

DAVCOR GROUP PTY LTD

DOOR HARDWARE ASSESSMENT

Davcor door hardware



Prepared for

Adrian Aldridge

Report sponsor: Davcor Group Pty Ltd

Products: Davcor door hardware

Report number: FAS220387

Revision: DHAR 1.5

Issued date: 20 June 2025 Expiry date: 28 February 2028



JENSEN HUGHES

Quality management

Revision	Date	Revision description		
DHAR 1.5	Issue: 23 Feb 2023	Initial issue		
		Prepared	Reviewed	Authorised
		Dugald Watson	Alim Rasel	Omar Saad
DHAR 1.1	Issue: 07 Mar 2023	Report updated with additional hardware		
		Prepared	Reviewed	Authorised
		Dugald Watson	Alim Rasel	Omar Saad
DHAR 1.2	Issue: 06 Feb 2024	Report updated with additional hardware		
		Prepared	Reviewed	Authorised
		Renz Rabusa	Alim Rasel	Omar Saad
DHAR 1.3	Issue: 29 May 2024	Report updated with additional hardware		
		Prepared	Reviewed	Authorised
		Mohammed Mutafi	Alim Rasel	Alim Rasel
DHAR 1.4	Issue: 11 Mar 2025	Report updated with additional hardware		
		Prepared	Reviewed	Authorised
		Derek Thongcharen	Mohammed Mutafi	Mohammed Mutafi
DHAR 1.5	Issue: 20 Jun 2025	Report updated with additional hardware		
	Expiry: 29 Feb 2028	Prepared	Reviewed	Authorised
		Mohammed Mutafi	Alim Rasel	Alim Rasel
<p>Note–</p> <p>The stated expiry date is dependent on the continued validity of report FCO 3428 throughout the duration of this report's validity period. Therefore, it is essential to read this report in conjunction with FCO 3428.</p>				

Jensen Hughes Fire Testing Pty Ltd
ABN 81 050 241 524
Formerly Warringtonfire Australia Pty Ltd¹

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1.0 Introduction

This report documents the findings of the assessment to determine the expected fire resistance level (FRL) of a range of Davcor door hardware installed on Firecore doorsets in accordance with AS 1530.4:2005², AS 1530.4:2014³ and AS 1905.1:2015⁴ (as applicable).

Jensen Hughes performed this assessment at the request of the report sponsors listed in Table 1.

Table 1 Report sponsor details

Report sponsor	Address
Davcor Group Pty Ltd	14 John Hines Avenue Minchinbury NSW 2770 Australia
Firecore Pty Ltd	291 Warringah Road Beacon Hill NSW 2100 Australia

2.0 Baseline test data for full scale doorset

Firecore doorsets were tested in accordance with AS 1530.4:2005 and AS 1530.4:2014. Based on the test data– the achieved performance is summarised in Table 2.

Table 2 Referenced test reports and assessments

Test / assessment reference	Doorset description	Reference doorset	Test standard	FRL
FSV 1382a	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	A	AS 1530.4:2005	-/120/30
FSV 1418a	Single leaf TVC40 core Firecore doorset, nominally 48 mm thick	B		-/240/30
FSV 1391a	Double leaf TVC40 core Firecore doorset, nominally 48 mm thick	C		-/240/30
FCO 3428	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	D	AS 1530.4:2014	Up to -/120/30
	Single leaf TVC40 core Firecore doorset, nominally 48 mm thick	E		Up to -/240/30
	Double leaf TVC40 core Firecore doorset, nominally 48 mm thick	F		
Notes:				
+ It should be noted that the performance of the doorset varied based on their construction and test standards. The relevant doorsets were referenced in section 5 as defined in this table.				

² Standards Australia, 2005, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2005, Standards Australia, NSW.

³ Standards Australia, 2014, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2014, Standards Australia, NSW.

⁴ Standards Australia, 2015, Components for the protection of openings in fire-resistant walls Fire-resistant doorsets, AS 1905.1:2015, Standards Australia, NSW.

Test / assessment reference	Doorset description	Reference doorset	Test standard	FRL
+ Please contact Firecore Pty Ltd for the latest version of FCO 3428.				

3.0 Hardware considered in this report

A range of door hardware was considered in this report. The hardware considered is listed in Table 3 to Table 8.

