

High Pressure Laminate Cladding

Data Collection

Summary Report

September 2021



Scottish Government
Riaghaltas na h-Alba
gov.scot

Report prepared by:

Building Standards Division, Scottish Government

Report by:
Building Standards Division
Local Government and Communities Directorate
Denholm House
Almondvale Business Park
Livingston
EH54 6GA

Tel: 0300 244 400
e-mail: buildingstandards@gov.scot
web: www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards

© Crown Copyright 2021

Applications for reproduction of any part of this publication should be addressed to:
BSD, Local Government and Communities Directorate, Denholm House,
Almondvale Business Park, Livingston, EH54 6GA

This report is published electronically to limit the use of paper.

Summary

The HPL data collection aimed to collect data across care homes, colleges of further education and universities, high-rise domestic buildings, hotels, independent schools, local authority schools, health buildings and prison service buildings. The different sectors include residential and non-residential buildings.

High pressure laminate (HPL) panels are a form of cladding panel typically manufactured by layering sheets of wood or paper fibre with a resin and bonding them under heat and pressure. The fire performance of HPL varies, depending on the composition and the use of fire retardants. HPL is not considered to present the same fire risk as Aluminium Composite Material (ACM) panels with an unmodified polyethylene (PE) core i.e. the type of panel used on Grenfell Tower.

The data collection exercise used a spreadsheet to capture a range of information on the relevant buildings and the HPL cladding. A total of 393 buildings that had external HPL cladding installed were identified across the eight building sectors. A complete set of data returns was made by five of the sectors. The independent schools and hotel sectors were nearly 90% complete and the care home sector was 54% complete. The extent of use of HPL cladding across the eight sectors, varies from 1% to 12%, however the number of buildings in each sectors varied substantially. The distribution of the buildings that have external HPL cladding installed across the eight building sectors is concentrated in ten local authorities, accounting for 78% of the buildings. The majority of HPL used across the sectors was towards the safer end of fire performance when assessed against either the older British Standard tests or current European Standards tests.

Contents

Summary	iii
1. Introduction	1
2. Fire and high pressure laminate cladding	2
2.1 Fire classification	2
2.2 High pressure laminate	3
3. Methodology	5
3.1 HPL data collection design	5
3.2 HPL data collection questionnaire	6
3.2.1 HPL data collection return - nil return	7
3.2.2 HPL data collection return - positive return	7
4. Findings	8
4.1 Whole survey data summary	8
4.2 High rise domestic buildings	11
4.2.1 Data summary	11
4.3 Care homes	13
4.3.1 Data summary	13
4.4 Hotels	15
4.4.1 Data summary	15
4.5 Prisons	17
4.5.1 Data summary	17
4.6 Schools – local authority and independent	18
4.6.1 Data summary	18
4.7 Universities and colleges	21
4.7.1 Data summary	21
4.8 Health buildings	23
4.8.1 Data summary	23
5. Fire safety in buildings	24
6. Conclusions and recommendations	26
6.1 Conclusions	26
6.2 Recommendations	27
7. References	28

1. Introduction

The Scottish Government has undertaken a data collection exercise to establish the extent of the use of external high pressure laminate (HPL) cladding across a number of building sectors in Scotland. This followed a UK Government commissioned test of a HPL cladding system that passed the large scale fire safety test (BS 8414 and BR135 classification). However it led to the UK Government's Independent Expert Advice Panel (IEAP) advising that other configurations of HPL cladding may not be suitable for high rise domestic buildings.

The HPL data collection undertaken by the Scottish Government was intended as an internal business data improvement exercise to assist and inform the work of the Scottish Government. It aimed to collect data on care homes, colleges of further education and universities, high-rise domestic buildings, hotels, independent schools, local authority schools, health buildings and prisons.

The different sectors include residential and non-residential buildings. The manner in which fire safety is managed differs between the different sectors and building types and this should be taken into account when building owners are assessing the risk and the impact of HPL cladding.

2. Fire and high pressure laminate cladding

The term 'cladding' refers to components that are attached to the primary structure of a building to form non-structural, external surfaces as opposed to buildings in which the external surfaces are formed by structural elements, such as masonry walls.

2.1 Fire classification

The Euroclass system, of BS EN 13501-1, is recognised as the standard to determine the reaction to fire performance of materials across Europe. It classifies the reaction to fire, as well as evaluating multiple aspects such as ignitability, flame spread, heat release, smoke production and propensity for producing flaming droplets/particles. The reaction to fire tests are scenario tests ranging from small scale material tests to intermediate scale tests typically used to assess the fire performance of internal wall and ceiling linings. In the absence of a large scale façade systems test, these tests are often used by regulators to classify the fire performance of façade systems. The European Commission are currently developing a large scale façade system test and preliminary work on this standard is expected to be completed in 2022.

Reaction to fire classes for surface coverings and insulation materials that may be installed behind the surface are divided into seven main classes, as A1 (or non-combustible), which is the best performance through A2 (will not significantly contribute to fire load and fire growth), B, C, D, E and to finally F, the worst fire performance.

