K15 BS 8414 Testing and Technical Support Advice Note

April 6th 2021

Introduction

This advice note is intended to support building owners and fire engineers in instances where K15 has been used as part of a cladding system in high-rise buildings.

It is issued in response to the MHCLG letter of 9 March 2021 entitled "*Retraction of three tests carried out on Kingspan K15 insulation*"[1] which advises that:

> "Fire safety professionals and buildings control bodies should review their records to check that any assessments (direct, extended application or fire engineering assessment) they have carried out using these tests are identified and revisited in light of Kingspan's announcement [of the withdrawal of three tests referred to below]."

It also addresses the MHCLG guidance note of 20 January 2020 entitled "*Advice for Building Owners of Multi-storey, Multi-occupied Residential Buildings*", which outlines the steps that owners of multi-storey, multi-occupied buildings are now recommended to take, which includes the following[2]:

> "Building owners should seek the advice of a Chartered Engineer registered with the UK Engineering Council with suitable experience in the fire safety of high-rise residential buildings where a system that should have had a BR135 certificate prior to installation does not have one. They can advise on next steps; this may include carrying out further large-scale tests or forming an opinion on the risk posed to occupants based on available evidence."

In accordance with that guidance, this note aims to assist with the revalidation of any assessments made on the basis of the three BS 8414 system tests which were withdrawn in October 2020 (referred to below), and to provide technical support for any other assessments or independent system tests that were undertaken.

Kingspan Insulation wishes to provide reassurance regarding its full confidence in the safety of current K15 when used in compliant systems that are correctly installed in the manner in which they were tested.

Kingspan Insulation has published all available successful BS 8414 tests of cladding systems incorporating current K15. Details of these system tests, along with those of other failed system tests, can be found on our website[3].

In October 2020 Kingspan Insulation withdrew the following three BS 8414 cladding system tests as the K15 that they incorporated did not sufficiently represent the product currently on sale. These reports were removed for download from the Kingspan Insulation website, and have also been removed from product literature:

- Test Report No 220876 carried out in 2005 to BS 8414-1 with Classification Report No P10181 2-1000, (6mm UAC cement particle boards - BR 135 Compliant);
- Test Report No 297099 carried out in 2014 to BS 8414-2 with Classification Report No 291642, (30mm Terracotta Tiles - BR 135 Compliant);
- Test Report No 293940 carried out in 2014 to BS 8414-2, (15mm Trespa FR - early termination).

[1] https://www.gov.uk/government/publications/letter-to-building-control-bodies-on-the-retraction-of-three-tests-carried-out-on-kingspan-k15-insulation

[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/869532/Building_safety_advice_for_building_owners_including_fire_doors_January_2020.pdf

[3] https://www.kingspan.com/gb/en-gb/fire-safety/kingspan-bs-8414-tested-systems

However, Kingspan Insulation has either undertaken further testing designed to replicate each system test using current K15, or it already had additional test evidence of similar systems using current K15. These further tests can be used in support of reviews of historical specifications, Fire Engineering Assessments and Desk Top Studies (DTS) undertaken by Fire Engineers on their respective projects. Please see further information in Section 1.1 below.

In addition, K15 holds a valid BBA certificate (Ref. 14/5134 Product Sheet 9) dated 24 November 2020, details of which can be found on our website.

We are engaged in a review, using independent testing, of all changes to K15 that occurred between 2006 and the present day to understand if they had any impact on fire performance. It is intended that this will be the subject of a further external independent review. It is important to note that our review gives us confidence that all K15 made in the UK from June 2010 onwards displays the same fire performance as current K15[4]. This accounts for approximately 85% of all K15 sales between 2006 and 2018[5] (when the ban on the use of combustible materials on the external walls of new high-rise buildings above 18 metres came into effect), and covers the entire period where desktop studies for such buildings were a route to compliance.

This is important because we wish to provide absolute confidence that decisions made by fire engineers with respect to the historic use of K15 can be supported either by the current suite of BS 8414 system tests published on our website[3] or by alternative system tests that have been undertaken independently using current K15 (with the permission of the owner of any of the tests, as appropriate, where those tests were not commissioned by Kingspan).Kingspan Insulation is committed to responding to any queries with respect to the use of K15 on high-rise buildings between 2006 and November 2018, and we have established a dedicated support team for this purpose.

