

Submission 79 - Expanded Polystyrene Australia

Expanded Polystyrene Australia made submission 26 to the inquiry into non-conforming building products in the 44th Parliament.

This document is intended as a supplementary submission to the original submission 26.

All submissions received in the 44th Parliament can be accessed via the following link:

http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming_products/Submissions

SENATE INQUIRY INTO NON-CONFORMING BUILDING PRODUCTS

**Minimising the risks to consumers,
businesses and the community associated
with failure of non-conforming building
products**



expanded polystyrene
australia

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Overview

Expanded Polystyrene (EPS) is one of the most common lightweight building and construction materials used in Australia, offering excellent insulation and strength properties at a very light weight. When handled and installed correctly, it is safe, practical and cost effective, especially when taking into account its insulation properties over the life of a building.

Expanded Polystyrene Australia (EPSA – www.epsa.org.au) is the national peak body for EPS manufacturers. The association has a long history of leadership on the use of flame retardant EPS additives, with a view to improving safety, saving lives and preventing injury, but also to saving money and ensuring that the EPS industry continues to play a positive role in the wider building and construction industry, while supporting government initiatives to reduce greenhouse gas emissions through the use of appropriate levels of insulation.

So when supplying EPS products for any use in construction, EPSA requires all of its member organisations to comply with Australian Standard AS1366.3 and supply flame retardant grades of EPS in all cases, whether it be for commercial or domestic purposes, to reduce the risk presented by fire to the loss of life and property.

The EPSA's requirement goes above and beyond the current National Construction Code. The code mandates the use of flame retardant EPS for use in the construction of commercial buildings, but not in the construction of domestic buildings. However, this should not be confused with the Australian Standard AS4859.1 for the thermal insulation of buildings, which applies to the use flame retardant EPS in thermal insulation for *both* domestic and commercial purposes.

Within the Australian EPS industry, a limited number of non-EPSA aligned moulders and fabricators choose to use raw materials that do not contain a fire retardant when they supply foam products for use in the domestic housing construction market. These raw materials do not comply with the fire retardant standards of AS1366.3. The primary motivation for using a raw material without retardant is a small reduction in cost, which helps to reduce production costs and boost business profitability.

EPSA believes that the EPS industry should only supply fire retardant grade EPS for use anywhere in the constructions market, and non-fire retardant grade EPS should be limited to use in packaging applications. This is primarily for the packaging of fish, fruit and vegetables, and overseas the packing of white goods, electrical and electronic products.

EPSA is calling for assistance from the Federal Government to support its stance on the use of flame retardant in EPS for all construction applications, both commercial and domestic. We are seeking uniform regulations to enforce the National Construction Code and the associated building codes throughout the states and territories, to ensure that Australian EPS manufacturers and importers of construction materials containing EPS, such as insulated sandwich panels, exterior insulation panels, structural insulated panels and waffle pods, all use flame retardant grades of EPS conforming to Australian Standards AS1366.3, in all their products for construction and thermal insulation.





What is expanded polystyrene?

Expanded polystyrene (EPS) is a lightweight plastic material that most people recognise as being used in packaging material. EPS is also used widely in the building and construction industry, with this sector making up approximately 65 per cent of all EPS use in Australia.

EPS is derived from styrene – a naturally occurring substance found in many plants, fruit, vegetables, nuts and meats. On a commercial scale styrene is refined from oil and gas. It is then polymerised and impregnated with a blowing agent, and frequently a flame retardant modifier, to form EPS.

Since the start of 2010, when the last domestic manufacturer of styrene and EPS raw material ceased operations in Australia, all styrene and expandable polystyrene used here is manufactured overseas and imported into Australia.

The end product is typically around 98 per cent air and 2 per cent polymer, consisting of small spheres in a closed cellular construction which gives EPS valuable characteristics for the building and construction industry, including being:

- exceptionally cost effective and light weight construction material
- 100 per cent recyclable
- versatile and easy to cut and mould for different purposes
- easy to install and maintain
- water resistant
- sterile
- an excellent thermal insulator
- shock absorbent
- a high load-bearing material at low weight
- a good vapour, air and dust barrier.

How do you make EPS?

EPS is produced in a three stage process: pre-expansion, conditioning and moulding.

