The Performance of 'Pyroglaze 30' and 'Pyroglaze 60' Glazing Seals Within Shaped Glazed Apertures in FD 30 and FD 60 Doorsets

Report For

Mann McGowan Fabrications Limited

THE PROFESSIONALS IN FIRE SAFETY •

Warrington FIRE research
CONSULTANCY • TESTING

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Report For

Mann McGowan Fabrications Limited
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Deadbrook Lane
Aldershot
Hampshire
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Issue 2 - Modification to stated density (paragraphs 4.3 and 4.7)
Modification to fixing centres (paragraph 4.7)
Modification to Figure 1

Report	Name	Signature*	Date
Prepared By	C. W. Miles		04.07.96
Reviewed By	M. Thompson		09.07.96

* For and on behalf of Warrington Fire Research Centre.

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant. This is included as Appendix 2 to this report.

The Performance of 'Pyroglaze 30' and 'Pyroglaze 60' Glazing Seals Within Shaped Glazed Apertures in FD30 and FD60 Doorsets

1. Introduction

1.1 This report presents an appraisal of the fire resistance performance of shaped glazed apertures within FD 30 and FD60 doorsets when the panes of glass are glazed using proprietary intumescent glazing systems manufactured by Mann McGowan Fabrications Limited referenced 'Pyroglaze 30' and 'Pyroglaze 60'.

1.2 The proposed glazed timber doorsets are required to provide a fire resistance performance of 30 minutes integrity when Pyroglaze 30 is used and 60 minutes when Pyroglaze 60 is used, with respect to BS 476: Part 22: 1987. Insulation may also be provided for 30 and 60 minutes dependent on the type of glass used.

1.3 The data referred to in Appendix 1 has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 64A, 1993.

2. Assumptions

2.1 It is assumed that the proposed glazing seals will be fitted to doors that have previously been tested by a NAMAS laboratory (or assessed by Warrington Fire Research centre) to BS 476: Part 22: 1987 and achieved the required fire resistance with a similar sized glazed aperture.

2.2 It is also assumed that the glass will be glazed in accordance with the manufacturers instructions.

2.3 It is assumed that the glazing of the doors will be performed by competent installers to a similar level of workmanship used when glazing the original test specimen or by approved operators of a FIRAS registered and approved glazing installation company.

3. Proposals

3.1 It is proposed that 'Pyroglaze 30' glazing seals as manufactured by Mann McGowan Fabrications Limited will be fitted into FD30 doors which have been tested (or assessed by Warrington Fire Research Centre) to BS 476: Part 22: 1987 and obtained a minimum performance of 30 minutes integrity when incorporating glazed vision panels.

3.2 This proposal extends to the following glass types:

(i) Pyroshield (formerly known as Georgian Wired Polished Plate)
(ii) Pyran S
(iii) Firelite
(iv) Pyrostop
(v) Pyrodur
(vi) Pyrobel
(vii) Pyrobelite

3.3 It is further proposed that 'Pyroglaze 60' seals as manufactured by Mann McGowan Fabrications Limited will be fitted into FD60 doors which have been tested by a NAMAS approved laboratory (or assessed by Warrington Fire Research Centre) to BS 476: Part 22: 1987 and obtained a minimum performance of 60 minutes integrity when incorporating glazed vision panels.

3.4 This proposal extends to the following glasses:

(i) Pyroshield
(ii) Pyran S
(iii) Firelite
(iv) Pyrostop
(v) Pyrobel

3.5 The shapes to be assessed as part of this appraisal include full circles, semi circles, quadrant circles, rectilinear with radiused sections and ellipse.

4. Assessed Performance

4.1 The basic test evidence as summarised in Appendix 1 is considered to illustrate the ability of Pyroglaze 30 and Pyroglaze 60 to be used with shaped timber beads and fire resistant glasses.

Pyroglaze 30

4.2 The successful performance of the specimens noted in Appendix 1 is due to the contribution of a number of various factors.

