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How they built Grenfell

Away from the media spotlight, the Grenfell Tower inquiry is quietly disentangling a web of corporate spin and scandal.



BY ANOOSH CHAKELIAN

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In December 2007, an Irish building materials company called Kingspan tested the fire safety of one of its insulation materials, Kooltherm K15. It was tested on a rig mocked up like a building, to mimic how the product might be used in real life, with aluminium cladding panels on a steel frame six metres tall.

It created a “raging inferno”, according to one of the test’s observers from Kingspan. The Building Research Establishment (BRE), the certification body that carried out the test, had to stop it early because it risked setting fire to the laboratory. Even after the heat source was extinguished, the product continued to burn on its own.

Nevertheless, the company went on selling the product as safe to use on high-rise buildings following a successful test in 2005 on a previous, different formulation of the product.

Yet even the 2005 test was declared “wholly invalid” at the Grenfell Tower Inquiry in November. Its rig used products that were not freely commercially available or widely used, such as non-combustible cement fibre cladding, and steel and graphite cavity barriers. This meant the test was unrepresentative.

The timings recorded did not reveal that the flames “had reached four metres up the six-metre rig after only five minutes of a 60-minute test, thereby demonstrating that the test would have failed but for the cavity barriers”.

K15 was one of the materials used in the refurbishment of Grenfell Tower, the west-London high-rise block where a fire broke out on 14 June 2017, killing 58 people.

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The Grenfell Tower inquiry is a rare exposé of the UK construction industry, scrutiny of which is usually confined to private arbitrations. During its first phase, the inquiry exhaustively combed through the events of the night of the fire, producing recommendations for the government, the London Fire Brigade, emergency services, and landlords and owners of high rises last October.

The inquiry has now entered module two of its second phase, looking into how the materials used on Grenfell Tower were tested, approved, advertised and sold. Stephanie Barwise QC, who is representing some of the victims, has argued there were no valid fire tests carried out on any of the materials used on Grenfell Tower.

It has long been clear that the exterior cladding of the tower was a key factor in the devastating spread of the fire. **In his report in October 2019**, the inquiry's chair Martin Moore-Bick wrote that the use of aluminium composite material (ACM) rainscreen cladding and combustible insulation on the exterior of Grenfell Tower were central to the fire's broad and rapid spread.

Now, we are discovering how it got there in the first place.

In 2009, K15 was certified by the Local Authority Building Control (LABC) accreditation body as being "of limited combustibility". This was wrong – even Kingspan's technical adviser Ivor Meredith "couldn't believe" what had been written in the certificate.

"We can be very convincing when we need to be," remarked a jubilant email from Kingspan's technical manager Philip Heath at the time. "In the end I think the LABC convinced themselves Kooltherm is the best thing since sliced bread. We didn't even have to get any real ale down him!"

"They're on to us"

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When the independent construction approval body, the British Board of Agrément (BBA), drafted its own, less forgiving certificate, an internal Kingspan email in 2013 observed: “The phrase used more than once yesterday was ‘they’re on to us’.”

A **text message exchange revealed recently to the inquiry** showed jokes between colleagues about K15 being marketed as “Class 0” – a rating that many in the construction industry interpret as meaning safe for use on above-18 metre buildings. The messages include “doesnt [sic] actually get class 0 when we test the whole product tho LOL!”; “WHAT we lied?”; “yeahhhh tested K15 as a whole – got class 1 wheyy lol”; “alls [sic] we do is lie in here”.

Although K15 was never specified or sold by Kingspan for use on Grenfell Tower, contractors responsible for the building’s refurbishment in 2015 used it for about 5 per cent of the outside of the building.

After a building company complained about K15’s fire risk in 2008, Heath commented to others that the firm could “go fuck themselves” and threatened to “sue the arse of [sic] them”. He described another contractor, who was raising questions, of “getting me confused with someone who gives a dam [sic]. I’m trying to think of a way out of this one, imagine a fire running up this tower! [...] Any ideas...?”

When he was asked about K15’s fire performance by Kingspan’s sister company, he told a colleague: “I’m spinning so much I’m dizzy.”

Kingspan denies responsibility and wrongdoing, saying it did not know its materials were being used on Grenfell and did not pursue the job. As late as October this year, it withdrew three test certificates relating to K15 on the grounds that they were not reflective of the version of the product that had been marketed since 2006. It says K15 **has now passed numerous tests** that back up its marketing claims.

