



Certificates



Insulation

Installation in walls and ceilings with wooden constructions

Surveyor's report no. GA-2019/028-Mey, valid until 05-22-2024

Fire protection systems for the highest level of safety



Be it in a residential building or an industrial complex – OBO has the appropriate solution for fireproof electrical installations. Our tested and certified fire protection systems cover all the relevant fire protection guidelines and provide you with an electrical installation that really serves its purpose. We will be happy to provide you with more details – on our website or personally.

*This is a translation of the original German version,
which has neither been checked nor approved by the
issuing institution IBB GmbH - Ingenieurbüro für Brandschutz
von Bauarten. Only the original German document is valid.*

Surveyor's report no. GA-2019/028 - Mey dated 22.05.2019

Client: OBO Bettermann Holding GmbH & Co. KG
Hüingser Ring 52
58710 Menden, Germany

Order from: 14.03.2019

Order symbol: Mr Mittmann

Order arrival 14.03.2019

Contents of the order: Surveyor's report on the fire behaviour of cable and pipe insulation (PYROMIX, PYROPLATE Fibre, PYROSITNG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems) in accordance with various general technical approvals or general construction type approvals for installations in solid wooden ceilings and walls or wooden walls and ceilings with a fire resistance period of 30, 60 or 90 minutes with a fire load according to DIN 4102-2 or DIN EN 13501-2.

Construction project: This surveyor's report applies to construction projects in the Federal Republic of Germany

This surveyor's report comprises 17 pages and 5 appendices.

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1 Order and reason

Through the mail of 14.03.2019, IBB GmbH, Gross Schwülper, was charged by OBO Bettermann Holding GmbH & Co. KG, Menden, to compile a surveyor's report on the fire behaviour of cable and pipe insulation (PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems) in accordance with various general technical approvals or general construction type approvals for installations in solid wooden ceilings and walls or wooden walls and ceilings with a fire resistance period of 30, 60 or 90 minutes with a fire load according to DIN 4102-2 or DIN EN 13501-2.

In addition, the requirement for the creation of effective fire protection panelling of classifications K230 or K260 according to DIN EN 13501-2 can be applied to comparable wall and ceiling structures.

The fire protection evaluation is required, as the cable and pipe insulation designs described in the context of this surveyor's report are not directly covered by general technical proofs (general technical approvals or general construction type approvals).

2 Fire protection requirements

According to the details provided by the client, the insulation measures must be designed in such a way that, with a single-sided fire load, the spread of fire and smoke must be prevented for at least 30, 60 or 90 minutes according to the standard temperature curve.

This surveyor's report shall only apply to fire protection. Further requirements, e.g. structural physics, statics, electrical engineering, ventilation technology, etc., may result from the technical construction regulations valid for the insulation and from the appropriate state construction regulations and/or the regulations for special structures.

The overall fire protection concept is not a component part of this surveyor's report.

The fire protection proof of the solid wall ceilings and walls – as well as wooden-beamed ceilings, wooden stand-off walls and wood panelled wall structures – itself is not a component part of this surveyor's report. It is assumed that, for the structures described in Section 4 and the Appendices,

appropriate proofs of suitability (e.g. general statutory test reports) exist, which confirm the fulfilment of the requirements for construction types of the fire resistance class of at least F30-B (EI 30 or REI 30), F60-B (EI 60 or REI 60) or F90-B (EI 90 or REI 90) according to DIN 4102-2 (or DIN EN 13501-2) in conjunction with at least normally flammable construction materials and – if required – for effective fire protection panelling of classifications K230 or K260 according to DIN EN 13501-2.

3 Documents and underlying documents of the surveyor's report

The surveyor's report on the fire behaviour of various items of cable or pipe insulation of OBO Bettermann Holding GmbH & Co. KG, Menden, is based on the following underlying documents:

- [1] General technical approval no. Z-19.15-1115 DIBt dated 01.01.2017 regarding cable insulation "PYROBAG system KBK" of fire resistance class S 90 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [2] General technical approval no. Z-19.15-1119 DIBt dated 01.01.2017 regarding cable insulation "PYROBAG system KBK-K" of fire resistance class S 90 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [3] General technical approval no. Z-19.15-1558 DIBt dated 01.06.2015 regarding cable insulation "PYROPLUG Peg system FBA-S" of fire resistance class S 90, S 60 or S 30 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [4] General technical approval no. Z-19.15-1559 DIBt dated 01.06.2015 regarding cable insulation "PYROPLUG Shell system FBA-D" of fire resistance class S 90, S 60 or S 30 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [5] General technical approval no. Z-19.15-1849 DIBt dated 02.10.2017 regarding cable insulation (combination insulation) "PYROPLUG Block system FBA-B200" of fire resistance class S 90, S 60 or S 30 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [6] General technical approval no. Z-19.15-1851 DIBt dated 20.09.2017 regarding cable insulation "PYROPLUG Mini system FBA-SP" of fire resistance class S 90 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [7] General technical approval no. Z-19.15-2031 DIBt dated 07.04.2017 regarding cable insulation (combination insulation) "PYROCOMB Tubes system" of fire resistance class S 90 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [8] General technical approval no. Z-19.15-2046 DIBt dated 10.04.2017 regarding cable insulation (combination insulation) "PYROMIX system" of fire resistance class S 90 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [9] General technical approval no. Z-19.15-2047 DIBt dated 13.07.2017 regarding cable insulation (combination insulation) "PYROPLATE Fibre system" of

- fire resistance class S 90 according to DIN 4102-9, issued to OBO Bettermann GmbH & Co. KG, Menden,
- [10] General technical approval no. Z-19.17-2036 DIBt dated 07.04.2017 regarding pipe insulation "PYROCOMB system" of fire resistance class R 90 according to DIN 4102-11, issued to OBO Bettermann GmbH & Co. KG, Menden,
 - [11] General construction approval no. Z-19.53-2314 DIBt dated 20.02.2019 regarding fire-resistant insulation for electrical cables "PYROMIX Screed", issued to OBO Bettermann GmbH & Co. KG, Menden,
 - [12] General construction approval no. Z-19.53-2338 DIBt dated 20.02.2019 regarding fire-resistant insulation for electrical cables and/or plastic or metal pipelines "PYROMIX NG", issued to OBO Bettermann GmbH & Co. KG, Menden,
 - [13] DIN 4102-2: 1977-09,
 - [14] DIN 4102-4: 2016-05,
 - [15] DIN 4102-9: 1990-05,
 - [16] DIN 4102-11: 1985-12,
 - [17] DIN EN 13501-2:2016-12,
 - [18] The German guidelines on fire protection requirements for highly fire-resistant components in wooden structures – M-HFHolzR (July 2004 edition) and
 - [19] The construction drawings in accordance with Appendices 1 to 5 of this surveyor's report.

Besides these documents, the fire protection evaluation also contains the comprehensive fire protection experience of the compilers of this surveyor's report with regard to insulation measures. The over 30 years of professional experience of the engineers of IBB GmbH, Gross Schwülper, was obtained from, amongst other things, activities in recognised testing institutes.

4 Description of the structures

4.1 General information

For construction projects in Germany, various solid wood ceilings and walls, along with wooden-beamed ceilings and wall structures with a wooden stand-off design, through sub-areas of which cables and pipe installations are passed.

The installation of insulation systems in wooden structures does not fall into the scope of application of the general technical approvals or general construction type approvals named in Section 3, and thus deviates from the specifications of the proofs of suitability. In contrast to the requirements that the installation of the insulation systems in F 90 or REI 90 solid ceilings, F 90 or (R)EI 90 solid walls and F90 or EI 90 lightweight construction walls must take place with a metal sub-construction, the

insulation systems "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB" shall be used in F 30, F 60, F 90 or (R)EI 30, 90 wooden structures to insulate electrical cables and pipes.

4.2 Details on the design of the structures

The section below describes the design of the components, divided up into the key construction types and the appropriate designs of the insulations. Only the key details relating to fire protection will be described.

4.2.1 Design of the solid wood ceilings

The solid wood ceilings consist of full-surface, interlocking and interconnected wood structures or wooden slats, which are given full planking or a floor structure on their top side. On the lower side, panelling of non-combustible construction plates is fastened to a metal sub-construction. The minimum thickness of the panelling results from the data of the statutory proofs of suitability on the fulfilment of the requirements for supporting solid wood ceilings that end a room with a single-sided fire load. The ceiling structure shown in Appendix 1 shows the basic principle of the panelling, as well as the constructive installation of the insulations "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK, or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" in conjunction with rectangular ceiling penetrations. The ceiling structures must be created according to the details of the appropriate structural proofs of suitability, although with a minimum thickness of ≥ 150 mm, in analogue fashion to the thickness details of the general technical approvals or general construction type approvals [1] to [12].