As well as reaction to fire, smoke development (classifications lowest to highest - s1, s2 and s3) and the formation of flaming droplets/particles (classifications lowest to highest - d0, d1 and d2) are measured and declared.

Prior to the introduction of European Standards the British Standard, BS 476, was used as the basis of the classification of fire performance. Whilst the building standards no longer refer to BS 476 the relevant parts cited in earlier editions of the technical standards and guidance were as follows:

- BS 476: Part 4 describes the non-combustibility test for materials. The test measures temperature rise and flaming of test specimens under standard heating conditions using a small furnace. Materials that do not meet specified conditions in the standard were deemed combustible.
- BS 476: Part 6 describes a method of testing for the fire propagation of products. The standard specifies the method to determine the fire propagation index of materials and was used primarily for internal wall and ceiling linings.
- BS 476: Part 7 describes the method of testing to determine the classification of the surface spread of flame of products. The standard specifies the test to measure the lateral spread of flame along the surface of a product and gives the related classification system for essentially flat materials, composites or assemblies and was used primarily for the exposed surfaces of walls or ceilings (Classes 1 to 4).
- BS 476: Part 11 describes a method for assessing the heat emission from building materials. Any material that does not flame or cause any rise in

temperature on either the centre of the test specimen or the furnace thermocouples were deemed to be non-combustible.

A Class O product was a classification defined in the relevant building regulations rather than the British Standards. Until the introduction of the European Standards, Class O was one of the highest fire performance classifications that could be obtained by products, and is described by the following:

- The surface material (or where it is bonded throughout to a substrate, the surface material combined with the substrate) has a surface of Class 1 when tested in accordance with BS 476-7: 1997 and has an index of performance (I) not more than 12 and a sub-index (i_1) not more than 6 when tested in accordance with BS 476: Part 6: 1981(1989).

Note: Any product that meets the criteria for a 'non-combustible' classification when tested in accordance with BS 476-4 or assessed in accordance with BS 476-11 achieves the highest possible product classification for reaction to fire.

2.2 High pressure laminate

High pressure laminate (HPL) panels are a form of cladding panel typically manufactured by layering sheets of wood or paper fibre with a resin and bonding them under heat and pressure. They sometimes include additional chemicals to provide fire retardant properties and are available in a wide range of colours and finishes.

Panels which incorporate fire retardant chemicals are sometimes referred to as "FR grade" and these will typically achieve European Standard Classification B-s1, d0. Panels manufactured without fire retardant chemicals are typically Class C or D, depending on the thickness of the panel.

Following the Grenfell Tower Fire and subsequent concerns regarding the fire performance of cladding panels (in particular Aluminium Composite Material (ACM) cladding), the Ministry of Housing, Communities and Local Government (MHCLG) conducted a BS 8414 test of a cladding system comprising an HPL panel with fire retardant (Class B-s1, d0) together with stone wool insulation and fire barriers. This system specification achieved the performance criteria set out in BR135 Fire performance of external thermal insulation for walls of multi-storey buildings. As a result, MHCLG's Independent Expert Advisory Panel (IEAP) consider this combination of materials can be safe on existing buildings, depending on the composition of the entire cladding systems and how it is fitted.

The Scottish Advice Note (2021) has taken a similar view using the evidence provided by the BS 8414 test. However according to the IEAP, HPL panels of Class C or D are unlikely to adequately resist the spread of fire regardless of the type of insulation material exposed behind the cladding. In addition, the IEAP suggest that systems using any type of HPL panels of Class B with combustible insulation are also unlikely to adequately resist the spread of fire.

The level of risk from HPL systems is not as high as the risk from systems using aluminium composite material panels with a polyethylene core (Category 3).

Extensive experimental fire testing in a MHCLG sponsored programme has validated the opinion of the expert panel on this matter.

Note that when the solid constituent parts of HPL panels are tested in the bomb calorimeter, they typically provide a gross heat of combustion of circa 20 Mega Joules per kilogram (MJ/kg) in accordance with BS EN ISO 1716: 2018. The core material used in thin category 3 ACM(PE) panels typically achieve more than double the HPL value at circa 45 MJ/kg.

In conclusion, where HPL panels are installed on buildings, test evidence should be sought which may include small scale, intermediate scale or large scale fire test data. Appropriate panel fixings, support rails and fire barriers within the cavity are extremely important when determining the fire performance of the cladding system. The information gathered should be taken account as part of the holistic fire risk assessment to determine the safety of the building occupants in the case of fire.

3. Methodology

3.1 HPL data collection design

The data collection exercise utilised a spreadsheet to capture a range of information on the relevant buildings and the HPL cladding. The approach was subject to extensive data validation testing. Sequentially numbered, iterative draft versions of the HPL data collection questionnaire were developed for each of the sectors before the final published versions were issued to the respondents via appropriate distribution channels for each sector. For example, care homes were collected via the Care Inspectorate’s registered care homes contacts.

Sector specific requirements are set out in table 3.1.

