

BRE Global Assessment Report

An assessment of the fire performance of a Kingspan K15 insulated system with a ventilated ArGeTon terracotta tile rainscreen against the criteria of BR 135, Third Edition when evaluated in accordance with BS 9414:2019

Prepared for: Kingspan Insulation Limited

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1 Introduction

A fire test in accordance with 8414-2:2005 has been carried out on a Kingspan K15 insulated system with a ventilated ArGeTon terracotta tile rainscreen. This assessment report considers the fire performance of this system where the facings on the Kingspan Kooltherm K15 insulation incorporate an alternative scrim and adhesive.

2 Scope

This assessment report considers the fire performance of a Kingspan K15 insulated system with a ventilated ArGeTon terracotta tile rainscreen against the criteria of BR 135, Third Edition. The evaluation has been carried out in accordance with BS 9414:2019.

3 Supporting data

3.1 BRE Global test report no. P100184-1000 Issue 3

3.1.1 General

A fire test in accordance with BS 8414-2:2005 was carried out on an external wall system incorporating Kingspan Kooltherm K15 insulation with rainscreen cladding comprising 30mm-thick ArGeTon Tampa terracotta tiles. The test was carried out on 26 January 2016.

3.1.2 Description of substrate

The test specimen was installed onto face 1 of the BRE Global External Cladding Test Facility. This is a multi-faced test facility constructed from steel, the cladding system was affixed to the steel substructure.

3.1.3 Description of product

The system, as shown in figures 1 to 5, comprised of:

- Double layer of 12.5mm Gyproc Wallboard
- 150mm steel frame
- 12mm cement particle board (Versapanel Manufactured by Euroform)
- ArGeTon aluminium T rail section
- ArGeTon aluminium helping hand brackets
- ArGeTon Tampa clips
- AIM VRB Plus Firebreaks (2 x FF102 6.0 x 75 x 1000mm) horizontal intumescent expanding fire break fixed and mineral wool batts forming 150mm x 195mm firebreak
- 140mm Kingspan K15 Kooltherm insulation board
- 30mm ArGeTon Tampa terracotta tiles (Grey)



3.1.4 Installation of cladding system

3.1.4.1 Steel substructure and fixings

A sectional steel frame system (SFS) was installed between the floor slab hangers on the main cladding wall 1, with horizontal base and head tracks fixed to the steel substrate. Vertical rails were installed at nominal 300mm centres to form the steel frame. A double layer of 12.5mm Gyproc Wallboard was installed on the rear of the SFS and a single layer of cement particle sheathing board was fixed to the front of the SFS. The build-up of the cladding system is shown in figures 1 to 5.

3.1.4.2 Cladding system

An array of 200mm-deep ArGeTon helping hand brackets were attached to the steel frame using 3-SS-5.5 x 35 tec screws through the sheathing boards. A single layer of 140mm Kingspan K15 Kooltherm insulation board was pushed into position over the helping hand brackets and mechanically attached to the sheathing board with 160mm self-tapping screws and plastic washers. All the joints in on the K15 panels were taped with aluminium tape.

3.1.4.3 Fire breaks

Three horizontal ventilated fire breaks, formed from two mineral wool batts of 75mm x 195mm with two intumescent strips (AIM FF 102/ 50. FF102 x 6.0 x 75 x 1000mm), fixed to the face of the mineral wool batts. These were fixed in a continuous strip, were fixed back to the sheathing board with the AIM 25mm x 150mm fire break fixings at the manufactures recommended spacing of two clips per linear metre of barrier. The barrier was pushed onto the fixings.

3.1.4.4 Rain screen

ArGeTon Tampa 30mm x 250mm x 600mm tiles were held in place using ArGeTon Tampa tile clips and Fixfast R-AC 4.8 x 15mm rivets, which were fixed to the ArGeTon T rail sections .

3.2 BRE classification report no. P100184-1001 Issue 3

This report presents the classification of an external wall system incorporating Kingspan Kooltherm K15 insulation with rainscreen cladding comprising 30mm-thick ArGeTon Tampa terracotta tiles. The classification is carried out in accordance with the procedures given in BR 135 – ‘Fire performance of external thermal insulation for walls of multi-storey buildings’, Third edition, Annex B 2013.