4.2.2 Design of the solid wood walls

The solid wood walls consist of full-surface, interlocking and interconnected wood structures or wooden slats, which are given full planking of non-combustible construction plates on both sides. Alternatively, a metal sub-construction can be provided on one or both sides. The minimum thickness of the planking results from the data of the statutory proofs of suitability on the fulfilment of the requirements on supporting walls closing off rooms for single-sided fire loads. The wall structure shown in Appendix 2 shows the basic principle of the panelling, as well as the constructive installation of the insulations "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG

KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" in conjunction with rectangular installation openings or wall penetrations. The wall structures must be created according to the details of the appropriate structural proofs of suitability, although with a minimum thickness of ≥ 100 mm, in analogue fashion to the thickness details of the general technical approvals or general construction type approvals [1] to [12].

4.2.3 Design of the wooden-beamed ceilings

The wooden-beamed ceilings consist of a supporting beam layer, which has full-surface planking or a floor structure and cavity insulation between the beam layers. On the lower side, planking of non-combustible construction plates is fastened to a metal sub-construction. The minimum thickness of the panelling results from the data of the statutory proofs of suitability on the fulfilment of the requirements on supporting ceilings closing off rooms for single-sided fire loads. The ceiling structure shown in Appendix 3 shows the basic principle of the panelling, as well as the constructive installation of the insulations in conjunction with rectangular ceiling penetrations. The ceiling structures must be created according to the details of the appropriate structural proofs of suitability, although with a minimum thickness of ≥ 150 mm, in analogue fashion to the thickness details of the general technical approvals or general construction type approvals [1] to [12].

4.2.4 Design of the wooden stand-off walls

The wooden stand-off wall structures consist of a supporting or unsupported stand-off structure made of solid wood, which has full-surface planking and non-combustible cavity insulation on both sides (mineral wool insulation according to DIN EN 13162, non-combustible, melting point $> 1,000$ °C according to DIN 4102-17). The minimum thickness of the planking results from the data of the statutory proofs of suitability on the fulfilment of the requirements on supporting and non-supporting walls closing off rooms for single-sided fire loads. The wall structure may have one or two shells. The wall structure shown in Appendix 5 shows the basic principle of the panelling, as well as the constructive installation of the insulations "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" in conjunction with rectangular installation openings or wall penetrations. The wall structures must be created according to the details of the appropriate structural proofs of suitability, although

with a minimum thickness of ≥ 100 mm, in analogue fashion to the thickness details of the general technical approvals or general construction type approvals [1] to [12].

4.2.5 Design of the different cable or pipe insulation in solid wood ceilings

Appendix 1 shows an example of the installation of the cable or pipe insulation "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" in solid wood ceilings. Appropriate rectangular installation openings must be created before the insulation is installed. The maximum dimensions and the minimum installation thicknesses of the insulation for the "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes systems" can be found in the general technical approvals or general construction type approvals [1] up to [12].

Surrounding soffit panelling shall be created in the component openings. The soffit panelling shall consist of at least 2 layers of non-combustible construction plates and shall have a joint offset. The non-combustible plates shall be screwed into the solid wooden ceiling with rapid construction screws, $d \geq 3.5$ mm, with a horizontal spacing of ≤ 200 mm and a vertical spacing of ≤ 150 mm. Alternatively, galvanised and resinated clamps, $d \geq 1.5$ mm, can be clamped into the solid wooden ceiling with a horizontal spacing of ≤ 150 mm and a vertical spacing of ≤ 150 mm. The minimum length of the fastening agent should be chosen according to the thickness of the soffit panelling, so that the minimum penetration depth s into the solid wood ceiling for rapid construction screws is $5x$ the diameter of the screw or, with clamps, $15x$ the diameter of the wire.

The minimum thickness of the soffit panelling is calculated as follows:

- a) From the statutory proofs of suitability on the fulfilment of the requirements for fire resistance class F 30-B (REI 30), F 60-B (REI 60) or F 90-B (REI 90) according to DIN 4102-2:1977-09 (or DIN EN 13501-2) with a one-sided fire load. In this case, the thickness of the soffit panelling corresponds to the minimum panelling thickness of the top and/or bottom side of the ceiling.

- b) From the data of the proofs on the fulfilment of the requirements named in the scope of the fire protection concept for fire protection panelling (K230 or K260 encapsulation according to DIN EN 13501-2).

The thicker panelling according to a) or b) should have supremacy when designing the soffit.

The cable or pipe insulation may be run vertically in the centre of the ceiling or flush to the top side of the ceiling, providing that the general technical approvals or general construction type approvals [1] to [12] and the statutory proofs of suitability of the ceiling structure are complied with. The insulation must be installed in such a way that there is no risk of slippage within the soffit panelling. If not or not otherwise stated in the general technical approvals or general construction type approvals [1] to [12], retaining bars, made of doubled, mechanically fastened strips of non-combustible construction plates or screws screwed into the soffits and protruding into the opening soffit, must be used in the surrounding soffits in the insulation installation area.

In addition, the design of the cable or pipe insulation must take place according to the general technical approvals or general construction type approvals [1] to [12]. The approved dimensions, installations, etc. can also be found in these proofs of suitability.

4.2.6 Design of the different cable or pipe insulation in solid wood walls

Appendix 2 shows an example of the installation of the cable or pipe insulation "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" in solid wood walls. Appropriate rectangular installation openings must be created before the insulation is installed. The maximum dimensions and the minimum installation thicknesses of the insulation for the "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" can be found in the general technical approvals or general construction type approvals [1] to [12].

Surrounding soffit panelling shall be created in the component openings. The soffit panelling shall consist of non-combustible construction plates and shall have a joint offset. The non-combustible plates shall be screwed down around their edge into the solid wood wall with rapid construction screws, $d \geq 3.5$ mm, with a horizontal spacing of ≤ 200 mm and a vertical spacing of ≤ 150 mm. Alternatively, galvanised and resinated clamps, $d \geq 1.5$ mm, can be clamped into the solid wooden wall with a horizontal spacing of ≤ 150 mm and a vertical spacing of ≤ 150 mm. The minimum length of the fastening agent should be chosen according to the thickness of the soffit panelling, so that the minimum penetration depth s into the solid wood wall for rapid construction screws is $5x$ the diameter of the screw or, with clamps, $15x$ the diameter of the wire.

The minimum thickness of the soffit panelling is calculated as follows:

- a) From the statutory proofs of suitability on the fulfilment of the requirements for fire resistance class F 30-B (REI 30), F 60-B (REI 60) or F 90-B (REI 90) according to DIN 4102-2:1977-09 (or DIN EN 13501-2) with a one-sided fire load. In this case, the thickness of the soffit panelling corresponds to the minimum panelling thickness of the structure.
- b) From the data of the proofs on the fulfilment of the requirements named in the scope of the fire protection concept for fire protection panelling (K230 or K260 encapsulation according to DIN EN 13501-2).

The thicker panelling according to a) or b) should have supremacy when designing the soffit. The insulation must be installed in such a way that there is no risk of slippage within the soffit panelling. If not or not otherwise stated in the general technical approvals or general construction type approvals [1] to [12], retaining bars, made of doubled, mechanically fastened strips of non-combustible construction plates or screws screwed into the soffits and protruding into the opening soffit, must be used in the surrounding soffits in the insulation installation area.

The cable or pipe insulation may be run vertically in the centre of the wall or flush to the wall surface, providing that the general technical approvals or general construction type approvals [1] to [12] and the statutory proofs of suitability of the wall structure are complied with.

In addition, the design of the cable or pipe insulation must take place according to the general technical approvals or general construction type approvals [1] to [12]. The approved dimensions, installations, etc. can also be found in these proofs of suitability.

4.2.7 Design of the different cable or pipe insulation in wooden beam ceilings

Appendix 3 shows the installation of the cable or pipe insulation "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" in wooden-beamed ceilings. Appropriate rectangular installation openings must be created before the insulation is installed. For this, additional wood fillers ($d \geq 80$ mm) are mounted in the opening, forming the soffit of the opening. The wood filler is friction-locked (e.g. with steel brackets) to the supporting beam layers. The maximum dimensions and the minimum installation thicknesses of the insulation for the "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" can be found in the general technical approvals or general construction type approvals [1] to [12].