Table 3 List of locksets with or without additional furniture

Item	Model	Description	Backset	Reference test/assessment
1.	Carbine CDL7200	Digital door lock, tubular latch	60 mm	FRT210191 R1.0 / FRT210191 DHAR1.0
2.	Carbine CDL7100	Digital door lock, tubular latch	60 mm	FRT210191 R1.0 / FRT210191 DHAR1.0
3.	Davcor Carbine PN6000	Entrance leverset, tubular latch	70 mm	FRT220081 R1.0 / FRT220081 DHAR3.0
4.	Carbine PA8000	Ascot entrance set leverset	70 mm, 127 mm	FRT200071 R1.0/ DHAR RT200071a.1
5.	Carbine PS4000	Sandown entrance set knob set, cylindrical lock	70 mm, 127 mm	FRT200071 R1.0 / DHAR FRT200071a.1
6.	Carbine PR6000	Rosehill entrance set leverset, cylindrical lock	70 mm, 127 mm	FRT200071 R1.0 / DHAR FRT200071a.1
7.	Carbine PD7000	Carbine professional series cylindrical lockset	127 mm	FSP 0944 / No. 354
8.	Carbine Night Hawk Pro	Auxiliary lock	60 mm	FRT220082 R1.0 / FRT220082 DHAR2.0
9.	Carbine Alpha Deadlatch with lever	Lockset	60 mm	FRT230072 R1.0 / FRT230072 DHAR1.0
10.	Carbine Alpha Deadlatch with key lever	Lockset	60 mm	FRT230072 R1.0 / FRT230072 DHAR1.0
11.	Carbine Alpha Deadlatch with knob	Lockset	60 mm	FRT230072 R1.0 / FRT230072 DHAR1.0
12.	Carbine Alpha Deadlatch with key knob	Lockset	60 mm	FRT230072 R1.0 / FRT230072 DHAR1.0
13.	Carbine PY6000-L1 entrance set (tested) Carbine PY6011-L1 Double cylinder leverset Carbine PY6012 – L1 Classroom Leverset Carbine PY6030 – L1 Privacy Leverset Carbine PY6062 – L1 Vestibule Leverset	Cylindrical lockset	70 mm	FRT240030 R1.0 / FRT240030 DHAR 1.0

Item	Model	Description	Backset	Reference test/assessment
	Carbine 6075 – L1 Dummy lever Carbine PY6082 – L1 Passage Leverset Carbine PY6085 – L1 Half cupboard Leverset Carbine PY6095 – L1 Double cylinder Vestibule Leverset Carbine PY3000 – L1 Knob & Lever Entrance Set Carbine PY3013 – L1 Knob & Lever Classroom Set Carbine PY3062 – L1 Knob & Lever Vestibule Set			
14.	Davcor Carbine Longreach (CSM72-SS) mortice lock installed with + Davcor Carbine Crisi round rose furniture and standard Cogni lever (CRF136-L7-SS) + Davcor Carbine oval key cylinder (COV SC6X) + Carbine oval escutcheon (CRF136-EETF-SS) + Carbine indicator disability lever internal turn snib (CRF136-DT-SS)	Mortice lock with furniture	60 mm	FRT250608 R1.0
15.	CRF136-T-SS Round turnsnib	Turn snib	-	FRT250608 R1.0
16.	CRF136-EITF-SS Internal cylinder escutcheon furniture	Furniture	-	FRT250608 R1.0

Table 4 List of door closers

Item	Model	Description	Reference test/assessment
1.	CDC-CA2 + slide arm	Surface mounted door closer	FRT210055 R1.0 / FAS210177 DHAR1.2
2.	CDC-CA1 + slide arm	Surface mounted door closer	FRT210055 R1.0 / FAS210177 DHAR1.2
3.	CDC-1 + link arm	Surface mounted door closer	FRT210055 R1.0 / FAS210177 DHAR1.2
4.	CDC-5 + link arm	Surface mounted door closer	FRT210055 R1.0 / FAS210177 DHAR1.2
5.	CDC-3 + link arm	Surface mounted door closer	FRT210055 R1.0 / FAS210177 DHAR1.2

Table 5 List of door electric strike

Item	Model	Description	Reference test/assessment
1.	Davcor Carbine CES710S	Non-monitored electric strike	FRT220081 R1.0 / FRT220081 DHAR1.1
2.	Davcor Carbine CES720S	Monitored electric strike	FRT220081 R1.0 / FRT220081 DHAR1.1
3.	Davcor Carbine CES350-1224	Electric strike	FRT220081 R1.0 / FRT220081 DHAR2.0
4.	Davcor Carbine CES300-ST-1224	Electric Strike	FRT220082 R1.0 / FRT220082 DHAR1.0

Table 6 List of savers and blocker plates

Item	Model	Description	Reference test/assessment
1.	Carbine BP-LF1	Blocker plate	FRT210191 R1.0 / FRT210191 DHAR3.0
2.	Carbine DS6-7-40	Door saver	FRT210191 R1.0 / FRT210191 DHAR4.0

Table 7 List of door viewers

Item	Model	Description	Reference test/assessment
1.	Lenlok 34043	Door viewer	FRT210191 R1.0 / FRT210191 DHAR2.0

Table 8 List of hinges

Item	Model	Description	Reference test/assessment
1.	CHBB-100X100-SSS	ball bearing hinge	FRT230072 R1.0 / FRT230072 DHAR2.0
2.	CHBB-100X75-SSS	ball bearing hinge	FRT230072 R1.0 / FRT230072 DHAR2.0
3.	CHBB-100X100-SSS	fixed pin hinge	FRT230072 R1.0 / FRT230072 DHAR2.0
4.	CHBB-100X75-SSS	fixed pin hinge	FRT230072 R1.0 / FRT230072 DHAR2.0

4.0 Additional supporting data considered in this report

The proposed hardware was assessed based on supporting test data listed in Table 9 and in compliance with AS 1905.1:2015.