Table 3.1: Relevant building height and size factor for the different sectors			
Sector	Building height	Floor area	Data collection
Care homes	Any height	Over 200 m ²	Via Care Inspectorate contacts
Colleges of further education and universities	Any height	Any size	Via the Scottish Funding Council to individual institutions
High-rise domestic buildings	Over 18 m	Any size	Via the relevant local authorities
Hotels	Over 18 m	Any size	Via SFRS fire risk contacts
Independent schools	Any height	Over 500 m ²	Via Scottish Government policy area
Local Authority Schools	Any height	Over 500 m ²	Via Scottish Government policy area and local authorities
Health buildings	Any height	Any size	Via Health Facilities Scotland
Prisons	Any height	Any size	The Scottish Prison Service

There were 19 questions as part of the data collection exercise, which are given in table 3.2.

Table 3.2: Question set for the HPL data collection exercise	
1	Is HPL external wall cladding installed on the building?
2	In which local authority is the building located?
3	Who is responsible for the structure of the building?
4	What is the building address?
5	What is the building type?
6	What is the date of the building warrant application for installation of the external cladding with HPL panels?
7	Approximately when was the building completed?
8	What is the height of the floor of the topmost storey above ground level in metres?
9	How many storeys above ground level are in the building?
10	If applicable, what is the total number of residential units in the building?
11	11 a. i. What is the fire classification of the HPL panels?
	11 a. ii. What is the manufacturer's expected lifespan of the HPL cladding from installation?
12	Are there any insulation materials exposed in the external wall cavity?
13	If Yes to Question 12, please identify the type of exposed insulation material?
14	What evidence has been provided to demonstrate compliance of the cladding system with Building Regulations?
15	What is the relative total external wall area covered by the HPL cladding panels?
16	Have you carried out a fire risk assessment on the cladding system?
17	If Yes to Question 16, has any remedial action been identified by the fire risk assessment?
18	If Yes to Question 17, please specify the remedial action identified by the fire risk assessment?
19	If Yes to Question 17, please specify the timescale for remedial action/work?

3.2 HPL data collection questionnaire

Each of the sector specific versions of the HPL data collection questionnaire comprised two worksheets as follows:

- Guidance - includes background and data protection/processing information, instructions and guidance to assist the respondents to answer the listed questions in the HPL data collection return worksheet.
- Data return sheet - HPL data return and HPL data return information tables to be completed, as applicable, by the respondents and submitted to the Scottish Government. Each of the sector specific versions of the HPL data collection questionnaire were issued along with a corresponding sector specific cover letter that detailed the criteria applied to each building sector.

3.2.1 HPL data collection return - nil return

An HPL data collection return - nil return - was an individually or centrally submitted return document completed by a respondent that does not have or record external HPL cladding installed in any single building. HPL data nil returns from the respondents in each sector were submitted either individually for single buildings or collectively for a range of buildings.

3.2.2 HPL data collection return - positive return

An HPL data collection return - positive return was an individually or centrally submitted return document completed by a respondent that does have and records external HPL cladding installed in any single building. HPL data positive returns from the respondents in each sector were submitted either individually for single buildings or collectively for a range of buildings.

The HPL data collection differs from the preceding high rise inventory (HRI) data collection, which will be added to and maintained on a recurring annual basis, in that it is a snapshot of the buildings that it collected data on between January 2020 to February 2021. The HPL data collection is linked to the HRI data collection, which collected data on high rise domestic buildings (HRDBs) across Scotland with a floor level equal to or greater than 18 meters in height. The HRI data was used to prepopulate the HPL data collection questionnaire for that sector prior to it being issued to the nine local authorities in Scotland that have HRDBs located within their respective geographic areas.

4. Findings

4.1 Whole survey data summary

The HPL data collection identified a total of 393 buildings that have external HPL cladding installed across the eight sectors. Table 4.1 provides a summary of the findings across the eight sectors, numbers are also shown in figure 4.1.