The surrounding soffit panelling shall be created in the component openings. The soffit panelling shall consist of at least 2 layers of non-combustible construction plates and shall have a joint offset. The non-combustible plates shall be screwed into the wooden-beamed ceiling with rapid construction screws, $d \geq 3.5$ mm, with a horizontal spacing of ≤ 200 mm and a vertical spacing of ≤ 150 mm on the beams and wood filler that form the opening soffit. Alternatively, galvanised and resinated clamps, $d \geq 1.5$ mm, can be clamped into the solid wooden ceiling with a horizontal spacing of ≤ 150 mm and a vertical spacing of ≤ 150 mm. The minimum length of the fastening agent should be chosen according to the thickness of the soffit panelling, so that the minimum penetration depth s into the solid wood ceiling for rapid construction screws is $5x$ the diameter of the screw or, with clamps, $15x$ the diameter of the wire. The minimum thickness of the soffit panelling is calculated as follows:

- a) From the data of the statutory proofs of suitability on the fulfilment of the requirements for fire resistance class F 30-B (REI 30), F 60-B (REI 60) or F 90-B (REI 90) according to DIN 4102-2:1977-09 (or DIN EN 13501-2) with a one-sided

fire load. In this case, the thickness of the soffit panelling corresponds to the minimum panelling thickness of the top and/or bottom side of the ceiling.

- b) From the data of the proofs on the fulfilment of the requirements named in the scope of the fire protection concept for fire protection panelling (K230 or K260 encapsulation according to DIN EN 13501-2).

The thicker panelling according to a) or b) should have supremacy when designing the soffit.

The cable or pipe insulation may be run vertically in the centre of the ceiling or flush to the top side of the ceiling, providing that the general technical approvals or general construction type approvals [1] to [12] and the statutory proofs of suitability of the ceiling structure are complied with.

In addition, the design of the cable or pipe insulation must take place according to the general technical approvals or general construction type approvals [1] to [12]. The approved dimensions, installations, etc. can also be found in these proofs of suitability.

4.2.8 Design of the different cable or pipe insulation in wooden stand-off walls

Appendices 4 and 5 show an example of the installation of the cable or pipe insulation "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes systems" in wooden stand-off wall structures. Appropriate rectangular installation openings must be created before the insulation is installed. For this, the sub-construction is expanded to include further wooden shafts or replacements, meaning that they form the surrounding opening soffit or serve as a sub-construction for the soffit panelling. Alternatively, metal profiles can be pushed into the opening and screwed to the external planking layer. The maximum dimensions and the minimum installation thicknesses of the insulation for the "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" can be found in the general technical approvals or general construction type approvals [1] to [12].

Surrounding soffit panelling shall be created in the component openings. The soffit panelling shall consist of non-combustible construction plates and shall have a joint offset.'

The non-combustible plates shall be screwed down around their edge to the opening soffit with rapid construction screws, $d \geq 3.5$ mm, with a horizontal spacing of ≤ 200 mm and a vertical spacing of ≤ 150 mm. Alternatively, the construction plates, in the case of wooden opening soffits, can be clamped using galvanised and resinated brackets, $d \geq 1.5$ mm, in the wall structure in a wooden stand-off method with a horizontal spacing of ≤ 150 mm and a vertical spacing of ≤ 150 mm. The minimum length of the fastening agent should be chosen according to the thickness of the soffit panelling, so that the minimum penetration depth s into the soffit wall for rapid construction screws is $5x$ the diameter of the screw or, with clamps, $15x$ the diameter of the wire. With soffits made of metal profiles, the length of the rapid construction screws must be such that they penetrate the metal profile by at least 10 mm.

The minimum thickness of the soffit panelling is calculated as follows:

- a) From the statutory proofs of suitability on the fulfilment of the requirements for fire resistance class F 30-B (EI 30), F 60-B (EI 60) or F 90-B REI 90) according to DIN 4102-2:1977-09 (or DIN EN 13501-2) with a one-sided fire load. In this case, the thickness of the soffit panelling corresponds to the minimum panelling thickness of the structure.
- b) From the data of the proofs on the fulfilment of the requirements named in the scope of the fire protection concept for fire protection panelling (K230 or K260 encapsulation according to DIN EN 13501-2).

The thicker panelling according to a) or b) should have supremacy when designing the soffit.

The cable or pipe insulation may be run vertically in the centre of the wall or flush to the wall surface, providing that the general technical approvals or general construction type approvals [1] to [12] and the statutory proofs of suitability of the wall structure are complied with.

In addition, the design of the cable or pipe insulation must take place according to the general technical approvals or general construction type approval [1] to [12]. The approved dimensions, installations, etc. can also be found in these proofs of suitability.

5 Fire protection evaluation of the structure

The installation or soffit openings of the solid wood ceilings and walls described in Section 3, along with wooden-beamed ceilings and wall structures of wooden panels or wooden stand-off structures, are designed with surrounding soffit panelling made up of at least two layers of inflammable construction plates. The thicknesses of the soffit panelling for the wall and ceiling installations correspond to the requirements, on the one hand, of the minimum panelling thickness of the structure with regard to the appropriate fire resistance of the structure (fire resistance classes F 30-B (EI 30), F 60-B (EI 60) or F 90-B (EI 90) according to DIN 4102-2:1977-09 (or DIN EN 13501-2), as well as the requirements for fire protection panelling (K230 or K260 encapsulation according to DIN EN 13501-2). The resulting minimum thickness of the soffit panelling thus fulfils both the minimum dimensions of the wall and ceiling panelling listed in Section 3 of the statutory proofs of suitability. In addition, the panelling thicknesses of the soffits correspond to the details in the general technical approvals and general construction type approvals [1] to [7], [9], [10] and [12] for the installation described according to the appropriate executive principle in partition walls with a coating on both sides (light-duty partitions) or exceed these.

The closed and interconnected soffit panelling or those fastened to the surrounding sub-constructions described in Section 4 made of inflammable construction plates, in conjunction with the neighbouring closed surface panelling and the wall and ceiling structures, ensure sufficient protection against unapproved burning in the connection area with a single-sided fire load for the required fire resistance period of 30, 60 or 90 minutes and prevent the passing through of fire and smoke into the installation area of the insulation.

The general technical approvals or general construction type approvals [1] to [12] regulate the installation of the cable and pipe insulation in light-duty partitions, solid walls and solid ceilings. In conjunction with the general conditions named in Section 4 for the solid wood ceilings and walls, as well as wooden-beamed ceilings and wall structures of wooden panels or wooden stand-off structures, it can be stated that, from a fire protection standpoint, an equivalent or sufficient stability or load capacity in conjunction with the installation of the insulation can be certified. Thus, with regard to the fire behaviour of solid wood ceilings and walls, as well as wooden-beamed ceilings and wall structures of wooden panels or wooden stand-off structures, as well cable and pipe insulation, comprehensive testing experience is available.

The fire protection effectiveness of the named cable and pipe insulation of OBO Bettermann Holding GmbH & Co. KG, Menden, is, from the fire protection standpoint of IBB GmbH, Gross Schwülper, also in conjunction with installation in solid wood ceilings and walls, as well as wooden-beamed ceilings and wall structures with wooden panels or wooden stand-off structures, guaranteed, as the installation of the insulation within the soffit panelling occurs according to the basic construction principles of the general technical approvals or general construction type approvals [1] to [12].

From a fire protection point of view, IBB GmbH, Gross Schwülper, can therefore recommend the classification of the cable and combination insulation "PYROMIX, PYROPLATE Fibre, PYROSITNG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell and PYROCOMB systems" within the solid wood ceilings and walls described above and in the appendices, and in wooden-beamed ceilings and wall structures with a wood panel or wood stand-off structure, in spite of the specified deviations to the general technical approval with a one-sided fire load according to the standard temperature curve, according to the fire resistance classification of the ceiling and wall structures, in

the fire resistance class "S 30", "S 60" or "S 90" according to DIN 4102-9

for the "PYROMIX, PYROPLATE Fibre, PYROSIT NG, PYROBAG KBK or KBK-K, PYROPLUG Block and PYROCOMB Tubes, PYROMIX Screed, PYROPLUG Mini, Peg or Shell" systems

or in the

fire resistance class "R 30", "S 60" or "S 90" according to DIN 4102-11

for the "PYROCOMB" system.

Here, it should be noted that the construction details described in Section 4 and depicted in Appendices 1 to 5 must be implemented or complied with during the implementation of the measures and that the measures must be implemented by a specialist company.

