AS1530.4 Fire Performance Test

Reference seal

Ceram Polymerik ceramifying flame retardant glazing seal

Benefits of Ceram Polymerik Technology:

- forms a ceramic structure in a fire
- more flexibility than existing systems
- halogen free where necessary
- lower smoke development
- potentially lower toxicity
- greater design freedom
- reduced component weight
- moisture and corrosion resistance
- can be coloured
- cost efficiency

Potential Fire Protection Applications:

- door and window components
- gap seals for concrete wall panels
- ducting and building penetrations
- structural steel protection
- fire protection in marine and transport
- partitions, ceilings and wall linings
- equipment security
- fire barriers for material storage
- protection from incendiary devices

Products

We work closely with customers to identify, develop and supply products or technology for a wide range of applications. We can supply:

- compounds for extrusion or injection moulding
- pre-blended additive packages
- semi finished products

The ultimate passive fire protection
technology

We would be pleased to hear more about your passive fire protection needs. Please contact our office by telephone: +61 3 8508 9508 or email: info@cerampolymerik.com or visit www.cerampolymerik.com

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The Company

Ceram Polymerik Pty Ltd is a rapidly growing company established to commercialise innovative new technology in polymer composites for passive fire protection. In a fire, these composites transform into a ceramic structure once the activation temperature is reached. The technology is very effective in a wide range of plastics and rubbers. Composites can be made flexible or rigid to meet the particular requirements of a fire protection component or material.

This technology evolved from several years of Research & Development by the Cooperative Research Centre for Polymers. As a world first, the technology has been successfully commercialised by **Olex Australia (www.olex.com.au)** as insulation for their **Pyrolex® Ceramifiable®** high performance fire cable. The cable is flexible under normal conditions but forms a protective ceramic barrier when exposed to heat and fire. Even after 2 hours at 1000° C, the cable can continue to conduct electricity because of the protection provided by the ceramic cover. Further information on these cables can be obtained from Olex.

The technology is covered by several patents. Ongoing Research and Development is expected to result in additional patents covering new ceramifying technology.

WHAT IS PASSIVE FIRE PROTECTION?

Passive fire protection refers to products in buildings, structures or transport vehicles that enhance fire resistance. The aim is to counteract the movement of heat and smoke between floors, rooms or compartments by sealing penetrations, prolonging stability or creating barriers to the passage of fire, heat or smoke.

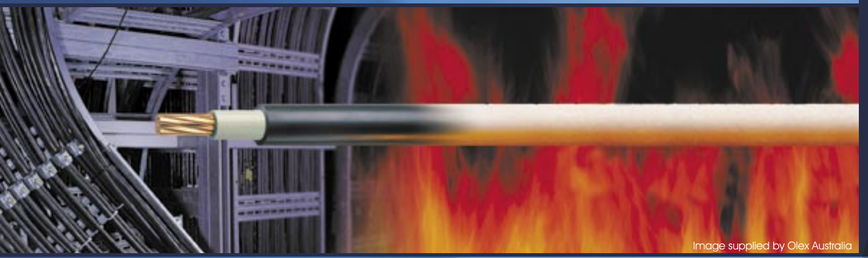
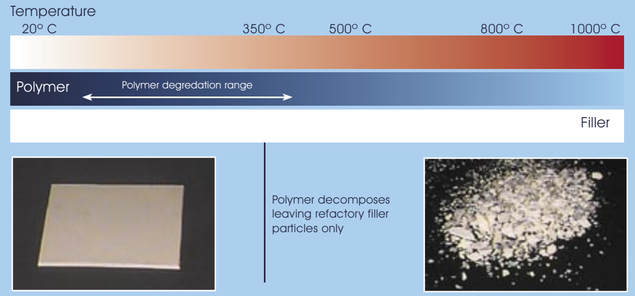


Image supplied by Olex Australia

How does this innovative technology work?

In conventional polymer composites (plastics and rubbers), inorganic components such as talc and clays are widely used as fillers. When burnt in a fire, these conventional polymers leave behind a powdery ash, which provides little or no fire protection **(Figure 1)**.
Ceram Polymerik's ceramifying polymer technology provides an innovative new approach for passive fire protection.

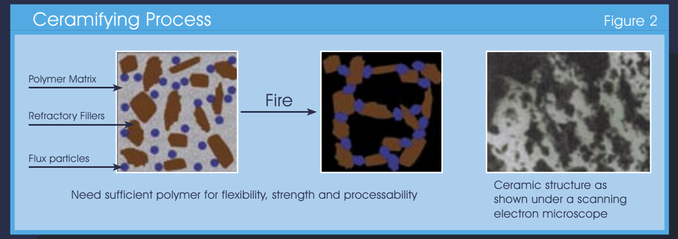
Conventional Mineral Filled Plastics and Rubbers — Figure 1



Ceram Polymerik's patented technology performs well in most types of plastics and rubbers. A complex mixture of refractory components, fluxing agents and other inorganic ingredients are used. These composites can be processed on conventional extrusion or injection moulding equipment. At normal service temperatures, they behave like conventional polymers, with similar physical and mechanical properties.

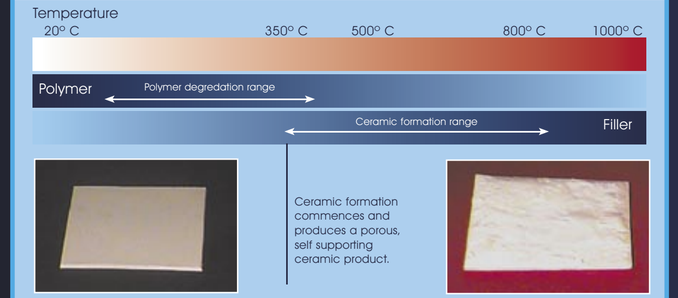
Ceram Polymerik technology makes
"plastics and rubbers more firesafe"

Ceramifying Process — Figure 2



In a fire situation, the fluxing agents bind the refractory fillers together as the polymer burns off. A solid or semi-porous ceramic structure is left, which retains the integrity of the original article, thus acting as a fire barrier **(Figure 2)**. The ceramic is stable even after exposure to temperatures exceeding 1000° C. A typical ceramic structure is shown in the scanning electron microscope photo above.

Ceramifying Plastics and Rubbers — Figure 3



By optimising the formulation, the temperature at which the ceramic starts to form may be adjusted, within a range of 350 to 800° C, to fit a particular application **(Figure 3)**.

These materials can be formulated to provide minimal shrinkage. Where a seal has to be maintained or a gap filled, composites which expand during ceramification are also available. These properties are important as they provide a physical barrier to reduce fire spread from one area to another.

Such additive systems are compatible with a wide range of polymers commonly used in fire resistant foams, mastics, sealants and putties as well as thermoplastic or thermoset profiles, sheet or enclosures.