

Evidence of Performance

Fire resistance of building elements



Classification Report
Nr.: 16-002734-PR01
(KB-F14-01-en-01)

Client	AGC Glass Europe SA/NV Avenue Jean Monnet 4 1348 Louvain-la-Neuve (Belgium)
Prepared by the notified body	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim
Notified body No.	0757
Designation	"Jansen VISS"
Classification	Classification of fire resistance according to EN 13501-2:2007+A1:2009 / EN 13501-2:2016
Issue No.	1

Basis

EN 13501-2:2007+A1:2009
EN 13501-2:2016
EN 13830:2003
EN 13830:2015
EN 1363-1:2012
EN 1364-3:2014

Instructions for use

This classification report for fire resistance defines the classification assigned to the building element according to its product name in conformity with the methods set out in EN 13501-2. This document does not represent type approval or certification of the product.

Validity

The data and results given relate solely to the tested and described specimen.

Notes on publication

The ift Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies.

Contents

The report comprises a total of 32 pages

- 1 Introduction
- 2 Details of classified product
- 3 Test reports/extended application reports and test results in support of the classification
- 4 Classification and field of application
- 5 Limitations



Curtain Walling

Classification

E 45 (o↔i)

EW 30 (o↔i)

EI 30 (o↔i)

ift Rosenheim
16.12.2016

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1 Introduction

This classification report for fire resistance defines the classification assigned to the building element "Jansen VISS" in conformity with the method set out in EN 13501-2.

This is the first classification of the building element.

2 Details of classified product

2.1 General

The building element "Jansen VISS" is defined as a type of product curtain walling in accordance with EN 13830.

Its function is to withstand fire exposure on one face according the fire performance parameters set out in the case of fire by Clause 5 of EN 13501-2, from the inside to the outside (i→o) or the outside to the inside (o→i).

Classification of the load, both o→i and i→o, is based on the standard temperature/time curve in accordance with EN 1363-1:2012, Clause 5.1.1, equation (1).

Classification includes the vertical linear gap seal and the perimeter seal.

2.2 Description

The building component "Jansen VISS" is described below in the test reports referenced in section 3.1, to justify this classification:

Test report 16-001615-PR01 – Fire resistant, straight curtain wall type "Jansen Viss Ixtra TV", stick construction made of steel, overall dimensions (W x H) 4950 mm x 5000 mm, with transparent infill panels – type Pyrobel 16 TGU manufactured by AGC Glass Europe, mounted to concrete frame in accordance with EN 1364-3, exposure from o->i (external face).

Test report 16-001616-PR01 – Fire resistant curtain wall type "Jansen Viss DV", stick construction made of S260 NC steel, overall dimensions (W x H) 5520 mm x 5944 mm, with transparent infill panels – type Pyrobel 16 manufactured by AGC Glass Europe, mounted to concrete frame in accordance with EN 1364-3, exposure from i->o (internal face / mullion side).

3 Test reports/extended application reports and test results in support of the classification

3.1 Test reports / extended application reports

The following test reports, test results and evaluations have been provided to justify this classification.

Name laboratory	Name of sponsor	Reference No. of report	Test standard and date/field of extended application standards and dates
ift Rosenheim GmbH NB 0757	AGC Glass Europe SA/NV 1348 Louvain-la-Neuve (Belgium)	16-001615-PR01 (PB-F14-01-en-02)	EN 1364-3:2014
ift Rosenheim GmbH NB 0757	AGC Glass Europe SA/NV 1348 Louvain-la-Neuve (Belgium)	16-001616-PR01 (PB-F14-01-en-02)	EN 1364-3:2014

3.2 Results

Test report number	Testing laboratory	Client	Test standard
16-001616-PR01 (PB-F14-01-en-02) Date: 13.07.2016	ift Rosenheim Notified Body: 0757	AGC Glass Europe SA/NV 1348 Louvain-la-Neuve (Belgium)	EN 1364-3:2014
	Supporting construction	Concrete according to EN 1364-3	
	Exposed face	i->o	
	Criteria		Results
	E - flame > 10 s (S2, S3, S4, S5, S6, perimeter seal, linear gap seals)		46 minutes
	E – gap gauge (S2, perimeter seal, linear gap seals)		46 minutes
	E – cotton pad (S2, S3, S4, S5, S6, perimeter seal, linear gap seals)		46 minutes
	I – insulation, mean temperature rise (S2, S3, S4)		41 minutes
	I – insulation, maximum temperature rise (S2, S3, S4, S6, perimeter seal, linear gap seals)		33 minutes
W – radiation; max. 15kW/m ² (S2)		npd	

Test report number	Testing laboratory	Client	Test standard	
16-001615-PR01 (PB-F14-01-en-02) Date: 13.07.2016	ift Rosenheim Notified Body: 0757	AGC Glass Europe SA/NV 1348 Louvain-la-Neuve (Belgium)	EN 1364-3:2014	
	Supporting construction	Concrete according to EN 1364-3		
	Exposed face	o->i		
	Criteria		Results	
	E - flame > 10 s (S1)		56 minutes	
	E – gap gauge (S1)		57 minutes	
	E – cotton pad (S1)		57 minutes	
	I – insulation, mean temperature (S1)		56 minutes	
	I – insulation, maximum temperature rise (S1)		40 minutes	
W – radiation; max. 15kW/m ² (S1)		npd		



4 Classification and field of application

4.1 Reference of classification

This classification has been carried out in accordance with Clause 7 of EN 13501-2.

4.2 Classification

The building component "Jansen VISS" is classified according to the example of the following combinations of performance parameters and classes as appropriate.