The surveyor's report shall only be valid subject to the requirement that the solid wood ceilings and walls, as well as wooden-beamed ceilings and wall structures of wooden panels or wooden stand-off structures described above or in the Appendices, possess their own statutory proof of suitability that proves the fulfilment of the requirements for fire resistance class F 30-B (EI 30 or REI 30), F 60-B (EI 60 or REI 60) or

F 90-B (EI 90 or REI 90) according to DIN 4102-2: 1977-09 (or DIN EN 13501-2) for a single-sided fire load, with regard to the criteria of stability or the intrinsic load-bearing capacity, room closure and insulation.

An additional requirement is that the stiffening and load-arresting components of the structures can also at least be classified in the required fire resistance class.

6 Special information

This surveyor's report can be used in conjunction with the general technical approvals or general construction type approvals [1] to [12], as well as the general statutory proofs of suitability of the ceiling and wall structure, in the supervisory procedures as the basis of the proof of conformity, as the deviations relating to the installation of the described insulation in solid wood ceilings and walls, as well as wooden-beamed ceilings and wall structures of wooden panels or wooden stand-off structures from the presented proofs, can be regarded as "insignificant" from a fire protection standpoint. The issuing of a proof of conformity for the structure (with the note that the created construction is an "insignificant" deviation from the fundamental construction principles and general conditions in accordance with the above fire protection proof) shall be the responsibility of the construction's manufacturer.

This surveyor's report shall only be valid in conjunction with the general statutory proof of suitability. A transfer of the statements of this report to the appropriate general conditions of the construction project shall be checked and evaluated before the appropriate mounting operation is carried out.

Changes and supplementary construction details (derived from this surveyor's report) shall only be possible subject to consultation with IBB GmbH, Gross Schwülper.

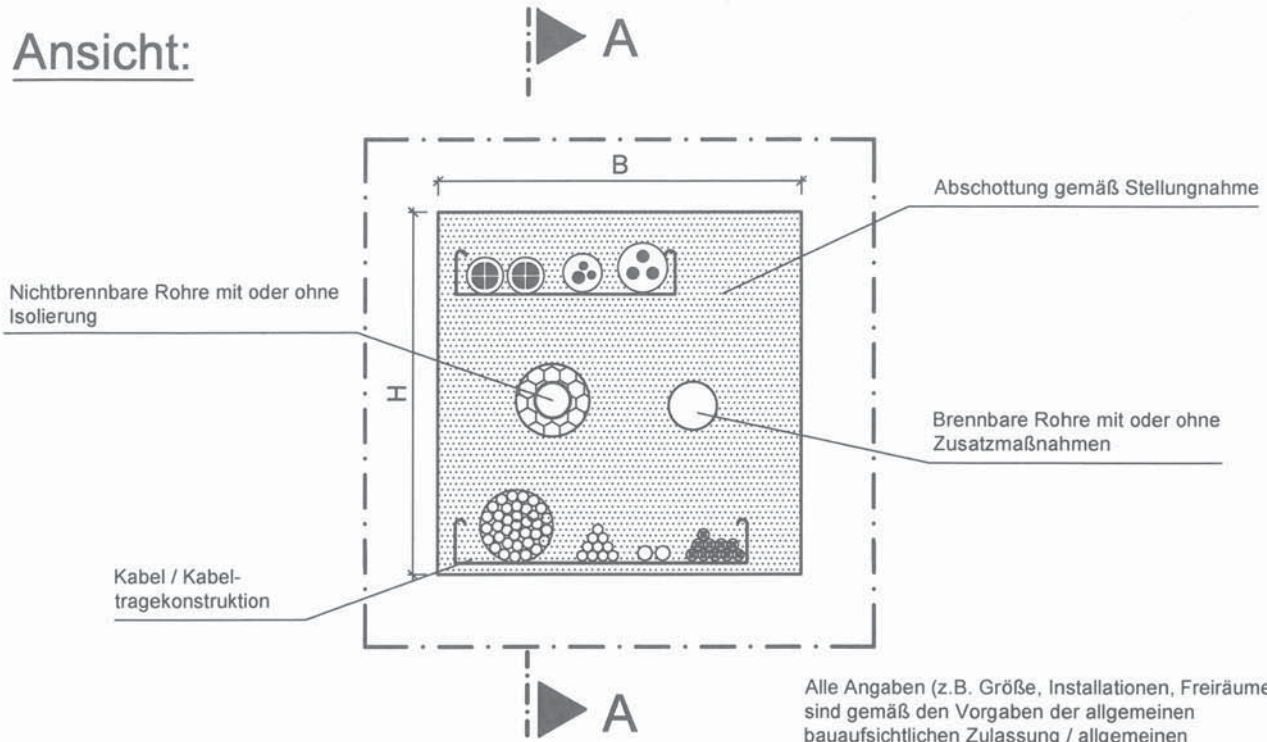
The correct execution shall be the sole responsibility of the executive companies.

This surveyor's report applies only to construction projects in the Federal Republic of Germany.

The validity of this surveyor's report shall end on 22.05.2024, although at the least with the expiry of the validity of the general statutory proofs of suitability [1] to [12] and can be extended on request according to the state of the art.

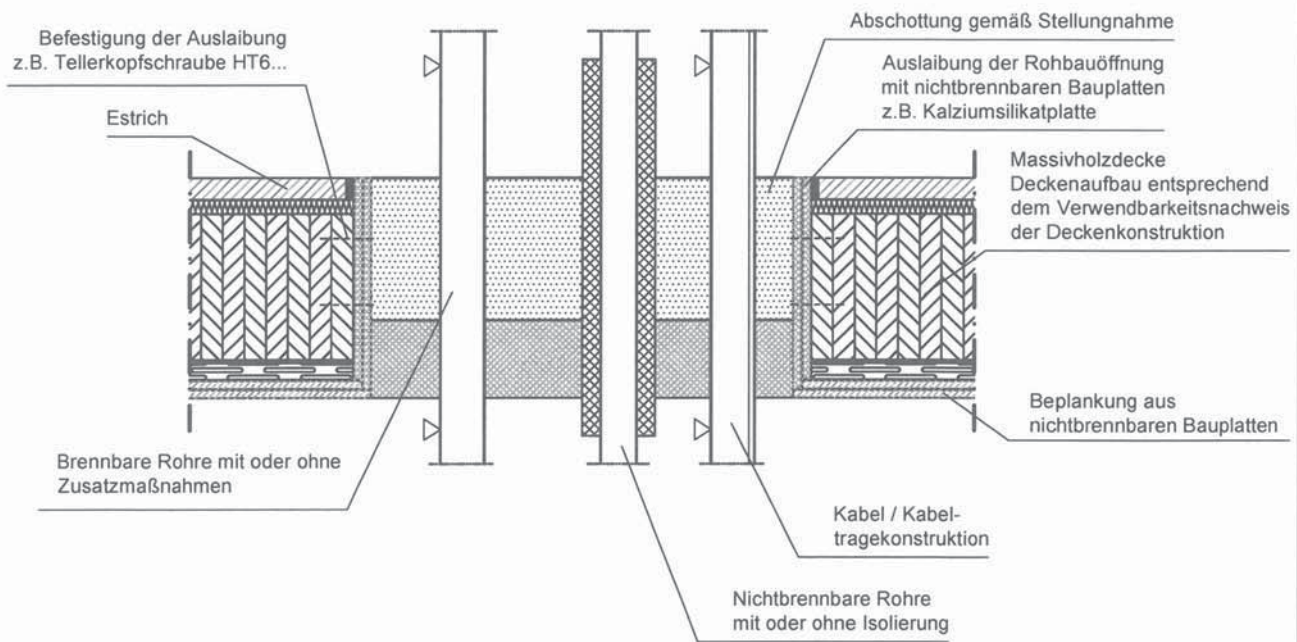
Dipl-Ing (FH) Cord Meyerhoff
Fire Protection Surveyor

Ansicht:



Alle Angaben (z.B. Größe, Installationen, Freiräumen...) sind gemäß den Vorgaben der allgemeinen bauaufsichtlichen Zulassung / allgemeinen Bauartgenehmigung zu berücksichtigen.

Schnitt A-A:



Hinweis: Die dargestellten Installationen sind lediglich beispielhaft !

