



Northern Ireland  
Assembly

Committee for Finance

# OFFICIAL REPORT (Hansard)

Building Regulations (Northern Ireland) 2012:  
Kingspan Insulation and Engineered Panels  
in Construction

2 December 2020

# NORTHERN IRELAND ASSEMBLY

## Committee for Finance

### Building Regulations (Northern Ireland) 2012: Kingspan Insulation and Engineered Panels in Construction

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**Members present for all or part of the proceedings:**

Dr Steve Aiken (Chairperson)  
Mr Paul Frew (Deputy Chairperson)  
Mr Jim Allister  
Mr Pat Catney  
Ms Jemma Dolan  
Mr Philip McGuigan  
Mr Maolíosa McHugh  
Mr Jim Wells

**Witnesses:**

Mr Chris Pateman	Engineered Panels in Construction
Mr Alan Macklin	Kingspan Insulation
Mr Fergal Murphy	Kingspan Insulation

**The Chairperson (Dr Aiken):** I remind members that this session is being recorded by Hansard. I welcome Fergal Murphy, general manager of Kingspan Insulation. Fergal, can you hear us? Put your thumb up if you can hear me. Do you have Alan there?

**Mr Alan Macklin (Kingspan Insulation):** Can you hear us?

**The Chairperson (Dr Aiken):** Yes, we can hear you now. Is that Fergal and Alan?

**Mr Fergal Murphy (Kingspan Insulation):** Can you hear me? Hello?

**The Chairperson (Dr Aiken):** We can hear you, but you are fading in and out a bit.

**Mr Macklin:** OK. Apologies for that. Can you hear us now?

**The Chairperson (Dr Aiken):** Yes, we are happy with that. We also welcome Chris Pateman, the general secretary of Engineered Panels in Construction (EPIC). Chris, will you wave your hand if you can hear us OK?

**Mr Chris Pateman (Engineered Panels in Construction):** Good afternoon, Chair. I can hear you fine.

**The Chairperson (Dr Aiken):** OK. Thank you very much indeed.

**Mr Pateman:** Can you hear me?

**The Chairperson (Dr Aiken):** Yes, we can, loud and clear.

I advise members that Jonathan Arnold, who is the product development manager for building systems at Tata Steel, was scheduled to provide oral evidence, but the Committee office was informed this afternoon that he will not be able to join the meeting. Chris has been advised that, if there are any technical questions as we go through, he may have to respond in writing with detailed answers.

I ask Mr Murphy and Mr Pateman to make a brief opening statement. Over to you, gentlemen.

**Mr Murphy:** Good afternoon, Chairman. I have an opening statement that covers three key points, and we would like to read that now. Is that OK with you, Chair?

**The Chairperson (Dr Aiken):** Certainly.

**Mr Murphy:** Thank you for your time today. We very much welcome the opportunity to engage with you, via video link, on this very important topic. I am the general manager for Kingspan Insulation, and I am responsible for three insulation manufacturing facilities in Ireland. You may be familiar with our facility at Ballyclare in County Antrim, which employs 27 people. We have additional insulation sites at Castleblayney in County Monaghan and Askeaton in County Limerick. Kingspan Insulation is part of the wider Kingspan Group, which is headquartered in County Cavan and employs 15,000 people worldwide, operating across 150 sites. Our sister company in the group, Kingspan Water and Energy, has additional sites: the Portadown site employs 300 people; the Newry site an additional 41. I am joined today by Alan Macklin, our technical director. Alan and his team are responsible for providing technical guidance on the appropriate use of our products to designers, specifiers, builders and relevant stakeholders.

With the permission of the Chair, we will now speak about the consultation process.

**The Chairperson (Dr Aiken):** Yes, please.

**Mr Murphy:** We are aware of your engagement with a wide group of stakeholders in this consultation process, and we watched your meeting with the Northern Ireland Fire and Rescue Service (NIFRS) last week. We agree with many of the points that its officials raised, and we state clearly that our objective is aligned with theirs: to ensure the safety of the community, occupants and firefighters when dealing with the topic of fire safety in buildings.

As manufacturers, we strive to provide appropriate products and systems in order to comply with regulations and to meet the previously stated objective of providing fire-safe buildings for the occupants. We welcome the consultation with stakeholders that you began in August, and, as you are aware, we made a full statement in October.

If it is acceptable to the Chair and members, we will detail the three points in our submission. The first point is determining fire safety for product use. We believe that determining the suitability of products in use in a building should be on the basis of appropriate, evidence-based performance testing: for example, testing set out by the British Standards (BS). These include areas of fire and thermal performance. Under the proposed ban, materials would be classified as "combustible", "non-combustible" or of "limited combustibility", solely on the basis of bench-scale tests of individual products, using tiny samples the size of an Oxo cube.

Relying on small-scale testing to classify products oversimplifies the discussion and the complexity of fire-safety engineering. These small-scale tests give no consideration to how materials perform when combined in a system, as they would be on a real building. They ignore the way in which different components within that system interact with each other and what might happen if just one of those components failed in a fire. There is nothing real life about the small-scale tests used to decide whether a product is combustible or non-combustible, so it makes no sense that we are looking at moving to a world where we will allow products on tall buildings without thinking how they would work together in a system and in combination with all other materials involved.

By contrast, Kingspan believes that large-scale system testing is the appropriate way to assess the performance of any given facade system, across all building types with a floor of over 18 metres. The rigorous BS 8414 test is specifically designed to assess the risk of fire spread over systems in a

combined approach on a building, and this accords with the findings of the Hackitt report, which calls for a "systems-based approach". BS 8414 tests all of the many components that are used together to build a cladding system, including cavity barriers, just as they would on a real building, and this test wall is 3.5 metres by 2.5 metres by 9 metres tall. This is superior to small-scale tests of individual products that establish limited or non-combustibility.