Table 9 Additional supporting test data

Test report	Test date	Test scale	Doorset description	Tested hardware	Test duration	Test standard
FSP 0944	26 November 2002	Pilot scale	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	+ Carbine Professional Series cylindrical lockset	120 minutes	AS 1530.4:1997
FRT200071 R1.0	3 March 2020	Pilot scale	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	+ Carbine PA8000 ascot entrance set leverset	121 minutes	AS 1530.4:2014
FRT210055 R1.0	30 March 2021	Pilot scale	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	+ CDC-CA2 surface mounted cam-action closer with electromagnetic hold open track arm	121 minutes	AS 1530.4:2014
FRT210191 R1.0	28 June 2021	Pilot scale	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	+ Carbine CDL7200 digital door lock with tubular latch + Carbine BP-LF1 blocker plate + Carbine DS6-7-40 door saver + Lenlok 34043 door viewer	121 minutes	AS 1530.4:2014
FRT220081 R1.0	26 May 2022	Pilot scale	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	+ Davcor Carbine CES720S monitored electric strike + Davcor Carbine CES350-1224 electric strike + Davcor Carbine PN6000 entrance leverset	241 minutes	AS 1530.4:2014
FRT220082 R1.0	1 June 2022	Pilot scale	Single leaf TVC30 core Firecore doorset, nominally 38 mm thick	+ Davcor Carbine CES300-ST-1224 electric strike + Davcor Carbine Night Hawk Pro Night auxiliary lock	121 minutes	AS 1530.4:2014

Test report	Test date	Test scale	Doorset description	Tested hardware	Test duration	Test standard
FRT230072 R1.0	28 July 2023	Pilot scale	Single leaf TVC30 core Firecore mini doorset nominally 38 mm thick	<ul style="list-style-type: none"> + Carbine Alpha Deadlatch with lever – installed on unexposed side + Carbine Alpha Deadlatch with lever – installed exposed side + 100 × 100 × 2.5 mm ball bearing hinges 	121 minutes	AS 1530.4:2014
FRT240034 R1.0	18 April 2024	Pilot scale	Single leaf TVC30 core Firecore mini doorset nominally 38 mm thick.	<ul style="list-style-type: none"> + Carbine PY6000-L1 entrance set + Souber anti thrust plate 	120 minutes	AS 1530.4:2014
FRT250608 R1.0	23 April 2025	Pilot scale	Single leaf TVC30 core Firecore mini doorset, nominally 38 mm thick	<ul style="list-style-type: none"> + Davcor Carbine Longreach (CSM72-SS) mortice lock, with Davcor Carbine Crisi round rose furniture, standard Cogni lever (CRF136-L7-SS), Davcor Carbine oval key cylinder (COV SC6X), and a Carbine oval escutcheon (CRF136-EETF-SS) with turn snib (CRF136-DT-SS) + ASSA ABLOY SS304/24 100 mm × 75 mm stainless steel fixed pin hinges 	240 minutes	AS 1530.4:2014

5.0 Assessment

5.1 Door hardware assessment in accordance with AS 1905.1:2015

The performance of Firecore doors in accordance with AS 1530.4:2005 and AS 1530.4:2014 was established based on a number of fire resistance tests. The outcomes of these tests and a subsequent assessment report – FCO 3428 – are summarised in Table 2. It should be noted that FCO 3428 was issued by Infrastructure Technologies on 24 December 2021. Jensen Hughes has not verified the outcome of this assessment report. However, for the purpose of this report, it is assumed that the outcome is accurate. This report must be read in conjunction with test and assessment report listed in Table 2. Therefore, the validity of this report is conditional upon the validity of FCO 3428. Any changes or updates to FCO 3428 may therefore impact the outcome of this report.

As per section 4 of AS 1905.1:2015, door hardware can be assessed based on additional pilot scale or full-scale tests when conducted in accordance with AS 1530.4. The proposed hardware listed in section 3 was tested in full or pilot scale. The test outcomes are summarised in Table 9. Based on the above, the proposed hardware is assessed in this assessment.

This assessment is conditional upon the operational characteristics and materials of the doorset complying with section 2 of AS 1905.1:2015. The field of application of the hardware included in this report is defined by the field of application of the doorset that the door hardware is installed on.

5.2 Applicability of test data to AS 1530.4:2014

It is noted that some full scale or pilot scale tests were conducted in accordance with AS 1530.4:2005. The stipulations provided in Appendix B11 of AS 1530.4:2005 and AS 1530.4:2014 are not appreciably different. Therefore, the pilot scale test results can be used to assess the fire resistance performance of the hardware if tested in accordance with AS 1530.4:2014.