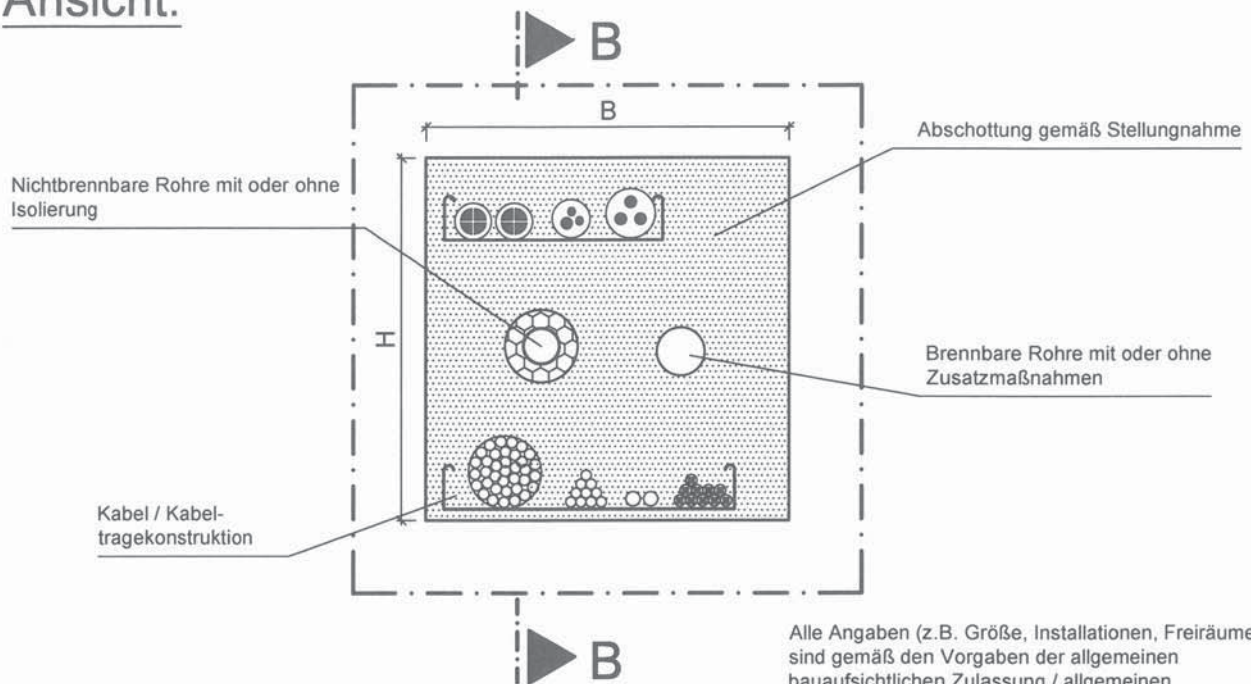
IBB | Anlage ¹ zur brand-
schutztechnischen
Stellungnahme Nr. **GA-2019**
v. **22.05.2019** **028**
Maße in cm

Kombiabschottung / Kabelabschottung der Feuerwiderstandsklasse S 30 / S 60 / S 90 nach DIN 4102-9

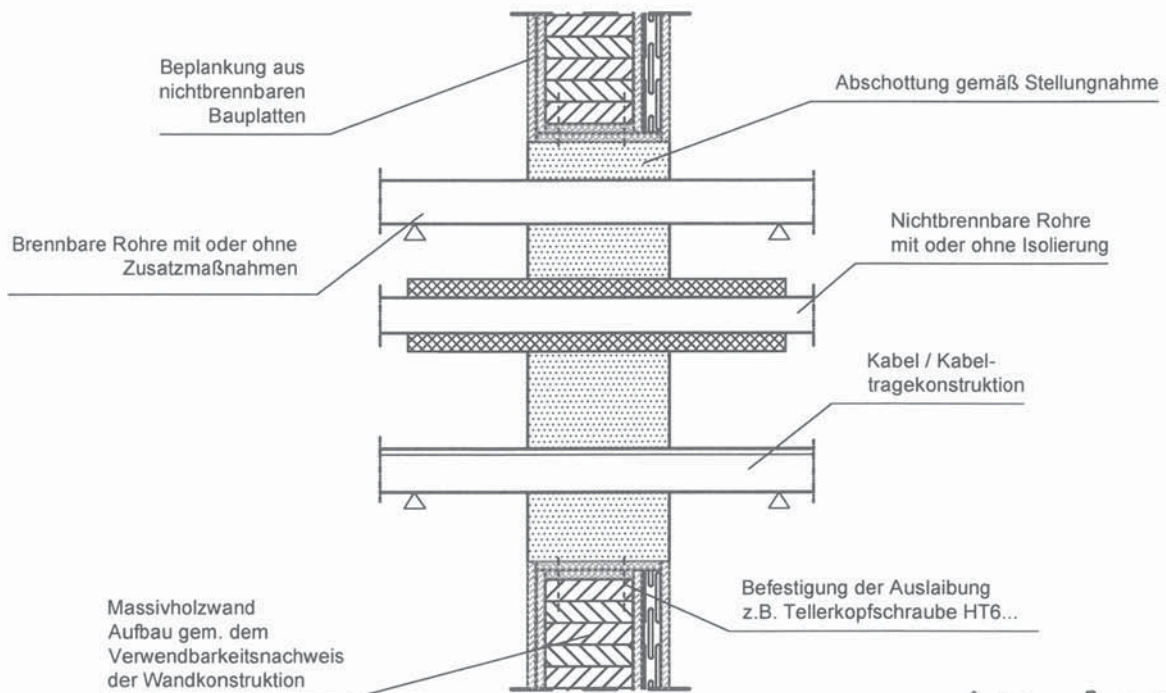
Einbau in Massivholzdecken mit einer Feuerwiderstandsdauer von mindestens 30 Minuten bei einer einseitigen Brandbeanspruchung nach DIN 4102-2

Anlage 1

Ansicht:



Schnitt B-B:



Anlage 2 zur brand-
schutztechnischen
Stellungnahme Nr. GA-2019/026
v. 22.05.2019

Hinweis: Die dargestellten Installationen sind lediglich beispielhaft !

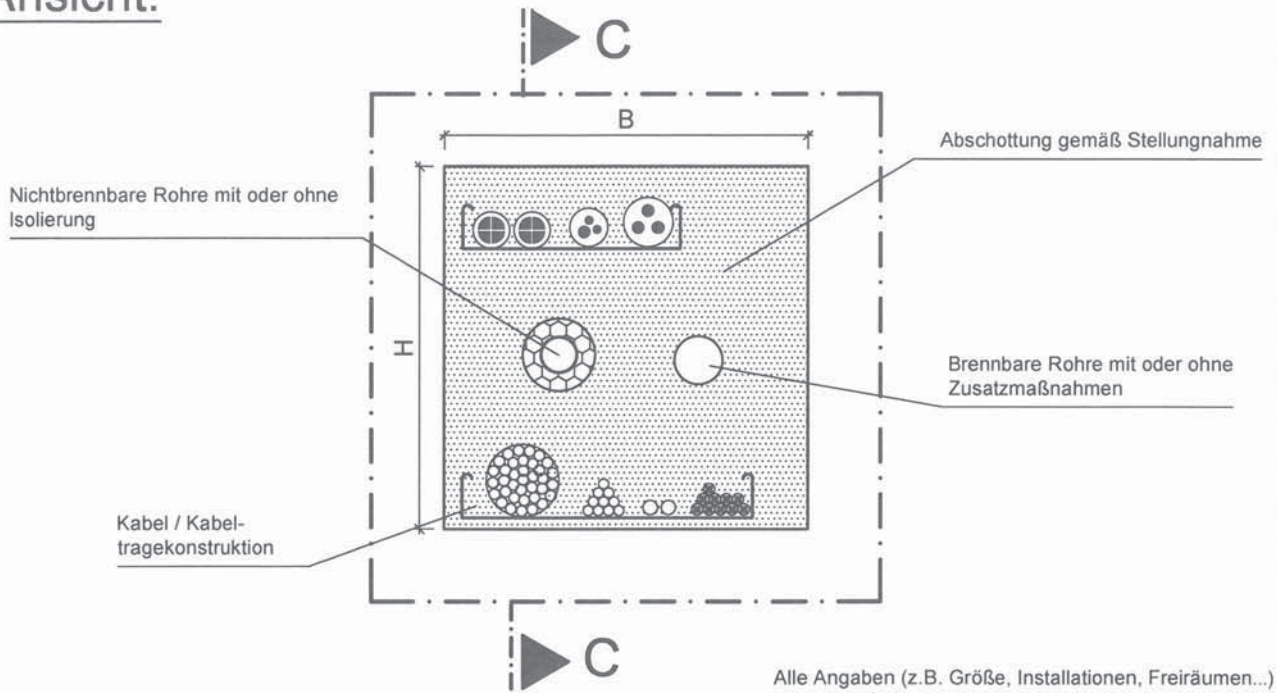
Maße in cm

Kombiabschottung / Kabelabschottung der Feuerwiderstandsklasse S 30 / S 60 / S 90 nach DIN 4102-9

