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INSURANCE INDUSTRY

ALUMINIUM COMPOSITE PANEL AND OTHER COMBUSTIBLE FAÇADE MATERIALS

RESIDUAL HAZARD IDENTIFICATION/REPORTING PROTOCOL

Introduction

A number of multi-level building fires in Australia and overseas have resulted in Federal and State governments inquiring into risks arising in buildings where non-conforming and non-compliant building products have been used. Governments are particularly focused on the potential risks caused by inappropriate use of some types of aluminium composite panels (ACPs) and other combustible façade materials (CFMs).

A joint initiative from fire protection professionals

Insurers in providing insurance cover for a building, set premiums according to the residual risk (considering effective risk mitigation measures implemented for the building), of damage occurring and a claim being made against the policy. The higher the probability of a damaging event occurring, the higher the premium.

Through the Insurance Council of Australia (ICA), insurers have agreed on a Residual Hazard Identification Protocol for the identification of residual risk presented by the use of ACPs and CFMs.

Critically, the evaluation of exposure relative to a building where ACPs or other CFMs are present needs to be conducted on a case-by-case basis. That evaluation will only be performed by competent fire protection professionals, including fire safety engineers, assessing the most critical exposures, safety to life and compliance to the Building Code.

Building owners should consider working closely with their insurer to ensure that the identification and evaluation process adopted for the building, including those engaged to undertake the evaluation process, will be considered sufficient for ongoing underwriting of the building.

Purpose

The purpose of this protocol is to provide a consistent methodology, in circumstances where ACPs or other CFMs are considered to be present, for assessment and reporting of the residual risk, suitable for both building owners (to make decisions) and underwriters (to set premiums).

Intent

This protocol should be referenced by all stakeholders involved in assessing building risk posed by ACPs or other CFMs. Adopting this protocol will produce reports that are consistent across all jurisdictions and will be meaningful to building owners and their insurers.

Approach

The approach includes both the identification of the material used and the installation methodology - the whole wall assembly. This will enable assessment of the risks posed by use of the materials, which may then trigger consideration of remedial actions to lower a building's residual risk to acceptable levels.

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RESIDUAL HAZARD IDENTIFICATION/REPORTING PROTOCOL

3 STEPS

1 IDENTIFY MATERIALS

OVERVIEW

The identification of ACPs or other CFMs is the critical first step in the process of identifying the potential hazard to life and property. The purpose is to accurately classify and quantify the materials present including the insulation and sarking, in order to determine the fire load along with its location and proximity to ignition sources. Representative, appropriate and documented sampling and observations to assist a Certified/Accredited Fire Engineer's Risk Assessment is required. Once identification and quantification is achieved, this enables respective parties to consider Steps 2 and 3 of this protocol.

REPORT QUESTIONS

1. Who has carried out inspections, sampling and testing for the building owner; location of the sampling and tests carried out on the cladding and insulation material; company name, relevant competencies, qualifications and experience of testing laboratories used to test the samples?
2. What category(s) of ACPs or other CFMs, are present on the building and location of each type?
3. What quantity of the material is present and extent of coverage (m^2)?
4. What substrate or insulation is present behind the ACP(s)?

2 EVALUATE RISK

Using the identification and quantification outcomes of Step 1, the purpose of this step is to provide a consistent report into the exposure of the building regarding the presence of ACPs or other CFMs.

This output is dependent upon the category of the ACP or identification of other combustible façade material determined in Step 1, as well as its configuration on the building and any fire protection systems that reduce the risk.

5. What potential ignition sources exist for the ACP(s) or other CFMs given the configuration of the building?
6. What exposures exist to the safety of the occupants based on the Step 1 outcomes?
7. Is the building compliant, with regard to ACPs or other CFMs, with the National Construction Code and associated Australian Standards?
8. What are the exposures to the property and consequential business interruption risk of a fire involving the ACP or other façade material?
9. What exposures exist to the reputation, image and market value of the building as a result of the ACP or other façade material identified?

3 REMEDIAL ACTION

Remedial actions (if any are required) will be different from building to building and dependent on the category and quantity of ACPs or other CFMs, as well as insulation/sarking installed.

Depending on the quantity of installation, configuration and extent, there is the potential for actions to be taken that would not necessarily involve 100 per cent replacement.

10. What remedial actions are necessary (if any) to address unacceptable risks to the building due to the presence of unsuitable ACPs or other CFMs?