The company says in a statement:

“The inquiry has highlighted historic process shortcomings and unacceptable conduct within a part of our UK insulation business, for which we have apologised unreservedly and which we are treating with the utmost seriousness.

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fire safety and to professional conduct. We continue to support the inquiry in its work and are determined to learn all necessary lessons.”

Kingspan was a market pioneer of an enviable product: a plastic-based insulation material that appeared to be safe for buildings over 18 metres. In other words, this was a cheap to make product that could be sold at scale.

Celotex, a smaller UK insulation firm that was struggling to sell its own plastic insulation for big builds, wanted in. It had heard its rival Kingspan was making around £15m a year from K15, and a former employee told the inquiry the firm was under pressure from its new French multinational owner – Saint-Gobain, which bought the company in 2012 – to increase profits on new products.

It simply rebranded its existing plastic insulation, FR5000, as RS5000, and sought to get it approved for use in high rises.

For this, it needed the product to pass a “large-scale fire test”, similar to the mock-ups described earlier. That way, it could be used in cladding systems so long as it was in the same combination of products as in the test.

RS5000 followed a similar journey to K15. Its first test on a rig with aluminium cladding in February 2014 failed after 26 minutes.

Jon Roper, who was 22 at the time and a Celotex junior in his first job, witnessed the test. He has given devastating evidence to the inquiry, claiming he was made to “lie for commercial gain”.

Tasked with ensuring the product was accredited for use on tall buildings, which was one of his “KPIs” and tied to a financial bonus, Roper had done some research and warned colleagues that it “realistically should not be used behind most cladding panels, because in the event of a fire it would burn”, and an aluminium cladding system would “melt and allow fire to enter [the] cavity”.

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“I went along with a lot of actions that were completely unethical”

Another test was scheduled three months after the February 2014 failure, with disguised magnesium oxide panels – which were non-combustible – by the heat sensors and at the top of the rig. The gaps between panels were also narrowed to limit the fire spreading. It passed.

“WTF?” wrote Celotex’s product manager Debbie Berger in the margins of the test report, which she told the inquiry was “shorthand for shock”. When she raised the “design tweaks” with colleagues, Celotex’s managing director Craig Chambers **told her** to “be very careful how many people [are] circulated on e mails on this topic [sic]”, and warned that “things will leak” about the test results.

She never raised the subject again.

*[See also: **I was a firefighter at Grenfell – why do I still see towers in flammable cladding across Britain?**]*

At the inquiry, Roper admitted he was “fully aware” the rig was “over-engineered to achieve a pass”, and accepted it constituted a “fraud on the market”, which was “misleading and intended to mislead”, as posited by the inquiry’s chief lawyer Richard Millett QC.

Roper had even asked the BRE to remove a photo revealing the concealed magnesium oxide board from its test report. His misleading marketing of RS5000 as safe for high rises was copied and pasted word-for-word, complete with a typo, on a certificate for RS5000 by the LABC in 2014.

“I went along with a lot of actions at Celotex that, looking back, on reflection, were completely unethical,” Roper said. He recalled going home one evening after being asked to make a presentation on the test’s success and telling his parents how uncomfortable he felt.

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“Never has the expression ‘smoke and mirrors’ been more appropriate”

Another former technical team member at Celotex, Jamie Hayes, told the inquiry he was “very concerned” about the misleading test report. He said he failed to challenge the practice because, like Roper, he did not know who to tell and lacked experience.

“It was a failure of courage and a failure of character and a failure of moral fibre on my part not to do so,” he said.

In 2015, Rob Warren, the technical director at Celotex, told a construction consultant that fire would “love to race up” a tower with combustible insulation, and RS5000 could be used depending on “opinion and interpretation” of building regulations – to which the reply came: “Never has the expression ‘smoke and mirrors’ been more appropriate.”

RS5000 formed the majority of Grenfell Tower’s insulation. It was sold to Harley Facades, a construction company working on the refurbishment, at a 47.5 per cent discount. Celotex planned on using the refurbishment project as a case study in marketing materials for its “new” product.

Celotex denies responsibility for the Grenfell disaster, and maintains that it was the duty of those behind the refurbishment to ensure they used the insulation with other materials to make it fire-safe. It admits “unacceptable conduct on the part of a number of employees”, and says it has taken “concerted steps” to “ensure that no such issues reoccur”.

The UK **lifted its ban** on combustible insulation for high rises in 2006. Even after the Garnock Court fire of 1999 and Lakanal House fire in 2009 exposed the deadly consequences of flammable external panels, it **did not tighten or clarify rules** on high-rise cladding.

