

Exposing the Gaps in ACP Cladding Fire Testing: A Call for Scientific Integrity

by CCN Editor



In recent years, the fire risks associated with aluminium composite panel (ACP) cladding have become a pressing concern in the construction industry. While various testing methodologies exist, serious shortcomings in the way cladding materials are analyzed and evaluated continue to put public safety at risk.

The Critical Need for Proper ACP Testing

ACP testing is fundamental to understanding the true fire risks of cladding materials. However, not all testing methods provide the level of detail necessary for an accurate assessment. Many labs in Australia, for instance, still rely on outdated and insufficient techniques such as muffle furnace ashing tests. These tests offer only partial insight into the composition of the cladding, missing crucial information about its fire resistance properties.

Why Material Science Matters More than Engineering Assumptions

One of the biggest misconceptions in cladding analysis is the reliance on building engineers and academics who may lack deep polymer knowledge.

Proper assessment of ACP cladding requires expertise in polymer chemistry and material science—fields that delve into the molecular structure and performance characteristics of flame-retardant additives.

ExcelPlas, a leading polymer testing lab in Melbourne, has demonstrated that accurate cladding testing must go beyond simple burning assessments. Their use of x-ray diffraction (XRD) technology ensures precise identification of mineral flame retardants, distinguishing between cheap fillers like calcium carbonate (calcite) and talc (magnesium silicate) versus true fire-resistant additives such as aluminium trihydrate (ATH) and magnesium dihydroxide (MDH).

The Truth About Fire Retardants

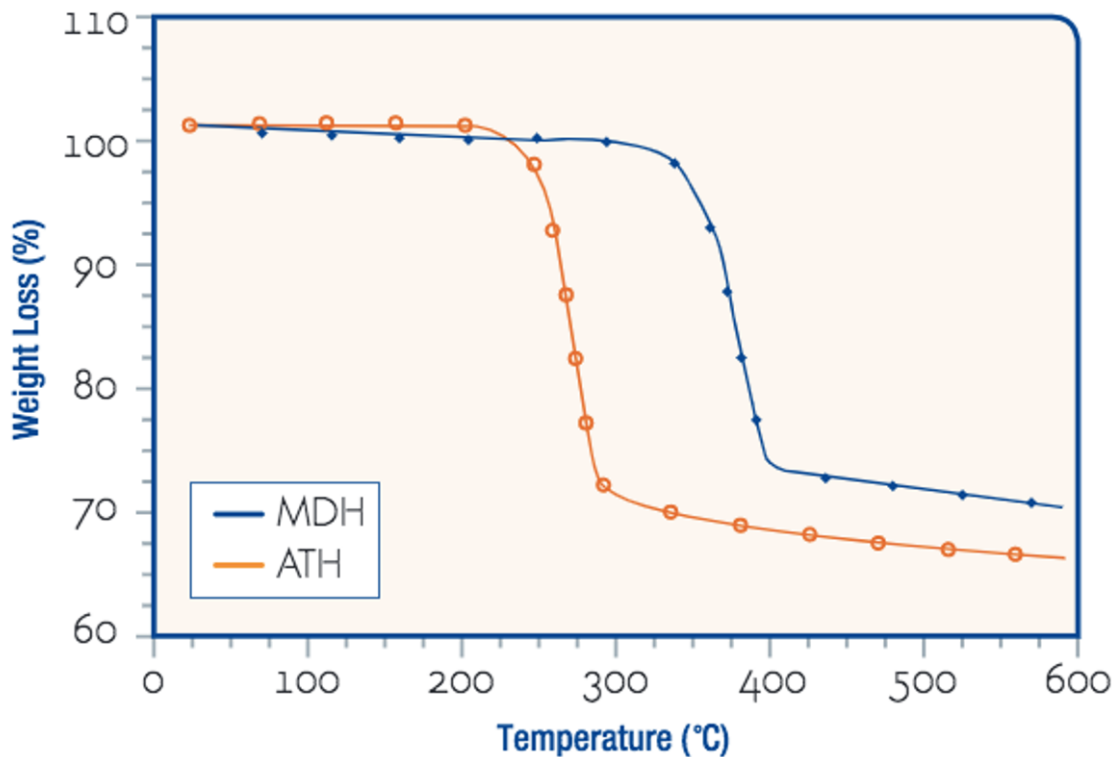
The key factor in fire-resistant ACP cladding is not just the presence of fillers but the ratio between the polymer and the flame-retardant components. True flame retardants like ATH and MDH work by releasing water vapor when exposed to high temperatures, cooling the flame and forming a protective barrier over the polymer.

Thermal decomposition reaction (endothermic):



- Take heat away from the flame
- Water vapors dilute volatile polymer decomposition products (fuel)
- Form protective metal oxide layer on polymer surface

The difference in their thermal decomposition properties—occurring at temperatures approximately 100°C apart—demonstrates why comprehensive testing is necessary to determine the true fire performance of ACP materials.



Uncovering the Flaws in Fire Spread Analysis

Another critical discovery is the varying fire spread mechanisms among different types of ACP cladding. Fire can spread both vertically and horizontally, but the rate of spread depends on the precise formulation of the cladding core. A well-balanced formulation with a high proportion of active flame-retardant minerals can significantly slow fire propagation, reducing overall risk.

However, many industry-standard tests fail to differentiate between slow-burning combustible materials and those that ignite rapidly. This lack of nuance in fire safety classification leads to inaccurate risk assessments, potentially leaving hazardous materials in circulation under the guise of compliance.

A Call for Transparency and Better Testing Standards

The construction and safety industries must prioritize scientific accuracy over convenience when evaluating cladding materials. The message is clear: testing should be performed by highly specialized polymer laboratories capable of conducting precise de-formulation and reverse engineering analyses. Only then can we confidently identify the true risk profile of ACP cladding and prevent future disasters.

Public safety depends on rigorous scientific scrutiny, not outdated testing methods that tell only half the story. It's time for regulatory bodies, industry professionals, and policymakers to demand higher standards and ensure that only the most reliable fire-resistant materials make it onto our buildings.

