REGULATORY INFORMATION REPORT

The fire resistance performance of walls and floors penetrated by electrical cables and metal pipes protected by 3M CS195+ Composite Sheet, if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005.

Report No:

RIR 22695-01

Report Sponsor:

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Testing. Advising. Assuring.

DOCUMENT REVISION STATUS

Date Issued	Issue No	Description
29/03/09	RIR 22695-00	Initial Issue
25/06/13	RIR 22695-01	Revised to include additional wrapping options for service penetrations

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CONTENTS

1 INTRODUCTION

This report contains the minimum information sufficient for regulatory compliance and refers to the Assessment Report EWFA 22695-01.

The referenced report presents an assessment of the fire resistance performance of walls and floors penetrated by electrical cables and metal pipes protected by 3M CS195+ Composite Sheet if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005.

The tested prototypes described in Section 2 of this report, when subject to the proposed variations described in Section 3, are to perform satisfactorily if tested in accordance with the referenced test method described in Section 4. The conclusions of the report are summarised in Section 5.

The validity of this assessment is conditional on compliance with Sections 7, 8 and 9 of this report.

Summaries of the test data on which this assessment is based are provided in Appendix A.

A summary of the critical issues leading to the assessment conclusions including the main points of argument is given in Appendix B.

2 TESTED PROTOTYPES

The referenced assessment makes reference to test reports BWA 2243200, BWA 2243202 and BWA 2243203, which comprised drywall and concrete slab construction with apertures sealed with 3M Fire Barrier CS195+ Composite Sheet penetrated by cables. The specimens were tested in accordance with AS1530.4-2005 by Bodycote Warringtonfire Australia and sponsored by 3M Australia.
The assessment also makes reference to the test EWFA 2800000, which comprised two pipe penetrations and two cable penetrations in a wall and the penetrations were protected by 3M Interam E-5A-4 Endothermic Mat.
In addition, reference is made to WF155352 and WF155352, which comprised a drywall partition and an autoclaved aerated concrete (AAC) block wall, respectively, with apertures sealed with 3M Fire Barrier CS195+ Composite Sheet penetrated by cables and metal pipes. The specimens were tested in accordance with EN1363-1999 by Bodycote Warringtonfire UK and sponsored by 3M UK Plc.

Refer to Appendix A for full summaries of the prototype test data.

3 VARIATION TO TESTED PROTOTYPES

3.1 FLOORS

The proposed floor construction shall be as tested in BWA 2243202 subject to the following variations:

- Inclusion of copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4.
- Inclusion of copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 and with 19mm thick Armaflex insulation that penetrates the seal.
- Inclusion of steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7 and with 19mm thick Armaflex insulation that penetrates the seal
- Variation to floor thickness, 120mm or greater:
- Without services as a blank seal
- Penetrations shall be wrapped with 3M Interam E-5A-4 Endothermic Mat (Emat) wrapped with VentureTape® 1577CW and hold in place with 1.0mm Mild steel

modelling wire at 50mm from lagging ends and one at the centre as per tested in EWFA 2800000.

- The service penetrations shall be located a minimum of 40mm apart

3.2 WALLS

The proposed wall construction shall be as tested in BWA 2243200 subject to the following variations:

- Inclusion of copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4.
- Inclusion of copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 and with 19mm thick Armaflex insulation that penetrates the seal.
- Inclusion of steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7 and with 19mm thick Armaflex insulation that penetrates the seal
- Supporting drywall shall be nominally 116mm or thicker. Apertures in drywall shall be fully framed with stud or track sections
- Supporting walls of: clay brickwork, solid masonry blockwork of at least 600kg/m^3 (including AAC) walls, solid or hollow masonry blockwork of normal weight concrete or, reinforced concrete, shall be at least 116mm.
- Extension of aperture size to up to 800mm high x 600mm wide
- Without services as a blank seal
- Penetrations shall be wrapped with 3M Interam E-5A-4 Endothermic Mat (Emat) wrapped with VentureTape® 1577CW and hold in place with 1.0mm Mild steel modelling wire at 50mm from lagging ends and one at the centre as per tested in EWFA 2800000.
- The service penetrations shall be located a minimum of 40mm apart

4 REFERENCED TEST PROCEDURES

This report is prepared with reference to the requirements of AS1530.4-2005 and AS4072.1-2005 for the determination of a FRL.