We are aware of a number of systems featuring non-combustible or limited combustibility insulation and cladding that have failed to pass a BS 8414 but which would be deemed compliant under current building regulations on a linear route. That demonstrates the robustness of the large-scale testing BS 8414. Furthermore, several countries use BS 8414 or similar large-scale tests, including the USA, Canada, Sweden, Germany, Belgium, France, Ireland, the UAE, Australia and New Zealand. This evidences a strong international consensus that large-scale, full-systems testing provides the best measure of fire safety.

For these reasons, we are concerned that not putting all systems through a large-scale system test is potentially dangerous for building occupants. A combination of individual materials can be deemed safe only if tested in a full large-scale system, irrespective of their combustible or non-combustible characterisation in a small-scale bench test. Small scale should not be a substitute for large scale. Ensuring that all wall assemblies undertake a BS 8414 test, with the testing results and the full assemblies published and available to all stakeholders, would allow all stakeholders full visibility of compliance and the fire performance of the proposed wall construction on the relevant buildings. Should the Committee be minded to allow the use of non-combustible and combustible insulation where they are deemed appropriate for use by the British Standard 8414 large-scale test, testing could be carried out in Northern Ireland. Large-scale fire-testing rigs are situated at the Ulster University in Jordanstown and a new facility in Carrickfergus. Both are operated by Efectis, a widely respected global expert in fire testing. Developing and expanding large-scale fire-testing environments could allow for the expansion of quality fire-testing and research jobs in the region and could lead to Jordanstown becoming a test hub similar to Warrington or other world-renowned test centres.

The second of our three points is the economic impact of a ban. Amending the building regulations and limiting the options for construction materials would have a significant economic impact. There are no manufacturers of non-combustible insulation in Northern Ireland, which means that all the required materials would need to be imported. The unintended consequences could mean the loss of manufacturing jobs in Northern Ireland and the border regions. That scenario may be further compounded in a post-Brexit environment as those products come to Northern Ireland from mainland Europe.

Our experience in England and Wales shows that, although a proposed ban is limited to certain reference buildings with a storey over 18 metres, many specifiers, developers and builders may switch over all buildings, irrespective of height or building use, as it becomes increasingly difficult to manage multiple specification types on small or mid-sized projects. That further compounds the potential for job losses in the insulation sector in Northern Ireland and could lead to project delays due to the constraints on supplies of imported products.

It is also worth noting that a recent survey commissioned by the Minister of Housing, Communities and Local Government in Westminster highlighted some adverse impacts that the ban has caused for the construction industry in England and Wales. I include the following key findings: 97% of respondents reported that new legislation is causing technical specification problems; 79.5% thought that construction detailing had become more complex as a result of the UK ban; 79.5% reported that products normally available were no longer acceptable and that alternatives were hard to find; 68% said that the ban will have an impact on the buildability and sequencing of projects; and 52.9% noted impacts on delivery times for new projects. All those findings are likely to have a similar or greater impact on the Northern Ireland construction economy. It appears that that new study has not been addressed in the economic assessment that forms part of the key consultation process.

The third and final point is the impact on carbon emissions. Carbon emissions from buildings contribute 30% of our CO<sub>2</sub> emissions. Fire safety is always our primary concern. However, we believe that systems that contain Kingspan products are capable of being fire safe and helping to deliver energy-efficient buildings. Under the proposed ban, the only allowed products would be non-combustible synthetic mineral fibre insulation, which typically has a lower insulating performance for any given thickness than traditional high-performance closed-cell insulation boards. That would result in the potential for buildings to have a higher carbon footprint. Delivering better insulated and net-zero carbon buildings would be made more challenging by introducing a ban. Furthermore, non-combustible synthetic mineral fibre insulation is much heavier than high-performance closed-cell

boards, which would create a requirement for larger structural supports and foundations. Additionally, the carbon footprint of buildings would be increased by the added road haulage of importing insulating products from Europe to Northern Ireland.

In conclusion, as noted earlier, the key outcome of the policy should be the highest performance standards for buildings, and changes should come with a clear evidence base. We reiterate that that does not automatically mean opting for non-combustible material only as the best option. At this point, we reflect on our shared objective: to ensure the safety of the community, occupants and firefighters when dealing with the topic of buildings and fire safety. We believe that, if the Department of Finance wishes to improve fire safety, large-scale testing is a more robust and practical way to achieve that.

Finally, we ask MLAs to consider adopting a solution closer to that of Scotland or Ireland, where BS 8414 large-scale testing is a supported route to demonstrating fire safety on all relevant building types.

Thank you for allowing me to read the statement.

**The Chairperson (Dr Aiken):** Thank you very much, Fergal. Will you forward the statement, because it was quite detailed, to the Committee so that we can have that formally brought into the evidence?

**Mr Murphy:** Certainly, no problem at all.

**The Chairperson (Dr Aiken):** I would like Chris to give his presentation, and we will then open up to questions to all three of you. Chris, will you give your presentation now?