Einbau in tragende raumabschließende Wandkonstruktionen in Massivholzbaweise mit einer Feuerwiderstandsdauer von mindestens 30 Minuten bei einer einseitigen Brandbeanspruchung nach DIN 4102-2

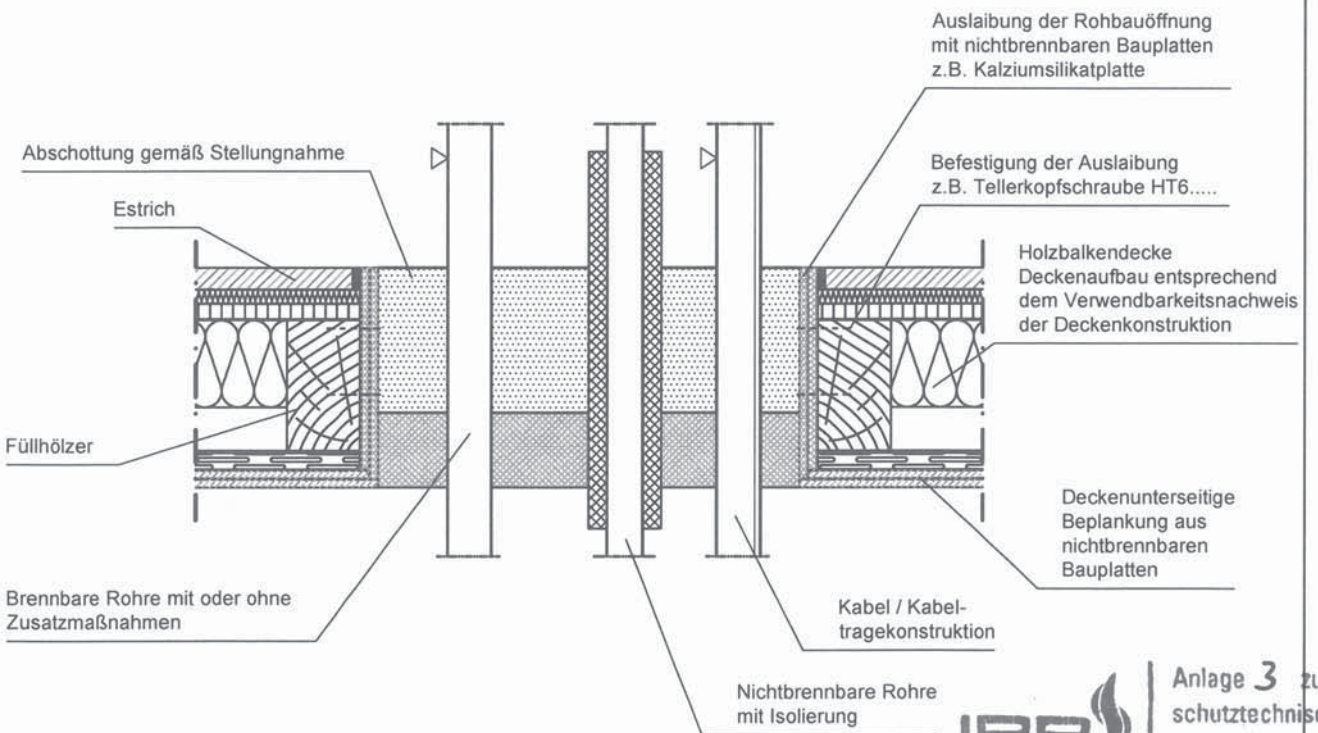
Anlage 2

Ansicht:



Alle Angaben (z.B. Größe, Installationen, Freiräumen...) sind gemäß den Vorgaben der allgemeinen bauaufsichtlichen Zulassung / allgemeinen Bauartgenehmigung zu berücksichtigen.

Schnitt C-C:



Hinweis: Die dargestellten Installationen sind lediglich beispielhaft !

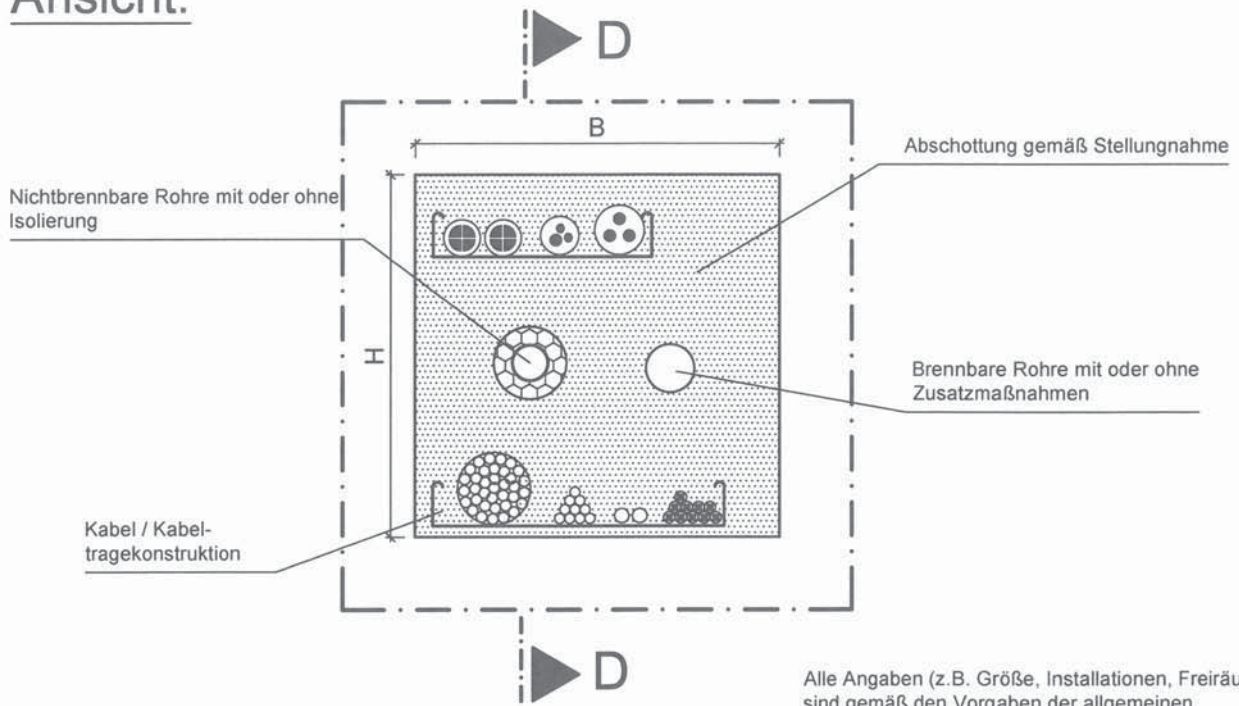
IBB | Anlage 3 zur brand-
schutztechnischen
Stellungnahme Nr.
GA-2019/028
Maße in cm u. 22.05.2019

Kombiabschottung / Kabelabschottung der Feuerwiderstandsklasse S 30 / S 60 / S 90 nach DIN 4102-9

Einbau in Holzbalkendecken mit einer Feuerwiderstandsdauer von mindestens 30 Minuten bei einer einseitigen Brandbeanspruchung nach DIN 4102-2