1. Steam causes the raw polystyrene beads to expand up to 50 times their original volume.
2. After expansion, the beads are then conditioned and undergo a maturing period in preparation for moulding.
3. The beads are then placed within a mould and reheated with steam, expanding further to completely fill the mould and fuse together.





No ozone-depleting materials are used in the manufacturing of EPS.

EPS is produced in a wide range of densities. These are matched to the various applications where the material is used, to optimise its performance and strength. Broadly speaking, EPS is manufactured in two generic types:

- flame retardant grade EPS, which is primarily used in construction products for its high-strength-to-light-weight and excellent thermal insulation properties
- standard grade EPS (non-flame retardant modified) which is commonly used in food-related packaging for its insulation and cushioning properties.

What is flame retardant EPS?

Flame retardant EPS is produced by incorporating flame retardant additives during the manufacturing process. The overseas manufacturer of the EPS polymer adds the flame retardant additive during manufacture and tests compliance of their process to international flame retardant standards, as embodied in AS2122.1. This process ensures that the flame-retardant quality of the material is spread throughout its structure, not just applied to its surface.

Flame retardant grade EPS reduces the risk of accidental fire from small ignition sources such as a spark, electrical short or cigarette. By incorporating the flame retardant, the EPS foam when tested in accordance with AS1530.3 or AS1366.3 will show reduced ignitability and spread of flame indices, such that when the source of ignition is removed from the flame retardant EPS, it self-extinguishes.

Who is Expanded Polystyrene Australia?

Expanded Polystyrene Australia (EPSA) is the national industry body for manufacturers and distributors of expanded polystyrene products across Australia, representing approximately 70 per cent of all suppliers in the Australian EPS market. Association members work together to protect and enhance the reputation of EPS as an economical and versatile product.

EPSA is made up of four sector groups from the EPS industry in Australia:

- block – moulded into solid blocks then cut into sheets or shapes for a variety of purposes
- pod – used in the laying of concrete slabs
- packaging – used in a wide variety of forms
- raw materials – including the importing of the styrene polymer resin, its conversion into polystyrene beads and their expansion into EPS.





Expanded polystyrene in construction and greenhouse gas abatement

Flame retardant expanded polystyrene (EPS) is widely used for domestic and commercial insulation in construction, and within the building sector for foundation and support structures, wall cladding and external finishing. It is often used in insulated panel systems in the floors, walls and roofs of domestic as well as commercial buildings.

The importance of using appropriate insulation materials for the reduction of greenhouse gas emissions was highlighted in a 2009 report from the International Council of Chemical Associations, [*Innovations for Greenhouse Gas Emission Reductions*](#). Global management consulting firm, McKinsey & Company, conducted independent analyses and overall project management for the study, which examined the global chemical industry's impact on greenhouse gas emissions through the life cycle of chemical products and the difference they make in the applications they enable. The report determined that insulation alone could account for 40 per cent of the total identified carbon savings from the international chemical industry.

EPS is critical to the future of the construction industry, for the following reasons.

- It is ranked as one of the most efficient forms of thermal insulation and is very cost effective in terms of cost-per-unit.
- It is an inert material that does not rot.
- It is safe and easy to cut to size.
- Its insulation properties play a key role in achieving greenhouse gas abatement targets.
- Energy savings produced through use of insulation in buildings has been found to deliver 150-fold on the energy used to produce the insulation.
- It provides no nutritional benefits to vermin, therefore does not attract pests such as rats or termites.

EPS's other applications include the following.

- Facades for both domestic and commercial buildings.
- Void-forming fill material in civil engineering projects such as bridge beams.
- A lightweight fill in road and railway construction.
- Geofoam (light weight infill for unstable soil) to support the construction of major highways.
- Intricate architectural mouldings.
- Floatation material in the construction of pontoons and marinas.
- Use in sandwich panel construction to produce light weight building panels for use in commercial cool rooms, transportable housing, energy efficient housing.





Australian compliance with use of fire retardant in EPS

In the 1970s, the EPS industry adopted a voluntary industry convention to ensure that all foam blocks of EPS were produced from flame retardant material. At this time, these blocks were generally fabricated and used in construction projects.

This voluntary approach was successful for many years. However, by the mid-1990s a number of different pre-moulded EPS components were developed. These included:

- insulated concrete formwork (ICFs), which are foam blocks used as moulds for concrete
- a variety of wall, floor and roof insulation, made by many different manufacturers
- 'waffle pods', which are used in concrete housing slabs.

