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Testing. Advising. Assuring.

Title:

The Fire Resistance
Performance of Panic Exit
Devices When Fitted To Fire
Resisting Doorsets

Report No:

128348 Issue 5

Prepared for:

Allegion (UK) Ltd
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Walsall
West Midlands
WS1 4DL.

Date:

11th October 2004

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Executive Summary

Objective This report provides a considered opinion regarding the fire resistance performance of single-acting timber or mineral composite based and metallic based doorsets in single or double-leaf configurations when fitted with various Briton 376/376E Series panic exit devices (PEDs) as supplied by Allegion (UK) Ltd as referenced in Annex A to this report.

Report Sponsor **Allegion (UK) Ltd**

Address Bescot Crescent,
Walsall,
West Midlands,
WS1 4DL.

Summary of Conclusions Previously fire tested (or assessed by Exova Warringtonfire) insulated (timber or mineral composite) doorsets which have achieved up to 120 minutes integrity and insulation as discussed in this report, and subject to restrictions where indicated, may be fitted with '376/376E Series' PEDs, as referenced in Annex A in accordance with recommendations given in this report without detracting from the overall performance of the doorset.

The doorsets to which the items of hardware are to be fitted, shall include 54 mm thick timber based door leaves and should have been fire tested at a UKAS accredited laboratory (or assessed by Exova Warringtonfire) to BS EN 1634-1: 2000/2008, in a suitable configuration, as discussed in Section 3, and for the relevant period of integrity.

Furthermore, previously fire tested (or assessed by Exova Warringtonfire) metallic based doorsets which have achieved up to 240 minutes integrity, as discussed in this report, and subject to restrictions where indicated, may be fitted with '376/376E Series' PEDs, as referenced in Annex A in accordance with recommendations given in this report without detracting from the overall performance of the doorset.

The doorsets to which the items of hardware are to be fitted, shall include 45 mm thick metallic based door leaves and should have been fire tested at a UKAS accredited laboratory (or assessed by Exova Warringtonfire) to BS EN 1634-1: 2000/2008, in a suitable configuration, as discussed in Section 3, and for the relevant period of integrity.

Valid until 1st September 2014

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Introduction

This report provides a considered opinion regarding the fire resistance performance of single-acting timber based and metallic based doorsets in single or double-leaf configurations when fitted with various Briton 376/376E Series panic exit devices (PEDs) as referenced in Annex A to this report.

The proposed insulated timber based doorsets are required to provide fire resistance performances of up to 120 minutes integrity and insulation, with respect to BS EN 1634-1: 2000/2008.

The proposed metallic based doorsets are required to provide fire resistance performances of up to 240 minutes integrity and insulation, with respect to BS EN 1634-1: 2000/2008.

FTSG

The data referred to in the supporting data section has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 82: 2001.

Assumptions

Supporting wall

It is also assumed that the construction of the wall which supports the proposed doorsets will have been the subject of a separate test and the performance of the wall is such that it will not influence the performance of the doorset for the required period.

Clearance gaps

Door leaf to frame clearance gaps can have a significant effect on the overall fire performance of a doorset. It is therefore assumed that the leaf to leaf and leaf to frame clearance gaps will not exceed those measured for the relevant fire tested doorset.

In addition it is assumed that the door leaves will be in the fully closed position and, where appropriate, latched position (depending on doorset fire test evidence).

The other items of ironmongery fitted to the doorset are also assumed not to compromise the fire resistance performance of the assembly.

It is assumed that the proposed PED's will be fitted to insulated (timber or mineral composite based) doorsets which have previously been shown to be capable of providing 120 minutes integrity and insulation in the same configuration and construction as that proposed i.e. single-acting, single or double-leaf.

It is further assumed that the proposed PED's will be fitted to metallic based doorsets which have previously been shown to be capable of providing up to 240 minutes integrity in the same configuration and construction as that proposed i.e. single-acting, single or double-leaf.