The system, as tested, satisfied the criteria as follows:

Test method & test number	Parameter	No. of tests	Results	
			Fire spread test result time, t_s (min)	Compliance with parameters in Annex B BR135:2013
BS 8414-2:2005/ P100184-1000 Issue 3	External fire spread	1	>15 minutes	Compliant
	Internal fire spread cavity 1		>15 minutes	Compliant
	Internal fire spread Insulation layer		>15 minutes	Compliant



Test method & test number	Parameter	No. of tests	Results	
			Fire spread test result time, t_s (min)	Compliance with parameters in Annex B BR135:2013
BS 8414-2:2005/ P100184-1000 Issue 3	Internal fire spread cement particle board	1	>15 minutes	Compliant
	Internal fire spread cavity 2		>15 minutes	Compliant
	Internal fire spread plasterboard		>15 minutes	Compliant

The system described in this classification report was deemed to meet the performance criteria set in Annex B of BR 135:2013.

3.3 Warringtonfire test report no. 427069

A test in accordance with EN ISO 1716:2018 was carried out on a sample of “5x5 Scrim”, comprising fiberglass filaments, five yarns per inch in both directions, to determine its heat of combustion on 21 May 2019.

For the product tested, the following results relating to the gross calorific potential were obtained.

Gross calorific value per unit mass (MJ/kg)	Gross calorific value per unit area (MJ/m ²)
3.6167	0.1040

3.4 Warringtonfire test report no. 414282

A test in accordance with EN ISO 1716:2018 was carried out on a sample of “4x4 Scrim”, comprising fiberglass filaments, four yarns per inch in both directions, to determine its heat of combustion on 21 May 2019.

For the product tested, the following results relating to the gross calorific potential were obtained.

Gross calorific value per unit mass (MJ/kg)	Gross calorific value per unit area (MJ/m ²)
3.6167	0.0832

3.5 Warringtonfire test report no. 414280

A test in accordance with EN ISO 1716:2018 was carried out on a sample of “Low Smoke Adhesive”, comprising synthetic rubber, to determine its heat of combustion on 21 May 2019.

For the product tested, the following results relating to the gross calorific potential were obtained.



Gross calorific value per unit mass (MJ/kg)	Gross calorific value per unit area (MJ/m ²)
24.1034	0.6990

3.6 Warringtonfire test report no. 414281

A test in accordance with EN ISO 1716:2018 was carried out on a sample of “FR Adhesive”, comprising synthetic rubber, to determine its heat of combustion on 21 May 2019.

For the product tested, the following results relating to the gross calorific potential were obtained.

Gross calorific value per unit mass (MJ/kg)	Gross calorific value per unit area (MJ/m ²)
13.4048	0.3887

4 Description of the proposed systems

The proposed external wall system has the same construction as that tested. The only difference is that facings on the Kingspan Kooltherm K15 insulation incorporate an alternative scrim and adhesive.



5 Assessment

5.1 Applicable rule from BS 9414:2019

Parameter 1: INSULATION LAYER(S)

Tested component/product	Variation proposed	Sub-groups	Option for change	Additional evidence required (of tested and alternative/modified products)	For rule, see clause reference
Facing layer (if applicable), including any adhesive	Alternative facing layer and/or adhesive	All insulation products	Permissible – see note to rule	Reaction-to-fire test data	5.4.10



5.2 Applicable clause from BS 9414:2019 (Clause 5.4.10)

The test result shall be deemed to be valid if the tested facing is replaced with an alternative facing (including the adhesive) with a gross heat of combustion in MJ/m² equal to or less than the tested product.

NOTE If the membrane is used for the purpose of protecting the insulation from the effects of fire, either as a separate membrane or encapsulation of the insulation product, it is not permitted to remove it or replace it with an alternative product.

5.3 Evaluation

5.3.1 General

In this instance, the membrane is not considered to be for the purpose of protecting the insulation from the effects of the fire, so it is permitted to replace it with an alternative product.