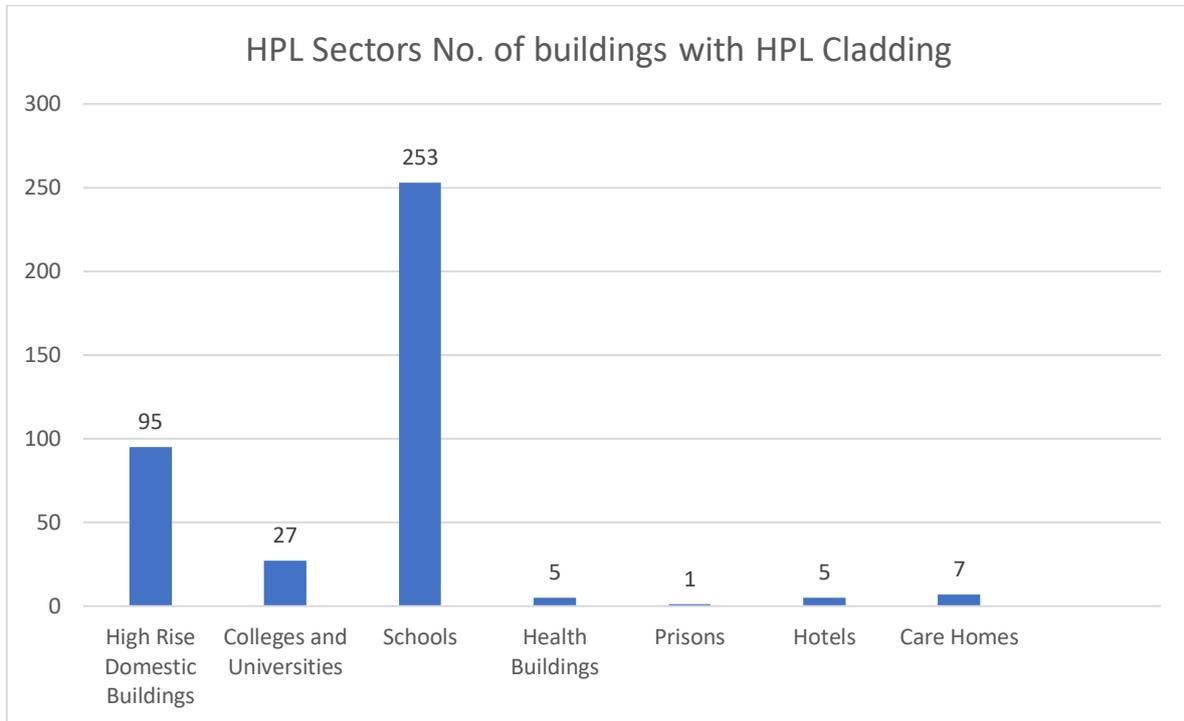
A complete set of data returns was made by five of the sectors. The independent schools and hotel sectors were nearly 90% complete and the care home sector was 54% complete. The care home sector had a high number of buildings and a range of diverse ownerships, including local authorities and a range of private sector and charitable sector providers. Other sectors with larger numbers of buildings such as local authority schools and health buildings had lesser numbers of organisations to communicate with to ensure completion of the datasets.

The extent of use of HPL cladding across the eight sectors, varies from 1% to 12%. For high-rise domestic buildings there were 95 out of 774, or 12%, with external HPL cladding. The local authority school sector has 10% of schools with HPL. Prisons buildings are at 6%, although this is on a much smaller estate of buildings. Whilst the other sectors have between 1% and 5% with HPL.

Table 4.1: Summary of HPL data across eight sectors

	High rise domestic blocks	Colleges and universities	Local authority schools	Independent schools	Hospitals	Prisons	Hotels	Care homes	Totals
Number of buildings in survey	774	1,856	2,448	1,076	1,134	18	99	1,142	8547
Number of buildings with HPL installed	95	27	244	9	5	1	5	7	393
Number of buildings with HPL installed & storey floor \geq 11m	95	10	17	1	0	0	5	0	128
Percentage of total Number of buildings in sector with HPL installed	12%	1%	10%	1%	0%	6%	5%	1%	
Percentage of total No. of buildings with HPL installed	24%	7%	62%	2%	1%	1%	1%	2%	
Percentage Completion	100%	100%	100%	89%	100%	100%	89%	54%	

Figure 4.1: Number of buildings with HPL across all sectors



4.2 High rise domestic buildings

4.2.1 Data summary

The high rise domestic buildings (HRDB)s in the data collection were all over 18 m. Local authorities supplied data for all of these buildings using building warrant records.

In total there were 95 HRDBs across six local authorities that have external HPL cladding installed. Of these 10 were in private ownership and one was owned by a registered social landlord. The remaining 84 were in local authority ownership.

The private blocks had been built with HPL cladding from the outset, with the building warrants being dated between 2005 and 2021. The local authority and Registered Social Landlord owned blocks were typically 1960s and 1970s high rises that had been overclad with HPL cladding from the mid-1990s through to around 2010.

The height of the 95 HRDBs varied from 20 m to 60 m, or between eight and 20 storeys.

The fire performance specification of the HPL cladding is summarised in table 4.2.

Table 4.2: Classification of HPL cladding in High Rise Domestic Buildings	
Cladding specification	Number of buildings
Class 0	41
Euroclass A1 / A2	6
Euroclass B	26
Euroclass C	0
Euroclass D	5
Euroclass E	0
Euroclass F	0
No classification given	17

Table 4.3 sets out the types of insulation used across the HRDBs.

Table 4.3: Insulation used with HPL cladding for High Rise Domestic Buildings	
Insulation specification	Number of buildings
Mineral wool	70
Phenolic	4
Polyurethane	3
Kingspan	1
No detail given / no insulation	17

The most common combinations of HPL fire performance classifications and insulation were as follows:

- Euroclass A2 and phenolic insulation – 4
- Euroclass B and mineral wool insulation – 25
- Class 0 and mineral wool insulation – 40
- Euroclass B and other insulation types – 0
- Class 0 and other insulation types – 1
- Euroclass C, D, E or F and mineral wool insulation – 5
- Euroclass C, D, E or F and other insulation types – 0
- No detail given / polyurethane insulation – 3.