Where K15 was recommended in a system by Kingspan Insulation for use in a particular building, and the existing suite of BS 8414 tests does not support that use, then we are committed to evaluating what action is required, and to providing remediation as appropriate. This process is outlined in more detail in Section 3 below, together with key points of contact.

1. Overview of BS 8414 Tests which have replaced the 3 Withdrawn Tests

Kingspan Insulation has conducted a thorough review of its historical testing, accreditation and marketing processes relating to K15. This work has involved a detailed review of the composition, manufacturing methodology and testing carried out on K15 since 2005. Regrettably, this has uncovered that there were three BS 8414 tests of systems containing K15 insulation where the products placed on the market differed from the products tested. Kingspan Insulation acknowledges that this should not have happened, and apologises unreservedly for these process shortcomings.

The 2005 test: This test was carried out on a system incorporating the K15 product before certain changes were made to our phenolic insulation manufacturing technology in 2006 (ie a change from "old technology" to "new technology"). Kingspan Insulation acknowledges that the 2005 BS 8414 test should have been either validated appropriately at the time, or retested using K15 made with the "new technology" manufacturing process.

After the issue came to light, a system was tested using an updated, but similar, assembly more in line with our current testing procedure and using current K15. The test was carried out in June 2019 at BRE and met the BR 135 performance criteria (i.e. it passed). Test Report No P 114679-1000 and its corresponding Classification Report P 114679-1001 are available from the Kingspan Insulation website[3].

The 2014 tests: In 2014, two tests were carried out using a research & development variation of K15, where the product utilised the hydrofluoroolefin (HFO) blowing agent now used in our K100 range, with the intention of improving the thermal efficiency of the product.

[4] Note that a small amount of product was made in an Irish plant (Castleblayney) for sale in the UK. Our review gives us confidence that all K15 made in Castleblayney from January 2013 onwards displays the same fire performance as current K15. It is intended that this will also be the subject of a further external independent review.

[5] This covers all sales of K15 during that period (high-rise and low-rise)

The first system tested in 2014 was an HPL system which failed to meet the BR 135 performance criteria. Kingspan Insulation retested the system in July 2019 using a build up as close as possible to the construction tested in 2014, but using current K15, and once again the HPL system failed and the test was terminated early. A test was conducted in November 2019 which was constructed to closely resemble the MHCLG HPL test, except using current K15, and this system also failed to meet the BR 135 performance criteria.

The second of these tests from 2014 involved a Terracotta rainscreen system which met the BR135 performance criteria, but that report has now been withdrawn. Two other Terracotta BS 8414-2 tests using current K15 were subsequently carried out in 2015 and 2016 respectively and these tests met the BR 135 performance criteria. Both test reports are available on our website (Test Reports 303930 & P100184-1000).

A detailed letter outlining the test data for the three original and replacement tests was issued by Kingspan Insulation in October 2020 and can be found in the Advice & Support section of our dedicated microsite: https://inquiry.kingspan.com

In total, Kingspan Insulation has conducted, or participated in, an extensive suite of successful BS 8414 tests incorporating current K15 and details of all of the tests, for which we have reports, (both passes and fails) can be found on the Kingspan Insulation website.[3]

2. Review of Historical Manufacturing and Formulation Changes of K15

2.1 Review of independent testing

We are engaged in a review, using independent testing, of all changes to K15 that occurred between 2006 and the present day to understand if they had any impact on its fire performance. It is intended that this will be the subject of a further external independent review.