4.3 In order that the success may be repeated on the proposed 30 minute elements when fitted into previously successfully fire tested (or assessed) timber doorsets, the following details should be replicated:

i) The glazing system should comprise of timber glazing beads having a density of at least 660 kg/m^3.

ii) The height of the bead should not be less than 15 mm with a 20^0 chamfer away from the glass.

iii) When the insulating glasses are used, the beads may be square i.e. without a chamfer as there is likely to be minimal emitted heat radiation.

iv) The aperture should be lined with either Pyrostrip 300, Pyrostrip 500 or Pyrostrip 100 EC material from Mann McGowan Fabrications Limited prior to installation of the glass.

v) Glazing beads should be fixed into the door leaf of minimum thickness 45 mm using steel nails, of minimum length 50 mm or steel/brass screws of minimum length 45 mm and in either case shall be angled such that pass under the edge of the glass. The fixing centres shall not be less than 100 mm.

vi) Pyroglaze 30 seals will be fitted to both faces of the glass, as indicated in Figure 1, and to all edges of the pane. The seal should have overall dimensions of 15 mm by 2 mm.

4.4 The above conditions are considered sufficient to ensure the satisfactory performance of the proposed glazing system for a period of 30 minutes integrity when the available test evidence is analysed.

4.5 The proposed glasses have each been shown by numerous fire resistance tests to be able of satisfying the requirements of integrity as given by BS 476: Part 20: 1987 and this test evidence is considered to be public domain information, in particular when the small pane sizes as proposed are considered.

Pyroglaze 60

4.6 The successful 60 minute performance of the specimens noted in Appendix 1 may be considered to be due to the contribution of a number of various factors in a similar manner to that described above for the 30 minute system.

4.7 In order that the success may be repeated on the proposed 60 minute elements when fitted into previously successfully fire tested (or assessed) timber doorsets, the following details should be replicated:

i) The glazing system should comprise of timber glazing beads having a density of at least 660 kg/m^3. (Ash is not an acceptable timber).

ii) The height of the bead should not be less than 25 mm with a 25^0 chamfer away from the glass.

iii) When the insulating glasses are used the beads may be square i.e. without a chamfer as there is likely to be minimal emitted heat radiation.

iv) The aperture should be lined with either Pyrostrip 300 or Pyrostrip 100 EC material from Mann McGowan Fabrications Limited prior to installation of the glass.

v) Glazing beads should be fixed into the door leaf of minimum thickness 50 mm using steel nails of minimum length 60 mm or steel/brass screws of minimum length 55 mm and in either case shall be angled such that pass under the face of the glass. The fixing centres shall be not greater than 100 mm.

vi) Due to the likely levels of emitted heat radiation in the top corner of a quadrant or rotated semi-circle, only insulating glass should be used or the apertures orientated as shownin Figure 2.

4.8 Pyroglaze 60 seals will be fitted to both faces of the glass, as indicated in Figure 2, and to all edges of the pane. The seal should have overall dimensions of 25 mm by 2 mm.

4.9 The above conditions are considered sufficient to ensure the satisfactory performance of the proposed glazing system for a period of 60 minutes integrity when the available test evidence is analysed.

4.10 The proposed glasses have each been shown by numerous fire resistance tests to be able of satisfying the requirements of integrity as given by BS 476: Part 20: 1987 and this test evidence is considered to be public domain information, in particular, when the small pane sizes as proposed are considered.

