

# assessment report

**Title:**

The Fire Resistance  
Performance Of  
Pyroplex Air Transfer Grilles  
When Installed into Timber  
Based FD30 & FD60 Doorsets  
And Partition/Wall  
Assemblies

**WF Report No:**

149511 Issue 2

**Prepared for:**

**Pyroplex Limited**

The Furlong  
Droitwich  
Worcestershire  
WR9 9BG

**Date:**

31<sup>st</sup> October 2005

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## Executive Summary

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<b>Objective</b>	<p>This assessment report presents an appraisal of the fire resistance performance of Pyroplex Air Transfer Grilles, when installed within previously tested, FD30 and FD60 timber based doorsets or partition/wall assemblies.</p> <p>The doorsets or partition/wall assemblies, when fitted with the Pyroplex Air Transfer Grilles, are required to satisfy the integrity performance requirements of BS 476: Part 22: 1987, for a period of either 30 or 60 minutes.</p>
<b>Report Sponsor</b>	<b>Pyroplex Limited</b>
<b>Address</b>	<p>The Furlong Droitwich Worcestershire WR9 9BG</p>
<b>Summary of Conclusions</b>	<p>Should the recommendations given in this report be followed, it can be concluded that previously tested FD30 or FD60 timber based doorsets incorporating Pyroplex Air Transfer Grilles, would be expected to be capable of satisfying the integrity performance criteria of BS 476: Part 22: 1987, for periods 30 or 60 minutes as relevant.</p> <p>Additionally, previously tested partition /wall assemblies incorporating Pyroplex Air Transfer Grilles, would be expected to be capable of satisfying the integrity performance criteria of BS 476: Part 22: 1987, for periods 30 or 60 minutes as relevant.</p>
<b>Valid until</b>	1 <sup>st</sup> November 2010

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## Introduction

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This report presents a considered opinion regarding the performance of Pyroplex Air Transfer Grilles when installed within previously tested timber based FD30 and FD60 doorsets or partition / wall assemblies and assessed against the performance criteria for integrity of BS 476: Part 22: 1987.

The Pyroplex Air Transfer Grilles basically comprise a galvanised mild steel framework housing layers of graphite based intumescent. The grilles are installed within a hardwood liner aperture and held in place via pin fixing prior to the fitting of steel covers to each face.

The Air Transfer Grilles are required to provide a fire resistance performance (with respect to integrity) of 30 or 60 minutes in accordance with BS 476: Part 22: 1987.

### 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

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### Doorsets

It is assumed that the supporting structure is composed of masonry or concrete and that it is capable of effectively supporting the proposed doorset constructions, fitted with the Pyroplex Air Transfer Grilles, for the required period.

It is assumed that the grilles will be of the same construction and will installed in a similar manner as those tested, further details of which are included in this assessment.

It is further assumed that the doorsets into which the Pyroplex Air Transfer Grilles are to be fitted, will have been previously successfully tested to BS 476: Part 22: 1987 and have achieved an integrity performance of at least 30 or 60 minutes (as relevant). In addition, the tested doorset must have incorporated an aperture (typically a glazed aperture) of a size at least equal to that of the Pyroplex Air Transfer Grille (i.e. 300 mm high by 300 mm wide). Failure to satisfy these criteria will render this assessment invalid.

The doorset into which the grille will be fitted will not contain any other apertures, glazed or otherwise, unless test evidence is available which specifically covers the incorporation of two separate apertures within the leaf.

### Partition / Wall Assemblies

It assumed that the partition/wall assembly into which the Pyroplex Air Transfer Grilles are to be fitted, will have been previously successfully tested to BS 476: Part 22: 1987 and have achieved an integrity performance of at least 30 or 60 minutes (as relevant). In addition, the tested assembly must have incorporated an aperture of a size at least equal to that of the Pyroplex Air Transfer Grille (i.e. 450 mm high by 375 mm wide). Failure to satisfy these criteria will render this assessment invalid.

