Logo DIBT
Deutsches Institut für Bautechnik [German Institute for Structural Engineering]

General building approval / General design certification
N°Z-70.4-249

Registration office for construction products and designs

Building inspectorate

General building inspection approval/ General design certification

A public institute jointly-funded by Federal Government and the federal states
Member of EOTA, the UEAtc and the WFTAO

Date : 11/03/2019

Reference : I 38-1.70.4-24/18

Validity :

from: **11 March 2019**

to: **11 March 2024**

Number :
Z-70.4-249

Applicant :

SWISSPACER Vetrotech
Saint-Gobain (International) AG
Zweigniederlassung Kreuzlingen
Sonnenwiesenstrasse 15
8280 Kreuzlingen
SWITZERLAND

Subject-matter of the ruling:

Pressure-equalised multi-layer insulated glazing with Swisspacer Air pressure equalisation valve

The above-mentioned subject-matter of the ruling is hereby granted general building inspection approval/authorisation.
This notice includes seven pages and one appendix.

Logo DIBt
Addresse of DIBt

[Translation of the original German version, not checked by the Deutsches Institut für Bautechnik]

Logo DIBT
Deutsches Institut für Bautechnik [German Institute for Structural Engineering]

General building approval / General design certification
N°Z-70.4-249

I. GENERAL PROVISIONS

1 By the present notice, the usability / applicability of the subject-matter of this ruling is verified within the meaning of the federal state building codes.

2 This notice does not replace the statutory authorisations, approvals and certificates required for the execution of building projects.

3 This notice is issued without prejudice to the rights of third parties, in particular private property rights.

4 The user or operator of the subject-matter of the ruling must be provided with a copy of this notice. This is without prejudice to more extensive regulations included in the “Special Provisions”. Furthermore, the user or operator of the subject-matter of the ruling must be informed that this notice must be displayed at the place of use or operation. Copies must also be made available to the authorities involved upon request.

5 This notice may only be reproduced in full. Publication of excerpts of this notice requires the consent of the Deutsches Institut für Bautechnik. Texts and drawings from promotional literature must not contradict this notice. Translations must include the following note: “Translation of the original German not certified by the Deutsches Institut für Bautechnik”.

6 This notice may be withdrawn at any time. The provisions may be supplemented or modified at a subsequent date, in particular if required owing to new technical knowledge coming to light.

7 This notice is based on information provided by the applicant and documents presented. Any modification to this basis will not be recorded in this notice and must be communicated to the Deutsches Institut für Bautechnik without delay.

8 The general design certification covered by this notice also serves as a general building inspection approval for the type of construction.

II SPECIAL PROVISIONS

1 Subject-matter of the ruling and scope of use/application

The subject-matter of the approval is pressure-equalised multi-layer insulated glazing with a Swisspacer Air pressure equalisation valve from the company SWISSPACER Vetrotech Saint-Gobain (International) AG.

The valve is incorporated into the edge seal of the multi-layer insulated glazing and allows the pressure to be equalised between the cavity inside the panes of glass and the surrounding atmospheric pressure (see appendix 1). When determining the properties and dimensioning the multi-layer insulated glazing, the cavity must be filled with air as any other filling glass would quickly dissipate.

The pressure-equalised multi-layer insulated glazing may be used for linearly supported vertical glazing in accordance with DIN 18008-2[1].

2 Provisions for construction products

2.1 Properties and composition of the construction product

2.1.1 Glass panes

The individual panes of the pressure-equalised multi-layer insulated glazing consist of the following glass panes:

- Float glass in accordance with DIN EN 572-2[2] or
- Heat-strengthened glass in accordance with DIN EN 1863-1[3] or
- Soda lime silicate safety glass in accordance with DIN EN 12150-1[4] or
- Laminated glass or laminated safety glass in accordance with DIN EN 14449[5] or
- Heat soaked silicate safety glass in accordance with DIN EN 14179-1[6]
- Heat-strengthened glass with special requirements

Additional material properties are filed with the DIBt. The material properties must be substantiated by means of a "3.1" acceptance test certificate in accordance with DIN EN 10204[7].

