
Title

Assessment of the Fire Resistance
Performance in Accordance with BS
476: Part 22: 1987 for:

Ottostumm W40 Glazed Doorsets
and Screens

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WF 514554

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METALFORM

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1 Foreword

This report has been commissioned by Ottostumm SA and relates to the fire resistance of up to 120 minutes integrity only of fire resisting W40 glazed doorsets.

The report is for National Application and has been written in accordance with the general principles outlined in BS EN 15725: 2010; *Extended application reports on the fire performance of construction products and building elements*.

This report uses established empirical methods of extrapolation and experience of fire testing similar glazed doorsets, in order to extend the scope of application by determining the limits for the designs based on the tested constructions and performances obtained. The scope is an evaluation of the potential fire resistance performance, if the variations specified herein were to be tested in accordance with BS 476: Part 22: 1987.

This scope document cannot be used as supporting documentation for either a CE marking application nor can the conclusion be used to establish a formal classification against EN13501-2.

The scope presented in this report relates to the behaviour of the Ottostumm W40 glazed doorsets under the particular conditions of the test; they are not intended to be the sole criterion for considering the potential fire hazard of the door assembly in use.

This report has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the Passive Fire Protection Forum (PFPF) 'Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence - 2021'. The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used for building control and other purposes.

This report has been written using appropriate test evidence generated at UKAS accredited laboratories, to the relevant test standard. The supporting test evidence has been deemed appropriate to support the stated design and is summarised in section 3.

2 Proposal

It is proposed to consider the fire resistance performance of the Ottostumm W40 glazed doorsets, for up to 120 minutes fire resistance integrity performance, if the W40 glazed doorsets were to be tested to the requirements of BS 476: Part 22: 1987.

The field of application defined in this report is based on the fire resistance test evidence for the Ottostumm W40 glazed doorsets, which is summarised in section 3. Analysis of specific construction details that require assessment are given within this report against the relevant element of construction, as appropriate.

2.1 Assumptions

- It is assumed that the supporting structure for the doorsets is capable of providing the required level of fire performance to effectively support the proposed doorsets without detriment to the fire performance for the required 30, 60, 90 or 120 minutes.
- It is assumed that the doorsets will be of identical specification to that previously fire tested in the test report WR 501608/R Issue 2, EFR-18-V-003019, 2019-Efectis-R001381 and 2019-Efectis-R001669 unless otherwise specified in this report.
- Door leaf to frame gaps can have a significant influence on the fire resistance performance of doorsets and it is therefore assumed that the leaf to frame gaps for the proposed doorsets will be no greater than those of the approved tested doors.
- It is assumed that the proposed doorsets assemblies will be installed by competent installers in a similar manner to the previously tested specimens.

3 Test Data

The test evidence summarised below has been generated to support the fire resistance performance of the Ottostumm W40 glazed doorsets that are the subject of this field of application. The summary details are considered to be the key aspects of the design tested.

Note:

1. Dimensions are in mm unless otherwise stated.
2. Abbreviations: (h) = height; (w) = width; (t) = thickness; (d) = deep; (l) = long.

3.1 Primary Test Evidence

3.1.1 Test Report WF 501608/R Issue 2

Date of Test:	13.Aug.2021
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 0249
Sponsor:	Pyroguard UK Ltd. Written permission given.
Tested Product:	Unlatched, Single Acting, Equal Double Leaf, Steel W40 Doorset with Side and Transom lights
Tested Orientation:	Opening away from heating condition. The glazing beads on the exposed face.
Sampling information:	The glass was sampled by Warringtonfire on 16.Jun.021, Report No. FM501823-5. The Ottostumm W40 doorset was not sampled.
Test Standard:	BS EN 1634-1:2014 + A1:2018
Performance:	Integrity: 147 minutes Insulation: 4 minutes
Reason for Use (if test failed)	N/A
Failure Mode: (if test failed)	N/A

WF 501608/R Issue 2 was a fire resistance test performed in accordance with BS EN 1634-1: 2014 +A1:2018, on a specimen of an Ottostumm W40 single-acting, double-leaf doorset with side and transom lights. The specimen had overall dimensions of 3000 (w) by 3000 (h) and was mounted in a high density rigid supporting construction.

The framework was made from welded Ottostumm W40 sections and glazed with Pyroguard T-EW/15-1. The perimeter of the frame was extended with 30 by 20 by 2 RHS. At the door threshold was a 50 by 5 (t) steel plate. The side lights were of equal width on each side and were split with a transom at 650 (h). The transom lights were on two levels with the tallest glass adjacent to the door leaves giving six glazed apertures. The largest side light pane was 537 (w) by 1585 (h) and the largest transom light was 1844 (w) by 430 (h).

The glazing apertures were lined with 15 by 1.5 (t) Tenmat OS PL20 G99952-80 intumescent tape. The glass was retained with 16 by 16 by 3 thick steel angle beads fixed with 6 screws 60 from corners and 500mm centres. 10 by 3 Tenmat OS T20 G99950-79 glazing tape was used adhered to the frame and beads. 30 by 2 Tenmat OS PR20 G99951-81 intumescent tape was applied to the vertical

faces of the door frame. The frame was fixed to supporting construction at top and bottom with the vertical edges adjacent to the side lights free.

The door leaves were made from welded Ottostumm W40 sections and glazed with Pyroguard T-EW/15-1. The leaf leading edges were reinforced with 35 by 15 by 2 RHS. The base of the door leaves were reinforced with 20 by 15 by 2 RHS. The leaves had an overall size of 923 (w) by 2206 (h). The glazing aperture was split with a horizontal rail in line with that in the side light frame. The upper and largest panes were 863 (w) by 1512 (h).

The glazing apertures were lined with 15 by 1.5 (t) Tenmat OS PL20 G99952-80 intumescent tape. The glass was retained with 16 by 16 by 3 (t) steel angle beads fixed with 6 screws 60 from corners and 500 centres. 10 by 3 Tenmat OS T20 G99950-79 glazing tape was used adhered to the frame and beads. 20 by 1.5 Tenmat OS PR10 G99953-81 intumescent tape was applied to the door leaf stop at the head and the hinge sides. 35 by 2 Tenmat OS FPH G99956-84 intumescent tape was applied to the door leaves meeting edges.

The leaves were fitted with concealed Dorma ITS 96 EMF door closers. The leaves were connected with a OS 1552 single point roller latch which was unlatched during the test. Each leaf was supported on three 3D G99008-12 adjustable weld-on hinges. Each leaf was fitted with a G99510-62 automatic drop seal.

The doorset was installed so that the beads were on the exposed side and the doors opened away from the furnace. The doorset was unlatched during the test.

The specimen achieved a fire resistance performance of 147 minutes integrity only.

