

Mary Creagh MP
House of Commons
London
SW1A 0AA

11th June 2019

Dear Ms Creagh,

I am writing to you from ROCKWOOL, a leading manufacturer of non-combustible stone wool insulation, with regards to the evidence heard by your committee on 14 May. In particular, I wanted to follow-up on two points of discussion on toxic emissions from building materials in a fire scenario.

Façade ventilation and smoke toxicity

Firstly, there was an important discussion on toxic emissions and ventilation, as follows:

Q402 Chair: What do you think Grenfell Tower was? Was it well-ventilated –

Witness, Roy Weghorst: The façade itself – if I look at it and if I look at the research we have done afterwards – back in 2017 we did research into nine different façade build-ups with both mineral fibre insulation as well as a PIR and a phenolic foam with the cladding panel polyethylene cord, as used on Grenfell, and we did toxicity measurements on these nine build-ups because the others were with the fire retardant, ACM, as well as with the limited combustibility ACM. In these readings you see hardly any difference. You see some differences but they are minor because they are in a well-ventilated condition, what you would expect in a fire on a façade where you have oxygen availability.

Q403 Chair: It was an open fire situation at Grenfell?

Witness, Roy Weghorst: The fire on the façade, yes. What burned inside the tower is a different story.

The assertion that the fire on the façade at Grenfell Tower was well-ventilated stands directly at odds with evidence provided by Professor David Purser in his capacity as an expert witness to the Grenfell Tower Inquiry. In his report to the Inquiry, Professor Purser unequivocally concludes that the plastic insulation behind the cladding on Grenfell Tower combusted in under-ventilated conditions, and he describes how that resulted in higher yields of toxic emissions from the insulation.

Specifically, Professor Purser states:

“26. During the early exterior fire, the main source of smoke particulates, carbon monoxide and hydrogen cyanide is likely to have been under-ventilated burning of the PIR insulation in the cavities outside each flat, especially that on the columns, together with other PIR and PUR items in the window surrounds. The PIR also releases organic irritants and acid gases, which combined with HCl from the PVC window surrounds to produce a highly irritant smoke. [...]”

“201. [...] the cladding and insulation materials are important because they are likely to have been the first items ignited other than in Flat 16, were present as a large mass of combustible material, and produced very large amounts of toxic smoke both during the early stages and throughout the fire, affecting almost all of the Tower [...]”

“259. [...] On a preliminary basis I consider that any fire burning the PIR inside the cavity behind the spandrel and particularly behind the column ACM, is likely to have become rapidly under-ventilated, producing higher yields of smoke and toxic gases penetrating into the flat above.”

“267. On this basis I estimate that sufficient smoke from the burning PIR outside a flat may have penetrated into and beyond the flats during the early stages of the fire outside any flat, to cause distress and affect escape capability from other flats where it penetrated into the lobbies. I also estimate that the concentrations of asphyxiant gases in the flat would be sufficient to cause collapse within a few minutes exposure, depending on the pattern of fire development outside and within the flat.”¹

Toxic emissions from insulation materials

Secondly, it was asserted during the session that the type of insulation used makes little difference to the production of toxic smoke, drawing on research from ISO 13785-1 tests as supporting evidence. However, this research has a number of technical weaknesses, including the fact that the test has a low fire load, which fails to replicate the real-life conditions of a building fire.

In his expert witness report to the Grenfell Inquiry, Professor Purser considered this research, stating:

“255. [...] another paper provided to the Inquiry by Kingspan, in which an insulation and cladding a system was subjected to a relatively small fire source in a medium scale ISO 13785-1 standard test carried out by Efectis. In these tests, while there was considerable combustion of the ACM-PE, the involvement of the PIR insulation, and the production of combustion products from it, was minor.”

Professor Purser goes on to say:

“256. When PIR and aluminium foil faced PIR foam are tested in other configurations and conditions the results can differ somewhat. [...] When tested in this way PIR not only burned vigorously, but produced high yields of smoke, CO and HCN during under-ventilated flaming [...] In other tests of a PIR panelled room in the ISO 13784-1 test, with the standard burner and with an additional room fuel contents load in the form of a wood crib, considerable involvement of the PIR panels was obtained and high concentrations of HCN were evolved.”

Further to Professor Purser’s report, the Euroclass Reaction to Fire (RtF) classification system provides clarity around the behaviour of materials in a fire. Mineral wool insulation has an RtF classification of A1, meaning that it is non-combustible and does not make any contribution to the spread of fire. Because it will not burn, the material will by extension not produce any significant toxic smoke and this is noted within the definition of an A1-rated product. By contrast, plastic foam insulation is classified as combustible, and does produce significant quantities of toxic smoke whilst burning.

¹ <https://www.grenfelltowerinquiry.org.uk/evidence/professor-david-pursers-expert-report>



Despite inhalation of toxic smoke being the leading cause of death in fires, current regulations do not contain any restrictions around the use of materials that produce high levels of toxic smoke, nor is there a toxicity standard and accompanying requirement for product labelling. We believe this should be addressed under the current review of Approved Document B and I would be pleased to brief you on how this could be achieved.

Please do let me know if we can be assistance with any further clarifications or details on the matters raised in this letter, and thank you for your time.

Kind regards,

A handwritten signature in black ink, appearing to read 'D Matthews', written in a cursive style.

Darryl Matthews
Managing Director | ROCKWOOL UK