Stronghold Insulated Concrete Forms and Fire Protection:

Stronghold Insulated concrete forms provide an excellent means to protect your structure, personal property, and life from fire. Stronghold Insulated concrete forms are considered an ignition resistant building material and can be used to achieve a one to four-hour fire barrier dependent on concrete mix and core thickness. The results in slower fire propagation and improve structural integrity and may result in occupants having more time to reach safety, and more time for fire fighters to rescue trapped or injured occupants and more time combat the fire. This document serves to illustrate how Stronghold Insulated Concrete Forms improve fire design and meet various building codes to meet ever more increasing requirements.

There are 2 main areas of concern for fire safety, external and internal. External fire safety is concerned with an outside fire source i.e. a nearby structure or wildfire and is primarily concerned with the protection of the building. Internal fires and the design of fire protection is concerned with life saving measures. Minimum code standards for interior fires are to limit fire spread from room to room by 15 minutes.

With the increase in media awareness of wildfires, the monetary loss thereof and subsequent cancellation of fire protection insurance policies building with enhanced fire protection is critical. The International Code Council, the United States leading code writing authority sought to address fire protection against wildfires with the publication of "International Wildland-Urban Interface Code" (IWUIC) in 2024.

Wildland-Urban Interface Code: Insulated Concrete Forms (ICFs) can play a large part in satisfying the IWUIC and other building codes related to fire protection. The design of a building to meet the IWUIC addressed in Chapter 5 and is based on several factors including Fire Hazard Safety which evaluates property slope, critical fire days and fuel load as well as defensible space. There are 4 bases of designs for Ignition Resistant Construction IR1, IR2, IR3 and IR1 NC (non-combustible).

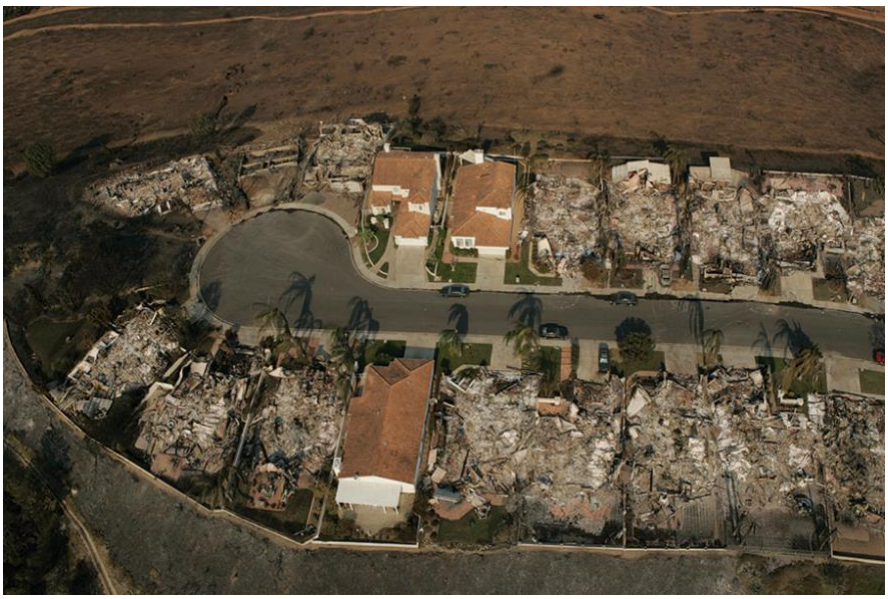
Exterior wall construction may satisfy ignition resistance requirements in one of 5 ways

1. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side.
2. Approved noncombustible materials.
3. Heavy timber or log wall construction.
4. Fire-retardant-treated wood on the exterior side.
5. Ignition-resistant materials complying with Section 503.2 on the exterior side.

Stronghold ICF satisfies the requirements of section 503.2 through section 503.2.4 by complying with sections 503.2.4.1 through 503.2.4.3

1. 503.2.4.1 Flame Spread: <25 per UL723[1]
2. 503.2.4.2 Flame Front: Less than 10' 6" from centerline of burner
3. Weathering: Not Applicable as ICF's are protected from weathering with finish materials

[1] (Intertek, 2025)



In this aerial photo of a fire-devastated San Diego suburb, it's easy to see the three houses on the street made of ICFs.[1]

IBC Fire Resistant Construction: Stronghold Insulated Concrete Forms also satisfies the fire-resistance rated walls by following IBC 703.3.(2) referencing table 721.1(2). See the table below for a quick reference[2]. Fire resistance construction may also be satisfied via IBC 703.3(3) via calculation in accordance with section 722.