3.1.2 Test Report EFR-18-V-003019

Date of Test:	14.Dec.2018
Identification of Test Body:	Efectis France. Cofrac Essais no. 1-1762
Sponsor:	Ottostumm SA
Tested Product:	Unlatched, Single Acting, Rebated, Equal Double Leaf, Steel W40 Doorset mounted in a reinforced concrete support
Tested Orientation:	Opening away from heating condition. The glazing beads and door closer was on the exposed face.
Sampling information:	The Ottostumm W40 doorset was not sampled.
Test Standard:	BS EN 1634-1:2014 + A1:2018
Performance:	Integrity: 135 minutes Insulation: N/A
Reason for Use (if test failed)	N/A
Failure Mode: (if test failed)	N/A

EFR-18-V-003019 was a fire resistance test performed in accordance with BS EN 1634-1: 2014 +A1:2018, on a specimen of an Ottostumm W40 single-acting, rebated, double-leaf

doorset. The specimen had overall dimensions of 2380 (w) by 2523 (h) and was mounted in a low density rigid supporting construction.

The door frame was made from welded Ottostumm W40 sections. The perimeter of the frame was extended with 30 by 20 by 2 RHS. At the door threshold was a 50 by 4 (t) steel plate.

The door leaves were made from welded Ottostumm W40 sections and glazed with 14 (t) Pyrodur T 60-20. The leaves had an overall size of 1190 (w) by 2500 (h). The glass panes in each leaf were 1079 (w) by 2443 (h).

The glazing apertures were lined with 15 by 1.5 OS PL20 G99952-80 intumescent tape. The glass was retained with 16 by 16 by 3 (t) steel angle beads fixed with 6 screws 60 from corners and 500 centres. 10 by 3 OS T20 G99950-79 glazing tape was used adhered to the frame and beads. The perimeter of the door frame and leaves were lined with 30 by 2 OS PR20 G99951-81 intumescent tape. 20 by 1.5 OS PR10 G99953-81 intumescent tape was applied to the closing faces of the door leaves.

The leaves were fitted with a ECO Schulte TS61 GS-B door closers mounted on the exposed face. The doorset was fitted with a OS B99002-02 mortice deadlock and top shoot bolt. Each leaf was supported on three 3D G99008-12 adjustable weld-on hinges. Each leaf was fitted with an Ottostumm G99510-62 automatic drop seal..

The doorset was installed so that the beads were on the exposed side and the doors opened away from the furnace. The doorset was unlatched during the test.

The specimen achieved a fire resistance performance of 135 minutes integrity only.

3.1.3 Test Report 2019-Efectis-R001381

Date of Test:	19.Jul.2019
Identification of Test Body:	Efectis Nederland Notified Body No. 1234
Sponsor:	Ottostumm SA
Tested Product:	Unlatched, Single Acting, Rebated, Single Leaf, Steel W40 Doorset mounted in an aerated concrete wall
Tested Orientation:	Opening away from heating condition. The glazing beads and door closer was on the exposed face.
Sampling information:	The Ottostumm W40 doorset was not sampled.
Test Standard:	BS EN 1634-1:2014 + A1:2018
Performance:	Integrity: 135 minutes Insulation: 16 minutes
Reason for Use (if test failed)	N/A
Failure Mode: (if test failed)	N/A

2019-Efectis-R001381 was a fire resistance test performed in accordance with BS EN 1634-1: 2014 +A1:2018, on a specimen of an Ottostumm W40 single-acting, rebated, single-leaf doorset. The specimen had overall dimensions of 1237 (w) by 2593 (h). It was mounted into

a low density rigid standard supporting construction being an aerated concrete wall built in accordance with EN 1363-1.

The door frame was made from welded Ottostumm W40 sections. The perimeter of the frame was extended with 30 by 20 by 2 RHS.

The door leaf was made from welded Ottostumm W40 sections and glazed with 14 (t) Pyrodur T 120-20. The leaf had an overall size of 1186 (w) by 2504 (h). The glass pane in the leaf was 1079 (w) by 2443 (h).

The glazing aperture was lined with 20 by 1.5 OS PL20 G99953-81 intumescent tape. The glass was retained with 16 by 16 by 3 (t) steel angle beads fixed with 6 screws 60 from corners and 500 centres. 10 by 4 OS T30 G99954-79 was used adhered to the frame and beads.

The leaf was fitted with a ECO Schulte TS61 GS-B door closer mounted on the exposed face. The doorset was fitted with a OS B99002-02 mortice deadlock. The leaf was supported on three 3D C99008-12 adjustable weld-on hinges. The leaf was fitted with a Ottostumm G99510-62 automatic drop seal.

The doorset was installed so that the beads were on the exposed side and the door opened away from the furnace. The doorset was unlatched during the test.

The specimen achieved a fire resistance performance of 135 minutes integrity only.

3.1.4 Test Report 2019-Efectis-R001669

Date of Test:	19.Jul.2019
Identification of Test Body:	Efectis Nederland Notified Body No. 1234
Sponsor:	Ottostumm SA
Tested Product:	Unlatched, Single Acting, Rebated, Single Leaf, Steel W40 Doorset mounted in an aerated concrete wall
Tested Orientation:	Opening in to the heating condition. The glazing beads were on the unexposed face and door closer was on the exposed face.
Sampling information:	The Ottostumm W40 doorset was not sampled.
Test Standard:	BS EN 1634-1:2014 + A1:2018
Performance:	Integrity: 135 minutes Insulation: 19 minutes
Reason for Use (if test failed)	N/A
Failure Mode: (if test failed)	N/A

2019-Efectis-R001669 was a fire resistance test performed in accordance with BS EN 1634-1: 2014 +A1:2018, on a specimen of an Ottostumm W40 single-acting, rebated, single-leaf doorset. The specimen had overall dimensions of 1237 (w) by 2593 (h). The doorset was mounted into a rigid standard supporting construction being an aerated concrete wall built in accordance with EN 1363-1.

The door frame was made from welded Ottostumm W40 sections. The perimeter of the frame was extended with 30 by 20 by 2 RHS.

The door leaf was made from welded Ottostumm W40 sections and glazed with 14 (t) Pyrodur T 120-20. The leaf had an overall size of 1186 (w) by 2504 (h). The glass pane in the leaf was 1079 (w) by 2443 (h).

The glazing aperture was lined with 20 by 1.5 OS PL20 G99953-81 intumescent tape. The glass was retained with 16 by 16 by 3 (t) steel angle beads fixed with 6 screws 60 from corners and 500 centres. 10 by 4 OS T30 G99954-79 glazing tape was used adhered to the frame and beads.

The leaf was fitted with a ECO Schulte TS61 GS-B door closer mounted on the exposed face. The doorset was fitted with a OS B99002-02 mortice deadlock. The leaf was supported on three 3D C99008-12 adjustable hinges. The leaf was fitted with a Ottostumm G99510-62 automatic drop seal

The doorset was installed so that the beads were on the unexposed side and the door opened in to the furnace. The doorset was unlatched during the test.

