



Warsaw, 2025-01-14

INTUSEAL Sp. z o. o.
Kineskopowa 1
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ITB Work No. 00518/25/Z00NZP

**Technical assessment of fire resistance of walls, floors and doors with installed
INTU FR GRILLE EI60, INTU FR GRILLE EI120 and INTU FR GRILLE EI240
air transfer grilles of INTUSEAL company**

1. FORMAL BASES

- 1.1. Order of Intuseal Sp. z o. o. company.
- 1.2. Agreement No. 00518/25/Z00NZP.

2. TECHNICAL BASES

- 2.1. EN 13501-2:2023: Fire classification of construction products and buildings elements – Part 2: Classification using data from fire resistance and/or smoke control tests, excluding ventilation services.
- 2.2. EN 1634-1:2018: Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware – Part 1: Fire resistance tests for doors, shutters and openable windows.
- 2.3. EN 1364-1:2015: Fire resistance tests for non-loadbearing elements – Part 1: Walls.
- 2.4. EN 1365-2:2014: Fire resistance tests for loadbearing elements – Part 2: Floors and roofs.
- 2.5. Test Report No. LP01-02646/15/Z00NP of fire resistance test of aerated concrete wall thickness of 150 mm with air transfer grilles. ITB Fire Testing Laboratory in Pionki, 2015-11-20.
- 2.6. Test Report No. L郑01-01490/16/Z00NP of fire resistance test of aerated concrete wall thickness of 150 mm with air transfer grilles. ITB Fire Testing Laboratory in Pionki, 2016-07-20.
- 2.7. Test Report No. L郑02-02646/15/Z00NP of fire resistance test of aerated concrete wall thickness of 150 mm with air transfer grilles. ITB Fire Testing Laboratory in Pionki, 2016-02-05.
- 2.8. Test Report No. L郑19-02580/16/Z00NP of fire resistance test of reinforced concrete floor thickness of 150 mm with air transfer grilles. ITB Fire Testing Laboratory in Pionki, 2017-10-16.

- 2.9.** Test Report No. L郑34-02580/16/Z00NP of fire resistance test of reinforced concrete floor thickness of 150 mm with air transfer grilles. ITB Fire Testing Laboratory in Pionki, 2017-12-06.
- 2.10.** Test Report No. L郑43-02580/16/Z00NP of fire resistance test of steel doors with air transfer grilles. ITB Fire Testing Laboratory in Pionki, 2017-12-21.
- 2.11.** Technical documentation delivered by the Sponsor

3. TECHNICAL DESCRIPTION

3.1. General information

INTU FR GRILLE EI60, INTU FR GRILLE EI120 and INTU FR GRILLE EI240 air transfer grilles are designed for filling ventilation openings in walls, floors and doors.

3.2. Structure of air transfer grilles

INTU FR GRILLE EI60, INTU FR GRILLE EI120 and INTU FR GRILLE EI240 air transfer grilles with dimensions shown in table 2 are made of strips of INTU A1, INTU A2 INTU A3 or INTU DP intumescent material of parameters shown in table 1. Intumescent material type depending on the type of grille is shown in table 2. The intumescent strips are formed in grilles in accordance with Fig. 1 – 1g.

The grille made of the intumescent material is placed in a steel casing with dimensions adapted to air transfer grilles, made of galvanized steel sheet thickness of 0.5 mm $\pm 15\%$ (round grilles), 0.7 mm $\pm 15\%$ (rectangular grilles) and 1.0 mm $\pm 15\%$ (rectangular grilles). The thickness of the steel casing (dimension along the thickness of the floor/ wall) is in accordance with Table 2. On both sides of the air transfer grille (parallel to the floor/ wall surface), the casing is made of steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 0.8 mm $\pm 15\%$ (rectangular grilles) or 1.0 mm $\pm 15\%$ (round grilles) wire thickness.

Air transfer grilles are covered with the masking grilles made of steel sheet thickness of 0.9 mm $\pm 15\%$ and dimensions according to Table 2.

Dimensions (width x height or diameter) of the grilles given in table 2 are the maximum dimensions and smaller dimensions are allowed.

Table 1. Properties of the intumescent materials

Intumescent material type	Intumescent material thickness	Intumescent material depth	Expansion pressure, [N/mm ²]	Expansion height, [mm]	Relative expansion height	Density, [g/cm ³]
INTU A1	2.0 mm ± 0.5 mm	36 mm $\pm 10\%$	0.443 $\pm 15\%$	50.40 $\pm 15\%$	24.60 $\pm 15\%$	1.20 $\pm 15\%$
INTU A2	2.5 mm ± 0.5 mm	36 mm $\pm 10\%$	0.769 $\pm 15\%$	39.55 $\pm 15\%$	15.89 $\pm 15\%$	1.10 $\pm 15\%$
INTU A3	2.5 mm ± 0.5 mm	36 mm $\pm 10\%$	0.607 $\pm 15\%$	48.20 $\pm 15\%$	18.70 $\pm 15\%$	1.10 $\pm 15\%$
INTU DP	3.6 mm ± 0.6 mm	40 mm $\pm 10\%$	0.95 – 1.60	-	4.5 – 9.5	-

