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**UL Technical Assessment Report of Fire Performance of Previously Fire Tested/classified
Timber and Mineral Composite Based Doorset Assemblies when fitted with
YD30D & YD30S Auxiliary Locks**

Report Prepared for:

BQT Solutions (NZ) Limited

Unit 4, 101 Diana
Drive, Wairau Valley,
Auckland, 627
New Zealand

This report has been prepared by Danny Forshaw, Senior Project Engineer, in full accordance with the PFPF standard procedures guidance, (as outlined in the 2021 edition of 'Guide to undertaking technical assessments of fire performance of construction products based on test evidence') and in line with the principles of EN 15725: 2010.

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Introduction

This report relates to a request from BQT Solutions (NZ) Limited to undertake an assessment of the likely fire test performance of previously fire tested/classified timber and mineral composite based doorsets when fitted with the YD30D and YD30S auxiliary locks.

The request to assess was for the following reason/s:

- Provide a scope of use for the tested lock YD30D model with previously proven, timber and mineral composite based doorsets required to provide fire resistance performances of up to 60 minutes
- Provide a scope of use for the YD30S model, based on comparison with the YD30D, with previously proven, timber and mineral composite based doorsets required to provide fire resistance performances of up to 60 minutes

The proposed doorsets are required to satisfy the integrity criteria, and where applicable the insulation criteria, of EN 1634-1: 2014 +A1: 2018 for periods of up to 60 minutes.

Definition

In accordance with the PFPF guide – **Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence** the definition used for the scope of this report is as follows.

‘A technical evaluation of the likely performance of a component or element of structure (as defined in Approved Document B for England and Wales or their equivalent in Scotland and Northern Ireland) if it were subject to a standard fire test.

An assessment may consider design changes to a tested element of construction for a specific project or it could form a wider scope of approval with a defined period of validity

Assessments are based on sufficient relevant test evidence and provide a defined scope of approval for a particular design or range of designs and is an opinion of the likely performance of a component or element if it were subject to a standard fire test’.

For the purpose of this assessment the level of complexity is defined as –

Intermediate Assessment

The assessment of intermediate complexity and significant changes to a tested product or system. Such changes may be critical to the fire performance of the product or construction being assessed.

Client Declaration

During the application process the client, BQT Solutions (NZ) Limited, has confirmed in writing the following.

All information and evidence provided is accurate and reflects exactly the product or system which is subject to assessment. All information relevant to the assessment; references, drawings technical specifications, photographs and test/certification reports have been made available to the UL assessor; including any test failures and any information/evidence which they are aware of which may be unfavourable to the assessment outcome.

The client has confirmed that to their knowledge the product or system has not been tested in the configuration (or similar) they are seeking an assessment on.

The original application declaration is kept on file for reference.

UL Declaration

UL have agreed to undertake this assessment based on the client's supplied information and their declaration confirming full disclosure of information. UL have reviewed the application and have completed an impartiality assessment. This report therefore represents an independent expert opinion, which has not been influenced by any commercial, financial, or other pressures, that could compromise impartiality.

Assumptions

It is assumed that the doorsets to which the lock assemblies may be fitted shall be previously tested and proven in the required single or double* action, single-leaf configuration and for the required period of fire resistance performance, having demonstrated their capability of providing either 30 or 60 minutes integrity and, where applicable, insulation.

In all cases, the doorsets to which the YD30D and YD30S lock assemblies are proposed to be fitted shall be previously proven in terms of the required level of fire resistance performance when fitted with similarly mounted lock assembly and, therefore, are also proven when incorporating similarly sized and positioned cutouts to the door leaf and frame to those needed for the installation of the YD30D and YD30S lock assemblies.

The purpose of this assessment is to consider the use of the YD30D and YD30S lock assemblies in terms of their suitability for inclusion within timber and mineral composite based doorsets that have demonstrated the relevant fire resistance performance when fitted with a mortice lock or latch, therefore, the scope of this report is limited only to doorsets satisfying the above criteria. However, this report only considers the inclusion of the lock assemblies within previously proven doorsets as a non-essential hardware item. This report does not consider the ability of the YD30D and YD30S locks to provide an essential latching function in fire and, when fitted to any doorset that requires positive latching, this function must be provided by a separate lock/latch as appropriate to the doorset's own supporting evidence.

*YD30D model only.