The assessment of compliance with building regulations was carried out on the basis of information given in manufacturers data sheets for 52 buildings, and using third party certification for two buildings. In 11 cases the use of a BRE test report was cited as the basis of compliance. In the remaining 30 cases no information could be provided.

The surface area coverage of HPL cladding across the 95 buildings is given in table 4.4.

Table 4.4: Surface area of HPL for High Rise Domestic Buildings	
Coverage of HPL cladding	Number of buildings
0% to 20%	56
21% to 40%	6
41% to 60%	0
61% to 80%	29
>81%	4
Not known or not stated	0

In 52 cases a fire safety risk assessment (FRA) had been carried out on the building and the cladding, and in 40 of these cases the FRA required some remedial action. The types of remedial action included the following:

- Address shortcomings in cladding and fire compartmentation – 33
- Cavity barrier type and location – 1
- Cavity Barrier type and location - panel compliance queried – 1
- incorrectly installed vertical firebreak reinstalled – 1
- Missing section of mineral wool insulation replaced – 1
- Missing section of vertical fire barrier – 1
- Missing vertical firebreak to 2nd floor level replaced – 2.

4.3 Care homes

4.3.1 Data summary

The care home buildings in the data collection were all equal to or under 8 m. The building owners were local authorities, charitable organisations and private companies who supplied data for these buildings based upon the building warrant records or their own building records.

In total there were seven care home buildings across four local authorities that had external HPL cladding installed. Of these were four that were in charitable and private ownership. The remaining three care homes were in local authority or housing association ownership.

The building warrants of these seven care homes were dated between 1999 and 2016.

The height of the seven care homes varied from 1 m to 8 m, or between one storey and three storeys.

The fire performance specification of the HPL cladding is summarised in table 4.5.

Table 4.5: Classification of HPL cladding in care homes	
Cladding specification	Number of buildings
Class 0	5
Class 2	1
Euroclass A1 / A2	0
Euroclass B	0
Euroclass C	0
Euroclass D	1
Euroclass E	0
Euroclass F	0
No classification given	0

None of the seven care home buildings had any insulation materials exposed in the external wally cavity.

The assessment of compliance with building regulations was carried out on the basis of information given in manufacturers data sheets for three buildings, and using third party certification for one building. In the remaining three cases drawings and specifications were cited as evidence of compliance.

The surface area coverage of HPL cladding across the seven buildings is given in table 4.6.

Table 4.6: Surface area of HPL for care homes	
Coverage of HPL cladding	Number of buildings
0% to 20%	5
21% to 40%	2
41% to 60%	0
61% to 80%	0
>81%	0
Not known or not stated	0

In six cases a fire safety risk assessment had not been carried out on the building and the cladding, and in the one case where a fire safety risk assessment had been carried out no remedial actions were identified.

4.4 Hotels

4.4.1 Data summary

The hotel buildings in the data collection were all equal to or over 18 m in height. The Scottish Fire and Rescue Service (SFRS) and private hotel companies supplied data for these buildings based on operational records or building records.

In total there were five hotel buildings that have external HPL cladding installed across two local authorities. All five were in private ownership.

The hotel buildings have building warrants being dated between 1982 and 2008.

The height of the five hotel buildings varied from 18 m to 40 m, or between six storeys and 13 storeys.

The fire performance specification of the HPL cladding is summarised in table 4.7.

Table 4.7: Classification of HPL cladding in hotels	
Cladding specification	Number of buildings
Class 0	2
Euroclass A1 / A2	0
Euroclass B	1
Euroclass C	0
Euroclass D	0
Euroclass E	0
Euroclass F	0
No classification given	2

Only one of the five hotel buildings had any insulation materials exposed in the external wally cavity.

Table 4.8 sets out the types of insulation used across the hotels.

Table 4.8: Insulation used with HPL cladding for hotels	
Insulation specification	Number of buildings
Mineral wool	1
Phenolic	0
Polyurethane	0
No detail given / no insulation	4

The most common combinations of HPL fire performance classifications and insulation were as follows:

- Euroclass A2 and phenolic insulation – 0
- Euroclass B and mineral wool insulation – 1
- Class 0 and mineral wool insulation – 0

- Euroclass B and other insulation types – 0
- Class 0 and other insulation types – 0
- Euroclass C, D, E or F and mineral wool insulation – 0
- Euroclass C, D, E or F and other insulation types – 0
- No detail given / no insulation – 4.

The assessment of compliance with building regulations was carried out on the basis of information given in manufacturers data sheets for two buildings, and using a Building Warrant completion certificate for one building. In the remaining two cases no information could be provided.

The surface area coverage of HPL cladding across the five buildings is given in table 4.9.