5 FORMAL ASSESSMENT SUMMARY

5.1 GENERAL ASSESSMENT

On the basis of the discussion presented in the referenced report it is the opinion of this testing authority that if the tested prototypes described in Section 2 had been varied as described in Section 3, they would be likely to achieve the fire resistance as stated below if tested in accordance with the test method referenced in Section 4 and subject to the requirements of Section 7.

5.2 FLOOR PENETRATIONS

The performance of 3M CS195+ Composite Sheet protecting apertures in normal weight concrete floors is shown in Table 1 for layers of Composite Sheet on both faces of the floor, and in Table 2 for a single layer of Composite Sheet on the upper face only. The apertures may incorporate PVC insulated cables, metal pipes or, may be empty.

5.3 WALL PENETRATIONS

The performance of 3M CS195+ Composite Sheet protecting apertures in drywall construction is shown in Table 3, and in Table 4 for solid or hollow masonry walls, and normal weight concrete walls. The apertures may incorporate PVC insulated cables, metal pipes or, may be empty.

Table 1 – Performance of 2 layers of 3M CS195+ Composite Sheet for Floors

Penetration Seal	Minimum Slab Depth	Penetrating Service	FRL
Apertures sealed using a single thickness of 3M CS195+ Composite Sheet on each face of the floor, with the steel face outermost, cut 100mm oversize to overlap the floor by 50 mm on all sides and cut to closely follow the contour of the services. Edges fixed at 150mm centres with 50mm by 6.5mm anchor bolts. Edges of Sheet bedded on 3M CP25 WB+ sealant. All cables and pipes wrapped in a single layer of 3M MPP pad for full floor thickness, and wrapped in 3M FS195+ Wrap/Strip where they pass through the layer of CS195+ Composite Sheet. A single layer of 3M FS195+ wrap/strip to be laid in cable trays whether full or empty. A fillet of 3M CP25 WB+ sealant shall be applied around all services on both sides of the seal. Maximum aperture 425mm x 300mm and maximum area of 0.128m^2	At least 120mm thick normal weight concrete of known FRL See Section 7	PVC Insulated Cables as described in AS1530.4-2005 Appendix D, Type D1 cables only	**-/180/30**
		PVC Insulated Cables as described in AS1530.4-2005 Appendix D, Type D1 cables only wrapped with 500mm long Emat each side	**-/180/120**
		PVC Insulated cables, as described in AS1530.4-2005 Appendix D, Type D2 cables only	**-/180/90**
		PVC Insulated cables, as described in AS1530.4-2005 Appendix D, Type D2 cables only wrapped with 500mm long Emat each side	**-/180/120**
		Empty	**-/240/120**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4.	**-/240/-**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 wrapped with 600mm long Emat each side	**-/240/120**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 and with 19mm thick Armaflex insulation that penetrates the seal	**-/240/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7	**-/240/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7 wrapped with 600mm long Emat each side	**-/240/120**

Penetration Seal	Minimum Slab Depth	Penetrating Service	FRL
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9:7 and with 19mm thick Armaflex insulation that penetrates the seal	**-/240/-**
		Pipes referenced Penetrants E, B, C, G, see A.7.6.2 for descriptions	**-/120/-**
		Pipes referenced Penetrants A, D, F, J, K, L, and M, see B, C, G, see A.7.6.2 for descriptions	**-/240/-**
		Pipes referenced Penetrants A, D, F, J, K, L, and M, see B, C, G, see A.7.6.2 for descriptions wrapped with 600mm long Emat each side	**-/240/120**