The specimen achieved a fire resistance performance of 135 minutes integrity only.

4 General Description of Construction

4.1 Proposals

4.1.1 Door Opening Direction

It is proposed that the doorsets discussed in this assessment may open in either direction with respect to the fire risk.

4.1.2 Double and Single Leaf Doorset

It is proposed that the doorsets discussed in this assessment may be double or single leaf versions of those in the referenced tests.

4.1.3 Door Leaf Sizes

It is proposed that the door leaves discussed in this assessment may be of larger sizes than those in the referenced tests.

4.1.4 Glass Sizes in Side and Transom Lights

It is proposed that the glass sizes in side and transom lights may be of larger sizes than those in the referenced test.

4.1.5 Glazed Screens

It is proposed that W40 glazed screens without doorsets be approved with maximum pane sizes permitted for side and transom lights.

4.1.6 Radiused Transom Lights

It is proposed that transom lights on the perimeter of doorsets or glazed screens may be radiused.

4.1.7 Alternative Glass Types

It is proposed that for a performance of 30 minute integrity only Pyroguard T-EW/15-1 may be substituted by Pyroguard T-E/6, T-E/8 or T-E/10 in door leaves, side lights and transom lights.

4.1.8 Alternative Glazing beads

It is proposed that the tested steel angle beads may be substituted with steel square hollow section beads with the same overall size.

4.1.9 Latched Doorsets and Alternative Hardware

It is proposed that the unlatched doorsets in the referenced tests may be latched and that alternative hardware may be used.

4.1.10 Rebated and Non-rebated Doorsets

It is proposed that the Ottostumm W40 doorsets discussed in this assessment may be either rebated or non-rebated.

4.1.11 Alternative Concealed Door Closers

It is proposed that alternative concealed door closers to the Dorma ITS 96 EMF tested may be fitted to the Ottostumm W40 doorsets.

4.1.12 Alternative Surface Mounted Overhead Door Closers

It is proposed that alternative surface mounted overhead door closers to the ECO Schulte TS61 GS-B tested may be fitted to the Ottostumm W40 doorsets on the exposed face only.

4.1.13 Addition of Horizontal Extension Sections

It is proposed that horizontal extension sections may be fabricated into either the door leaf or the door frame.

4.1.14 Addition or removal of Horizontal Rails and Vertical Stiles

It is proposed that additional horizontal rails and vertical stiles may be added. It is also proposed that the horizontal rails in the tested doorsets may be removed or moved in position.

4.1.15 Overall Screen Height and Width

It is proposed that the overall height of the doorset including transom lights or screens may be up to 4m and of infinity width.

4.1.16 Supporting Structures

It is proposed that the doorsets discussed in this report may be mounted in rigid or flexible constructions.

5 Analysis

The fire resistance test evidence has been generated to EN 1634-1:2014 +A1:2018. This is known to be more onerous than the BS 476: Part 22: 1987 standard, primarily due to the use of plate thermocouples within the furnace to record the furnace temperature.

The same time temperature curve is used to control the temperature within the furnace for both test methods (the heating curve given within ISO 834-1). However, the plate thermocouple used to record the temperature within the furnace for the EN test method, requires a higher thermal inertia to read the same temperature as the probe thermocouple that is used for the BS 476: Part 22: 1987 test, particularly during the early stages of the test. Furthermore, the neutral pressure regime is positioned lower relative to the specimen height in a European fire door test, therefore resulting in greater relative positive pressure conditions than those expected in a BS 476: Part 22: 1987 test, which has the potential to increase hot gases and flaming on the unexposed side. These factors result in more onerous test conditions for doorsets tested to the BS EN 1634-1 test standard compared with the BS 476: Part 22: 1987 test standard, which has been demonstrated by testing the same products to both standards.

It is therefore the opinion of Warringtonfire that the evidence cited in the following section, tested to the named standard referenced above can be utilised in this assessment which will conclude in terms of the fire resistance performance of the Ottostumm W40 doorset with side and transom light designs if tested in accordance with BS 476: Part 22: 1987.

Certifire certification is gained by a third party analysis of previously tested products and constructions and approval against quality procedures and represents a higher level of attestation than simple 'type' testing.

Certifire listed products are approved on the basis of:

- a) Initial type testing
- b) A design appraisal against the appropriate Technical Schedule
- c) Product surveillance under EN ISO 9001:2015
- d) Audit testing.

5.1.1 Door Opening Direction

It is proposed that the doorsets discussed in this assessment may open in either direction with respect to the fire risk.

In tests 2019-Efectis-R001381 and 2019-Efectis-R001669 the single leaf doorsets were identical with the exception of the door closers which were on mounted the exposed face in both cases. The doors opened away from and into the furnace respectively. Both specimens achieved a performance of 135 minutes. Therefore it is positively assessed that these single leaf doorsets can have exposure from either side provided the door closer is always on the exposed face only.

In tests WF 501608/R and EFR-18-V-003019 the assemblies were orientated such that the doors opened away from the furnace.

According to EN 1634-1:2014+A1:2018 clause 13.4.2 a "hinged, metal leaf, metal frame" doorset tested "opening away from furnace" with integrity only performance covers opening into the furnace. "This only applies to doors without insulation in the core and with a movement restrictor at approximately mid-height on the hinge side." In tests WF 501608/R

and EFR-18-V-003019 the doorsets contained no insulation and each leaf had three hinges, one at mid-point, acting as a movement restrictor.

The glazing beads in the two referenced tests were on the exposed face. This considered to be the most onerous side and therefore having the beads on the unexposed face is approved.

In test WF 501608/R the concealed door closer was within the W40 frame work and therefore not affected by the orientation of opening. However in test EFR-18-V-003019 the door closer was a surface mounted type on the exposed face. This type of closer is only permitted when mounted on the exposed face of Ottostumm W40 doorsets.

The proposed Ottostumm W40 doorsets discussed in this report are positively assessed for opening into the fire risk as well as the tested away from. Surface mounted door closers are only permitted on the exposed face.

5.1.2 Double and Single Leaf Doorset

It is proposed that the doorsets discussed in this assessment may be double or single leaf versions of those in the referenced tests.

Test WF 501608/R was on a single acting, unrebated, unlatched, equal leaf double doorset with side and transom lights. The PFPF rules for metallic doorsets permit single doorsets to be assessed from unlatched double doorset test evidence. Therefore single doorsets to the specification of WF 501608/R are positively assessed.

The single leaf doorsets tested in 2019-Efectis-R001381 and 2019-Efectis-R001669 were of the same specification as the double doorset tested in EFR-18-V-003019. Therefore single and double doorsets to this specification are approved. None of these three tests had side or transom lights.

5.1.3 Door Leaf Sizes

It is proposed that the permitted door leaf sizes may be larger than in the referenced test.