5.3.2 Scrim

The gross heat of combustion for the “5x5 Scrim”, which was used in BRE Global report no. P100184-1000 Issue 3, was found to be 0.1040MJ/m² (see Warringtonfire report no. 427069) and that for the alternative “4x4 Scrim” was found to be 0.0832MJ/m² (see Warringtonfire report no. 414282). The latter is therefore considered a suitable alternative.

5.3.3 Adhesive

The gross heat of combustion for the “Low Smoke Adhesive”, which was used in BRE Global report no. P100184-1000 Issue 3, was found to be 0.6990MJ/m² (see Warringtonfire report no. 414280) and that for the alternative “FR Adhesive” was found to be 0.3887MJ/m² (see Warringtonfire report no. 414281). The latter is therefore considered a suitable alternative.

6 Conclusion

Therefore, it is our opinion that the Kingspan K15 insulated system with a ventilated ArGeTon terracotta tile rainscreen, where the facings on the Kingspan Kooltherm K15 insulation incorporate an alternative scrim and adhesive, as described in section 4, will satisfy the criteria of BR 135, Third Edition, if tested to BS 8414-2:2005.

This evaluation has been carried out in accordance with BS 9414:2019.



7 Figures

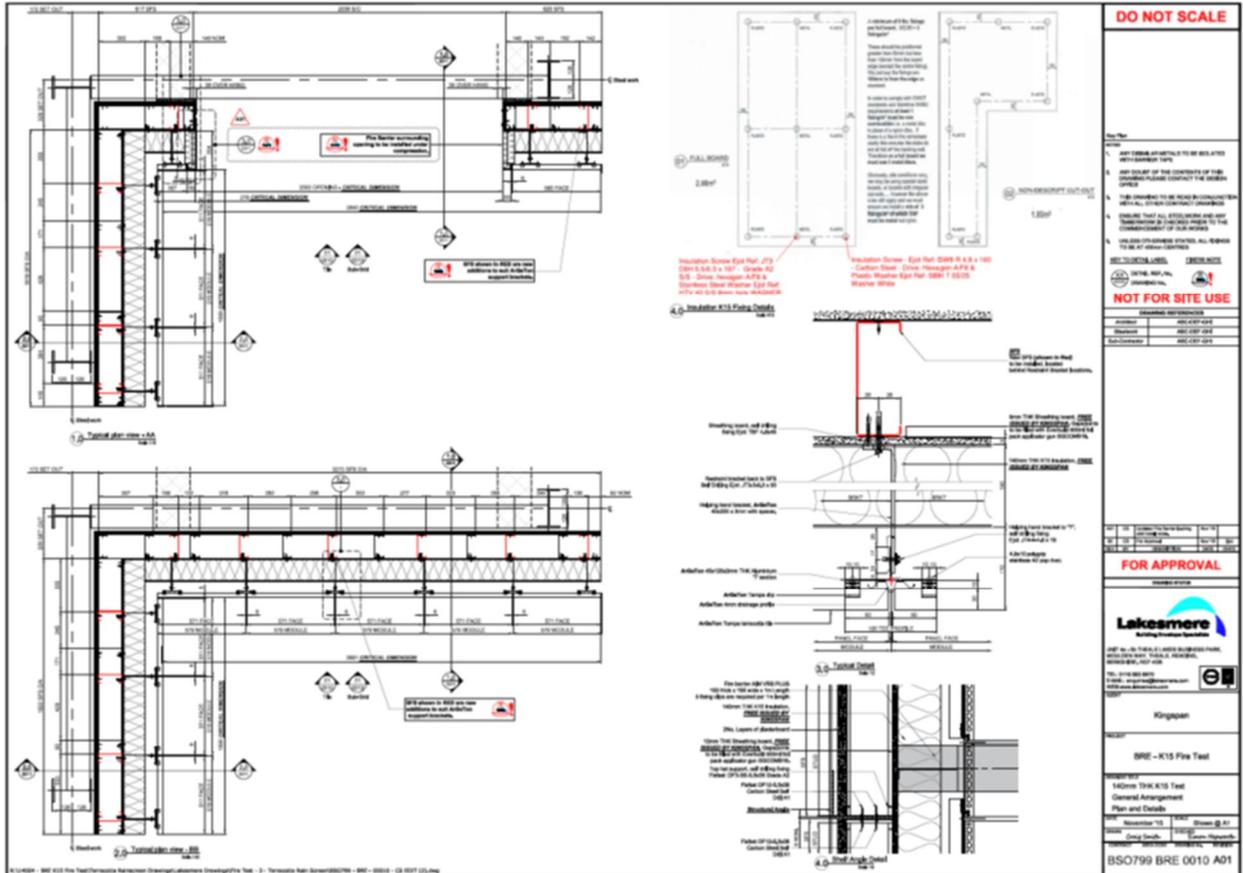


Figure 1 Construction details showing an overview of the system

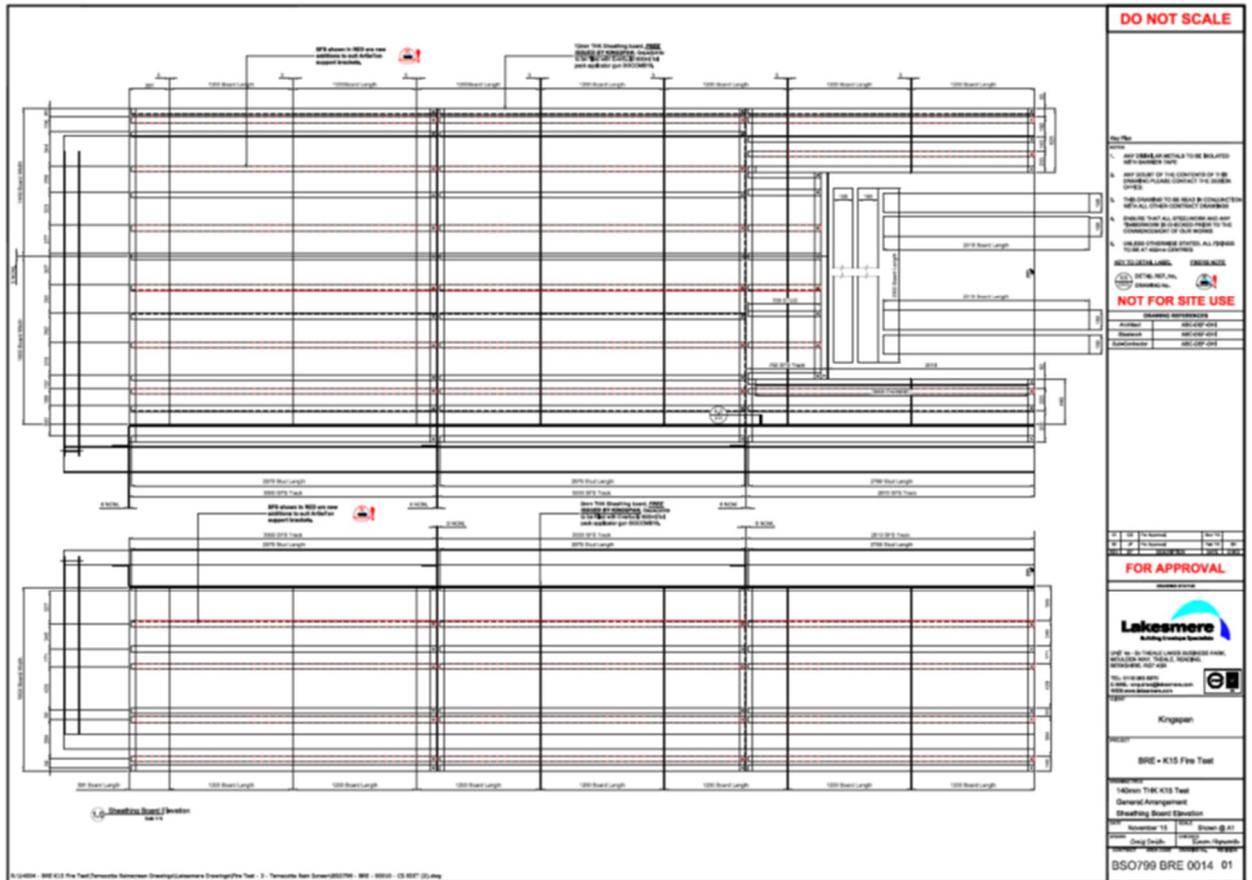


Figure 2 Construction of the System showing the SFS layout

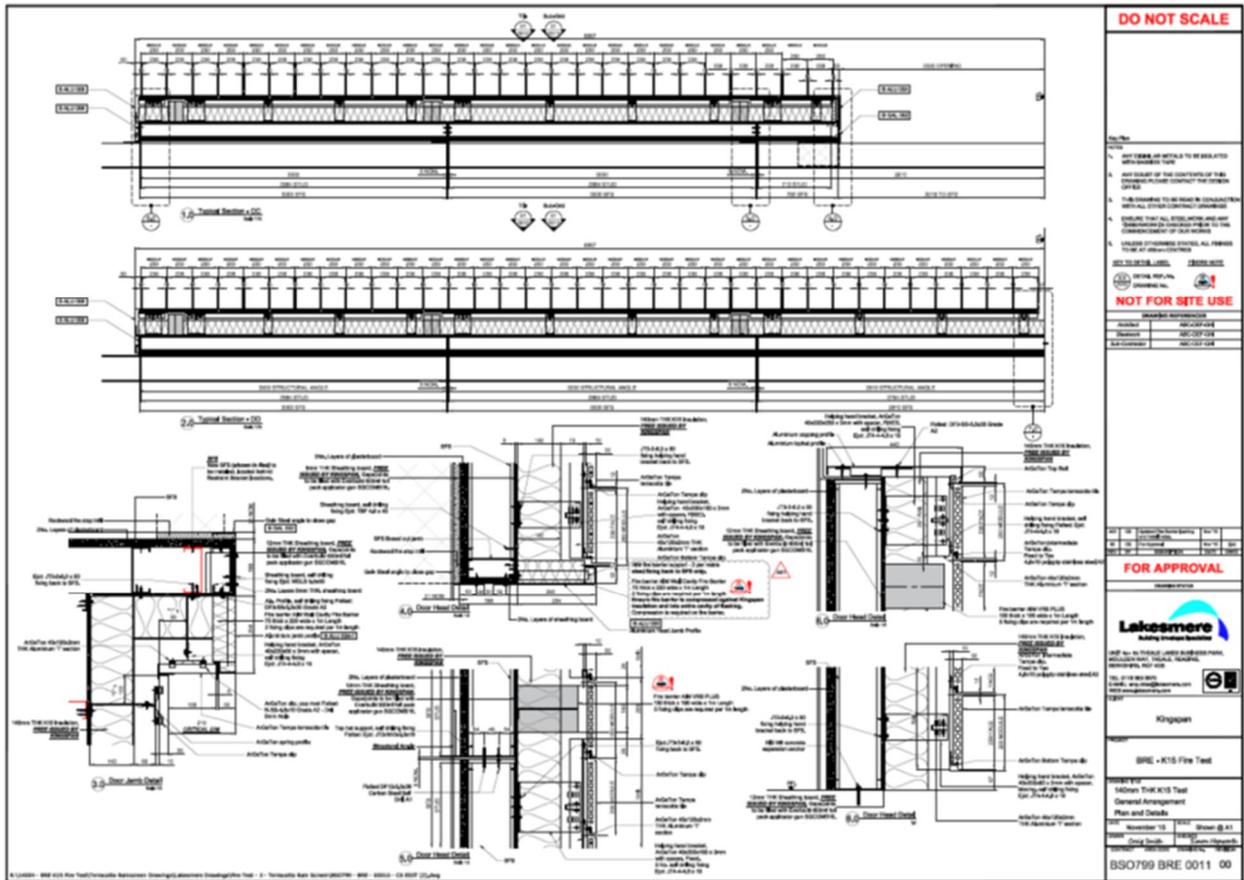


Figure 3 Construction of the System showing the rails and fire break details