Proposals

It is proposed that previously fire tested timber or mineral composite based, insulated doorsets which have achieved up to 120 minutes integrity and insulation, as discussed in this report, may be fitted with 'Briton 376/376E Series' Panic Exit Devices (PEDs) as referenced in Annex A of this report, in accordance with recommendations given in this report without detracting from the overall fire resistance performance of the doorset.

It is further proposed that previously fire tested metallic based doorsets which have achieved up to 240 minutes integrity, as discussed in this report, may be fitted with 'Briton 376/376E Series' Panic Exit Devices (PEDs) as referenced in Annex A of this report, in accordance with recommendations given in this report without detracting from the overall fire resistance performance of the doorset.

Basic Test Evidence

WARRES No. 140181

Test report referenced WARRES No. 140181 describes a test conducted on a single-acting, double-leaf doorset in accordance with BS EN 1634-1: 2000. The doorset was fitted with Panic Exit Devices referenced 376E-P and 379E-N to provide an indication of the effect the items may have on the fire resistance performance of timber fire resisting doorsets. Further details of the test are given in Summary of Primary Supporting Data section of this report.

The tested doorset was of overall dimensions 2045 mm high by 1870 mm wide and included two door leaves of dimensions 2015 mm high by 900 mm wide by 54 mm thick. The panic exit devices were rendered inactive for the duration of the test, the closure of the door leaves therefore was effected via the overhead mounted door closers.

The test is considered to show the ability of 376E-P and 379E-N PEDs to be fitted onto a 54 mm thick timber fire door without detracting from its performance for a period of 60 minutes integrity.

WARRES No. 137635

Test referenced WARRES No. 137635 included two single-acting, single-leaf timber based doorsets which were each fitted with an '8157N' mortise lock and tested in accordance with BS EN 1634-1: 2000. The doorsets remained intact with regards to integrity and insulation for the test duration of 66 minutes. Further details of the test are given in Summary of Primary Supporting Data section of this report

WF No. 332444

Test report referenced WF No. 332444 describes a test conducted on a single-acting, double-leaf steel based doorset in accordance with BS EN 1634-1: 2008. The doorset was fitted various items of door hardware including a 'Briton 378.R.SE' push bar rim panic latch mounted on the unexposed side of the right hand door leaf. Further details of the test are given in Summary of Primary Supporting Data section of this report.

Whilst initial integrity failure of the doorset occurred after 7 minutes of testing, no mode of failure associated with the panic latch was recorded during the 264 minute duration of the test.

Assessed Performance

Briton 376/376E Series Panic Exit Devices For Insulated Doorsets (Timber and Mineral composite)

It is proposed that variations on the tested PEDs be fitted to alternative timber based fire resisting doorsets.

In order to enable the use of the alternative items listed in Annex A on timber fire resisting doorsets, it is necessary to consider the size and fitting position of the proposed items of hardware and the level of restraint that they are likely to offer to the proposed door leaves.

In principle, alternative items of ironmongery may be used providing they constitute a like-with-like substitution in terms of the following:

- quantity, size and location of mortices or recesses required for installation.
- material of critical component parts such as fixings, latch bolts, rods and linkages.
- protection by intumescent materials if used in conjunction with the originally fire tested ironmongery.

The doorset as described in WARRES No. 140181 was fitted with 376E-P vertical bolts and a 379E-N push bar mortice panic nightlatch which were shown to be able to be fitted to a timber doorset without detriment to the integrity of the doorset. These devices were primarily face fixed to the doorset and therefore do not require the use of intumescent protection as they do not remove significant amounts of leaf or frame material.

The PEDs were rendered inactive for the duration of the test and therefore did not offer any restraint to the door leaves during the 67 minute test duration. There were no recorded modes of integrity failure during the 67 minute test duration.

In reality the PED's would be active and would be used in conjunction with a surface mounted overhead door closer. This would increase the level of restraint offered to the door leaf and would be expected to have a positive effect on the overall fire resistance performance of the proposed system.

Therefore, in accordance with the principles noted above, the alternative PED's listed in Table 1 of Annex A are acceptable as they are considered to satisfy the critical conditions when compared against the tested items.

