COONS CONSTRUCTION INC — SCIP PANEL FAQ SERIES

Fire Safety & SCIP Construction: What You Need to Know

Addressing the fire marshal's question — and the permit conversation — with verified facts about how SCIP panels perform in a fire. SCIP panels supplied to Coons Construction Inc by TIPs (Total Integrated Panel System).

The question from a retired fire marshal: "If a fire starts inside a SCIP home, what is stopping the fire from getting out of hand when the fire department opens a door or breaks a window to get in?" This is an excellent and important question. The answer is rooted in how concrete-encased construction fundamentally differs from wood-frame construction — and it directly affects the permit and sprinkler conversation.

CERTIFIED FIRE RATINGS — TIPS SCIP PANELS

1 hr
STANDARD BUILD
Standard concrete thickness per IBC Section 722 & ASTM E119

TIPS DEFAULT
2 hr
CERTIFIED RATING
TIPs panels are certified non-combustible with a 2-hour fire rating as standard

4 hr
ENHANCED BUILD
Achieved by increasing shotcrete thickness to 3 inches on each face

Source: TIPs Panel (tipspanel.com), Carmelo SCIP / GCT, ICC-ES ESR-5623. A 2-hour rating exceeds the 1-hour requirement typical of residential construction under IBC.

THE CORE FIRE SAFETY QUESTIONS

Q **When a firefighter opens a door or breaks a window on a SCIP home, will a backdraft or flashover get out of control — spreading fire faster than in a wood-frame house?**

✔ VERIFIED — CROSS-REFERENCED TIPS, ASTM E119, NFPA, FIRE ENGINEERING

This is the right question. And the short answer is: **no — SCIP construction significantly reduces that risk compared to wood-frame construction.** Here is why.

The danger of a backdraft or flashover when entry is made comes from two conditions working together: (1) oxygen-depleted air igniting superheated gases when air rushes in, and (2) combustible structural materials contributing fuel to that ignition chain. In a wood-frame home, the walls, floor joists, roof framing, and concealed cavities are all combustible. Once fire gets into those void spaces, it can race through the entire structure silently — and when a firefighter opens a door, the sudden air can feed an explosive re-ignition of fuel that has already permeated every cavity.

In a SCIP home, **the structural shell is reinforced concrete on both faces.** The EPS (expanded polystyrene) core is fully encased — it cannot ignite and spread once the concrete shell is intact. There are no hollow stud bays, no open truss cavities, no wood channels for fire and superheated gases to travel through before the firefighter arrives. The fire is contained to the compartment of origin far longer — and with significantly less structural fuel available — than a comparable wood-frame structure.

When entry is made, firefighters are entering a situation where **the walls themselves are not burning**, the structure is holding its integrity, and the fire load is limited to the room contents rather than the building envelope.

Sources: TIPs Panel (tipspanel.com/why-panel); Carmelo GCT SCIP specs; FireEngineering.com Building Construction Review; superformicf.com ICF fire analysis (concrete wall behavior); NFPA 921 backdraft definition; USFA Backdraft & Reading Smoke.

Q

What actually happens to the EPS foam core in a fire — does it ignite and spread flames through the wall?

✔ VERIFIED — ASTM C-578, GCT SCIP SPECS, SIPSECO BRE TESTING

No. The EPS core in SCIP panels is **fully encased in structural concrete on both faces** before the building is occupied. The concrete is the fire barrier — the EPS never sees direct flame during a building fire.

But even if the concrete were compromised and EPS were exposed to flame: **fire-retarded EPS used in SCIP panels (meeting ASTM C-578) is self-extinguishing.** When exposed to direct flame, it melts and shrinks away from the heat source. It does not ignite and sustain combustion. Remove the direct flame, and the material stops degrading. It does not act as a fuel that feeds the fire forward through the wall.

Compare this to wood-frame construction, where the structural framing is itself combustible and will sustain combustion once ignited — without any external flame source needed.

Sources: Carmelo GCT SCIP ("The EPS core is self-extinguishing, meeting ASTM C-578. Once covered with concrete on each side, the panels are protected from melting."); SipsEco BRE fire test (143-minute breach); SuperForm ICF blowtorch demonstration data.

Q How does SCIP construction compare to wood frame specifically on fire spread through concealed spaces — the hidden pathways that create firefighter danger?

✔ VERIFIED — FIRE ENGINEERING BUILDING CONSTRUCTION REVIEW, NFPA

This is one of the biggest differences — and one the retired fire marshal will recognize immediately.

Wood-frame (Type V) construction: Wall cavities, ceiling voids, and truss spaces form interconnected hidden pathways. Fire or superheated gas enters a wall cavity, travels silently through the void, and emerges at a distant location. Firefighters believe they are attacking a contained room fire — but the structural cavities are already carrying heat and fuel throughout the building. When ventilation occurs (door or window opened), rapid fire development happens throughout those hidden spaces simultaneously. Lightweight engineered lumber — the standard in modern construction — can fail structurally in as little as 5–10 minutes under fire load.