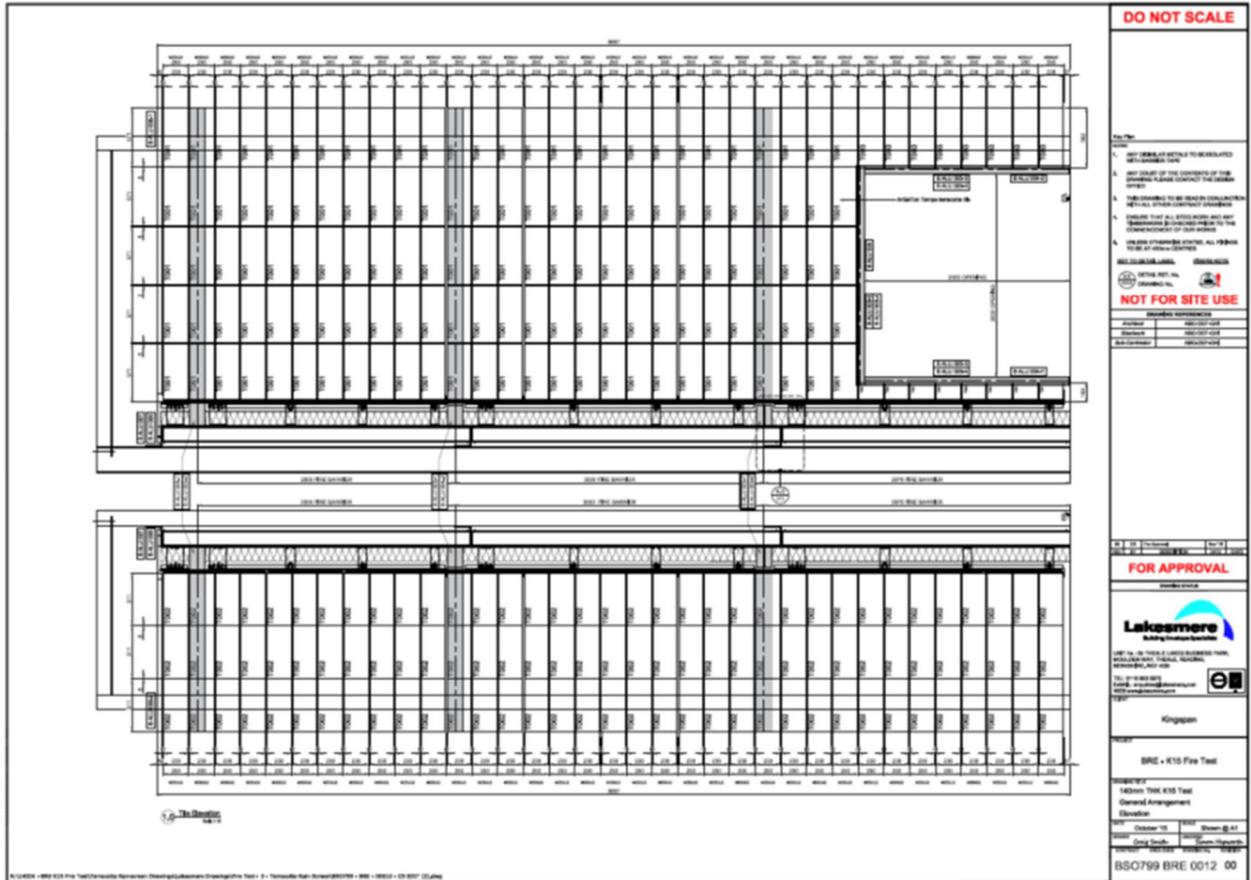


Figure 5 Construction of the System showing the terracotta tile layout



8 Validity of the assessment

8.1 Declaration by applicant

We the undersigned confirm that we have read and complied with the obligations placed on us by the PFPF Guide to Undertaking Assessments in Lieu of Fire Tests.

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 this 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 BRE Global to withdraw the assessment.

Signed:

For and on behalf of:

8.2 BRE Global declaration

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to BRE Global the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly, the assessment is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. The assessment is valid for a period of five years after which it should be returned for review to consider any additional data which has become available or any changes in the fire test procedures. Any changes in the specification of the product will invalidate this assessment.

This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82. It relates to the fire performance of the product and does not cover aspects of quality, durability, maintenance nor service requirements. This assessment relates only to the specimen(s) assessed and does not by itself imply that the product is approved under any Loss Prevention Certification Board approval or certification scheme or any other endorsements, approval or certification scheme.

Next review date: 30 September 2025