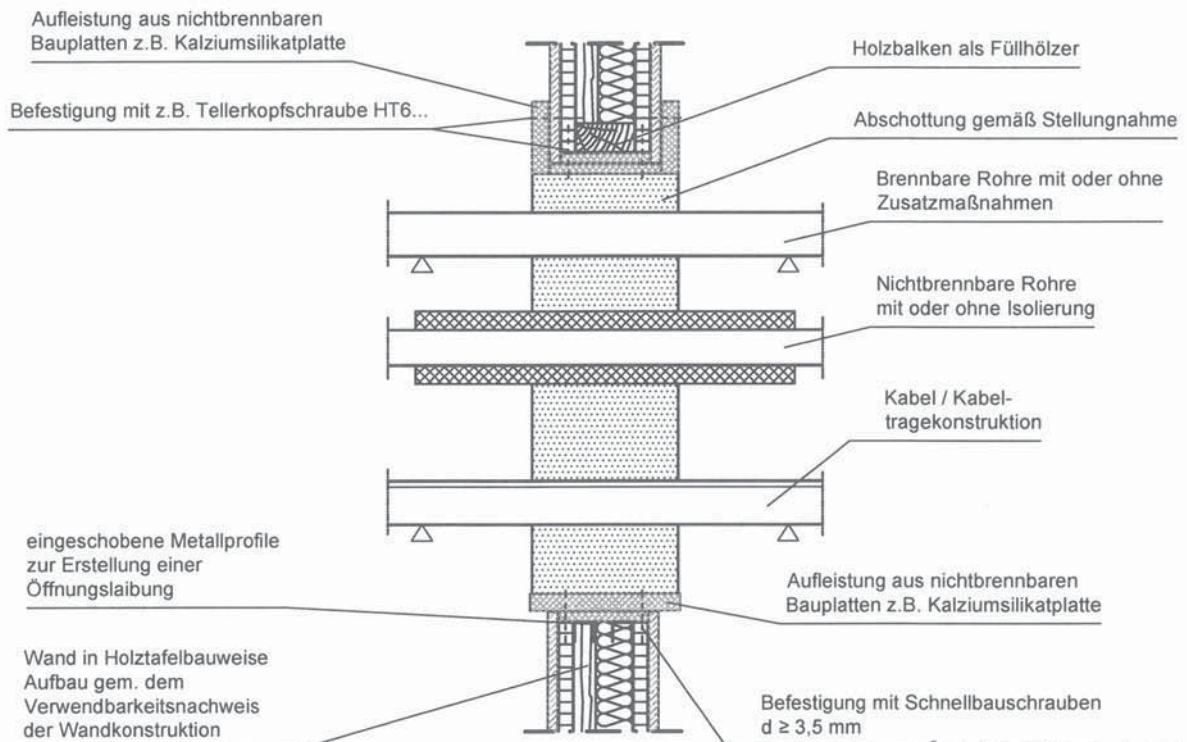
Anlage 3

Ansicht:



Alle Angaben (z.B. Größe, Installationen, Freiräumen...) sind gemäß den Vorgaben der allgemeinen bauaufsichtlichen Zulassung / allgemeinen Bauartgenehmigung zu berücksichtigen.

Schnitt D-D:



Hinweis: Die dargestellten Installationen sind lediglich beispielhaft !



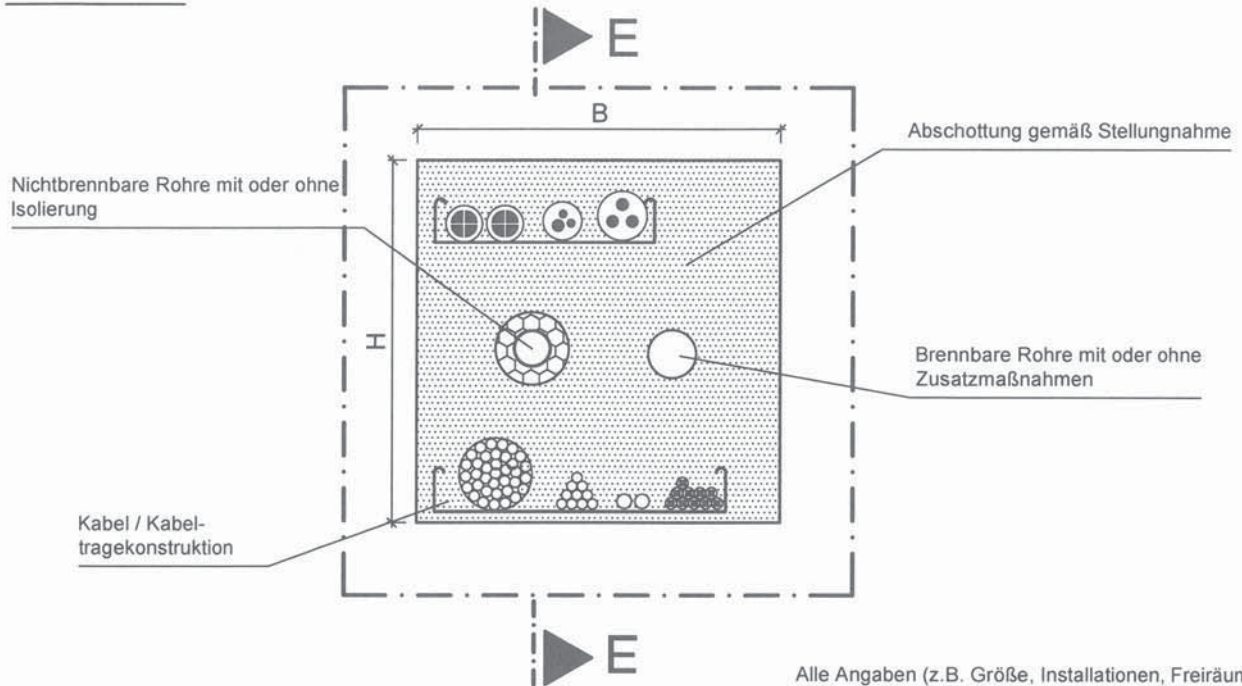
Anlage 4 zur brand-
schutztechnischen
Stellungnahme Nr. GA-2019/028
v. 22.05.2019
Maße in cm

Kombiabschottung / Kabelabschottung der Feuerwiderstandsklasse S 30 / S 60 / S 90 nach DIN 4102-9

Einbau in tragende raumabschließende Wandkonstruktionen in Holztafelbauweise mit einer Feuerwiderstandsdauer von mindestens 30 Minuten bei einer einseitigen Brandbeanspruchung nach DIN 4102-2

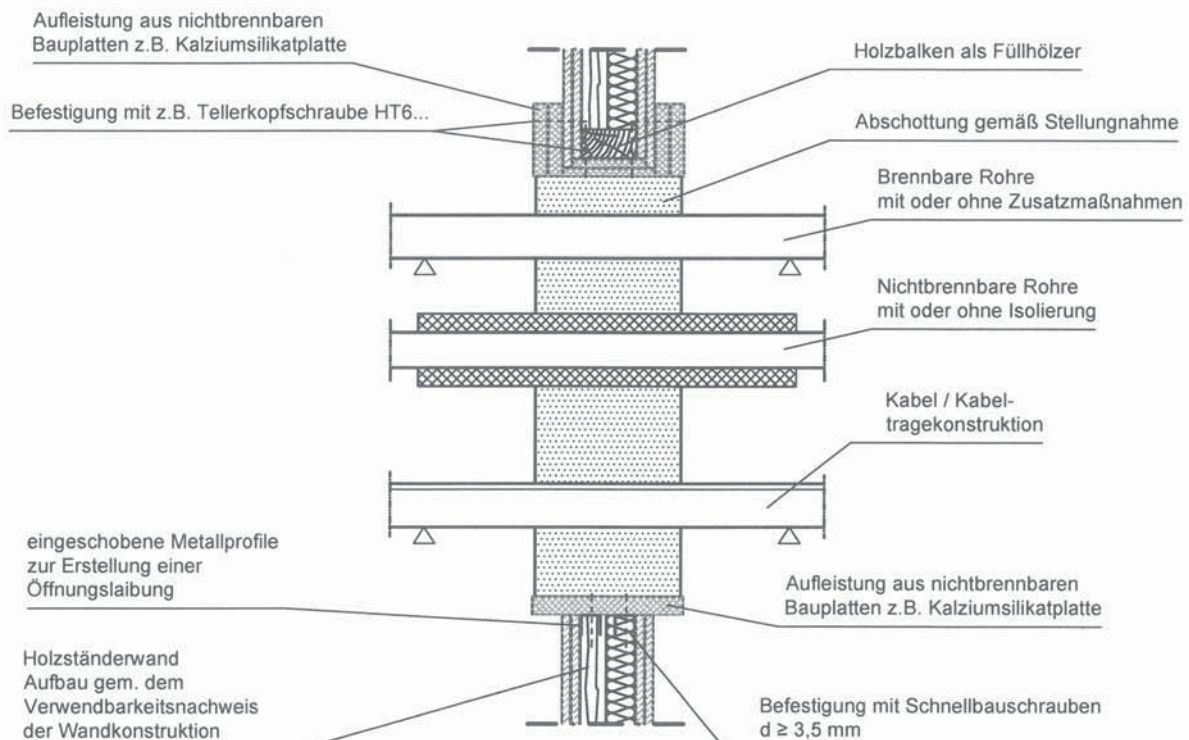
Anlage 4

Ansicht:



Alle Angaben (z.B. Größe, Installationen, Freiräumen...) sind gemäß den Vorgaben der allgemeinen bauaufsichtlichen Zulassung / allgemeinen Bauartgenehmigung zu berücksichtigen.

