

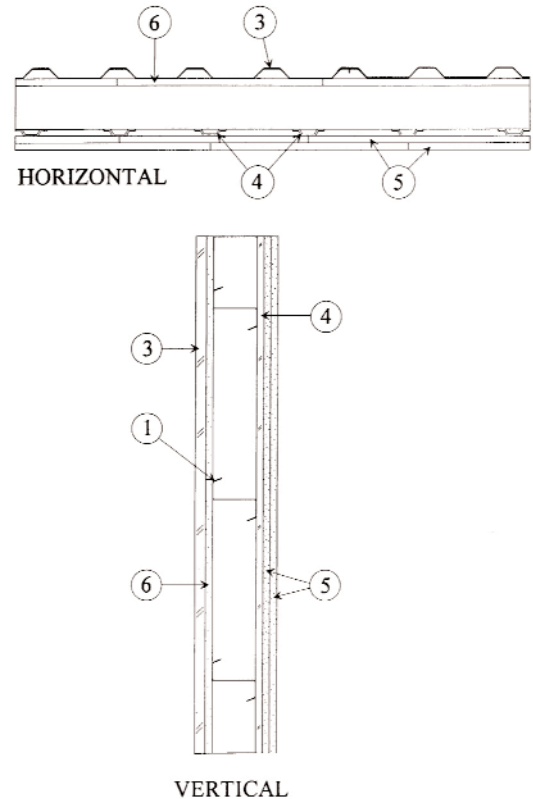
Fire Resistance Ratings for Exterior Walls UL Tested and Classified For 1-and 2-Hours

MBMA has developed fire resistance ratings based on fire tests of columns, roofs and exterior walls conducted at Underwriters Laboratories, Inc. (UL). The exterior wall ratings in MBMA Fire Resistance Bulletin No. 2 (formerly Insurance Bulletin #16), which are based on UL Design Nos. U489 and U425, were adapted for use in MBMA buildings where fire resistance ratings were needed.

It became apparent that a special gypsum wallboard fire protection framing design was needed to take advantage of the existing components used in metal buildings. Although the previous UL exterior wall listings for metal building systems are still technically acceptable, this new assembly reduces the extra cost of labor and materials required to build those assemblies.

The MBMA fire tests of exterior walls in 1997 resulted in a new UL Design, No. V421, which provides 1 and 2-hour fire resistance ratings for exterior walls in metal buildings. The ratings are for unsymmetrical walls that require ratings from both sides. The thickness and number of the layers of Type X gypsum wallboard are specified for each rating.

For exterior walls that are more than 5 feet from a property line, some building codes only require a fire resistance rating from the inside. This permits all the gypsum wallboard to be located on the interior face of the wall, and is shown in the Table following Item 6.



**Design No. V421 Non-Loading Bearing Wall
Rating - 1 and 2 Hr**

1. **Girts** - "Z" or "C" shaped girts, 0.056 to 0.120 in. thick steel, 6 to 12 in. deep, with 2 to 4 in. wide flanges. Girts placed horizontally (with flanges up or down) and spaced maximum 48 in. O.C. Girts are secured to columns with girt clips, Item 2, or bolted to the column through the girt flange.
2. **Girt Clips** - (Optional, not shown) - Steel clips secured to column by welds or bolts.

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Note: This bulletin was previously released as Insurance Bulletin #18

3. Steel Wall Panels - Minimum No. 26 MSG, minimum 16 in. wide coated steel panels. Panel joints offset 6 in. from gypsum sheathing joints. If one layer of exterior wallboard is used, panels are fastened to the horizontal girts with 1 ½ in. long (min.) No. 12-14 self-drilling screws 12 in. O.C. If two layers of exterior wallboard are used, panels are fastened to the horizontal girts with 2 in. long (min.) No. 12-14 self-drilling screws 12 in. O.C. Vertical raised rib profiles of adjacent panels are overlapped approximately 3 in. and attached to each other with 7/8 in. long (min.) ¼ - 14 self-drilling screws (stitch screws) 24 in. O.C. (max.) along the lap.