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r	G	K
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Fire resistance classification: E 45, EW 30, EI 30

4.3 Field of application

4.3.1 General

This classification is valid for the following end use applications:

EN 13830

Curtain walling

4.3.2 Field of direct application in accordance with EN 1364--3

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
13.1	General rules			
13.1.1	<p>General</p> <p>The rules given in 13.2 to 13.4 apply to stick constructions only. For rules for unitised constructions see Annex A.</p> <p>The rules given in 13.2 to 13.4 shall not be used for curtain walling constructions with glued infill panels (e.g. Structural Sealant Glazing Systems – SSGS).</p> <p>Rules which result in higher weight of the curtain walling are only applicable if the fixing of the framing system used in practice has been designed for the higher load. The measured temperature at the fixing of the framing system shall be taken into account.</p>	√ √ √	√ √ √	√ √ √
13.1.2	<p>Exposure conditions</p> <p>Test results from tests using the standard temperature time curve cover a test condition using the external fire curve but not vice versa.</p>	√	√	√
13.1.3	<p>Overrun time</p> <p>For some rules to be applicable an overrun time in the fire test result compared to the envisaged classification time is required. The required overrun time is shown in Table 2. This overrun time is required for the following</p>			

¹ √ = Transmission applicable
 - = Transmission not applicable

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹								
	<p>criteria:</p> <ul style="list-style-type: none"> – E classification: integrity; – EW classification: integrity and radiation; – EI classification: integrity and insulation. <p>Table 2 — Overrun time</p> <table border="1" data-bbox="367 871 1424 1070"> <thead> <tr> <th>Classification time</th> <th>Overrun time</th> </tr> </thead> <tbody> <tr> <td>≤ 20 minutes</td> <td>minimum 3 minutes</td> </tr> <tr> <td>30, 45 and 60 minutes</td> <td>minimum 6 minutes</td> </tr> <tr> <td>≥ 90 minutes</td> <td>minimum 10 % of the classification time</td> </tr> </tbody> </table>	Classification time	Overrun time	≤ 20 minutes	minimum 3 minutes	30, 45 and 60 minutes	minimum 6 minutes	≥ 90 minutes	minimum 10 % of the classification time	-	-	-
Classification time	Overrun time											
≤ 20 minutes	minimum 3 minutes											
30, 45 and 60 minutes	minimum 6 minutes											
≥ 90 minutes	minimum 10 % of the classification time											
13.2	Rules for the complete construction											
13.2.1	<p>Width of the curtain walling</p> <p>Test results are equally valid for curtain walling with classification E and EI extending over one or more fire separating walls with a higher distance between the fire separating walls than the width of the tested construction provided</p> <ul style="list-style-type: none"> – the construction (distance of mullions etc.) are the same as the one tested; 	√	-	√								
		√	-	√								

Classification Report
Fire resistance of building elements

Project 16-002734-PR01 (KB-F14-01-en-01) dated 16. December 2016
 Client AGC Glass Europe SA/NV, 1348 Louvain-la-Neuve (Belgium)



Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>– option A for detail D1 according to Figure 7 was used in the test on one side, and</p> <p>– a vertical linear gap seal abutting a simulated wall according to Detail D3 in Figures 18 and 19 was used on the other side.</p> <p>Test results are equally valid for curtain walling with a higher width than the width of the tested construction in case they are not abutting fire separating walls provided</p> <p>– the construction details (distance of mullions etc.) are the same as the one tested</p> <p>– option A for detail D1 according to Figure 7 was used in the test on one side and Detail D2 or option B for detail D1 on the other side.</p> <p>NOTE Width refers to the exposed area of the test specimen.</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>-</p> <p>-</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>
13.2.2	<p>Height of the curtain walling</p> <p>Test results are valid for a curtain walling of increased overall height, i.e. repetition of the tested construction in vertical direction provided the construction is the same as the one tested.</p> <p>NOTE Height refers to the exposed area of the test specimen.</p>	√	√	√
13.2.3	<p>Span length</p> <p>Test results are also valid for curtain walling with classification E and EI for a higher span length subject to a maximum of 1,2 times the span length used in the test provided:</p>	√	-	√

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<ul style="list-style-type: none"> – the maximum deflection perpendicular to the surface measured during the fire test is less than 100 mm, and – there is sufficient elongation allowance of the mullions. <p>Test results are also valid for a higher span length subject to a maximum of 1,3 times the span length used in the test provided:</p> <ul style="list-style-type: none"> – an overrun time as defined in Table 2 has been achieved, and – the maximum deflection perpendicular to the surface measured during the fire test is less than 100 mm, and – there is sufficient elongation allowance of the mullions. <p>Test results are also valid for a higher span length subject to a maximum of 1,5 times the span length used in the test provided</p> <ul style="list-style-type: none"> – an overrun time as defined in Table 2 has been achieved, and – the maximum deflection perpendicular to the surface measured during the fire test is less than 50 mm, and – there is sufficient elongation allowance of the mullions. 	<p>√</p> <p>√</p> <p>-</p> <p>-</p> <p>√</p> <p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>√</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>√</p> <p>-</p> <p>-</p> <p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>√</p>
13.2.4	<p>Installation angle (vertical/sloped)</p> <p>Test results on a vertical curtain walling cover curtain walling sloped inside or sloped outside to a maximum angle of 10° from the vertical axis for both exposure orientations (o → i and i → o).</p>	√	√	√