## Proposals

### General

It is proposed that the Pyroplex Air Transfer Grilles detailed in Table 1 below, when installed within previously tested timber based FD30 and FD60 doorsets or partition / wall assemblies would be expected to be capable of satisfying the integrity performance criteria of BS 476: Part 22: 1987, for periods 30 or 60 minutes as relevant.

**Table 1**

Part No.	Dimensions mm	Fire Resistance mins.	Air Flow sq. cm	Compatible Faceplates
ATG 1500	150 x 150	30 & 60	153	FP1500
ATG 1503	150 x 300	30 & 60	307	FP1503
ATG 1300	300 x 300	30 & 60	614	FP1300
ATG 2251	112 x 225	30 & 60	161	FP2251
ATG 2250	225 x 225	30 & 60	323	FP2250

## Basic Evidence

Indicative test report nos. 146520, 146521 and 148053 were performed on a range of timber (chipboard) based sections of FD30 and FD60 door leaves to provide information on the ability of the grilles to provide the required integrity performances.

The tests included apertures cut within the sections of door leaf which were then lined with nominally 6 mm thick hardwood. The hardwood liner was pinned and glued in position; the grille was then pinned within the aperture and bedded onto Pyroplex intumescent mastic. Several of the grilles installed within FD60 based door leaves included an additional 2 No. 11 mm wide by 1 mm thick graphite based seals to the perimeter of the system.

Test referenced No. 146520 included a sample section of 44 mm thick chipboard based door leaf. Specimens A and B were of dimensions 225 mm wide by 112 mm high and 300 mm high by 300 mm wide respectively and satisfied the integrity performance criteria for periods of 41 and 55 minutes respectively. The tested system was subjected to a positive pressure of (+)7 Pa at the top edge of the lower grille.

Test referenced No. 146521 included a sample section of 54 mm thick chipboard based door leaf. Specimens C and D were of dimensions 225 mm wide by 112 mm high and 300 mm high by 300 mm wide respectively and each satisfied the integrity performance criteria for periods of 65 minutes. The tested system was subjected to a positive pressure of (+)7 Pa at the top edge of the lower grille.

Test referenced No. 148053 included a sample section of 54 mm thick chipboard based door leaf. Specimen D was of dimensions 300 mm high by 300 mm wide and satisfied the integrity performance criteria for a period of 66 minutes. The tested system was subjected to a negative pressure of (-)7 Pa at the top edge of the lower grille.

## Assessed Performance

### FD30 Doorsets

The grilles tested under reference No. 146520 provide direct information on the proposed items' ability to provide the required 30 minutes integrity performance. The tested 300 mm high by 300 mm wide grille represents the largest grille in the proposed range for use with FD30 doorsets and was therefore deemed to represent the most onerous case. This specimen is therefore considered to provide confidence in the ability of the proposed grilles at equal or lesser dimensions to be capable of contributing towards the required 30 minutes integrity.

The tested pressure of (+7) Pa represents a grille positioned at a height of 2.2 m from the threshold of a doorset.

Whilst the test series did not include a negative pressure test, the comparison of tests 146521 and 148053 displays the two pressure conditions (negative and positive) produce similar results.

### FD60 Doorsets

The grilles tested under reference Nos. 146521 provide direct information on the proposed items' ability to provide the required 60 minutes integrity performance. The tested 300 mm high by 300 mm wide grille represents the largest grille in the proposed range for use with FD60 doorsets and was therefore deemed to represent the most onerous case. This specimen is therefore considered to provide confidence in the ability of the proposed grilles at equal or lesser dimensions to be capable of contributing towards the required 60 minutes integrity.

The tested pressure of (+7) Pa represents a grille positioned at a height of 2.2 m from the threshold of a doorset.

Specimen D tested under reference Nos. 148053 provides direct information on the ability of a 300 mm high by 300 mm wide grille to provide the required 60 minutes integrity performance when subjected to a test performed at a negative pressure of (-) 7 Pa.

The performance of the grilles at the standard dimensions as detailed within Figure 1 below, when installed within FD30 or FD60 timber based doorsets is therefore not in doubt.