Table 2 – Performance of 1 layer of 3M CS195+ Composite Sheet for floors

Penetration Seal	Minimum Slab Depth	Penetrating Service	FRL
Apertures sealed using a single thickness of 3M CS195+ Composite Sheet on the upper face of the floor, with the steel face outermost, cut 100mm oversize to overlap the floor by 50 mm on all sides and cut to closely follow the contour of the services. Edges fixed at 150mm centres with 50mm by 6.5mm anchor bolts. Edges of Sheet bedded on 3M CP25 WB+ sealant. All cables and pipes wrapped in a single layer of 3M MPP pad for full floor thickness, and wrapped in 3M FS195+ Wrap/Strip where they pass through the layer of CS195+ Composite Sheet. A single layer of 3M FS195+ wrap/strip	At least 120mm thick normal weight concrete of known FRL See Section 7	PVC Insulated Cables as described in AS1530.4-2005 Appendix, Type D1 PVC insulated power supply cables only	**-/60/30**
		PVC Insulated Cables as described in AS1530.4-2005 Appendix, Type D1 PVC insulated power supply cables only wrapped with 500mm long Emat each side	**-/60/60**
		PVC Insulated cables generally, as described in AS1530.4-2005 Appendix D, Type D1 and D2 cables.	**-/60/30**
		PVC Insulated cables generally, as described in AS1530.4-2005 Appendix D, Type D1 and D2 cables wrapped with 500mm long Emat each side	**-/60/60**

Penetration Seal	Minimum Slab Depth	Penetrating Service	FRL
to be laid in cable trays whether full or empty. A fillet of 3M CP25 WB+ sealant shall be applied around all services on both sides of the seal. Maximum aperture 425mm x 300mm and maximum area of 0.128m^2		Empty	**-/60/30**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4.	**-/60/-**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 wrapped with 600mm long Emat each side	**-/60/60**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 and with 19mm thick Armaflex insulation that penetrates the seal	**-/60/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7	**-/60/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7 wrapped with 600mm long Emat each side	**-/60/60**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9:7 and with 19mm thick Armaflex insulation that penetrates the seal	**-/60/-**

Table 3 – Performance of 2 layers of 3M CS195+ Composite Sheet for drywall

Penetration Seal	Drywall Details	Penetrating Service	FRL
Apertures sealed using two layers of 3M CS195+ Composite Sheet, one on each side of a wall aperture, with the steel face outermost, cut 100mm oversize to overlap the floor by 50 mm on all sides and cut to closely follow the contour of the services. Edges of Sheets bedded on 3M CP25 WB+ sealant and fixed at 150mm centres with 45mm long drywall screws and washers. All cables and pipes wrapped in a single layer of 3M MPP pad for full wall thickness, and wrapped in 3M FS195+ Wrap/Strip where they pass through the layer of CS195+ Composite Sheet. A single layer of 3M FS195+ wrap/strip to be laid in cable trays whether full or empty. A fillet of 3M CP25 WB+ sealant applied around all services on both sides of the seal. Maximum aperture up to 800mm high x 600mm wide.	116mm or thicker, and of known FRL See Section 7	PVC Insulated Cables as described in AS1530.4-2005 Appendix D, Type D1 PVC insulated power supply cables only	**-/120/30**
		PVC Insulated Cables as described in AS1530.4-2005 Appendix D, Type D1 PVC insulated power supply cables only wrapped with 500mm long Emat each side	**-/120/120**
		PVC Insulated cables generally, as described in AS1530.4-2005 Appendix D, Type D1 and D2 cables.	**-/120/30**
		PVC Insulated cables generally, as described in AS1530.4-2005 Appendix D, Type D1 and D2 cables wrapped with 500mm long Emat each side	**-/120/120**
		Empty	**-/120/30**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4.	**-/120/-**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 wrapped with 600mm long Emat each side	**-/120/120**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 and with 19mm thick Armaflex insulation that penetrates the seal	**-/120/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7	**-/120/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7 wrapped with 600mm long Emat each side	**-/120/120**

Penetration Seal	Drywall Details	Penetrating Service	FRL
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9:7 and with 19mm thick Armaflex insulation that penetrates the seal	**-/120/-**
		Pipes referenced Penetrants E, B, C, G, see A.7.6.2 for descriptions	**-/120/-**
		Pipes referenced Penetrants A, D, F, J, K, L, and M, see B, C, G, see A.7.6.2 for descriptions	**-/120/-**
		Pipes referenced Penetrants A, D, F, J, K, L, and M, see B, C, G, see A.7.6.2 for descriptions wrapped with 600mm long Emat each side	**-/120/120**