Table 2. Dimensions of the air transfer grilles

No.	Air transfer grille type	Maximum dimensions, width x height (or diameter) of grille, $\pm 5\text{mm}$ [mm]	Thickness of steel casing, $\pm 5\text{mm}$ [mm]	Intum. material type	Place of assembly (floor/ wall/ door)	Dimensions of masking grille (width x height, or diameter), $\pm 5\text{mm}$ [mm]
1	INTU FR GRILLE EI60	$\varnothing 100$	50	INTU A3	wall EI 60	143 x 143
2	INTU FR GRILLE EI120	$\varnothing 100$	80	INTU A3	wall EI 120	143 x 143
3	INTU FR GRILLE EI60	$\varnothing 200$	50	INTU A3	wall EI 60	244 x 244
4	INTU FR GRILLE EI120	$\varnothing 200$	80	INTU A3	wall EI 120	244 x 244
5	INTU FR GRILLE EI60	$\varnothing 400$	50	INTU A3	wall EI 60	447 x 447
6	INTU FR GRILLE EI120	$\varnothing 400$	80	INTU A3	wall EI 120	447 x 447
7	INTU FR GRILLE EI60	100 x 100	40	INTU A2	wall EI 60	143 x 143
8	INTU FR GRILLE EI120	100 x 100	40	INTU A1	wall EI 120	143 x 143
9	INTU FR GRILLE EI240	100 x 100	80	INTU A2	wall EI 240	143 x 143
10	INTU FR GRILLE EI60	300 x 300	40	INTU A2	wall EI 60	346 x 346
11	INTU FR GRILLE EI120	300 x 300	40	INTU A1	wall EI 120	346 x 346
12	INTU FR GRILLE EI240	300 x 300	80	INTU A2	wall EI 240	346 x 346
13	INTU FR GRILLE EI120	600 x 600	80	INTU A1	wall EI 30	651 x 651
14	INTU FR GRILLE EI60	$\varnothing 100$	50	INTU A3	floor EI 60	143 x 143
15	INTU FR GRILLE EI120	$\varnothing 100$	80	INTU A3	floor EI 120	143 x 143
16	INTU FR GRILLE EI60	$\varnothing 200$	50	INTU A3	floor EI 60	244 x 244
17	INTU FR GRILLE EI120	$\varnothing 200$	80	INTU A3	floor EI 120	244 x 244
18	INTU FR GRILLE EI60	$\varnothing 400$	50	INTU A3	floor EI 60	447 x 447
19	INTU FR GRILLE EI120	$\varnothing 400$	80	INTU A3	floor EI 120	447 x 447
20	INTU FR GRILLE EI60	100 x 100	40	INTU A2	floor EI 60	143 x 143
21	INTU FR GRILLE EI120	100 x 100	40	INTU A1	floor EI 120	143 x 143
22	INTU FR GRILLE EI240	100 x 100	80	INTU A2	floor EI 180	143 x 143
23	INTU FR GRILLE EI60	300 x 300	40	INTU A2	floor EI 60	346 x 346
24	INTU FR GRILLE EI120	300 x 300	40	INTU A1	floor EI 120	346 x 346
25	INTU FR GRILLE EI240	300 x 300	80	INTU A2	floor EI 180	346 x 346
26	INTU FR GRILLE EI240	600 x 600	80	INTU A2	floor EI 90	651 x 651
27	INTU FR GRILLE DS	400 x 100	50	INTU A2	door EI 60	447 x 143
28	INTU FR GRILLE DP	400 x 100	50	INTU DP	door EI 90	447 x 143

3.3. Air transfer grilles in wall supporting construction

Air transfer grilles No. 1 – 13 (in accordance with Table 2) can be installed into walls thickness of min. 150 mm and fire resistance class given in p. 4, one of the following types:

- walls made of solid bricks or checker bricks density of not less than 600 kg/m^3 ,
- concrete and reinforced concrete walls density of not less than 600 kg/m^3 ,
- walls made of aerated concrete blocks density of not less than 600 kg/m^3 .

The air transfer grilles are placed in the middle of the wall thickness, at any height in the wall. The grilles are covered with a masking grilles on both sides of the wall.

The cross-section through the grille mounted in the wall is shown in Fig. 2.

3.4. Air transfer grilles in floor supporting construction

Air transfer grilles No. 14 – 26 (in accordance with Table 2) can be installed into reinforced concrete floors thickness of min. 150 mm, density of not less than 1700 kg/m³ and fire resistance class given in p. 4.

The air transfer grilles are placed in the bottom of the floor. The grilles are covered with a masking grilles on both sides of the floor.

The cross-section through the grille mounted in the floor is shown in Fig. 3.

3.5. Air transfer grille in doors

Air transfer grille No. 27 and 28 (in accordance with Table 2) can be installed into steel doors thickness of min. 52 mm, with mineral wool filling density of min. 155 kg/m³, hinged in steel door frame, with fire resistance class given in p. 4, provided that the doorset were tested with other air transfer grille and the fixing solution of the grille remains the same as tested and the position of the top edge of the grille remains the same as tested, wherein the distance from the bottom edge of the door leaf and the top edge of the grille cannot be greater than 500 mm.

The air transfer grille is placed in the middle of the door leaf thickness. The grille is covered with a masking grilles on both sides of the door leaf.

The cross-section through the grille mounted in the door is shown in Fig. 4.

4. ASSESSMENT OF FIRE RESISTANCE OF BUILDING PARTITIONS WITH ATG

4.1. Walls

- 4.1.1. Based on the analysis of test results [2.5 – 2.7] and provided technical documentation [2.11] it is concluded that the application of **air transfer grilles No. 13** (in accordance with Table 2) described in p. 3.1 – 3.2, **in walls thickness of min. 150 mm** described in p. 3.3, with **fire resistance class EI 30 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this wall.
- 4.1.2. Based on the analysis of test results [2.5 – 2.7] and provided technical documentation [2.11] it is concluded that the application of **air transfer grille No. 1, 3, 5, 7 and 10** (in accordance with Table 2) described in p. 3.1 – 3.2, **in walls thickness of min. 150 mm** described in p. 3.3, with **fire resistance class EI 60 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this wall.
- 4.1.3. Based on the analysis of test results [2.5 – 2.7] and provided technical documentation [2.11] it is concluded that the application of **air transfer grilles No. 2, 4, 6, 8 and 11** (in accordance with Table 2) described in p. 3.1 – 3.2, **in walls thickness of min. 150 mm** described in p. 3.3, with **fire resistance class EI 120 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this wall.
- 4.1.4. Based on the analysis of test results [2.5 – 2.7] and provided technical documentation [2.11] it is concluded that the application of **air transfer grille No. 9 and 12** (in accordance with Table 2) described in p. 3.1 – 3.2, **in walls thickness of min. 150 mm** described in p. 3.3, with **fire resistance class EI 240 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this wall.

4.2. Floors

- 4.2.1.** Based on the analysis of test results [2.8 – 2.9] and provided technical documentation [2.11] it is concluded that the application of **air transfer grille No. 14, 16, 18, 20 and 23** (in accordance with Table 2) described in p. 3.1 – 3.2, **in floors thickness of min. 150 mm** described in p. 3.4, with **fire resistance class REI 60 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this floor.
- 4.2.2.** Based on the analysis of test results [2.8 – 2.9] and provided technical documentation [2.11] it is concluded that the application of **air transfer grille No. 26** (in accordance with Table 2) described in p. 3.1 – 3.2, **in floors thickness of min. 150 mm** described in p. 3.4, with **fire resistance class REI 90 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this floor.
- 4.2.3.** Based on the analysis of test results [2.8 – 2.9] and provided technical documentation [2.11] it is concluded that the application of **air transfer grilles No. 15, 17, 19, 21 and 24** (in accordance with Table 2) described in p. 3.1 – 3.2, **in floors thickness of min. 150 mm** described in p. 3.4, with **fire resistance class REI 120 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this floor.
- 4.2.4.** Based on the analysis of test results [2.8 – 2.9] and provided technical documentation [2.11] it is concluded that the application of **air transfer grilles No. 22 and 25** (in accordance with Table 2) described in p. 3.1 – 3.2, **in floors thickness of min. 150 mm** described in p. 3.4, with **fire resistance class REI 180 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this floor.

