

Technical Note

tenos

Project: University Square, Southend
Client: Essex University
Ref: TS18823-TN02-Issue03
Re: External cladding, Student Note

Date: 17 June 2019
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Checked by:

This note has been produced to provide information regarding the cladding that has been applied to the external walls of the residential buildings in University Square, Southend.

A brief summary of my qualifications and experience has been included at the end of this note.

The external cladding used on these buildings is referred to as High Pressure Laminate (HPL) panels and these panels are made from cellulose fibres contained in a resin matrix and, as such, will burn when exposed to a heat source. Behind these panels, there are rigid thermal insulation boards, and these are required to reduce heat loss from the building. The insulation used is a rigid foamed phenolic polymer board which, when exposed to a heat source, will burn and form a thick black surface char, which may act to slow down the combustion process.

Both of these materials, the HPL panels and the phenolic insulation, are combustible and will burn when exposed to a sufficiently large source of heat.

England & Wales Building Regulations have been developed to ensure that buildings provide a safe environment for the people that may be in and around them, and these Regulations apply to all buildings, with very few exceptions.

At the time the residential buildings in University Square were being built, there was a requirement for the materials used in the external walls to be of *limited combustibility*. Limited combustibility materials are those that have achieved a European classification of A2, or better, when tested in accordance with BS EN 13501. These materials, whilst they may burn, will not “significantly contribute to the fire load and fire growth” so, will not significantly increase the size or the severity of the fire.

The HPL cladding panels and the phenolic thermal insulation are not materials of limited combustibility and, therefore, should not have been used in these buildings.

Following the tragic fire at Grenfell Tower, the University reviewed the external wall construction and sought expert advice from Tenos, a Fire Engineering consultancy; advice which confirmed that the materials used are not appropriate for use on these buildings. The University is now taking legal advice to determine how best to rectify this issue and is liaising with other interested parties as appropriate.

Further details of the Tenos advice are attached as APPENDIX 1.

It is important to recognise that the materials used on the buildings in University Square are not the same as those used on Grenfell Tower.

Whilst the removal and replacement strategy is being progressed, the University has implemented or improved a number of temporary measures including;

- 24-hour staff patrols. This has been increased to three security guards patrolling University Square 24/7.

- Building evacuation strategies have been reviewed and the University does not operate a “stay put” policy.
- Increased frequency of fire evacuation drills.
- Additional testing of portable electrical appliances.
- Implementation of works and improvement programmes relating to fire doors and fire compartmentation.

These measures, as well as the overall fire safety arrangements, have been reviewed by Essex County Fire & Rescue Service, which has confirmed that these arrangements are adequate and that the buildings are safe to occupy as normal.

In summary then, the external walls of the student accommodation buildings contain materials that did not, and do not, meet the rigorous requirements of the Building Regulations. These materials, however, are not the same as those used on Grenfell Tower.

The University are working towards agreeing a strategy for the replacement of these materials, but, until that work has been completed, the temporary fire safety measures listed above will remain in place. In the meantime, Essex County Fire & Rescue Service has confirmed that the buildings are safe to occupy.

If you have any queries or concerns arising from this note, or any other related matter, please address them to directorofestates@essex.ac.uk.

If you see anything that causes you concern regarding fire safety in or around the buildings, please report them immediately to askthehub-sc@essex.ac.uk.

This note has been produced by Steven Cooper B.Eng. (Hons) CEng CMIFireE.

I am a Director of Tenos, a fire engineering company and I have more than 30 years' experience in firefighting, fire research and fire engineering, and for 10 years I was an officer in Essex County Fire & Rescue Service

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Appendix 1

Tenos has previously provided a detailed report on this matter to the University, and in that report, Tenos included the following information;

“.....the external cladding system consists of Trespa Meteon high pressure laminate panels supported on an alloy sub-frame, which is then supported by a lightweight steel framing system. The thermal insulation behind the Trespa rainscreen is Kingspan Kooltherm K15 foamed phenolic rigid board insulation. The system also contains Nilvent breather membrane, cavity barriers and Tyvek waterproof tape.

