



## TECHNICAL BULLETIN NO. 8

**PRODUCT:** XFLAM® INSULATION

**MAY 2010**

**SITUATION:** PRODUCTS OF COMBUSTION

**APPLICATION:** GENERAL CONSTRUCTION

**ISSUE:** Fire rated materials are used to protect life and property by delaying the development of a fire. Products of combustion from these materials should not contain highly toxic gases.

**BACKGROUND:** Fire safety of buildings with public access, accommodation facilities or other uses has long been a well regulated and controlled property through building codes and various compliance documents. Insulated panel has come into the spotlight with some large scale fires occurring in polyurethane and polystyrene insulation cores, which have been in code compliant buildings.

The three most widely accepted fire resistant panel insulation materials are :-

- XFLAM a syntactic foam composite
- Mineral Wool a blanket made from molten fibres of volcanic rock
- Polyisocyanurate (PIR) a modified polyurethane

Mineral wool is classed as a non-combustible material and therefore provides not only the ultimate fire protection for an insulated panel, but also during the initial stages of fire development will not produce any combustion products. XFLAM and Polyisocyanurate are both thermoset plastics and do not support the spread of fire, but will burn ultimately.

It is therefore appropriate to confirm that any smoldering areas of these products are not releasing potentially dangerous combustion products. A test simulating the two core materials encapsulated within the steel facings of a panel produced the following combustion products under a heat load of 25kW/m<sup>2</sup>. (Reference 1)

GAS	XFLAM Colorimetric tube (ppm) 8mins	PIR Colorimetric tube (ppm) 8mins
CO <sub>2</sub>	600	600
CO	600	500
Hydrogen Cyanide	Below LoQ	10

Where ND = not detected and LoQ = limit of quantification

Furthermore data from exhaust gas analysis of cone calorimeter tests and corner room tests showed high concentrations of isocyanates from PIR samples even in a strongly oxidising environment. (Reference 2)

Total isocyanates from PIR were measured at 1.8ppm, being close to the NOSH immediately dangerous to health level of 2.5ppm

XFLAM® is free from compounds containing nitrogen and therefore does not produce the severely toxic combustion products typical of PIR. The message from these tests is clearly that while PIR shows good fire performance it is not a sensible option for habitable spaces.

Approval

Technical Manager  
XFLAM Pty Ltd

References:

1. INTERSCIENCE COMMUNICATIONS REPORT 5TH MAY 2010
2. PARTICLES AND ISOCYANATES FROM FIRES, HERTZBERG, BLOMQVIST, DALENE & SKARPING. SWEDISH NATIONAL TESTING AND RESEARCH INSTITUTE.