Table 4 – Performance of 2 layers of 3M CS195+ Composite Sheet for masonry walls

Penetration Seal	Drywall Details	Penetrating Service	FRL
Apertures sealed using two layers of 3M CS195+ Composite Sheet, one on each side of a wall aperture, with the steel face outermost, cut 100mm oversize to overlap the floor by 50 mm on all sides and cut to closely follow the contour of the services. Edges fixed at 150mm centres with 45mm long drywall screws and washers. Edges of Sheets bedded on 3M CP25 WB+ sealant. All cables and pipes wrapped in a single layer of 3M MPP pad for full wall thickness, and wrapped in 3M FS195+ Wrap/Strip where they pass	clay brickwork, solid masonry blockwork of at least 600kg/m^3 (including AAC), solid or hollow masonry blockwork of normal weight concrete or, reinforced concrete; all forms shall be at least 120mm thick and of known FRL See Section 7	PVC Insulated Cables as described in AS1530.4-2005 Appendix D, Type D1 cables only	**-/180/30**
		PVC Insulated Cables as described in AS1530.4-2005 Appendix D, Type D1 cables only wrapped with 500mm long Emat each side	**-/180/120**
		PVC Insulated cables generally, as described in AS1530.4-2005 Appendix D, Type D2 cables only	**-/180/90**
		PVC Insulated cables generally, as described in AS1530.4-2005 Appendix D, Type D2 cables only wrapped with 500mm long Emat each side	**-/180/120**
		Empty	**-/240/90**

Penetration Seal	Drywall Details	Penetrating Service	FRL
through the layer of CS195+ Composite Sheet. A single layer of 3M FS195+ wrap/strip to be laid in cable trays whether full or empty. A fillet of 3M CP25 WB+ sealant applied around all services on both sides of the seal. Maximum aperture up to 800mm high x 600mm wide.		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4.	**-/180/-**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 wrapped with 600mm long Emat each side	**-/180/120**
		Copper pipes up to 15mm diameter with diameter to wall thickness ratio less than 21.4 and with 19mm thick Armaflex insulation that penetrates the seal	**-/180/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7	**-/180/-**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9.7 wrapped with 600mm long Emat each side	**-/180/120**
		Steel pipes up to 34mm diameter with diameter to wall thickness ratio less than 9:7 and with 19mm thick Armaflex insulation that penetrates the seal	**-/180/-**
		Pipes referenced Penetrants E, B, C, G, see A.7.6.2 for descriptions	**-/120/-**
		Pipes referenced Penetrants A, D, F, J, K, L, and M, see A.7.6.2 for descriptions	**-/240/-**
		Pipes referenced Penetrants A, D, F, J, K, L, and M, see A.7.6.2 for descriptions wrapped with 600mm long Emat each side	**-/240/120**

6 DIRECT FIELD OF APPLICATION

The results of this assessment are applicable to cables and metal pipes penetrating walls and exposed to fire from either side or to cables and metal pipes penetrating floors exposed to fire from below.

The results of the assessment are based on actual test data and the scope is necessarily limited to the specifications indicated Section 3 and discussed in the Appendices of this report.

AS1530.4-2005, Clause 10.11.4

It can be confirmed that the tested cables described in BWA Report Nos. 2243200 and 2243202 are consistent with the informative specifications in AS1530.4-2005, Appendix D for Group A and B cable configurations.

AS1530.4-2005, Clause 10.11.4 extends the application of test data from Group A and B cable configurations directly to support all PVC-insulated and sheathed power and communications cables with copper conductors. Should the extended scope of application in Clause 10.11.4 be adopted, it is recommended that the seal dimensions and specifications of the supporting walls and floors shall be consistent with those described in this assessment.

7 REQUIREMENTS

This report details the methods of construction, test conditions and assessed results that would have been expected had the specific elements of construction described herein been tested in accordance with AS 1530.4-2005.

The supporting wall or floor construction shall be capable of providing effective support of the proposed construction for the required fire resistance period (FRL).

In addition, the wall or floor construction shall be capable of tolerating apertures at least as large as the proposed 3M Fire Barrier CS195+ Composite Sheet seals without detrimentally affecting the FRL of the support construction.

Any further variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the conclusions drawn in this report.

8 VALIDITY

The referenced assessment report does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products supplied.