Permitted  
Dimensions

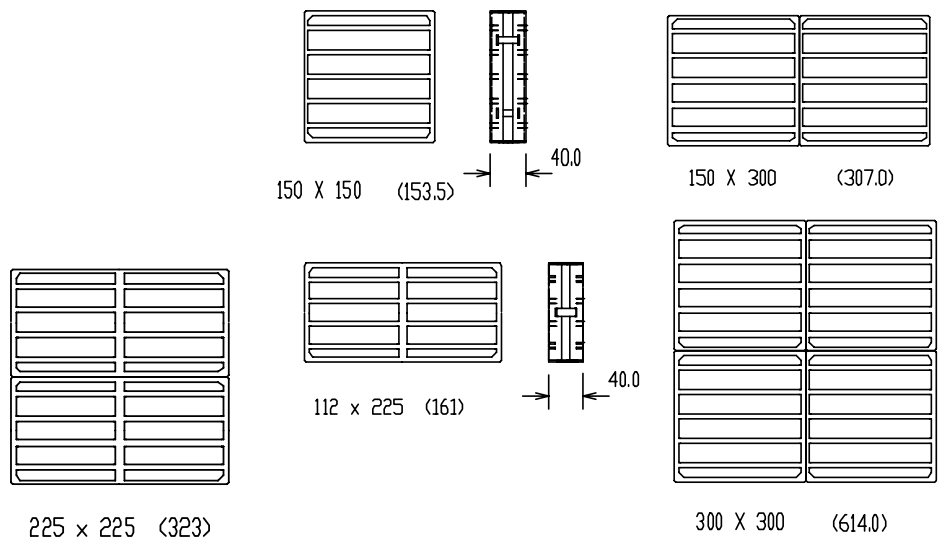


Figure 1. – Permitted Pyroplex Air Transfer Grille Dimensions  
for Installation within FD30/FD60 door leaves

Installation  
Details

The installation detail within FD30 or FD60 timber based doorsets is similar, Figure 2 below includes brief details of the installation methods:

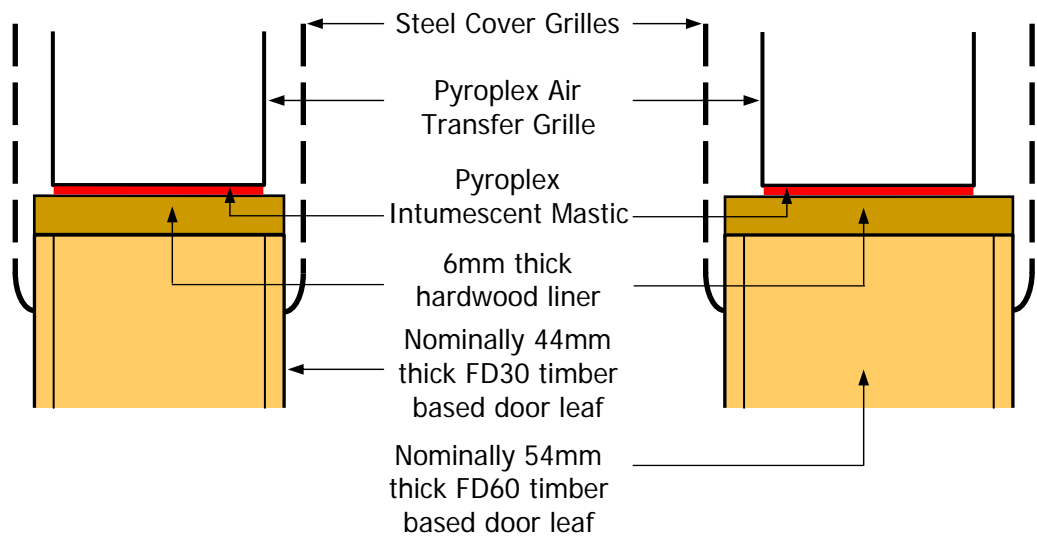
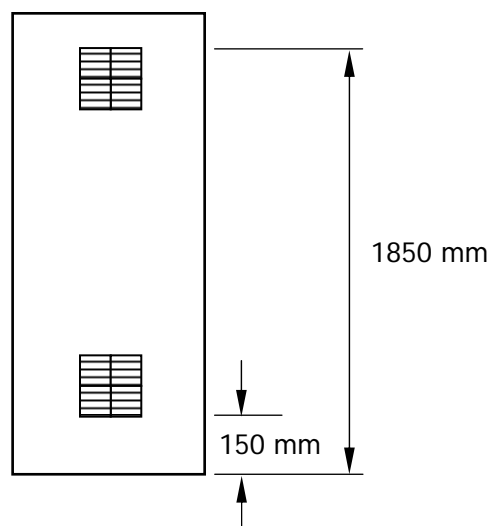