4.3. Doors

- 4.3.1.** Based on the analysis of test results [2.10] and provided technical documentation [2.11] it is concluded that the application of **air transfer grille No. 27** (in accordance with Table 2) described in p. 3.1 – 3.2, **in steel doors** described in p. 3.5, with **fire resistance class EI₁ 60 or lower/ EI₂ 60 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this doors.
- 4.3.2.** Based on the analysis of test results [2.10] and provided technical documentation [2.11] it is concluded that the application of **air transfer grille No. 28** (in accordance with Table 2) described in p. 3.1 – 3.2, **in steel doors** described in p. 3.5, with **fire resistance class EI₁ 90 or lower/ EI₂ 90 or lower**, determined in accordance with PN-EN 13501-2:2023 [2.1], will not change the fire resistance class of this doors.

5. EXPIRY DATE OF THE ASSESSMENT

Technical assessment given in p. 4 is valid until 30th of January 2028, provided that there will be no material or structural changes in air transfer grilles.

Prepared by:

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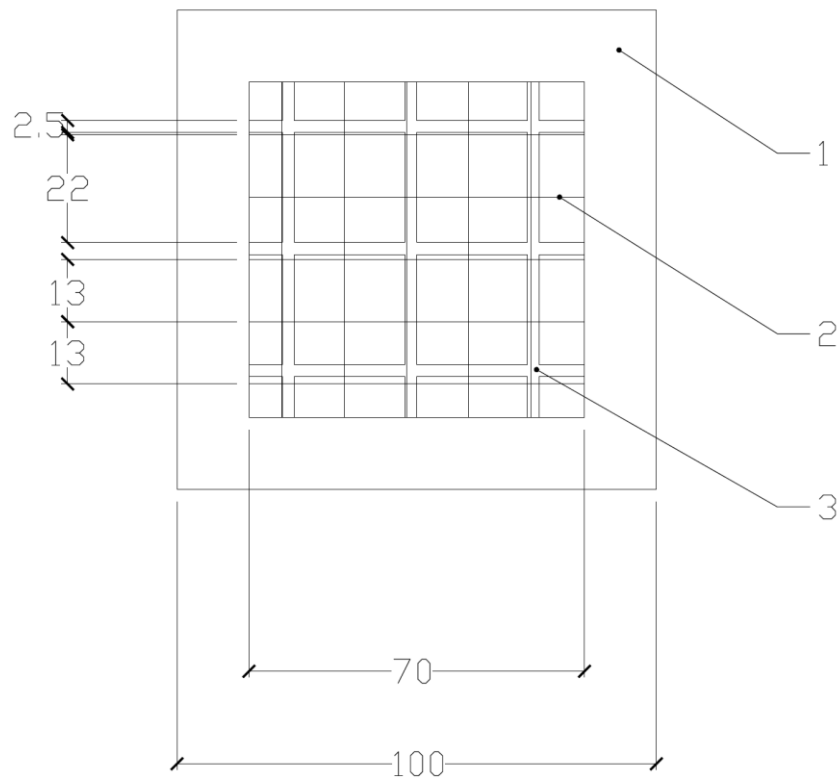
Verified by:

Paweł Sulik,
PhD. Civil Eng.
(e-signature)

Approved by:

Bartłomiej Papis,
PhD. Eng.
(e-signature)

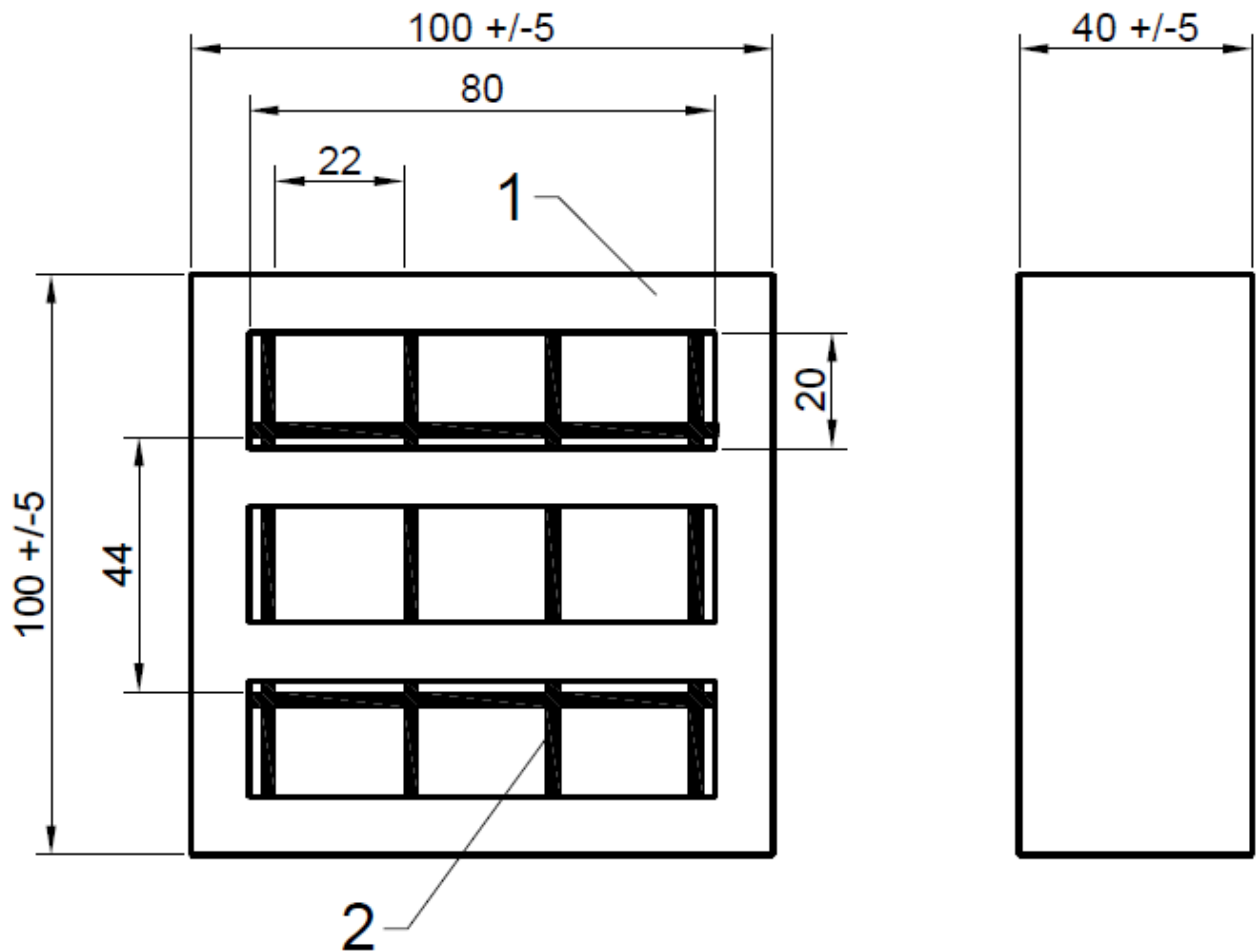
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel
sheet thickness of 0.7 mm $\pm 15\%$
- 2) steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 0.8 mm $\pm 15\%$ wire thickness
- 3) intumescent material in accordance with table 2