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The inquiry heard that aluminium composite is often used instead of fire-proof materials, as part of “value engineering” exercises to save money. This was the case in the refurbishment of Grenfell Tower, when non-combustible zinc panels were swapped out for aluminium composite to save nearly £300,000.

As with the insulation material, questions have been raised about how Arconic’s Reynobond PE cladding ended up on Grenfell Tower.

The inquiry heard from expert fire safety witness Barbara Lane that the product’s certificate, granted by the BBA in 2008, was “factually incorrect” and “does not certify compliance with the requirements of the building regulations reaction to fire”.

In fact, the version of the cladding (aluminium sheets with a polyethylene core, in a “cassette” form) used on Grenfell Tower had failed to achieve any classification at all during testing in 2005, and since then had consistently only been deemed “Class E” (which you “wouldn’t put on a dog kennel”, **according to one expert**).

Yet it was sold on the basis of its erroneous 2008 certificate for Grenfell Tower. “We’re not ‘clean’,” Claude Wehrle, the head of technical sales support at Arconic, told a salesperson at the company when a customer was pressing them for the necessary fire certificate.

“We’re not ‘clean’”

The inquiry also heard how Arconic was aware of the product’s true properties long before the Grenfell Tower fire. After a 2009 panel fire involving polyethylene in Romania, Wehrle sent the firm’s president Claude Schmidt photos of the blaze: “Here are some pictures to show you how dangerous ‘PE’ [polyethylene] can be when it comes to architecture.”

A year later, Wehrle emailed other colleagues warning of Reynobond PE’s “shortfall” in

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In 2013, Deborah French, Arconic's UK sales representative, circulated an email from an aluminium cladding representative that stated "using PE is like a chimney which transports the fire... in the shortest times". Referring to a live test of this type of cladding system in Bangkok, Thailand, it described how the architects present "almost fainted", and called the panel a "whole cheat" that "burns fiercely". Fire regulations were **deemed a "touchy" subject** in internal Arconic emails that year.

Two years later, after a fire at a building with fire retardant panelling in China, Wehrle noted that had the building been cladded with polyethylene, "the fire would have spread over the entire height of the tower... Long Live FR [fire retardant] :-)."

"We need to stop. We are in the 'know'"

With a tone of desperation in 2016, after another fire in Strasbourg, France, Wehrle emailed the French sales team again warning them that they were "very lucky" the Reynobond PE on an adjacent building had not caught fire. "We really need to stop proposing PE in architecture! We are in the 'know', and I think it is up to us to be proactive... AT LAST."

The following year, Grenfell Tower caught fire.

Arconic denies responsibility for the disaster, blaming the way its materials were used in the refurbishment. Four Arconic staff members in France and Germany are refusing to give evidence to the public inquiry, citing a French statute regarding foreign legal proceedings.

Richard Millett QC has asked firms not to indulge in a "merry-go-round of buck-passing".

In December 2020, more than three years on from Grenfell Tower fire, **hundreds of buildings**

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Residents around the country are still stuck in dangerous housing, and leaseholders are doubly trapped with punitive housing association bills for the removal of the panel.

Last year, Boris Johnson promised to accept all recommendations for central government from the first phase of the inquiry so that “justice will be done”. Just four of the 46 recommendations have been implemented in full so far, all of which are targeted at the emergency services, according to analysis by the BBC’s *Grenfell Tower Inquiry Podcast*.

Conservative MPs have already **rejected an amendment** to the Fire Safety Bill in September, which sought to legislate for some of the recommendations, including requiring flat owners and building managers in England and Wales to share design information with the local fire service, carry out regular inspections of flat doors and lifts, and ensure evacuation and fire safety plans for residents. (The government said it wants to wait for a consultation.)

There is no national body overseeing standards in fire services across the country, meaning there is little chance of standardising special cladding training and equipment for firefighters.

Now, we have unprecedented insight into the machinations of a construction industry putting profit above safety.

The government recently announced controversial planning reforms to accelerate housebuilding, alongside its promises to “level up” non-London regions through infrastructure investment and to meet green housebuilding and refurbishment targets. Unless this inquiry’s revelations are taken seriously, however, its ambition to “build back better” will remain a hollow slogan – and a laugh in the face of the victims of Grenfell, the survivors and their families.

Anoosh Chakelian is the New Statesman’s Britain editor.



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