5.3 Lockset with or without additional furniture

5.3.1 Assessment based on pilot/full scale test

Section 4.5 of AS 1905.1:2015 permits the assessment of locksets based on a pilot scale or full-scale fire resistance test in accordance with AS 1530.4. As such, in addition to the full-scale tests listed in Table 2, pilot scale or full-scale tests listed in Table 9 form the basis of this assessment.

It is noted that, some locksets included additional furniture. In such case, the furniture was tested as part of the pilot scale or full-scale tests. Any variation in surface mounted furniture is discussed in section 5.3.5.

AS 1530.4:2014 states that either sustained flaming on the surface of the unexposed face for 10 seconds or longer, ignition of a cotton pad, gap gauge failure, or the latching mechanism being disengaged at the end of the test constitute integrity failure. From the pilot scale or full-scale tests, the attained duration of integrity performance of each lockset based on the above criteria is noted.

As the proposed locksets with or without additional furniture (as applicable) did not cause failure up to the noted timeframes in the pilot scale tests or full-scale tests, substituting the locksets with or without additional furniture (as applicable) for the hardware tested in the referenced doorsets listed in Table 2 is not expected to affect their performance. Based on the above, the proposed locksets listed in Table 3 are positively assessed. Variations from the tested locksets are discussed under section 5.3.2 and 5.3.4 (as applicable).

5.3.2 Variation in surface mounted furniture

The proposed locksets included variations in surface mounted furniture in the form of levers or escutcheon plates. AS 1530.4:2014, clause 7.9.7 (l) states: Where locksets or latchsets are operated by a steel shaft, their surface-mounted furniture may be varied provided—

(i) the melting point of any part is not reduced;

(ii) any replacement handle or knob is not so massive or asymmetrical as to introduce a turning moment about the operating shaft which exceeds 0.07 Nm.

(iii) any replacement lever handle is not so massive or asymmetrical as to increase the turning moment about the operating shaft by more than 10%.

(iv) any replacement escutcheon plate adequately covers any hole in the door leaf formed to accommodate the lockset or latchset but does not increase the area of the face of the door leaf covered by the escutcheon by more than 20%.

The proposed locksets with surface mounted furniture that varies from the tested system all satisfied clauses 7.9.7 (l) (i), (ii), (iii) and (iv) of AS 1530.4:2014. Based on the above, the proposed variations in surface mounted furniture are positively assessed.

5.3.3 Variation in operating mechanism

The proposed locksets included variations in operating mechanism from the tested specimen. AS 1530.4:2014, clause 7.9.7 states that:

(i) Changes may be made in the operating characteristics of latchset or lockset hardware, provided the changes do not require modification of the door leaf or door frame and changes to the functions of the latchsets involving the operating mechanism.

(j) Changes may be made to the materials of the essential latching components, provided the melting point of any part is the same or higher.

It has been confirmed through a survey conducted by Jensen Hughes that the variations in operating mechanism did not require modification of the door leaf and did not require changes to the function of the latchset. Additionally, the melting point of any part was not reduced. Based on the above, variation in the operating mechanisms of the locksets is positively assessed.

5.3.4 Variation in backset for cylindrical lockset

The proposed locksets included variations in the depth/length of the backset for cylindrical lockset. Clause 7.9.7 of AS 1530.4:2014 states that:

(h) The backset of a cylindrical lockset or latchset may be varied, provided no additional encroachment is made on any structural framework of the door leaf and the fixing method remains identical.

The fixing method – how the lock is secured (i.e., bored hole diameter, latch bolt recess, fasteners) – should remain the same. Essentially, we are adjusting where along the horizontal axis the lockset is installed, not how it is installed. This ensures the door leaf is still drilled or prepared using standard hole sizes and reinforcing hardware (if any), preserving the integrity of both the door and lockset assembly.

Cylindrical locksets with different backset dimensions are permitted as long as the door leaf's internal framework (often rails, stiles, or reinforcing core) is not weakened or cut in a way that compromises the structural soundness of the door.

5.3.5 Conclusion

Based on the discussion above, it is the opinion of this laboratory that the proposed locksets listed in Table 10 are capable of achieving the FRLs listed in Table 10 – if they are fitted in the referenced Firecore doorsets.

Table 10 Fire resistance level of door locksets and furniture installed on AS 1530.4:2005 and AS1530.4:2014 compliant Firecore doorsets