Additional items included within Annex A are those referenced 379 and 389 Series. These devices are as tested with regards to the panic exit devices but are also required to be installed in conjunction with a mortise lockset reference '8157N'. Test referenced WARRES No. 137635 displayed the ability of the proposed locksets to provide the required period of integrity (i.e. in excess of 60 minutes on a 54 mm thick door leaf) when installed with additional 1 mm thick Interdens wrapping around the lockcase.

As the proposed panic exit devices are predominantly surface mounted items and are only required to restrain the door leaves up until such time that the intumescent seals react, their use on previously tested insulated (timber or mineral composite) doorsets for periods up to 120 minutes is considered acceptable.

Any devices that include mortised components however shall be restricted to 60 minutes integrity performance.

**Briton 376/376E
Series Panic Exit
Devices For
Insulated
Doorsets
(Metallic based)**

It is proposed that variations on the tested PEDs be fitted to alternative metallic based fire resisting doorsets.

In order to enable the use of the proposed alternative items listed in Annex A on metallic based fire resisting doorsets, it is necessary to consider the materials of construction and method of installation of the proposed items of hardware.

In principle, alternative items of ironmongery may be used providing they constitute a 'like for like' substitution in terms of the following:

- Method of installation and the requirement for mortices or recesses required for installation.
- material of critical component parts such as fixings, latch bolts, rods and linkages.

The doorset as described in WF No. 332444 was fitted with various items of door hardware including a 'Briton 378.R.SE' push bar rim panic latch mounted on the unexposed surface of the right hand door leaf. Whilst initial integrity failure of the doorset occurred after 7 minutes of testing, this mode of failure was not attributable to, or a consequence of the performance or presence of the proposed item.

The panic latch was rendered inactive for the duration of the test and therefore did not offer any restraint to the door leaves during the 264 minute test duration. There was no recorded mode of integrity failure during the relating to the panic latch within the 264 minute test duration.

In reality the latch would be active and would be used in conjunction with a surface mounted overhead door closer. This would increase the level of restraint offered to the door leaf and would be expected to have a positive effect on the overall fire resistance performance of the proposed system.

The various panic and emergency exit devices included in this assessment have been reviewed and compared to the tested panic latch in terms of their materials of construction and method of installation in terms of its likely impact on the performance of alternative, previously proven metallic based doorsets.

As the tested panic latch was of a wholly surface mounted design, only those items which are also wholly surface mounted have been considered as comparable. Therefore the appraisal excludes any item which is either morticed into the door or frame. This restriction includes all of the previously assessed OAD accessories.

The tested panic latch of an almost entirely metallic based construction, with the exception of polymer based end caps used in the push bar assembly. The unit was mounted to the unexposed face of the doorset to confirm that it did not pose an increased risk of flaming due to the highly conductive nature of the steel based uninsulated door construction.

The test demonstrated that the unit was able to contribute positively to the performance of the doorset without any ignition of the end caps, or any other component. Having reviewed the other models and accessories included in the Briton 376/376E range of hardware, those items considered comparable to the tested unit have also been positively appraised.

Therefore, in accordance with the principles noted above, the alternative PEDs, indicated as suitable for use with metallic based doorsets in Table 1 of Annex A are acceptable as they are considered to satisfy the critical conditions when compared against the tested unit.

All of the indicated products are therefore positively assessed for their use on previously tested metallic based doorsets for periods up to 240 minutes and are considered acceptable.

Revision of product references

For the fourth issue of this report revised product references have been included within Table 1 of Annex A. These revised product references relate to the 'Briton 376 Series' which incorporate minor aesthetic changes to the originally tested and assessed '376E series'.

The design changes include:

- Shape change to the main and end box units.
- Change to the crossbar profile from flat sided oval to elliptical oval.

These changes are purely aesthetic and are not considered to have any bearing on the previously assessed performances of the products.

As both the previous and revised referenced products remain available, Table 1 of Annex A has been amended to include both sets of product references.

