

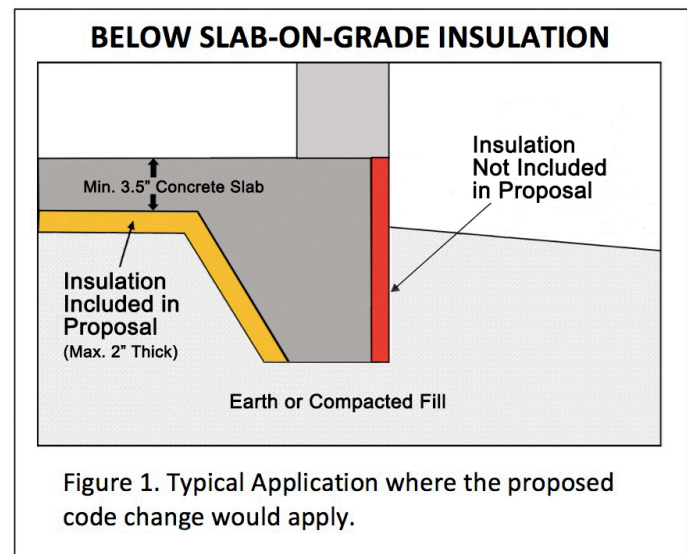
Proposed Code Change for Insulation Below a Concrete Slab

PROPOSAL SUMMARY

Current building codes require fire tests for polystyrene building insulation that lead to the use of chemical flame retardants. Research has shown that **flame retardants in insulation below a concrete slab do not provide a fire safety benefit**, as there is insufficient oxygen for combustion and no ignition source. A proposal by Reax Engineering would **modify the International Residential Code (IRC) to allow the use of polystyrene insulation without flame retardants when installed below a concrete slab**. This proposal is identical to code change proposals developed by the California Office of the State Fire Marshal (OSFM) and unanimously approved by the California Building Standards Commission for the 2019 California Residential and Building Codes.

THE PROPOSED CODE CHANGE WOULD:

- **Exempt polystyrene insulation below a concrete slab-on-grade** from required fire tests that can only be met by adding chemical flame retardants.
- **Require detailed labeling** of polystyrene insulation boards that do not contain flame retardants to ensure proper use and storage.
- **Reduce potential health harm** from flame retardant chemicals



RESEARCH SHOWS NO RISK OF FIRE SPREAD

Independent researchers at Oklahoma State University, funded by the California State Fire Marshal, conducted fire testing on in-situ below-grade insulation. Here's what they found:

- When installed below a slab-on-grade, insulation without flame retardants presents **no risk of fire spread to the building** and will not endanger occupants or first responders
- The time to ignition for polystyrene insulation without flame retardants is **comparable to other combustible construction materials**
- Added flame retardants in polystyrene insulation **do not significantly change** peak heat release rates

THE PROPOSED CODE CHANGES ARE VOLUNTARY

They provide a choice for green building.

This proposed code change is not a ban on flame retardants in polystyrene insulation board. It allows designers, builders, and owners to choose polystyrene insulation board with or without flame retardants for use below a slab-on-grade.

POLYSTYRENE INSULATION WITHOUT FLAME RETARDANTS IS USED IN SCANDINAVIA

Code updates in Norway and Sweden have allowed polystyrene insulation board without flame retardants in buildings for over 14 years. The vast majority of polystyrene insulation in Norway and Sweden is flame retardant-free. No additional insulation fires have been evident as a result of the changes.

Fig. 2. Norway and Sweden have updated codes allowing flame retardant-free foam insulation



BENEFITS OF THE PROPOSED CODE CHANGE

The proposed changes would safely enable below-slab use of polystyrene insulation board without hazardous flame retardants. These changes would:

- **Increase Product Selection**

Architectural, engineering and construction firms and building owners support having the choice to safely use polystyrene insulation without flame retardants below a concrete slab to meet the increasing market demand for less-toxic insulation. The code change would allow this as well as the manufacturing of flame-retardant-free insulation to meet this demand.

- **Positively Impact Human and Environmental Health**

Flame retardants in polystyrene insulation have been associated with human and ecological harm including neurological and reproductive impairment, hormone disruption, and aquatic toxicity.

- **Reduce Lifecycle Pollution from Polystyrene Insulation**

The manufacture, installation, demolition, landfilling, incineration, and recycling of polystyrene insulation can lead to environmental release of harmful flame retardants, their breakdown products, and their toxic combustion by-products, including dioxins and furans.