In test WF 501608/R, a double doorset with side and transom lights, the leaves were 923 (w) by 2206 (h) with the glazing aperture split with a horizontal rail and achieved a performance of 147 minutes integrity only with Pyroguard T-EW/15-1.

PFPF rules for metallic doorsets permits the assessment of single leaf doorsets from an unlatched double doorset. For latched single leaf doorsets the sizes may be increased as with the tested unlatched double doorset. With unlatched single leaf doorsets the leaves can only be at the tested size of double doorset.

Applying the rules of PFPF for metallic doorsets the door leaves may be increased but this increase will be limited by the permitted increase in glass size according to the rules of Technical Schedule TS25. The permitted leaf sizes are given in the table below according to required fire resistance performance.

Performance minutes integrity only	Maximum width mm	Maximum height mm
30	1138 (w) @ 2206 (h)	2734 (h) @ 923 (w)
60	1138 (w) @ 2206 (h)	2734 (h) @ 923 (w)
90	1108 (w) @ 2206 (h)	2647 (h) @ 923 (w)
120	1061 (w) @ 2206 (h)	2537 (h) @ 923 (w)

The sizes in the table above are positively approved for Ottostumm W40 latched single or latched or unlatched equal width leaf double doorsets with the glazing aperture split with a horizontal rail and with or without side and or transom lights glazed with Pyroguard T-EW/15-1. Unequal leaf width double doorsets are not permitted.

The maximum permitted size of unlatched single doorsets with side and transom lights is 923 (w) by 2203 (h). In test EFR-18-V-003019 a double doorset glazed with Pyrodur T 60-20 without side and transom lights the leaves were 1190 (w) by 2500 (h) and achieved a performance of 135 minutes integrity only.

According to the rules of PFPF for metallic doorsets it is permitted to assess single leaf doorsets from tests on double doorsets.

PFPF rules for metallic doorsets permits the assessment of single leaf doorsets from an unlatched double doorset. For latched single leaf doorsets the sizes may be increased as with the tested unlatched double doorset. With unlatched single leaf doorsets the leaves can only be at the tested size of double doorset.

Applying the rules of PFPF for metallic doorsets the door leaves may be increased but this increase will be limited by the increase in glass size according to the rules of Technical Schedule TS25. The permitted leaf sizes are given in the table below according to required fire resistance performance.

Performance minutes integrity only	Maximum width mm	Maximum height mm
30	1524 (w) @ 2500 (h)	3110 (h) @ 1190 (w)
60	1488 (w) @ 2500 (h)	3110 (h) @ 1190 (w)
90	1428 (w) @ 2500 (h)	3000 (h) @ 1190 (w)
120	1369 (w) @ 2500 (h)	2805 (h) @ 1190 (w)

The PFPF rules do not allow the addition of side and transom lights without test evidence. Therefore the sizes in the table above are positively approved for Ottostumm W40 latched single or latched or unlatched equal width leaf doorsets without side or transom lights and glazed with Pyrodur T 60-20. The door leaves may be glazed with Pyroguard T-E/13-1 or T-E/15-1 subject to the size limits in steel doors specified in Certifire CF5227. Unequal leaf width double doorsets are not permitted.

5.1.4 The maximum permitted size of unlatched single doorsets without side and transom lights is 1190 (w) by 2500 (h). Glass Sizes in Side and Transom Lights

It is proposed that the permitted glass sizes in side and transom lights may be larger than in the referenced test.

In test WF 501608/R the upper side light Pyroguard T-EW/15-1 panes were 537 (w) by 1585 (h) and the larger transom light Pyroguard T-EW/15-1 pane was 1844 (w) by 430 (h) and achieved a performance of 147 minutes.

Applying the rules in Technical Schedule TS25 tested glass sizes may be increase according to the percentage overrun up to a maximum of 25% giving the permitted sizes of Pyroguard T-EW/15-1 in the table below.

The testing of glass in a door leaf is more onerous than when being test in fixed lights or screens due to more severe deflections. It is therefore concluded that the Pyroguard T-

EW/15-1 glass sizes approved for door leaves may also be approved for use in side lights at sizes as in the table below.

The maximum width of transom light is limited by the maximum permitted door leaf size which is smaller than that permitted by the overrun.

Certifire certificate CF5227 permits an increase in Pyroguard T-EW/15-1 pane height in a previously tested frame.

The combination of the above parameters gives the permitted Pyroguard T-EW/15-1 side and transom light pane sizes in the table below.

Performance minutes integrity only	Position	Maximum width mm	Maximum height mm	Maximum area m ²
30	Side light	671 (w) @ 1585 (h)	1981 (h) @ 537 (w)	1.06
30	Side light	1078 (w) @ 1512 (h)	1890 (h) @ 863 (w)	1.63
30	Transom light	2274 (w) @ 800 (h)	1000 (h) @ 2274 (w)	2.27
60	Side light	671 (w) @ 1585 (h)	1981 (h) @ 537 (w)	1.06
60	Side light	1078 (w) @ 1512 (h)	1890 (h) @ 863 (w)	1.63
60	Transom light	2274 (w) @ 800 (h)	1000 (h) @ 2274 (w)	2.27
90	Side light	671 (w) @ 1585 (h)	1981 (h) @ 537 (w)	1.06
90	Side light	1078 (w) @ 1512 (h)	1890 (h) @ 863 (w)	1.63
90	Transom light	2214 (w) @ 800 (h)	1000 (h) @ 2214 (w)	2.14
120	Side light	657 (w) @ 1585 (h)	1941 (h) @ 537 (w)	1.04
120	Side light	1057 (w) @ 1512 (h)	1852 (h) @ 863 (w)	1.59
120	Transom light	2120 (w)	800 (h)	1.69

It is positively assessed that the Pyroguard T-EW/15-1 pane sizes in the table above are approved for use in Ottostumm W40 side and transom lights.

5.1.5 Glazed Screens

It is proposed that W40 glazed screens without doorsets be approved with maximum pane sizes permitted for side and transom lights.

Test WF 501618/R was on a glazed doorset with side and transom lights. The vertical edges were not fixed to the supporting structure, i.e. unrestrained free edges. It is therefore considered that the side and transom light arrangement may be replicated into a glazed screen limited to glass sizes as listed in 5.1.4. and positively assessed.

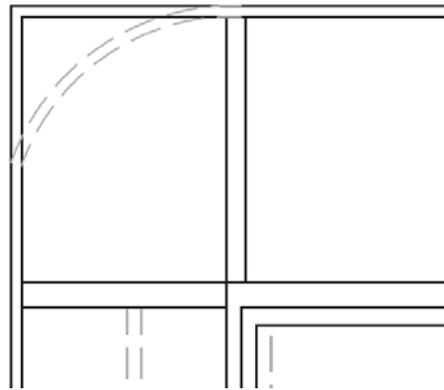
5.1.6 Radiused Transom Lights

It is proposed that transom lights on the perimeter of doorsets or glazed screens may be radiused. See below.