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>Test results on a vertical curtain walling with an E or EW classification cover curtain walling sloped inside or sloped outside to a maximum angle of 12,5° from the vertical axis provided an overrun time was achieved according to Table 2 and the screws for fixing the infill panels / spandrel panels penetrate the mullions/transoms.</p> <p>Test results on a vertical curtain walling with an EI classification cover curtain walling sloped inside or sloped outside to a maximum angle of 15° from the vertical axis provided an overrun time was achieved according to Table 2 and the screws for fixing the infill panels / spandrel panels penetrate the mullions/transoms.</p>	-	-	-
13.2.5	Facet angles of horizontally faceted curtain walling			
13.2.5.1	<p>Installation tolerance</p> <p>Facet angles between 0 and 1,5° (angle β in Figure 1) is covered by a test on a straight curtain walling. In case the curtain walling includes fire resistant translucent or transparent infill panels the rule is only applicable if the overlap of the pressure plate and/or the edge cover on the inner side of a fire resistant translucent or transparent infill panel, whatever is smaller, is minimum the same as in the fire test for infill panels with EI classification and the same as tested for infill panels with E or EW classification (see Figure 20).</p>	√	√	√
13.2.5.2	<p>Small facet angles</p> <p>Facet angles between $\geq 1,5^\circ$ and 5° are covered by a test on a straight curtain walling provided</p> <ul style="list-style-type: none"> – the system remains the same as in the fire test and – the pressure plate remains the same as in the fire test and – the nominal inner or outer edge cover of the translucent or transparent infill panel, whichever would be de- 	-	-	-

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>creased by the inclination of the translucent or transparent infill panel, remains the same as in the fire test and</p> <p>– an overrun time according to Table 2 has been achieved</p> <p>NOTE The maximum facet angle covered will depend on the thickness of the translucent or transparent infill panel and on the maximum distance the translucent or transparent infill panel can be moved towards the centre of the mullion.</p> <p>This rule does not apply to curtain walling with E and EW classification.</p>	- - -	- - -	- - -
13.3	Framing system			
13.3.1	<p>Distance between mullions and transoms</p> <p>The distance between the mullions and transoms is defined by the rules for the infill panels, based on test results on straight specimens.</p> <p>Test results on a higher distance between the mullions and/or transoms cover smaller distances.</p> <p>Test results cover a higher distance between mullions and/or transoms than tested subject to the rules given in 13.4, provided that all of the relevant frame junctions have been tested in accordance with this standard.</p>	√ √ √	√ √ √	√ √ √
13.3.2	<p>Geometry/dimension of mullions and transoms</p> <p>Test results cover higher wall thickness of mullions and transoms made of metal subject to a maximum of 1.5 times the thickness used in the test. Decrease of wall thickness is not permitted.</p>	√	√	√

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹																																																													
	<p>Test results cover width and depth ranges of mullions and transoms as given in Table 3. A decrease of width and /or depth of mullions and transom is not permitted. The values given in Table 3 refer to the factor the width and depth may be higher in comparison to the width and/or depth used in the test.</p> <p>Table 3 — Factor for width and depth of mullions and transoms</p> <table border="1" data-bbox="367 724 1556 1094"> <thead> <tr> <th rowspan="3">Framing material</th> <th colspan="4">Classification E and EW</th> <th colspan="4">Classification EI</th> </tr> <tr> <th colspan="2">Transom</th> <th colspan="2">Mullion</th> <th colspan="2">Transom</th> <th colspan="2">Mullion</th> </tr> <tr> <th>Width</th> <th>Depth</th> <th>Width</th> <th>Depth</th> <th>Width</th> <th>Depth</th> <th>Width</th> <th>Depth</th> </tr> </thead> <tbody> <tr> <td>Aluminium</td> <td>1,25^{a,c}</td> <td>1,5^b</td> <td>1,25^{a,c}</td> <td>1,5</td> <td>1,25^a</td> <td>2^b</td> <td>1,25^a</td> <td>2</td> </tr> <tr> <td>Steel</td> <td>1,25</td> <td>1,5^b</td> <td>1,25</td> <td>1,5</td> <td>1,25</td> <td>2^b</td> <td>1,25</td> <td>2</td> </tr> <tr> <td>Stainless steel</td> <td>1,25</td> <td>1,5^b</td> <td>1,25</td> <td>1,5</td> <td>1,25</td> <td>1,5^b</td> <td>1,25</td> <td>1,5</td> </tr> <tr> <td>Timber</td> <td>2^c</td> <td>1,5^b</td> <td>2^c</td> <td>1,5</td> <td>2</td> <td>4^b</td> <td>2</td> <td>4</td> </tr> </tbody> </table> <p>^a In case the transom or mullion contains a core material for the purpose of improving the fire resistance the dimensions of this core material shall be increased so that the contact area with the aluminium remains minimum the same and the overlap between the infill panel and the core material remains minimum the same.</p> <p>^b But maximum to the depth of the mullion.</p> <p>^c Provided the pressure plate system is changed accordingly so that the overlap remains the same subject to the rules given in 13.3.7.</p>	Framing material	Classification E and EW				Classification EI				Transom		Mullion		Transom		Mullion		Width	Depth	Width	Depth	Width	Depth	Width	Depth	Aluminium	1,25 ^{a,c}	1,5 ^b	1,25 ^{a,c}	1,5	1,25 ^a	2 ^b	1,25 ^a	2	Steel	1,25	1,5 ^b	1,25	1,5	1,25	2 ^b	1,25	2	Stainless steel	1,25	1,5 ^b	1,25	1,5	1,25	1,5 ^b	1,25	1,5	Timber	2 ^c	1,5 ^b	2 ^c	1,5	2	4 ^b	2	4	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>
Framing material	Classification E and EW				Classification EI																																																												
	Transom		Mullion		Transom		Mullion																																																										
	Width	Depth	Width	Depth	Width	Depth	Width	Depth																																																									
Aluminium	1,25 ^{a,c}	1,5 ^b	1,25 ^{a,c}	1,5	1,25 ^a	2 ^b	1,25 ^a	2																																																									
Steel	1,25	1,5 ^b	1,25	1,5	1,25	2 ^b	1,25	2																																																									
Stainless steel	1,25	1,5 ^b	1,25	1,5	1,25	1,5 ^b	1,25	1,5																																																									
Timber	2 ^c	1,5 ^b	2 ^c	1,5	2	4 ^b	2	4																																																									

