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By post and email to: markwilson@panelagency.com

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Dear Mark,

Certificate of Equivalence
Lindner GFT Fibre Reinforced Calcium Sulphate Board
Performance in terms of Reaction to Fire test data based on test standards EN ISO 1182 and EN ISO 1716, compared to BS 476: Parts 4 and 11

Thank you for your enquiry with respect to the performance of Lindner GFT fibre reinforced calcium sulphate board in terms of reaction to fire. International Fire Consultants Ltd (IFC) have received the following test reports:

- B5238, Technical University of Münich, non-combustibility test of Lindner GFT boards according to DIN EN ISO 1182:2002
- B5178, Technical University of Münich, calorific value test of Lindner GFT board material according to DIN EN ISO 1716:2002

IFC have also received the following Classification Report:

- B9074, Reaction to fire Classification according to DIN EN 13501-1

Product description

The Lindner GFT board is a fibre reinforced calcium sulphate board. The colour is light ivory, i.e. creamy white.

Test methods

ISO 1182 describes a test method in order to determine the non-combustibility of a building material. A cylindrical test sample 45mm in diameter and 50mm high is made. The test sample is then lowered into a small furnace at an average temperature of approximately 750°C. Both during and after the test, the temperatures are measured on the inside and on the outer surface of the test sample.

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The criteria for a material to be identified as non-combustible is that the test sample should not contribute significantly to the temperature development in the furnace and that the specimen, should not produce sustained flaming. After the test the loss in mass is also measured.

ISO 1716 describes a test method for the measurement of the gross heat of combustion (MJ/kg). The gross heat of combustion is a measure of the total heat energy that is provided by a certain quantity of material when it is fully combusted.

Analysis

The ISO 1182 and ISO 1716 tests were performed on test samples with densities of 1018kg/m^3, 1214kg/m^3 and 1415kg/m^3. The temperature rises measured in the small ISO 1182 furnace were 4.2°C, 2.7°C and 3.2°C.

The gross heat of combustion as measured in the ISO 1716 tests were 0.86MJ/kg, 0.88MJ/kg and 0.40MJ/kg respectively.

Based upon the results from the ISO 1182 and ISO 1716 tests, the Lindner GFT board can be classified as A1 to EN 13501-1, and, Classification Report B9074 states that the Lindner GFT calcium sulphate fibre board is classified as A1.

A1 is the highest classification possible to EN 13501-1, and clause A.4.2 of Appendix A in EN 13501-1 makes the following statement *"Class A1 products will not contribute in any stage of the fire including the fully developed fire. For that reason they are assumed to be capable of satisfying automatically all requirements of all lower classes"*, i.e. all other classes defined in EN 13501-1, namely Classes A2, B, C, D, E and F.

Application of results within Approved Document B

The principle that A1 satisfies other lower classes is confirmed within 'Approved Document B', (ADB), the document which gives guidance with respect to the requirements of the **Building Regulations 2000, England & Wales.** Note 1 (European) in Appendix A8 of ADB states *"For the purpose of the Building Regulations…Materials and products listed under Class A1 also meet Classes A2-s3 d2, B-s3 d2, C-s3 d2, and D-s3 d2".**

** IFC explanatory note: A classification that includes 's3 d2' means that there is no set limit for smoke production and/or flaming droplets.*

There are three main requirements within ADB, with regard to 'Reaction to Fire' performance:

a) To inhibit the spread of flame over the surface of the internal linings of the building, (Section B2)
b) To resist the spread of fire over the internal structure of the building, (Section B3)
c) To resist the spread of fire over the external structure of the building, and to adjacent buildings, (Section B4)

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The relevant clauses and sections of Appendix A in ADB describe the different classes of performance, and the appropriate methods of test; referring to both 'National', and 'European', Classifications/Standards. These are discussed below.

Table 10 of B2 in Approved Document B defines the 'Classification of linings' for walls and ceilings, with regards to surface spread of flame. Depending upon the location, the National class required is either Class 0, 1, or 3, whereas, in the respective locations, European classes B-s3 d2, C-s3 d2, or D-s3 d2 would be accepted. Since the Lindner GFT board is classified as A1, this automatically satisfies all requirements of all lower classes.

With regard to the requirements of B3 and B4, Tables 6 and 7 in Appendix A of ADB refer to non-combustible materials, and materials of limited combustibility, respectively. The tables stipulate that materials should comply with the relevant criteria of BS 476: Parts 4 and/or 11 (National class), whereas, in the same applications, a material classed as A1 to EN 13501-1, is deemed to be equivalent; i.e. non-combustible.

Conclusion and identification of applications

The Lindner GFT boards, with densities from 1018kg/m³ to 1415 kg/m³, would satisfy the surface spread of flame performance of interior linings of walls and ceilings in situations where Class 0, Class 1, or Class 3 (National class), or B-s3 d2, C-s3 d2, or D-s3 d2 (European class), is required in Table 10 of Approved Document B.

The Lindner GFT boards, with densities from 1018kg/m³ to 1415 kg/m³, would meet the classification of non-combustible materials, and materials of limited combustibility, (National class), or A1 (European class), as defined in Tables 6 and 7 of Appendix A, respectively, in Approved Document B.

I trust this is of assistance to you.

Yours sincerely,

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