Doorset constructions will be installed in a similar manner to that detailed in the relevant test reports, and by competent installers. 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 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 closed and latched position, unless the doorset's own test evidence indicates that it may be unlatched. The YD30D and YD30S lock assemblies shall be fitted in accordance with the manufacturer's instructions.

The proposed doorsets will include a surface mounted overhead door closer capable of returning the door leaf to the fully closed position and overcoming any resistance from the latch mechanism.

Installation of a mortice case lock and its strike plate into the edge of a door leaf and door frame invariably requires the interruption of the doorset's standard intumescent seal specification. The amount of interruption should be replicated or reduced from that originally recorded for the tested doorset and lock case. Specific intumescent protection included with the tested YD30D electric lock assemblies is detailed later in this report and shall always be fitted with the lock assemblies.

Proposals

It is proposed that previously fire tested timber and mineral composite based doorsets which have achieved 30 or 60 minutes integrity and, where applicable, insulation performance, as discussed in this report, may be fitted with the BQT Solutions YD30D and YD30S electric lock assemblies, in accordance with the recommendations given in this report, without detracting from the overall performance of the doorset in terms of the requirements of BS EN 1634-1:2014 +A1:2018 or BS476: Part 22: 1987.

Models covered by this report are only those referenced below:

YD30D

YD30S

For 30 and 60 minute applications it is proposed that the locks may be fitted to the top horizontal door frame member or alternatively to the vertical leading edge of the door leaf or door frame jamb.

Assessment - Performance to EN 1634-1: 2014 +A1: 2018 or BS476: Part 22: 1987

YD30D 30 minute doorsets

The report referenced FPA 104947 r0 details a fire resistance test conducted in accordance with BS EN 1634-1: 2014+ A1: 2018 on two double-acting, single-leaf timber based doorsets. Only Doorset A is relevant to this assessment. The doorset was of a 30 minute rated construction comprising a nominally 45 mm thick door leaf of a solid graduated density chipboard construction with hardwood lippings to the vertical edges and mounted within a softwood timber frame on a double-action floor spring and pivots.

The doorset was provided with two YD30D lock assemblies; one mounted within the door frame leading edge jamb at approximately 400mm from the top of the door leaf and one mounted within the door frame head member approximately 100mm away from the leading edge corner of the door frame. Both YD30D locks were disengaged, and the door leaf was not provided with any other means of latching, being held in the closed position only by means of the floor spring closer.

As part of their installation, the locks were provided with intumescent protection in the form of 1 mm thick MAP intumescent sheet wrapping the lock body and the same thickness applied behind the forend and the strike plate.

The test demonstrated the ability of the doorset to provide integrity and insulation performances of 36 minutes. The test was terminated after a period of 60 minutes.

A review of the observations included in the test report confirms that there was no instance of failure at the positions of the lock assemblies for the 36 minute duration of the doorset's evaluation. Having achieved and exceeded its required performance, the doorset was sealed off at this time to allow continuation of the test for the other doorset.

The test demonstrated the performance of the YD30D lock assembly when mounted within the frame head and frame jamb of a 30 minute timber based doorset.

It is therefore reasonable to conclude that the proposed use of the YD30D lock assemblies with other previously proven timber based doorsets for 30 minute applications is acceptable, subject to the requirements given for suitable doorsets within this report

YD30D 60 minute doorsets

The report referenced FPA 106037 r0 details a fire resistance test conducted in accordance with BS EN 1634-1: 2014+ A1: 2018 on a double-acting, single-leaf timber based doorset. The doorset was of a 60 minute rated construction comprising a nominally 55 mm thick door leaf of a solid graduated density chipboard construction with hardwood lippings to the vertical edges and mounted within a hardwood timber frame on a double-action floor spring and pivots.

The doorset was provided with two YD30D lock assemblies; one mounted within the door frame leading edge jamb at approximately 400mm from the top of the door leaf and one mounted within the door frame head member approximately 100mm away from the leading edge corner of the door frame. Both YD30D locks were disengaged, and the door leaf was not provided with any other means of latching, being held in the closed position only by means of the floor spring closer.

As part of their installation, the locks were provided with intumescent protection in the form of 2 mm thick MAP intumescent sheet wrapping the lock body and the same thickness applied behind the forend and the strike plate.

The test demonstrated the ability of the doorset to provide integrity and insulation performances of 73 minutes. The test was terminated after a period of 73 minutes.