Table 4.9: Surface area of HPL for hotels	
Coverage of HPL cladding	Number of buildings
0% to 20%	2
21% to 40%	3
41% to 60%	0
61% to 80%	0
>81%	0
Not known or not stated	0

In 3 cases a fire safety risk assessment had been carried out on the building and the cladding, and in 2 of these cases the FRA required some remedial action. The types of remedial action included the following:

- The risk assessment requires production of a BR135 assessment to justify the use of Trespa and the cavity barrier design as signed off by building control, which has been put to the original contractor and discussions are ongoing – 1
- Insert extra fire dampening in some voids – 1.

4.5 Prisons

4.5.1 Data summary

The Scottish Prison Service supplied the data for all of the buildings in their estate using their building records.

The single prison building in the data collection is 4 m in height. The building had been built with HPL cladding from the outset, with the building warrant dated from 2009. The single building was two storeys in height.

The fire performance specification of the HPL cladding was Euroclass D, which was used with phenolic insulation.

The assessment of compliance with building regulations was carried out on the basis a fire safety strategy report, by a fire engineering specialist.

The surface area coverage of HPL cladding for the building was less than 20%.

4.6 Schools – local authority and independent

4.6.1 Data summary

The maximum height of the local authority (LA) and independent school buildings in the data collection was 15 m at the floor level of the top most storey. Local authorities and independent schools supplied data for all of these buildings using building warrant records and building records.

In total there were 253 schools buildings across 26 local authorities that have external HPL cladding installed. Of these 244 were in local authority ownership while the remaining 9 were owned or operated by independent schools.

The 253 schools buildings that have external HPL cladding installed have building warrants dated between 1970 and 2019.

The height of the schools buildings varies up to a maximum of 15 m, or between one storey and six storeys.

The fire performance specification of the HPL cladding is summarised in table 4.10.

Table 4.10: Classification of HPL cladding in local authority and independent school buildings	
Cladding specification	Number of buildings
Class 0	98
Class 1	4
Class 2	3
Euroclass A1 / A2	4
Euroclass B	30
Euroclass C	3
Euroclass D	52
Euroclass E	0
Euroclass F	0
No classification given	59

Table 4.11 sets out the types of insulation used across the LA and independent school buildings where any insulation materials were exposed in the external wall cavity.

Table 4.11: Insulation used with HPL cladding for local authority and independent school buildings

Insulation specification	Number of buildings
Mineral wool	13
Phenolic	28
Polyurethane	1
Polyisocyanurate	5
Expanded Polystyrene	1
No detail given / no insulation	4

The most common combinations of HPL fire performance classifications and insulation were as follows:

- Euroclass A2 and phenolic insulation – 0
- Euroclass B and mineral wool insulation – 0
- Class 0 and mineral wool insulation – 11
- Class 1 and 2 phenolic insulation – 2
- Class 2 and polyurethane – 1
- Euroclass B and other insulation types – 7
- Class 0 and other insulation types – 2
- Euroclass C, D, E or F and mineral wool insulation – 2
- Euroclass C, D, E or F and other insulation types – 8
- No detail given / various insulation – 19.

The assessment of compliance with building regulations was carried out on the basis of information given in manufacturers data sheets for 158 buildings, and using third party certification for 21 buildings. Of the remaining cases, 26 demonstrated compliance by others means while no information could be provided in 48 cases.

The surface area coverage of HPL cladding across the 253 buildings is given in table 4.12.

Table 4.12: Surface area of HPL for local authority and independent school buildings

Coverage of HPL cladding	Number of buildings
0% to 20%	147
21% to 40%	64
41% to 60%	25
61% to 80%	10
>81%	3
Not known or not stated	4

In 26 cases a fire safety risk assessment had been carried out on the building and the cladding, and in none of these cases was remedial action required.

4.7 Universities and colleges

4.7.1 Data summary

The maximum height of the university and college buildings in the data collection was 18 m at the floor level of the top most storey. Universities and colleges of further education (FE) supplied the data for all of these buildings using their systems of record.

In total there were 27 university and college buildings across twelve local authorities. Of these nine were owned by colleges of FE, 15 were owned by universities while the remainder were in private or local authority ownership.

The 27 university and college buildings that have external HPL cladding installed have building warrants dated between 1994 and 2019. The height of the 27 university and college buildings varies from 3 m to 18 m, or between one storey and six storeys.

The fire performance specification of the HPL cladding is summarised in table 4.13.

Table 4.13: Classification of HPL cladding in college and university buildings	
Cladding specification	Number of buildings
Class 0	5
Class 1	1
Class 2	2
Class 3	1
Euroclass A1 / A2	1
Euroclass B	9
Euroclass C	1
Euroclass D	6
Euroclass E	0
Euroclass F	0
No classification given	1

Table 4.14 sets out the types of insulation used across the 10 college and university buildings where any insulation materials were exposed in the external wall cavity.