**Mr Pateman:** That will be fine, Chair. Can everybody hear me OK?

**The Chairperson (Dr Aiken):** Yes.

**Mr Pateman:** Splendid. Thank you. I will not take too long because a lot of what I have to say has already been said. Our point is not that a ban on combustible materials is necessarily wrong; our point is that it is not complete. We simply like to say that, by all means, go with class A1/A2, but do not go only with class A1/A2, because banning products is a suboptimal solution. Dame Judith Hackitt said that the UK Government's independent expert panel has recommended:

*"the clearest way of ensuring an external wall system adequately resists external fire spread is for all the relevant elements of the wall to be of limited combustibility, or to use an external wall system which can be shown to have passed a large-scale system test as specified in British Standard BS8414."*

Our only ask is that the Northern Ireland Assembly inform its decision on the basis of this best guidance, rather than defaulting to a "ban everything and live with the consequences" approach. Alan mentioned that you should have, somewhere among your documents or in the Library, the research that was produced by Adroit Economics on behalf of the Ministry of Housing, Communities and Local Government (MHCLG), which I sent to the secretary last week. I will not go through the list of those outputs again. All I will say is that Northern Ireland has the opportunity to benefit from the experience of the ban in England. Adroit's evidence demonstrates that MHCLG has just undertaken another piece of work, which has not yet been published, to demonstrate that that ban has unintended consequences.

The preamble to question B7 in your consultation clearly acknowledges that buildings are complicated elements and that testing the fire performance of one individual element is not a sure guide to how that whole building will perform in practice. We are manufacturers of large-scale panel systems. A typical application for our products is, for example, the Charles Hurst Jaguar Land Rover dealership in Belfast, which some of you may be aware of. These are large, complicated buildings, and the appropriate way to demonstrate the performance of the materials of which they are made is a large-scale test of that complex wall as built.

BS 8414 was mentioned in your discussions with the NIFRS. I will not try to screen share, but I will try to position this picture on the web camera so that you can get a sense of what a BS 8414 test rig looks like. Essentially, a pallet-load of wood is set fire to, and the flames lick up the outside of the building. It is a large-scale and internationally recognised test. Our only argument is that you should not default to a non-combustible only solution. It should be, as in Scotland, non-combustible or demonstrable evidence of performance and successful performance to a BS 8414 test.

Thank you, Chair.

**The Chairperson (Dr Aiken):** OK. Thank you very much indeed.

**Mr Wells:** This is an extraordinarily serious issue, and we all know why we are here. Grenfell Tower has not been mentioned so far. As a Committee, we would be hung out to dry if we allowed this legislation to be passed without making absolutely certain that the people of Northern Ireland would be safe.

He has disappeared from the screen.

**The Chairperson (Dr Aiken):** He is back.

**Mr Wells:** The wonders of modern technology. He cannot hear me.

**Mr Pateman:** I can hear you now, sir.

**Mr Wells:** That is good. Your signal was very erratic for a few moments. I repeat: as a Committee, we would be hung out to dry and lambasted, rightly so, if we allowed anything to be passed that endangered the lives of those living in high-rise buildings in Northern Ireland. None of the three witnesses referred to the Grenfell Tower incident, which was absolutely horrific. You said that you would be quite happy to have both the British Standard test and the test that is being advocated to us. Products would therefore have to face both tests, and that seems like a reasonable compromise. What tests, if any, were carried out on the Grenfell Tower cladding before that horrific disaster?

**Mr Pateman:** Can you hear me, folks?

**The Chairperson (Dr Aiken):** Yes, we can.

**Mr Pateman:** It is difficult for us to comment on Grenfell Tower, but we can say with some certainty that the existing building regulations, which were in place when that place was put together, included a provision — regulation 36 in your regulations provides for this — that products that are fixed to the outside of buildings should resist a surface spread of flame. That is a very clear requirement in the existing building regulations. I believe that I am correct in saying that Judge Moore-Bick made it pretty clear when summing up phase 1 of the Grenfell inquiry that those products had failed to meet that requirement. It is not a question of whether the requirement was adequate; it is a question of whether the testing regime was appropriately followed, and I cannot comment on the detail of that. I can refer you, and will gladly do so, to the relevant paragraphs of Judge Moore-Bick's report. Of course, the inquiry is ongoing, and the products are not represented in the panoply of materials that my members produce.

**Mr Wells:** Given what you have said, it is clear that, as far as employment in Northern Ireland is concerned, this causes problems. I am very aware, of course, of the very large plant in Portadown. Three hundred jobs are extremely important to that area. Surely, there is an opportunity for the industry in Northern Ireland to manufacture products that meet both tests and therefore provide reassurance to residents of tower blocks.

**Mr Murphy:** May Alan and I come in on that point?

**The Chairperson (Dr Aiken):** Yes, please.

**Mr Murphy:** A variety of products and systems is available and is tested for suitability in terms of application to building types. As manufacturers, we manufacture a wide range of — sorry, I will use some technical terms — expanded polystyrene (EPS), extruded polystyrene (XPS) and rigid polyurethane (PUR/PIR) insulation, as well as the range of fibre products. A wide range of products is manufactured by insulation manufacturers and system providers. In all cases, we look at the most suitable products for a wide range of performances. Our point remains that the BS 8414 for other large-scale tests should be an applicable and suitable way to test all the components together, because an individual element may pass a non-combustibility test. If I understand the question, individual materials or components may be repurposed, but that still does not give us the same certainty as when all those individual components are joined together in a full through-wall assembly.

We believe that testing and demonstrating a very clear 8414 large-scale British standard system test is the best and most appropriate way to demonstrate to all the stakeholders — specifiers, architects, occupants and the Fire Service — that that through wall of components is large-scale tested and performs together with all the components in the assembly.

**Mr Wells:** You are a vast company, obviously employing a lot of people and giving a huge amount of employment to the people of Northern Ireland and the Irish Republic, but I have to say this: you are not neutral in this debate. You are the manufacturers. Do you understand our position that we have to be absolutely certain that, whatever is decided in the legislation, is the safest for the people of Northern Ireland rather than the most convenient for the manufacturers?

**Mr Murphy:** Yes, we absolutely understand and respect that point. We, as manufacturers, will and can only provide products that comply with the legislation and the standards set out by any of the relevant authorities, and we will always seek to test those products that we put into the market against those standards that you have deemed to be the most appropriate. We have a view that the products, as we test them, are applicable for those specific products and services.

