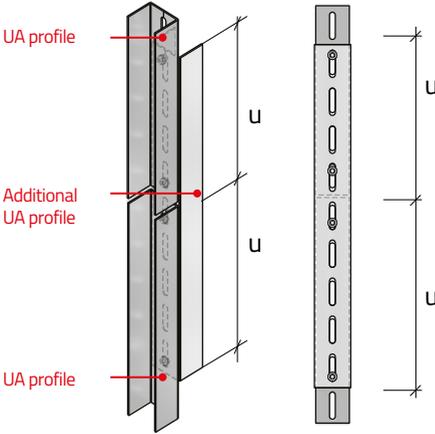


Fig. 19. Diagram of UA50 extensions constructed by screwing an additional UA50 profile

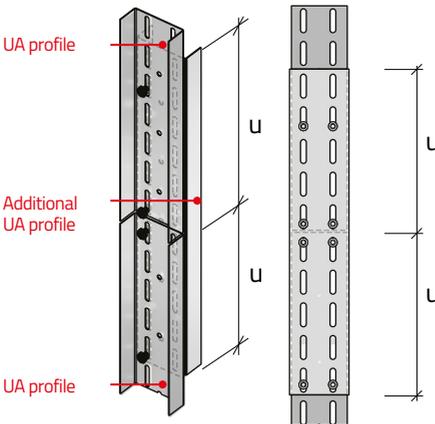


Fig. 20. Diagram of UA75/100 extensions constructed by screwing an additional UA75/100 profile

It should be checked whether joints of adjacent profiles are not located at the same level. Such joints of adjacent profiles should be located interchangeably, and the distance between the levels of those joints must not be less than 100 cm.

Warning! For walls of the height up to 300 cm it is prohibited to utilise profiles joined along their length.

**5.1.1.8.** When the quality of the structure of a partition wall is checked it is necessary to pay close attention whether the solutions of the installed door frames are properly selected. According to the recommendations of the system provider, for walls of height up to 260 cm with door opening widths (construction opening width) up to 90 cm and a door leaf weight up to 25 kg it is possible to utilise standard CW (C) profiles, acc. to fig. 21. However, if any of those values are exceeded, it is necessary to utilise UA vertical profiles.

Installation of door leaves (single or double) on UA profiles is acceptable for door opening widths not exceeding 150 cm for the walls of heights up to 650 cm and the overall door leaf weight not exceeding the values presented in table 6.

Opening width	UA50	UA75	UA100
Up to 100 cm	50 kg	75 kg	100 kg
Up to 120 cm	40 kg	60 kg	80 kg
Up to 150 cm	35 kg	50 kg	65 kg

Tab. 6. Acceptable door leaf weight

When the width of an opening does not exceed 120 cm the horizontal profiles forming lintels are constructed of the U/UW 50/75/100 profiles, acc. to fig. 21 and fig. 22. If this condition is not met, a lintel must be constructed of UA50/75/100 profiles, acc. to fig. 23.

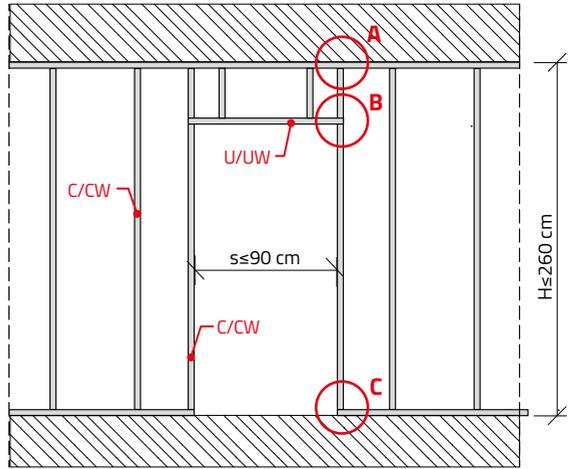
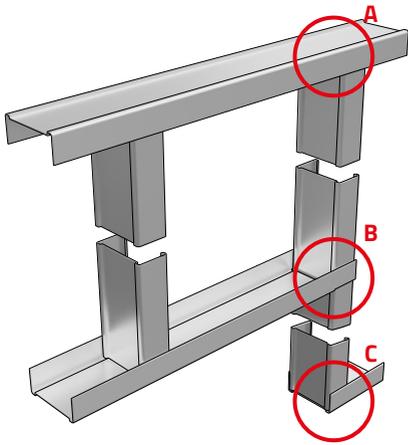


Fig. 21. Structural diagram of a door opening, max. width 90 cm.

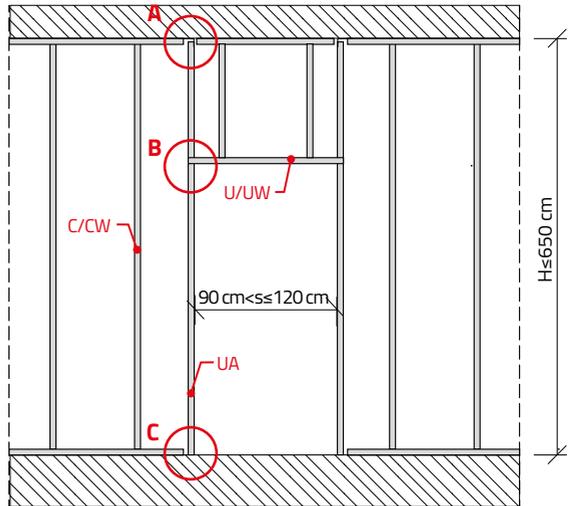
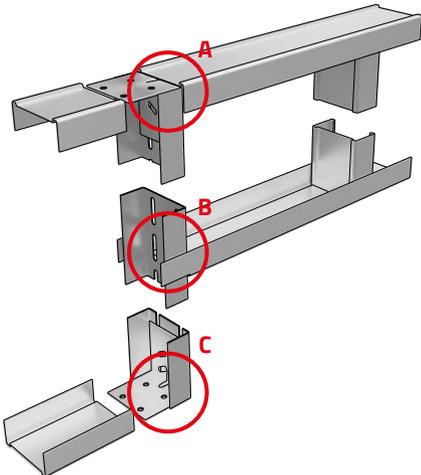


Fig. 22. Structural diagram of a door opening, width from 90 cm to 120 cm.

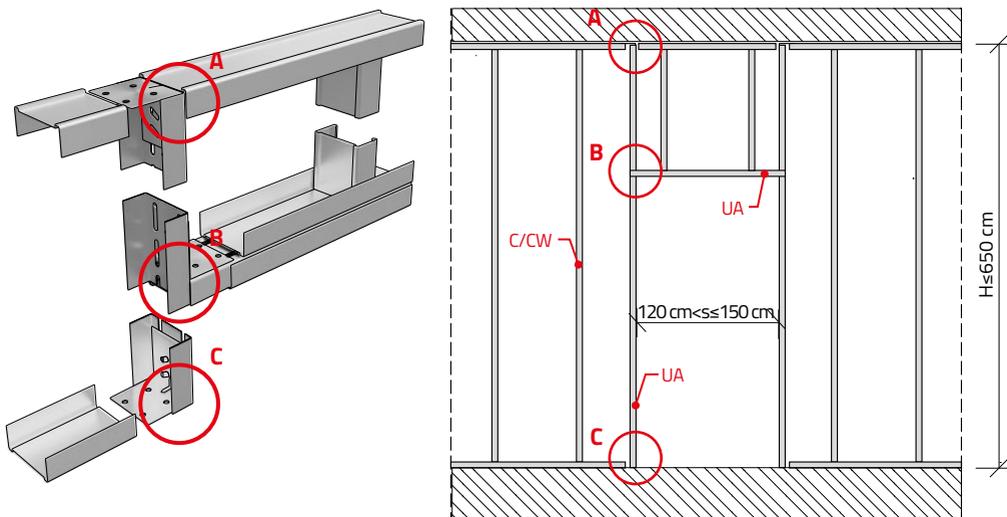


Fig. 23. Structural diagram of a door opening, width from 120 cm to 150 cm.

For door openings widths exceeding 150 cm, and for walls of heights exceeding 650 cm and door leaf mass exceeding the values presented in the table, an independent door support structure must be provided. Openings without installed door joinery can be installed in such walls, as well:

- max. opening width 180 cm, or three times the spacing between the posts – max. wall height up to 6.5 m, the vertical posts can be constructed of the C / CW profiles and the horizontal ones - of the U/ UW profiles (acc. to fig. 24);
- max. opening width 240 cm, or four times the spacing between the posts – max. wall height up to 650 cm, the vertical posts must be constructed of UA profiles and the horizontal ones - of the U/ UW profiles (acc. to fig. 25);
- max. opening width 300 cm, or five times the spacing between the posts – max. wall height up to 400 cm, framing profiles can be utilised as the vertical and horizontal profiles for walls of heights up to 6.5 m, the vertical posts can be constructed of the C/CW profiles, whereas the horizontal elements can be constructed of the U/UW profiles (acc. to fig. 26).

CW (C) and UW (U) profiles located above an opening must be screwed together with sheet metal screws. The spacing of the elements anchoring the top UW (U) profiles must be reduced to 50 cm within the span of any constructed openings. If those conditions are not met, it is necessary to design an independent support structure for such an opening.

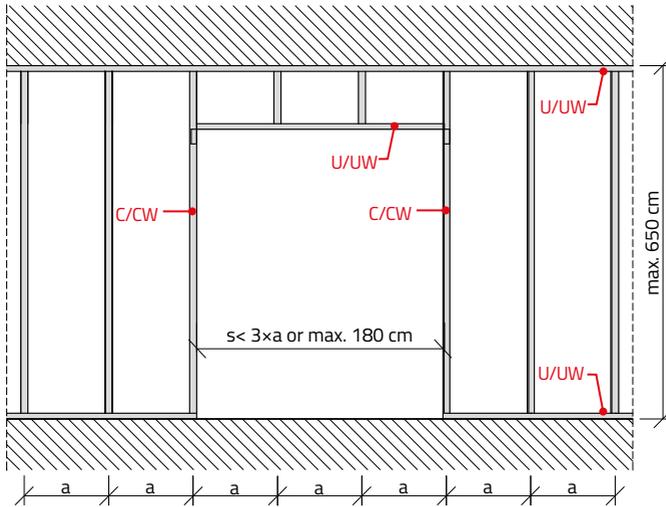


Fig. 24. Diagram presenting the structure of an opening, max. width 180 cm, in a partition wall

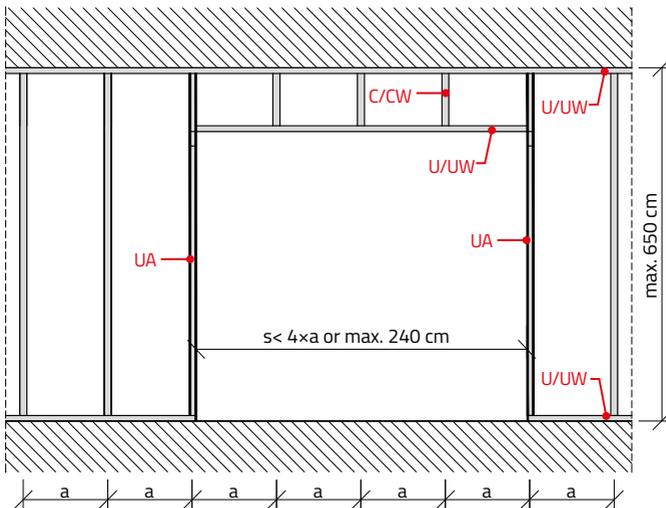


Fig. 25. Diagram presenting the structure of an opening, max. width 240 cm, in a partition wall

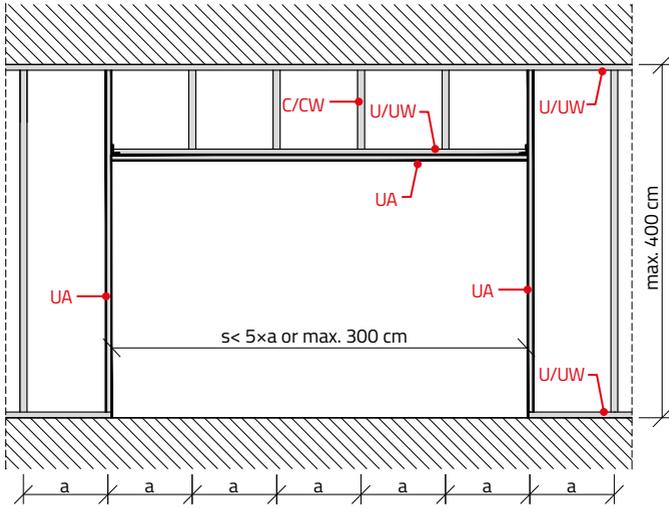


Fig. 26. Diagram presenting the structure of an opening, max. width 300 cm, in a partition wall



The possibility of constructing openings in walls is stipulated. Openings can be constructed in walls of a max. height up to 650 cm. If the width of an opening does not exceed 120 cm, the vertical elements should be constructed of the C/CW profiles, and the horizontal ones - of UW profiles.

Whereas for opening widths from 120 cm to 150 cm the vertical and horizontal ele-

ments located around the perimeter of such openings must be constructed of UA door frame profiles.

For openings with widths exceeding 150 cm, and wall heights exceeding 650 cm, or when window joinery is installed inside such openings, it is necessary to design an independent sub-structure.

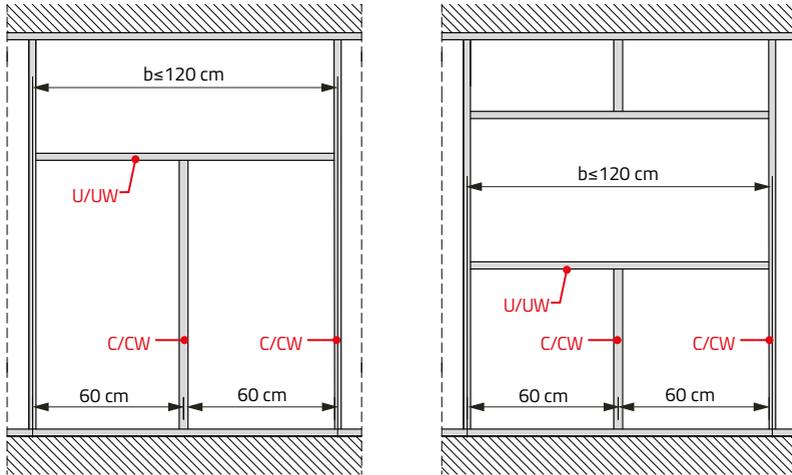


Fig. 27. Diagram presenting the structure of an opening, max. width 120 cm, in a partition wall

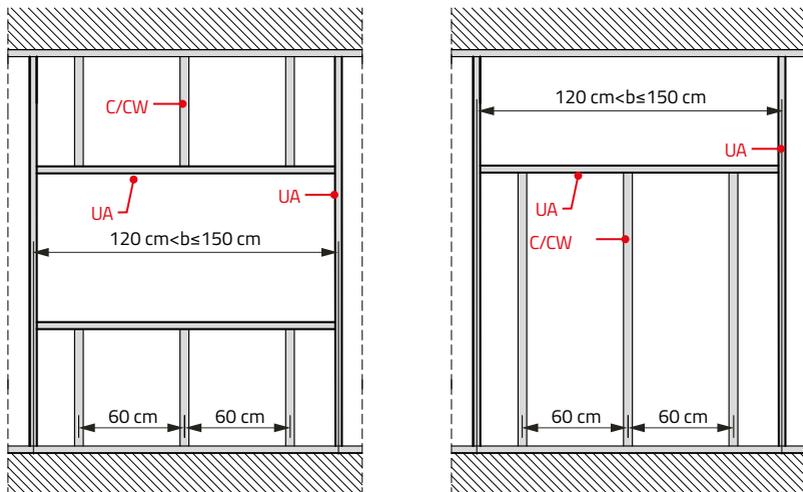


Fig. 28. Diagram presenting construction of an opening, max. width 150 cm, in a partition wall

**5.1.1.9.** Apart from the utilised technical solutions, door frame structures are assessed for correctness of assembly. According to the system provider's guidelines and specifications it must be checked whether CW (C) profiles are installed directly within UW (U) profiles, and if UA profiles are fixed to their substrates with utilisation of installation angle profiles for UA profiles, which provides constructed structures with appropriate rigidity. Those angle profiles must be fixed to their substrates with utilisation of min. two expansion plugs, or dowels. Subsequently, those angle profiles must be fixed to UA profiles with utilisation of bolts and nuts, diameter 8 mm, in the amount of:

- 1 piece for UA 50,
- 2 pieces for UA 75 or UA 100 per each connection.

It is also necessary to check whether the beams forming the door frame lintels are in both the cases constructed of UW (U) profile, fixed on both the sides to the webs of CW/UA post profiles. Min. two posts made of CW (C) profiles should be provided within the span of the lintel above a given door opening, located min. 10 cm from its edges.

**5.1.1.10.** According to the system provider's guidelines, electrical installations located within partition walls can be run through factory-made openings of CW (C) profiles. The wiring of such electrical installations should be appropriately sheathed before it is installed within a wall.