Schnitt E-E:



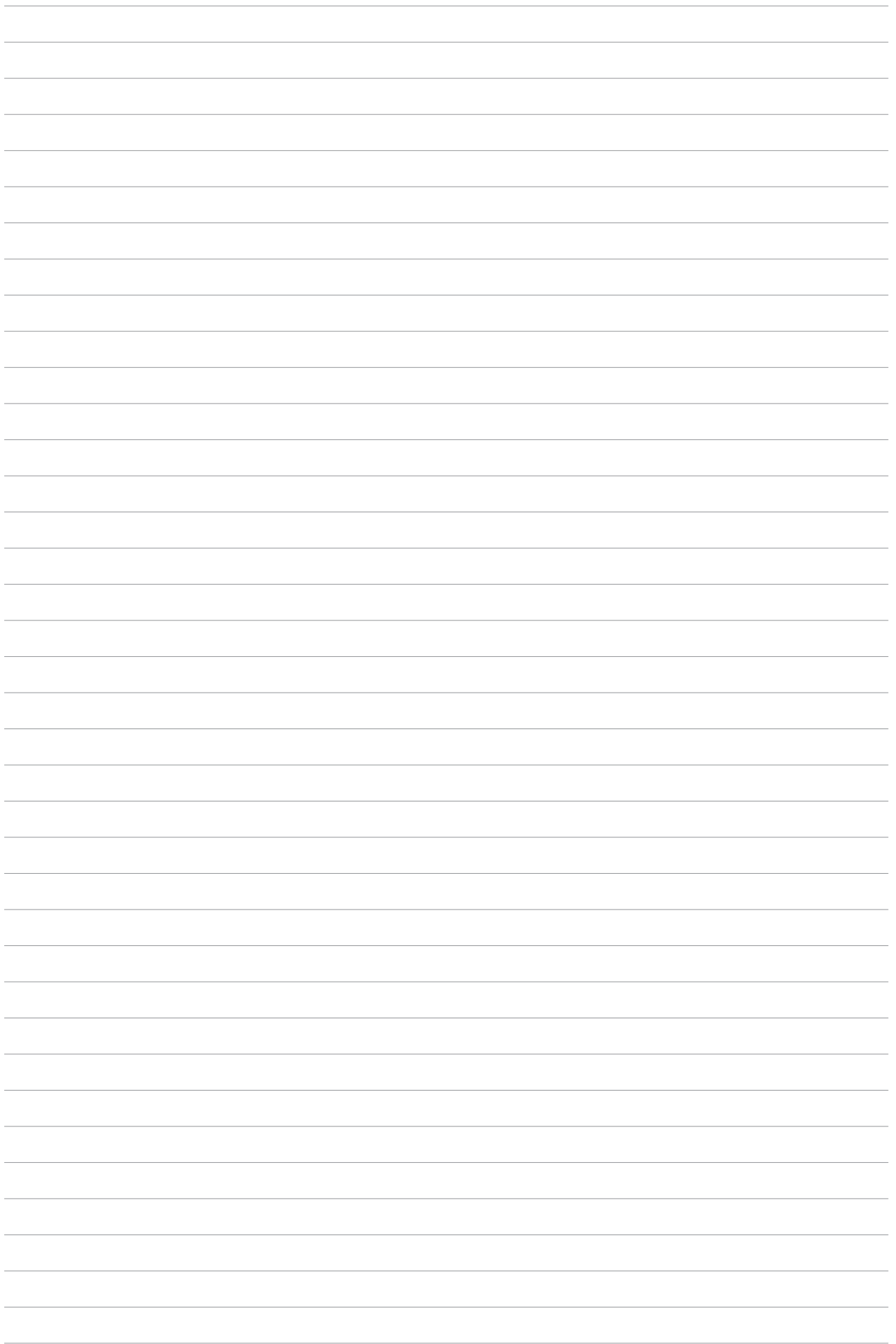
Hinweis: Die dargestellten Installationen sind lediglich beispielhaft !

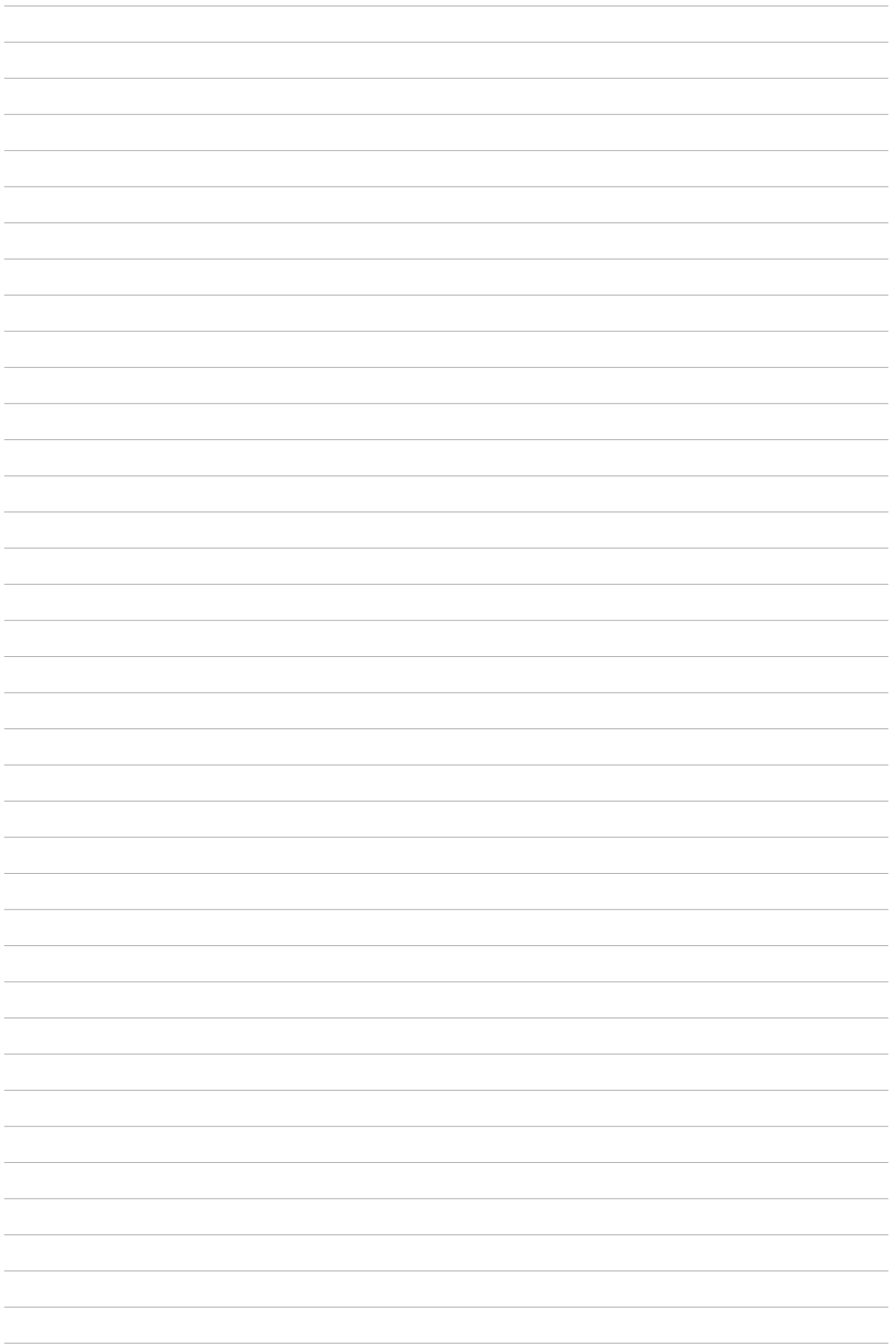
IBB | Anlage 5 zur brand-
schutztechnischen
Stellungnahme Nr. GA-2019/021
v. 22.05.2019
Maße in cm

Kombiabschottung / Kabelabschottung der Feuerwiderstandsklasse S 30 / S 60 / S 90 nach DIN 4102-9

Einbau in nichttragende raumabschließende Wandkonstruktionen in Holzständerbauweise mit einer Feuerwiderstandsdauer von mindestens 30 Minuten bei einer einseitigen Brandbeanspruchung nach DIN 4102-2

Anlage 5







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