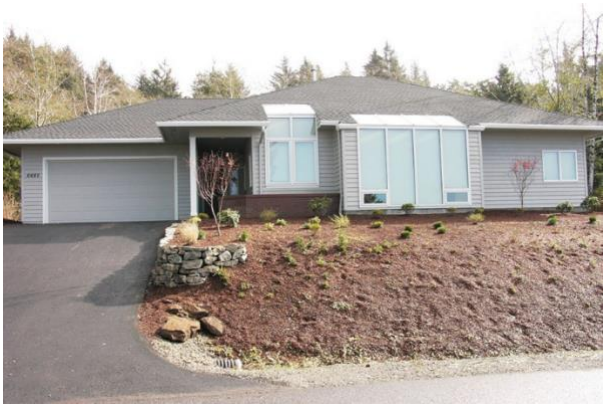
Construction[1,2]	Minimum ICF Core Cavity Thickness (in)			
	4-Hour	3-Hour	2 Hour	1 Hour
Siliceous aggregate concrete	8"	8"	6"	4"
Carbonate aggregate concrete	8"	6"	6"	4"
Sand-lightweight concrete	8"	6"	4"	4"
Lightweight Concrete	6"	6"	4"	4"

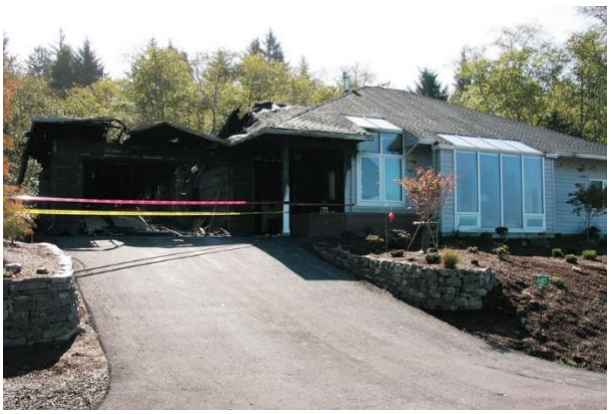
1. Based on IBC Table 721.1(2) Item 4-1.1
2. Concrete wall construction, with horizontal and vertical reinforcement as required, shall be in accordance with IBC Ch 19.

Stronghold ICF are permitted in construction classifications of Type I, II, III and V.

Flame Spread Ratings: Stronghold ICF is tested according to UL723 which evaluates the flame spread and smoke development of building materials. The test is used to measure the results against a benchmark of materials whereas Fiber-Cement Board is rated at 0 and Red Oak is rated at 100. Stronghold Insulated Concrete Forms have a flame spread classification of less than 25.

(Boca Engineering Co., 2020) [2]





In rural Oregon, these photos show the before and after of an accidental fire that started in the garage. This home was constructed with Insulated Concrete Forms and the partition wall between the garage and the home protected the living spaces. This fire raged for 35 minutes prior to the fire department arriving.[3]

Code review. This document and the information contained was written with respect to the 2024 Internation Wildland-Urban Code and the 2024 Internation Building Code as published by the International Code Council Always check with local, state and federal building codes for applicability.

Common Objections

1. ICFs are combustible products – ICF's are not considered a combustible building material in fact ICFs are considered a type of fire-resistant construction according to the Wildland-Urban Interface Code. ICF's can also achieve up to a 4-hour fire resistance rating according to the IBC.
2. The EPS insulation is a plastic that can burn – While some EPS does burn, i.e. packaging, the EPS used in construction is modified with a fire retardant and improves burning characteristics. Stronghold ICF's have a flame rating of less than 25. For comparison, fiber-cement board has a rating of 0 and Red Oak has a rating of 100
3. Does Stronghold ICFs need to be covered with a fire barrier? It most applications, yes, a 15-minute fire barrier complying with IBC Section 2603.4.1.6, or IRC Sections R303.5.3 or R303.5.4. Certain attic and crawls spaces may not need to have the insulation covered. See our listing report or talk with a sales rep for more details.

References

Boca Engineering Co. (2020). *Internation Building Code Engineering Evaluation Report.* Retrieved from https://www.strongholdicf.com/wp-content/uploads/2021/01/international-building-code-ibc-engineering-evaluation-report-for-stronghold-icf-blocks-usa-and-canada.pdf

ICF Builder Magazine. (2025, 3 21). *Fireproof ICFs.* Retrieved from www.icfmag.com: https://www.icfmag.com/2008/08/fireproof-icfs/

Intertek. (2025). *Listing information of Stornghold Insulated Concrete Form (ICF) System.* Retrieved from https://bpdirectory.intertek.com/pages/Report.aspx?ReportName=Listing&Type=Single&SpecID=51355

[3] (ICF Builder Magazine, 2025)