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Insurers have observed that ACPs typically come in four general categories defined by the composition of their core materials ranging from A – High fire risk, through to D – non-combustible as follows:

A. 30-100% Organic Polymer and 0-70% inert – Similar to *Category 3 in the BRE appendix*
Inert materials are considered those that do not contribute to combustion.
ACP's in this category typically have close to 100% organic polymer in their core and were identified by most manufacturers as PE (Polyethylene) core. Some core binders are polymers other than PE.

B. 8-29% Organic Polymer and 71-92% inert – Similar to *Category 2 in the BRE appendix*
Typically identified by ACP manufacturers as fr, FR, Plus or rated Class B per EN 13501 and typically have around 30% organic polymer in the core however some State Regulations limit the PE content to less than 30% for this category.

C. 1-7% Organic Polymer and 93-99% inert – Similar to *Category 1 in the BRE appendix*
Typically identified by ACP manufacturers as A2, rated as Class A2 per EN 13501. These are considered as having very limited combustibility. Testing to EN 13501 and obtaining class A2 is a valid alternative.

D. 0% Organic Polymer and 100% inert – Similar to *Category 1 in the BRE appendix*
Typically, panels tested or deemed non-combustible by the building code (National Construction Code). These could be aluminium skins with low adhesive aluminium honeycomb cores, compressed fibre cement core or even compressed fibre cement panel. Steel panels with calcium silicate or similar core.

Category	Polymer Percentage	Polymer%	Inert Filler%
A	30-100% Polymer and 0-70% inert materials	30-100%	0-70%
B	8-29% Polymer and 71-92% inert materials	8-29%	71-92%
C	1-7% Polymer and 93-99% inert materials	1-7%	93-99%
D	0% Polymer and 100% inert materials or deemed non-combustible by the National Construction Code	0%	100%

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In cases where there is no documentation associated with the building's construction, or where available documentation lacks the necessary information to positively identify the ACPs that have been installed; or where there is sufficient doubt that the ACPs installed are not what is documented (substitution), it is necessary for samples of the ACP, along with sarking and insulation materials behind any ACP, to be subjected to testing to clearly identify the composition and combustibility of core material and the insulation/sarking behind the panel. Importantly, visual examination of the ACP or small flame application to a sample, in these circumstances, is insufficient on their own for identification purposes.

Reports

Cladding composition reports should be on official laboratory letterhead/report and must clearly indicate sampling, submission, analysis, discussion and conclusions as well as positions of the signatories of the report.

Reports commissioned by a building owner using this protocol should answer the following questions:

1. Who has carried out inspections, sampling and testing for the building owner; location of the sampling and tests carried out on the cladding and insulation material; company name, relevant competencies, qualifications and experience of testing laboratories used to test the samples?
2. What category(s) of ACPs or other CFMs, are present on the building and what are the location(s) of each type?
3. What quantity of the material is present and extent of coverage (m^2)?
4. What substrate or insulation is present behind the ACP(s)?
5. What potential ignition sources exist for the ACP(s) given the configuration of the building?

Other Combustible Façade Materials

Apart from ACPs, other façade materials of concern include:

1. Rendered expanded polystyrene (EPS). Where this material is identified on Class A or B buildings, its presence shall be reported. Identification is typically visual once a sample is taken.
2. Insulated Metal Panels. Where this material is identified on facades of Class A and B buildings, the metal facing and core material needs to be identified as follows:
    a) The facing would typically be steel or aluminium but could also be plywood, fibreglass or plastic.
    b) The core material would typically be – Expanded polystyrene, phenolic encapsulating expanded polystyrene beads (XFLAM or Polyphen), polyurethane or polyisocyanurate.
3. For the above materials, accurate identification of all components is required. This protocol does not provide risk ranking for all the material types.

Testing Laboratories

ICA members, Engineers Australia, the Fire Protection Association of Australia and fire safety engineers, have worked with accredited laboratories to agree upon a series of controlled tests that will identify the core composition of installed ACP materials on a building. The tests have been verified by providing known samples of each category of ACP. Each sample was coded and provided to independent labs for testing. Results were compared to ensure that the testing methods used provided results that accurately identified the ACP into the correct category.

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1

IDENTIFY MATERIALS

The identification of ACPs or other combustible façade materials is the critical first step in the process of identifying the potential hazard to life and property. The purpose is to accurately classify and quantify the materials present including the insulation and sarking, in order to determine the fire load along with its location and proximity to ignition sources. Representative, appropriate and documented sampling and observations to assist a Certified/Accredited Fire Engineer's Risk Assessment is required. Once identification and quantification is achieved, this enables respective parties to consider Steps 2 and 3 of this protocol.