Maximum Glass Sizes Permissible

4.11 This assessment allows the glasses previously detailed in this report, to be used up to the following sizes:

Pyroglaze 30

(i)	Full circles	:	Up to 500 mm diameter
(ii)	Semi circles	:	Up to 500 mm diameter
(iii)	Quadrants	:	Straight edges not to exceed 500 mm
(iv)	Rectilinear	:	Straight edges not to exceed 500 mm
(v)	Ellipse	:	Length not to exceed 500 mm

Pyroglaze 60

(i)	Full circles	:	Up to 450 mm diameter
(ii)	Semi circles	:	Up to 450 mm diameter
(iii)	Quadrants	:	Straight edges not to exceed 450 mm
(iv)	Rectilinear	:	Straight edges not to exceed 450 mm
(v)	Ellipse	:	Length not to exceed 450 mm

4.12 These sizes have been derived due to the success of tested circular glazed aperture at sizes only marginally smaller than those proposed. The proposed sizes and shapes therefore do not present concern.

5. Conclusion

5.1 Fire resistant doors that have been previously fire tested (or assessed by Warrington Fire Research Centre) to BS 476: Part 22: 1987 and have achieved at least 30 minutes integrity and incorporate shaped glazed apertures as previously described in this report and glazed with Mann McGowan Pyroglaze 30 seals are expected to be capable of a performance of 30 minutes integrity if tested in accordance with BS 476: Part 22: 1987.

5.2 Fire resistant doors that have been previously fire tested (or assessed by Warrington Fire Research Centre) to BS 476: Part 22: 1987 and have achieved at least 60 minutes integrity and incorporate shaped glazed apertures, as previously described in this report, can be glazed with Mann McGowan Pyroglaze 60 glazing seals are expected to be capable of a performance of 60 minutes integrity if tested in accordance with BS 476: Part 22: 1987.

6. Validity

6.1 This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to WFRC the assessment will be unconditionally withdrawn and Mann McGowan Fabrications 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 two years, i.e. until 1st August 1998, at which time it is recommended that it be returned for re-appraisal.

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

Appendix 1

Summary of Supporting Test Data

A1.1 **IT 238/1**

A report on a fire test conducted in accordance with BS 476: Part 8: 1972 on a circular glazed window, mounted within a door panel 52 mm thick consisting of flaxboard core.

The glazing consisted of dark red Meranti glazing beads, 17 mm x 2 mm Pyrostrip 500 intumescent seals and the aperture was lined with Pyrostrip 500 intumescent strip. The aperture was glazed with 6 mm thick Georgian Wired Polished Plate Glass.

Test Result

Integrity	:	56 minutes
Insulation	:	0 (no value given)
Test date	:	13th August 1985
Test sponsor	:	Mann McGowan Fabrications Limited

Appendix 1 (Continued)

A1.2 **Warrington Fire Research Centre**
Report Referenced WFRC No. 67719

A report on a fire test conducted utilising the heating and pressure and conditions specified in BS 476: Part 20: 1987, on two circular glazed apertures mounted within two door panels. One door panel was constructed from flaxboard.

A glazed aperture of overall size 404 mm diameter was cut into the door and lined with Pyrostrip 300 intumescent material. Circular timber glazing beads of a nominal dimension 25 mm x 29 mm with a 25° chamfer were fitted either side of 6 mm Pyroshield glass. The glass to glazing bead interface was fitted with Pyroglaze 60 glazing seals.

If the specimen was evaluated against the performance criteria of the Standard, the results would be as follows:

Integrity : 64 minutes
Insulation : 5 minutes

One door panel was tested and constructed from softwood lamels. A glazed aperture of overall size 404 mm diameter was cut into the door and lined with Pyrostrip 100EC intumescent material. Circular glazing beads of a nominal dimension of 25 mm x 29 mm with a 25° chamfer, were fitted either side of 6 mm Pyroshield glass. The glass to glazing bead interface was fitted with Pyroglaze 60 glazing seals.

If the specimen was evaluated against the performance criteria of the Standard, the results would be as follows:

Integrity : 59 minutes **
Insulation : 5 minutes

** The door blank exhibited integrity failure at 59 minutes but the glazed aperture satisfied the integrity performance requirements for a period of 62 minutes.

Test date : 11th June 1996
Test sponsor : Mann McGowan Fabrications Limited

Appendix 2

Declaration by Mann McGowan Fabrications Limited

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. 64A: 1993.