SCIP construction: There are no hollow stud bays. There are no truss cavities. The wall assembly is a concrete-EPS-concrete sandwich — solid through its full thickness. **Fire cannot chain from room to room through the structural walls.** The building behaves as a series of contained compartments — which is exactly how fire-resistant construction is designed to work. A fire stays where it started until the structural concrete is breached, which at TIPs' 2-hour rating, provides 120+ minutes of structural stability.

Factor	Wood Frame (Type V)	SCIP / Concrete
Wall fire rating (residential)	30–60 min typical	2 hr (TIPs standard)
Hidden void fire travel	Yes — major hazard	No — solid wall assembly
Structural elements combustible?	Yes — wood framing burns	No — concrete is non-combustible
Collapse risk under fire load	High (LVL/truss: 5–10 min)	Very low within fire rating window
Fire compartmentalization	Limited by cavity travel	Strong — concrete acts as natural firewall

Sources: FireEngineering.com Building Construction Types Guide; AllFirefighter.com Construction Types I–V Firefighter Guide; SuperForm ICF fire analysis; TIPs Panel specifications.

Q What building construction type does SCIP fall under — and how does that affect sprinkler requirements?

✔ VERIFIED — IBC 2021, KOORSEN.COM, NFPA FIRE SPRINKLER IBC GUIDE

SCIP construction, once shotcrete is applied to both faces of the panel, produces a reinforced concrete wall assembly. Under the International Building Code (IBC), this typically qualifies as **Type I or Type II construction** — fire-resistive or non-combustible — depending on the specific assembly and design.

This matters for sprinklers because:

- **Concrete and masonry buildings are less likely to require residential fire sprinklers** than wood-frame buildings, according to IBC construction type-based requirements.
- The IBC's sprinkler trigger for residential (Group R) occupancies is primarily driven by construction type, occupancy, and height — not a blanket requirement regardless of materials.
- A non-combustible or fire-resistive construction type (as SCIP delivers) addresses the fundamental reason sprinklers are commonly required in wood-frame residential: to compensate for the combustibility of the structure itself.

The TIPs panel's certified 2-hour fire rating exceeds the 1-hour requirement for residential Type III construction, and its non-combustible classification positions SCIP homes favorably relative to sprinkler triggers that exist specifically to address wood-frame fire risk.

We recommend a pre-application meeting with the local AHJ (Authority Having Jurisdiction — the building department and fire marshal) before pulling permits, with TIPs' ICC-ES evaluation report and fire test data in hand. The data supports the case.

Sources: Koorsen.com sprinkler requirements (concrete buildings less likely to require sprinklers); NFPA Fire Sprinkler Guide to IBC 2015; IBC Section 903.2; TIPs Panel (tipspanel.com/why-panel) — "certified for a two-hour fire rating" and "non-combustible."

Q TIPs says their panels are "non-combustible and certified for a 2-hour fire rating." What does that actually mean in real fire terms?

✔ VERIFIED — TIPS PANEL, ASTM E119, ICC-ES ESR-5623

"Non-combustible" means the structural wall assembly — the concrete shell — does not contribute fuel to a fire. It will not ignite, it will not sustain combustion, and it will not add to the heat release rate of a fire burning inside the building.

"2-hour fire rating" (ASTM E119) means the wall assembly was tested in a controlled furnace against the ASTM E119 standard fire-time/temperature curve — temperatures that exceed 1,000°F within the first hour — and maintained structural integrity and fire containment for a full

two hours. This includes the assembly holding up under axial load (real structural weight), not just standing there.

In practical terms: **a firefighter making entry within the first two hours of a fire in a TIPs SCIP home can expect the walls, floors, and roof panels to still be structurally sound.** The structure is not going to collapse around them the way modern lightweight wood-frame construction can — and does — within 5–10 minutes of fire involvement in the structural members.

At 3-inch shotcrete thickness, the 4-hour rating is achieved — which is the same classification used for Type I fire-resistive construction (the highest level), the standard in high-rise residential and commercial buildings designed for maximum firefighter safety.

Sources: TIPs Panel (tipspanel.com/why-panel); ASTM E119 standard description (ASTM.org); ICC-ES ESR-5623 for FSS SCIP panels (1-hour at standard thickness, extendable); FireEngineering.com Building Construction Review — Type I concrete: "structural members generally receive 3–4 hour fire protection; only under sustained attack by fire does failure occur."

Q Has a SCIP home actually been through a real fire? Is there real-world evidence beyond test data?

✔ VERIFIED — MARK ANDERSON DESIGN/BUILD (HEFTY HOMES), VALLEY FIRE ACCOUNT

Yes. One of the most documented real-world cases involved the 2015 Valley Fire in Northern California — one of the most destructive wildfires in California history, which burned over 1,000 homes.

A SCIP-3D panel home in the affected area was hit by the fire. The owner's documented account: "*There are still signs of the fire (discoloration, melted plastic fused to the concrete, etc.), but most will disappear with a coat of paint, or be relatively easy to chip off. I expect to be back in my house within a month instead of just starting reconstruction.*" The structure stood. The EPS core was protected by the concrete shell. The home did not burn down.