1	DIN 18008-2:2010-12	Glass in building - Design and construction rules - Part 2: Linearly supported glazings
2	DIN EN 572-2:2012-11	Glass in building - Basic soda lime silicate glass products - Part 2: Float glass
3	DIN EN 1863-1:2012-02	Glass in building - Heat strengthened soda lime silicate glass - Part 1: Definition and description
4	DIN EN 12150-1:2015-12	Glass in building - Thermally toughened soda lime silicate safety glass - Part 1: Definition and description
5	DIN EN 14449:2005-07	Glass in building - Laminated glass and laminated safety glass - Evaluation of conformity/Product standard
6	DIN EN 14179-1:2016-12	Glass in building - Heat soaked thermally toughened soda lime silicate safety glass - Part 1: Definition and description
7	DIN EN 10204:2005-01	Metallic products - Types of inspection documents

2.1.2 Swisspacer Air pressure equalisation valve

The structure and dimensions of the Swisspacer Air must comply with the detailed information filed with the Deutsches Institut für Bautechnik.

2.1.3 Other components

The structure and properties of the other components of the pressure-equalised multi-layer insulated glazing must comply with the detailed information filed with the Deutsches Institut für Bautechnik.

2.1.4 Sound insulation index

The rated sound insulation index R_w of the multi-layer insulated glazing must be determined in accordance with DIN EN 12758[8].

2.1.5 Thermal transmittance coefficient, total energy transmittance and light transmission level

The thermal transmittance coefficient, Ug, of the multi-layer insulated glazing must be calculated [9] using the nominal thicknesses of the panes and nominal widths of the cavities inside the panes of glass in accordance with DIN EN 673, or determined in accordance with DIN EN 674[10] or DIN EN 675[11].

The total energy transmittance, g, and the light transmission level, tv, of the multi-layer insulated glazing must be determined in accordance with DIN EN 410[12].

2.2 Production and labelling

2.2.1 Production

The pressure-equalised multi-layer insulated glazing is produced using glass panes as described in section 2.1.1, while the Swisspacer Air valve is produced as described in section 2.1.2 and other components as described in section 2.1.3. The production process complies with the provisions filed with the Deutsches Institut für Bautechnik.

2.2 Labelling

The manufacturer must label the pressure-equalised multi-layer insulated glazing or the packaging for the pressure-equalised multi-layer insulated glazing with the conformity symbol (Ü-symbol) in accordance with the conformity regulations of the countries in question. The products may only be labelled if the conditions under section 2.3 are met. Furthermore, the following information must be provided:

- rated sound insulation index, R_w (if required)
- thermal transmittance coefficient, U_g

8	DIN EN 12758:2011-04	Glass in building - Glazing and airborne sound insulation - Product descriptions and determination of properties
9	DIN EN 673:2011-04	Glass in building - Determination of thermal transmittance (U value) - Calculation method
10	DIN EN 674:2011-09	Glass in building - Determination of thermal transmittance (U value) - Guarded hot plate method
11	DIN EN 675:2011-09	Glass in building - Determination of thermal transmittance (U value) - Heat flow meter method
12	DIN EN 410:2011-04	Glass in building - Determination of luminous and solar characteristics of glazing

- total energy transmittance, g
- light transmission level, tv

2.3 Certificate of conformity

2.3.1 General information

The conformity of the construction product with the provisions of the general building inspection approval recorded in this notice must be confirmed for each production plant by means of a declaration of conformity by the manufacturer on the basis of an in-house production control and an initial test of the construction product conducted by an approved testing institution. The manufacturer must provide the declaration of conformity by labelling the construction product with the conformity symbol (Ü-symbol) and referring to the intended use.

2.3.2 In-house production control

An in-house control system must be established and conducted in every production plant. The term “in-house production control” refers to the continuous monitoring of production to be carried out by the manufacturer by means of which the manufacturer ensures that the construction products manufactured comply with the provisions of the general building inspection approval recorded in this notice.

The in-house production control must, at the very least, include the measures listed below:

- verification that the information in the test certificates complies with the information in section 2.1;
- documentation of the relevant production parameters used in the production process. The production parameters must comply with the information filed with the Deutsches Institut für Bautechnik.

The records must be kept for at least ten years. They must be presented to the Deutsches Institut für Bautechnik and to the relevant highest building supervisory authority upon request.

The results of the in-house production control must be recorded and evaluated. At the very least, the records must contain the following information:

- the designation of the construction product and/or the raw material;
- the type of control or inspection;
- the date of production and inspection of the construction product or the raw material;
- the result of the controls and inspections and, where applicable, a comparison with the requirements;
- signature of the officer responsible for the in-house production control.

In the event of an unsatisfactory test result, the manufacturer must immediately take all necessary measures to correct the deficiency. Construction products which do not meet the requirements must be handled such that they cannot be confused with compliant products. Once the deficiency has been rectified - insofar as this is technically possible and proof of the correction is required - the test in question must be repeated without delay.