Item	Model	Description/ Additional furniture	Backset	Reference doorset as listed in Table 2	FRL
1.	Carbine CDL7200	Digital door lock, tubular latch	60 mm	A, B, C, D, E, F	-/120/30
2.	Carbine CDL7100	Digital door lock, tubular latch	60 mm	A, B, C, D, E, F	-/120/30
3.	Davcor Carbine PN6000	Entrance leverset, tubular latch	70 mm	A, D	-/120/30
				B, C, E, F	-/240/30
4.	Carbine PA8000	Ascot entrance set leverset	70 mm, 127 mm	A, B, C, D, E, F	-/120/30
5.	Carbine PS4000	Sandown entrance set knob set, cylindrical lock	70 mm, 127 mm	A, B, C, D, E, F	-/120/30
6.	Carbine PR6000	Rosehill entrance set leverset, cylindrical lock	70 mm, 127 mm	A, B, C, D, E, F	-/120/30
7.	Carbine PD7000	Carbine professional series cylindrical lockset	127 mm	A, B, C, D, E, F	-/120/30 ¹
8.	Carbine Night Hawk Pro	Auxiliary lock	60 mm	A, B, C, D, E, F	-/120/30 ²
9.	Carbine Alpha Deadlatch with lever	Lockset	60 mm	A, B, C, D, E, F	-/120/30 ³
10.	Carbine Alpha Deadlatch with key lever	Lockset	60 mm	A, B, C, D, E, F	-/120/30 ³
11.	Carbine Alpha Deadlatch with knob	Lockset	60 mm	A, B, C, D, E, F	-/120/30 ³
12.	Carbine Alpha Deadlatch with key knob	Lockset	60 mm	A, B, C, D, E, F	-/120/30 ³
13.	+ Carbine PY6000-L1 entrance set (tested)	Cylindrical lockset	70 mm	A, B, C, D, E, F	-/120/30

Item	Model	Description/ Additional furniture	Backset	Reference doorset as listed in Table 2	FRL
	<ul style="list-style-type: none"> + Carbine PY6011-L1 Double cylinder leverset + Carbine PY6012 – L1 Classroom Leverset + Carbine PY6030 – L1 Privacy Leverset + Carbine PY6062 – L1 Vestibule Leverset + Carbine 6075 – L1 Dummy lever + Carbine PY6082 – L1 Passage Leverset + Carbine PY6085 – L1 Half cupboard Leverset + Carbine PY6095 – L1 Double cylinder Vestibule Leverset + Carbine PY3000 – L1 Knob & Lever Entrance Set + Carbine PY3013 – L1 Knob & Lever Classroom Set + Carbine PY3062 – L1 Knob & Lever Vestibule Set 				
14.	<p>Davcor Carbine Longreach (CSM72-SS) mortice lock installed with:</p> <ul style="list-style-type: none"> + Davcor Carbine Crisi round rose furniture and standard Cogni lever (CRF136-L7-SS) + Davcor Carbine oval key cylinder (COV SC6X) + Carbine oval escutcheon (CRF136-EETF-SS) + Carbine indicator disability lever internal turn snib (CRF136-DT-SS) 	Mortice lock with furniture	60 mm	A, B, C, D, E, F	-/240/30
15.	CRF136-T-SS Round turnsnib	Turn snib	-	A, B, C, D, E, F	-/240/30
16.	CRF136-EITF-SS Internal round rose furniture	Furniture	-	A, B, C, D, E, F	-/240/30

Item	Model	Description/ Additional furniture	Backset	Reference doorset as listed in Table 2	FRL
<p>¹Assessed for door opening away from fire exposure only</p> <p>²Assessed as secondary latch only</p> <p>³It is understood that the bolt cannot be left in a thrown position when the door is in open position in a way that can render the door non self-latching.</p> <p>Notes:</p> <ul style="list-style-type: none"> + The listed FRL is the maximum FRL assigned to the hardware. The system FRL needs to be determined in conjunction with the FRL of the referenced doorset. The lowest index between the FRL of the hardware and doorset will be the applicable FRL of any particular combination. Therefore, this report needs to be read in conjunction with the referenced reports listed in Table 2. + The FRLs provided in this table are contingent upon the validity of the assessment report FCO 3428. 					

5.4 Door closers

5.4.1 Assessment based on pilot scale tests

Section 4.5 of AS 1905.1:2015 permits the assessment of door closers based on a pilot scale fire resistance test in accordance with Appendix B11 of AS 1530.4:2014. As such, in addition to the full-scale tests listed in Table 2, pilot scale tests listed in Table 4 form the basis of this assessment.

AS 1530.4:2014 states that either sustained flaming on the surface of the unexposed face for 10 seconds or longer, ignition of a cotton pad, gap gauge failure, or the latching mechanism being disengaged at the end of the test constitutes integrity failure. From the pilot scale tests, the attained duration of integrity performance of the closer based on the above criteria is noted.

As the proposed closers did not cause failure up to the noted timeframe in the pilot scale tests, substituting them for the hardware tested in the referenced doorsets listed in Table 2, is not expected to affect their performance. Based on the above, the proposed door closers listed Table 4 are positively assessed. Variations from the tested closers are discussed under section 5.4.2 and 5.4.3 (as appropriate).

5.4.2 Variation in proposed door closers

Clause 7.9.7 (e) of AS 1530.4:2014 stipulates that “An alternative closer manufactured by the same manufacturer and of a smaller size closer in the same series of closers may be used, provided the closer—

- (i) *is manufactured from the same materials;*
- (ii) *has the same operating mechanism design; and*
- (iii) *uses the same hydraulic fluids.*

The proposed door closers are manufactured by the same manufacturer of the tested specimen using the same materials, has the same design, and hydraulic fluids as required by AS 1530.4:2014. A detailed survey to measure the mass and dimensions of the proposed door closers was conducted. The survey found that all the proposed door closers were smaller in size and have a lower mass compared to the tested door closer in FRT210055 R1.0.

