



# Fire Safety and Balanced Design with Masonry

Of all possible construction systems, masonry offers the utmost protection against fire. Masonry materials—brick, concrete block, stone, mortar, grout and tile—don't burn, and therefore don't contribute fuel to a fire. Masonry maintains its structural integrity at high temperatures, and heat transfers slowly through its mass. Depending on its configuration, a masonry wall can remain intact and contain a fire burning on one side for two, three, four hours or even longer.

These characteristics make masonry the ideal choice for fire-rated walls required by building codes to separate occupancies within buildings. Such walls offer passive fire protection; once constructed, they typically require no ongoing maintenance or testing. Used in combination with active fire protection systems such as smoke detectors, temperature sensors and sprinklers, masonry fire walls provide the highest level of fire safety for buildings and occupants.

The difference between a material's fire rating and actual performance in a fire can literally mean life or death. In independent laboratory tests conducted on common gypsum walls and AAC block walls under the two-phased (furnace and water application) protocol of ASTM E-119, the AAC block wall assembly emerged unscathed, while both gypsum walls disintegrated. Yet, both walls could still "earn" a 2-hour fire rating under E-119. Videos of the tests are on [www.imiweb.org](http://www.imiweb.org).

The cornerstones of fire safety design are:

- **Prevention:** Reduce the chances of fire through good housekeeping, education and building layout.
- **Detection and Alarm:** Use early warning devices, like smoke detectors.
- **Suppression:** Use sprinklers, fire extinguishers or other suppressions systems to help put out fires quickly.
- **Compartmentation:** Building features like masonry fire walls can isolate and contain fire, toxic smoke and gases without losing the building's structural integrity. This allows for safe evacuation for residents and access for fire fighters.



### Masonry Fire Safety Tip

Fire ratings are not the same as true fire performance. Masonry contains fires where they start, period.



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