According to EN 15254-4, the EXAP for glazing, clause 5.2 – Glass shapes:

“Circular, triangular or 4 sided non-rectangular shapes may be cut from within the extended rectangular pane size defined by the field of direct application. All other non-rectangular shapes may be only be cut from the tested rectangular pane size and shall not be extended further.”

Proposed Radiused Panel



Following the EXAP rules the maximum size of radiused transom pane from WF 501608/R is 1844 (w) by 430 (h).

The introduction of radiused or arched heads to doorset or glazed screen frame will not have a deleterious on the performance of the system providing the securing of the head of the frame is as tested and the overall size of the screen remains within that approved.

It is positively assessed that that transom lights on the perimeter of a glazed screen sizes may be radiused with maximum sizes above.

5.1.7 Alternative Glass Types

It is proposed that for a performance of 30 minute integrity only Pyroguard T-EW/15-1 may be substituted by Pyroguard T-E/6, T-E/8 or T-E/10 in door leaves, side lights and transom lights.

According to Certifire certificate CF5319 the sizes of Pyroguard T-E30/6, T-E/8 or T-E/10 listed below are approved for use in previously test steel applications for 30 minute integrity only.

Application	Pyroguard product	Maximum width mm	Maximum height mm	Maximum area m ²
Door leaf	T-E/6, T-E/8, T-E/10	1078 (w) @ 1512 (h)	1890 (h) @ 863 (w)	1.63
Side light	T-E/6, T-E/8, T-E/10	671 (w) @ 1585 (h)	1981 (h) @ 537 (w)	1.06
Side light	T-E/6, T-E/8, T-E/10	1078 (w) @ 1512 (h)	1890 (h) @ 863 (w)	1.63
Transom light	T-E/6, T-E/8	1800 (w) @ 430 (h)	537 (h) @ 1500 (w)	0.99
Transom light	T-E/10	2274 (w) @ 800 (h)	1000 (h) @ 2274 (w)	2.27

It is positively assessed that Pyroguard T-EW/15-1 may be substituted by Pyroguard T-E/6, T-E/8 or T-E/10 as above for applications where the required performance is 30 minutes integrity only.

5.1.8 Alternative Glazing Beads

It is proposed that the tested 16 by 16 by 3 (t) steel angle beads as used in the referenced tests be replaced with 15 by 15 by 2 (t) steel square hollow section. See Appendix C.

According to Technical Schedule TS25 “Changes in the appearance, shape and size of glazing beads are permitted provided there is no weakness of any retention or shielding effect nor any increased exposure to ignition from radiant heat.” This condition is satisfied by the proposed substitution and is therefore positively assessed.

5.1.9 Latched Doorsets and Alternative Hardware

It is proposed that the unlatched doorsets in tests WR 501608/R, EFR-18-V-003019, 2019-Efectis-R001381 and 2019-Efectis-R001669 may be latched and that alternative hardware may be used.

In the referenced test reports the door leaves were unlatched during the tests. According to the PFPF rules for metallic doorsets “A test on an unlatched doorset can be assessed to a latched and/or bolted doorset (as relevant) providing the door leaf was tested with the appropriate (disengaged) latch and flush bolts.

According to Technical Schedule TS12 for metallic doorsets:

“Changes in building hardware are permitted provided the specification is the same and the items comply with current certification requirements (CE or Certifire certification).

“The number of any movement restrictors such as locks, latches and hinges may be increased but shall not be decreased. Changes to the method of attachment to door panels or frames for items of building hardware shall not be made unless proven by testing.”

It is therefore positively assessed that the tested doorsets may be latched and changes in hardware can be made providing it follows the rules of TS12.

5.1.10 Rebated and Non-rebated Doorsets

It is proposed that the Ottostumm W40 doorsets discussed in this assessment may be either rebated or non-rebated.

Test WF 501608/R was conducted with a W40 non-rebated double doorset and achieved a performance of 147 minutes integrity only. Test EFR-18-V-003019 was conducted with a W40 rebated double doorset and achieved a performance of 135 minutes integrity only. Tests 2019-Efectis-R001381 and 2019-Efectis-R001669 were conducted with a W40 rebated single leaf doorsets and both achieved a performance of 135 minutes integrity only

It is therefore positively assessed that the tested W40 doorsets may be either rebated or non-rebated.

5.1.11 Alternative Concealed Door Closers

It is proposed that alternative concealed door closers to the tested Dorma ITS 96 EMF may be fitted to the Ottostumm W40 doorsets.

In test WF 501608/R the doorset achieved a performance of 147 minutes integrity only and was fitted with Dorma ITS 96 EMF which is a standard ITS 96 fitted with an electro-mechanical hold open device.

It is proposed that alternative concealed closers Dorma ITS 96 standard and Dorma ITS 96 GSR EMF may be fitted to W40 doorsets. The standard unit is as the EMF version without the electro-mechanical components including wiring. The GSR EMF unit is as the EMF version but with door closing sequencing. This is achieved with push rod clamping and is independent of the hydraulic system. As these alternatives add no potential combustible products to the Dorma ITS 96 EMF closer it is positively assessed that these closers are suitable for W40 doorsets for a performance of up to 120 minutes integrity only. These

models of Dorma closers are certified under Certifire certificate CF140 for applications up to 240 minutes.

It is proposed that alternative concealed door closers Geze Boxer standard, E and E-ISM may be fitted to W40 doorsets. As with the Dorma the Geze Boxer E is as the standard Boxer but fitted with an electro-mechanical hold open device. The Boxer E-ISM unit is as the ISM version but with door closing sequencing. These models of Geze closers are certified under Certifire certificate CF242 for applications up to 240 minutes. In CF242 for Geze Boxer closers it states "The closer shall only be fitted to ITT, MM or IMM doorsets which have previously been shown capable of accommodating the installation of similar concealed closers at the head of the doorset, without detriment to the doorset's performance." An IMM is a 20 to 240 minute doorset consisting of uninsulated or insulated predominantly steel leaves, hung in steel frames with intumescent seals.

It is positively assessed that these models of Geze Boxer closers are suitable to be fitted to W40 doorsets for a performance of up to 120 minutes integrity only.

5.1.12 Alternative Surface Mounted Overhead Door Closers

It is proposed that alternative Certifire certified surface mounted overhead door closers from Dorma and Geze may be fitted to the Ottostumm W40 doorsets in lieu of the tested ECO Schulte TS61 GS-B on the exposed face only.

With closers fitted to the exposed face the closer will be destroyed early in the exposure to a fire and consequently have little effect on the doorset's performance. This was noted in test EFR-18-V-003019 for the ECO Schulte TS61 GS-B closer when in the first minutes a "Fall of an element of an exposed door closer."

Models of Dorma surface mounted door closers are covered by CF119 and those from Geze by CF144, CF145 and CF252.