5.4.3 Performance of door closers with slide arms without electromagnetic hold open device

A fire resistance test was conducted on a surface mounted cam-action closer with electromagnetic hold-open track arm fitted onto the door leaf with the anchor fixed to the frame. It is proposed that the door closers with slide arms presented in Table 4 are installed with either the tested electromagnetic hold-open device or without it. The electromagnetic hold-open track arm includes a device with plastic components and cables providing the hold open function. The door closer variation without the hold open device is less onerous as the plastic components and cables are removed. There are no other variations between the closers with electromagnetic hold open device and the closers without electromagnetic hold open device. As such, the closers without electromagnetic hold open devices can be positively assessed for a duration not less than that achieved in the fire resistance test.

Based on the above, adding the proposed door closers as described in Table 4 but with slide arms without electromagnetic hold open device to the referenced doorsets will not impact their performance.

5.4.4 Conclusion

Based on the discussion above, it is the opinion of this laboratory that the proposed door closer listed in Table 11 are capable of achieving the FRLs listed in Table 11– if they are fitted in the referenced Firecore doorsets.

Table 11 Fire resistance level of door closer and furniture installed on AS 1530.4:2005 and AS1530.4:2014 compliant Firecore doorsets

Item	Model	Description	Reference doorset as listed in Table 2	FRL
1.	CDC-CA2 + slide arm	Surface mounted door closer	A, B, C, D, E, F	-/120/30
2.	CDC-CA1 + slide arm	Surface mounted door closer	A, B, C, D, E, F	-/120/30
3.	CDC-1 + link arm	Surface mounted door closer	A, B, C, D, E, F	-/120/30
4.	CDC-5 + link arm	Surface mounted door closer	A, B, C, D, E, F	-/120/30
5.	CDC-3 + link arm	Surface mounted door closer	A, B, C, D, E, F	-/120/30
Notes –				
<p>+ The listed FRL is the maximum FRL assigned to the hardware. The system FRL needs to be determined in conjunction with the FRL of the referenced doorset. The lowest index between the FRL of the hardware and doorset will be the applicable FRL of any particular combination. Therefore, this report needs to be read in conjunction with the referenced reports listed in Table 2.</p>				
<p>+ The FRLs provided in this table are contingent upon the validity of the assessment report FCO 3428.</p>				

5.5 Electric strike

5.5.1 Assessment based on pilot scale test

Section 4.5 of AS 1905.1:2015 permits the assessment of electric strikes based on a pilot scale fire resistance test in accordance with Appendix B11 of AS 1530.4:2014. As such, in addition to the full-scale tests listed in Table 2, pilot scale tests listed in Table 5 form the basis of this assessment.

AS 1530.4:2014 states that either sustained flaming on the surface of the unexposed face for 10 seconds or longer, ignition of a cotton pad, gap gauge failure, or the latching mechanism being disengaged at the end of the test constitutes integrity failure. From the pilot scale tests, the attained duration of integrity performance of the electric strikes based on the above criteria is noted.

As the proposed electric strikes did not cause failure up to the noted timeframe in the pilot scale tests, adding the electric strikes as an additional item of hardware to the referenced doorsets listed in Table 2 is not expected to affect their performance. Based on the above, the electric strikes listed in Table 4 are positively assessed. Variations from the tested electric strikes are discussed under section 5.5.2.

5.5.2 Variation in non-monitored electric strikes

The manufacturer confirmed that the Davcor Carbine CES720S monitored electric strike and Davcor Carbine CES710S non-monitored electric strike differ only with the complexity of the construction of the electric strikes. The main notable difference between the strikes is the additional monitoring function that the Davcor Carbine CES720S monitored electric strike has. This includes a latch sensor and extra electronic components in the Davcor Carbine CES720S monitored electric strike – adding extra mass and plastic componentry. Otherwise, the electric strikes are of the same materials, similar build and same geometric size.

As the Davcor Carbine CES710S non-monitored electric strike has less combustible material (plastic) than the Davcor Carbine CES720S monitored electric strike and is of similar size, the Davcor Carbine CES710S non-monitored electric strike is believed to perform as well as the Davcor Carbine CES720S monitored electric strike. As Davcor Carbine CES720S monitored electric strike caused no detrimental effect on the fire resistance of the door throughout the period of the test, it is expected that Davcor Carbine CES710S non-monitored electric strike will behave similarly and will not cause integrity failure to the doorset if tested in accordance with AS1530.4:2014.

5.5.3 Conclusion

Based on the discussion above, it is the opinion of this laboratory that the proposed electric strike listed in Table 12 are capable of achieving the FRLs listed in Table 12– if they are fitted in the referenced Firecore doorsets.