The test satisfactorily demonstrated the performance of the YD30D lock assembly when mounted within the frame head and frame jamb of a 60 minute timber based doorset.

It is therefore reasonable to conclude that the proposed use of the YD30D lock assemblies with other previously proven timber based doorsets for 60 minute applications is acceptable, subject to the requirements given for suitable doorsets within this report

YD30S

The tested YD30D is a bidirectional lock intended for use with both single and double action doorsets. As such, its design, including two latch bolts, allowing the lock to engage and correct a misaligned door swinging from either direction. The YD30S is essentially a single direction version intended for use only with single action doorsets.

Dimensionally the YD30S is smaller having a lock body 95mm long by 47mm wide and a forend 30mm wide by 160mm long. This is compared to the 183mm long by 47mm wide body and 255mm long by 30mm wide forend of the YD30D.

The smaller dimensions of the model mean that less material is required to be removed from the door and frame to allow for its installation. On this basis the YD30S can be considered as a less onerous proposal than the tested model.

Since neither model is intended to provide an essential latching function to doorset that they may be used with, there is no need to make any further consideration of the latching ability of either model.

Based on the above comparison, and the proven performance of the YD30D model, it is considered reasonable to conclude that the use of the YD30S within the same 30 and 60 minute applications would be comparable to that of the YD30D.

Use of the YD30S lock assembly with previously proven timber based doorsets for 30 and 60 minute applications is, therefore, deemed acceptable, subject to use of the same level of intumescent protection detailed for the tested model, and the requirements given for suitable doorsets within this report.

Suitable doorsets

Within the scope of this report, it is intended that the proposed lockset assemblies may be used with doorsets other than those included in the original tests. To enable the report's use on a general basis, and avoiding restriction of it to specific manufacturers' doorsets, or doorset type, the following requirements are given to ensure that the locksets are used only with appropriately proven doorsets:

The timber or mineral composite based doorset including its door frame, intumescent seals and any other installed ironmongery shall have achieved the appropriate 30 or 60 minute fire resistance performance when tested to EN 1634-1 by a suitably accredited laboratory. Within the UK this would be a laboratory accredited by UKAS for the test method.

For the avoidance of doubt, doorsets intended to be covered by this report under the term mineral composite are considered to be doorsets including timber based frames with door leaves having a core of mineral composite material that, as a minimum, are faced and lipped with timber.

Those aspects of the doorset construction considered critical to its performance are the material of the door frame, the door leaf to frame clearance gaps and the lipping material. Close attention must be paid to these details, and they should not be altered from that previously tested. To ensure compatibility of the doorset construction with the scope of use given in this report for the locks, the following minimum specification must be followed:

- Door frame density – 510kg/m³ (30 minutes), 650 kg/m³ Hardwood (60 minutes)
- Leaf to frame clearance gaps not to exceed 3 mm average and 3.5 mm maximum
- Door leaves must be lipped with hardwood, minimum 8 mm thick – density 650 kg/m³ (30 and 60 minutes)
- Door leaf thickness – 45 mm (30 minutes), 55 mm (60 minutes)

Use of the locks shall only be considered where the proposed doorset has demonstrated the required performance when fitted with a similarly sized and positioned lock and the amount of interruption of the standard intumescent seal specification at the door leaf to frame perimeter clearance gaps can be replicated or reduced from that originally included in the tested assembly.

For 30 and 60 minute applications the assessment positively appraises that the locks may be fitted to the top horizontal door frame member or alternatively to the vertical leading edge of the door leaf or door frame jamb, however, the proposed doorset shall have suitable evidence to confirm that the doorset can accommodate the lock at the head when this option is required.

In all instances the lock must be installed with the requisite intumescent protection. For 30 minute applications this is 1 mm thick MAP intumescent sheet wrapping the lock case and 2 mm thick MAP behind the forend and the strike plate. For 60 minute applications a 2 mm thickness of MAP intumescent sheet shall be used to wrap the lock case and be provided behind the forend and strike plate.

Test evidence for the proposed doorset must be appropriate to the scope of doorset configuration considered by this report which is single or double action for the YD30D, and single action for the YD30S, single-leaf doorset only for both models.

Limits of Applicability

This assessment does not constitute product certification by UL and should not be used to demonstrate compliance where the project requires product certification.