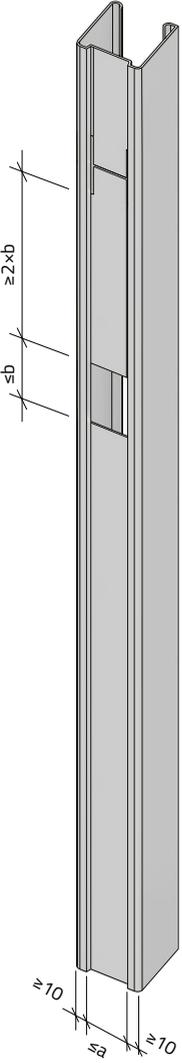
It is also possible to make additional openings in CW (C) profiles and UA frame profiles according to the following rules:

- additional openings must be located on the axis of profiles,
- making additional openings is not allowed in any areas where doors, and transoms are located, and at the spots where loads, such as, e.g. hanging cupboards, are located,
- making additional openings in profiles is also prohibited in situations when increased uniform load values acting on walls occur owing to the presence of, e.g. gas operated fire extinguishing systems,
- additional holes should be made according to table 7.

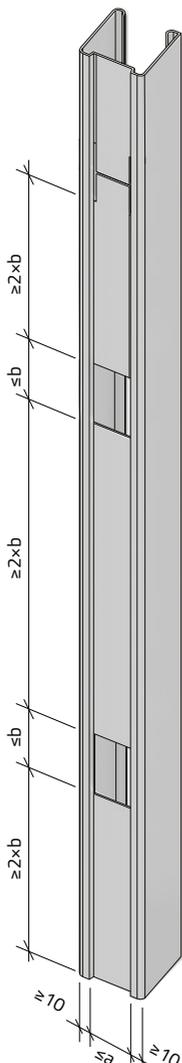
Profile	Acceptable number of additional openings	Dimensions of additional openings: width(a)×height(b) [mm]	Min. distance between openings or min. distance from opening edge to profile edge (2×b) [mm]	Minimum sheathing thickness for each wall side
CW50	x	x	x	1x12,5
	1	≤ 30 × 50	≥ 100	≥ 18
CW75	2	≤ 55 × ≤ 75	≥ 150	≥ 12,5
CW100	2	≤ 80 × ≤ 100	≥ 200	≥ 12,5
UA50	2	≤ 30 × ≤ 50	≥ 100	≥ 12,5
UA75	2	≤ 55 × ≤ 75	≥ 150	≥ 12,5
UA100	2	≤ 80 × ≤ 100	≥ 200	≥ 12,5

Tab. 7. Maximum dimensions of additional openings cut in the webs of CW (C) and UA profiles.

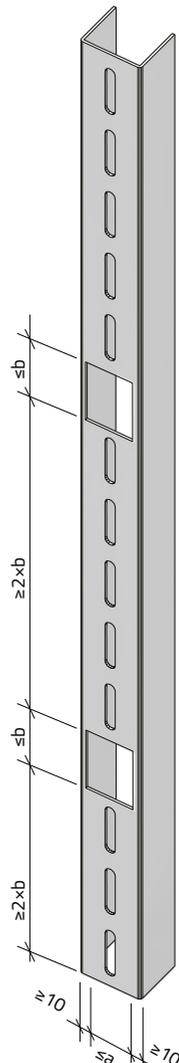
CW (C) 50  
profile



CW (C) 75  
and CW (C) 100 profiles



UA 50  
profile



UA 75 and UA 100  
profiles

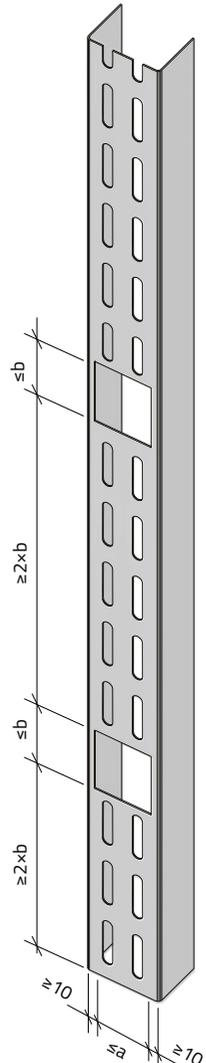


Fig. 29. Diagram for making additional openings in CW(C) profiles and UA frame profiles

**5.1.2.** Commissioning of insulation installation (applied according to system specifications)

**5.1.2.1.** During commissioning of insulation installations it is necessary to check the technical parameters of the insulation material, e.g. mineral wool. It is necessary to check the following:

- type,
- thickness of boards or mats,
- bulk density, or characteristic values of its self-weight (if the technical documentation specifies the so called density of wool, it is necessary to request a declaration whether the characteristic load of the product's self-weight is appropriate for a given product),
- width of boards or mats,
- other declared characteristics, as required for a given drywall partitioning system.

**5.1.2.2.** Close attention must be paid to the minimum dimensions of the used mineral wool boards and mats. According to the guidelines of the system provider, their width must enable installation of insulation without making any vertical joints between posts, and their height must be equal to the typical trade standard – for slabs it is usually 100 cm, and for mats – it must be equal to their standard trade length, or the height of the wall they are installed in. Installing 'leftovers' of insulation materials, of min. height 30 cm, is acceptable up to max. 25% of the overall area of a wall, with the exception of mineral wool strips which are installed in order to complete the infill of the whole wall height.

**5.1.2.3.** Tightness of the mineral wool infill installed in the spaces within CW (C) profiles must be checked during the commissioning procedure. It is especially important to check whether such mineral wool boards, or mats are appropriate to the spacing of posts, i.e. if their width is 30 cm, 40 cm, or 60 cm re-

spectively. For glass wool it must be checked most carefully – especially for high walls – whether the installed panels are 1–3 cm wider than the spacing of the profiles of a given structure.

**5.1.2.4.** During control special attention must be paid to tightness of insulation placement on the whole height of a wall. Easily visible gaps of the horizontal joints between the edges of slabs or mats of insulation materials are unacceptable. Appropriate filling of the top and bottom UW (U) profiles must be checked especially closely.

**5.1.2.5.** The maximum thickness of mineral wool boards, or mats (glass, or rock) – according to the guidelines of the system provider – is usually equal to the width of CW (C) post profiles, i.e. it is respectively: 50 mm for CW (C) 50 profile, 75 mm for CW (C) 75 profile, 100 mm for CW (C) 100 profile. If the main wall profiles are connected in a way forming a hollow profile, so called "box-shaped" profile, such profiles must be filled with wool, according to the system provider's guidelines, or the system specifications.

**5.1.3.** Commissioning of plasterboard installation

**5.1.3.1.** The technical parameters of the installed plasterboards must be checked according to Standard PN-EN 520 within the range of: their type, thickness, edge type. According to the guidelines of the system provider, or their system specifications, the CE marking, type, board thickness, reaction to fire class, and reference document number must be checked.

**5.1.3.2.** It must be checked whether the connections between the installed walls of plasterboards and the building structure (constructed of materials different from plasterboards) were provided with slip joints.

In the case of connections of walls with other walls, or sheathing of plasterboards it must be checked whether such joints were provided with reinforcement tape, of paper, or glass fibre felt, as well.

For walls with lengths exceeding 15 m running in a straight line, it should be checked whether such walls were provided with at least one expansion joint – according to the guidelines of the system provider. The fact of constructing expansion joints at the points where the structure of a given building is provided with expansion joints must also be checked.

**5.1.3.3.** Dimensions of the utilised plasterboards must be checked. According to the guidelines of the system provider, or the system specification, the minimum width of plasterboards utilised as sheathing of such structures should be equal to double the spacing of its structural elements. It is assumed that in most cases for the post spacing of 60 cm it is 120 cm. It should be checked whether the height of the utilised boards is equal to their typical trade height, or the height of a given floor.

For wall heights exceeding 260 cm the horizontal joints between boards are acceptable. For multi-layered sheathing, one horizontal joint in an internal layer is acceptable for sheathing heights below 260 cm.

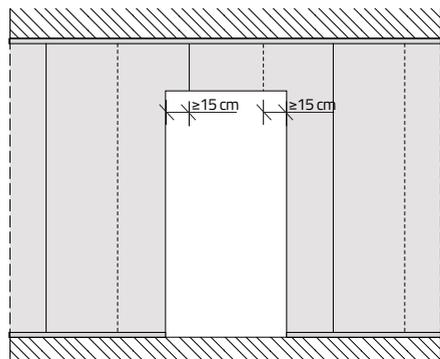
It must be checked whether the distance between the horizontal joints of plasterboards of the same sheathing layer (the same layer, and the same side of sheathing) is not below 200 cm. It is acceptable to install trimmed board fragments of min. height 40 cm.

**5.1.3.4.** During commissioning of construction works the minimum displacement of horizontal board joints must be checked. The horizontal joints of adjacent strips of each of the sheathing layers should be shifted by min. 40 mm.

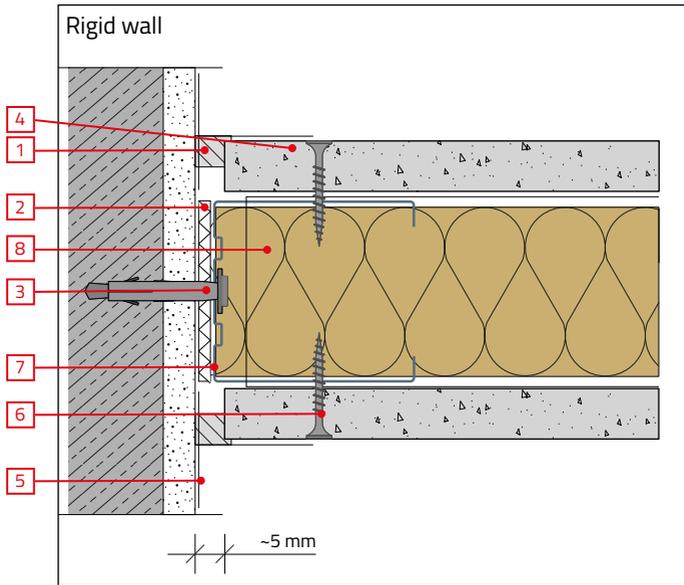
The horizontal joints of the following layers of sheathing, as well as the first and the second layer in the case of double-layered sheathing, on each of the wall sides, should be shifted by min. 40 cm. The horizontal joints of symmetrical sheathing layers on both the wall sides should also be shifted by min. 40 cm.

**5.1.3.5.** The min. displacement of the vertical joints must be checked. The vertical joints of neighbouring, adjacent layers of sheathing, on both the wall sides, should be shifted against each other by – at least – the width of the structural spacing module, which is usually 60 cm. For partition walls with increased structural density (e.g. 40 or 30 cm) comprising multi-layered sheathing (double-, three-, or four-layered), the vertical joints of any neighbouring (adjacent) layers should be – if possible – shifted against each other by at least the width of the structural spacing module. The vertical joints of symmetrical layers of sheathing on both the wall sides must be shifted against each other by the width of the structural spacing module, which is usually 60 cm.

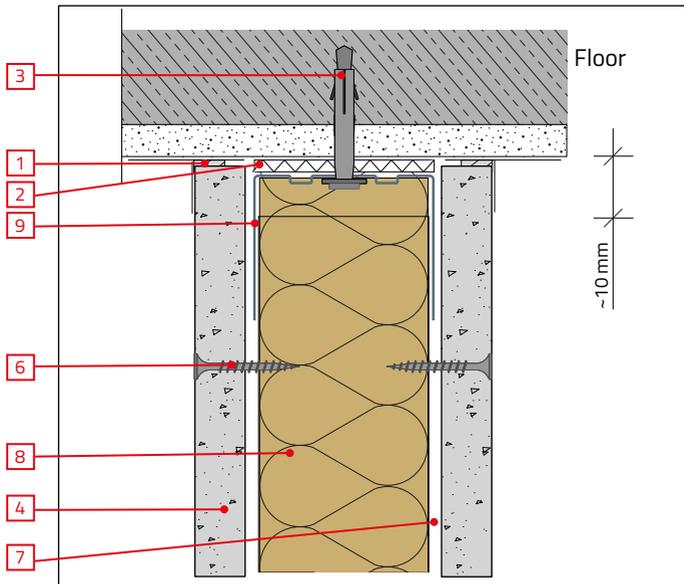
Vertical connections of boards in wall openings made in walls must also be checked. Board joints located above door openings should always be shifted, acc. to the diagram presented in fig. 30.



**Fig. 30.** Diagram of the vertical joints' placement around an opening on both the wall sides



Horizontal cross-section



Vertical cross-section

Fig. 31. Sliding connection: (from top) horizontal cross-section and vertical cross-section

- |                                     |                            |
|-------------------------------------|----------------------------|
| 1. Structural joint filler          | 6. Sheet metal screws      |
| 2. Acoustic insulation sealing tape | 7. CW (C) vertical profile |
| 3. Mechanical fastener              | 8. Mineral wool            |
| 4. Plasterboards                    | 9. UW (U) top profile      |
| 5. Slip tape                        |                            |

**5.1.3.6.** The gap size between the installed adjacent plasterboards must also be checked. The maximum acceptable distance between longitudinal and crosswise edges is 3 mm.

**5.1.3.7.** Appropriate selection of screws must also be checked. The utilised type of screws must be – acc. to the system provider's guidelines – appropriate for the utilised profiles. Sheet metal screws should be utilised for installing plasterboards to CW (C) post profiles made of sheet metal with thickness not exceeding 0.6 mm. For UA frame profiles, made of 2.0 mm thick sheet metal, self-drilling sheet metal screws must be utilised. It must be checked whether the length of the utilised screws is greater than the board thickness, or the overall sheathing thickness (for multi-layered sheathing) by min. 10 mm.

When plasterboards (e.g. for 1 x 12.5 mm sheathing) are fixed to a frame made of CW (C) profiles, it is necessary to use 3.5 x 25 mm sheet metal screws, and when a frame is made of UA profiles, 3,5 x 25 mm self-drilling sheet metal screws should be used.

**5.1.3.8.** It should be checked whether the spacing of the installed screws is max. 25 cm for single-layered sheathing, and for the external layers of multi-layered sheathing. According to the guidelines of the system providers, the maximum spacing of screws in internal board layers of multi-layered sheathing should not exceed 75 cm.

**5.1.3.9.** It must be checked whether screw heads are embedded below the surfaces of plasterboards. It must also be checked whether screws are driven in the installed boards without cutting the cardboard surface around the whole perimeter of their heads.

**5.1.4.** Commissioning of joint filling

**5.1.4.1.** The characteristics of the applied joint fillers must be assessed by checking their type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, it is possible to utilise a joint filler designed as structural filling of joints between plasterboards with application of reinforcement tapes, or those designed for filling joints without application of such tapes.

It must also be checked whether the utilised compound was granted the CE marking, check its intended use and range of application, and the number of its reference document.

**5.1.4.2.** During the filling quality control, the technical characteristics of the applied jointing tape are checked, with special attention paid to its type, width, range of applications, and markings. According to the system provider's guidelines, one of the following system jointing tape types must be applied: self-adhesive glass fibre "mesh", "fliseline" glass fibre tape, or paper tape. The minimum width of such tape is 45 mm.

**5.1.4.3.** It must be checked what type of jointing tape was applied. According to the system provider's guidelines, any tape type can be utilised for plasterboards with flattened edges (NS, PRO, KS, and KPOS) on their vertical joints. For plasterboards with NS and PRO type edges, self-adhesive jointing tape ("mesh") must be stuck onto the edges of the joined boards, directly to their cardboard, and for plasterboards with the NS, PRO, KS and KPOS type edges such tape must be applied on the structural joint filler ("wet compound") placed beforehand on board such edges. If fliseline or paper tape is applied, it must be checked whether those tape types were embedded into "wet jointing compo-

und". The vertical joints (of factory-made tapered edges) between plasterboards with rounded and flattened edges (KPOS) can be filled without utilisation of jointing tape on the condition that a specially designed jointing compound is used. It must be checked whether jointing of the horizontal joints between plasterboards, i.e. the „trimmed“ edges, was performed with utilisation of fliseline, or paper tape embedded in “wet compound”.

**5.1.4.4.** The manner in which the “trimmed” edges were prepared for forming the horizontal joints must be checked. According to the supplier’s guidelines, any “trimmed” edges prepared for forming the horizontal joints must be especially formed by chamfering at an angle ranging from 40° to 50° to the height of about 2/3 of a board thickness (which means 9-10 mm for 12.5 thick plasterboards – fig. 8). Before filling the horizontal joints formed between the “trimmed” edges it must be checked whether they were thoroughly cleaned and dusted and if they were moistened directly before applying joint filler.

**5.1.4.5.** While commissioning works are performed it is necessary to check the manner of filling both the vertical and horizontal joints. According to the system provider’s guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation jointing tape embedded into previously placed jointing compound (“onto wet compound”) requires another stage of skimming with a type of structural jointing compound. The aim of the second stage is “covering” the applied jointing tape with the joint filler. Filling of the vertical joints with utilisation of self-adhesive jointing tapes depending on the edge depth might require a second stage of filling with the structural joint filler. If a higher joint finish standard

was required, i.e. when increased finish aesthetics of plasterboard joint areas, or of the whole wall area is required, it must be checked whether special “finishing” skimming compounds were utilised for the final skimming stage (see descriptions of the PSG finish levels).

**5.1.4.6.** According to the system provider’s guidelines, any vertical or horizontal joints between plasterboards, as well as all the peripheral joints (at the peripheral connections between partition walls and building structural elements) should be filled with structural joint filler placed throughout all the existing sheathing layers. It must be checked if all the horizontal and, in most cases, the vertical joints of the outermost sheathing layers were additionally reinforced with jointing tape (this does not apply if jointing compounds designed for filling joints without utilisation of reinforcement tapes were used).