It is positively assessed that the Certifire certified models of Dorma and Geze surface mounted door closers are suitable for W40 doorsets for a performance of up to 120 minutes integrity only when fitted to the exposed face only.

5.1.13 Addition of Horizontal Extension Sections

It is proposed that horizontal extension sections may be fabricated into either the door leaf or the door frame.

These profiles add 46mm to the size of the frame. See Appendix C. The inclusion of these sections will provide additional stiffness to the frame they are applied to and will not have a deleterious on the performance of the arrangement. The inclusion of these horizontal extension sections is positively assessed for either to door leaf or the door frame.

5.1.14 Addition or removal of Horizontal Rails and Vertical Stiles

It is proposed that additional horizontal rails and vertical stiles may be added. It is also proposed that the horizontal rails in the tested doorsets may be removed or moved in position.

According to EN 15269-5:2014+A1:2016 it is permitted to add horizontal rails or vertical stiles to a tested door leaf provided the same glass retention system is used. It is also permitted to move or remove the horizontal rail from the tested door leaf provided the height of the glass panes are not bigger than the approved size in the door leaves. It is not permitted to have angled rails without additional test evidence.

5.1.15 Overall Screen Height and Width

It is proposed that the overall height of the doorset including transom lights or screen may be up to 4m and the width infinite.

Subject to the limits of door leaf and transom light pane heights listed above, a glazed arrangement tested at 3m may be increase “to a maximum of 4m” according to Technical Schedule TS25. Test WF 501608/R was conducted with a doorset with transom lights of overall height of 3m.

An increase to greater than 4m would necessitate the screen being suitably tied back to the supporting structure at or below this level with a stable beam or structure which will not be affected by fire exposure for the required performance duration. It is recommended that the design of such an arrangement would need further approval.

In test WF 501608/R both vertical edges of the frame were not fixed to the supporting structure, i.e. unrestrained free edges. It is therefore considered that the side light arrangement may be replicated limited to glass sizes as listed above.

It is positively assessed that W40 doorset including transom lights may be up to 4m maximum high and of infinite width.

5.1.16 Supporting Structures

It is proposed that the doorsets discussed in this report may be mounted in rigid or flexible constructions.

In the four referenced tests the doorsets were mounted into high or low density rigid constructions as defined in EN 1363-1:2020. According to the field of direct application in EN 1634-1:2014+A1:2018 “For uninsulated metal doors, the result of a test in a rigid standard supporting construction is applicable to that door assembly mounted in a flexible construction, but not vice versa.” The flexible construction is that defined in EN 1363-1:2020.

6 Conclusion

If Ottostumm W40 doorsets were constructed in accordance with the specification documented in WF 514544 and were to be tested in accordance with BS 476: Part 22: 1987, it is our opinion that they would provide a minimum of 30 minutes integrity only and up to 120 minutes integrity only dependent on specification.

This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 22: 1987, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.

7 Declaration by the Applicant

- 1) We the undersigned confirm that we have read and comply with obligations placed on us by the Passive Fire Protection Forum (PFPF) Guide to undertaking technical assessments and engineering evaluations based on fire test evidence 2021 Industry Standard Procedure
- 2) We confirm that any changes to a component or element of structure which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.
- 3) We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.
- 4) We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.
- 5) We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

(in accordance with the principles of FTSG Resolution No. 82: 2001)

Signed: *Patrik Kleebaum*

Name: Patrik Kleebaum

Position: System Engineering

Date: 31.03.2022

For and on behalf of: **Ottostumm SA**

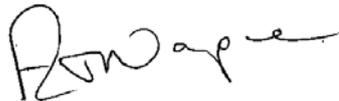
8 Limitations

The following limitations apply to this assessment:

- 1) This report addresses itself solely to the elements and subjects discussed and do not cover any other criteria or modifications. All other details not specifically referred to should remain as tested or assessed.
- 2) This report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to Warringtonfire, the assessment will be unconditionally withdrawn, and the applicant will be notified in writing. Similarly, the assessment evaluation is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.
- 3) This field of application has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
- 4) Opinions and interpretation expressed herein are outside the scope of UKAS accreditation.
- 5) This field of application relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions against the ISO 834 time/temperature curve that is stipulated in the standard this assessment concludes to. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this field of application, the element is suitable for its intended purpose.
- 6) This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 22: 1987, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.
- 7) This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Warringtonfire. All work and services carried out by Warringtonfire Testing and Certification Limited are subject to, and conducted in accordance with, the Standard Terms and Conditions of Warringtonfire Testing and Certification Limited, which are available at <https://www.element.com/terms/terms-and-conditions> or upon request.
- 8) The version/revision stated on the front of this report supersedes all previous versions/revisions and must be used to manufacture the assessed systems from the stated validity date on this front cover. Previous revisions of the report cannot be used once an updated report has been issued under a new revision.

9 Validity

- 1) The assessment is initially valid for five years after which time it is recommended to be submitted to Warringtonfire for re-appraisal.
- 2) This assessment report is not valid unless it incorporates the declaration given in Section 7 duly signed by the applicant.

Position:	Assessor	Reviewer
Signature:		
Name:	*A Napier	*A Kearns
Title:	Certification Engineer	Technical Manager

* For and on behalf of Warringtonfire

Appendix A: Summary of Supporting Test Evidence

Report No	WF 501608/R Issue 2		
Test date	13.Aug.2021		
Sponsor	Pyroguard UK Ltd. Written permission given.		
Test Standard	EN 1634-1:2014+A1:2018		
Test Specimen Description/ Configuration/ Specification	Unlatched, single acting, equal double leaf, steel W40 doorset with side and transom lights opening away from fire risk		
Performance (mins)	Integrity	:	147
	Insulation	:	4
	Loadbearing Capacity	:	N/A
	Radiation	:	147

Report No	Efectis EFR-18-V-003019		
Test date	14.Dec.2018		
Sponsor	Ottostumm SA		
Test Standard	BS EN 1634-1:2014 + A1:2018		
Test Specimen Description/ Configuration/ Specification	Unlatched, single acting, equal double leaf, steel W40 doorset opening away from fire risk		
Performance (mins)	Integrity	:	135
	Insulation	:	N/A
	Loadbearing Capacity	:	N/A
	Radiation	:	134

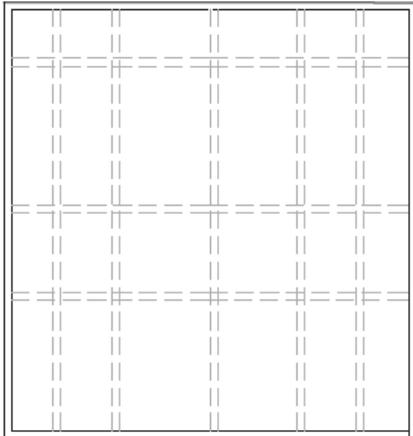
Report No	2019-Efectis-R001381		
Test date	19.Jul.2019		
Sponsor	Ottostumm SA		
Test Standard	BS EN 1634-1:2014 + A1:2018		
Test Specimen Description/ Configuration/ Specification	Unlatched, single acting, single leaf, steel W40 doorset opening away from fire risk		
Performance (mins)	Integrity	:	135
	Insulation	:	16
	Loadbearing Capacity	:	N/A
	Radiation	:	135