Assessment Conclusion

The BQT Solutions YD30D and YD30S electric locks detailed in this report would be expected to contribute positively towards the overall fire resistance performance of previously proven timber and mineral composite based doorsets required to provide performances of up to 30 or 60 minutes, subject to satisfaction of the assumptions and requirements for suitable doorsets detailed, if tested in accordance with BS EN 1634-1:2014 +A1:2018 or BS476: Part 22: 1987.

UL Confirmation of Validity

This assessment is issued on the basis of the test data and information to hand at the time of issue. If contradictory evidence becomes available to the assessing authority, the assessment will be unconditionally withdrawn, and the applicant will be notified in writing. Similarly, the assessment should be re-evaluated, if the assessed construction is subsequently tested, since actual test data is deemed to take precedence.



This assessment is valid for an initial period of five years (if the clause above is not enacted) after which time it is recommended that it be submitted to the assessing authority for re-evaluation.

This report may only be used in its entirety and should be supplied to interested parties or AHJ's as such.

NB This assessment report is not valid unless it incorporates all pages and the declaration duly signed by the applicant's representative.

Signatories

Engineer Completing the Assessment on behalf of UL.

Name of Engineer	Signature	Date
Danny Forshaw		26 th February 2024
Name of Reviewer	Signature	Date
David Yates		26 th February 2024

Date of Issue	26 th February 2024
Date end of validity (five years from issue)	25 th February 2029
Reissue Date	21 st May 2024
ISSUE 2: Inclusion of test evidence from formal 60 minute test and removal of secondary test evidence	

Annex A - Primary Evidence referred to

Lab: The Fire Protection Association
Report Number: FPA 104947 r0

A fire resistance test conducted in accordance with BS EN 1634-1: 2014+ A1: 2018 on two double-acting, single-leaf timber based doorsets. Only Doorset A is relevant to this assessment. The doorset was of a 30 minute rated construction comprising a nominally 45 mm thick door leaf of a solid graduated density chipboard construction with hardwood lippings to the vertical edges and mounted within a softwood timber frame on a double-action floor spring and pivots. The doorset was provided with two YD30D lock assemblies; one mounted within the door frame leading edge jamb at approximately 400mm from the top of the door leaf and one mounted within the door frame head member approximately 100mm away from the leading edge corner of the door frame. Both YD30D locks were disengaged, and the door leaf was not provided with any other means of latching, being held in the closed position only by means of the floor spring closer.

The results of the test were as follows:

Doorset A	
Integrity:	
Sustained flames:	36 minutes
Gap gauge:	36 minutes
Cotton pad:	36 minutes
Insulation:	
	36 minutes

The evaluation of Doorset A was terminated at 36 minutes without any instance of failure.

Test Date: 9th October 2023
Report Date: 31st October 2023
Test Sponsor: BQT Solutions (NZ) Limited

Lab: The Fire Protection Association

Report Number: FPA 106037 r0

A fire resistance test conducted in accordance with BS EN 1634-1: 2014+ A1: 2018 on a double-acting, single-leaf timber based doorset. The doorset was of a 60 minute rated construction comprising a nominally 55 mm thick door leaf of a solid graduated density chipboard construction with hardwood lippings to the vertical edges and mounted within a hardwood timber frame on a double-action floor spring and pivots. The doorset was provided with two YD30D lock assemblies; one mounted within the door frame leading edge jamb at approximately 400mm from the top of the door leaf and one mounted within the door frame head member approximately 100mm away from the leading edge corner of the door frame. Both YD30D locks were disengaged, and the door leaf was not provided with any other means of latching, being held in the closed position only by means of the floor spring closer.

The results of the test were as follows:

Integrity:	
Sustained flames:	73 minutes
Gap gauge:	73 minutes
Cotton pad:	73 minutes
Insulation:	
	73 minutes

The test was discontinued after a period of 73 minutes.

Test Date: 17th April 2024

Report Date: 24th April 2024

Test Sponsor: BQT Solutions (NZ) Limited

Report Prepared For: BQT Solutions (NZ) Limited

Project: 4790970497

Report No.: 4790970497-2

Annex B – Declaration by the Applicant

Reference No. 4790970497-2

We the undersigned confirm that we have read and complied with the 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

We confirm that any changes which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.

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.

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.

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 82)

Signature:



Name:

Matthew Nye-Hingston

Position:

Chief Operating Officer

Company:

BQT Solutions (NZ) Limited

Date:

21st May 2024