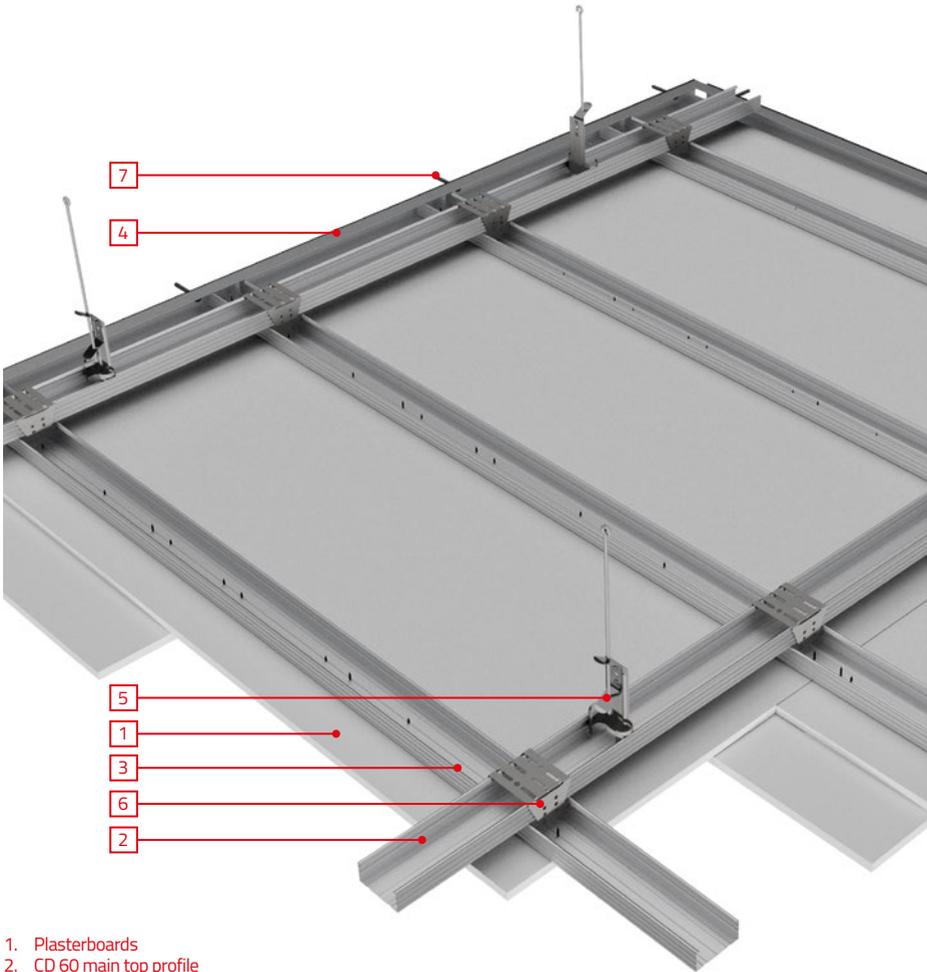
### **5.1.5. Commissioning of surface finish**

**5.1.5.1.** While performing the surface commissioning procedure, assessment of surface smoothness (finish level assessment) takes place on the basis of the plasterboard finish quality level characterisation which was presented in detail in section 4.3.

**IMPORTANT:** For the partition wall systems with qualified fire resistance levels, such systems must be constructed according to the requirements for the adequate fire classification.

**5.1.5.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.

## 5.2. Suspended ceiling systems



1. Plasterboards
2. CD 60 main top profile
3. CD 60 bottom top profile
4. UD profile
5. Hanger
6. Cross connector
7. Anchoring element

Suspended ceilings are consist of galvanised steel cross structures, comprising main (top) CD profiles and load-bearing (bottom) CD profiles, which are suspended underneath floors with utilisation of different types of

hangers. UD peripheral profiles are utilised for constructing connections between suspended ceilings and walls. Suspended ceilings are sheathed with plasterboards. Their sheathing can be single- or multi-layered.

## 5.2.1. Commissioning of structure

**5.2.1.1.** During the frame commissioning procedure it is necessary to pay attention to the following technical parameters of profiles:

- type,
- thickness of metal sheet they were made of,
- external dimensions,
- surface quality,
- markings acc. to Standards PN-EN 14195, PN-EN 13964, which must be cross-referenced with the supplier's recommendations and the specification of a given system.

Steel profiles are usually marked with the construction mark B, or the CE marking. The nominal thickness of the steel sheet utilised for production of the profiles, the reference document number, and the thickness, or mass, and the anti-corrosion layer type (e.g. Z275, AZ100) are also indicated.

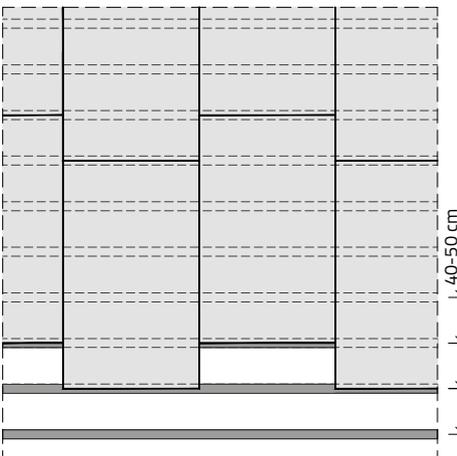
**5.2.1.2.** The technical parameters and spacing of the fixing elements around the perimeter of a ceiling must be checked carefully. Particularly, their maximum spacing and the type of

fasteners must be checked and cross-referenced with the supplier's recommendations and the specification of a given system. Those structures are usually fixed to the substrate with utilisation of expansion plugs, or steel dowels with diameters and lengths depending on the substrate type, at least 6×40 mm, with the max. spacing of 100 cm.

**5.2.1.3.** The technical parameters of the sealing tape recommended for utilisation around the perimeter of ceiling sheathing under UD wall profiles must be checked, as well. According to the system provider's guidelines, it is usually a 3 mm thick tape of polyethylene foam.

**5.2.1.4.** Further control is performed in relation to the technical parameters and spacing of the hangers fixed to the ceiling, their conformity with the supplier's guidelines, and system specification. The maximum spacing and type of the used mechanical fasteners and their conformity with the supplier's guidelines and system specification must be checked. Usually, when a double-level cross frame arrangement is used for a suspended ceiling with a single

### Crosswise arrangement



### Longitudinal arrangement

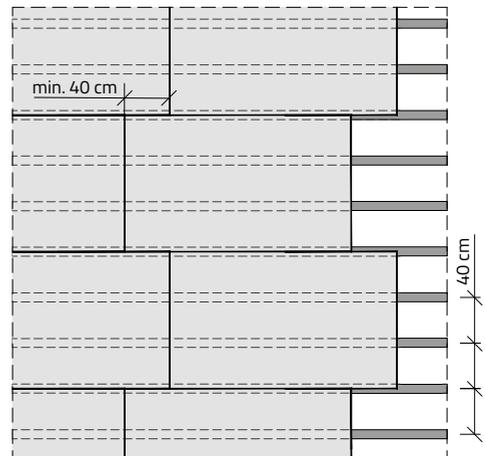


Fig. 32. Principles for installing plasterboards on suspended ceilings

layer of 12.5 mm thick boards without any additional loads, the top (main) levels of such structures should be installed with a spacing of max. 100 cm, and the bottom (load-bearing) level – max. 40 or 50 cm, depending on the direction of plasterboards' installation (fig. 23). In such cases the max. spacing of hangers must not exceed 100 cm.

**5.2.1.5.** Attention must be paid to the technical parameters and spacing of the main (top) level and bottom (load-bearing) profiles, as well. It is necessary to be especially careful when checking whether the max. spacing of the installed profiles corresponds to the system provider's guidelines and system specification, as well as the structural design.

**5.2.1.6.** Mechanical fasteners used for fixing hangers, or holders must also be checked. Steel fasteners must be appropriate for a given substrate type and the character of load a given structure is supposed to carry (compressive or tensile loads acting on reinforced concrete), which are specified in the technical documentation (structural design).

**5.2.1.7.** The way of fixing CD profiles to UD peripheral profiles must be checked. According to the system provider's guidelines, permanent and rigid fixing with utilisation of fixing screws, or other types of screws, or with utilisation of a crimper, is not acceptable. At the same time, it must be checked if the outermost hangers are placed max. 25 cm from a wall, or according to the system provider's recommendations.

**5.2.1.8.** The way in which CD profiles are fixed along their length must also be checked. Usually, according to the system provider's recommendations, such fixing should be made with utilisation of longitudinal fasteners screwed to those CD profiles with utilisation of fastening screws, and at the points where

CD profiles are extended an additional hanger should be provided, but it should be placed at a distance not exceeding 15 cm. It must also be checked if fastening points – if they occur in greater numbers – are shifted against each other by at least 100 cm.

**5.2.2.** Commissioning of insulation installation (applied according to system specifications)

**5.2.2.1.** During commissioning of insulation installation it is necessary to check the technical parameters of the utilised mineral wool. It is necessary to check the following:

- type,
- thickness of boards or mats,
- bulk density, or characteristic values of its self-weight (if the technical documentation specifies the so called density of wool, it is necessary to request a declaration whether the characteristic load of the product's self-weight is appropriate for a given product),
- width of boards or mats,
- other declared characteristics, as required for a given drywall partitioning system.

**5.2.2.2.** Insulation layers must be checked for their continuity (if there are no gaps between mats, or slabs of mineral wool). Visible gaps between edges of individual slabs, or mats of insulation materials are unacceptable.

**5.2.2.3.** The maximum thickness of mineral wool slabs, or mats used as suspended ceiling insulation is determined by the system provider's guidelines.

**5.2.3.** Plasterboard installation commissioning

**5.2.3.1.** The technical parameters of the utilised plasterboards must be checked within the range of: their type, thickness, edge type, acc. to Standard PN-EN 520. According to the system provider's guidelines, or system specifications, it is usually necessary to check the

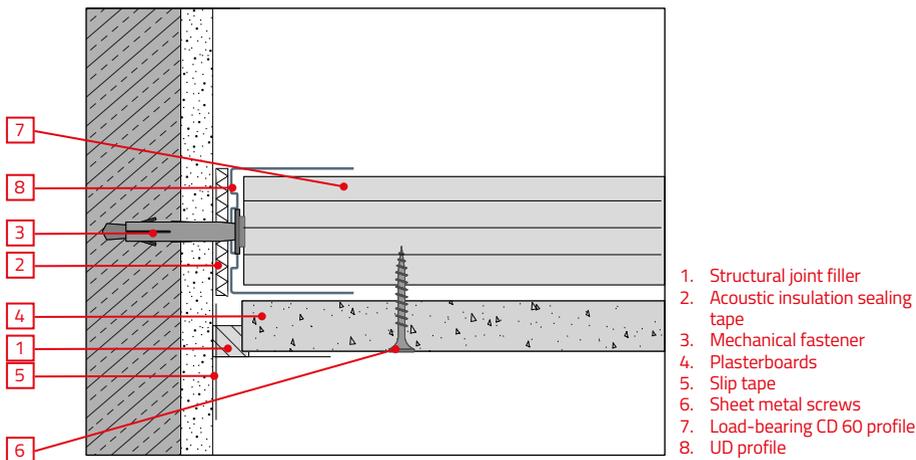


Fig. 33. Sliding connection

CE marking, type, board thickness, reaction to fire class, and reference document number.

**5.2.3.2.** It should be controlled whether connections between suspended ceilings and walls were constructed according to the system provider's guidelines. If suspended ceilings are connected with a structural element of the building (which is not constructed of plasterboards), it is necessary to check whether a sliding joint was constructed at such points (fig. 34). When the sheathing of a suspended ceiling is connected to walls, or sheathing constructed of plasterboards, such connections must be provided with paper, or glass fibre fliseline reinforcement tape. It must be checked whether suspended ceilings with the diagonal exceeding 15 m were provided with at least one expansion joint and if the system supplier's recommendations were followed.

**5.2.3.3.** The dimensions of the utilised plasterboards must be checked as well. According to the system supplier's guidelines, or system specifications, the minimum width of plasterboards should be equal to double the modulus of the frame spacing, and not less than 80 cm for the longitudinal board arrangement, and not less than 60 cm for the

crosswise board arrangement. It is acceptable to install min. 40 cm long and min. 30 cm wide board fragments within ceiling sheathing.

**5.2.3.4.** The minimum shift of board edge joints must be checked. Joints of shorter board edges in the case of the crosswise orientation must always be located on CD 60 profiles. Joints of adjacent board layers must be shifted against each other – see fig. 35.

**5.2.3.5.** The gap size between the installed adjacent plasterboards must be checked. The maximum gap between longitudinal and crosswise edges can be max. 3 mm.

**5.2.3.6.** It is necessary to check whether an appropriate screw type was selected. According to the system supplier's guidelines, the utilised screw type must be appropriate for a particular type of structure. Sheet metal screws should be utilised for installing plasterboards to CD 60 post profiles made of sheet metal with thickness not exceeding 0.6 mm. It must be checked whether the length of the used screws is at least 10 mm greater than the thickness of the installed boards, or the overall thickness of the installed sheathing (for multi-layered sheathing). 3.5×25 mm sheet metal screws must be used

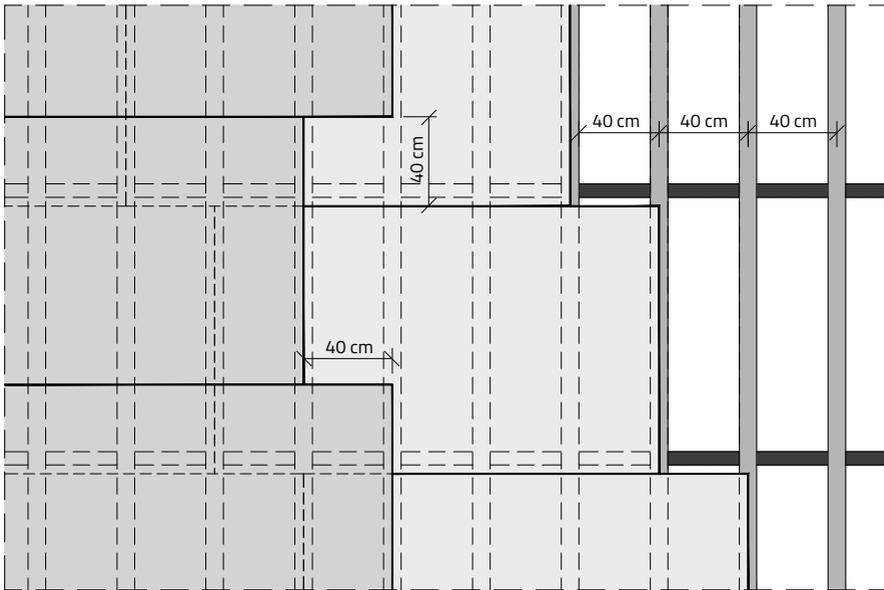


Fig. 34. Shift of layers of sheathing

for fixing plasterboards (e.g. for 12.5 mm thick sheathing) to their frame constructed of CD 60 profiles.

**5.2.3.7.** It should be checked whether the spacing of screws for single-layered sheathing, and for the external layers of multi-layered sheathing is max. 15 cm, or as required by the system provider's guidelines. According to the system provider's guidelines, the max. spacing of screws for internal sheathing layers of multi-layered sheathing must not exceed 40 cm.

**5.2.3.8.** It must be checked whether screw heads are embedded below the surface of plasterboards. It must also be checked whether screws are driven in the installed boards without cutting the cardboard surface around the whole perimeter of their heads.

#### 5.2.4. Commissioning of joint filling

**5.2.4.1.** The characteristics of the applied joint fillers must be assessed by checking their

type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, a joint filler type developed for structural filling of plasterboard joints with utilisation of jointing tape must be used. It must also be checked whether the utilised compound is marked with the CE marking, and control its intended use and range of application, as well as the number of its reference document.

**5.2.4.2.** During the joint filling quality assessment technical characteristics of the applied jointing tape are checked, especially its type, width, range of applications, and markings. According to the system provider's guidelines, one of the following jointing tape types must be used: a fliseline tape of glass fibres "fliseline", paper tape, self-adhesive glass fibre "mesh". The minimum tape width is 45 mm.

**5.2.4.3.** It must be checked what type of jointing tape was applied. According to the system provider's guidelines, any type of reinforcement tape can be used for the plasterboards with

flattened edges (NS, PRO, KS and KPOS). For the plasterboards with the NS and PRO type edges, self-adhesive jointing tape ("mesh") must be stuck to the edges of the joined boards, directly to their cardboard, and for the plasterboards with the NS, PRO, KS and KPOS edges tape can be applied on a layer of structural joint filler ("wet jointing compound") placed beforehand on those board edges. If fliseline or paper tape is applied, it must be checked whether those tape types were embedded into "wet jointing compound". It must also be checked whether the horizontal joints between the installed plasterboards, i.e. the „trimmed“ edges were filled with utilisation of fliseline, or paper type jointing tapes applied directly onto the "wet jointing compound".

**5.2.4.4.** The manner in which the "trimmed" edges were prepared for forming the horizontal joints must be checked. According to the supplier's guidelines, any "trimmed" edges prepared for forming the horizontal joints must be especially formed by chamfering them at an angle ranging from 40° to 50° to about 2/3 of board thickness (which means 9-10 mm for 12.5 thick plasterboards – fig. 8). Before filling the horizontal joints formed between the "trimmed" edges, it must be determined whether they were thoroughly cleaned and dusted and if they were moistened directly before applying joint filler.