The conclusions of the referenced assessment may be used to directly assess 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 testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. 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 referenced assessment can therefore only relate only 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.

The referenced assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test

results are the subject of constant review and improvement and it is recommended that this report be reviewed on or, before, the stated expiry date.

The information contained in this report shall 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.

9 AUTHORITY

9.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance the applicant(s) confirms that:

to their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the Standard against which this assessment is being made, and

they agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test by a test authority in accordance with the Standard against which this assessment is being made and the results are not in agreement with this assessment, and

they are not aware of any information that could adversely affect the conclusions of this assessment and if they subsequently become aware of any such information, agree to ask the assessing authority to withdraw the assessment.

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9.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTON FIRE AUS PTY LTD

Prepared by:	Reviewed by:
	
S. Hu	K Nicholls

9.4 DATE OF ISSUE

25th June 2013

9.5 EXPIRY DATE

31st March 2014

ASSESSMENT REVIEW

Review of assessment report EWFA 22695-01 and Regulatory Information Report RIR 22695-01

The fire resistance performance of walls and floors penetrated by electrical cables and metal pipes protected by 3M CS195+ Composite Sheet if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005

EWFA Report No:

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Report Sponsor:

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1 INTRODUCTION

The referenced assessment EWFA 22695-01 and Regulatory Information Report (RIR) RIR 22695-01, both dated 25th June 2013. They provide an assessment of the fire resistance performance of walls and floors penetrated by electrical cables and metal pipes protected by 3M CS195+ Composite Sheet if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005.

2 CONFIRMATION OF SPECIFICATION

The sponsor of referenced assessment EWFA 22695-01 and reflected regulatory information report RIR 22695-01 and the sponsor of referenced test reports BWA 2243200, BWA 2243202, BWA 2243203, WF167159, WF155352, WF155355, R9700/91NK10806 and EWFA 2800000.1 is 3M Australia Pty Ltd.

3M Australia Pty Ltd has stated in writing that there have been no changes to the design and material specifications of the protection systems or component since the issue of the original formal assessment EWFA 22695-01 and reflected regulatory information report RIR 22695-01 which reference the test reports BWA 2243200, BWA 2243202, BWA 2243203, WF167159, WF155352, WF155355, R9700/91NK10806 and EWFA 2800000.1.

3 FORMAL OPINION SUMMARY

Since the issue of assessment report EWFA 22695-01 and regulatory information report RIR 22695-01, there have been no changes to the testing experience that could affect the opinion expressed.

The procedures adopted for the original assessment have been re-examined and are similar to those currently in use.

The specification used for the original assessment has been re-examined and found to be satisfactory.

Therefore, with respect to the fire resistance performance of walls and floors penetrated by electrical cables and metal pipes protected by 3M CS195+ Composite Sheet if tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005, referenced in assessment report EWFA 22695-01 and reflected regulatory information report RIR 22695-01, it is confirmed that the assessed performance is considered valid subject to the requirements in Section 4.

4 VALIDITY

This assessment review does not provide an endorsement by Exova Warringtonfire Aus Pty Ltd of the actual products assessed.

This review is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review and improvement and it is recommended that this report be reviewed on or before the stated expiry date.

This review remains valid until the expiry date stated in Section 5.5 subject to compliance with the applicant undertakings and conditions in the original assessment and this review.

5 AUTHORITY

5.1 APPLICANT UNDERTAKINGS AND CONDITIONS OF USE

By using this report as evidence of compliance or performance the applicant(s) confirms that:

- to their knowledge the component or element of structure, which is the subject of this assessment, has not been subjected to a fire test to the Standard against which this assessment is being made, and
- they agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test by a test authority in accordance with the Standard against which this assessment is being made and the results are not in agreement with this assessment, and
- they are not aware of any information that could adversely affect the conclusions of this assessment and if they subsequently become aware of any such information, agree to ask the assessing authority to withdraw the assessment.

5.2 GENERAL CONDITIONS OF USE

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5.3 AUTHORISATION ON BEHALF OF EXOVA WARRINGTONFIRE AUS PTY LTD

Prepared by:

S. Hu

Reviewed by:

D. Nicholson

5.4 DATE OF ISSUE

15/08/2016

5.5 EXPIRY DATE

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