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
13.3.3	Connection between mullions and transoms			
13.3.3.1	<p>Connection geometry</p> <p>Figure 21 shows a cross connection, vertical T-connection, horizontal/standing and horizontal/hanging T-connection.</p> <p>Test results for a cross-connection do not cover T-connections and vice versa.</p> <p>A horizontal T-connection does not cover a vertical one and vice versa.</p> <p>A standing T-connection does not cover a hanging T-connection and vice versa.</p> <p>Test results for cross connections or T-connections with an angle of 90° between mullions and transoms cover situations where the angle between mullions and transoms is minimum 80° and maximum 100° disregarding whether the mullions are vertically oriented or not or the transoms are horizontally oriented or not. This rule also applies to corner connections of unitised systems.</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>
13.3.3.2	<p>Connection system between framing members</p> <p>Test results for a particular connection system are only valid for connection systems of the same construction principle.</p> <p>The dimensions of the connection system may be varied as required in relation to dimension changes of mullions and transoms according to 13.3.2.</p>	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>
13.3.4	Framing material			

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹															
13.3.4.1	<p>Metal framing</p> <p>Test results for stainless steel apply to construction steel (unalloyed, low alloyed steel) but not vice versa.</p> <p>Test results for steel do not apply to Aluminium and vice versa.</p> <p>Test results apply only to the Aluminium alloy used in the test. Change to another Aluminium alloy is not permitted.</p>	- √ -	- - -	- √ -															
13.3.4.2	<p>Timber framing</p> <p>Test results for any solid or laminated timber type of a group according to Table 4 apply equally to all other timber types of the same group. Test results for any timber type of group 1 according to Table 4 apply equally to all other groups but not vice versa. Test results for any timber of group 2 according to Table 4 apply equally to all timber types of groups 3 and 4 but not vice versa. Test results for any timber of group 3 according to Table 4 apply equally to all timber types of group 4 but not vice versa.</p> <p>Table 4 — Timber groups</p> <table border="1"> <thead> <tr> <th>Group</th> <th>Timber type</th> <th>Density (kg/m³)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Softwood and beech</td> <td>< 450</td> </tr> <tr> <td>2</td> <td>Hardwood excluding beech</td> <td>< 450</td> </tr> <tr> <td>3</td> <td>Softwood and beech</td> <td>≥ 450</td> </tr> <tr> <td>4</td> <td>Hardwood excluding beech</td> <td>≥ 450</td> </tr> </tbody> </table> <p>Test results for unprotected timber apply equally to protected timber but not vice versa. Test results for protected timber apply only to the type of protection used in the test. Protection means any measure, e.g. impregna-</p>	Group	Timber type	Density (kg/m ³)	1	Softwood and beech	< 450	2	Hardwood excluding beech	< 450	3	Softwood and beech	≥ 450	4	Hardwood excluding beech	≥ 450	- - -	- - -	- - -
Group	Timber type	Density (kg/m ³)																	
1	Softwood and beech	< 450																	
2	Hardwood excluding beech	< 450																	
3	Softwood and beech	≥ 450																	
4	Hardwood excluding beech	≥ 450																	

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	tion, varnish, coating or paint, intended to im-prove the reaction to fire classification according to EN 13501-1 or the K-classification ac-cording to EN 13501-2 of the timber.			
13.3.5	<p>Decorative frame surface treatments/coverings/coatings</p> <p>Decorative frame surface treatments/coverings/coatings which achieve minimum class A2 according to EN 13501-1 together with the relevant frame component may be added or changed without restrictions.</p> <p>Any decorative frame surface treatments/coverings/coatings with a thickness equal to or less than 1.5 mm may be added or changed without restrictions for curtain walling classified EI.</p> <p>Decorative frame surface treatments/coverings/coatings of more than 1,5 mm thickness other than covered by the rule given in the first paragraph shall be included in the test as part of the test specimen. Test results of such decorative frame coverings/coatings apply only to decorative frame coverings/coatings made of the same material type and thickness.</p> <p>Decorative frame surface treatments/coverings/coatings other than covered by the rule given in the first paragraph for curtain walling classified E or EW shall be included in the test as part of the test specimen. Test results of such decorative frame coverings/coatings apply to all types of decorative frame coverings/coatings of minimum the same reaction to fire class according to EN 13501-1 and of maximum the same thickness as used in the test if the framing system was at the unexposed side of the test specimen. Otherwise the results apply only to decorative frame coverings/coatings made of the same material type and thickness.</p> <p>Test results for decorative frame surface treatments/coverings/coatings other than covered by the rule given in the first paragraph from a test for intended classification E may be also used for classification EW.</p>	<p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>√</p> <p>-</p> <p>-</p> <p>-</p>
13.3.6	Fixing of the framing system (anchoring)			