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 Warrington Fire Research Centre to withdraw the assessment.

Signed: .....

For and on behalf of: .....

Typical Installation Incorporating Pyroglaze Seals

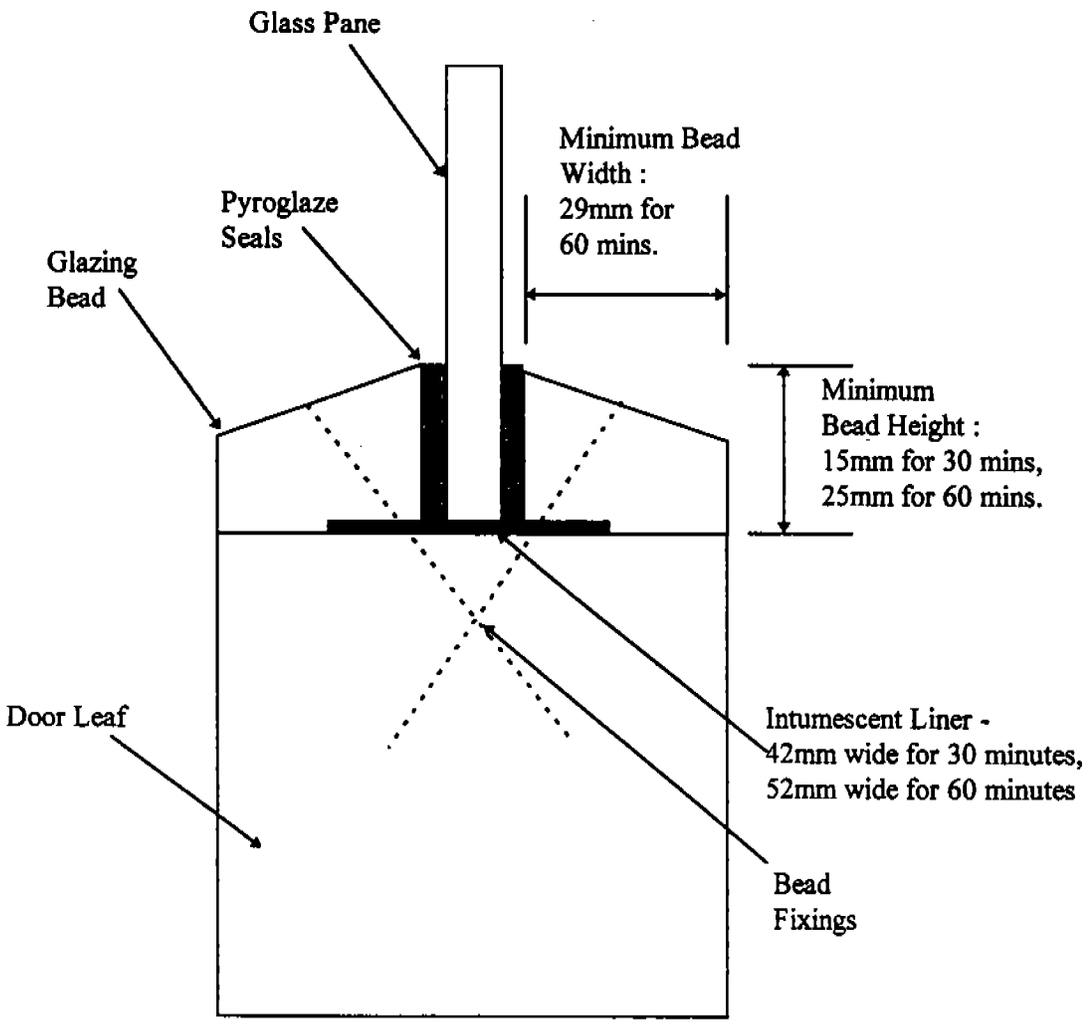
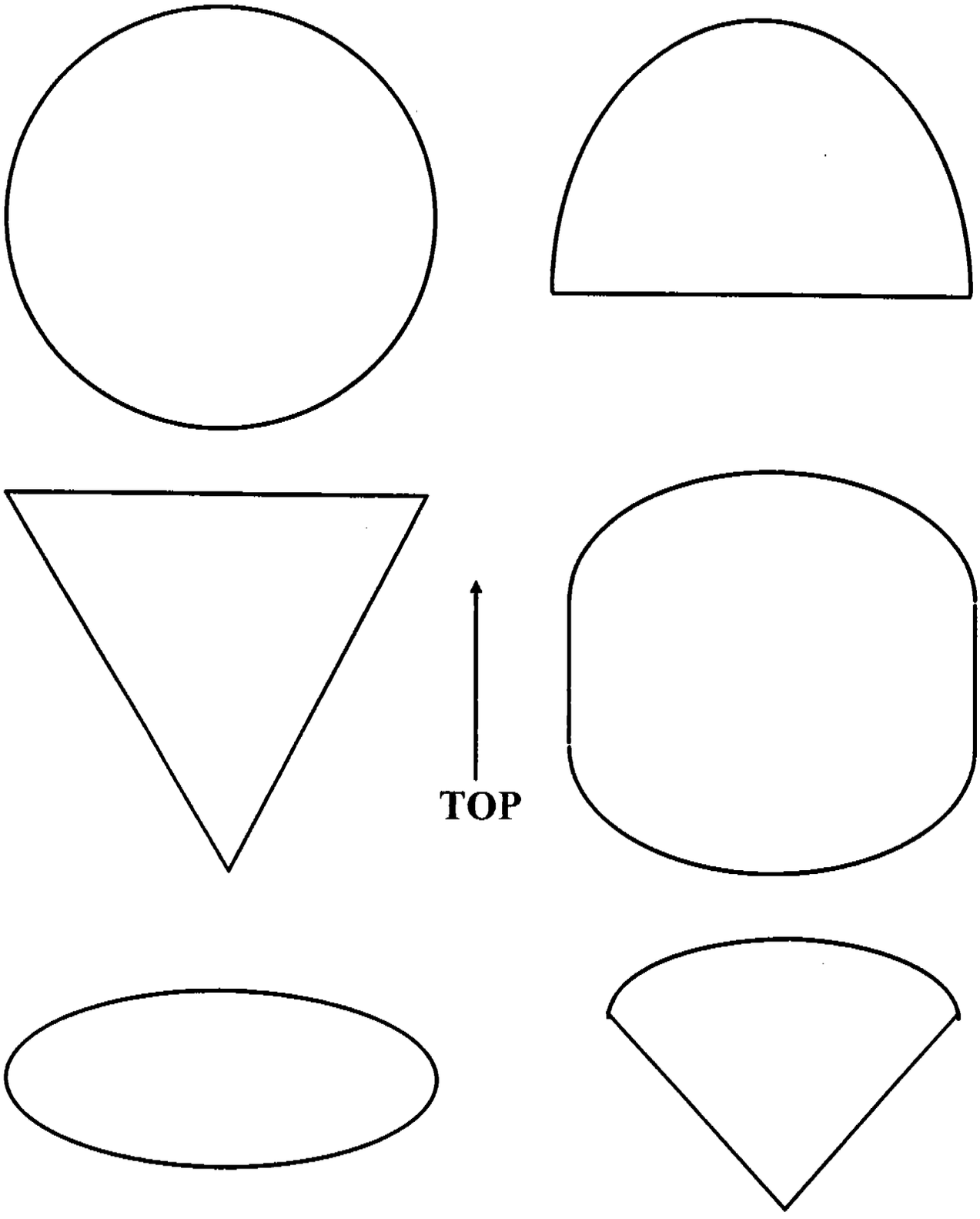


FIGURE 1



Acceptable Shapes for Pyroglaze 30 & 60

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FIGURE 2