**5.2.4.5.** During the commissioning procedure it is necessary to check the manner of filling both the vertical and horizontal joints. According to the system provider's guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation of jointing tape embedded in previously applied jointing compound ("onto wet compound") requires a subsequent stage of skimming with structural jointing compound. The aim of the second stage is "covering" the applied jointing tape with joint filler. Filling of the vertical joints with utilisation of

self-adhesive jointing tapes depending on the edge depth may require a second filling stage with utilisation of structural joint filler. If a higher joint finish standard was required, i.e. increased finish aesthetics in the area of joints of plasterboards, or over the whole wall area, it must be checked whether special "finishing" skimming compounds were utilised for the final skimming stage (see descriptions of the PSG finish levels).

**5.2.4.6.** According to the system provider's guidelines, the vertical and horizontal joints between plasterboards, as well as all the peripheral joints (at the peripheral connections between partition walls and the building structure) should be filled with structural joint filler throughout all the existing sheathing layers. It must be checked if all the horizontal and, in most cases, the vertical joints of the outermost sheathing layers were additionally reinforced with jointing tape (this does not apply to jointing compounds designed for filling joints without utilisation of reinforcement tapes).

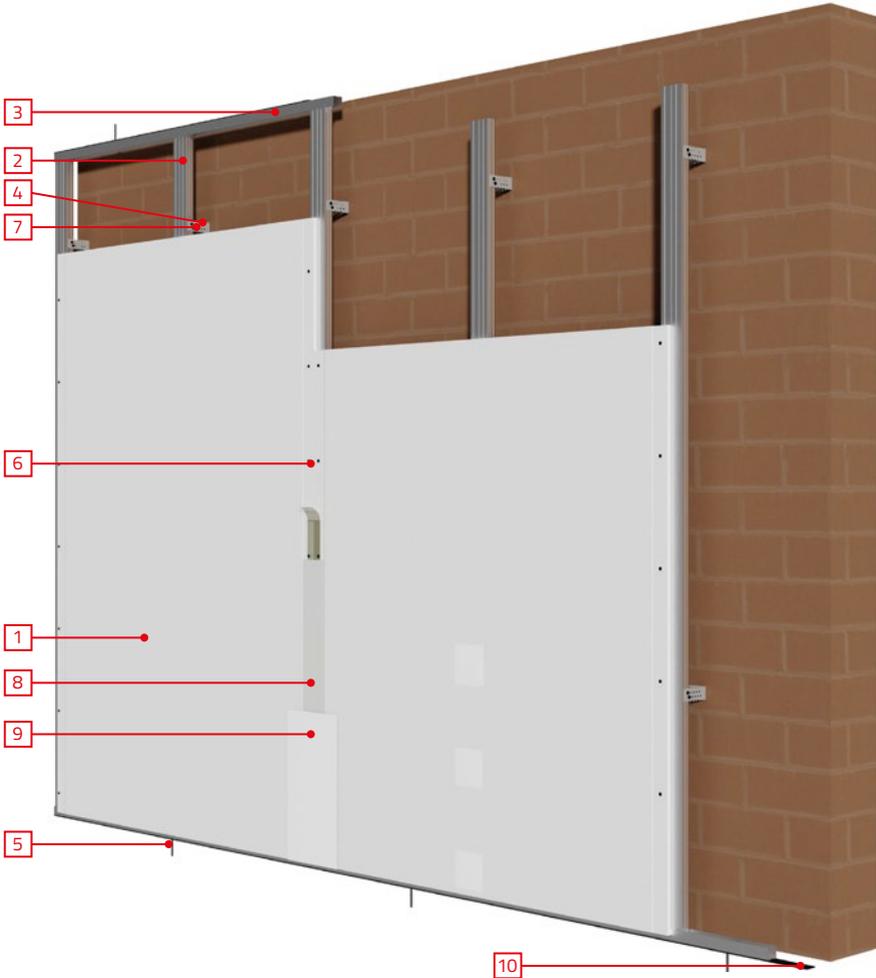
## **5.2.5. Commissioning of surface finish**

**5.2.5.1.** During the surface finish commissioning procedure, assessment of the surface smoothness (finish level assessment) takes place on the basis of the plasterboard finish quality level characterisation, as stated in detail in section 4.3.

**5.2.5.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.

**IMPORTANT:** For the suspended ceiling systems with qualified fire resistance levels, such systems must be constructed according to the requirements for the adequate fire classification.

### 5.3. Wall cladding systems



- 1. Plasterboards
- 2. CD 60 vertical profile
- 3. UD profile
- 4. Fixing element, e.g. ES 60
- 5. Anchoring element
- 6. Sheet metal screws
- 7. Self-drilling screws
- 8. Joint between plasterboards filled with gypsum putty with reinforcement tape
- 9. Finishing compound
- 10. Acoustic insulation sealing tape

Wall cladding consists of a load bearing structure of galvanised steel CD profiles fixed directly to an existing wall with utilisation of hangers, or holders, with single- or multi-layered sheathing of plasterboards.

### 5.3.1. Commissioning of structure

**5.3.1.1.** During the structure assembly commissioning procedure it is necessary to pay attention to the following technical parameters:

- type,
- thickness of metal sheet they were made of,
- external dimensions,
- surface quality,
- markings acc. to Standards PN-EN 14195, PN-EN 13964, which must be cross-referenced with the supplier's recommendations and specification of a given system.

Steel profiles are usually marked with the construction mark B, or the CE marking. The nominal thickness of the steel sheet utilised for production of the profiles, their reference document number, thickness, or mass, and anti-corrosion layer type (e.g. Z275, AZ100) are also indicated.

**5.3.1.2.** The following technical parameters and spacing of ES installation elements or direct hangers (holders) must be checked:

- type,
- spacing,
- thickness of metal sheet,
- external dimensions,
- surface quality,
- markings acc. to their technical documentation, or Standard PN-EN 13964
- markings: the construction product marking B or CE, which must be cross-referenced with the supplier's recommendations and specification of a given system.

The type of mechanical fasteners utilised for holder or hangers must be checked, as well (acc. to the system provider's guidelines). Usually those are expansion plugs, or dowels with diameters and lengths depending on the substrate – at least 6×40 mm placed with a spacing of max. 125 cm.

**5.3.1.3.** The technical parameters and spacing of the applied fixing elements installed around the perimeter of a ceiling must be checked. The max. spacing and type of fasteners which – acc. to the system provider's recommendations – usually are expansion plugs, or dowels of diameters and lengths selected according to the characteristics of a given substrate, but not less than 6×40 mm, max. spacing 100 cm.

**5.3.1.4.** The technical parameters of the utilised sealing tape recommended for application around the perimeter of ceiling sheathing placed under UD wall-mounted profiles must be checked. According to the system provider's guidelines, it is usually a polyethylene foam tape with a min. thickness of 3 mm.

**5.3.1.5.** Proper placement of the sealing tape around the sheathing perimeter and between hangers (ES hangers, or other direct hangers) and their substrate must be checked if the system provider's specification requires that. According to the system provider's guidelines, individual fragments of such tape must adhere tightly to each other at their connections (placed adjacently), and adhere tightly to the surfaces and profiles on the whole length of a structure (no readily visible gaps between the tape and the profiles and substrates) on the whole contact area between the hangers and substrates, and around the sheathing perimeter.

**5.3.1.6.** The length and spacing of vertical profiles must be checked. The length of those profiles – according to the system provider's guidelines – should be shorter than the height of the floor, or wall by 1.0 – 1.5 cm (the distance between the webs of the top and bottom profiles). The max. spacing of the vertical profiles should be 60 cm.

**5.3.1.7.** It is necessary to check connections between the vertical and horizontal profiles. According to the system provider's guidelines, permanent and rigid fixing of the vertical and horizontal profiles with utilisation

of fastening, or other, screws, or with utilisation of a crimper is unacceptable.

**5.3.1.8.** The way of fixing the vertical profiles along their length must be determined, as well. According to the system provider's guidelines, such connections should be constructed with utilisation of longitudinal connectors. The minimum distance between the fixing points of adjacent profiles should not be less than 30 cm.

**5.3.2.** Commissioning of insulation installation (applied according to system specifications)

**5.3.2.1.** During the commissioning procedure of insulation installation it is necessary to check the technical parameters of the utilised mineral wool. It is necessary to check the following:

- type,
- thickness of boards or mats,
- bulk density or characteristic load of self-weight (if the technical documentation specifies the so called density of wool, it is necessary to request a declaration whether the characteristic load of the product's self-weight is appropriate for a given product),
- width of boards or mats,
- other declared characteristics, as required for a given drywall partitioning system.

**5.3.2.2.** It must be checked whether the existing minimum dimensions of the installed mineral wool slabs and mats conform to the system provider's guidelines. Installing 'leftovers' of those insulation materials, of min. height 30 cm, is acceptable up to max. 25% of the overall area of wall infill, with the exception of the mineral wool strips which complete the infill of the whole wall height.

**5.3.2.3.** During control close attention must be paid to tightness of the insulation placed on the whole height of sheathing. Easily visible gaps between horizontal edges of individual slabs or mats of insulation materials are unacceptable.

**5.3.3.** Commissioning of plasterboard installation

**5.3.3.1.** The technical parameters of the utilised plasterboards must be checked within the range of: type, thickness, edge type, according to Standard PN-EN 520. According to the system provider's guidelines, or system specifications, the CE marking, type, board thickness, reaction to fire class, and reference document number should usually be checked.

**5.3.3.2.** It must be checked if wall sheathing was connected to walls according to the system provider's guidelines. When a connection with a structural element of a building (made of a material different from plasterboards) is constructed, a sliding connection must be constructed (point 5.1.3.2). When the wall sheathing is connected to walls, or sheathing constructed of plasterboards, a paper, or glass fibre fliseline reinforcement tape must be applied on such connections.

**5.3.3.3.** According to the system provider's guidelines, or the system specification, the minimum width of plasterboards utilised as sheathing of such structures should be equal to double the spacing of its structural elements. It is assumed that in most cases post spacing is 120 cm, and for CD 60 it is 60 cm. And its height must be equal to the trade length of plasterboards, or the height of a floor. For wall heights exceeding 260 cm occurrences of the horizontal joints between boards are acceptable. For multi-layered sheathing, one horizontal joint in an internal sheathing layer is acceptable for sheathing heights below 260 cm. The distance between the horizontal joints of the same sheathing strip (of the same layer) must not be less than 200 cm (it does not apply to internal sheathing layers). It is acceptable to install trimmed board fragments of min. height 40 cm in wall sheathing.

**5.3.3.4.** During the commissioning procedure the minimum shift of horizontal board joints must be checked. Horizontal connections located in adjacent strips of each of the sheathing layers should be shifted against each other by min. 40 cm. Horizontal connections of the following sheathing layers (adjacent to each other, e.g. the first and the second sheathing layer of double-layered sheathing) should be shifted against each other by at least 40 cm.

**5.3.3.5.** The min. shift distance of the vertical joints must be checked as well. The vertical joints of neighbouring, adjacent layers of sheathing should be shifted against each other by – at least – the width of the structural spacing module, which is usually 60 cm. For partition walls with increased structural density (e.g. 40 or 30 cm) utilisation of multi-layered sheathing (double-, or three-layered), such vertical joints of the neighbouring (adjacent) layers should be shifted against each other by at least the width of the structural spacing module.

**5.3.3.6.** The gap size between installed adjacent plasterboards must also be checked. The maximum acceptable distance between longitudinal and crosswise edges is 3 mm.

**5.3.3.7.** Appropriate selection of screws must be checked, as well. According to the system provider's guidelines, the type of screws should be selected according to the utilised profiles. Sheet metal screws should be utilised for installing plasterboards to vertical CD profiles made of sheet metal with thickness not exceeding 0.6 mm. It must be checked whether the length of the utilised screws is greater from the board thickness, or the overall sheathing thickness (for multi-layered sheathing) by min. 10 mm. 3.5×25 mm sheet metal screws must be used for fixing plasterboards (e.g. for 12.5 mm thick sheathing) to their frame constructed of CD profiles.

**5.3.3.8.** It should be checked whether the spacing of screws utilised for fixing single-layered

sheathing, and for the external layers of multi-layered sheathing is max. 25 cm. According to the system provider's guidelines, the max. spacing of screws applied for internal sheathing layers of multi-layered sheathing must not exceed 75 cm.

**5.3.3.9.** According to the system provider's guidelines, screw heads must be embedded below the surface of boards' cardboard. It must also be checked whether screws are driven into the boards without cutting the cardboard surface around the whole perimeter of their heads.

### **5.3.4. Commissioning of joint filling**

**5.3.4.1.** The characteristics of the applied joint fillers must be assessed by checking their type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, it is possible to utilise joint fillers designed for structural filling of joints between plasterboards with application of reinforcement tapes, or those designed for filling joints without application of such tapes. It must also be checked whether the utilised compound is marked with the CE marking, its intended use and range of application, as well as the number of its reference document must also be checked.

**5.3.4.2.** During the quality control for joint filling the technical characteristics of the applied jointing tape must be checked, especially its type, width, range of applications, and markings. According to the system provider's guidelines, one of the following jointing tape types must be used: self-adhesive glass fibre "Mesh", fliseline tape of glass fibres "fliseline", or paper tape. The minimum tape width is 45 mm.

**5.3.4.3.** It must be checked what type of jointing tape was applied. According to the system provider's guidelines, any tape type can be utilised for plasterboards with flatened edges (NS, PRO, KS, and KPOS) for

their vertical joints. For plasterboards with the NS and PRO type edges, self-adhesive jointing tape ("mesh") must be stuck to the edges of the joined boards, directly to their cardboard, and for plasterboards with the NS, PRO, KS and KPOS edges such tape can be applied on previously applied structural joint filler ("wet compound") applied on such board edges. If fliseline or paper tape was applied, it must be checked whether those tape types were applied onto "wet jointing compound". Vertical connections (on factory-made tapered edges) between plasterboards with oval and flattened edges (KPOS) can be filled without utilisation of jointing tape if a special joint filling compound designed especially for such applications is used. It must be checked whether jointing of the horizontal joints between the installed plasterboards, i.e. the „trimmed“ edges, was performed with utilisation of fliseline, or paper tape applied onto "wet compound".

**5.3.4.4.** The manner in which the „trimmed“ edges were prepared for forming the horizontal joints must be checked. According to the supplier's guidelines, any "trimmed" edges prepared for forming the horizontal joints must be especially formed by chamfering at an angle ranging from 40° to 50° to about 2/3 of board thickness (which means 9–10 mm for 12.5 thick plasterboards – fig. 8). Before filling of the horizontal joints formed between the "trimmed" edges it must be determined whether they were thoroughly cleaned and dusted and if they were moistened directly before applying joint filler.

**5.3.4.5.** During the commissioning works it is necessary to check the manner of filling of the vertical joints. According to the system provider's guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation of jointing tape placed onto previously applied jointing compound ("onto wet compound") requires another stage of skimming with structural jointing compound, which aims at "covering" jointing tape with filling compound.

Filling of the vertical joints with utilisation of self-adhesive jointing tapes might require a second stage of filling with the structural joint filling compound, depending on the edge depth. If a higher finishing standard was required, i.e. with regard to aesthetics in the vicinity of plasterboard joints, or on the whole area of sheathing, it is necessary to check whether special "finishing" skimming compounds designed for performing finishing works were used (see the PSG finishing levels' descriptions).

**5.3.4.6.** According to the system provider's guidelines, the vertical and horizontal joints between plasterboards, as well as all the constructed peripheral joints (on the peripheral connections between sheathing and the building structure) should be filled with structural joint filler throughout all the existing sheathing layers. It must be checked if all the horizontal and, in most cases, the vertical joints of the outermost sheathing layers were additionally reinforced with jointing tape (this does not apply to jointing compounds designed for filling joints without utilisation of reinforcement tapes).

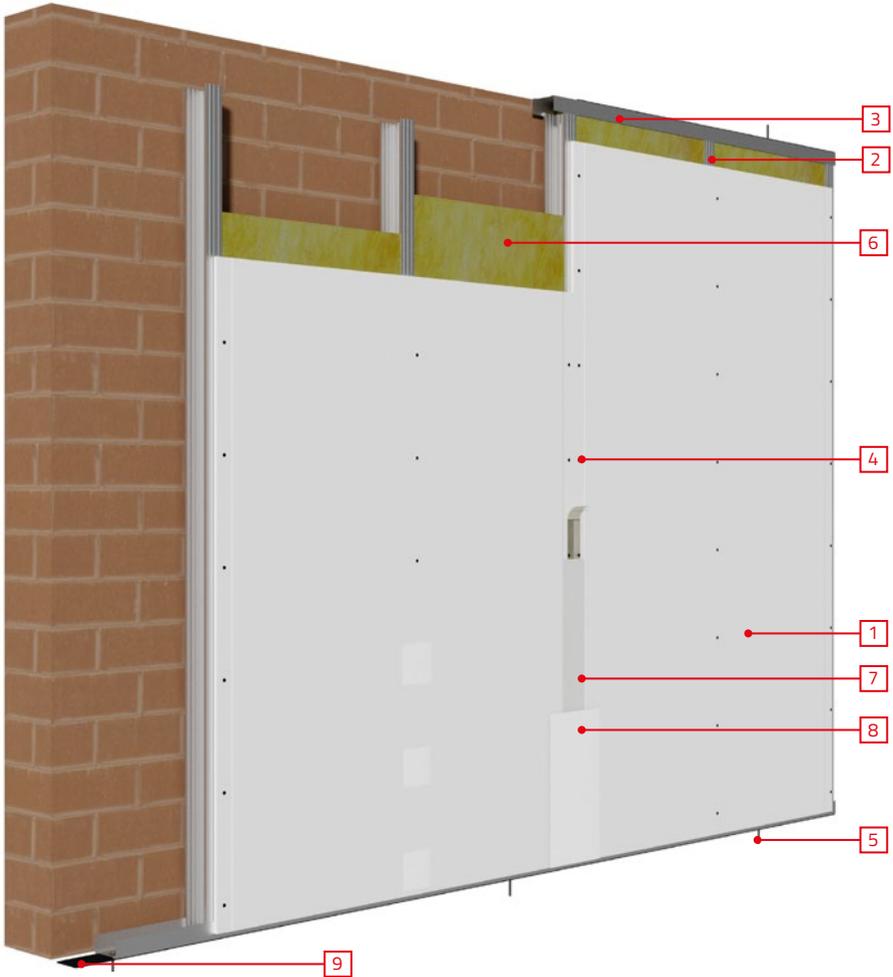
### **5.3.5. Commissioning of surface finish**

**5.3.5.1.** During the surface finish commissioning procedure, assessment of the surface smoothness (finish level assessment) takes place on the basis of the plasterboard finish quality level characterisation, as stated in detail in section 4.3.