**Mr Pateman:** To the best of my knowledge, there is no evidence to suggest that products or assemblies that have successfully passed a BS 8414 large-scale test have gone on in real life to fail in a fire situation. The products have consistently performed in accordance with the results of the test, and the pass/fail criteria are quite stiff.

It is a question of looking at the available evidence, I suggest. One of the documents that I forwarded to the Committee has some research that was carried out by Tenos into large-scale fires where systems have been accredited to 8414. It can find no evidence of behaviour that is out of what one would expect in the performance of the tested sample.

**Mr McHugh:** Tá fáilte romhaibh uilig. You are all very welcome. My line of questioning is not dissimilar to that which has been presented to you. Do you have any idea, roughly, about the financial ramifications for your company if the ban went ahead?

**Mr Murphy:** We do not have any specifics from studies that were conducted for our company, but we can tell you that the findings from the MHCLG survey show that respondents identified that the new legislation caused technical and specification problems and made buildings more complex and alternative products harder to find. We have a view that that is because those products need to come from outside the marketplace. We do not have any specific impact study that was conducted from our business's point of view.

**Mr McHugh:** I am disappointed that you do not have an indication of the implications of that. That brings me to my next point. If combustible materials were banned, surely it would be in the producer's economic interest to repurpose your business and produce the safer material here in Ireland.

**Mr Murphy:** The test that defines the classification for products as "combustible", "non-combustible" or having "limited combustibility", which we said means that samples are approximately the size of an Oxo cube, does not necessarily demonstrate the most appropriate way to measure the large-scale performance of a building in an assembly. Conducting a large-scale assembly test defines the safety of the product in the full assembly when all those components are measured together.

**Mr McHugh:** Finally, you placed great emphasis on testing the product that was used in Grenfell. It was marketed as safe to use, and it was claimed that the product had passed fire-safety testing. It now turns out that that was not true and that the product failed the fire test in 2007. However, Kingspan decided to keep using the product. Do you accept that there is an inconsistency in Kingspan suggesting that greater testing is needed while you have products that failed safety tests and you have ignored those very same tests? Does that not highlight a very serious flaw in the increased testing solution that, in fact, would lead to carrying out those tests?

**Mr Murphy:** In response to that, I will say that neither Alan nor I are not involved in assisting the inquiry in its work; Kingspan personnel in the UK are assisting the inquiry. Kingspan has acknowledged that there were shortcomings, has apologised for that and has set out specific new processes and systems. It has also changed the full traceability of the K15 product and incorporated new fire testing and accredited protocols. It is also true that, if Kingspan had been consulted, it would have advised that the K15 Kingspan product, along with the cladding, was not suitable for the tower

and would have not been BS 8414 approved for large-scale system in that particular assembly. Kingspan would not have recommended that product for use in that application.

**Mr McHugh:** To conclude, you commented that using the less-combustible material would increase carbon emissions. Is any life meant to take less priority than carbon emissions?

**Mr Murphy:** I acknowledge that, and on the point about carbon emissions contributing to 30% of our CO2 emissions, fire safety was always our primary concern, and that will certainly be the case in our products.

**Mr Pateman:** Can I just make a supplementary point? The reason that people come up with modern materials is that they wish to improve the performance of existing legacy materials. We are talking about an insulation product that can deliver the same thermal performance for half the thickness and a quarter of the weight of the legacy materials. There are engineering considerations. These are higher-performance products that can deliver better-quality homes for similar prices. They are all tested to appropriate standards anyway. That does not fully answer your question but, perhaps, adds a little more depth to the response.

**Mr Allister:** Good afternoon. I want to ask the Kingspan representatives a couple of questions. I want to press you further about the credibility of you telling us that you are devoted to large-scale testing. In light of the quite shocking evidence this week to the Grenfell inquiry when Kingspan had to admit that it distorted testing in K15, after it changed its composition, by continuing to rely on a previous test when promoting that product. When the new product was further tested, it burnt like a "raging inferno". What credibility does Kingspan come with to this subject when that sort of admission had to be made this week at the public inquiry?

**Mr Murphy:** Although Kingspan Insulation is confident that K15 is, and was, safe for use in compliant systems, you noted the historical shortcomings in what happened, and we have offered, and do offer, a full and sincere apology for them. We have made substantial changes in order to ensure that those cannot be repeated, and the changes that have been introduced to date include full traceability of the K15 product; the publication of all BS 8414 tests incorporating K15; new fire-testing and accrediting protocols; and a new employee code of conduct. We are committed to having the highest standard of fire performance in our products through continuous R&D and rigorous testing and complemented by technical support and accurate product information.

**Mr Allister:** Is it not the case that the gentleman giving evidence on behalf of Kingspan, Mr Philip Heath, is still an employee and that he is the gentleman who had it quoted back to him that he said that a firm was:

*"getting me confused with someone who gives a dam [sic]"?*

Is that the mindset of Kingspan?

**Mr Murphy:** I do not believe that to be the culture of the business. It would be inappropriate for me to comment on Mr Heath specifically, as he is a more senior member of staff.

**Mr Allister:** He is still a member of staff. Is that correct? He is still on the technical side. Is that correct?

**Mr Murphy:** Yes, Mr Heath is still employed by Kingspan.

**Mr Allister:** Yes, and he is the gentleman who said that they must think he is "someone who gives a dam [sic]."

**Mr Murphy:** Yes. As I said, Mr Heath and other Kingspan people are assisting the inquiry with its findings.

**Mr Allister:** Did he also say, on cheating the certificate system whereby a certificate was obtained by relying on the old test for the changed product, that:

*"We didn't even have to get any real ale down him"?*

He was referring to the official who issued the certificate.

