

Unparalleled Fire Safety

Every 20 seconds, a fire department responds to a fire somewhere in the United States, resulting in fire being the nation's fifth leading unintentional cause of injury and death. Consequently, the choice of construction materials that don't burn or contribute to the spread and size of a fire should be very important considerations.

Unlike wood or other organic construction materials, steel is a non-combustible. And because it can't burn, steel doesn't provide a means for a fire to start or fuel that will allow it to spread. It maintains its non-combustibility throughout the entire lifecycle of building; during building construction, occupation or future renovation/repair. The result is reduced fire risk to workers and occupants, less impact on municipal fire services, and lower property destruction and collateral damage to adjacent buildings if a fire should ever occur.

The building codes recognize cold-formed steel as "non-combustible" and therefore make it eligible for use in Type I buildings where the fire-resistance standards are the most stringent. "Fire walls" are code-mandated assemblies that help limit or slow the spread of flames in a building, and cold-formed steel frame assemblies have been proven to be fire proof in up to four hours when subjected to tests conforming to ASTM E119 (Standard Test Methods for Fire Tests of Building Construction). [Click here to search an online directory of fire-rated assemblies for both load-bearing and non-loadbearing conditions.](#)

The performance of steel components and steel structures in fire has been researched more extensively than any other building material. Decades of research into understanding the behavior of structural steel components when exposed to fire has given designers the confidence to engineer buildings that will provide optimum safety.

Cold-formed steel has also proven it can withstand the severity of fire exposure in tests that follow the rigorous protocols of NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

Research has also set the melting point of steel at approximately 2700°F, which means that it will not melt in a building fire, where temperatures average 1000°F and almost never exceed 1800°F. And while the yield strength of steel is reduced at elevated temperatures, modern building codes and fire protection methods take this into account. Further, fires in buildings don't

reach temperatures high enough to melt steel.

Non-combustible cold-formed steel construction also makes sense from a cost saving standpoint, as insurers traditionally offer lower builders risk and general liability premiums compared to wood. [Click here for a white paper on cold-formed steel and insurance](#) .

The Risks of Combustible Construction Materials

Code changes to permit increased building heights for combustible wood framing have had a predictable result: a rash of large, catastrophic fires in Canada and the US that have destroyed entire building complexes and caused significant damage to adjacent properties and infrastructure. [A record of recent multi-story wood frame building fires is available at this link.](#)

The negative consequences from one of these major fires often extends far beyond damage to the structure itself, also putting neighboring buildings and occupants at risk and creating enormous potential adverse economic impact for local government, businesses and residents. To understand and quantify these impacts, [a study was conducted](#) to detail the direct and indirect costs ranging from those associated with extinguishing the fire to productivity loss due to infrastructure damage and business disruption. Using data from actual fire events in Los Angeles, and extrapolating them to quantify the potential economic from the continued construction of mid-rise buildings with combustible framing from 2014 to 2028, the study found that for this fifteen-year period, Los Angeles County may face:

- Over \$22.6 billion in potential exposure based on the average scenario; the range of exposure over the period is \$6 billion to \$39.1 billion (low and high scenarios).
- Up to \$378.9 million in forgone tax revenues based on the average scenario, the range being \$347.9 million to \$410 million over fifteen years.

These urban fires have challenged the resources and equipment of fire services, increased costs of construction insurance rates for builders, and prompted several concerned provinces and municipalities to implement regulatory strategies for site safety practices during the construction of combustible buildings that will ultimately increase construction costs and lengthen time to building occupancy. The mounting evidence of these building code changes calls into question whether the relentless pursuit of supposedly lower cost construction methods is more important than increased risk to safety of the public and protection of their property.