Report No	2019-Efectis-R001669		
Test date	19.Jul.2019		
Sponsor	Ottostumm SA		
Test Standard	BS EN 1634-1:2014 + A1:2018		
Test Specimen Description/ Configuration/ Specification	Unlatched, single acting, single leaf, steel W40 doorset opening into fire risk		
Performance (mins)	Integrity	:	135
	Insulation	:	19
	Loadbearing Capacity	:	N/A
	Radiation	:	135

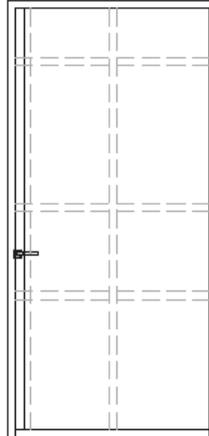
Appendix B: Revisions

Rev.	WF Ref.	Date	Description

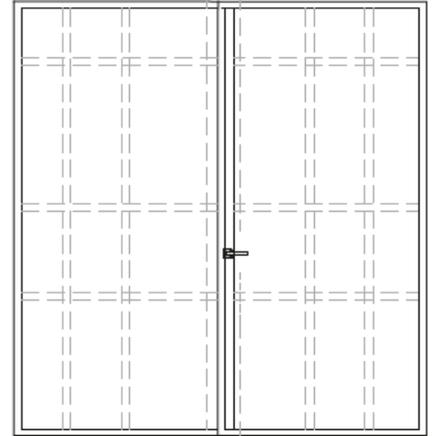
Appendix C: Drawings



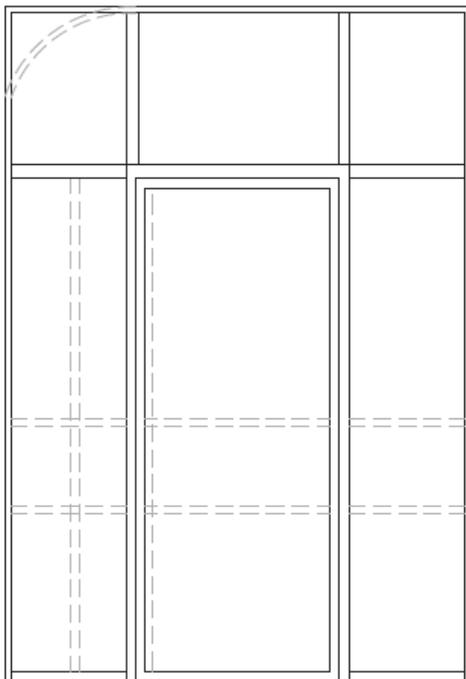
Fixed partition



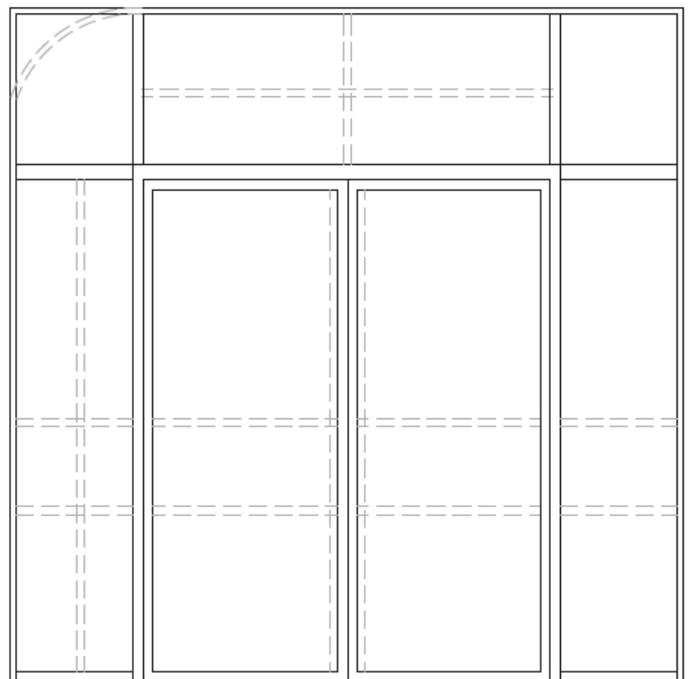
Single leaf door



Double leaf door

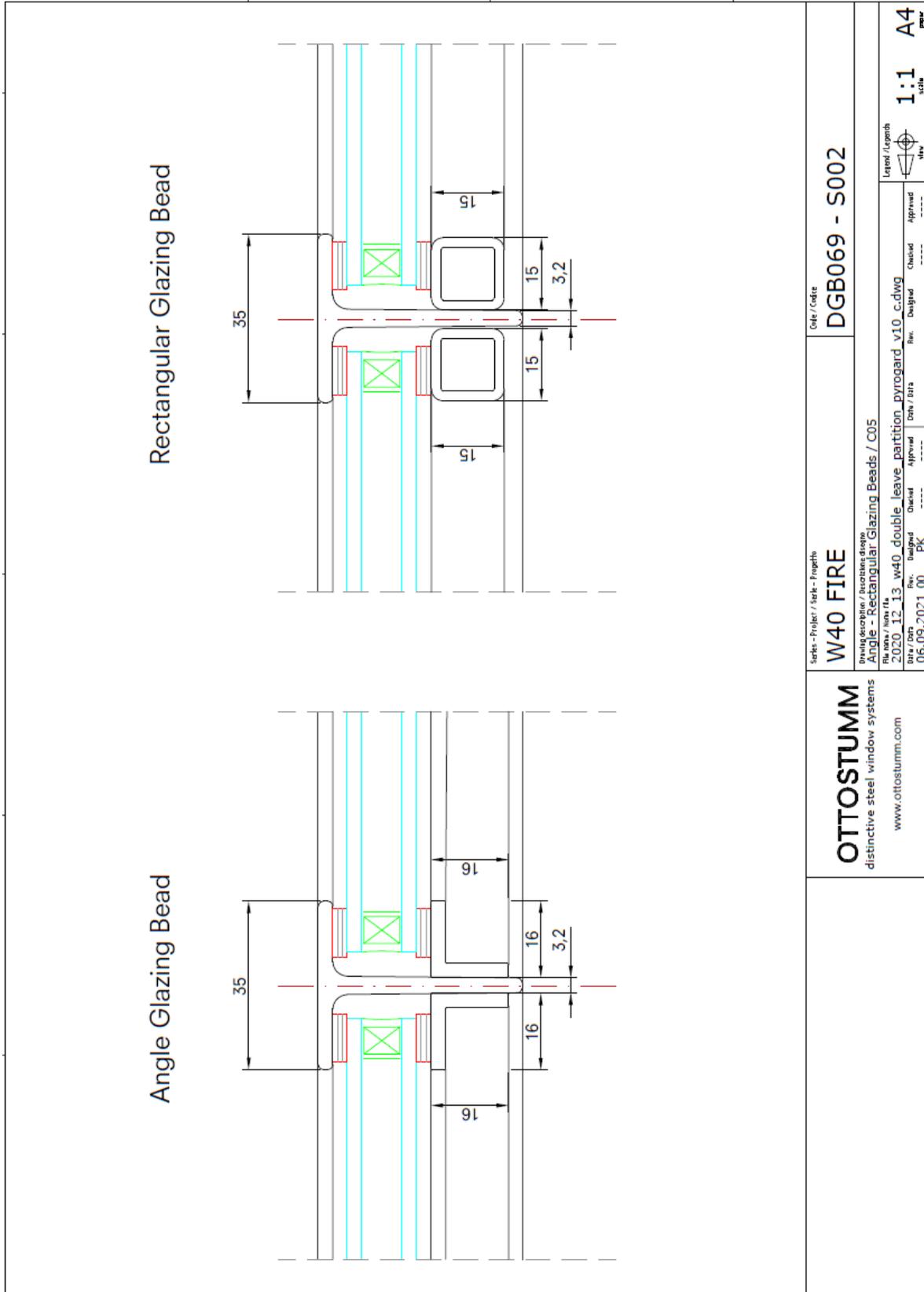


Single leaf door in partition

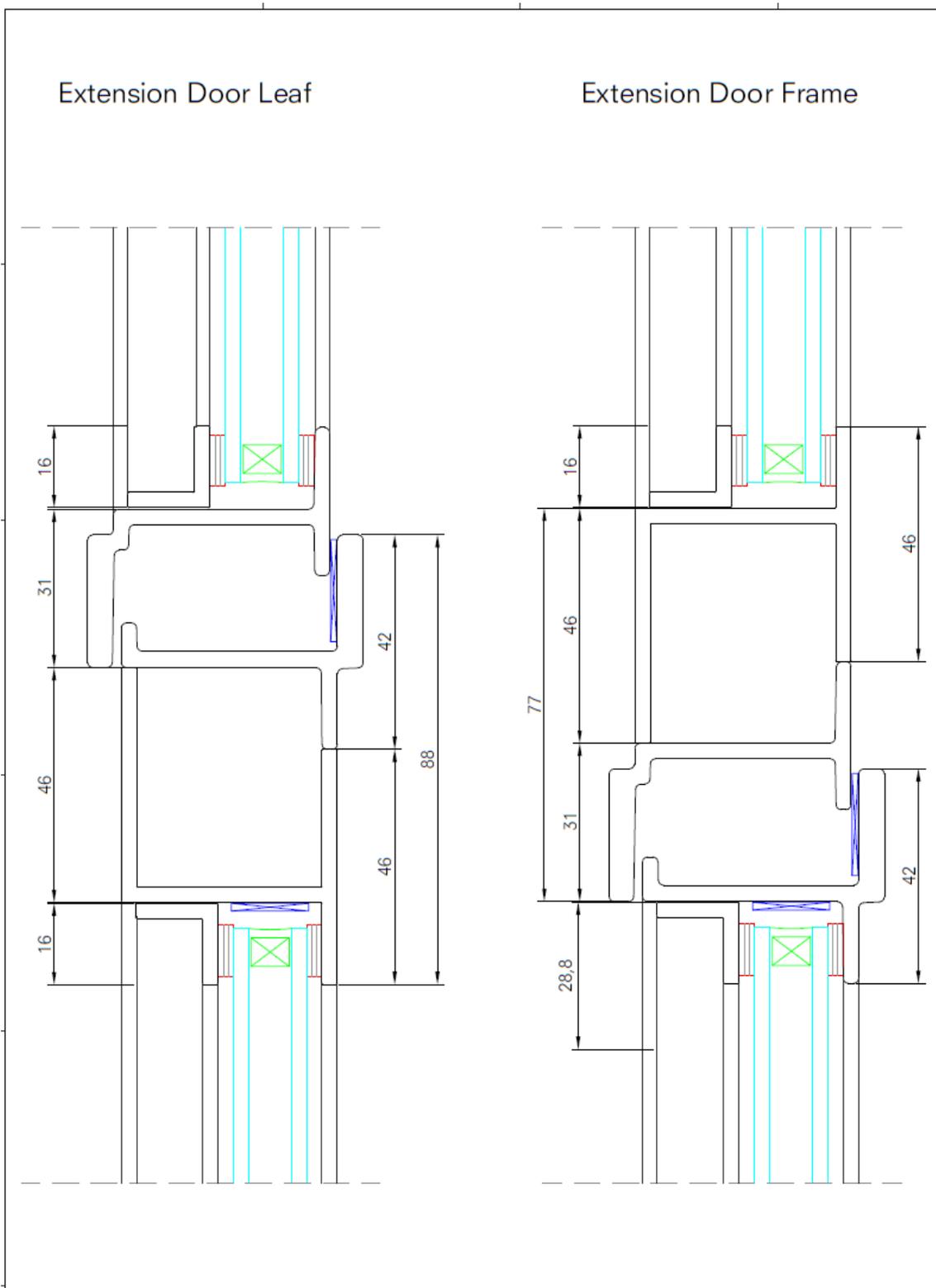


Double leaf door in partition

Typical Arrangements



W40 FIRE	Series - Project / Marke - Projehti W40 FIRE	Code / Code DGB069 - S002
OTTOSTUMM distinctive steel window systems www.ottostumm.com	Drawing description / Beschreibung des Zeigens Angle - Rectangular Glazing Beads / C05	
File name / Name der Datei 2020_12_13_w40_double_leave_partition_pyrogard_v10_c.dwg		
Date / Datum 06.09.2021 00	Rev. / Revidiert PK	Rev. / Revidiert PK
Designed / Entworfen PK	Checked / Geprüft PK	Checked / Geprüft PK
Approved / Genehmigt PK	Approved / Genehmigt PK	Approved / Genehmigt PK
Legend / Legende		1:1 scale
		A4 paper



OTTOSTUMM distinctive steel window systems www.ottostumm.com	Series - Project / Serie - Projekt W40 FIRE	Code / Codici DGB069 S003										
	Drawing Description / Descrizione disegno Extension Leaf - Frame / C08											
	File name / Nome file 2020_12_13_w40_double_leave_partition_pyrogard_v10_c.dwg											
Date / Data 06.09.2021	Rev. 00	Designed PK	Checked ----	Approved ----	Date / Data 06.09.2021	Rev. 00	Designed PK	Checked ----	Approved ----	Legend / Legendi 	1:16 SCW	A4 DRAW

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