Table 12 Fire resistance level of electric strikes installed on AS 1530.4:2005 and AS 1530.4:2014 compliant Firecore doorsets

Item	Model	Description	Reference doorset as listed in Table 2	FRL
1.	Davcor Carbine CES710S	Non-monitored electric strike	A, D	-/120/30
			B, C, E, F	-/240/30
2.	Davcor Carbine CES720S	Monitored electric strike	A, D	-/120/30
			B, C, E, F	-/240/30
3.	Davcor Carbine CES350-1224	Electric strike	A, D	-/120/30 ¹
			B, C, E, F	-/240/30 ¹
4.	Davcor Carbine CES300-ST-1224	Electric Strike	A, B, C, D, E, F	-/120/30

¹Assessed as secondary latch only

Notes –

+ The listed FRL is the maximum FRL assigned to the hardware. The system FRL needs to be determined in conjunction with the FRL of the referenced doorset. The lowest index between the FRL of the hardware and doorset will be the applicable FRL of any particular combination. Therefore, this report needs to be read in conjunction with the referenced reports listed in Table 2.

+ The FRLs provided in this table are contingent upon the validity of the assessment report FCO 3428.

5.6 Door savers and blocker plates

5.6.1 Assessment based on pilot scale test

Section 4.5 of AS 1905.1:2015 permits the assessment of door savers and blocker plates based on a pilot scale fire resistance test in accordance with Appendix B11 of AS 1530.4:2014. As such, in addition to the tests listed in Table 2, the pilot scale tests listed in Table 6 form the basis of this assessment.

AS 1530.4:2014 states that either sustained flaming on the surface of the unexposed face for 10 seconds or longer, ignition of a cotton pad, gap gauge failure, or the latching mechanism being disengaged at the end of the test, constitutes integrity failure. From the pilot scale tests, the attained duration of integrity performance of the door savers and block plates based on the above criteria is noted.

As the proposed door savers and blocker plates did not cause failure up to the noted timeframe in the pilot scale tests, adding the door savers and blocker plates as an additional item of hardware to the referenced doorsets listed in Table 2 is not expected to affect their performance. Based on the above, the proposed door savers and blocker plates listed in Table 6 are positively assessed.

5.6.2 Conclusion

Based on the discussion above, it is the opinion of this laboratory that the proposed door savers and blocker plates listed in Table 13 are capable of achieving the FRLs listed in Table 13 – if they are fitted in the referenced Firecore doorsets.

Table 13 Fire resistance level of door savers and blocker plates installed on AS 1530.4:2005 and AS 1530.4:2014 compliant Firecore doorset

Item	Model	Description	Reference doorset as listed in Table 2	FRL
1.	Carbine BP-LF1	Blocker plate	A, B, C, D, E, F	-/120/30
2.	Carbine DS6-7-40	Door saver	A, B, C, D, E, F	-/120/30
Notes –				
<p>+ The listed FRL is the maximum FRL assigned to the hardware. The system FRL needs to be determined in conjunction with the FRL of the referenced doorset. The lowest index between the FRL of the hardware and doorset will be the applicable FRL of any particular combination. Therefore, this report needs to be read in conjunction with the referenced reports listed in Table 2.</p>				
<p>+ The FRLs provided in this table are contingent upon the validity of the assessment report FCO 3428.</p>				

5.7 Door viewers

5.7.1 Assessment based on pilot scale test

Section 4.5 of AS 1905.1:2015 permits the assessment of door viewers based on a pilot scale fire resistance test in accordance with Appendix B11 of AS 1530.4:2014. As such, in addition to the tests listed in Table 2, the pilot scale tests listed in Table 7 form the basis of this assessment.

AS 1530.4:2014 states that either sustained flaming on the surface of the unexposed face for 10 seconds or longer, ignition of a cotton pad, gap gauge failure, or the latching mechanism being disengaged at the end of the test constitutes integrity failure. From the pilot scale tests, the attained duration of integrity performance of the door viewers based on the above criteria is noted.

As the proposed door viewers did not cause failure up to the noted timeframe in the pilot scale tests, adding the door viewers as an additional item of hardware to the referenced doorsets listed in Table 2 is not expected to affect their performance. Based on the above, the proposed door viewer listed in Table 7 is positively assessed.

5.7.2 Conclusion

Based on the discussion above, it is the opinion of this laboratory that the proposed door viewer listed in Table 14 are capable of achieving the FRLs listed in Table 14 – if they are fitted in the referenced Firecore doorsets.

Table 14 Fire resistance level of door viewers installed on AS 1530.4:2005 and AS 1530.4:2014 compliant Firecore doorset

Item	Model	Description	Reference doorset as listed in Table 2	FRL
1.	Lenlok 34043	Door viewer	A, B, C, D, E, F	-/120/30
<p>Notes –</p> <ul style="list-style-type: none"> + The listed FRL is the maximum FRL assigned to the hardware. The system FRL needs to be determined in conjunction with the FRL of the referenced doorset. The lowest index between the FRL of the hardware and doorset will be the applicable FRL of any particular combination. Therefore, this report needs to be read in conjunction with the referenced reports listed in Table 2. + The FRLs provided in this table are contingent upon the validity of the assessment report FCO 3428. 				