Initially, all of these products were manufactured using flame retardant material. However, as new players have entered the industry, they have not adopted this voluntary standard.

Unfortunately, the National Construction Code does not mandate the use of flame retardant to an Australian Standard, when used in light weight construction materials for domestic dwellings, such as that defined by Australian Standard AS1366.3 and AS1530.3.

EPSA has encouraged all EPS moulders and suppliers of product to the Australian building industry to supply materials containing flame retardant grades of EPS. However, there are a number of EPS manufacturers, and potentially importers, who operate outside of EPSA, and who market and provide EPS without flame retardant for use in construction products, inclusive of waffle pods to builders and developers. EPSA is powerless to enforce change in this matter.

It is estimated that the cost advantage in non-compliance with the use of flame retardant is approximately 2 to 3 per cent on the cost of EPS raw materials. This does not sound significant, but the savings quickly multiply. This should also be taken in the context of many EPS manufacturers having an annual turnover of \$5-\$10 million per annum, and the industry's biggest players having sales of \$30-\$40 million per year combined. In this context, even a 1 per cent cost saving is significant over the long term.

EPSA has also heard, through the Insulated Panel Council of Australia, that where EPS is used in sandwich panel construction for transportable housing and insulated cool rooms, that some imported sandwich panel material is not compliant with Australian building codes. The risks are that imported panels are not tested and may not contain flame retardant, all in an attempt to save cost, rather than build to standards.





EPS and the National Construction Code

It is Expanded Polystyrene Australia's position that all EPS used in construction, for domestic and commercial purposes, should be flame retardant grade EPS. Therefore the association requires this as a condition of membership.

Non flame retardant EPS is flammable, although the risk of accidental combustion is significantly reduced by installing EPS thermal insulation behind fire-inert materials, such as plaster panelling and under concrete.

However, there remains a compelling reason for the additional use of flame retardant in all EPS used in construction. There have been many incidents where accidental fires have occurred on building sites, through the use of cutting and grinding equipment in the vicinity of insulation prior to it being buried in concrete, and where EPS may be exposed during repairs and renovations, which is why EPSA believes that all EPS used in all construction activities must be flame retardant grade EPS.

However, this position is not currently embodied in Australia's National Construction Code (NCC) nor the associated state and territory building codes. Currently, the NCC applies Australian Standard AS4859.1 for the use of flame retardant in EPS when used as thermal insulation in commercial and domestic buildings. The NCC also applies fire performance tests according to Australian Standard AS1530.3 and AS/ISO 9705 for flame retardant in EPS for use in the construction of commercial buildings. However, the NCC does not mandate the use of flame retardant EPS in the construction of domestic buildings.

The decision by some Australian EPS moulders to not use flame retardant grade EPS in the manufacture of EPS building products represents a significant reputational risk to the EPS industry. Should such material ignite, the fire spreads rapidly, increasing the risk of injury and property damage, and would likely attract negative media attention. This detracts from the significant benefits that EPS provides to the Australian economy whilst providing an easy to use lightweight construction material, with excellent thermal insulation properties that contribute towards Australia achieving its greenhouse gas abatement targets.





What are EPSA's recommendations?

Expanded Polystyrene Australia (EPSA) has a long history of leadership on the issue of flame retardant material in the construction industry and has required its membership to adhere to a voluntary guideline that enforces the use of flame retardant in EPS.

Our position is that all construction materials made from EPS should be made from flame retardant grade EPS raw material, that is compliant with AS1366.3, and that this should be called up by a National Building Code.

The EPSA is calling on the Federal Government to support this stance, through a small update to the National Construction Code that will see Australian Standard 1366.3 applied to the use of flame retardant EPS used in the construction of both commercial and – for the first time – domestic buildings.

EPSA also calls for the corresponding Australian state and territory building codes to be updated in line with the National Construction Code, to ensure uniformity of practice across the country.

Further, EPSA also calls for the effective enforcement of the National Construction Code, to ensure that non-compliant businesses are held to account, and also that international suppliers comply with Australian law. It is essential to maintain an even playing field for all building product manufacturers in Australia and ensure this is regulated for importers of products.

Ultimately, this change to the NCC and effective enforcement will go a long way to ensuring the safety of Australians on building sites and in their homes, and – if properly enforced – will ultimately save lives.

