

Fire Resistance Ratings for Exterior Walls U. L. Tested and Classified For 1 and 2 Hours

Insurance Bulletin No. 5 explains how insurance rates for metal buildings are affected by exterior wall construction. Fire Resistive Bulletin #1 (formerly listed as Insurance Bulletin #6) explains how insurance rates can be improved by using U.L. tested and classified 1, 1 ½ and 2-hour fire protected columns.

Through meetings and discussions with Insurance Services Office headquarters and through field experience it was determined that although the protected columns were providing an improved insurance rate, they were still not producing rates that would be directly competitive with buildings with concrete block exterior walls. Therefore, the MBMA Committee on Fire Protection and Related Insurance Matters undertook an engineering analysis and testing program to establish fire resistant rated exterior walls.

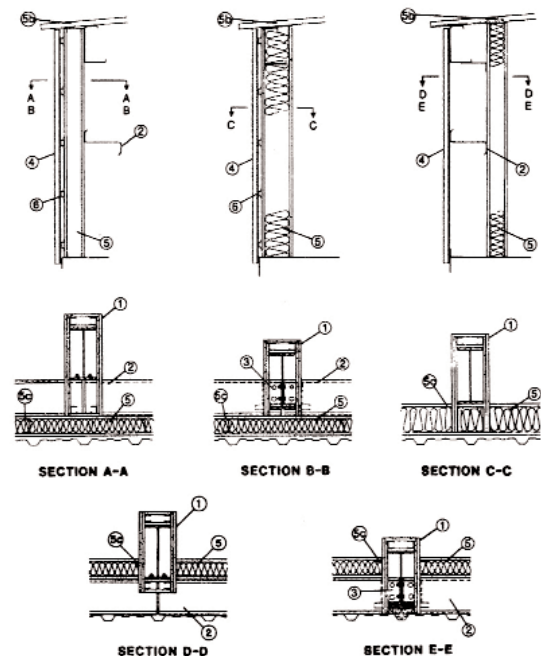
These walls are listed by Underwriters Laboratories, Inc. in the 1996 Fire Resistance Directory as U.L. Design No. U489.

In addition to improving fire insurance rates, fire resistant exterior rated walls are helpful in meeting building code requirements, including lot line separation and set-back requirements. The BOCA National Building Code published by the Building Officials and Code Administrators International, Inc. require that exterior walls having a 5 foot or less fire separation to the closest interior lot line, to the centerline of a street or public way or to an imaginary line between two buildings on the same property, be rated for exposure to fire from both sides. Where the fire separation distance is greater than 5 feet, the exterior wall needs only be rated from the inside (Section 705.2).

The same requirement is in the Standard Building Code published by the Southern Building Code Congress International, Inc. (Table 600, note i). U.L. Design No. U425 details the wall construction and gypsum wallboard protection. U.L. Design U425 is also included in this bulletin.

As with the fire rated columns, MBMA considers this a breakthrough in fire protection research of great importance to the designers and users of economical light steel frame buildings.

Design No. U489 Bearing Wall Rating - 1, 1 ½ and 2 Hr.



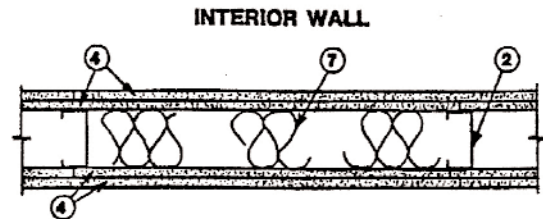
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Note: This bulletin was previously released as Insurance Bulletin #16

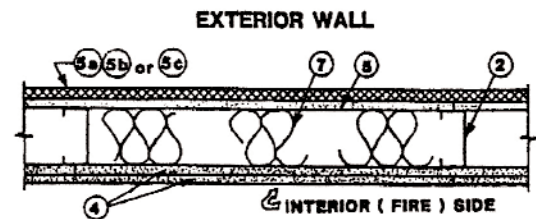
1. **Column Protection** - See Design Nos. X524 and X530 for column protection.
2. **Girts** - "Z" or "C" shape girts fabricated from 0.056 to 0.120 in. thick steel. Girts shall be 6 to 10 in. deep with 2 ½ to 3 in. flanges.
3. **Girt Clips** - Fabricated from min. 0.115 in. thick steel, angles may be bolted to columns with ½ by 1 ½ in. bolts and nuts or may be plates shop-welded to columns.
4. **Steel Wall Panels** - No. 26 MSG min. coated steel.
5. **Wall Construction** - See Design No. U425 for details.
 - a. Top of the wall shall be against the underside of roof deck.
 - b. All openings between top of wall and roof deck are to be filled with UL Classified mineral wool or glass fiber insulation.
 - c. Steel studs in accordance with the specifications in Design No. U425.
6. **Subgirts** - Min. 0.020 in. (25 gauge) thick galvanized steel, 1 5/16 in. wide on top and 2 ¾ in. wide at bottom by 7/8 in. deep (hat section), spaced 48 in. O.C. max.

*Bearing the UL Classification Marking

Design No. U425
(For Exterior Walls, Ratings Applicable For Exposure To Fire On Interior Face Only)
(See Items 4 and 5)
Bearing Wall Rating - 45 Min., 1, 1 ½ or 2 HR.



HORIZONTAL SECTION



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1. **Steel Floor and Ceiling Tracks (Not Shown)** - Top and bottom tracks of wall assemblies shall consist of steel members, min. No. 20 GSG (0.036 in. thick) galvanized steel or No. 20 MSG (0.033 in. thick) primed steel, that provide a sound structural connection between steel studs, and to adjacent assemblies such as a floor, ceiling, and/or other walls. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24 in. O.C.