Fig. 1 INTU FR GRILLE EI60 / INTU FR GRILLE EI240, 100 x 100 mm

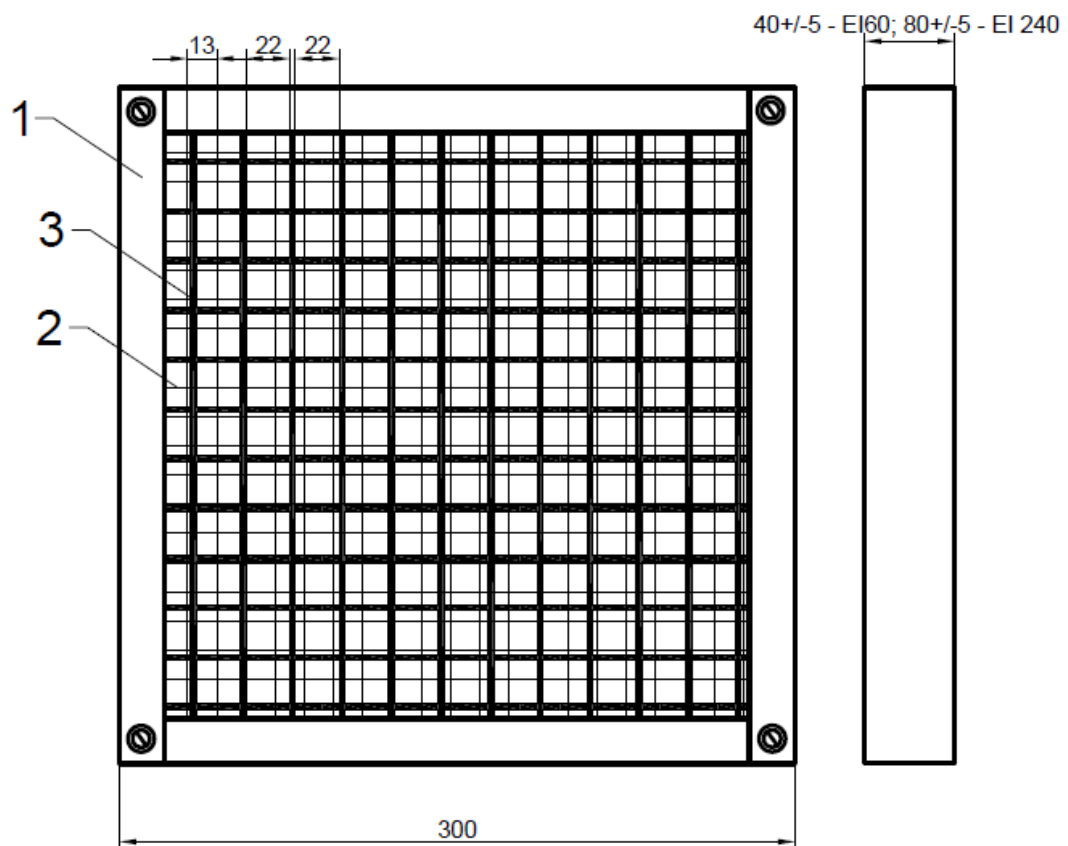
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 0.7 mm $\pm 15\%$
- 2) intumescent material in accordance with table 2

Fig. 1a INTU FR GRILLE EI120, 100 x 100 mm

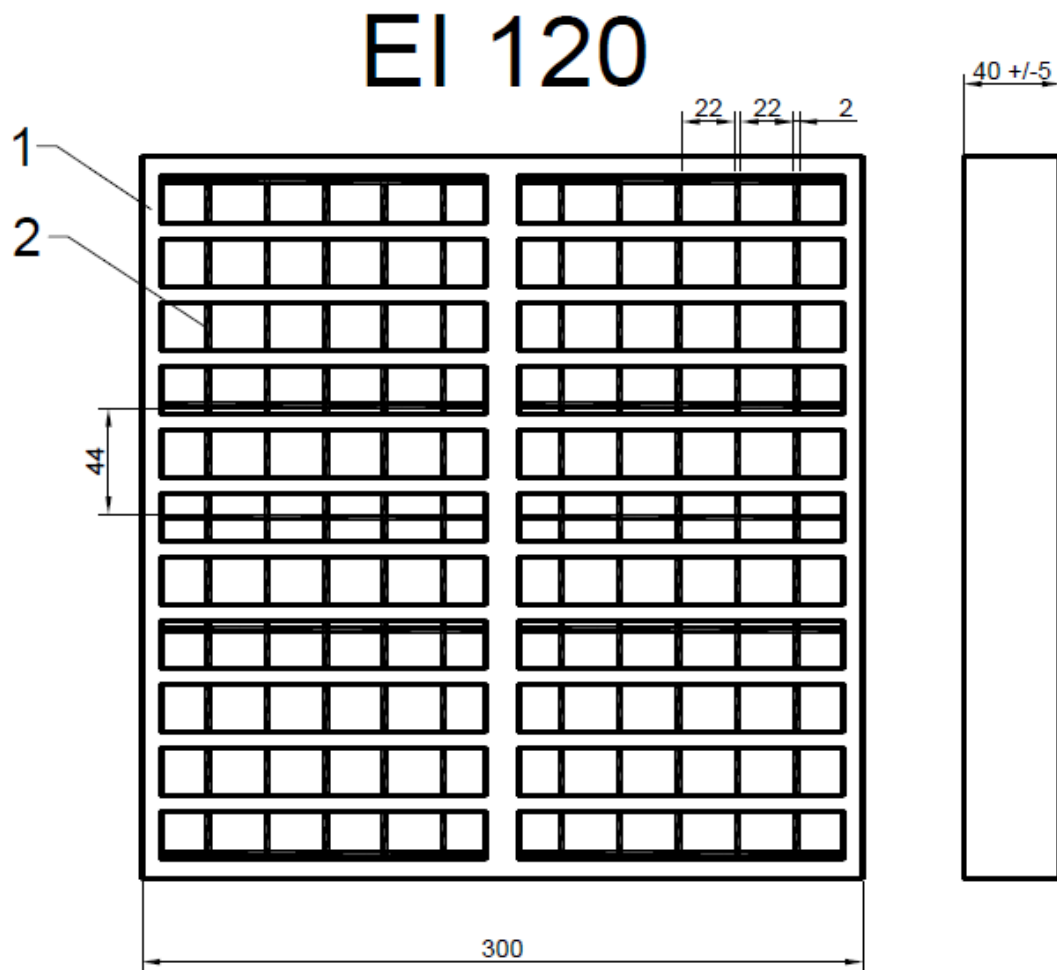
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 0.7 mm $\pm 15\%$
- 2) steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 0.8 mm $\pm 15\%$ wire thickness
- 3) intumescent material in accordance with table 2