**Mr Murphy:** Yes, I acknowledge that. I made the point that Kingspan has offered a full and sincere apology and assurances that substantial changes have been made, and I noted some of those, such as the accreditation protocols and the new employee code of conduct that is in place.

**Mr Allister:** You come to us today telling us that you can be trusted to produce material subject to all the certifications and testing, but you have a track record of avoiding and evading those very tests.

**Mr Murphy:** That proposal that we put forward, which includes the large-scale British standard A 414 testing, includes publishing all the test data in order to make it available to all the stakeholders, be they the constructors, the architects, the specifiers, building control or the fire services, so that all the relevant stakeholders understand the components as constructed together.

**Mr Macklin:** It is important to add that those tests are carried out by third-party organisations that are United Kingdom Accreditation Service (UKAS) accredited, so the test procedures and the results of those tests are completely independent.

**Mr Allister:** Yes, but the point, sir, is that, when you got the test, you then changed the product and promoted it as if it was that product that passed the test when you knew that it was not. When that product was tested, it burnt like a "raging inferno" to the very point, according to the evidence, where the test had to be stopped in case it set fire to the laboratory. Do you not see the credibility issue when you then come to the Committee and say, "No bans, just tests, and we will apply by the tests" when you have a track record like that?

**Mr Murphy:** I reiterate my earlier point that we have, and Kingspan has, fully and sincerely apologised for the historical shortcomings. There have been learnings in the business and substantial changes in order to ensure that they cannot be repeated.

Our hope is that the BS 8414, as a large-scale system test carried out by independent test, houses with results published and that all those assembly components that are available to all the parties or stakeholders are then transparent and simple for all members to understand how those walls can be constructed in compliance with the regulations.

**Mr Allister:** I hear what you say. Thank you.

**Mr McGuigan:** Most of the points that I wanted to make have been covered by Maoliosa and Jim. This is a difficult week, I guess, for representatives of Kingspan to come before any Committee to try to argue about the credibility of the industry and testing given, as Jim pointed out, some of the evidence that came to the fore yesterday and over the tail end of November about the industry, Kingspan in particular, and some of the things that were said in internal emails.

As has been said, the Committee's duty of care is to try to ensure that something like Grenfell does not happen here in the North. I was struck by something that Chris, I think, said, in conjunction with something that the representatives of Kingspan said, which was that combustible materials in small quantities are safe but there is no certainty about how they react when combined in larger quantities. Surely, then, it is up to the industry to work to ensure that the materials, individually and collectively, are non-combustible rather than arguing for testing that may or may not be practical given what we discussed about Grenfell. The industry should surely follow guidelines that state that individual materials, when put together, are non-combustible and that people's safety is the prime concern.

**Mr Macklin:** I take that point. The overarching requirement of the building regulations is in regulation 36, which Chris alluded to and which states:

*"The external walls and roof of a building shall be so designed and constructed that they afford adequate resistance to the spread of fire over them".*

We argue that the only way to assess that in reality is to test a large-scale assembly.

It is regrettable that the discussion and narrative on fire safety have always been diluted down to combustibility versus non-combustibility. It is important for the Committee to understand the limitations and nature of that small-scale test in a bit more detail. I am not going to go into a great deal of detail

on the test, but as a basis and as Fergal said, a small sample of a material — about 50 grams, which is the size of an Oxo cube — is ground into a powder. A small amount of that powder — about 0.5 of a gram, which is equivalent to about a tenth of a teaspoon — is then put into a bomb calorimeter test, and, in an atmosphere of pure oxygen, is fully combusted. That measures the gross calorific content of that product. It is important to note that there are limits in that. If the combustion is fewer than 3 megajoules per kilogram, it is classified as limited combustibility. If it is fewer than 2 megajoules per kilogram, it is classified as non-combustible. It is not zero, but there are limited values there.

We argue that, when you take those individual component products that achieve non-combustibility, or limited combustibility, and put them into an assembly, you have no way of knowing how they will interact. You have no way of assessing the structural integrity of the panel under fire load. We know from experience that the cavity width, and the cavity gap between different panels and external cladding, has an impact on how that system performs in a large-scale test. If there are any questions about the validity of BS 8414 as a test methodology, we have witnessed non- and limited-combustibility products being tested in a large-scale assembly and failing that test.

That does two things. First, it demonstrates the robust nature of BS 8414 as a test methodology. Secondly, it brings into question the characterisation of products on small-scale tests. It is important for the Committee to understand the question of scale. If we go back to the requirements of the building regulations and limiting fire spread over the facade, we very strongly argue that the best and most robust way of demonstrating that is via a large-scale test rather than relying on individual components on a multistorey high-rise building that has never been constructed and tested as an assembly.

**Mr Pateman:** I will perhaps add that the person who decides what the building will look like, how it will be designed, how it will function and how it will meet its intended purpose is the building designer, the architect, the specifier — the individual who draws that assembly together to meet a specific purpose.

There is a limit to the extent to which the manufacturer can influence that, beyond saying, "We think that you should use our products". The competence issue really sits with the building designer. What we are saying is that that building designer needs to be able to satisfy all the relevant authorities that his choice of materials is going to perform in such a way that, in the event that there is a fire, it will not allow that fire to spread across the surface of that building.

That is why we suggest that what you need is an "as-built" assembly that has been tested at scale so that you have something. I showed you the photograph at the beginning of something that was essentially designed to mimic what we saw at Grenfell, which was an established fire breaking out through a window and lapping up the outside of the building. How a product performs in real life, in a real fire and at scale is something that you can only effectively demonstrate with precision and confidence if you have tested the as-built structure.