Table 4.14: Insulation used with HPL cladding for college and university buildings	
Insulation specification	Number of buildings
Mineral wool	5
Phenolic	3
Polyurethane	0
Polyisocyanurate	1
No detail given / no insulation	1

The most common combinations of HPL fire performance classifications and insulation were as follows:

- Euroclass A2 and mineral wool insulation – 1
- Euroclass B and mineral wool insulation – 1
- Class 0 and mineral wool insulation – 1
- Class 2 and phenolic insulation – 2
- Euroclass B and other insulation types – 1
- Class 0 and other insulation types – 0
- Euroclass C, D, E or F and mineral wool insulation – 2
- Euroclass C, D, E or F and other insulation types – 1
- No detail given / no insulation – 1.

The assessment of compliance with building regulations was carried out on the basis of information given in manufacturers data sheets for 14 buildings, and using third party certification for five buildings. In one case the use of a BRE test report was cited as the basis of compliance. In the remaining seven cases no information could be provided.

The surface area coverage of HPL cladding across the 27 buildings is given in table 4.15.

Table 4.15: Surface area of HPL for college and university buildings	
Coverage of HPL cladding	Number of buildings
0% to 20%	16
21% to 40%	1
41% to 60%	5
61% to 80%	5
>81%	0
Not known or not stated	0

In seven cases a fire safety risk assessment had been carried out on the building and the cladding, and in two of these cases the FRA required some remedial action to be taken. The types of remedial action included the following:

- The cladding will be removed and replaced with non-combustible material.
- The remedial work identified is the replacement of the panels, these are to be replaced with 8mm Trespa Meteor Fire Rated (FR).

4.8 Health buildings

4.8.1 Data summary

The National Health Service had undertaken a separate, pre-emptive data collection on health buildings that have external HPL cladding installed prior to this data collection. The NHS submitted a positive HPL return based on the separate data collection, which identified five buildings across four NHS Boards that may have external HPL cladding installed. No further details were supplied on these buildings.

5. Fire safety in buildings

Whilst it is not the purpose of this report to provide guidance on fire safety in buildings a range of guidance is available to designers, contractors and building managers for new and existing buildings. The Scottish Building Standards give the requirements for fire safety as set out in the building regulations. Guidance is given in the Technical Handbooks (Section 2) in order to meet the regulations. Building standards are updated regularly and there is routinely, no retrospective application of standards.

The approach to fire safety in buildings varies by the type of building involved as well as factors such as use and height. The risk to occupants is greater if they are asleep during the outbreak of fire as their ability to detect a fire and to escape will be impaired.

Recent changes to the building standards apply to all domestic and non-domestic buildings over 11 m. Since 1 October 2019 cladding systems should have been designed and built from materials with a classification of A1 (non-combustible) or A2 (will not significantly contribute to fire load and fire growth). An alternative route to compliance has been allowed via the large-scale fire test BS 8414 and the assessment in BRE Report BR135. European classifications were introduced into the Scottish Technical Standards in 2002, prior to that reference was made only to British Standards of which Class 0 was one of the highest reaction to fire classifications.

Other measures introduced on or since October 2019 for new build blocks of flats include the following:

- Fire service activated sounders, 18 m plus.
- Minimum of two escape stairs, 18 m plus.
- Automatic fire suppression systems in all flats regardless of height.

The Scottish Advice Note (2021) gives guidance on the fire performance of cladding systems on existing residential buildings.

Guidance on fire safety in high rise domestic buildings in Scotland is given in guidance by the Scottish Government (updated March 2021). The guidance covers fire resistant construction, escape routes, fire detection and warning, evacuation strategies and facilities for use by SFRS. A principle of fire safety is that escape from a fire should not rely on external rescue by the fire service. Fire detection and alarm systems give early warning of fire, although high rise blocks do not normally require a communal fire alarm system. Facilities are available for firefighters to allow them to fight fires in high rise blocks where necessary and alert the building occupants in the unlikely event of a partial or full evacuation.

Other building types use simultaneous or phased evacuation rather than stay put. This is where building occupants react to the alarm and follow the designated means of escape to the place of safety away from the building. Some buildings may be

designed so that evacuation is initially limited to those nearest the hazard, before being extended if necessary to others.

The Fire (Scotland) Act 2005 and The Fire Safety (Scotland) Regulations 2006, are the key elements of fire safety legislation building owners in Scotland must follow. They set out the important responsibilities the duty holder (e.g. employer/premises manager) must fulfil and continue to maintain. The regulations focus on non-domestic buildings as opposed to domestic blocks of flats.