Fig. 1b INTU FR GRILLE EI60 / INTU FR GRILLE EI240, 300 x 300 mm

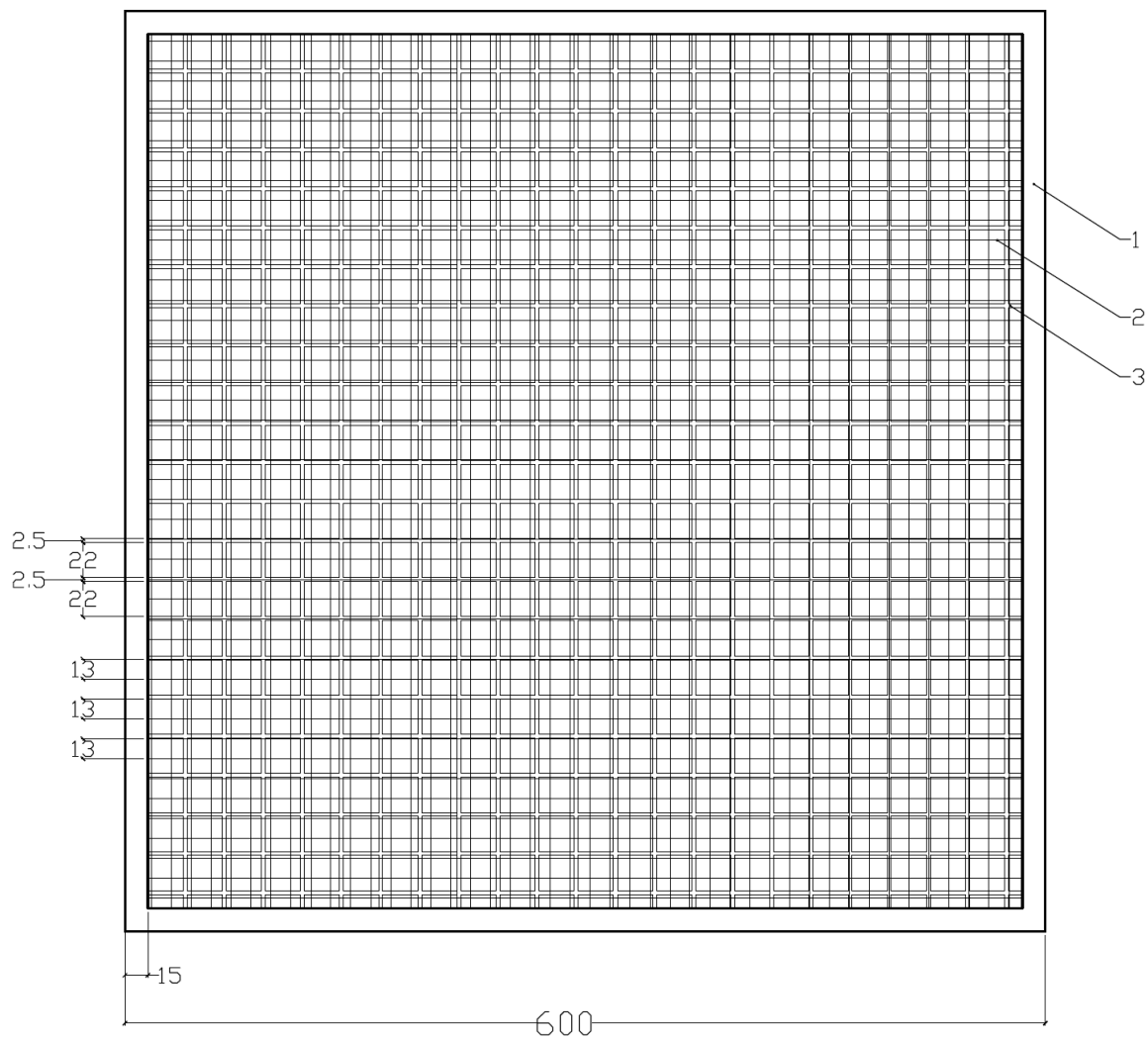
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 1.0 mm $\pm 15\%$
- 2) intumescent material in accordance with table 2

Fig. 1c INTU FR GRILLE EI120, 300 x 300 mm

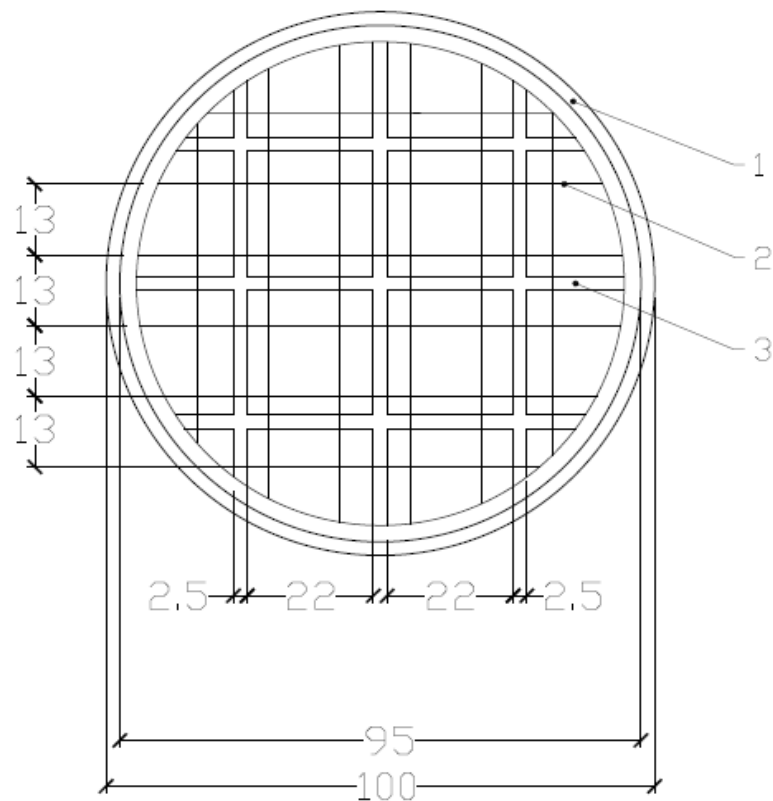
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 0.7 mm $\pm 15\%$
- 2) steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 0.8 mm $\pm 15\%$ wire thickness
- 3) intumescent material in accordance with table 2