Figure 2. – Installation Details

## Position

As the test series including both positive and negative pressure tests it is considered that the proposed grilles may be installed within doorsets adhering to the following parameters:



**Figure 3. – Permitted Installation Positions**

The grilles shall be installed no closer than 150 mm to the threshold of the door leaf and no higher than 1850 mm.

## Partition / Wall Assemblies

In addition to the grilles being installed within proprietary timber based FD30 and FD60 doorsets, it is proposed that the grilles may be installed within plasterboard face partition assemblies or blockwork wall assemblies.

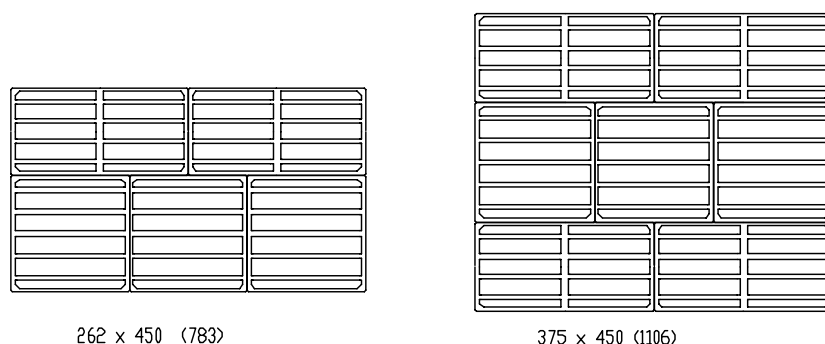
As the partition or wall assembly would be expected to possess an equal or higher level of dimensional stability to the tested door leaf substrates and thus would be expected to restrain and support the grilles to the same or a higher level, the proposal to install the grilles within previously tested wall / partition assemblies is considered acceptable.

When installed within a plasterboard faced partition (utilising either steel or timber studs) the aperture shall be prepared using a hardwood timber liner and the grille installed as for doorsets (see Figure 2). Partitions requiring 60 minutes integrity performance shall utilise the 11 mm wide by 1 mm thick Pyroplex graphite based seals.

Blockwork / masonry wall constructions do not require the use of the timber liner, providing the perimeter of the aperture is uniform, as the block/brick supporting construction would not be expected to significantly erode under standard fire test conditions for a 30 or 60 minute period.

The use of the following grilles (within Figure 4) within such supporting constructions is considered acceptable based on them using the same construction and jointing mechanism as the tested assemblies. The increases in dimensions are not expected to significantly affect the performance of the proposed grilles.





**Figure 4. – Permitted Pyroplex Air Transfer Grille Dimensions for Installation within 30/60 minute wall / Partition assemblies**

## Conclusions

Should the recommendations given in this report be followed, it can be concluded that previously tested FD30 or FD60 timber based doorsets incorporating Pyroplex Air Transfer Grilles, would be expected to be capable of satisfying the integrity performance criteria of BS 476: Part 22: 1987, for periods 30 or 60 minutes as relevant.

Additionally, previously tested partition / wall assemblies incorporating Pyroplex Air Transfer Grilles, would be expected to be capable of satisfying the integrity performance criteria of BS 476: Part 22: 1987, for periods 30 or 60 minutes as relevant.