5.8 Hinges

5.8.1 Assessment based on pilot scale test

Section 4.5 of AS 1905.1:2015 permits the assessment of hinges based on a pilot scale or full-scale fire resistance test in accordance with AS 1530.4. As such, in addition to the full-scale tests listed in Table 2, the pilot scale or full-scale tests listed in Table 8 form the basis of this assessment.

AS 1530.4:2014 states that either sustained flaming on the surface of the unexposed face for 10 seconds or longer, ignition of a cotton pad, gap gauge failure, or the latching mechanism being disengaged at the end of the test constitutes integrity failure. From the pilot scale tests, the attained duration of integrity performance of the hinges based on the above criteria is noted.

As the proposed hinges did not cause failure up to the noted timeframes in the pilot scale or full scale tests, adding the hinges as an additional item of hardware in the referenced doorsets listed in Table 2 is not expected to affect their performance. Based on the above, the proposed hinges listed in Table 8 are positively assessed.

5.8.2 Variation in proposed fixed pin hinges

It is understood that the proposed fixed pin hinges including the pin are of the same stainless-steel material used for the tested hinge. Therefore, the proposed fix pin hinges are expected to have the same melting point temperature as the tested hinge.

Compared to the tested ball bearing hinge, a fixed pin hinge consists only of a single pin inserted through the length of the hinge barrel and does not contain ball bearings. The intent of the ball bearings is to relieve the stress on the hinge and reduce the friction so that the door may open and close smoother. It is to be

noted that the tested ball bearing hinge still contains a pin. It is not considered that the omission of the ball bearings in the proposed fixed pin hinges will impact on the insulation and integrity of the doorset.

Based on the above, the proposed fixed pin hinges listed in Table 8 are positively assessed.

5.8.3 Variation in proposed hinge width

It is proposed to assess hinges up to 75 mm width. The reduction in the width of the proposed hinges from 100 mm to 75 mm requires less of the fire door core to be removed for installation. It is considered then that the 75 mm wide hinges will not perform worse than the tested 100 mm wide hinge. On this basis, the hinges listed as items 2 and 4 of Table 8 are positively assessed.

5.8.4 Conclusion

Based on the discussion above, it is the opinion of this laboratory that the proposed hinges listed in Table 15 are capable of achieving the FRLs shown in Table 15 – if fitted in the referenced Firecore doorsets.

Table 15 Fire resistance level of hinges installed on AS 1530.4:2005 and AS 1530.4:2014 compliant Firecore doorset

Item	Model	Description	Reference doorset as listed in Table 2	FRL
1.	CHBB-100X100-SSS ball bearing hinge	Hinge – ball bearing	A, B, C, D, E, F	-/120/30
2.	CHBB-100X75-SSS ball bearing hinge	Hinge – ball bearing	A, B, C, D, E, F	-/120/30
3.	CHBB-100X100-SSS fixed pin hinge	Hinge – fixed pin	A, B, C, D, E, F	-/120/30
4.	CHBB-100X75-SSS fixed pin hinge	Hinge – fixed pin	A, B, C, D, E, F	-/120/30
<p>Notes –</p> <ul style="list-style-type: none"> + The listed FRL is the maximum FRL assigned to the hardware. The system FRL needs to be determined in conjunction with the FRL of the referenced doorset. The lowest index between the FRL of the hardware and doorset will be the applicable FRL of any particular combination. Therefore, this report needs to be read in conjunction with the referenced reports listed in Table 2. + The FRLs provided in this table are contingent upon the validity of the assessment report FCO 3428. + The load bearing capacity of the hinges in relation to the door leaf size are outside the scope of this report and needs to be considered separately. 				

6.0 Summary of assessment

The door hardware assessed in this report and their reference outcome tables are summarised in Table 16.

Table 16 Assessment summary

Hardware	Reference table
Locksets and furniture	Table 10
Door closers	Table 11
Electric strikes	Table 12
Door savers and blocker plates	Table 13
Door viewers	Table 14
Hinges	Table 15

7.0 *Conditions and validity*

- + The conclusions of this assessment may be used to directly assess the fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all conditions.
- + Because of the nature of fire resistance testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy of the result. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.
- + The assessment can therefore only relate to the actual prototype test specimens, testing conditions and methodology described in the supporting data, and does not imply any performance abilities of constructions of subsequent manufacture.
- + This assessment is based on information and experience available at the time of preparing this report. The published procedures for the conduct of tests and the assessment of the test results are the subject of constant review and improvement and it is recommended that this report be reviewed by Jensen Hughes before the end of the validity date.
- + The information in this report must not be used for the assessment of variations other than those stated in the conclusions above. The assessment is valid provided no modifications are made to the systems detailed in this report. All details of construction should be consistent with the requirements stated in the relevant test reports and all referenced documents.
- + The data, methodologies, calculations and results documented in this report specifically relate to the tested specimen/s and must not be used for any other purpose. This report may only be reproduced in full. Extracts or abridgements must not be published without permission from Jensen Hughes.