The records must be kept for at least five years. They must be presented to the Deutsches Institut für Bautechnik and to the relevant highest building supervisory authority upon request.

2.3.3 Initial test of the construction product

As part of the initial test, the product properties listed below must be checked:

- test and/or control of the raw material as well as its labelling or certificates provided by the manufacturer;
- verification of the relevant production parameters used in the construction product manufacturing process. The production parameters must comply with the information filed with the Deutsches Institut für Bautechnik;
- the rated sound insulation index pursuant to section 2.1.4;
- the thermal transmittance coefficient, total energy transmittance level and light transmission level pursuant to section 2.1.5

3 Provisions for design, dimensioning and implementation

3.1 Design

For the design of the pressure-equalised multi-layer insulated glazing, DIN 18008-1[13] and -2[1] apply. Insofar as additional accident-proof properties of the multi-layer insulated glazing are to be regulated, DIN 18008-4[14] applies.

3.2 Dimensioning

3.2.1 Verifications of the bearing capacity and fitness for use

For the dimensioning of the pressure-equalised multi-layer insulated glazing, the provisions of DIN 18008-2 and the provisions listed below apply.

When dimensioning the product in accordance with DIN 18008-2, the minimum value of the characteristic bending tensile strength of the glass panes listed in table 1 may be adopted as the characteristic bending tensile strength value, f_k.

[13]	DIN 18008-1:2010-12	Glass in building - Design and construction rules - Part 1: Terms and general bases
[14]	DIN 18008-4:2013-07	Glass in building - Design and construction rules - Part 4: Additional requirements for barrier glazing

Table 1: Glass panes

Glass panes	Product standard	Minimum value of the characteristic bending tensile strength [N/mm²]
Float glass	DIN EN 572-1[2]	45
Heat-strengthened glass / Annealed heat-strengthened glass [x)]	DIN EN 1863[3]	70 / 45
Soda lime silicate safety glass / Annealed soda lime silicate safety glass [x)]	DIN EN 12150[4]	120 / 75
Heat soaked soda lime silicate safety glass / Annealed heat soaked soda lime silicate safety glass [x)]	DIN EN 14179[6]	120 / 75
Heat-strengthened glass with special requirements / Annealed heat-strengthened glass with special requirements [x)]	--	120 / 75
[x)] annealed surface under tensile stress		

With regard to the use of monolithic silicate safety glass in accordance with DIN EN 14179-1 above an installation height of four metres, compliance with the technical building regulations (see MVV TB - Model Administrative Provisions - Technical Building Rules) and federal state building codes is required.

Heat-strengthened glass with special requirements may be used as a monolithic outer pane for the pressure-equalised multi-layer insulated glazing without any installation height restriction.

In deviation from DIN 18008-1, section 6.2.2, the air pressure difference may be set at zero in the documentation of the pressure-equalised multi-layer insulated glazing owing to the different heights of the production and installation locations. The following action combinations must be taken into account, as presented in table 2:

Table 2: Action combinations

Action combinations	**Temperature difference ΔT** K	**Change in atmospheric pressure Δp_{met}** kN/m²	**Local altitude difference ΔH** m
"Summer"	+20	-2.0	0
"Winter"	-25	+4.0	0

3.2.2 Verifications of the physical construction properties

For sound insulation requirements, DIN 4109-1[15] applies. Verification by calculation may be performed using the rated sound insulation index, R_w, in accordance with DIN 4109-2[16]

With regard to the design values of the thermal transmittance coefficient, the total energy transmittance level and the light transmission level, DIN 4108-4, section 5.2[17] applies accordingly.

3.3 Implementation

For the implementation of pressure-equalised multi-layer insulated glazing, DIN 18008-2 applies.

Pressure-equalised multi-layer insulated glazing may only be transported by means of appropriate transport aids which preclude the possibility of the edges of the glass being damaged. In the event of temporary storage on the construction site, appropriate documents must be provided concerning protection of the glass edges.

In order to confirm the conformity of the glazing with the general building inspection approval recorded in this notice, the contractor must submit a conformity declaration in accordance with §§ 16 a paragraphs 5 and 21 section 2 of the Model Building Regulation (MBO).

4 Provisions for use, servicing and maintenance

In the event of damage suffered by the glazing, the damaged components must be replaced immediately or the damage must be repaired professionally.