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2. **Steel Studs** - Corrosion-protected steel studs, min. 3 ½ in. wide, min. No. 20 GSG (0.036 in. thick) galvanized steel or No. 20 MSG (0.033 in. thick) primed steel, cold-formed, shall be designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute. All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max. stud spacing of wall assemblies shall not exceed 24 in. O.C. (or 16 in. O.C. - See Item 5c). Studs attached to floor and ceiling tracks with ½ in. long Type S-12 pan head, self-drilling, self-tapping steel screws on

both sides of studs or by welded or bolted connections designed in accordance with the AISI specifications.

Lateral Support Members (Not shown) - Where required for lateral support of studs, support may be provided by means of steel straps, channels or other similar means as specified in the design of a particular steel stud wall system.

Wallboard, Gypsum* - Gypsum wallboard bearing the UL Classification Marking as to Fire Resistance. Applied vertically with joints between layers staggered. Outer layer of 3 layer construction may be applied horizontally. The thickness and number of layers and percent of design load for the 45 min., 1 hr., 1 ½ hr and 2 hr ratings are as follows:

Interior Walls (Wallboard Protection Both Sides of Wall)

Rating	Number of Layers and Thickness of Boards in Each Layer	Percent of Design Load
45 min.	* 1 layer, ½ in. thick	100
1 hour	* 1 layer, 5/8 in. thick	100
1 ½ hr.	* 2 layers, ½ in. thick	100
2 hours	* 2 layers, 5/8 in. thick	80
	* 3 layers, ½ in. thick or	100
	* 2 layers, ¾ in. thick	100

*Ratings applicable to assemblies serving as exterior walls where Classified fire resistive gypsum sheathing type wallboard is substituted on the exterior face.

Exterior Walls (Wallboard Protection On Interior Side of Wall)

Rating	Number of Layers and Thickness of Boards in Each Layer	Percent of Design Load
45 min.	* 1 layer, 5/8 in. thick	100
1 hour	* 2 layers, 1/2 in. thick	100
1 ½ hr.	* 2 layers, 5/8 in. thick	100
2 hours	* 3 layers, 1/2 in. thick or	100
	* 2 layers, 3/4 in. thick	100

*Bearing the UL Classification Marking

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See **Wallboard Gypsum (CKNX)** Category for names of Classified Companies of ½ in. or 5/8 in thick wallboard. See below for Classified company of ¾ in. thick wallboard

**United States Gypsum Co. –
ULTRACODE or Type IP-X3**

4. Wallboard, Gypsum* (As an alternate to siding, steel siding, brick veneer, or 5/8 in. thick wallboards in Item 4) - Nom. ¾ in. thick.

**United States Gypsum Co. - Type AR
United States Gypsum Co. - Type WSX**

5. **Gypsum Sheathing** - For exterior walls, X or 5k in. thick exterior regular gypsum sheathing applied vertically and attached to studs and runner tracks with 1 in. long type S-12 bugle head screws spaced 12 in. O.C. along studs and tracks. One of the following exterior facings are to be applied over the gypsum sheathing.

A. Siding, Brick, or Stucco – Aluminum siding, steel siding, brick veneer, or stucco attached to studs over gypsum sheathing and meeting the requirements of local code agencies. When a min. 3 ¾ in. thick brick veneer facing is used, the Exterior Wall Rating is applicable with exposure on either face. Brick veneer wall attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

B. Mineral and Fiber Boards* - Exterior hardboard paneling, chemically treated over gypsum sheathing with primed or finished face, 7/16 in. thick by 48 in. wide. Attached to studs over gypsum sheathing with 1 7/8 in. long bugle head TEK fasteners 16 in. O.C. at the intermediate supports. Or, exterior lap siding, chemically treated, 7/16 in. thick by 8 in. or 12 in. wide. Attached to studs with 1 7/8 in. long, bugle head Type TEK fasteners at each lap. Panels lapped minimum 1 in.

Masonite Corp. - Type FT

C. Cementitious Backer Units* - ½ or 5/8 in. thick, square edge boards, attached to steel studs over gypsum sheathing with 1 5/8 in. long, Type S-12, corrosion resistant, self-tapping wafer head steel screws, spaced 8 in. O.C. Studs spaced a max. of 16 in. O.C. Joints covered with glass fiber mesh tape.

**United States Gypsum Co. -
Durock Exterior Cement Board or
Durock Cement Board
TEC Inc. - Type TEC**

6. **Fasteners (Not Shown)** - Screws used to attached wallboard to studs: self-tapping bugle head sheet steel type, spaced 12 in. O.C. First layer Type S- 12 by 1 in. long for ½ and 5/8 in. thick wallboard and 1 ¼ in. long for ¾ in. thick wallboard. Second layer Type S-12 by 1 5/8 in. long for ½ in. and 5/8 in. thick wallboards and 2 ¼ in. long for ¾ in. thick wallboard. Third layer Type S-12 by 1 7/8 in. long.
7. **Batts and Blankets*** - Placed in stud cavities of all exterior walls. May or may not be used in interior walls. Any glass fiber or mineral wool batt material bearing the UL Classification Marking as to Fire Resistance, of a thickness to completely fill stud cavity. See Batts and Blankets (BZJZ) Category for names of Classified Companies.
8. **Joint Tape and Compound (Not Shown)** - Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw-heads of out layer. Perforated paper tape, 2 in. wide, embedded in first layer of compound over all joints of outer layer.

*Bearing the UL Classification Marking

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