FIRE-RATED CONCRETE MASONRY UNITS(CMU)

Information Sheet for Architects, Engineers, Contractors & Building Owners

Manufactured by Brown's Concrete Products

What is Fire-Rated Concrete Block?

Fire-rated concrete masonry units (CMUs) are non-combustible building materials designed to provide a specified level of fire resistance when used in properly constructed wall assemblies.

Concrete block walls can achieve fire resistance ratings ranging from 1 hour to 4 hours or more, depending on:

- Block density
- Unit thickness
- Aggregate type
- Wall construction
- Grouting requirements
- Reinforcement details

Concrete masonry is widely used in schools, commercial buildings, industrial facilities, apartment buildings, and institutional construction where fire separation is required by building codes.

Why Choose Concrete Block for Fire Resistance?

Non-Combustible Construction

Concrete masonry does not burn, melt, emit smoke, or contribute fuel to a fire.

Built-In Fire Protection

Unlike many wall systems that require additional layers of fire-rated drywall or specialty assemblies, concrete block provides fire resistance as part of the wall itself.

Structural Integrity During Fire

CMU walls maintain strength and stability during prolonged fire exposure, helping contain fire and protect occupants.

Reduced Maintenance

Fire resistance is permanent and does not deteriorate over time.

Typical Fire Resistance Ratings

Nominal Block Thickness	Typical Fire Resistance Rating* (Normal Weight Concrete)	Typical Fire Resistance Rating* (Lightweight Concrete)
100 mm (4")	0.8 Hours	1.1 Hours
150 mm (6")	1.1 Hours	1.5 Hours
200 mm (8")	1.8 Hours	2.5 Hours
250 mm (10")	2.4 Hours	3.5 Hours
300 mm (12")	3.2 Hours	4+ Hours

*Actual ratings depend on aggregate type, equivalent thickness, density, and wall assembly design.

Common Applications

Fire-rated concrete block is commonly used for:

- Fire separations
- Party walls
- Mechanical rooms
- Electrical rooms
- Elevator shafts
- Stairwells
- Commercial buildings
- Industrial facilities
- Schools and institutions
- Multi-residential construction
- Warehouses
- Property line walls

How Fire Ratings Are Determined

Fire resistance ratings for concrete masonry are determined using:

Prescriptive Design Methods

Based on:

- Unit density
- Equivalent thickness
- Aggregate type

Fire Testing

Assemblies may also be tested in accordance with recognized standards such as:

- ASTM E119
- CAN/ULC-S101

These tests measure how long a wall can withstand exposure to a standardized fire while maintaining structural stability and limiting heat transmission.

Equivalent Thickness Explained

Fire resistance is based on the amount of concrete present in a wall, referred to as Equivalent Thickness.

Equivalent thickness considers:

- Face shell thickness
- Web thickness
- Hollow core configuration

In general:

Greater equivalent thickness = Greater fire resistance

Additional Benefits of Fire-Rated Block

Sound Control

Concrete masonry walls provide excellent sound attenuation between spaces.

Durability

CMUs resist impact, weather, rot, insects, and moisture damage.

Security

Solid masonry construction offers enhanced security and vandal resistance.

Sustainability

Concrete masonry can contribute to long-lasting, low-maintenance building construction.

Design Considerations

When designing a fire-rated CMU wall, consider:

- Required fire resistance rating
- Structural loading
- Reinforcement requirements
- Grouting specifications
- Control joints
- Penetrations and fire stopping details
- Applicable building code requirements

Fire ratings apply to the entire wall assembly, including any openings, penetrations, and connections.

Frequently Asked Questions

Does concrete block burn?

No. Concrete masonry is classified as a non-combustible building material.

Can hollow block be fire rated?

Yes. Hollow CMUs can achieve substantial fire resistance ratings when designed according to code requirements.

Does grouting improve fire resistance?

In many assemblies, grouting can increase fire resistance by adding mass and reducing heat transmission.

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Why Specify Concrete Masonry for Fire Separation?

- Non-combustible
- Long-lasting protection
- Structural performance during fire events
- Excellent sound control
- Low maintenance
- Cost-effective wall assembly
- Proven code compliance

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