If you are relying on adding a series of laboratory results for individual elements, you are ignoring how those elements act together, any kind of air channels that may be between them, what the weather might be doing and a whole variety of other things that are completely beyond the competence of anyone who is manufacturing that product or bringing it to market to influence.

We are not arguing that you get away from the idea of using lab tests, because they have some value but only some. By all means, use lab tests to give yourself that confidence that the product is not going to go up the way that the product on the outside of Grenfell went up. However, if a building designer wishes to put together a novel combination of products, if some new product comes to new market or if there is some new hypergreen or hyperrecyclable product that the designer wishes to incorporate into a design for whatever reason, you should also give yourself the option of having a path that gives you the confidence that that product will perform and that if anything goes wrong, the Northern Ireland Fire and Rescue Service will rock up and find it performing in accordance with what it would expect. For that, we believe that you need a large-scale test or the option of a large-scale test.

**The Chairperson (Dr Aiken):** I will come back to you, Philip, but one of the questions here is this: why have England and Wales decided to go against that approach? Why have they decided to go for the laboratory tests? What have England and Wales seen specifically that they feel they need to deal with?

**Mr Pateman:** If you will forgive me, I will say first that Scotland has not.

**The Chairperson (Dr Aiken):** No, I am asking specifically about England. If you look at the size of the construction industry across the United Kingdom, it is obvious that England and Wales is a much larger potential market than Scotland and Northern Ireland. Could somebody elucidate why England and Wales have gone down the laboratory route?

**Mr Pateman:** If you were the Secretary of State for Housing, Communities and Local Government in the wake of something like the Grenfell disaster, you would feel that you needed to take some kind of action that demonstrated that the Government were firmly in control of the situation. James Brokenshire took the view, and he chose to announce this at the Conservative Party conference, that he would ban combustible building materials. You can understand why he would want to do that. We suggest that that was a political decision rather than fundamentally an engineering decision. It was a political decision that flew in the face of the evidence of Dame Judith Hackitt's report into the fire, which was before the inquiry had actually started. It was a politically motivated decision. We can understand that.

**Mr Murphy:** I think I might add —.

**Mr Pateman:** We can demonstrate that the Government's research, which was carried out only, I think, six months or seven months after the inquiry was announced, demonstrated that it failed to address the fundamental issues. It created the idea that if you use non-combustible material, you will be safe, which, we venture to suggest, is a gross oversimplification.

The second thing that it did was that it had to include a whole variety of exclusions because there is a whole variety of building products that are not available in a non-combustible option. Therefore, if you look at building regulations in England, you will see that, yes, you have a ban on the use of combustible cladding; however, you also have derogations for cavity closers, window detailing, the materials with which those windows are made, breather membranes, and a variety of other products that do not meet the specification.

Our argument is that you would be better served either by saying, "Go non-combustible", or by being able to demonstrate that the combination of products that will be used in an application can pass a large-scale test, such as to give you confidence that they would perform adequately in a fire.

**Mr McGuigan:** I want to come back in, briefly. Apologies if you have already covered the issue. Who would pay for the large-scale testing proposed in your scenario?

**Mr Pateman:** Typically, in my sector, the manufacturers pay for it. The photo that I showed you earlier — obviously, it is the "after" shot — was paid for by a contractor who wanted the confidence that the assembly that he was going to put up was fit for purpose. It is a commercial transaction based on the need to satisfy the customer. It is part of the cost of bringing products to market.

**Mr Catney:** Thank you very much for your presentation. I had to step out for a moment or two. I have a couple of questions, Chair. I apologise if they have been covered.

Both EPIC and Kingspan suggest that large-scale system testing could be a more efficient method of demonstrating how products would perform. How would that testing be certified or authenticated in order to ensure that tests are completely consistent and demonstrate reliability of results, given what you said about architects choosing the materials that they want to use? They need to be able to look at what has been tested when choosing products off the shelf. Who tests the testers?

**Mr Macklin:** The test facilities that do the BS 8414 testing are accredited by the United Kingdom Accreditation Service (UKAS). UKAS is the governing body that audits the test facilities to ensure that tests are carried out in accordance with test standards. They are audited annually. It is the body that tests the testers, effectively.

**Mr Catney:** They need to be completely reliable and dependable. That is why I asked, "Who tests the testers?". Are you saying that the manufacturers carry out the tests?

**Mr Macklin:** No: UKAS audits the manufacturers and test houses; it provides the independent certification for the testing facility.

**Mr Pateman:** I think that, earlier, the two test houses available in Northern Ireland were mentioned. I know that the Committee was due to hear evidence from the head of the fire faculty at Jordanstown this afternoon. I understand that he is unable to present. However, I do hope that the Committee will have the opportunity to speak to Ali at some stage.

Those tests have to be carried out by professional laboratories that work against clear terms for how to set up the rig. A whole variety of laboratory techniques is embedded in the standards. I can think of nobody better, quite honestly, to guide the Committee in its understanding of that than Professor Nadjai from Jordanstown. He has EPIC's very highest respect.

**Mr Murphy:** There are two large-scale test rigs situated, as we mentioned, at the Ulster University at Jordanstown and at Carrickfergus, and Efectis is the independent operator of those facilities. It is a global expert in fire safety and testing. As Alan pointed out, its operation is independently verified by UKAS, which is the body that audits the testers. The manufacturers provide their products, and they are tested in accordance with, and under the guidance of, both Efectis and UKAS as the independent auditor of the test house.

**Mr Catney:** Kingspan states in its correspondence:

*"There are no indigenous manufacturers of non-combustible A1/A2 insulation products on the island of Ireland".*

Kingspan indicated that the absence of manufacturers of non-combustible insulation will have a significant impact on costs. Can you qualify the price differential between materials with a different combustibility classification?