***Trespa Meteon** hpl panels are available in two versions; Standard and FR. Both versions have a Class 0 surface-spread-of-flame classification. The Standard Meteon panel achieves a Euroclass D-s2. d0, when tested to BS EN 13501 and the Meteon FR panel achieves a Euroclass B-s1. 0 when tested to the same standard fire test.*

Neither version of the Trespa panels are therefore considered to be materials of limited combustibility.

***Kingspan Kooltherm K15** is a foamed phenolic material and can achieve a Class 0 surface-spread-of-flame rating due to the aluminium foil facing that is applied to the faces of the boards. Kingspan Kooltherm K15 is combustible material and the Kingspan website contains no information relating to Euroclass classification. The Kingspan Declaration of Performance (ref 1000.CPR.2013.K15.001) confirms that K15 has a Euroclass C, s1-d0 when tested to BS EN 13501, confirming that it is a combustible material. The relevant BBA certificate 08/4582 is, in my opinion, misleading as it refers to successful large-scale fire tests that have been carried out but fails to state that K15 is only acceptable for use when installed in exactly the same configuration as the tests. The two tests referred to do not include use with a Trespa system.*

Kingspan's K15 data sheet is equally misleading, as it states, under Fire Performance, that K15 meets the criteria within BR 135 and is therefore acceptable for use above 18 metres in accordance with Building Regulations. This is only true when K15 is used as part of a system that has successfully passed a large-scale test. A system comprising of Trespa cladding and K15 has not been tested successfully to BR135. Kingspan K15 is a foamed phenolic polymer that, when exposed to a heat source, will develop a surface char layer of predominantly carbon. This char layer partially insulates the unburned material from the heat source and the combustion process may be retarded as a result. When involved in a large scale fire, phenolic foam will emit smoke but does not melt and produce burning droplets.

***Nilvent** is a thin breather membrane that is used to reduce transport of moisture through the external wall make-up. It is a three-layer olefin membrane, i.e. largely constructed from polypropylene polymer and, as such, is combustible.*

***Tyvek** is a thin polymer-based waterproof material and is combustible.*

The Building Regulations 2000, in force at the time the buildings were designed and constructed, required, inter alia, that the external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building (Building Regulation B4(1)).

Building Regulation 4(1) *The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building.*

In order to comply with this, and other, requirements, technical guidance is provided in the form of a number of Approved Documents, with Approved Document B Fire (ADB), being the main guidance document that provides detailed advice on how the fire-related requirements of the Building Regulations can be met. There is, however, no obligation to adopt any of the design solutions detailed within an Approved Document, if the designer wishes to use an alternative method. This being the case, however, the onus is on the designer to demonstrate to the building control body that the alternative solution complies with the relevant requirements. In the absence of any information to the contrary, I have assumed that an alternative solution regarding the external cladding was not proposed and that the external cladding system was intended to comply with the recommendations made in ADB.

At the time the development was being constructed, Approved Document B Fire 2006 edition would have been the relevant version.

The relevant recommendations in ADB are as follows;

External wall construction

12.5 The external envelope of a building should not provide a medium for fire spread if it is likely to be a risk to health and safety. The use of combustible materials in the cladding system and extensive cavities may present such a risk in tall buildings.

External walls should either meet the guidance given in paragraphsor meet the performance criteria given in BRE Report Fire performance of external wall insulation for walls of multi storey buildings (BR135).

External surfaces

12.6 The external surfaces of walls should meet the provisions of Diagram 40. Where a mixed use building includes Assembly and Recreation Purpose Groups accommodation, the external surfaces of walls should meet the provisions in Diagram 40c. (Diagram 40 from ADB has been reproduced below).

Insulation materials/products

12.7 In a building with a storey 18m or more above ground level any insulation product, filler material (not including gaskets, sealants and similar) etc. used in the external wall construction should be of limited combustibility.