6. Conclusions and recommendations

6.1 Conclusions

The Scottish Government have carried out data collection on HPL cladding and the following points are concluded:

- A total of 393 buildings that had external HPL cladding installed across the eight building sectors. A complete set of data returns was made by five of the sectors. The independent schools and hotel sectors were nearly 90% complete and the care home sector was 54% complete.
- The extent of use of HPL cladding across the eight sectors, varies from 1% to 12%, however the number of buildings in each sectors varied substantially.
- The geographical distribution of the buildings that have external HPL cladding installed across the eight building sectors is concentrated in ten local authorities, accounting for 78% of the buildings.
- High-rise domestic buildings: the majority of buildings have the highest levels of fire performance, either Class 0 from the BS classification, or A1/A2/B Euro-classification. The insulation is mineral wool in the majority of cases, with lesser buildings with combustible insulation. The extent of HPL cladding coverage on the buildings is variable, with four being more than 80% clad and 62 less than 40%.
- Care homes: five buildings have a high level of fire performance, in these cases Class 0, two buildings have lesser fire performance. No care home buildings have insulation exposed in the cavity. The seven care homes have less than 40% cladding coverage.
- Hotels: three buildings have a high level of fire performance, either Class 0 from the BS classification, or B Euro-classification. Mineral wool insulation is present on one building, but no other insulation is present for the other four buildings. The five hotels have less than 40% cladding coverage.
- Prisons: only one prison building had HPL cladding, which had a Euroclass D specification with phenolic insulation. The extent of cladding was less than 20%, and therefore a limited amount across a two storey building.
- Schools: these sectors had the largest number of buildings at 253, and across the widest geographic coverage of 26 local authorities. The fire performance is dispersed across the classifications, although a majority of known classifications are in the higher performing categories, either Class 0 from the BS classification, or A1/A2/B Euro-classification. Insulation exposed in the cladding cavity is limited to a minority of school buildings. The extent of HPL

cladding coverage on the buildings is towards the lower end, with only three being more than 80% clad and 147 less than 20%.

- Universities and colleges: this sector had 27 buildings with HPL. The fire performance is dispersed across the classifications, although a majority of known classifications are in the higher performing categories, either Class 0 from the BS classification, or A1/A2/B Euro-classification. Insulation exposed in the cladding cavity is limited to a minority of buildings. The extent of HPL cladding coverage on these buildings is towards the lower end, with none being more than 80% clad and 16 out of 27 less than 20%.

6.2 Recommendations

The following recommendations are intended for the owners and managers of buildings:

- Consider the external wall, including HPL, as part of a holistic fire risk assessment of a building.
- Use the Scottish Advice Note (2021) to assess and manage the risk from HPL cladding. The scope of the guidance is residential buildings, which cover multi-storey blocks of flats, care homes, hotels, hospitals and other residential buildings.
- For non-residential buildings consider the HPL cladding as part of the holistic approach to managing risk including the means of escape in the event of fire.
- For domestic blocks of flats, use the Practical Guide for External Wall Appraisals (to be published 2021) for the approach and methodology for assessing the HPL cladding system.
- Reference to building standards and related guidance should use the relevant version of the technical handbooks applicable on the date of building warrant application.

7. References

British Standard, BS 476, Fire Tests, BSi, London.

BS 476-4: 1970. Fire tests on building materials and structures. Non-combustibility test for materials.

BS 476-6: 1989 + A1: 2009. Fire tests on building materials and structures. Method of test for fire propagation for products.

BS 476-7: 1997. Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products.

BS 476-11: 1982. Fire tests on building materials and structures. Method for assessing heat emission from building materials

British Standard, BS 8414: Part 1. Test method for non-loadbearing external cladding systems applied to the masonry face of a building, and Part 2: Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame, BSi, London, 2020.

British Standard, BS EN 13501-1. Fire classification of construction products and building elements - Classification using data from reaction to fire tests, BSi, London, 2018.

British Standard, BS EN ISO 1716, Reaction to fire tests for products. Determination of the gross heat of combustion (calorific value), BSi, London 2018.

Building Research Establishment, BRE Report BR135, Fire performance of external thermal insulation for walls of multi-storey buildings: Third edition, BRE Global Ltd., 2013.

Ministry of Housing, Communities and Local Government, Fire performance of cladding materials research, [Fire performance of cladding materials research - GOV.UK \(www.gov.uk\)](http://www.gov.uk), London, 2020.

The Scottish Government, Practical fire safety - existing high rise domestic buildings: guidance, [Practical fire safety - existing high rise domestic buildings: guidance - updated March 2021 - gov.scot \(www.gov.scot\)](http://www.gov.scot), updated March 2021.

The Scottish Government, Scottish Advice Note, Determining the fire risk posed by external wall systems in existing multi-storey residential buildings, [External wall cladding systems advice - gov.scot \(www.gov.scot\)](http://www.gov.scot), 2021.

The Scottish Government, Practical guide for single building assessment - external wall appraisal (to be published 2021).

The Scottish Government, Building standards technical handbook 2020: domestic, [Building standards technical handbook 2020: domestic - gov.scot \(www.gov.scot\)](http://www.gov.scot), April 2021.

The Scottish Government, Building standards technical handbook 2020: non-domestic, [Building standards technical handbook 2020: non-domestic - gov.scot \(www.gov.scot\)](http://www.gov.scot), April, 2021.



Scottish Government
Riaghaltas na h-Alba
gov.scot

© Crown copyright 2021

OGL

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3 or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at www.gov.scot

Any enquiries regarding this publication should be sent to us at
The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

ISBN: 978-1-80201-344-3 (web only)

Published by The Scottish Government, September 2021

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS931046 (09/21)

w w w . g o v . s c o t