Alternative Doorsets

The proposals also require the PED components, listed in Table 1, to be fitted to alternative insulated (timber and mineral composite) doorsets or uninsulated (metallic based) doorsets.

To enable the use of the proposed components on other doorsets it is necessary to address the available information on the proposed doorset. As this appraisal is intended to be used on a general basis and not restricted to any particular manufacturer of fire doors, the following points are given to enable the PED's to be used safely:

Insulated (timber and mineral composite) doorsets, including door frame, intumescent seals and associated ironmongery should have achieved up to 120 minutes integrity and insulation, when tested by a UKAS approved laboratory (or assessed by Exova Warringtonfire) to BS EN 1634-1: 2000/2008. In particular the proposed doorsets shall include a hardwood timber frame and a door leaf of overall thickness 54 mm.

The critical aspects of the doorset construction are considered to be the material of the door frame, the leaf to frame clearance gaps and the lipping material. Attention should be paid to these details and these should not be amended from that previously fire tested. Where this information is not known the following minimum leaf to frame specification will be that the leaf to frame clearance gaps will not exceed 2.5 mm average and 3 mm maximum.

Uninsulated (metallic based) doorsets, including door frame and associated ironmongery should have achieved up to 240 minutes integrity and insulation, when tested by a UKAS approved laboratory (or assessed by Exova Warringtonfire) to BS EN 1634-1: 2000/2008.

As the PED's did not remain in place for the full period of required fire performance, or have been tested where they did not provide an essential latching function, they shall only be used on doorsets which have been previously fire tested in an unlatched configuration.

If the proposed doorset is to be used in double-leaf configuration the test or assessment evidence should be applicable to double-leaf configurations.

Conclusions

Previously fire tested (or assessed by Exova Warringtonfire) insulated (timber or mineral composite) doorsets which have achieved up to 120 minutes integrity and insulation as discussed in this report, and subject to restrictions where indicated, may be fitted with '376/376E Series' PEDs, as referenced in Annex A in accordance with recommendations given in this report without detracting from the overall performance of the doorset.

Furthermore, previously fire tested (or assessed by Exova Warringtonfire) metallic based doorsets which have achieved up to 240 minutes integrity, as discussed in this report, and subject to restrictions where indicated, may be fitted with '376/376E Series' PEDs, as referenced in Annex A in accordance with recommendations given in this report without detracting from the overall performance of the doorset.

Validity

This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to Exova Warringtonfire the assessment will be unconditionally withdrawn and Allegion (UK) Ltd will be notified in writing.

Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion. The assessment is valid initially for a period of five years, after which time it is recommended that it be returned for re-appraisal.

The appraisal is only valid provided that no other modifications are made to the tested construction other than those described in this report.

Summary of Primary Supporting Data

**WARRES No.
140181**

Test report relating to the performance of a fully insulated, single-acting, double-leaf, timber doorset incorporating surface mounted overhead door closers, when subjected to a test in accordance with BS EN 1634-1: 2000 to determine its fire resistance performance.

The doorset had overall dimensions of 2084 mm high by 1973 mm wide and incorporated door leaves of overall dimensions 2040 mm high by 938 mm and 950 mm wide by 52 mm thick. The leaves comprised softwood stiles and rails, a flaxboard core, with non-combustible board sub facings, hardwood lippings to the vertical edges and MDF outer facings.

The doorset incorporated two separate panic exit devices fitted to the exposed face of the doorset. A 'Briton 376E-P push bar Pullman panic bolt' was fitted to leaf A and a 'Briton 379E-N push bar mortice panic nightlatch' was fitted to leaf B. The leaves were orientated such that they opened away from the heating conditions of the test. Each leaf was rendered unlatched for the duration of the test and was retained via a surface mounted overhead door closer.

The leaves were orientated such that they opened away from the heating conditions of the test. Each leaf was rendered unlatched for the duration of the test.

The specimen satisfied the test requirements for the following periods:

Integrity	Cotton Pad	67 minutes*
	Sustained Flaming	67 minutes*
	Gap Gauge	67 minutes*
Insulation		67 minutes*

* The test duration.