Fig. 1d INTU FR GRILLE EI60 / INTU FR GRILLE EI240, 600 x 600 mm

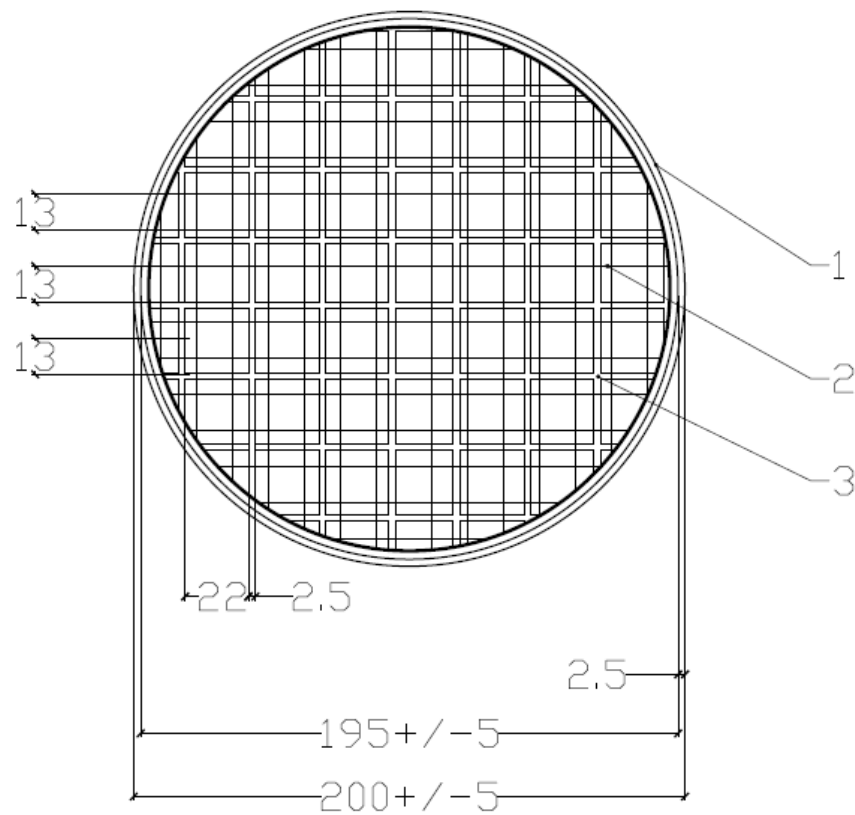
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 0.5 mm $\pm 15\%$
- 2) steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 1.0 mm $\pm 15\%$ wire thickness
- 3) intumescent material in accordance with table 2

Fig. 1e INTU FR GRILLE EI60 / INTU FR GRILLE EI120, $\varnothing 100$ mm

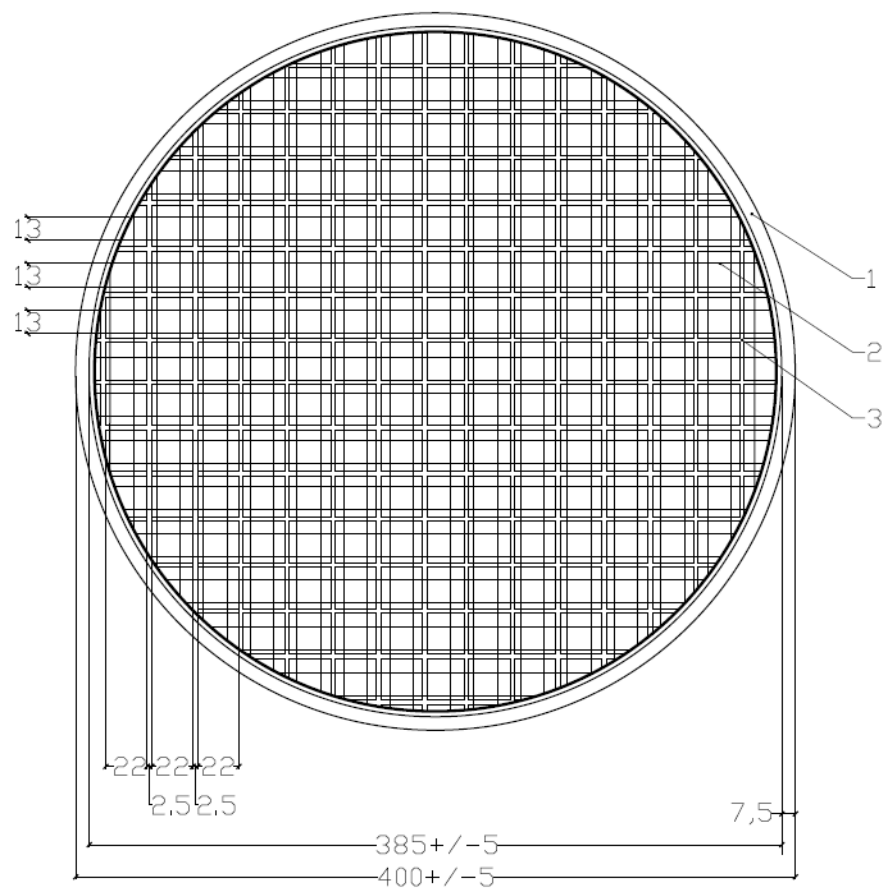
Dimensions in mm



- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 0.5 mm $\pm 15\%$
- 2) steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 1.0 mm $\pm 15\%$ wire thickness
- 3) intumescent material in accordance with table 2

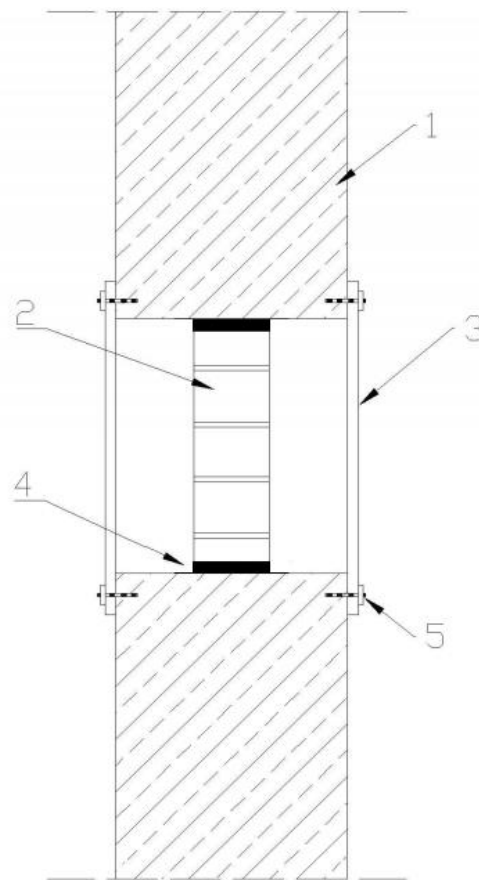
Fig. 1f INTU FR GRILLE EI60 / INTU FR GRILLE EI120, $\varnothing 200$ mm