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹																																																																								
	Fixing system made of Aluminium / Aluminium alloys: no change in material is permitted.	-	-																																																																									
	Test results for a fixing system made of aluminium / aluminium alloys covers steel but not vice versa.	-	-	-																																																																								
	Fixing system made of steel: change of alloy within construction steels (unalloyed / low alloy steels) is permitted.	√	√	√																																																																								
	Combinations of fixing positions in relation to the floor (in front, on top or below) and positions of the fixed and loose anchor (hanging or standing curtain walling) are covered by test results on a particular combination according to Table 5. Table 5 is applicable for internal exposure.	√	√	√																																																																								
	Test results on a particular fixing system type (anchored or cast-in or welded) are not applicable to another type.	√	√	√																																																																								
	Change in geometrical shape and/or linear dimensions within a fixing system type is permitted on the basis of a proper static calculation. The temperature at the fixing measured in the fire test shall be taken into account. If no temperature data of the fixing are available only increase in linear dimensions is permitted.	√	√	√																																																																								
	Test results for a non-insulated fixing system (not embedded in insulation material) apply equally to the same fixing system embedded in insulation material of reaction to fire class A1 or A2 according to EN 13501-1 but not vice versa.	√	√	√																																																																								
	<p>Table 5 — Field of application rules for fixing positions</p> <table border="1"> <thead> <tr> <th data-bbox="367 1238 477 1305">Tested ↓</th> <th colspan="11" data-bbox="483 1238 1554 1267">Covered →</th> </tr> <tr> <th></th> <th>AF/AL</th> <th>BF/BL</th> <th>CF/AL</th> <th>CF/BL</th> <th>CF/CL</th> <th>AL/AF</th> <th>AL/BF</th> <th>BL/BF</th> <th>CL/AF</th> <th>CL/BF</th> <th>CL/CF</th> </tr> </thead> <tbody> <tr> <td>AF/AL</td> <td></td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>Y</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> </tr> <tr> <td>AF/BL</td> <td>Y</td> <td>Y</td> <td>N</td> <td>N</td> <td>N</td> <td>Y</td> <td>N</td> <td>N</td> <td>Y1</td> <td>N</td> <td>Y1</td> </tr> <tr> <td>AF/CL</td> <td>Y1</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>Y1</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> </tr> <tr> <td>BF/AL</td> <td>Y1</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>Y1</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> </tr> </tbody> </table>	Tested ↓	Covered →												AF/AL	BF/BL	CF/AL	CF/BL	CF/CL	AL/AF	AL/BF	BL/BF	CL/AF	CL/BF	CL/CF	AF/AL		N	N	N	N	Y	N	N	N	N	N	AF/BL	Y	Y	N	N	N	Y	N	N	Y1	N	Y1	AF/CL	Y1	N	N	N	N	Y1	N	N	N	N	N	BF/AL	Y1	N	N	N	N	Y1	N	N	N	N	N	√	√	√
Tested ↓	Covered →																																																																											
	AF/AL	BF/BL	CF/AL	CF/BL	CF/CL	AL/AF	AL/BF	BL/BF	CL/AF	CL/BF	CL/CF																																																																	
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AF/CL	Y1	N	N	N	N	Y1	N	N	N	N	N																																																																	
BF/AL	Y1	N	N	N	N	Y1	N	N	N	N	N																																																																	

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Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results												E45 ¹	EW30 ¹	EI30 ¹	
	BF/BL	Y1		N	N	N	Y1	N	N	Y1	N	Y				
	BF/CL	Y1	N	N	N	N	Y1	N	N	N	N	N				
	CF/AL	Y	N		N	Y	Y	Y	Y	N	N	N				
	CF/BL	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y				
	CF/CL	Y1	N	Y1	N		Y	Y	Y	N	N	N				
	AL/AF	Y	N	N	N	N		N	N	N	N	N				
	AL/BF	Y	N	N	N	N	Y		Y	N	N	N				
	AL/CF	N	N	N	N	N	N	N	N	N	N	N				
	BL/AF	N	N	N	N	N	N	N	N	N	N	N				
	BL/BF	Y1	N	N	N	N	Y1	Y1		N	N	N				
	BL/CF	Y1	N	N	N	N	Y1	N	N	N	N	N				
	CL/AF	Y	Y	N	N	N	Y	N	N		N	Y				
	CL/BF	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y				
	CL/CF	Y1	Y	N	N	N	Y1	N	N	Y1	N					
	A Fixing in front of the floor (see Figure 22)		N not covered													
	B Fixing on top of the floor (see Figure 22)		Y covered without restriction													
	C Fixing on bottom of the floor (see Figure 22)		Y1 covered, provided the fixing is completely made of steel													
	F Fixed bearing															
	L Floating bearing (to allow thermal extension)															

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>The first position indicates the type of fixing on the upper floor, the second position the type of fixing on the lower floor, e. g.:</p> <p>AF/BL: Fixed bearing in front of the floor used on the upper floor / floating bearing on top of the floor used on the lower floor (hanging curtain walling)</p> <p>AL/BF: Floating bearing in front of the floor used on the upper floor / fixed bearing on top of the floor used on the lower floor (standing curtain walling)</p> <p>For further explanation see Annex B.7.6.3.</p>			
13.3.7	Pressure plate system			
13.3.7.1	<p>Edge cover / overlap of pressure plate</p> <p>Results from tests with a smaller edge cover / overlap of the pressure plate on the infill panel are also valid for a higher edge cover / overlap but not vice versa. This rule applies for both, the outer and inner edge cover (Figure 20). This rule does not apply to fire resistant translucent or transparent infill panels with E or EW classification.</p>	-	-	√
13.3.7.2	<p>Size of pressure plate</p> <p>Smaller and higher widths of the pressure plate are covered provided the moment of inertia of the pressure plate in the axis as shown in Figure 20 is minimum the same as tested and the overlap is minimum the same as tested subject to the rules given in 13.3.7.1.</p>	-	-	√
13.3.7.3	Material of pressure plate			