Test date : 15th June 2004

Test sponsor : IR Security and Safety (Now Allegion (UK) Ltd.

**WARRES No.
127579**

Test report relating to the performance of a single-acting, double-leaf doorset, when subjected to a test in accordance with BS EN 1634-1: 2000 to determine its fire resistance performance.

The doorset was fitted with Panic Exit Devices referenced 376E-D and 378E-D to provide an indication of the effect the items may have on the fire resistance performance of timber fire resisting doorsets. The doorset also included two surface mounted overhead door closers referenced 220T and 230T.

The specimen satisfied the test requirements for the following periods:

Integrity	Cotton Pad	36 minutes
	Gap Gauge	61 minutes
	Sustained Flames	38 minutes
Insulation		61 minutes

Test date : 23rd October 2002

Test sponsor : Warrington Certification Limited on behalf of IR Security and Safety (Now Allegion (UK) Ltd.

**WARRES No.
137635**

Test report relating to the performance of two single-acting, single-leaf doorsets, when subjected to a test in accordance with BS EN 1634-1: 2000 to determine their fire resistance performance.

The doorsets were each fitted with a '8157' mortise lock which was protected via 1 mm thick Interdens intumescent material.

The specimens satisfied the test requirements for the following periods:

		Doorset A	Doorset B
Integrity	Cotton Pad	66 minutes*	66 minutes*
	Gap Gauge	66 minutes*	66 minutes*
	Sustained Flames	66 minutes*	66 minutes*
Insulation		66 minutes*	66 minutes*

* The test duration.

Test date : 25th February 2004

Test sponsor : IR Security and Safety Limited (Now Allegion (UK) Ltd.

WF No. 332444

Test report relating to the performance of an uninsulated steel based single-acting, double-leaf doorset, when subjected to a test in accordance with BS EN 1634-1: 2008 to determine its fire resistance performance.

The doorset had overall dimensions of 2096 mm high by 2110 mm wide and incorporated two door leaves with overall dimensions of 2040 mm high by 1000 mm wide by 50 mm thick. The door leaves were hung within a Zintec steel frame on three stainless steel dogbolt hinges. The leaves were formed from 1.2 mm thick Zintec coated press formed steel sheet sandwiching a honeycomb paper core.

The doorset was fitted with various items of hardware including a 'Briton 378.R.SE' reversible rim panic latch which was mounted to the unexposed face of the right hand door leaf. The doorset was mounted such that its leaves opened away from the heating conditions of the test and was unlatched for the test duration.

The specimen satisfied the test requirements for the following periods:

Integrity	Cotton Pad	7 minutes
	Gap Gauge	264 minutes*
	Sustained Flames	7 minutes
Insulation		7 minutes

Test date : 10th September 2013

Test sponsor : Ingersoll Rand Security Technologies (Now Allegion (UK) Ltd.

Declaration by Allegion (UK) Ltd

We the undersigned confirm that we have read and complied with the obligations placed on us by the UK Fire Test Study Group Resolution No. 82: 2001.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.


We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information we agree to cease using the assessment and ask Exova Warringtonfire to withdraw the assessment.

Signed:

For and on behalf of:

Signatories


Responsible Officer
D Forshaw* - Principal Certification Engineer


Approved
A Kearns* - Technical Manager

* For and on behalf of Exova Warringtonfire.

Report Issued: 11 th October 2004
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The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

Issue 3: Inclusion of additional test evidence (28th October 2004)

Issue 4: Inclusion of new references and removal of obsolete product codes (24th August 2009)

Issue 5: Inclusion of steel door evidence and revision of sponsor name (19th December 2013)

