

**California Fire Tests for Insulation:
2013 California Building Code (CBC)**

2013 CBC: Chapter 7, Section 720 Thermal and Sound-Insulating Materials

Products	Insulating materials, fiberglass, mineral wool, cellulose, including facings and all layers of single and multilayer reflective foil insulation (except Foam insulation shall comply with Chapter 26, and Single and Multilayer reflective plastic core insulation shall comply with Section 2613)
Uses	Wall, roof, ceiling, attic, crawl spaces
Fire test requirements - applicability	Nationwide applicability: California Codes are based on the ICC model codes: International Building Code (IBC), International Residential Code (IRC)
Concealed installation	<p>Except cellulose, Flame spread index and smoke developed index (720.2) Flame Spread Index <25/Smoke-developed Index <450</p> <ul style="list-style-type: none"> • ASTM E84 -09 Test Method for Surface Burning Characteristics of Building Materials, or • UL723 -08 Standard for Test for Surface Burning Characteristics of Building Materials – <p>Facings are exempt from the flame spread and smoke developed index if they are in contact with the unexposed surface of the ceiling, wall, or floor finish.</p> <p>Cellulose – no limit on flame spread but must comply with <450 smoke-developed index AND (720.6)</p> <ul style="list-style-type: none"> • CPSC 16 CFR Part 1209 (???) edition) Interim Safety Standard for Cellulose Insulation, AND • CPSC 16 CFR Part 1404 (???) edition) Cellulose Insulation
Exposed installation	<p>Flame spread index and smoke developed index (720.3) Flame Spread Index <25/Smoke-developed Index <450</p> <ul style="list-style-type: none"> • ASTM E84 -09 Test Method for Surface Burning Characteristics of Building Materials, or • UL723 -08 Standard for Test for Surface Burning Characteristics of Building Materials – <p>(Except cellulose that is not spray applied, only the smoke developed index of <450 applies.)</p> <p>On Attic floors (720.3.1):</p> <ul style="list-style-type: none"> • ASTM E970 – 08A Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source
Loose fill insulation	<p>For materials that cannot be mounted in the E84 apparatus, Flame spread index and smoke developed index (720.4) Flame Spread Index <25/Smoke-developed Index <450</p> <ul style="list-style-type: none"> • CAN/ULC S102.2 - 1988 Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies – with 2000 Revisions <p>Except cellulose, which complies with the details in concealed or exposed applications AND the CPSC requirements in Section 720.6.</p>

Chapter 26 Plastics, Section 2603 Foam Plastic Insulation

Applies to all types of foam insulation: Extruded Polystyrene (XPS), Expanded Polystyrene (EPS), Rigid Polyurethane (PUR), Polyisocyanurate (PIR), Spray Polyurethane Foam (SPF)