3A. Steel Siding or Brick - (optional, not shown) - For Fire Resistance Ratings from inside wall only, steel siding or brick veneer meeting the requirements of local code agencies may be installed over additional furring channels (not shown), Item 4, on exterior of wall in place of steel wall panels. Brick veneer attached to furring channels with corrugated metal wall ties attached to each furring channel with steel screws, not more than each sixth course of brick. When a minimum 3 ¾ in. thick brick veneer facing is used, the fire resistance rating applies from either side of the wall.

4. Furring Channels - Hat shaped, Minimum 25 MSG galvanized steel, approximately 2 5/8 in. wide, 7/8 in. deep, spaced 24 in. O.C. perpendicular to girts. Channels are secured to each girt with 3/8 in. (min.) long self-drilling pan head sheet steel type screws. Two screws are used at each fastening location, one through each leg of the furring channel.

5. Wallboard, Gypsum* - See table under Item 6 for number of layers on interior face of wall. Any 5/8 in. thick gypsum wallboard bearing the UL Classification Mark for Fire Resistance. Applied horizontally or vertically. First layer attached to furring channels, Item 4, using 1 in. long Type S bugle head drywall screws spaced 24 in. O.C. vertically and horizontally. Second layer attached to furring channels using 1 5/8 in. long Type S bugle head drywall screws spaced 12 in. O.C. vertically and 24 in. O.C. horizontally. Third layer, when used, attached to furring channels using Type S bugle head drywall screws spaced 12 in. O.C. vertically and 24 in. O.C. horizontally, 1 7/8 in. long for ½ in. wallboard and 2 ¼ in. long for 5/8 in. wallboard. The horizontal or vertical joints of the wallboard are offset 24 in. when 2 successive layers are applied in the same orientation. See **Wallboard, Gypsum (CKNX)** category for names of manufacturers.

6. Wallboard, Gypsum* - See following table for number of layers on exterior face of wall. Any exterior grade 5/8 in. thick gypsum wallboard or gypsum sheathing bearing the UL Classification Mark for Fire Resistance. Applied horizontally or vertically. First layer attached to girts, Item 1, using 1 ¼ in. long (min.) self-drilling buglehead sheet steel type drywall screws spaced 8 in. O.C. horizontally. Second layer, when used, attached to girts using 1 5/8 in. long (min.) self-drilling buglehead sheet steel type drywall screws spaced 8 in. O.C. horizontally. The horizontal or vertical joints of the wallboard are offset 24 in. if 2 successive layers are applied in the same orientation.

See **Wallboard, Gypsum (CKNX)** category for names of manufacturers.

*Bearing the UL Classification Marking

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Fire Resistance from Both Sides of Wall

Rating	Layers 5/8 in. Gypsum Wallboard (Item 5) on Interior Face	Layers 5/8 in. Gypsum Wallboard (Item 6) on Exterior Face
1	1	1
2	2	2
2	3	1

Fire Resistance from Inside of Wall Only

Rating	Layers 1/2 in. Gypsum Wallboard (Item 5) on Interior Face	Layers 5/8 in. Gypsum Wallboard (Item 6) on Exterior Face
1	3	0
Rating	Layers 5/8 in. Gypsum Wallboard (Item 5) on Interior Face	Layers 5/8 in. Gypsum Wallboard (Item 6) on Exterior Face
2	4	0

7. **Column Protection** - (not shown) – Horizontal wall girts, Item 1, are attached to vertical structural steel columns. See Column Design No. X524 for protection of columns.
8. **Batts and Blankets*** (optional, not shown) - Glass Fiber Batts placed in the cavities of exterior walls. See Batts and Blankets (BZJZ) category for names of manufacturers.

9. **Joint Tape and Compound** - (optional, not shown) - Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of face layer of gypsum wallboard. Paper or glass fiber tape embedded in first layer of compound over all joints.

*Bearing the UL Classification Marking

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