Testing Laboratories

UQMP has over 20 years history of providing an investigation and analysis service to industry in the science and engineering of materials. UQMP resides within the UQ Consulting and Research Expertise section. UQMP uses FTIR and SEM/EDS to identify the constituents of ACP and insulation samples. For difficult samples the extensive facilities at UQ can be utilized. Reports are designed for fire safety engineers to perform risk assessments and results are reported using both ICA and State Government criteria.

Please contact Mr Jim Haig on 07 33653827 or projects@uqmp.uq.edu.au

Mark Wainwright Analytical Centre, UNSW. Provides independent analytical testing using FT/IR to identify the polymers in aluminium cladding, X-Ray Diffraction Spectroscopy to identify the mineral filler in the core and X-Ray Fluorescence Spectrometry to determine the percent composition of the mineral matter. We provide a written report together with analytical results and interpretation of results to indicate the ICA Category of façade materials tested.

Please contact Mr Terry Flynn on 02 9313 7908 or t.flynn@unsw.edu.au

CSIRO offers a wide range of specialist laboratory and engineering services to Australian industry and building owners. We can provide testing and identification ACP cladding core via analytical techniques, delivering a comprehensive report classifying materials in accordance with the ICA categories. CSIRO is an NATA Accredited Testing Laboratory for a wide range of materials performance tests and specifically the Ash testing ASTM D5630 Procedure B which forms part of the ACP identification procedure. In addition to ACP characterisation, we provide fire testing to the AS 1530 series of standards as well as full-scale evaluation to the new AS 5113 test for external walls. Our fire safety engineering experts can provide building audit and assessment, advice on structural fixing, regulatory compliance, help with selection of test methods, and independent third-party peer review.

Please contact us at firesafety@csiro.au or call our telephone enquiries team on 1300 363 400 and ask for ACP core categorisation. More information.

General Industry Surveillance (GIS) offers a wide range of materials testing services to fire engineers, building owners, building insurers, and other stakeholders in Australian industry. We can accurately identify the flammability, composition and toxicity of ACPs and insulations, and provide ACP classification in accordance to the ICA categories. GIS labs, supported by RMIT University, use an extensive range of analytical techniques including FT-IR, XRD, XRF, and other facilities to identify polymers and mineral fillers compositions in aluminium claddings. Our materials experts, which are mostly PhDs in chemistry, are also specialised in phase and elemental analysis for minerals, metals, polymers, composites, and many other material types.

Please contact us by email lab@gisteks.com or by phone 0423 735 578.

ExcelPlas Pty Ltd is an Australian specialist laboratory for the identification and testing of polymeric materials. With more than 25 years' experience, ExcelPlas is acknowledged as a leading provider of specialist analytical and technical capabilities for the building and construction industry in the area of polymer analysis. ExcelPlas Labs use a range of analytical techniques to assist building owners, building managers, building insurers, fire engineers and other stakeholders to provide advice relating to the flammability potential, composition and toxicity of cladding materials. ExcelPlas is a NATA-accredited laboratory and is ISO/IEC 17025 compliant. Please contact our head office on 03 9532 2207, or email info@excelplas.com for further information.

CETEC Pty Ltd is a technical and scientific risk management consultancy. With more than 30 years' experience, CETEC is acknowledged as a leading provider worldwide of specialist technical and scientific risk management solutions for the built environment. Through Foray Laboratories Pty Ltd, which is wholly owned by CETEC, we can use a range of sampling and analytical techniques to assist building owners, building managers, building insurers, fire engineers and other stakeholders to provide advice relating to the flammability potential, composition and toxicity of cladding materials and emissions . Foray Laboratories is a NATA-accredited laboratory and is ISO/IEC 17025 compliant.

Please contact our head office on +613 9544 9111 or email info@cetec.com.au for further information.

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2 EVALUATE RISK

Using the identification and quantification outcomes of Step 1, the purpose of this step is to provide a consistent report into the exposure of the building regarding the presence of ACPs or other CFMs.

This output is dependent upon the category of the ACP or identification of other CFM determined in Step 1, as well as its configuration on the building and any fire protection systems that reduce the risk.