**5.3.5.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.

**IMPORTANT:** For the wall cladding systems with qualified fire resistance levels, such systems must be constructed according to the requirements for the adequate fire classification.

## 5.4. Independent wall sheathing systems



1. Plasterboards
2. CW (C) profile
3. UW (U) profile
4. Sheet metal screws
5. Anchoring element
6. Insulation material (option)
7. Joint between plasterboards filled with gypsum putty with reinforcement tape
8. Finishing compound
9. Acoustic insulation sealing tape

Independent wall sheathing consists of a galvanised steel structure and plasterboard sheathing installed on one side. Pre-wall frames are constructed of horizontal UW (U) profiles fixed to floors – at

the bottom and at the top (to a floor and under a ceiling), and vertical CW (C) posts are inserted into those UW (U) profiles. The sheathing of those independent walls can be single- or multi-layered.

## 5.4.1. Commissioning of structure

**5.4.1.1.** During the structure commissioning procedure it is necessary to pay attention to the following technical parameters:

- type,
- thickness of metal sheet they were made of,
- external dimensions,
- surface quality,
- markings acc. to the technical documentation, or Standard PN-EN 14195
- should be cross-referenced with the system provider's guidelines and system specification.

Steel profiles are usually marked with the B construction marking, or CE marking. The nominal thickness of the steel sheet utilised for production of the profiles, reference document number, and thickness, or mass, and anti-corrosion layer type (e.g. Z275, AZ100) are also indicated.

**5.4.1.2.** The technical parameters and spacing of the fixing elements installed around the perimeter of a pre-wall must be checked carefully. The maximum spacing and type of fasteners must be checked. According to the system provider's guidelines, those are usually expansion plugs, or dowels of diameters and lengths selected according to the characteristics of a given substrate, but not less than 6×40 mm, with a spacing of max. 100 cm.

**5.4.1.3.** During the commissioning procedure the parameters of the sealing tape applied around the perimeter of a pre-wall must be checked. Polyethylene foam tape of min. thickness 3 mm is usually used.

**5.4.1.4.** Special care should be taken as far as proper placement of sealing tape around the wall perimeter is concerned. System suppliers recommend placing the tape along the whole perimeter of a pre-wall, i.e. along and its vertical CW (C) and horizontal UW (U) profiles. Individual fragments of the applied sealing tape should adhere to each other tightly, i.e. they should re-

main in contact. And on the whole length the tape should be in tight contact with the substrate and the profiles, with no visible gaps between the tape, the profiles, and the substrate.

**5.4.1.5.** The length and spacing of vertical post profiles are also checked. According to the system supplier's guidelines and specification of the system, the length of CW (C) vertical profiles should be shorter by 1.5–2.0 cm from the height of the room, or wall, when measured between the webs of the top and bottom UW (U) profiles. The maximum spacing of the profiles must be 60, 40, or 30 cm, depending on a given system.

**5.4.1.6.** It is necessary to pay attention to the type of connections between CW (C) and UW (U) profiles. Providers of the system do not accept permanent and rigid connections between CW (C) profiles and UW (U) horizontal profiles constructed with utilisation of fixing screws, or other, or with utilisation of a crimping tool.

**5.4.1.7.** The way of fixing CW (C) profiles along their length is also important and must be checked. According to the system provider's recommendations and system specification, such connections should be constructed by forming an overlap on CW (C) profiles, of the following lengths: 50 cm for CW (C) 50 profiles, 75 cm for CW (C) 75, 100cm for CW (C) 100 profiles. Another accepted solution is providing an attachment made of an additional piece of a CW (C), or UW (U) profile, with the length of respectively 100, 150, or 200 cm (see point 5.1.1.7). The minimum distance between the axis of such profile connections must not be less than 30 cm. For walls up to the height of 300 cm it is unacceptable to utilise profiles joined on their length.

**5.4.2.** Commissioning of insulation installation (applied according to system specifications)

**5.4.2.1.** During commissioning of insulation installation it is necessary to check the technical parameters of the insulation material,

e.g. mineral wool. It is necessary to check the following:

- type,
- thickness of boards or mats,
- bulk density or characteristic load of self-weight (if the technical documentation specifies the so called density of wool, it is necessary to request a declaration whether the characteristic load of the product's self-weight is appropriate for a given product),
- width of boards or mats,
- other declared characteristics, as required for a given drywall partitioning system.

**5.4.2.2.** Close attention must be paid to the minimum dimensions of mineral wool slabs and mats. According to the guidelines of the system provider, their width must enable installation of insulation without any vertical joints between posts, and their height – must be equal to the typical trade standard – for slabs, i.e. usually 100 cm, or equal to the standard trade length, or wall height for insulation mats. Installing 'leftovers' of insulation materials, of min. height 30 cm, is acceptable up to max. 25% of the overall area of wall infill, with the exception of mineral wool strips which complete the infill to the whole wall height.

**5.4.2.3.** Tightness of the mineral wool infill in the spaces within CW (C) profiles must be checked during the commissioning procedure. It is especially important if the dimensions of mineral wool slabs and mats are adjusted to the spacing of the posts according to the guidelines of the system provider, i.e. whether they are respectively 30 cm, 40 cm, or 60 cm. For flexible glass wool it must be checked whether the width of the installed slabs is greater than the profile spacing by 1-3 cm, especially when installation in high pre-walls is concerned.

**5.4.2.4.** During control special attention must be paid to tightness of insulation placement on the whole height of a wall. Easily visible gaps at the horizontal joints between edges of insula-

tion material slabs, or other insulation material forms are unacceptable. Appropriate filling of the top and bottom UW (U) profiles must be checked especially closely.

**5.4.2.5.** The maximum thickness of mineral wool slabs, or mats is – according to the system provider's guidelines – usually equal to the width of CW (C) post profiles, i.e. respectively: 50 mm for CW (C) 50 profile, 75 mm for CW (C) 75 profile, 100 mm for CW (C) 100 profile. If the installed main profiles are connected in a way forming a hollow – so called "box-shaped" profile, such profiles must be filled with wool, according to the system provider's guidelines, or the system specifications.

#### **5.4.3.** Commissioning of plasterboard installation

**5.4.3.1.** The technical parameters of the utilised plasterboards must be checked in the range of: their type, thickness, edge type, acc. to Standard PN-EN 520. According to the guidelines of the system provider, or the system specifications, the CE marking, type, board thickness, reaction to fire class, and reference document number should usually be checked.

**5.4.3.2.** It must be checked if pre-walls were connected to their substrate walls according to the system provider's guidelines. When connections with the building structure (made of a material different from plasterboards) are made, it must be checked whether a sliding connection was constructed (point 5.1.3.2). When sheathing of a pre-wall is connected to a wall, or other sheathing constructed of plasterboards, paper, or glass fibre fliseline reinforcement tape must be applied on such connections.

**5.4.3.3.** According to the system provider's guidelines, or the system specifications, the minimum width of plasterboards utilised as sheathing of such structures should be equal to double the spacing of its structural elements. It is assumed that in most cases for the post spacing of 60 cm it is 120 cm. Whereas plasterboards'

height should be equal to their trade length, or the floor height. For wall heights exceeding 260 cm occurrences of the horizontal joints between boards are acceptable. For multi-layered sheathing, only one horizontal joint in an internal layer is acceptable when sheathing height does not exceed 260 cm. The distance between the horizontal joints of the same strip of sheathing (of the same layer) must not be less than 200 cm (it does not apply to internal sheathing layers). It is acceptable to install trimmed board fragments of min. height 40 cm in the sheathing.

**5.4.3.4.** The minimum shift of the horizontal joints must be checked. The horizontal joints of adjacent strips of each of the sheathing layers should be shifted by min. 40 mm.

**5.4.3.5.** The min. shift distance of the vertical joints must be checked, as well. For pre-walls with the structure spacing of e.g. 40 or 30 cm with multi-layered sheathing (three- or four-layered), the vertical joints of adjacent (neighbouring and not neighbouring sheathing layers) should – if possible – be shifted against each other by the width of min. its structure spacing modulus.

**5.4.3.6.** The gap size between the installed adjacent plasterboards must be checked. Their longitudinal and crosswise edges can be separated by max. 3 mm.

**5.4.3.7.** Appropriate selection of screws must be checked, as well. According to the system supplier's guidelines, the utilised screw type must be appropriate for a particular type of structure. Sheet metal screws should be utilised for installing plasterboards to CD 60 post profiles made of sheet metal with thickness not exceeding 0.6 mm. It must be checked whether the length of the utilised screws is greater from the board thickness, or the overall sheathing thickness (for multi-layered sheathing) by min. 10 mm. When plasterboards (e.g. for 1×12.5 mm sheathing) are fixed to their steel structure of CW (C) profiles, 3.5×25 mm sheet metal screws must be used.

**5.4.3.8.** It must be checked whether the spacing of screws utilised for fixing single-layered sheathing, and for the external layers of multi-layered sheathing is max. 25 cm. According to the system provider's guidelines, the max. spacing of screws for the external sheathing layers of multi-layered sheathing must not exceed 75 cm.

**5.4.3.9.** It must be checked whether screw heads are embedded below the surface of plasterboards. It must also be checked whether screws are driven in the installed boards without cutting the cardboard surface around the whole perimeter of their heads.

#### **5.4.4. Commissioning of joint filling**

**5.4.4.1.** The characteristics of the applied joint fillers must be assessed by checking their type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, it is possible to utilise joint fillers designed for structural filling of joints between plasterboards with application of reinforcement tapes, or those designed for filling joints without application of such tapes. It must also be checked whether the utilised compound is marked with the CE marking, its intended use and range of application, as well as the number of its reference document must be controlled.

**5.4.4.2.** During the joint filling quality control the technical characteristics of the applied jointing tape are checked, especially its type, width, range of applications, and markings. According to the system provider's guidelines, one of the following jointing tape types must be used: self-adhesive glass fibre "Mesh", fliseline tape of glass fibres "fliseline", or paper tape. The minimum tape width is 45 mm.

**5.4.4.3.** It must be checked what types of jointing tape were applied. According to the system provider's guidelines, any tape type can be utilised for plasterboards with flatte-

ned edges (NS, PRO, KS, and KPOS) on the vertical joints. For plasterboards with the NS and PRO type edges, self-adhesive jointing tape ("mesh") is stuck to the edges of the joined boards, directly to their cardboard, and for plasterboards with the NS, PRO, KS and KPOS edges tape can be applied on the applied structural joint filler ("wet compound") placed beforehand on board edges. If fliseline or paper tape is applied, it must be checked whether those tape types were embedded into "wet jointing compound" on those joints. Vertical connections (on factory-made tapered edges) between plasterboards with oval and flattened edges (KPOS) can be filled without utilisation of jointing tapes if a special joint filling compound designed especially for such applications is used. It must also be checked whether the horizontal joints between plasterboards, i.e. the „trimmed“ edges were filled with utilisation of fliseline, or paper type jointing tapes applied directly onto previously applied "wet jointing compound"

**5.4.4.4.** The manner in which the „trimmed“ edges were prepared for forming the horizontal joints must be checked. According to the supplier's guidelines, any "trimmed" edges prepared for forming the horizontal joints must be especially formed by chamfering at an angle ranging from 40° to 50° to about 2/3 of board thickness (which means 9-10 mm for 12.5 thick plasterboards – fig. 8). Before filling the horizontal joints formed between the "trimmed" edges, it must be determined whether they were thoroughly cleaned and dusted and if they were moistened directly before applying joint filler.

**5.4.4.5.** During the commissioning works it is necessary to check the manner of filling both the vertical and horizontal joints. According to the system provider's guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation jointing tape embedded into previously placed jointing compound ("onto wet compound") requires another stage

of skimming with structural jointing compound in order to cover the applied reinforcement tape. Filling of the vertical joints with utilisation of self-adhesive jointing tapes might require a second stage of filling with the structural joint filling compound, depending on the edge depth. If a higher joint finish standard was required, i.e. increased finish aesthetics in the area of joints of plasterboards, or over the whole wall area is required, it must be checked whether special "finishing" skimming compounds were utilised for the final skimming stage (see descriptions of the PSG finish levels).

**5.4.4.6.** According to the system provider's guidelines, the vertical and horizontal joints between plasterboards, as well as all the peripheral joints (at the peripheral connections between pre-walls and the building structure) should be filled with structural joint filler throughout all the existing sheathing layers. It must be checked if all the horizontal and, in most cases, the vertical joints of the outermost sheathing layers were additionally reinforced with jointing tape (this does not apply to jointing compounds designed for filling joints without utilisation of reinforcement tapes).

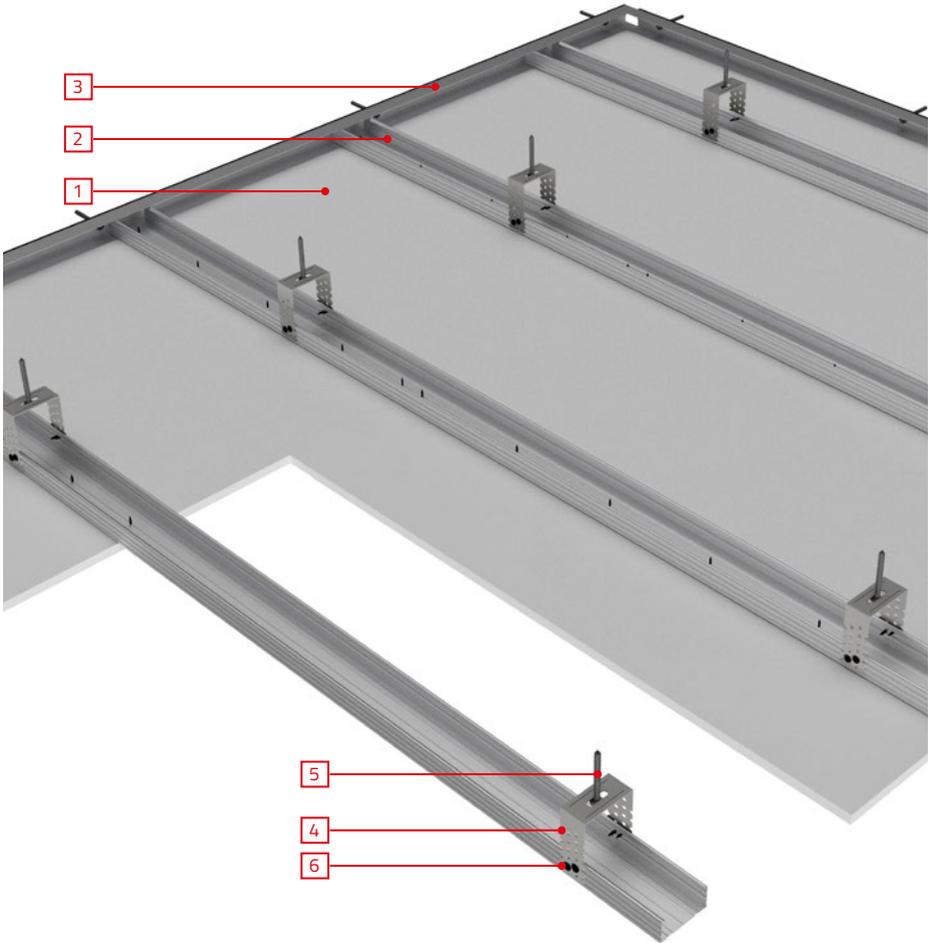
#### **5.4.5. Commissioning of surface finish**

**5.4.5.1.** During the surface quality commissioning procedure, assessment of its smoothness (finish level assessment) is performed basing on the plasterboard finish quality types' characteristics as described in section 4.3.

**5.4.5.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.

**IMPORTANT:** For the independent wall systems with qualified fire resistance levels, such systems must be constructed according to the requirements for the adequate fire classification.

## 5.5. Ceiling sheathing systems



1. Plasterboards
2. CD 60 profile
3. UD profile
4. Fixing element, e.g. ES 60
5. Steel anchoring element
6. Self-drilling screws

Ceiling sheathing consists of a single galvanised steel structure of CD profiles suspended underneath the floor with utilisation of various types of hangers. UD peripheral profiles are applied on joints between wall sheathing and walls. The ceiling is sheathed with plasterboards. Such sheathing can be single- or multi-layered.