Products	XPS, EPS, PU, PIR, SPF
Uses	Walls, roofs, crawl spaces, attics, below grade, exposed commercial interiors, coolers, freezers, entry doors, garage doors, metal panels, Exterior Insulation Finish Systems (EIFS), metal panels
Fire test requirements - applicability	Nationwide applicability: California Codes are based on the ICC model codes: International Building Code (IBC), International Residential Code (IRC)
Basic fire test	<p>Flame spread index and smoke developed index (2603.3) Flame Spread Index <75/Smoke-developed Index <450</p> <ul style="list-style-type: none"> • ASTM E84 -07 Test Method for Surface Burning Characteristics of Building Materials, or • UL723 -03 Standard for Test for Surface Burning Characteristics of Building Materials – with Revisions through May 2005 <p>ASTM E84 or UL 723 is also used as quality control for the labeling requirements in Section 2603.2 of the 2013 CBC</p> <p>ASTM E84 or UL 723 is also referenced in 2603.4.1.13 Walk in coolers, and 2603.5.4 Foam used on exterior walls in Type I, II, III, IV construction of any height – here the foam Flame spread index is limited to 25 or less and smoke –developed index is <450)</p>
In addition to ASTM E84, additional fire tests or prescriptive installation details are required for specific uses of foam insulation:	<p>Foam roof insulation – Exterior flame spread (2603.6):</p> <ul style="list-style-type: none"> • ASTM E108 – 07a – Test Methods for Fire Tests of Roof Coverings or • UL790 – 04 Standard Test Methods for Fire Tests of Roof Coverings –with revisions through October 2008 <p>Foam roof insulation – Interior (under steel deck) flame spread – fuel contribution (2603.3 – Exception3, 2603.4.1.5):</p> <ul style="list-style-type: none"> • ANSI/FM 4450 (1989) Approval Standard for Class 1 Insulated Steel Deck Roofs – with Supplements through July of 1992 or • UL 1256 – 02 Fire Test of Roof Deck Construction – with Revisions through January 2007 <p>Wall, roof/ceiling, floor/ceiling assemblies containing foam insulation – hourly fire resistance ratings (2603.5.1 if required for Exterior walls of Type I, II, III, IV of any height)</p> <ul style="list-style-type: none"> • ASTM E119 -08a – Test Methods for Fire Tests of Building Construction and Materials or • UL263 – 03 Standard for Fire Test of Building Construction and Materials - with Revisions through October 2007 <p>Garage Doors with foam insulation (2603.4.1.9)</p> <ul style="list-style-type: none"> • DASTMA 107 – 1997 (R2004) Room Fire Test for Garage Doors Using Foam Plastic Insulation (garage doors) <p>Siding backer board (2603.4.1.10) Potential Heat</p> <ul style="list-style-type: none"> • NFPA 259 – 13 Test Method for Potential Heat of Building Materials <p>One Story Exterior Walls: Flame Spread Index <25; Smoke-developed Index <450 (2603.4.1.4) and Exterior walls of Type I, II, III, IV of any height: Flame Spread Index <25; Smoke-developed Index <450 (2603.5.4);</p> <ul style="list-style-type: none"> • ASTM E84 -07 Test Method for Surface Burning Characteristics of Building Materials, or • UL723 -03 Standard for Test for Surface Burning Characteristics of Building Materials –

	<p>with Revisions through May 2005</p> <p>Exterior walls Type I, II, III, IV over 1 story - Potential Heat (2603.5.3)</p> <ul style="list-style-type: none"> • NFPA 259 – 13 Test Method for Potential Heat of Building Materials <p>Exterior Walls Type I, II, III, IV of any height - Ignitability (2603.5.7)</p> <ul style="list-style-type: none"> • NFPA 268 – 12 – Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using A Radiant Heat Source <p>Exterior Walls Type I, II, III IV of any height - Vertical and lateral flame propagation – (2603.5.5)</p> <ul style="list-style-type: none"> • NFPA 285 – 11 Standard Method of Test for the Evaluation of the Flammability Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components <p>Special approvals (2603.10), test must reflect actual end use configuration; typically used to qualify exposed interior wall/ceiling finish, elimination of ignition barriers for attics, crawl spaces, etc.</p> <ul style="list-style-type: none"> • NFPA 286 – 11 Standard Method of Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth (includes specific acceptance criteria) • ANSI/FM4880 – 05 American National Standard for Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior and Exterior Finish Systems (exposed foam in interior walls, also various assemblies as described, elimination of the thermal barrier), or • UL 1040 - 96 Fire Test of Insulated Wall Construction – with Revisions through September 2007 (2603.4, 2603.9 – exposed foam in interior walls, elimination of the thermal barrier), or • UL 1715-97 – Fire Test of Interior Finish Material – with Revisions through April 2008 (2603.4, 2603.9, exposed foam on interior walls)
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Chapter 26 Plastics, Section 2613 Reflective Plastic Core Insulation

Products	Reflective Plastic Core Insulation
Uses	Walls, roofs, crawl spaces, attics, exposed commercial interiors, coolers, freezers
Fire test requirements - applicability	Nationwide applicability: California Codes are based on the ICC model codes: International Building Code (IBC), International Residential Code (IRC)
Basic fire test	<p>Flame spread index and smoke developed index (2613.3) Flame Spread Index <25/Smoke-developed Index <450</p> <ul style="list-style-type: none"> • ASTM E84 -09 Test Method for Surface Burning Characteristics of Building Materials, or • UL723 -03 Standard for Test for Surface Burning Characteristics of Building Materials – with Revisions through May 2005
In addition to ASTM E84, if exposed	<ul style="list-style-type: none"> • NFPA 286 – 11 Standard Method of Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth (includes specific acceptance criteria in 803.1.2.1) • UL 1715-97 – Fire Test of Interior Finish Material – with Revisions through March 2004 (2603.4, 2603.9, exposed foam on interior walls)