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	Results for aluminium pressure plates are also valid for steel pressure plates of the same width, but not vice versa. The flexural strength of the pressure plate shall be equal or higher than the flexural strength used in the test.	-	-	-
13.3.7.4	Screws The screws shall have minimum the same effective screw depth (i.e. depth in the mullion/transom) and minimum the same cross section as used in the test. The distance between the screws may be reduced but not increased.	√	√	√
13.3.7.5	Mullion and transom cover cap Test results on any cover cap are equally valid for all other types of cover plates of minimum the same classification according to EN 13501-1, subject to maximum the same width in case of classifications E and EW.	√	√	√
13.3.8	Other fixing systems than pressure plate Test results are only applicable to the fixing system used in the test. Results from tests with a smaller edge cover / overlap of the fixing system on the infill panel are also valid for a higher edge cover / overlap but not vice versa. This rule applies for both, the outer and inner edge cover. This does not apply to fire resistant translucent or transparent infill panels with E or EW classification.	√ -	√ -	√ -
13.4	Infill panels			
13.4.1	Opaque (non-translucent/non-transparent) infill panels			
13.4.1.1	Type / construction			

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	Test results cover only the type / construction of the infill panel(s) used in the test.	√	√	√
13.4.1.2	Dimensions			
	Test results cover smaller panel width and height.	√	√	√
	Test results cover a higher thickness of the panel.	√	√	√
	Test results cover a higher thickness of the panel insulation.	√	√	√
	Test results for an infill panel of particular dimensions cover dimensions up to a maximum of the tested dimension multiplied by a factor 1,2 in width and/or height but only up to an area of maximum the tested area multiplied by a factor 1,21 provided an overrun time according to Table 2 has been achieved in the test.	-	-	-
	For classification times 30 min, 45 min and 60 min a factor 1,1 may be used to calculate the covered range of height, width and area, if the overrun time achieved in the test is less than the 6 min required in Table 2 but minimum 3 min.	-	√	√
	For a classification time ≥ 90 min a factor 1,1 may be used to calculate the covered range of height, width and area, if the overrun time achieved in the test is less than the 10 % required in Table 2 but minimum 5 %.	-	-	-
	Test results cover smaller distances in between fixing centres, vertical and horizontal.	√	√	√
13.4.1.3	Aspect ratio of individual infill panels			
	Test results for rectangular panels with portrait as well as landscape format cover all aspect ratios subject to the rules given in 13.4.1.2 provided that all panels have been tested in an identical framing system.	-	-	-

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
13.4.1.4	<p>Geometrical shapes</p> <p>Test results for a rectangular panel cover all other shapes provided that their size can be cut out of the tested rectangular size, subject to the rules given in 13.3.3.1.</p>	√	√	√
13.4.1.5	<p>Materials</p> <p>Test results of gypsum plasterboards except gypsum plasterboards type F according to EN 520 are valid for all types of gypsum plasterboards provided the thickness is minimum the same. Test results of gypsum plasterboards type F according to EN 520 are not valid for other types of gypsum plasterboard. Test results of all types of gypsum plasterboards apply equally to boards made of CaSi boards but not vice versa provided the thickness is minimum the same. Test results of boards made of CaSi are only valid for CaSi boards.</p> <p>The thickness of the board may be increased.</p> <p>Test results of a non-faced mineral wool board are equally applicable to an aluminium faced version of this mineral wool board but not vice versa.</p> <p>The insulation material as used in the test shall not be changed.</p> <p>The thickness of the insulation may be increased.</p> <p>The type of fixing of the components to each other (e.g. gluing) shall not be changed.</p> <p>External layers for optical reasons (e.g. metal, stone, concrete, glass) may be added or changed without restriction to the material.</p> <p>Increased weight of the infill panels as a result of changes according to the rules above shall be considered for</p>	√	√	√

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	the anchoring, the dimensioning of mullions and transoms and the fixing system for the panels.			
13.4.1.6	Back panel metal sheeting Change of thickness of metal sheeting is not permitted.	√	√	√
13.4.2	Sandwich panels The thickness of the insulation material may be increased. Change in thickness of metal sheeting is not permitted. Increased weight of the infill panels as a result of changes according to the rules above shall be considered.	√ √ √	√ √ √	√ √ √
13.4.3	Translucent or transparent infill panels			
13.4.3.1	Type of fire resistant translucent or transparent infill panel			
13.4.3.1.1	General Three major types of fire resistant translucent or transparent infill panels were identified: – a fire resistant translucent or transparent infill panel consisting only of the glass component that gives the fire resistance; this may be a monolithic pane, a laminated pane or a gel type glass depending on the required classification (E, EW or EI), indicated A in Figure 23	√	√	√

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>– an IGU consisting of the part that gives the fire resistance and a single pane for UV/acoustic/safety performance (counter pane), with or without additional coatings on either side of the counter pane, indicated B in Figure 23 (example shown with coating inside)</p> <p>– an IGU consisting of the part that gives the fire resistance and a laminated pane for UV/acoustic/safety performance (counter pane), with or without additional coatings on either side of the counter pane, indicated C in Figure 23 (example shown with coating inside)</p>	<p>-</p> <p>√</p>	<p>-</p> <p>√</p>	<p>-</p> <p>√</p>
13.4.3.1.2	<p>Classification EI (i → o)</p> <p>Test results of type A are equally applicable to type B and C but not vice versa.</p> <p>Test results of type B are equally applicable to type C and vice versa.</p> <p>Test results of type B without additional coatings are equally applicable to type B with additional coatings but not vice versa.</p> <p>Test results of type C without additional coatings are equally applicable to type C with additional coatings but not vice versa.</p> <p>NOTE For details see Figure 23.</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>-</p> <p>-</p> <p>-</p>
13.4.3.1.3	<p>Classification EI (o → i)</p> <p>Test results of type C are equally applicable to type B but not vice versa.</p> <p>Test results of type B without additional coatings are equally applicable to type B with additional coatings and vice versa.</p>	<p>-</p> <p>-</p>	<p>-</p> <p>-</p>	<p>√</p> <p>-</p>

