

Expanded Polystyrene (EPS) Concrete

The Victorian Building Authority (VBA) engaged the CSIRO to provide advice on the risks of external wall fire spread associated with the use of EPS concrete on external walls for existing Class 2 and 3 buildings of Type A or B construction.

Abbreviations & Definitions

The definitions and acronyms set out below are for guidance only. They are not intended to vary those set out in the Building Act 1993, Building Regulations 2018 or the National Construction Code.

- **ACP** – aluminium composite panels
- **CSIRO** – Commonwealth Scientific and Industrial Research Organisation
- **EIFS** – external insulated finish system
- **EPS** – expanded polystyrene
- **EPS concrete** – expanded polystyrene concrete (also known as Conpolcrete™ part of the QT EcoSeries wall system)
- **NCC** – National Construction Code 2019, Building Code of Australia, Volume One

Background

EPS concrete is a building material that primarily consists of a blend of cement and EPS to form a block or board that can be used as part of a non-load bearing EIFS.

EPS concrete has gained popularity in the building industry as it is a lighter alternative to autoclaved aerated concrete (AAC). These two materials should not be confused, as EPS concrete is created by mixing in polystyrene beads, whereas AAC uses a foaming agent to create closed air pockets.

As buildings required to be Type A or B construction have been constructed using EPS concrete, the VBA sought advice from the CSIRO as to the risk EPS concrete presents to existing buildings.

Key findings from the CSIRO report

The CSIRO report focuses on an assessment of the QT EcoSeries wall panel system as it is the most used EIFS comprising EPS concrete in Australia. It is important to note that the report is only advice that provides a review of the risks associated with EPS concrete on existing buildings and makes limited conclusions, not a determination of suitability or compliance.

The report assessed the QT EcoSeries Wall Panel system based on available information, such as the composition of Conpolcrete™, fire test reports and comparisons with other combustible cladding materials.

Based on the assessment of available information, the research concludes that the EPS concrete used in the QT EcoSeries Wall Panel system is likely to present significantly less risk to the spread of fire compared with other combustible cladding systems such as EPS and ACP.



The report recommends further fire tests be conducted, however the VBA has decided not to undertake this testing. The report provides a reasonable indication as to the comparably low fire spread of this product for the purposes of the Statewide Cladding Audit, which focusses on higher risk buildings. Any further testing is the responsibility of the manufacturer, which may be required to justify the product's usage in specific circumstances.

Existing Buildings with EPS Concrete

Through the Statewide Cladding Audit, the VBA found that EPS concrete has been used and approved without sufficient documentation to demonstrate compliance with the NCC. The documentation of these building permits largely relied on an opinion paper by the CSIRO (FCO-2545) which determined that EPS concrete (Conpolcrete™) may be considered non-combustible when compared with other materials which are permitted by the NCC to be used wherever a non-combustible material is required. Whilst the CSIRO report concludes that EPS concrete is not likely to significantly contribute to the spread of fire, EPS concrete remains a combustible material as it has not been determined to be non-combustible by an AS 1530.1 test report. The opinion paper could have been previously used via a Performance Solution, including consideration to the whole external wall, including the internal lining, framing, insulation and sarking.

Existing buildings found to have EPS concrete that visually matches that used in the QT EcoSeries wall panel system and has a bulk density of 345 kg/m³ or more, may be assigned a risk score of 0.5 within the risk assessment tool (RAT), equivalent to ACP with a core consisting of 30% or less polyethylene. The RAT score could also be impacted by the type of wall insulation.

Where the EPS concrete has a bulk density of less than 345 kg/m³, this may indicate a higher content of polystyrene and therefore will be assigned a risk score of 1, similar to 100% EPS panels. The bulk density of EPS concrete can be measured using the methods outlined in Appendix B of the CSIRO report.

The information presented in the CSIRO report can be used by Councils to assist with the assessment of the fire safety risks of existing buildings with combustible EPS concrete. Buildings that have been assigned a triage rating and risk score higher than 0.5 should be re-evaluated by the Municipal Building Surveyor, where it may be determined that the building is of lower risk than originally assigned.

Municipal Building Surveyors may use the information in the CSIRO report when acquitting a building to support their position.

As recommended in the report, consideration should be given to the possibility of multiple types of cladding products being used on a building, including EPS and EPS concrete as well as the method of installation and the presence of combustible cavity insulation to the wall. Appropriate investigations, including multiple penetrative site inspection, may be required to determine if these pose a danger to life or property.



Related Documentation

- [CSIRO report. EP.207255. Rev.H. Dated 27/04/2022](#)
- [Acquittal Guidelines](#)

List of Amendments

- Reference to amended CSIRO report, which superseded the previous version CSIRO report. EP.207255. Rev.G Dated 27/08/2021

Contact Us

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