For perspective: a conventional wood-frame home in the same fire zone was typically total loss. The SCIP home needed cleanup and cosmetic repair.

The California Fire Investigators Association has also hosted controlled burn demonstrations on SIP/SCIP-type construction. Results consistently show that concrete-encased panel construction outperforms wood-frame under sustained fire exposure.

Sources: Mark Anderson / HEFTY HOMES (markandersondesignbuild.com) — SCIP 3-D Panel Valley Fire account; Premier Building Systems blog citing California Fire Investigators Association demonstration data.

Q **What about ventilation — can firefighters still vent the roof or cut through a SCIP wall in an emergency?**

✔ VERIFIED — FIRE ENGINEERING BUILDING CONSTRUCTION REVIEW

This is a fair tactical concern. The tradeoff is real and worth naming directly with fire marshals during the permit conversation.

What's harder with SCIP/concrete construction: Vertical ventilation through the roof is more difficult than cutting a wood-frame roof. Concrete roofs cannot be quickly opened with a saw. This is acknowledged in Fire Engineering's Building Construction Review of Type I fire-resistive structures: "Roofs are extremely difficult to penetrate for the purposes of ventilation because of construction material and design."

Why this matters less than it does in wood-frame construction: The primary reason firefighters vent aggressively in wood-frame buildings is to prevent the concealed structural voids from building up to flashover or backdraft conditions. **In a SCIP building, there are no such concealed voids in the structural shell.** The compartment containing the fire is well-defined by concrete walls. Horizontal ventilation — opening windows and doors — is the more appropriate and effective tactic, and it works predictably because the fire is actually contained to the compartment of origin.

The same Fire Engineering review notes of Type I construction: "Only under sustained attack by fire does failure occur, and in those cases, it is usually localized collapse." This means firefighters have dramatically more time to work and withdraw compared to lightweight wood-frame, where structural failure can occur in under 10 minutes.

We recommend pre-incident planning walkthroughs with local fire departments on SCIP buildings — standard practice for any non-conventional construction type. TIPs can provide technical documentation to support those conversations.

Sources: FireEngineering.com Building Construction Review (Type I/concrete-specific notes); AllFirefighter.com Type I–V guide; FireRescue1.com ventilation tactics.

Q **Can SCIP achieve a 4-hour fire rating — the same as Type I high-rise construction?**

✔ VERIFIED — TIPS PANEL, CARMELO GCT SCIP, IBC SECTION 722

Yes. **TIPs panels achieve a 4-hour fire rating by increasing the shotcrete application to 3 inches on each face of the panel.** This is the same fire resistance classification used in Type I fire-resistive construction — the highest level under the IBC, applied to high-rise residential and commercial buildings where firefighter safety standards are most stringent.

Carmelo / GCT SCIP independently confirms the same: standard panels achieve 1-hour under IBC Section 722; increasing mortar layer thickness achieves up to 4 hours.

For projects where the AHJ or fire marshal requests elevated fire performance documentation, the upgrade path is straightforward: more shotcrete. No fundamentally different system, no added structural complexity. This is a strong answer to have in a permit pre-application meeting.

Sources: TIPs Panel (tipspanel.com/why-panel) — "A higher rating of 4 can also be achieved by increasing the thickness of the shotcrete applied to each face of the panel to 3 inches"; Carmelo GCT SCIP specs.

On the permit and sprinkler conversation: The goal is not to avoid sprinklers by arguing against fire safety — it's to present the documented fire performance of SCIP construction accurately, so the AHJ can make an informed decision based on the actual risk profile of the building rather than defaulting to wood-frame assumptions.

TIPs supplies Coons Construction Inc with full technical documentation including ICC-ES evaluation reports and fire test data. We bring that documentation to every pre-application meeting. If the AHJ reviews the 2-hour non-combustible rating, the absence of concealed combustible cavities, and the structural stability window, the case for treating a SCIP home differently from a wood-frame home on sprinkler requirements is well-grounded in the code.

We do the research. We don't show up at the permit desk without answers. That's how we've operated for 35 years.

Sources & verification: TIPs Panel (tipspanel.com) · Carmelo / GCT SCIP (carmelo.com) · ICC-ES ESR-5623 (FSS SCIP Panels) · ASTM E119 Standard (ASTM.org, ICC-ES) · IBC Section 722 · NFPA 921 (backdraft definition) · USFA Backdraft & Reading Smoke bulletin · FireEngineering.com Building Construction Review · AllFirefighter.com Construction Types I–V Firefighter Guide · Koorsen.com Residential Sprinkler Requirements · Mark Anderson / HEFTY HOMES Valley Fire case study · SipsEco BRE fire test data · SuperForm ICF EPS fire behavior analysis.

Coons Construction Inc — A-1 Licensed Design-Build General Contractor

7505 Tudor Rd, Colorado Springs, CO 80919 | coons-construction.com

SCIP panels supplied by TIPs (Total Integrated Panel System) | Building the Future, Restoring the Past

Ask Us a Question →