Andreas Schult
Head of Division

Certified

[15]	DIN 4109-1	Sound insulation in buildings – Part 1: Minimum requirements
[16]	DIN 4109-2	Sound insulation in buildings – Part 2: Verification of compliance with the requirements by calculation
[17]	DIN 4108-4:2017-03	Thermal insulation and energy economy in buildings – Part 4: Hygrothermal design values

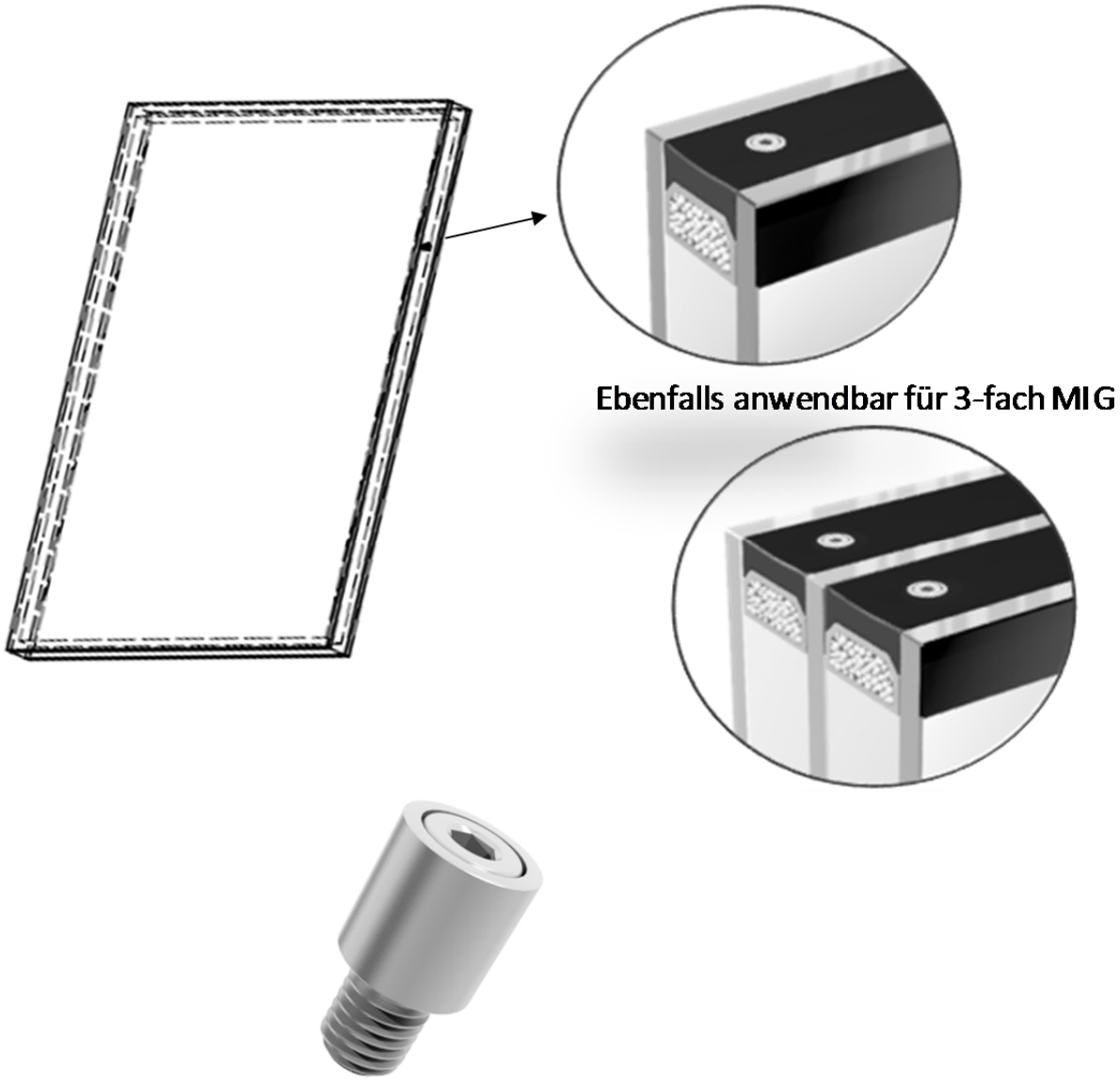
Logo DIBT
Deutsches Institut für Bautechnik [German Institute for Structural Engineering]

General building approval / General design certification
N°Z-70.4-249

Seal
Deutsches Institut für Bautechnik [German Institute for Structural Engineering]
(Signature illisible)

[Translation of the original German version, not checked by the Deutsches Institut für Bautechnik]

Deutsches Institut für Bautechnik DIBt



Druckentspanntes Mehrscheiben-Isolierglas mit Druckentspannungsventil Swisspacer Air	Anlage 1
Prinzipdarstellung	