Dimensions in mm



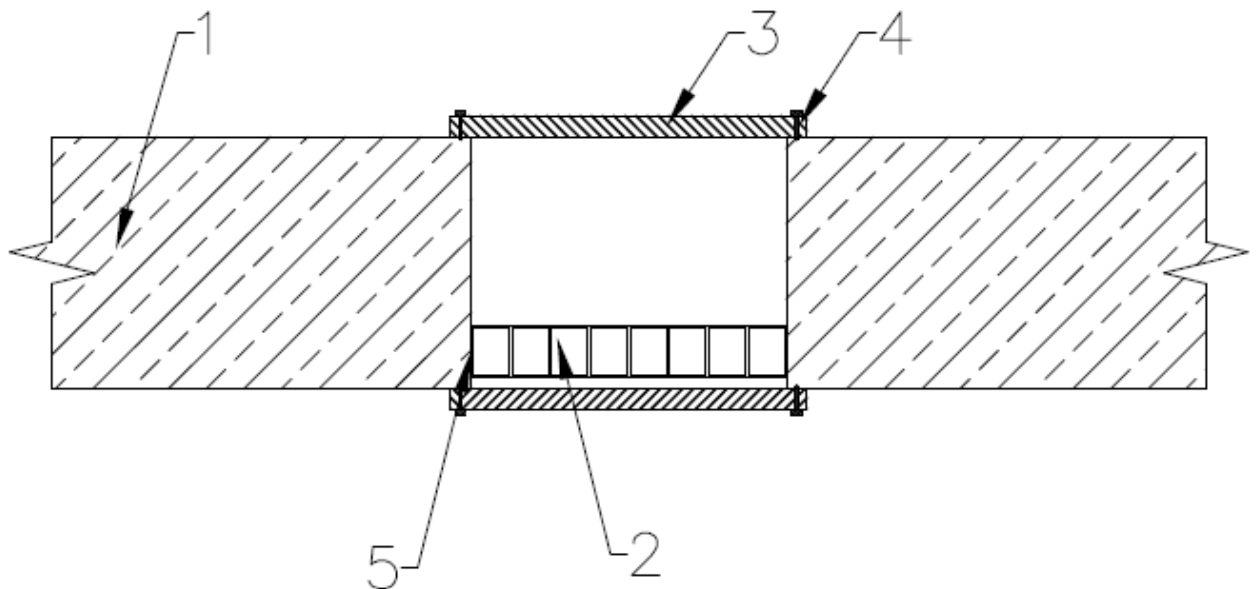
- 1) steel casing with dimensions adapted to air transfer grille, made of galvanized steel sheet thickness of 0.5 mm $\pm 15\%$
- 2) steel wire netting with 13 x 13 mm $\pm 15\%$ mesh size and 1.0 mm $\pm 15\%$ wire thickness
- 3) intumescent material in accordance with table 2

Fig. 1g INTU FR GRILLE EI60 / INTU FR GRILLE EI120, $\varnothing 400$ mm



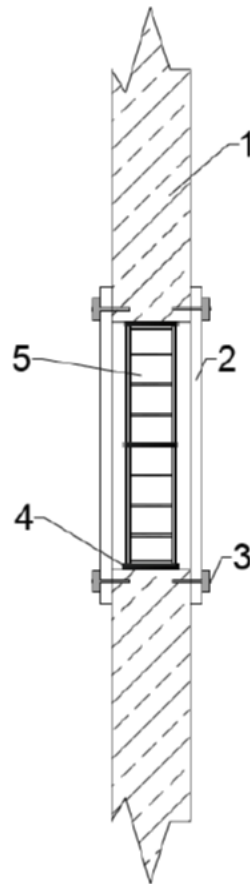
- 1) Wall thickness of min 150 mm
- 2) Air transfer grille INTU FR GRILLE EI60 / INTU FR GRILLE EI120 / INTU FR GRILLE EI240
- 3) Masking grille made of steel sheet thickness of 0.9 mm $\pm 15\%$
- 4) Intumescent mass density of $1.6 \text{ g/cm}^3 \pm 5\%$
- 5) Screw dimensions of 3 x 25 mm:
 - 2 pcs. in grilles dimensions of 100x100mm
 - 4 pcs. in grilles dimensions of 300x300mm
 - 8 pcs. in grilles dimensions of 600x600mm
 - 2 pcs. in grilles dimension of $\varnothing 100$
 - 4 pcs. in grilles dimension of $\varnothing 200$
 - 4 pcs. in grilles dimension of $\varnothing 400$