**Mr Murphy:** No. Kingspan has no details or studies on the cost differences. The point that we are making is that there is currently no manufacturer of non-combustible insulation in Northern Ireland, and that means those products need to be imported from other jurisdictions. So there will be the unintended consequence of potential job losses for people who manufacture insulation in Northern Ireland, and a further potential impact on the material being shipped from Europe to Ireland. However, we do not have any specific information on cost differences.

**Mr Catney:** Could this be an opportunity for manufacturers in Northern Ireland to repurpose their operations to meet that demand?

**Mr Murphy:** That is a wider question. Kingspan believes that the products that we manufacture, when tested appropriately in a large-scale system test, will meet the requirements of the Committee and of the regulations and that they are safe for purpose. Alan outlined the point about not necessarily relying on the terminology of combustible versus non-combustible in determining fire safety. What is important, however, is the opportunity to test full assemblies in large-scale tests for all the reasons that we have spoken about to understand how they would work together and coordinate to deliver a fire-safe solution.

**Mr Frew:** Thank you, gentlemen, for your time and answers. My question is about the two tests. I get it; I am a practical guy. I have worked in the construction industry. So I get the differences between the two tests. One is an Oxo cube in a fume cabinet with pure oxygen, and the other is a more practical test on a life-size scale. I get your argument about the practical use of material. My question is about abuse, fraud and the cheating of tests. Which of the tests would be most susceptible to fraud and cheating?

**Mr Murphy:** We cannot comment on that, to be honest. That is a matter for the independent third-party assessment bodies. As we mentioned, BS 8414 and the test houses that carry out the assessment are UKAS-accredited and independently audited. The test houses have clear, definable standards to adhere to when carrying out the tests.

Similarly, that applies to the small-scale reaction to fire testing. It is a third-party, verified external testing. The labs are also accredited by the relevant body in their jurisdiction. To that point, all the tests are regulated, with very limited opportunity to cheat in them.

**Mr Frew:** When did the tests become regulated?

**Mr Murphy:** UKAS is the UK accreditation authority. I am not sure when it was initiated, to be honest.

**Mr Frew:** Do you want to come in?

**Mr Pateman:** Forgive me, Mr Frew. I am trying to get to the sense of your question. I have served the building industry in one capacity or another for most of my working life, and it is a problem if someone wants to tell lies, as, in practice, there is very little that can be done on the ground to prevent that. If someone wants to bring a product with CE marking into the UK market from a Chinese manufacturer, all they have to do is send a PDF of CE marking and the Chinese manufacturer will obligingly put it on.

I have heard of cases where plywood has landed at Tilbury, and someone sitting in a shed with a stencil and a can of U-Spray has put on the plywood whatever standard and specification the customer wants. Forgive me, because this is a far deeper discussion, but there is a limit to what you can do to stop people who have chosen to lie in order to gain commercial advantage.

We are suggesting that the testing regimes to which they are subject should take place in an open environment and be subject to scrutiny. Whoever is responsible for incorporating the products in a building will, increasingly — that is one good thing to have come out of the Hackitt report — be personally liable in law to the very highest extent. That concentrates the mind in a way that we have not seen hitherto. However, there is a limit to what you can do to stop people telling lies, and no amount of product marking will prevent that from happening. You have to have lot traceability from reliable manufacturers.

**Mr Frew:** I take your answer, but it is not just about getting a market advantage or advertising standards; it is about safety and the fact that 72 people died. I am trying to get to the bottom, through my questioning, of how fail-safe and trustworthy both tests are. That is why I asked which one would be more liable to fraud and cheating.

I take your point that there are unscrupulous people who are prepared to lie or be bribed or take money or a gift or to defraud or cheat the system or to give a false reading for a test. The evidence that we have seen this week from the Grenfell inquiry suggests that that has been taking place in the industry. A company was able to set fire tests of its products to deliberately resist the spread of flames and give a misleading impression of safety. That is not a market value or advantage; it is safety. Hence my question.

Given the evidence this week, it seems that there has been a skewing and falsification of results and materials. No matter how efficient and accurate a test, if there is corruption at the heart of it, it is not worth the paper it is written on. That could lead to massive risks that we cannot measure, including multiple deaths in the future. It is a massive issue. How fail-safe are the test rigs that are being set up to resist corruption, falsification and cheating?

**Mr Murphy:** I go back to the point that Alan made, which is that the test houses are independent and are independently audited by UKAS. Building the components into the large-scale system test, and detailing and testing the systems, is something that the Fire and Rescue Service or relevant authorities could witness. We outlined that there are test facilities in Northern Ireland, and having the Fire Service witness them would provide a degree of comfort.

**The Chairperson (Dr Aiken):** Is it not doing that already?

**Mr Frew:** I cannot remember whether this was asked of the Fire and Rescue Service last week, but is it present at all tests to have an input into them? Is that what you are saying? I am not quite sure.

**Mr Murphy:** Yes. I am talking about the building of the rig and the designing and testing of the components as they work together in an assembly in the large-scale fire test. I was suggesting that while the test house is operated by an independent third-party testing authority, the Fire and Rescue Service could witness the tests because there are existing test facilities in Northern Ireland in order have a full understanding of what is being tested.

**Mr Frew:** What are the practicalities of the two tests? If you have your Oxo cube, as you said, in a fume cabinet full of oxygen, would you have to test the material just once, or would it be periodically? On the flip side, if you were to do the full rig test — the practical test — would that be for every building project and development?