Using the identification and quantification outcomes of Step 1, the purpose of this step is to provide a consistent report into the exposure of the building regarding the presence of ACPs or other combustible façade materials. This output is dependent upon the category of the ACP or identification of other combustible façade material determined in Step 1 and should make findings with regard to the following questions:

5. What potential ignition sources exist for the ACP(s) or other CFMs given the configuration of the building?
6. What exposures exist to the safety of the occupants based on the Step 1 outcomes?
7. Is the building compliant, with regard to ACPs or other CFMs, with the National Construction Code and associated Australian Standards?
8. What are the exposures to the property and consequential business interruption risk of a fire involving the ACP or other CFMs?
9. What exposures exist to the reputation, image and market value of the building as a result of the ACP or other CFMs identified?

Reports commissioned by a building's owner to make findings on the exposure should consider all features and factors. Some examples are provided below of guidance only.

Category B (8%-29% Organic Polymer core ACP).
The evaluation of the exposure to this type of ACP is more complex, with the existence of a combustible or semi-combustible (fire retardant) insulation or sarking in the cavity being a defining factor. Recently completed and published full-scale façade fire tests (BS 8414-1:2015) conducted by BRE Global (a fire testing laboratory in the UK) on behalf of the UK Department for Communities & Local Government showed this category of panel, when combined with a PIR or Phenolic insulation, with horizontal and vertical non-combustible cavity barriers (not typically provided in Australia), resulted in flaming above and to the top of the test structure respectively. The prime concern for stakeholders is how much more severe the fire spread would have been without the cavity barriers. Where a quantity of 8-29% organic polymer ACP present is combined with combustible or semi-combustible insulation materials, and relevant ignition scenarios exist, adverse findings to the four questions above should consider the risk as HIGH and Step 3 remedial action may be required, unless appropriate internal fire suppression and protection systems exist to reduce the risk. Where the insulation is considered close to non-combustible - mineral wool or fibreglass, and the sarking has a flame spread rating of less than 5 to AS 1530.2, the risk could be considered as low.

Category A (30%-100% Organic Polymer core ACP).
The exposure should be considered similar to that demonstrated by the Lacrosse Building fire (Melbourne), which was an ACP panel fire with fibreglass insulation and reflective foil sisalation in the cavity and an internal building sprinkler system (combined sprinkler/hydrant system sharing a redundant water supply). The Grenfell fire had the added impetus of a combustible foam-based insulation material behind it and no internal sprinkler protection[i].
Where the quantity of 30-100% organic polymer ACP present is considered to be sufficient to sustain a fire, and relevant ignition scenarios exist, adverse findings to the four questions above should consider the risk as HIGH and Step 3 remedial action may be required.

Categories C and D (1% - 7% and 0% Organic Polymer core ACP or deemed as non-combustible)
The fire risk presented by this material can be considered as LOW regardless of quantity, ignition scenarios and type of insulation.

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3

REMEDIAL ACTION

Remedial actions (if any are required) will be different from building to building and dependent on the category and quantity of ACP or other combustible façade material, as well as insulation/sarking installed.

Depending on the quantity of installation, configuration and extent, there is the potential for actions to be taken that would not necessarily involve 100 per cent replacement.

Remedial actions for consideration

Remedial actions (if any are required) will be different from building to building and dependent on the category of ACP or other combustible façade material and insulation/sarking installed. Depending on the quantity of installation, configuration and extent, there is the potential for actions to be taken that would not necessarily involve 100 per cent replacement.

The report submitted to the building's owners with regard to Step 3 should address, in detail if necessary, a response to the following question:

10. What remedial actions are necessary (if any) to address unacceptable risks to the building due to the presence of unsuitable ACP or other combustible façade material?

The acceptability of any such (alternative or performance) solutions should be agreed by all parties involved – such as the appointed fire safety engineer, the owner, insurer, regulator and fire authority – before any work is carried out.

The importance of consulting with the relevant jurisdiction's building regulator and fire authority cannot be stressed enough in response to this question.

Other resources

- Society of Fire Safety Practice Guide
- BRE Global ACP/Insulation Fire Tests

Conclusions

Inspections, assessments and reports commissioned by a building owner to determine the risk associated with the presence of ACPs on a building should be carried out by competent fire protection professionals and including fire safety engineers.

A consistent methodology – yielding responses to the 10 questions above and able to be accepted by the broadest possible regime of underwriters and other building professionals – is essential.

For further information contact

Karl Sullivan
Head of Risk and Operations
Email: ksullivan@insurancecouncil.com.au

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