Fig. 2. Cross-section through the air transfer grille in wall



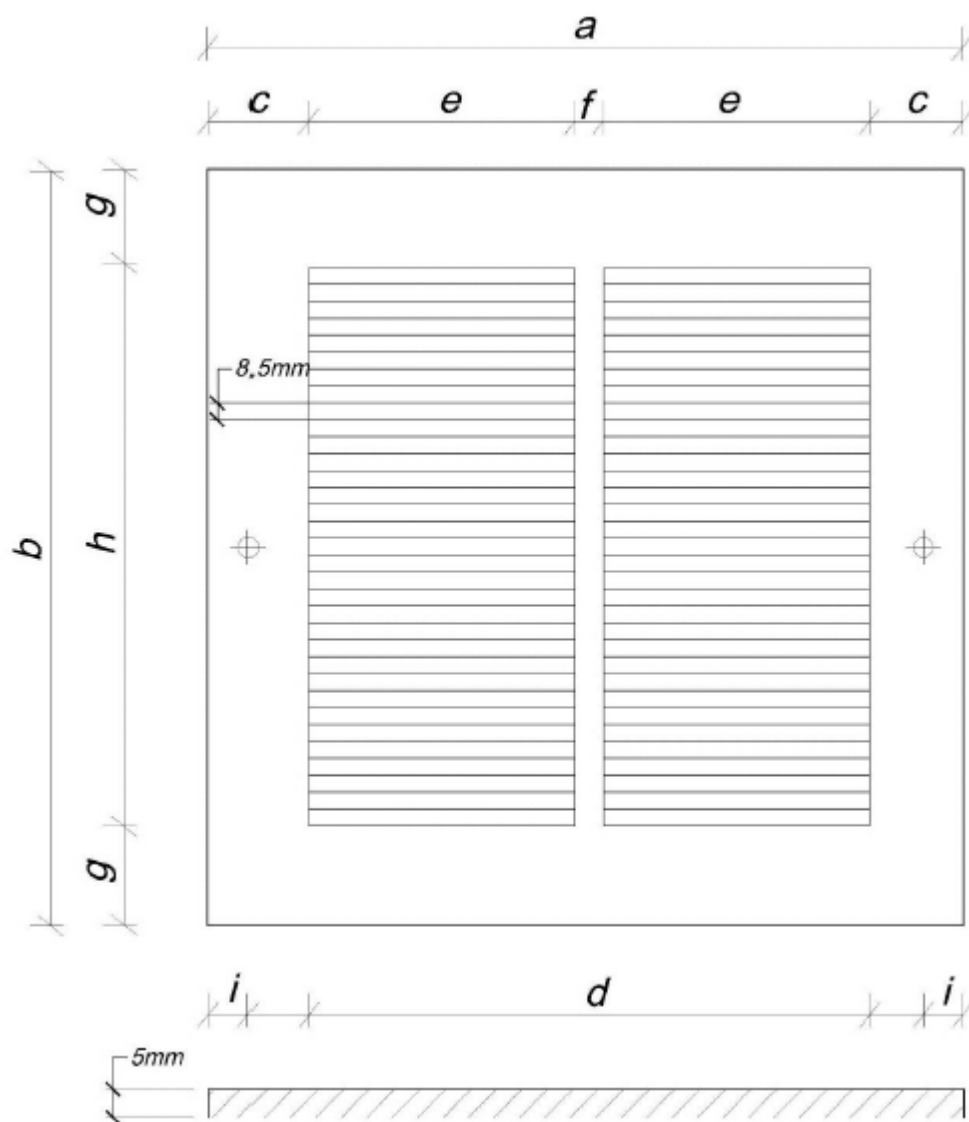
- 1) Floor thickness of min 150 mm
- 2) Air transfer grille INTU FR GRILLE EI60 / INTU FR GRILLE EI120 / INTU FR GRILLE EI240
- 3) Masking grille made of steel sheet thickness of 0.9 mm $\pm 15\%$
- 4) Screw dimensions of 3 x 25 mm:
 - 2 pcs. in grilles dimensions of 100x100mm
 - 4 pcs. in grilles dimensions of 300x300mm
 - 8 pcs. in grilles dimensions of 600x600mm
 - 2 pcs. in grilles dimension of $\varnothing 100$
 - 4 pcs. in grilles dimension of $\varnothing 200$
 - 4 pcs. in grilles dimension of $\varnothing 400$
- 5) Intumescent mass density of 1.6 g/cm³ $\pm 5\%$

Fig. 3 Cross-section through the air transfer grille in floor



- 1) door leaf
- 2) masking grille made of steel sheet thickness of 0.9 mm $\pm 15\%$
- 3) steel screw dimensions of 3 x 25 mm
- 4) sealing mass
- 5) air transfer grille INTU FR GRILLE DS / INTU FR GRILLE DP

Fig. 4 Cross-section through the air transfer grille in door



Dimensions in accordance with table 3

Fig. 5 Masking grille

Table 3. Dimensions of the masking grilles

Dimensions of the grille [mm]	a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]	g [mm]	h [mm]	i [mm]
100x100	143	143	27	89	38	13	27	89	13
100x150	143	193	27	89	38	13	27	139	13
100x200	143	244	27	89	38	13	27	190	13
100x250	143	295	27	89	38	13	27	241	13
100x300	143	346	27	89	38	13	27	292	13
100x350	143	397	27	89	38	13	27	343	13
100x400	143	442	27	89	38	13	27	393	13
100x450	143	498	27	89	38	13	27	444	13
100x500	143	549	27	89	38	13	27	495	13
100x600	143	651	27	89	38	13	27	597	13
150x150	193	193	27	139	63	13	27	89	13
150x200	193	244	27	139	63	13	27	139	13
150x250	193	295	27	139	63	13	27	190	13
150x300	193	346	27	139	63	13	27	241	13
150x350	193	397	27	139	63	13	27	292	13
150x400	193	442	27	139	63	13	27	343	13
150x450	193	498	27	139	63	13	27	393	13
150x500	193	549	27	139	63	13	27	444	13
150x600	193	651	27	139	63	13	27	495	13
200x200	244	244	27	190	88,5	13	27	139	13
200x250	244	295	27	190	88,5	13	27	190	13
200x300	244	346	27	190	88,5	13	27	241	13
200x350	244	397	27	190	88,5	13	27	292	13
200x400	244	442	27	190	88,5	13	27	343	13
200x450	244	498	27	190	88,5	13	27	393	13
200x500	244	549	27	190	88,5	13	27	444	13
200x600	244	651	27	190	88,5	13	27	495	13
250x250	295	295	27	241	114	13	27	139	13
250x300	295	346	27	241	114	13	27	190	13
250x350	295	397	27	241	114	13	27	241	13
250x400	295	442	27	241	114	13	27	292	13
250x450	295	498	27	241	114	13	27	343	13
250x500	295	549	27	241	114	13	27	393	13
250x600	295	651	27	241	114	13	27	444	13
300x300	346	346	27	292	139,5	13	27	190	13
300x350	346	397	27	292	139,5	13	27	241	13
300x400	346	442	27	292	139,5	13	27	292	13
300x450	346	498	27	292	139,5	13	27	343	13
300x500	346	549	27	292	139,5	13	27	393	13
300x600	346	651	27	292	139,5	13	27	444	13
350x350	397	397	27	343	165	13	27	241	13
350x400	397	442	27	343	165	13	27	292	13
350x450	397	498	27	343	165	13	27	343	13
350x500	397	549	27	343	165	13	27	393	13
350x600	397	651	27	343	165	13	27	444	13
400x400	442	442	27	393	190	13	27	292	13
400x450	442	498	27	393	190	13	27	343	13
400x500	442	549	27	393	190	13	27	393	13
400x600	442	651	27	393	190	13	27	444	13
450x450	498	498	27	444	215,5	13	27	343	13
450x500	498	549	27	444	215,5	13	27	393	13
450x600	498	651	27	444	215,5	13	27	444	13
500x500	549	549	27	495	241	13	27	393	13
500x600	549	651	27	495	241	13	27	444	13
600x600	651	651	27	597	298,5	13	27	444	13