### **5.5.1.** Commissioning of structure

**5.5.1.1.** During the frame commissioning procedure it is necessary to pay attention to the following technical parameters of the utilised profiles:

- type,
- thickness of metal sheet they were made of,
- external dimensions,
- surface quality,
- markings acc. to Standards PN-EN 1419, PN-EN 13964, which must be cross-referenced with the supplier's recommendations and specification of a given system. Steel profiles are usually marked with the B construction marking, or the CE marking.

The nominal thickness of the steel sheet utilised for production of the profiles, the reference document number, and the thickness, or mass, and anti-corrosion layer type (e.g. Z275, AZ100) must be indicated, as well.

**5.5.1.2.** The spacing of the fixing elements located around the perimeter of ceiling sheathing must be checked. Particularly, the maximum spacing and type of fasteners must be checked and cross-referenced with the supplier's recommendations and specification of a given system. The dimensions and diameters of the expansion plugs, or dowels used for assembly depend on the substrate type, but those elements must not be smaller than 6x40 mm, and they must be placed with a max. spacing of 100 cm.

**5.5.1.3.** The technical parameters of the sealing tape recommended for utilisation around the perimeter of ceiling sheathing under UD wall profiles must be checked, as well. According to the system provider's guidelines, polyethylene foam tape, min. thickness 3 mm, is usually used.

**5.5.1.4.** When sealing tape is utilised it is necessary to check its placement around the sheathing perimeter and between hangers (ES, or other direct hangers) and the substrate if it is required by the system provider's specification. According to the system provider's guidelines, individual fragments of such tape must adhere tightly to each other at their joints (butt joints), and adhere tightly to the surfaces and profiles on the whole length of a structure without easily visible gaps between the tape and the profiles and substrates on their whole length.

**5.5.1.5.** Further, the technical parameters and spacing of the hangers utilised for installation of ceiling sheathing and their conformity to the system provider's guidelines and system specification must be checked. The maximum spacing and type of the used mechanical fasteners and their conformity to the supplier's guidelines and system specification must be checked. Usually, when the single-level frame arrangement is used with a single layer of 12.5 mm thick boards, without any additional loads, the maximum spacing between hangers should not exceed 100 cm.

**5.5.1.6.** Attention must be paid to the spacing the ceiling sheathing profiles, it is especially important to check whether their maximum spacing meets the requirements set by the system supplier's guidelines and system specification, as well as the structural design. The maximum spacing between the installed profiles of such ceiling sheathing in the single-level arrangement with a single 12.5 mm board layer is re-

spectively: 50 cm for the crosswise board arrangement, 40 cm for the longitudinal board arrangement.

**5.5.1.7.** It is necessary to check all the mechanical steel fasteners used for fixing (e.g. ES), which should be selected appropriately to the existing substrate and load types (areas with compressive and tensile loads acting on reinforced concrete). The parameters of appropriate fasteners should be presented in the technical documentation (building-structural design).

**5.5.2.** Commissioning of insulation installation (applied according to system specifications)

**5.5.2.1.** During commissioning of insulation installation it is necessary to check the technical parameters of the utilised insulation material, e.g. mineral wool. It is necessary to check the following:

- type,
- thickness of boards or mats,
- bulk density, or characteristic values of its self-weight (if the technical documentation specifies the so called density of wool, it is necessary to request a declaration whether the characteristic load of the product's self-weight is appropriate for a given product),
- width of boards or mats,
- other declared characteristics, as required for a given drywall partitioning system.

**5.5.2.2.** The installed insulation layers must be checked for their continuity (if there are no gaps between mats, or slabs of mineral wool). Easily visible gaps between edges of individual slabs, or mats of insulation materials are unacceptable.

**5.5.2.3.** The thickness of the utilised mineral wool slabs, or mats must be checked. Their thickness should correspond to the system provider's guidelines.

**5.5.3.** Commissioning of plasterboard installation

**5.5.3.1.** The technical parameters of the utilised plasterboards must be checked within the range of: their type, thickness, edge type, acc. to Standard PN-EN 520. According to the system provider's guidelines, or system specifications, the CE marking, type, board thickness, reaction to fire class, and reference document number should usually be checked.

**5.5.3.2.** It should be checked whether the connections between ceiling sheathing and walls were constructed according to the system provider's guidelines. When a connection with the building structure (made of a material different from plasterboards) is made, a sliding connection must be constructed. When ceiling sheathing is connected to walls, or sheathing constructed of plasterboards, such connections must be provided with reinforcement tapes: paper, or glass fibre fliseline reinforcement tape must be applied on such connections.

**5.5.3.3.** According to the system provider's guidelines, the minimum width of the utilised plasterboards should be equal to their trade lengths and an iteration of the structure spacing modulus. For the outermost strips of sheathing (around the perimeter of ceiling sheathing) it is acceptable to install trimmed off board fragments, minimum width 30 cm. For the crosswise fixing arrangement it is acceptable to install trimmed off fragments of boards of a min. length equal to double the structure spacing modulus. For the crosswise fixing arrangement it is acceptable to install trimmed off fragments of boards, min. length 40 cm.

**5.5.3.4.** The minimum shift of plasterboard edges must be checked. Joints of

the shorter plasterboard edges for the crosswise orientation must be always located on CD 60 profiles. Joints of adjacent board layers should be shifted against each other (fig. 34, section 5.2.3.2).

**5.5.3.5.** Gaps formed between adjacent plasterboards must be checked. The maximum acceptable distance between longitudinal and crosswise board edges is 3 mm.

**5.5.3.6.** Appropriate selection of screws must be checked, as well. It must be checked whether the applied screw type is adequate to a given structure type according to the system supplier's guidelines. Sheet metal screws should be utilised for installing plasterboards to CD 60 post profiles made of sheet metal with thickness not exceeding 0.6 mm. It must be checked whether the length of the utilised screws is greater from the board thickness, or the overall sheathing thickness (for multi-layered sheathing) by min. 10 mm. 3.5×25 mm sheet metal screws must be used for fixing plasterboards (e.g. for 12.5 mm thick sheathing) to their steel frame constructed of CD 60 profiles.

**5.5.3.7.** It should be checked whether for single-layered sheathing, and for the external layers of multi-layered sheathing the spacing of screws is max. 17 cm. According to the guidelines of the system providers, the maximum spacing of screws in internal board layers of multi-layered sheathing should not exceed 40 cm.

**5.5.3.8.** It must be checked whether screw heads are embedded below the surfaces of plasterboards. It must also be checked whether screws are driven in the installed boards without cutting the cardboard surface around the whole perimeter of their heads.

## **5.5.4.** Commissioning of joint filling

**5.5.4.1.** The characteristics of the applied joint fillers must be assessed by checking their type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, a joint filler type designed for structural filling of joints between plasterboards with application of reinforcement tapes, or those designed for filling joints without application of such tapes should be used. It must also be checked whether the utilised compound is marked with the CE marking, control its intended use and range of application, and the number of its reference document.

**5.5.4.2.** During filling quality control, the technical characteristics of the applied jointing tape are checked, especially its type, width, range of applications, and markings. According to the system provider's guidelines, one of the following jointing tape types must be used:

- self-adhesive glass fibre "mesh",
- fliseline tape of glass fibres "fliseline",
- paper tape.

The minimum tape width is 45 mm.

**5.5.4.3.** It must be checked what types of jointing tape were applied. According to the system provider's guidelines, any tape type can be utilised for plasterboards with flattened edges (NS, PRO, KS, and KPOS) on the vertical joints. For plasterboards with the NS and PRO type edges, self-adhesive jointing tape ("mesh") must be stuck to the joined boards' edges, directly to their cardboard, and for plasterboards with the NS, PRO, KS and KPOS edges tape can be applied on structural joint filler ("wet compound") applied beforehand on those board edges. If fliseline or paper tape is applied, it must be checked whether

those tape types were applied onto “wet jointing compound”. It must be checked whether jointing of the horizontal joints between plasterboards, i.e. the „trimmed” edges, was performed with utilisation of fliseline, or paper tape embedded in “wet compound”.

**5.5.4.4.** The manner in which the “trimmed” edges were prepared for forming the horizontal joints must be checked. According to the supplier’s guidelines, any “trimmed” edges prepared for forming the horizontal joints must be especially formed by chamfering at an angle ranging from 40° to 50° to about 2/3 of board thickness (which means 9-10 mm for 12.5 thick plasterboards – fig. 8). Before filling the horizontal joints formed between the “trimmed” edges, it must be determined whether they were thoroughly cleaned and dusted and if they were moistened directly before applying joint filler.

**5.5.4.5.** During the commissioning works it is necessary to check the manner of filling both the vertical and horizontal joints. According to the system provider’s guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation jointing tape embedded into previously placed jointing compound (“onto wet compound”) requires another stage of skimming with structural jointing compound. The aim of the second stage is “covering” the applied jointing tape with joint filler. Filling of the vertical joints with utilisation of self-adhesive jointing tapes might require a second stage of filling with the structural joint filling compound, depending on the edge depth. If a higher joint finish standard was required, i.e. increased finish aesthetics in the area of joints of plasterboards, or over the whole wall area is required, it must be checked whether special “finishing” skimming compounds were utilised for the final skimming stage.

**5.5.4.6.** According to the system provider’s guidelines, the vertical and horizontal joints between boards, as well as any joints around the perimeter (on the peripheral joints between partition walls and the building structure) should be filled with a system structural joint filler throughout all the sheathing levels. It must be checked if all horizontal and, in most cases, the vertical joints of the outermost sheathing layers were additionally reinforced with jointing tape (this does not apply to jointing compounds designed for filling joints without utilisation of reinforcement tapes).

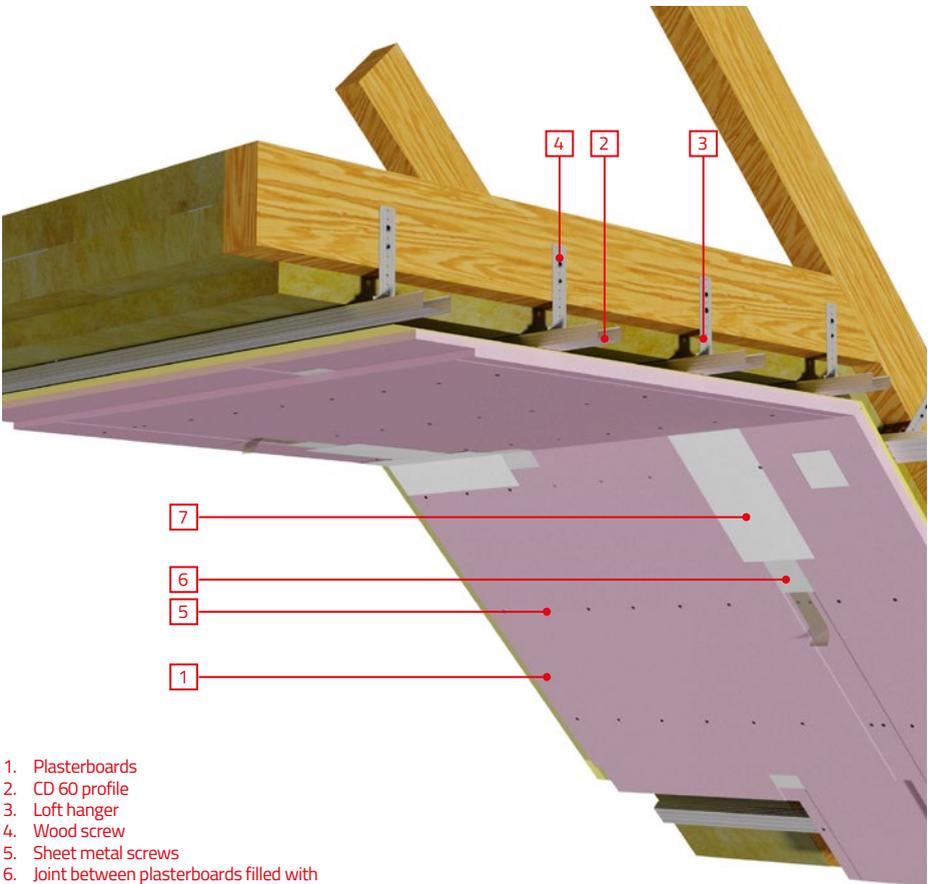
### **5.5.5.** Commissioning of surface finish

**5.5.5.1.** During the surface finish commissioning procedure, assessment of the surface smoothness (finish level assessment) takes place on the basis of the plasterboard finish quality level characterisation, as stated in detail in section 4.3.

**5.5.5.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.

**IMPORTANT:** For the ceiling sheathing systems with qualified fire resistance levels, such systems must be constructed according to the requirements for the adequate fire classification.

## 5.6. Loft drywall partitioning systems



1. Plasterboards
2. CD 60 profile
3. Loft hanger
4. Wood screw
5. Sheet metal screws
6. Joint between plasterboards filled with gypsum putty with reinforcement tape
7. Finishing compound

The loft drywall partitioning system consists of a load bearing structure of CD profiles of galvanised steel fixed to the existing roof truss structure with utilisation of hangers with single- or multi-layered sheathing of plasterboards.

### 5.6.1. Commissioning of structure

**5.6.1.1.** During the frame commissioning procedure it is necessary to pay attention to the following technical parameters of profiles:

- type,
- thickness of metal sheet they were made of,
- external dimensions,
- surface quality,
- markings acc. to Standards PN-EN 14195, PN-EN 13964, which must be cross-referenced with the supplier's recommendations and specification of a given system.

Steel profiles are usually marked with the construction mark B, or CE marking. The nomi-

nal thickness of the steel sheet utilised for production of the profiles, the reference document number, and the thickness, or mass, and anti-corrosion layer type (e.g. Z275, AZ100) are also indicated.

**5.6.1.2.** The following technical parameters and spacing of the fixing elements (e.g. ES direct hangers) must be checked: the type, load-bearing capacity, metal sheet thickness, external dimensions, surface quality, markings acc. to their technical documentation, or Standard PN-EN 13964. According to the system supplier's guidelines, the following markings are usually checked: the B construction marking, or CE marking, the nominal thickness of the steel elements used for constructing the suspending structure, the reference document number, and the thickness, or mass, and type of the anti-corrosion layer (e.g. Z275, AZ100). The type of the utilised mechanical fasteners, which according to the provider's guidelines are at least 2 pieces of wood screws (e.g. 3.5×35 mm) screwed into boards with a minimum depth of 20 mm.

**5.6.1.3.** The technical parameters and spacing of the fixing elements located around the perimeter of a loft drywall structure must be checked, as well. The maximum spacing and type of the utilised fasteners must be checked. Those are usually expansion plugs, or dowels of diameters and length depending on the substrate type, min. 6×40 mm, applied with a spacing of max. 100 cm.

**5.6.1.4.** The technical parameters of the sealing tape recommended for utilisation around the perimeter of loft drywall structure under UD wall profiles must be checked, as well. According to the system provider's guidelines, it is usually 3 mm thick tape of polyethylene foam.

**5.6.1.5.** When the sealing tape is applied, it is necessary to check its placement around the loft drywall partitioning perimeter and

between the utilised hangers (ES, direct, or other type) and the substrate if it is required by the system provider's specification. According to the system provider's guidelines, individual fragments of such tape must adhere tightly to each other at their connections (butt joint), and adhere tightly to the surfaces and profiles on the whole length of those structures (no readily visible gaps between the tape and the profiles and substrates) on the whole contact area between the hangers and substrates.

**5.6.1.6.** It is necessary to check the length and spacing of CD profiles, which, according to the system provider's guidelines should be shorter than the distance between UD peripheral profiles by 1.5–2.0 cm, and located with a max. spacing of 40 cm.

**5.6.1.7.** The way of fixing CD profiles to UD peripheral profiles must be checked. According to the system provider's guidelines, permanent and rigid fixing with utilisation of fixing screws, or other types of screws, or with utilisation of a crimper are unacceptable. At the same time it must be checked whether the outermost hangers are located max. 15 cm from walls.

**5.6.1.8.** The way in which CD profiles are fixed along their length must also be checked. According to the system provider's guidelines, such connections should be constructed with utilisation of longitudinal connectors screwed to CD profiles with utilisation of fastening screws. At the same time it must be checked if the fastening points – if they occur in greater numbers – are shifted against each other by at least 100 cm.

**5.6.2.** Commissioning of insulation installation (applied according to system specifications)

**5.6.2.1.** The technical parameters of the insulation material, e.g. mineral wool must be

carefully checked. It is necessary to check the following:

- type,
- thickness of boards or mats,
- bulk density or characteristic load of self-weight (if the technical documentation specifies the so called density of wool, it is necessary to request a declaration whether the characteristic load of the product's self-weight is appropriate for a given product from the manufacturer)
- width of boards or mats,
- other declared characteristics, as required for a given drywall partitioning system.

**5.6.2.2.** Insulation layers must be checked for their continuity (if there are no gaps between the installed mats of mineral wool at their joints). Easily visible gaps between the edges of individual slabs, or mats of insulation materials are unacceptable.

**5.6.2.3.** The maximum thickness of mineral wool slabs, or mats used as loft insulation is determined by the system provider's guidelines.

**5.6.3.** Commissioning of plasterboard installation

**5.6.3.1.** The technical parameters of the utilised plasterboards must be checked within the range of: their type, thickness, edge type, acc. to Standard PN-EN 520. According to the guidelines of the system provider, or the system specifications, the CE marking, type, board thickness, reaction to fire class, and reference document number should usually be checked.