2.2 K15 during the period between June 2010 and November 2018 (when the ban on the use of combustible materials on the external walls of new high-rise buildings above 18 metres came into effect)

There have been no significant (in terms of fire performance) changes to the manufacturing processes or chemistry of K15 since 2010. As outlined previously, our historical records of independent testing support the view that all K15 made in the UK from June 2010 onwards displays the same fire performance as the K15 currently on sale. As mentioned above, it is intended that this will be the subject of a further independent review. We expect this process to be concluded in approximately four months and will update if this changes. Please see previous note regarding the small amount of K15 made in Ireland for sale in the UK.[4]

This means that the three successful tests that replaced the two withdrawn tests as described in Section 1 above (i.e. the 2005 test and the 2014 Terracotta tiles test), plus the additional aforementioned successful BS 8414 system tests, can (with the permission of the owners where not commissioned by Kingspan) be used to support technical assessments for the safe retention of K15 made in the UK in high-rise buildings constructed since June 2010, and for K15 made in Ireland from January 2013.

This period accounts for approximately 85% of all K15 sales[4], and covers the entire period where desktop studies for such buildings were a route to compliance.

2.2 K15 during the period from 2006 – May 2010

In 2006, Kingspan Insulation made certain changes to the technology used in the manufacture of K15 in the UK (as outlined above in Section 1). Questions have arisen about whether this transfer from "old technology" to "new technology" might have resulted in a change in K15's fire performance.

In addition, the review process has highlighted one unsuccessful BS8414 system test carried out in December 2007, soon after this change in technology. This test has raised queries about a possible difference in fire performance of K15 after the transfer to "new technology". However, it is important to note that the system tested at that time differed significantly from the system tested 2005, that featured "old technology" K15, as the two tests also featured completely different cladding products (fibre cement board in 2005 vs aluminium cassettes in 2007). No definitive conclusion therefore can be drawn from a comparison of the different systems' test results. A large-scale fire test such as BS 8414 is a test of the entire cladding system, and not K15 in isolation. Thus a failed BS 8414 test means that the cladding system as a whole has failed, and does not necessarily mean that there is a problem with the insulation.

Between 2006 and May 2010 there were a number of changes in the formulation and manufacturing processes used to make K15.

The aforementioned review will include independent testing from throughout this time period, and it is intended that this will also be the subject of a further independent review. We expect this process to be concluded in approximately eight months and will update if this changes.

This 2006 – May 2010 period accounts for approximately 15% of all K15 sales[4].

3. Process in place to support technical assessments by fire engineers

Kingspan Insulation is committed to providing proactive support with respect to any queries regarding the use of K15 in high-rise buildings.

Kingspan Insulation firmly believes that compliant systems incorporating K15, that are correctly installed in the manner in which they were designed, are safe.

The MHCLG has provided guidance which supports the retention of K15 in existing cladding systems on high rise buildings where:

- the system is correctly installed and has passed a full-scale BS 8414 fire test; or
- there is a technically robust desktop study in place based on accurate test data; or
- a fire engineering assessment was completed on the building on which the system was installed.

It is important to note that as a manufacturer and supplier of insulation, Kingspan Insulation does not design or install cladding systems, and does not give engineering judgements on system compliance. However, where Kingspan Insulation recommended K15 in a system for use in a particular building, and the existing suite of BS 8414 tests does not support that use, then Kingspan Insulation is fully committed to evaluating what action is required, and to providing remediation where appropriate.

We are already actively engaged with fire engineers and have provided them with technical support as outlined above. In certain cases this has enabled them to revalidate Desktop Assessments based on the extensive BS 8414 fire testing referred to in Section 2. However, these are complex projects involving multi-disciplinary project teams, and each has to be assessed on a case-by-case basis.

Kingspan Insulation has established a dedicated team and process to respond to queries, and to provide support to fire engineers in making engineering judgements regarding the use of K15 in high-rise buildings. They can contact our team, and submit queries in one of the following ways:

Initial queries – please complete the contact form on our microsite:

https://inquiry.kingspan.com/en-gb/advice-support

Email :

info@kingspaninsulation.co.uk

Building occupants or leaseholders who have a query or concern should contact their building owner / freeholder and we will respond through the process outlined above.

4. Actions taken to provide further assurance

In addition to the very extensive testing review and action on legacy projects outlined above Kingspan Insulation is taking several other actions to underpin its clear commitment to proper professional conduct and safety. A full statement can be found on our dedicated microsite: inquiry.kingspan.com

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