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Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>Test results of type C without additional coatings are equally applicable to type C with additional coatings and vice versa.</p> <p>Test results of type C with additional coatings are equally applicable to type B without additional coatings but not vice versa.</p> <p>NOTE For details see Figure 23.</p>	-	-	√
13.4.3.1.4	<p>Classification E, EW</p> <p>No rules applicable.</p>	√	√	-
13.4.3.1.5	<p>Provisions</p> <p>All rules given in 13.4.3.1.2 and 13.4.3.1.3 are valid only provided:</p> <ul style="list-style-type: none"> - the glass component that gives the fire resistance is of the same type (monolithic, laminated or gel type) as tested and is made by the same manufacturer, and - the fire resistant translucent or transparent infill panel is CE marked based on a classification according to EN 13501-2 in minimum one glazed construction. 	√	√	√
13.4.3.2	<p>Dimensions of individual rectangular fire resistant translucent or transparent infill panels</p> <p>Test results cover smaller panel width and height.</p> <p>Test results cover a higher thickness of the panel.</p>	√	√	√

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>The framing system under consideration shall be able to support the additional weight due to the increased thickness of the panel.</p> <p>Test results for a panel of particular dimensions cover dimensions up to a maximum of the tested dimension multiplied by a factor 1,2 in width and/or height but only up to an area of maximum the tested area multiplied by a factor 1,21 provided an overrun time according to Table 2 has been achieved in the test.</p> <p>For classification times 30 min, 45 min and 60 min a factor 1,1 may be used to calculate the covered range of height, width and area, if the overrun time achieved in the test is less than the 6 min required in Table 2 but minimum 3 min.</p> <p>For a classification time ≥ 90 min a factor 1,1 may be used to calculate the covered range of height, width and area, if the overrun time achieved in the test is less than the 10 % required in Table 2 but minimum 5 %.</p> <p>For fire resistant translucent or transparent infill panels with EW classification the rules given above are only applicable if</p> <ul style="list-style-type: none"> – the mean unexposed face temperature remained below 300°C (see EN 1363-2), or – the test specimen was glazed over its full area and the measured radiation did not exceed 12,5 kW/m² (for further explanation see B.7.7.1). 	<p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>-</p> <p>√</p> <p>-</p> <p>-</p> <p>√</p> <p>-</p>	<p>√</p> <p>-</p> <p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>
13.4.3.3	<p>Aspect ratio of individual rectangular fire resistant translucent or transparent infill panels</p> <p>Test results for rectangular translucent or transparent infill panels with portrait as well as landscape format cover all aspect ratios up to an area $A \leq 1/2 * (A_{\text{portrait}} + A_{\text{landscape}})$ provided that:</p> <ul style="list-style-type: none"> – all translucent or transparent infill panels have been tested in an identical framing system, 	<p>√</p>	<p>√</p>	<p>√</p>

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>– the largest tested width as well as the largest tested height is not exceeded.</p> <p>In case an overrun time has been achieved according to Table 2 the values for A_{portrait} and $A_{\text{landscape}}$ may be determined by using the rules for dimensions given in 13.4.3.2.</p>	√ -	√ -	√ -
13.4.3.4	<p>Geometrical shapes</p> <p>Test results for a rectangular translucent or transparent infill panel cover all other shapes provided that their size can be cut out of the tested rectangular size subject to the rules given in 13.3.3.1.</p>	√	√	√
13.4.3.5	<p>Asymmetry in thickness</p> <p>If the translucent or transparent infill panel is asymmetrical in an axis perpendicular to the surface the test result is only valid for the direction and type of exposure (internal or external exposure) as tested.</p>	√	√	√
13.4.4	Glazing materials			
13.4.4.1	Gaskets			
13.4.4.1.1	<p>General</p> <p>Gaskets with a higher material cross sectional area in the uncompressed state cover gaskets with a smaller cross sectional area but not vice versa. The cross sectional area in the uncompressed state may be increased by maximum 50 % compared to what was tested.</p> <p>Test results from particular gasket geometry are also applicable to other geometries. In case of curtain walling classified E or EW no material addition (e.g. lips) is permitted on the side of the gasket that is visible in the built-in situation.</p>	√ √	√ √	√ √

Reference to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	Test results cover only the gasket material used in the test.	√	√	√
13.4.4.1.2	<p>Sealants</p> <p>Change in type of material (e.g. acrylic, silicone) is not permitted.</p> <p>Test results cover a lower sealant height (for definition see Figure 20) and a higher sealant height up to a maximum of 1,2 times the height used in the test.</p> <p>The sealant depth (for definition see Figure 20) shall be minimum the same as tested.</p>	√	√	√
13.4.4.1.3	<p>Intumescent strips/layers</p> <p>Changes to intumescent strips/layers are not permitted.</p>	√	√	√
13.5	Perimeter seals / Vertical linear joint seals			
13.5.1	<p>General</p> <p>Perimeter seals tested according to this standard shall not be used where in practice movement of the perimeter joint is expected.</p> <p>NOTE For information on test requirements for perimeter seals in case of required movement capability see B.7.8.</p>	√	√	√
13.5.2	<p>Orientation</p> <p>Results from tests on perimeter seals (horizontal linear gap seals) are only valid for perimeter seals. Results from tests on vertical linear gap seals are only valid for vertical linear gap seals.</p>	√	√	√