**5.6.3.2.** It should be checked whether the connections between the installed loft drywall partitioning system and adjacent walls were constructed according to the system provider's guidelines. When a connection with the building structure (made of a ma-

terial different from plasterboards) is made, a sliding connection must be constructed. When the installed loft drywall system is connected to walls, or sheathing constructed of plasterboards, such connections must be provided with reinforcement tapes: paper, or glass fibre fliseline reinforcement tape must be applied on such connections.

**5.6.3.3.** According to the system provider's guidelines, the minimum width of the utilised plasterboards should be equal to their trade lengths and an iteration of the structure spacing modulus. For the outermost strips of sheathing (around the perimeter of such ceiling sheathing) it is acceptable to install trimmed off board fragments with a minimum width of 30 cm. For the crosswise fixing arrangement it is acceptable to install trimmed off fragments of boards of a min. length equal to double the structure spacing modulus. For the longitudinal fixing arrangement it is acceptable to install trimmed off fragments of boards of a min. length 40 cm.

**5.6.3.4.** During commissioning of the performed works the minimum displacement of horizontal board joints must be checked. It must be checked whether the joints of the shorter board edges for the crosswise orientation are located on CD 60 profiles. The horizontal joints of adjacent strips of each of the sheathing layers should be shifted by min. 40 mm. The horizontal connections of neighbouring sheathing layers (adjacent to each other, e.g. the first and the second sheathing layer of double-layered sheathing) should be shifted against each other by at least 40 cm.

**5.6.3.5.** The min. shift distance of the vertical joints must be checked, as well. The vertical joints of adjacent, neighbouring sheathing layers should be shifted against each other by min. 40 cm.

**5.6.3.6.** The gap size between the installed adjacent plasterboards must also be checked. The maximum acceptable distance between the longitudinal and crosswise edges is 3 mm.

**5.6.3.7.** The range of the controlled parameters includes checking whether the utilised screws were selected appropriately. According to the system provider's guidelines, the type of screws should be selected accordingly to the utilised profiles.

**5.6.3.8.** It must be checked whether the spacing of the screws of single-layered sheathing and the external layers of multi-layered sheathing is max. 17 cm. The max. spacing of screws for internal sheathing layers of multi-layered sheathing should not exceed 40 cm. In certain cases, if the manufacturer of a given system allows it, a greater spacing of screws is acceptable.

**5.6.3.9.** It must be checked whether screw heads are embedded below the surfaces of plasterboards. It must also be checked whether screws are driven in the installed boards without cutting the cardboard surface around the whole perimeter of their heads.

#### **5.6.4.** Commissioning of joint filling

**5.6.4.1.** The characteristics of the applied joint fillers must be assessed by checking their type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, it is necessary to utilise a joint filler type designed for structural filling of joints between plasterboards with application of reinforcement tapes, or those designed for filling joints without application of such tapes. It must also be checked whether the utilised jointing compound is marked with the CE marking, control its intended use and range of applications, and the number of its reference document.

**5.6.4.2.** During the joint filling quality control the technical characteristics of the applied jointing tape are checked, especially its type, width, range of applications, and markings.

According to the system provider's guidelines, one of the following jointing tape types must be used: self-adhesive glass fibre "mesh", fliseline tape of glass fibres "fliseline", or paper tape. The minimum tape width is 45 mm.

**5.6.4.3.** It must be checked what types of jointing tape were applied. According to the system provider's guidelines, any tape type can be utilised for plasterboards with flattened edges (NS, PRO, KS, and KPOS) on the vertical joints. For plasterboards with the NS and PRO type edges, self-adhesive jointing tape ("mesh") must be stuck to the edges of the joined boards, directly to their cardboard, and for plasterboards with the NS, PRO, KS and KPOS edges tape can be applied onto structural joint filler ("wet compound") applied beforehand on such board edges. If fliseline or paper tape is applied, it must be checked whether those tape types were applied on their joints onto "wet jointing compound". It must be checked whether jointing of the horizontal joints between plasterboards, i.e. the „trimmed" edges, was performed with utilisation of fliseline, or paper tape embedded in "wet compound".

**5.6.4.4.** The manner in which the „trimmed" edges were prepared for forming the horizontal joints must be checked. According to the supplier's guidelines, any "trimmed" edges prepared for forming the horizontal joints must be especially formed by chamfering at an angle ranging from 40° to 50° to about 2/3 of board thickness (which means 9-10 mm for 12.5 thick plasterboards – fig. 8). Before filling the horizontal joints formed between the "trimmed" edges, it must be determined whether they were thoroughly cleaned and dusted and if they were moistened directly before applying joint filler.

**5.6.4.5.** During the commissioning works it is necessary to check the manner of filling both the vertical and horizontal joints. According

to the system provider's guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation of jointing tapes embedded into previously placed jointing compound ("onto wet compound") requires another stage of skimming with a structural jointing compound. The aim of the second stage is "covering" the applied jointing tape with a layer of joint filler. Filling joints with utilisation of self-adhesive jointing tapes depending on the edge depth may require a second filling stage with utilisation of structural joint filler, depending on the edge depth. If a higher joint finish standard was required, i.e. increased finish aesthetics in the area of joints of plasterboards, or over the whole wall area is required, it must be checked whether special "finishing" skimming compounds were utilised for the final skimming stage (see descriptions of the PSG finish levels).

**5.6.4.6.** According to the system provider's guidelines, the vertical and horizontal joints between plasterboards, as well as all the peripheral joints (at the peripheral connections between partition walls and the building structure) should be filled with structural joint filler throughout all the existing sheathing layers. It must be checked if all the

horizontal and, in most cases, vertical joints of the outermost sheathing layers were additionally reinforced with jointing tapes (this does not apply to jointing compounds designed for filling joints without utilisation of reinforcement tapes).

## **5.6.5.** Commissioning of surface finish

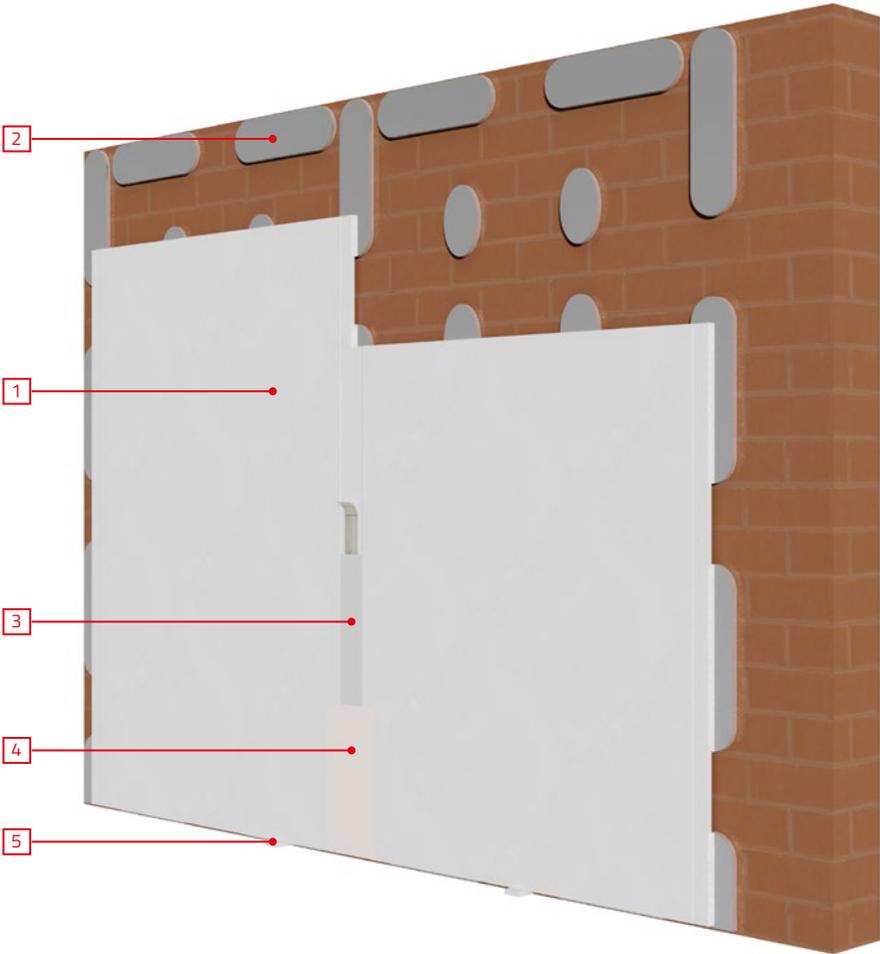
**5.6.5.1.** During the surface finish quality commissioning procedure, assessment of the surface smoothness (finish level assessment) takes place on the basis of the plasterboard finish quality level characterisation, as stated in detail in section 4.3.

**5.6.5.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.

**IMPORTANT:** For the loft drywall partitioning systems with qualified fire resistance levels, such systems must be constructed according to the requirements for the adequate fire classification.



## 5.7. Dry plaster



1. Plasterboards
2. Gypsum glue
3. Joint between plasterboards filled with gypsum putty with reinforcement tape
4. Finishing compound
5. Wedge

Dry plaster is formed by gluing plasterboards to the existing walls with utilisation of gypsum glue.

### **5.7.1.** Commissioning of substrate preparation

The substrate to which dry plaster is going to be glued must not be wet, or greasy, and it must be devoid of whitewash, or oil-based coatings. The substrate must be prepared in a way providing appropriate adherence of gypsum glue. Highly absorptive substrate and those of reduced adherence must be primed with an appropriate priming preparation, according to the system provider's guidelines.

### **5.7.2.** Commissioning of plasterboard installation

**5.7.2.1.** The technical parameters of the utilised plasterboards must be checked within the range of: their type, thickness, edge type, acc. to Standard PN-EN 520. According to the guidelines of the system provider, or the system specifications, the CE marking, type, board thickness, reaction to fire class, and reference document number should usually be checked.

**5.7.2.2.** According to the system provider's guidelines, the minimum width of the utilised plasterboards should be equal to their trade length, but it must not exceed 3 m. For the outermost strips of sheathing (around the perimeter of the installed dry plaster) it is acceptable to install trimmed off board fragments with a minimum width of 30 cm. Constructing horizontal joints is unacceptable, unless the system provider's guidelines state otherwise.

**5.7.2.3.** The technical parameters of the utilised gypsum glue must be checked, acc. to Standard PN-EN 14496. According to

the system provider's guidelines, a gypsum glue type as indicated by the system provider must be utilised.

**5.7.2.4.** It is necessary to check the spacing and the manner of application of the utilised gypsum glue. Along the side edges - the glue must be applied in the form of patches with a diameter of 10-15 cm located about 5 cm from one another. For the remaining area of the boards' back sides the gypsum glue must be applied in the form two rows of 10-15 cm patches. The spacing of those patches must not exceed 35 cm.

### **5.7.3.** Commissioning of joint filling

**5.7.3.1.** The characteristics of the applied joint fillers must be assessed by checking their type, with special attention paid to their range of applications and marking, acc. to Standard PN-EN 13963. According to the system provider's guidelines, it is possible to utilise joint filler types designed for structural filling of joints between plasterboards with application of reinforcement tapes, or those designed for filling joints without application of such tapes. It must also be checked whether the utilised compound is marked with the CE marking, control its intended use and range of application, and the number of its reference document.

**5.7.3.2.** During the joint filling quality control the technical characteristics of the applied jointing tape are checked, especially its type, width, range of applications, and markings. According to the system provider's guidelines, one of the following jointing tape types must be used: self-adhesive glass fibre "Mesh", fliseline tape of glass fibres "fliseline", or paper tape. The minimum tape width is 45 mm.

**5.7.3.3.** It must be checked what types of jointing tape were applied. According to

the system provider's guidelines, any tape type can be utilised for plasterboards with flattened edges (NS, PRO, KS, and KPOS) on the vertical joints. For plasterboards with the NS and PRO type edges, self-adhesive jointing tape ("mesh") must be stuck to the edges of the joined boards, directly to their cardboard, and for plasterboards with the NS, PRO, KS and KPOS edges – tape can be applied on a structural joint filler layer ("wet compound") which was previously applied on those board edges. If fliseline or paper tape is applied, it must be checked whether those tape types were embedded into "wet jointing compound" applied on joints. The vertical connections (on factory-made tapered edges) between plasterboards with oval and flattened edges (KPOS) can be filled without utilisation of jointing tape if a special joint filling compound designed especially for such applications is used.

**5.7.3.4.** During the commissioning works it is necessary to check the manner of filling both the vertical and horizontal joints. According to the system provider's guidelines, filling of the vertical and horizontal joints between plasterboards with utilisation of jointing tape embedded into previously placed jointing compound ("onto wet compound") requires another stage of skimming with structural jointing compound. The aim of the second stage is "covering" the applied jointing tape with joint filler. Filling of the vertical joints with utilisation of self-adhesive jointing tapes might require a second stage of filling with the structural joint filling compound, depending on the edge depth. If a higher joint surface finish standard was required, i.e. increased finish aesthetics in the area of joints of plasterboards, or over the whole wall area is required, it must be checked whether special "finishing" skimming com-

pounds were utilised for the final skimming stage (see the PSG surface finish levels).

**5.7.3.5.** According to the system provider's guidelines, the vertical and horizontal joints between boards, as well as any joints around the perimeter (on the peripheral joints of partition walls with the building structure) should be filled with a system structural joint filler throughout all the sheathing levels. It must be checked if all the horizontal and, in most cases, vertical joints of the outermost sheathing layers were additionally reinforced with jointing tape (this does not apply to jointing compounds designed for filling joints without utilisation of reinforcement tapes).

#### **5.7.4.** Commissioning of surface finish

**5.7.4.1.** During the surface finish commissioning procedure, assessment of the surface smoothness (finish level assessment) takes place on the basis of the plasterboard finish quality level characterisation, as stated in detail in section 4.3.

**5.7.4.2.** Assessment of deflection of intersecting wall planes takes place on the basis of the measurement procedures described in section 4.2.



## 6 Polskie Stowarzyszenie Gipsu */ Polish Gypsum Association*

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The statutory mission of Polskie Stowarzyszenie Gipsu (PSG) is popularisation of construction products made of gypsum as human-friendly materials for finishing interiors of residential and public utility buildings and indicating the possibility of their versatile utilisation in drywall systems, and formal and non-formal education.

The Association was established in 1999. Its members are the following leading manufacturers of drywall partitioning systems for interiors: KNAUF, NORGIPS, RIGIPS/SAINT-GOBAIN, SINIAT/ETEX and Instytut Ceramiki i Materiałów Budowlanych [Institute of Ceramics & Building Materials] (which presently belongs to the Łukasiewicz Research Institutes Network) PSG has belonged to EUROGYPSUM (the European Association of Plaster and Plaster Product Manufacturers), whose main aim is promoting gypsum-based building materials, with special focus on the drywall partitioning systems utilised in the construction industry, since 2000.

Since 2005, Polskie Stowarzyszenie Gipsu has belonged to the Confederation of Building Industry and Real Estate, which has participated in the works of Zespół Trójstronny Budownictwa [Trilateral Construction Team], promoting topics related to development of the construction industry.

Integration of the entities connected with the gypsum industry enables more effective promotion of ecological drywall systems in

Poland, for their application for building interiors with utilisation of plasterboards, and it makes it possible to assess the needs of potential investors, which results in better adjustment of those products to the requirements of the construction industry, and to the requirements related to the CO<sub>2</sub> emissions and sustainable development.

PSG also focuses on a wide range of educational activities, aiming at development of education quality for installation of drywall systems on the basic vocational school level, as well as advanced vocational education and training for professionals present on the job market. This long-term process was subdivided into stages.

Since 2010 the experts of the Association have developed and introduced a modular educational program for a new vocation called "Monter zabudowy i robót wykończeniowych w budownictwie" [Drywall installer and finisher in the construction industry] (in co-operation with Łukasiewicz – Instytut Technologii Eksploatacji in Radom) and prepared individual handbooks for students and teachers of vocational schools. They were the first modular and vocational education handbooks adjusted to the new core curriculum which was introduced in Poland in 2012. Those handbooks were promoted by the National Centre for the Support of Vocational and Continuing Education which was operating at that time. In the following years PSG compiled new editions of the handbook for the "Drywall installer and finisher" vocation.

Within the scope of our educational activities, accredited PSG trainers carried out a series of training sessions for vocational school teachers of practical education for the “Drywall installer and finisher qualification B6” vocation. This new vocation has become very popular and, as one of few, it required three stages of qualification.

As a result, a new vocation called “Technik robot wykończeniowych w budownictwie” [Finishing works technician in building] was introduced according to the core curriculum of 2019.

In the years 2011–2012, PSG participated in a program project called LdV Transfer Innowacji: „System wsparcia uczenia się nieformalnego dla osób o niskich kwalifikacjach [LdV Transfer of Innovation: The system of non-formal education for people with low qualifications] – SkillsUP”, co-ordinated by Łukasiewicz - ITeE, which, among other achievements, gave rise to creation of an e-learning platform for teaching the basics of drywall installation.

It is worth noting that the fact of compiling our pioneering professional handbook entitled “Warunki Techniczne Wykonania i Odbioru Systemów Suchej Zabudowy” (WTWiO) [Technical conditions for constructing and commissioning of drywall systems] gained recognition as very useful and practical over the period of 12 years (4 issues). It is often accepted as the base for concluding agreements relating to performing finishing works with utilisation of drywall systems. The annexes included in WTWiO are understood by the parties to such agreements as basis for post-completion commissioning of works. 11 thousand copies of WTWiO were provided to Polish specialists. The significance of

this pioneering publication is emphasised by the fact that in the recent years it has been translated into five languages and it plays an important role in the construction industry of the EU markets.