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Annex A

Acceptable Panic Exit Device Items

Table 1. Permitted References

DESCRIPTION	BRITON	BRITON (New Reference)	LAIDLAW	ITO
PUSH BAR VERTICAL PANIC BOLTS				
	376E	376	59 776.1	P376E
	376E-A#	376.A#	59 776.2#	
	376E-P	376.P	59 776.3	
	376E-D	376.D	59 776.4	
	376E-PD	376.PD	59 776.5	
	376EM	376M		P376EM
	376EM-P	376M.P		
	376OEM	376OEM		
	376OEM-P	376OEM.P		
PUSH BAR RIM PANIC LATCHES				
	378E/L	378.L	59 778.1	P378E/L
	378E/R	378.R	59 778.2	P378E/R
	378E-D/L	378.D.L	59 778.3	
	378E-D/R	378.D.R	59 778.4	
	378EM/L	378M.L		P378EM/L
	378EM/R	378M.R		P378EM/R
	378OEM/L	378OEM.L		
	378OEM/R	378OEM.R		
PUSH BAR MORTICE PANIC OPERATORS				
	379E*	379*		
	379E-A*	379.A*		
	379E-N*	379.N*	59 779.1*	P379E-N*
	379E-NA*	379.NA*	59 779.2*	
	379E-ND*	379.ND*	59 779.3*	
	379EM-N*	379M.N*		P379EM-N*
	379OEM-N*	379OEM.N*		

* Not approved for use with metallic based doorsets. Items to include lockset for use in timber based doorsets to be bedded on 1 mm thick Interdens material (60 minutes integrity)

Not approved for use with metallic based doorsets.

All other items – up to 120 minutes integrity for timber based doorsets and up to 240 minutes integrity for metallic based doorsets.

Table 1. (continued)

DESCRIPTION	BRITON	BRITON (New Reference)	LAIDLAW	ITO
PUSH BAR DOUBLE REBATED DOOR PANIC SETS				
	377E/L	377.L	59 777.1	P377E/L
	377E/R	377.R	59 777.2	P377E/R
PUSH PAD VERTICAL EMERGENCY BOLTS				
	372E	372	59 772	
	372EM	372M		
	372OEM	372OEM		
	372E-P	372.P	59 772.1	
	372EM-P	372M.P		
	372OEM-P	372OEM.P		
PUSH PAD RIM EMERGENCY LATCHES				
	1438E/L	1438.L	59 738.1	
	1438E/R	1438.R	59 738.2	
	1438EM/L	1438M.L		
	1438EM/R	1438M.R		
	1438OEM/L	1438OEM.L		
	1438OEM/R	1438OEM.R		
PUSH PAD MORTICE EMERGENCY OPERATORS				
	389E*	389*		
	389E-N*	389.N*	59 789.1*	
	389EM-N*	389M.N*		
	389OEM-N*	389OEM.N*		
OUTSIDE ACCESS DEVICE				
	1413E/KE#		36 413.KE#	P1413E/KE#
	1413E-NC/KE#		36 413.KE/NC#	
	1413E/LE#		36 413.LE#	P1413E/LE#
	1413E-NC/LE#		36 413.LE/NC#	
	1413OEM/KE#			
	1413OEM-NC/KE#			
	1413OEM/LE#			
	1413OEM-NC/LE#			

* Not approved for use on metallic based doorsets. Items to include lockset for use in timber based doorsets to be bedded on 1 mm thick Interdens material (60 minutes integrity)

Not approved for use on metallic based doorsets.

All other items – up to 120 minutes integrity for timber based doorsets and up to 240 minutes integrity for metallic based doorsets.

Table 1. (continued)

DESCRIPTION	BRITON	BRITON (New Reference)	LIDLAW	ITO
ACCESSORIES				
	376MDS		57 376.1	P376MDS
	376FFKP		57 376	P376FFKP
	378DDS		57 378	P378DDS
	378MDS		57 378.1	P378MDS
	379MDS*		57 379.1*	P379MDS*
	379DDRK-13*		57 379.3*	
	379DDRK-25*		57 379.5*	
	376ELTS		57 376.2	

* Not approved for use on metallic based doorsets. Items limited to use with timber based doorsets for 60 minutes integrity only.

All other items – up to 120 minutes integrity for timber based doorsets and up to 240 minutes integrity for metallic based doorsets.