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
13.5.3	<p>Material</p> <p>Test results for non-faced mineral wool are equally applicable to an aluminium faced version of the same mineral wool product (brand designation) but not vice versa.</p> <p>Test results for mineral wool are valid for a version with higher density of the same mineral wool product (brand designation) as long as it is compressible to the same extent as in the test, subject to restrictions depending on the direction of compression given in 13.5.5.4.</p> <p>Test results for compressed mineral wool are equally applicable to mineral wool of higher compression, subject to restrictions depending on the direction of compression given in 13.5.5.4.</p> <p>Changes to other materials or components are not permitted.</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p> <p>√</p>
13.5.4	<p>Width/depth</p> <p>For definition of width and depth of the perimeter seal see Figure 22. For definition of width and depth of the vertical linear gap seal see Figure 7C.</p> <p>Test results for linear joint seals or seal components with lower depth are equally applicable to linear joint seals with higher depth but not vice versa. For membrane forming coatings and elastomeric strips the results apply for all thicknesses within the tolerance band for the membrane/strip and higher depth of mineral wool (or other backing material).</p> <p>Test results for linear joint seals with higher nominal width are equally applicable to linear joint seals with narrower nominal width but not vice versa, subject to the depth of the seal or its components being minimum the same as tested and subject to the rules regarding compression (see 13.5.5.4). For membrane forming coatings and elastomeric strips the overlap on the floor and the spandrel shall be in practice minimum the same as</p>	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>	<p>√</p> <p>√</p>

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>tested.</p> <p>Test results for linear joint seals with an overrun according to Table 2 cover a nominal width range up to 1,2 times the tested nominal width, except for products with distinct sizes for specific gap widths and preformed products which are kept in place by compression (no additional mechanical fixing provided).</p> <p>In case an intumescent sealant is used as component of the perimeter seal its depth may be increased. For definition of depth see Figure 22.</p>	- √	- √	- √
13.5.5	Fixing of the perimeter seal			
13.5.5.1	For mechanically fixed seals the fixing of the perimeter seal is restricted to the fixing used in the test.	√	√	√
13.5.5.2	<p>For self-adherent seals or seal components, e.g. membrane forming coatings and sealants, as well as for adhesion fixed seals or seal components, e.g. elastomeric strips, the results apply for all substrates for which the adhesion is shown to be equal to or better than that in the fire test.</p> <p>NOTE An example for adhesion fixing is the use of a glue to fix the seal or seal component.</p>	√	√	√
13.5.5.3	For friction fixed seals or seal components, e.g. mineral wool and compressible strips, minimum the same compression shall be used in practice as used in the test, subject to the following rule.	√	√	√
13.5.5.4	For mineral wool with compression direction B-B or C-C according to Figure 24 the compression shall be minimum the same as tested but sufficiently low not to induce a mechanical failure of the seal, e.g. by de-lamination fracture.	√	√	√
13.5.6	Covering			

Refer- ence to standard Clause:	Permitted changes to the tested construction with evaluation and additional requirements based on the test results	E45 ¹	EW30 ¹	EI30 ¹
	<p>Tests without steel sheet covering cover perimeter seal systems including steel sheet covering, provided it is not force-fit fixed to the curtain walling, disregarding whether the steel sheet covering is installed on top or on bottom of the seal, but not vice versa.</p> <p>Test results are only valid for the covering material used in the test.</p> <p>No additional coverings of reaction to fire classification B to F according to EN 13501-1 are permitted on bottom side of perimeter seals and on both sides of vertical linear gap seals.</p>	<p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p>	<p>√</p> <p>√</p> <p>√</p>
13.6	<p>Supporting floor</p> <p>Test results obtained with the standard supporting floor construction may be applied to concrete floors of a thickness and density equal to or greater than that of the floor construction used in the test.</p> <p>The test results of a curtain walling specimen tested in front of a non-standard supporting floor are valid for other floors of the same type provided the thickness as well as the fire resistance with respect to loadbearing capacity, integrity and insulation of these floors are equal to or greater than that of the non-standard floor used in the test.</p>	<p>√</p> <p>-</p>	<p>√</p> <p>-</p>	<p>√</p> <p>-</p>

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<p>13.7</p>	<p>Walls abutting the curtain walling</p> <p>Test results obtained with rigid standard wall constructions according to 7.3.1 may be applied to concrete or masonry separating wall constructions of a thickness and density equal to or greater than that of the wall construction used in the test.</p> <p>Test results obtained with a standard flexible wall construction cover all flexible wall constructions of the same fire resistance classification provided:</p> <ul style="list-style-type: none"> – the construction is classified in accordance with EN 13501-2; – the stud depth is higher than that used in the test, subject to the rules given in EN 1363-1; – the number of board layers and the overall board layer thickness is equal or greater than that tested when no aperture framing on the joint face is used; – flexible wall constructions with timber studs are constructed with at least the same number of layers as used in the test, no part of the joint seal is closer than 100 mm to a stud, the cavity is closed between the joint seal and the stud, and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the joint seal and the stud. 	<p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>	<p>√</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>
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Client AGC Glass Europe SA/NV, 1348 Louvain-la-Neuve (Belgium)



5 Limitations

This document does not represent type approval or certification of the product.

ift Rosenheim
16.12.2016