Its latest edition, with corrections and amendments, will be available in the printed and digital form.

It must be stressed that PSG contributed greatly to the achievements of the Polish national team participating in EUROSkill international practical skills contest in the years 2008–2010. On the basis of a proposal made by the Polish side (FSNT NOT) in 2010, a new competition was introduced, i.e. Installation of drywall systems. A participant sponsored and prepared by PSG won the first silver medal for Poland in this competition. In the years 2019–2022 PSG experts participated in the ERASMUS+ project called “Platforma informacyjno-konsultacyjna wspierająca proces pozyskiwania talentów do udziału w konkursach umiejętności na poziomie krajowym i europejskim – WeRskills” [Informational and consulting platform supporting the process of acquiring talents to participate in skills competitions at national and European level], which was coordinated by Łukasiewicz – ITeE. As part of this project a nationwide vocational skills competition within the range of drywall partitioning systems was carried out.

PSG has participated in numerous contests of professional skills by supporting participants of widely known national contests, such as Złota Kielnia [Gold Trowel] and Buduj z Pasją [Build with Passion].

More information on drywall systems and Polskie Stowarzyszenie Gipsu is available on the following website: [www.polskigips.pl](http://www.polskigips.pl).

# 7 Glossary

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For full understanding and unification of the terms referring to installation of drywall systems used in this text, its authors compiled a short glossary of those terms presenting definitions of the most popular terms whose interpretation – in their opinion – might be unclear and cause controversies among specialists and construction authorities.

**ASSEMBLY ACCESSORIES** – steel and galvanised fasteners for construction of drywall systems, such as: cross connectors, longitudinal connectors, acoustic connectors, ceiling hangers, etc.

**STEEL PROFILE/SECTION** – steel and galvanised elements of drywall partitioning systems used for constructing frames and spatial constructions for installation of sheathing of plasterboards.

**CEILING FRAMES** – sets of structural elements of system profiles forming arrangements of suspended ceilings.

**DRYWALL PARTITIONING SYSTEM** – a set of products collected and recommended by plasterboard manufacturers installed according to the aforementioned system providers' guidelines. A set of drywall system products includes: system steel profiles, plasterboards, sealing tapes, system filling compounds, fixing elements, and accessories. Drywall partitioning systems enable constructing light partition walls, assembly of pre-walls (ducts), attic drywall partitioning, constructing of suspended ceilings.

**STRUCTURAL JOINT FILLER** – any joint filler type offered by a given drywall system manufacturer, designed for filling joints between plasterboards with utilisation of reinforcement tapes. Structural joint fillers might be provided as dry mix, or ready-to-use compound in a bucket.

**FINISHING COMPOUND** – finishing filling compound for obtaining uniform wall and ceiling surfaces, or for final filling of joints between plasterboards. Finishing compounds might be provided as dry mix, or ready-to-use compound in a bucket.

**INSULATION MATERIAL** – insulation filling of horizontal and vertical drywall systems (acoustic, thermal, or fire resistant insulation). The most commonly used material is mineral wool of glass, or rock fibre.

**ACOUSTIC INSULATION** – it is a measurement which shows how well a given building structure (system) insulates a room against noise (airborne noises) coming from other rooms, or from the surroundings. This value is presented in decibels – dB.

**NOISE ABSORPTION** – is a process of absorbing sound waves by physical objects, i.e. acoustic ceilings, and other elements of interior design, such as carpets, upholstered furniture. In order to define how well a given material absorbs undesired noises, the noise absorption coefficient  $w$  is used. Its values range from 0 (total reflection) to 1 (total absorption).

**FIRE RESISTANCE** – it is the ability of an element of a building to meet defined requirements in conditions portraying the course of a fire. The measurement of fire resistance is expressed in minutes that elapse from the start of a fire to the moment a given structural element reaches one of the following limiting criteria: fire carrying capacity (R), fire integrity (E), fire insulation (I).

**FIRE CARRYING CAPACITY (R)** – it is the state in which a tested element stops fulfilling its load bearing function owing to its mechanical damage, loss of balance, exceeding its displacement, or deformation limits.

**FIRE INTEGRITY (E)** – it is the state in which a tested element stops fulfilling its fire separating function owing to appearance of flames on the unexposed side, or cracks or gaps whose size exceeds their specified limit values, which enable permeating of flames, or gases, or occurrence of areas where the tested element gets detached from its structure.

**FIRE INSULATION (I)** – it is the state in which a tested element stops fulfilling its separating function owing to the fact of exceeding the limit of temperature on the unexposed side.

**FIRE RESISTANCE CLASS** – the unit of measurement is the time expressed in minutes characterising the fire resistance of individual building elements by two or three criteria: fire carrying capacity (R), fire integrity (E), fire insulation (I), e.g. REI120, EI30.

**Q1–Q4** – markings of the surface finish quality levels acc. to the nomenclature adopted by EUROGYPSUM, Q1 means the lowest le-

vel of plasterboard surface finish aesthetics requirements.

**PSG1–PSG4** – markings of the surface finish quality levels from 1 to 4, PSG1 means the lowest level of plasterboard surface finish aesthetics requirements.

**EUROGYPSUM** – European Association of Plaster and Plaster Product Manufacturers ([www.eurogypsum.org](http://www.eurogypsum.org)).

**TECHNICAL DOCUMENTATION** – any type of documentation which confirms the characteristics of a drywall system as declared by the drywall system manufacturer. Such technical documentation may include: a Declaration of Performance (DoP), European Technical Assessment (ETA), National Technical Assessment (NTA), as well as a Fire Classification, Technical Opinion, fire test, mechanical test, or acoustic test reports, or technical drawings, or any other documents provided by the manufacturer of a drywall system.

**DECLARATION OF PERFORMANCE** – it is a document which confirms the performance characteristics of a product declared by its manufacturer, formulated according to harmonised reference documents (Standard hEN). It contains the most important information concerning the characteristics of construction materials. It has a wide range of applications - the European Union market as a whole.

**HARMONISED STANDARD** – means an European standard accepted on the basis of a motion made by the Commission for harmonising application of the Union's law. One

of the essential requirements in order to institutionalise a standard as a harmonised standard is publishing its title and number in the Official Journal of the European Union.

### **EUROPEAN TECHNICAL ASSESSMENT (ETA)**

– is a voluntary and open-end document issued for construction products: which are not covered by a harmonised European standard (hEN), or not fully harmonised European standard, i.e. when the performance characteristics of a given product in reference to its essential characteristics cannot be assessed in full according to hEN (the assessment method referring to at least one essential characteristic is not applicable, or does not exist). The European Technical Assessment is a reference document used for formulating a Declaration of Performance and assigning the CE marking for the product it refers to.

### **NATIONAL TECHNICAL ASSESSMENT (NTA)**

– according to the definition presented in the Act on construction products, it is a documented, positive assessment of performance characteristics of a construction product, which, according to the product's intended use, have impact on meeting the basic requirements posed by the construction structures in which this product will be utilised. This document is usually issued for the definite period of 5 years.

### **NATIONAL DECLARATION OF PERFORMANCE**

– it is a document which confirms

the characteristics of performance declared by the manufacturer of a construction product, according to its subject reference documentation (National Technical Assessment). It contains all the most important information concerning characteristics of a given construction material. Its range of application is limited to one country, in which a given national technical assessment document was formulated and issued.

**HYGIENIC CERTIFICATE** – it refers to a product which does not have any negative impact on human health and the natural environment. It is issued basing on a manufacturer's application by an authorised quality assessment institution. Until recently, a hygienic certificate was obligatory for a majority of materials and machinery utilised in the building industry, as well as in water and air conditioning installations.

**IMPORTANT:** On 1<sup>st</sup> January 2016 regulations were altered, owing to which the certificate is required only for the group of products which come in contact with drinking water fit for human consumption. In any other situations the document is not required.

## 8 References

- PN-EN 520** – Płyty gipsowo-kartonowe - Definicje, wymagania i metody badań.  
*/ Gypsum plasterboards. Definitions, requirements and test methods*
- PN-EN 15283-1+A1** – Płyty gipsowe zbrojone włóknami - Definicje, wymagania i metody badań - Część 1: Płyty gipsowe ze zbrojeniem w postaci mat.  
*/ Gypsum boards with fibrous reinforcement - Definitions, requirements and test methods - Part 1: Gypsum boards with mat reinforcement*
- PN-EN 12467+A1** – Płyty płaskie włókniasto-cementowe - Właściwości wyrobu i metody badań.  
*/ Fibre-cement flat sheets - Product specification and test methods*
- PN-EN 14195** – Elementy szkieletowej konstrukcji metalowej do stosowania z płytami gipsowo-kartonowymi - Definicje, wymagania i metody badań.  
*/ Metal framing components for gypsum board systems. Definitions, requirements and test methods*
- PN-EN 13963** – Materiały do spoinowania płyt gipsowo-kartonowych - Definicje, wymagania i metody badań.  
*/ Jointing materials for gypsum boards - Definitions, requirements and test methods*
- PN-EN 14566+A1** – Łączniki mechaniczne do konstrukcji z płyt gipsowo-kartonowych - Definicje, wymagania i metody badań.  
*/ Mechanical fasteners for gypsum plasterboard systems. Definitions, requirements and test methods*
- PN-EN 13162+A1** – Wyroby do izolacji cieplnej w budownictwie - Wyroby z wełny mineralnej (MW) produkowane fabrycznie - Specyfikacja.  
*/ Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification*
- PN-EN 13964** – Sufity podwieszane - Wymagania i metody badań.  
*/ Suspended ceilings - Requirements and test methods*
- PN-EN 13501-1** – Klasyfikacja ogniowa wyrobów budowlanych i elementów budynków - Część 1: Klasyfikacja na podstawie badań reakcji na ogień.  
*/ Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*
- PN-EN 13501-2** – Klasyfikacja ogniowa wyrobów budowlanych i elementów budynków - Część 2: Klasyfikacja na podstawie wyników badań odporności ogniowej, z wyłączeniem instalacji wentylacyjnej.  
*/ Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services*

**MINISTER OF INFRASTRUCTURE REGULATION OF 12TH APRIL 2002** – on the technical conditions that should be met by buildings and their location.

**MINISTER OF LABOUR AND SOCIAL POLICY REGULATION OF 14TH MARCH 2000.** – on health and safety at work with manual handling of loads.

**DIN 18183-1** – Trennwände und Vorsatzschalen aus Gipsplatten mit Metallunterkonstruktionen - Teil 1: Beplankung mit Gipsplatten.

**MERKBLATT 3** – Fugen und Anschlüsse bei Gipsplatten und Gipsfaserplattenkonstruktionen.

**MERKBLATT 8** – Wandhohen leichter Trennwände - Stegausschnitte, Anschlüsse, Türen und Öffnungen.





# 1 Partition wall systems

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.1 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

Commissioning of the structure		
Technical parameters of profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of fixing elements around wall perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of sealing tape around wall perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Sealing tape is properly placed	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Length and spacing of CW (C) post profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections between CW (C) and UW (U) profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CW (C) profiles along their length are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Structural solutions of door frames are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of insulation installation (applied according to system specifications)		
Technical parameters of mineral wool are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of mineral wool slabs and mats are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum thickness of mineral wool slabs and mats is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of filling spaces within CW (C) profiles with mineral wool is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of insulation placement on whole wall height is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of plasterboard installation		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of horizontal joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

Minimum shift of vertical joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum spacing of screws is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are embedded correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
First layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Second layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of joint filling</b>		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
"Trimmed" plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Vertical and horizontal jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of surface finish</b>		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Deviations of intersecting planes from angle indicated in documentation from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface smoothness level is appropriate as indicated in documentation	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 1 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 2 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 3 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 4 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Deviation level of intersecting planes is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

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# 2 Suspended ceiling system

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.2 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

<b>Commissioning of the structure</b>		
Technical parameters of profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of fixing elements around ceiling perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of sealing tape applied around ceiling perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Placement of sealing tape is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of hangers are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of main and load-bearing level profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD profiles with peripheral profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD profiles along their length are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of insulation installation (applied according to system specifications)</b>		
Technical parameters of mineral wool are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of mineral wool slabs and mats are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum thickness of mineral wool slabs and mats is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of filling spaces within CW (C) profiles with mineral wool is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of plasterboard installation</b>		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

Screws are selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum spacing of screws is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are embedded correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of joint filling</b>		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
"Trimmed" plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of surface finish</b>		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Deviations of intersecting planes from angle indicated in documentation from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface smoothness level is appropriate as indicated in documentation	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 1 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 2 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 3 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 4 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Deviation level of intersecting planes is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

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# 3 Wall sheathing

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.3 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

Commissioning of the structure		
Technical parameters of profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of assembly elements are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of fixing elements around wall sheathing perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of sealing tape applied around wall sheathing perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Sealing tape is properly placed	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Length and spacing of CD or CW (C) post profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD or CW (C) and UW (U) profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD or CW (C) profiles along their length are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of insulation installation (applied according to system specifications)		
Technical parameters of mineral wool are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of mineral wool slabs and mats are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum thickness of mineral wool slabs and mats is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of insulation placement on whole wall height is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of plasterboard installation		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of horizontal joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of vertical joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum spacing of screws is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are embedded correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
First layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Second layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of joint filling</b>		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
"Trimmed" plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Vertical and horizontal jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of surface finish</b>		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Deviations of intersecting planes from angle indicated in documentation from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1

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# 4 Independent wall sheathing

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.4 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

Commissioning of the structure		
Technical parameters of profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of fixing elements around pre-wall perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of sealing tape applied around pre-wall perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Sealing tape is properly placed	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Length and spacing of CW (C) post profiles is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections between CW (C) and UW (U) profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CW (C) profiles along their length are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Structural solutions of door frames are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of insulation installation (applied according to system specifications)		
Technical parameters of mineral wool are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of mineral wool slabs and mats are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum thickness of mineral wool slabs and mats is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of filling spaces within CW (C) profiles with mineral wool is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of insulation placement on whole wall height is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of plasterboard installation		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of horizontal joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

Minimum shift of vertical joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum spacing of screws is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are embedded correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
First layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Second layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of joint filling</b>		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
"Trimmed" plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Vertical and horizontal jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of surface finish</b>		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1

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# 5 Ceiling sheathing

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.5 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

Commissioning of the structure		
Technical parameters of profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of fixing elements around ceiling sheathing perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of sealing tape applied around ceiling sheathing perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Placement of sealing tape is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of applied hangers are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of applied profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD profiles with peripheral profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD profiles along their length are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of insulation installation (applied according to system specifications)		
Technical parameters of mineral wool are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of mineral wool slabs and mats are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum thickness of mineral wool slabs and mats is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of plasterboard installation		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO

Maximum spacing of screws is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are embedded correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of joint filling</b>		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
"Trimmed" plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of surface finish</b>		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Deviations of intersecting planes from angle indicated in documentation from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface smoothness level is appropriate as indicated in documentation	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 1 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 2 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 3 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 4 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Deviation level of intersecting planes is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

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# 6 Loft drywall partitioning systems

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.6 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

<b>Commissioning of the structure</b>		
Technical parameters of profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of applied hangers are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of structural fixing elements around loft drywall partitioning system are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of sealing tape applied around loft drywall partitioning system perimeter are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Placement of sealing tape is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters and spacing of CD profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD profiles with peripheral profiles are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Connections of CD profiles along their length are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of insulation installation (applied according to system specifications)</b>		
Technical parameters of mineral wool are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of mineral wool slabs and mats are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum thickness of mineral wool slabs and mats is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Tightness of filling spaces within CW (C) profiles with mineral wool is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of plasterboard installation</b>		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum shift of joints is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Maximum spacing of screws is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Screws are embedded correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
First layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Second layer of sheathing is installed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of joint filling</b>		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
"Trimmed" plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
<b>Commissioning of surface finish</b>		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Deviations of intersecting planes from angle indicated in documentation from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface smoothness level is appropriate as indicated in documentation	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 1 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 2 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO

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# 7 Dry plaster

## Collective questionnaire

Basic parameters which are essential for commissioning of works performed according to the technologies of the drywall partitioning system. A detailed description is presented in section 5.7 of the publication entitled „Warunki techniczne wykonania i odbioru Systemów Suchej Zabudowy” / *The technical conditions for constructing and accepting drywall systems*, issued by the Polish Gypsum Association.

Commissioning of substrate preparation		
Technical parameters of substrate are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Gluing		
Technical parameters of gypsum glues are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Placement of glue mass is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of plasterboard installation		
Technical parameters of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Peripheral gap is constructed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Minimum dimensions of plasterboards are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Gap size between adjacent plasterboards is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of joint filling		
Technical parameters of joint filler compounds are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Technical parameters of jointing tape are correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Type of jointing tape is selected correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
“Trimmed” plasterboard edges are prepared correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Vertical and horizontal jointing is performed correctly	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Commissioning of surface finish		
Deviations of surfaces from plane and surface edges from straight line	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from vertical plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface and edge deviations from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1

Deviations of intersecting planes from angle indicated in documentation from horizontal plane	<input type="checkbox"/> KL.2	<input type="checkbox"/> KL.1
Surface smoothness level is appropriate as indicated in documentation	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 1 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 2 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 3 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
PSG 4 applies – does not apply (delete as appropriate)	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Deviation level of intersecting planes is correct	<input type="checkbox"/> YES	<input type="checkbox"/> NO

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