## 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 Bodycote **warringtonfire** the assessment will be unconditionally withdrawn and Pyroplex Limited 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 i.e. until 1<sup>st</sup> November 2010, 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

### Report No. 146520

A small scale indicative fire resistance test utilising the heating and pressure conditions of BS 476: Part 22: 1987.

The test was performed on a sample containing timber (chipboard) based section of FD30 and FD60 door leaves to provide information on the ability of the grilles to provide the required integrity performances.

The test included apertures cut within the sections of door leaf which were then lined with nominally 6 mm thick hardwood. The hardwood liner was pinned and glued in position; the grilles were then pinned within the aperture and bedded onto Pyroplex intumescent mastic. Two of the grilles installed within the FD30 based door leaf (A and B) and two within the FD60 based door leaf (C and D).

Specimens A and C were of dimensions 225 mm wide by 112 mm high and Specimens B and D were nominally 300 mm high by 300 mm wide. The tested system was subjected to a positive pressure of (+)7 Pa at the top edge of the lower grilles.

Test Sponsor: Pyroplex Limited

Test Date: 6<sup>th</sup> May 2005

### Report No. 146521

A small scale indicative fire resistance test utilising the heating and pressure conditions of BS 476: Part 22: 1987.

The test was performed on a sample containing timber (chipboard) based section of FD60 door leaves to provide information on the ability of the grilles to provide the required integrity performances.

The test included apertures cut within the sections of door leaf which were then lined with nominally 6 mm thick hardwood. The hardwood liner was pinned and glued in position; the grilles were then pinned within the aperture and bedded onto Pyroplex intumescent mastic. Two of the grilles (C and D) included an additional 2 No. 11 mm wide by 1 mm thick graphite based seals to the perimeter of the system.

Specimens A and C were of dimensions 225 mm wide by 112 mm high and Specimens B and D were nominally 300 mm high by 300 mm wide. The tested system was subjected to a positive pressure of (+)7 Pa at the top edge of the lower grilles.

Test Sponsor: Pyroplex Limited

Test Date: 13<sup>th</sup> May 2005

**Report No.  
148053**

A small scale indicative fire resistance test utilising the heating and pressure conditions of BS 476: Part 22: 1987.

The test was performed on a sample containing timber (chipboard) based section of FD60 door leaves to provide information on the ability of the grilles to provide the required integrity performances.

The test included apertures cut within the sections of door leaf which were then lined with nominally 6 mm thick hardwood. The hardwood liner was pinned and glued in position; the grilles were then pinned within the aperture and bedded onto Pyroplex intumescent mastic. Two of the grilles (C and D) included an additional 2 No. 11 mm wide by 1 mm thick graphite based seals to the perimeter of the system.

Specimens A and C were of dimensions 225 mm wide by 112 mm high and Specimens B and D were nominally 300 mm high by 300 mm wide. The tested system was subjected to a positive pressure of (-)7 Pa at the top edge of the lower grilles.

Test Sponsor: Pyroplex Limited

Test Date: 13<sup>th</sup> May 2005

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## Declaration by Pyroplex Limited

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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 Bodycote **warringtonfire** to withdraw the assessment.


Signed:

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For and on behalf of:

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## Signatories


Responsible Officer
S. Hankey* - Technical Consultant


Approved
C Johnson* - Technical Officer

\* For and on behalf of Bodycote **warringtonfire**.

Report Issued: 31 <sup>st</sup> October 2005
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### Issue 2: Modifications to Figure 2 (26<sup>th</sup> January 2006)

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

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Bodycote warringtonfire • Head Office • Holmesfield Road • Warrington • Cheshire • WA1 2DS • United Kingdom  
Tel: +44 (0) 1925 655 116 • Fax: +44 (0) 1925 655 419 • Email: [Info@warringtonfire.net](mailto:Info@warringtonfire.net) • Website: [www.warringtonfire.net](http://www.warringtonfire.net)