**The Chairperson (Dr Aiken):** No, just the material.

**Mr Macklin:** Under the European reaction to fire classifications EN 13501-1, which are effectively your small-scale tests, you are obliged to have initial testing done to categorise and audit with regard to its fire classification. Then you are required, under the European construction products regulation (CPR), to redo that test every two years. We do that across our entire range of products with regard to its initial reaction to fire. With BS 8414, that large-scale test is representative of a sad assembly, and we believe that that assembly should match and replicate what is on the actual building. That test remains valid, provided that neither the product nor the assembly changes from that.

**Mr Frew:** Thank you very much.

**The Chairperson (Dr Aiken):** OK. Team, I have a few final questions. In England and Wales, we are looking at a multibillion-pound housing development programme with a considerable amount of money being spent on infrastructure. England and Wales are going for the changed standard that you do not want to see us adopt here.

However, for the sheer size and volume of those products, along with the ongoing production, I am pretty certain that the insurance industry has taken a view on this and is probably already establishing the fact that particular buildings have to be built to particular standards or else they will not get insurance. So you in the manufacturing sector will have to look at how you service that market. If the insurance industry and the size of the market are stating that that is how they need to go, why are you not planning to repurpose to do that? I ask because the sheer economics of it suggest that that would be the most obvious outcome, if you would like to do it as well.

The second point is that Northern Ireland does not have a very good track record in derogating from rules that come from England and Wales on a whole variety of things; we are not very good with combustible materials or renewable heat incentive (RHI) boilers, and other bits and pieces. The knowledge and information that we normally have for derogation are fairly limited, so, obviously — I see you smiling, Alan, and I understand why, Chris — the reality here is that if England and Wales are doing something, we need to have a very good reason not to do it.

Speaking as somebody who was, unfortunately, in the Royal Navy for 30-odd years and who fought more than a fair number of fires caused by apparently completely incombustible material that turned out to be very combustible, I have real concerns. When the Northern Ireland Fire and Rescue Service tells us its concerns, the Committee takes them seriously. Can you address some of those points in your final comments, please?

**Mr Murphy:** Yes. I will pick them up in order if that is OK. On the first point, we said that we share an objective with the Fire Service and the Committee of providing buildings that are safe for their occupants, the community and for firefighters. That remains our overarching position. We believe that the products are suitable and fit for purpose when tested, and demonstrable proof exists that they are safe in a large British standard 8414 test.

While England and Wales introduced a ban on combustibles, I noted in our initial comments that the number of countries utilising British standard 8414, or similar large-scale system tests, include the United States, Canada, Sweden, Germany, Belgium, France, the UAE, Australia and New Zealand. Therefore, a large number of countries still rely heavily on large-scale system testing and believe that that is a robust way of demonstrating fire safety. I think that that answers all three points.

**Mr Pateman:** Perhaps I can pick up on some of those themes. First, the insurance industry ebbs and flows according to its attitude to risk. We have found that one of the unintended consequences of the ban is that insurers are failing to insure and lenders are failing to lend money against buildings that are well below the 18-metre threshold that we are discussing today and which are made of products that are not aluminium-composite material (ACM) cladding as well. Therefore, there is a deep discussion to be had with the insurance industry about its attitude to risk. Last month, in England, it came up with a new scheme whereby the Government essentially underwrite some of the risk in order to enable people to move house.

If we could find ways of bringing the insurance industry in as principal stakeholders at an early stage, and if the insurance industry were willing to consult in an open manner with us and with you about its attitude to risk and the building estate across Northern Ireland, that would be extremely useful for all of us. We know of occasions where work has been given the go-ahead for remediation of ACM-clad high-rise buildings in England, but the contractors have not been able to get professional indemnity

insurance to enable them to start work on the building because the insurance industry is risk-averse as there is an ACM-clad product on it. It is not a monochrome issue; it is a very complex issue requiring a good deal more transparency from all stakeholders.

My members are not really involved in putting a lot of our products on high-rise residential buildings; our core business is industrial and wholesale buildings and commercial buildings, such as car dealerships. There are quite a lot of mixed, low-rise residential and retail buildings. We find — I think that Alan made this point at the beginning — that if there is uncertainty in the marketplace, you tend to get a specification default that goes well beyond the intention of the legislation. There are serious implications for costs, the time taken to build, and the insurance risks associated with starts and refurbishments as a result of taking a suboptimal decision.

As a last point, one of the things that I have noticed since Grenfell is that so much of the discussion in the industry is about the idea of fire coming into houses from outside because that is what happened at Grenfell.

**The Chairperson (Dr Aiken):** It also comes from the inside.

**Mr Pateman:** You gentlemen will know, I am sure — a look at the Fire and Rescue Service statistics will tell you this — that the vast majority of fires do not start outside and find their way in; they start with a dropped dog-end or a shorted television circuit. They start in a house filled with flammable contents, and those flammable contents lead to a conflagration. That typically breaks out through a window, and that is why you have the 8414 test, as it gives you certainty about how products from outside will perform in the event of a fire.

I went through the NIFRS's major incidents log this morning and could find no evidence of a fire that started on the outside of the building and subsequently compromised people on the inside. Fires tended to start on the inside and permeate their way through fire stopping or penetrations inside the building. Therefore, my only argument is that we need to have a sense of perspective and proportion about this; we cannot legislate to stop people bringing flammable products into their homes. I was astonished to hear, at a European conference two weeks ago, the Dutch talk about what a good idea it would be to have smoke alarms, consumer awareness and flame retardants in our furniture. It is not all bad here: the UK is actually leading on the understanding of fire risk, but we need to be proportionate.

**The Chairperson (Dr Aiken):** Thank you very much, indeed, Fergal, Alan and Chris, for your time. I assure you that your evidence today has really informed the decision-making process of the Committee. For that, I thank you very much.

**Mr Pateman:** Thank you, Chair.