UL DESIGN NO. U419 NONBEARING WALL RATINGS-1,2,3 OR 4 HR (SEE ITEM 3 \$4)



I. FLOOR AND CEILING RUNNERS - (NOT SHOWN)-CHANNEL SHAPED, FABRICATED FROM MIN 25 MSG (MIN 20 MSG WHEN ITEM 4A IS USED) CORROSION PROTECTED STEEL, MIN WIDTH TO ACCOMMODATE STUD SIZE, WITH MIN I IN. LONG LEGS, ATTACHED TO FLOOR AND CEILING WITH FASTENERS 24 IN. OC MAX

2. STEEL STUDS - CHANNEL SHAPED, FABRICATED FROM MIN 25 MSG (MIN 20 MSG WHEN ITEM 4A IS USED) CORROSION-PROTECTED STEEL, MIN WIDTH AS INDICATED UNDER ITEM 4, MIN 1-1/4 IN. FLANGES AND 1/4 IN. RETURN, SPACED A MAX OF 24 IN. OC. STUDS TO BE CUT 3/8 TO 3/4 IN. LESS THAN ASSEMBLY HEIGHT.

3. BATTS AND BLANKETS* - (REQUIRED AS INDICATED UNDER ITEM 4)-MINERAL WOOL BATTS, FRICTION FITTED BETWEEN STUDS AND RUNNERS. MIN NOM THICKNESS AS INDICATED UNDER ITEM 4 SEE BATTS AND BLANKETS (BKNV OR BZJZ) CATEGORIES FOR NAMES OF CLASSIFIED COMPAINES.

3A. BATTS AND BLANKETS * - (OPTIONAL)- PLACED IN STUD CAVITIES, ANY GLASS FIBER OR MINERAL WOOL INSULATION BEARING THE UL CLASSIFICATION MARKING AS TO SURFACE BURNING CHARACTERISTICS AND/OR FIRE RESISTANCE. SEE BATTS AND BLANKETS (BKNV OR BZJZ) CATEGORIES FOR NAMES OF CLASSIFIED COMPANIES.

4. GYPSUM BOARD *- GYPSUM PANELS WITH BEVELED, SQUARE OR TAPERED EDGES APPLIED VERTICALLY OR HORIZONTALLY. VERTICAL JOINTS CENTERED OVER STUDS AND ATAGGERED ONE STUD CAVITY ON OPPOSITE SIDES OF STUDS. VERTICAL JOINTS IN ADJACENT LAYERS (MULTILAYER SYSTEMS) STAGGERED ONE STUD CAVITY. HORIZONTAL JOINTS NEED NOT BE BACKED BY STEEL FRAMING. HORIZONTAL EDGE JOINTS AND HOIRZONTAL BUTT JOINTS ON OPPOSITE SIDES OF STUDS NEED TO BE STAGGERED. HORIZONTAL EDGE JOINTS AND HORIZONTAL BUTT JOINTS IN ADJACENT LAYERS (MULTILAYER SYSTEMS) STAGGERED A MIN OF 12 IN. THE THICKNESS AND NUMBER OF LAYERS FOR THE I HR, 2 HR, 3 HR AND 4 HR RATINGS ARE AS FOLLOWS:

WALLBOARD PROTECTION ON EACH SIDE OF WALL

RATING	MIN STUD DEPTH	NO. OF LAYERS \$ THKNS.	MIN THKNS OF INSULATION
		OF PANEL	(ITEM 3)
I	3-1/2	I LAYER, 5/8 IN. THICK	OPTIONAL
I	2-1/2	I LAYER, 1/2 IN.	1-1/2 IN.
I	1-5/8	I LAYER, 3/4 IN.	OPTIONAL
2	1-5/8	2 LAYERS, 1/2 IN. THICK	OPTIONAL
2	1-5/8	2 LAYERS, 5/8 IN.	OPTIONAL
2	3-1/2	I LAYER, 3/4 IN.	3 IN.
3	1-5/8	3 LAYERS, 1/2 IN.	OPTIONAL
3	1-5/8	2 LAYERS, 3/4 IN.	OPTIONAL
3	I -5/8	3 LAYERS, 5/8IN. THICK	OPTIONAL
4	1-5/8	4 LAYERS, 5/8IN.	OPTIONAL
4	1-5/8	4 LAYERS, 1/2 IN.	OPTIONAL
4	2-1/2	2 LAYERS, 3/4 IN.	2 IN.

CANADIAN GYPSUM COMPANY - 1/2 IN. THICK TYPE C, IP-X2 OR IPC-AR; WRC 5/8 IN. THICK TYPE AR. C. IP-AR. IP-X1. IP-X2. IPC-AR. SCX. WRX OR WRC; 3/4 IN. THICK TYPE IP-X3, ULTRACODE, ULTRACODE SHC OR ULTRACODE WRC.

UNITED STATES GYPSUM CO.- 1/2 IN. THICK TYPE C. IP-X2. IPC-AR. WRC; 5/8 THICK TYPE SCX, SHX, WRX, IP-XI, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR; 3/4 IN THICK TYPE IP-X3, ULTRACODE, ULTRACODE SHC OR ULTRACODE WRC.

USG MEXICO S A DE C V- 1/2 IN. THICK TYPE C, IP-X2, IPC-AR OR WRC; 5/8 IN. THICK TYPE AR, C, IP-AR, IP-XI, IP-X2, IPC-AR, SCX, SHX WRX, WRC OR; 3/4 IN. THICK TYPE IP-X3, ULTRACODE, ULTRACODE SHC OR ULTRACODE WRC.

4A. GYPSUM BOARD+-(AS AN ALTERNATE TO ITEM 4)-5/8 IN. THICK GYPSUM PANELS INSTALLED AS DESCRIBED IN ITEM 4 WITH TYPE 5-12 STEEL SCREWS. THE LENGTH AND SPACING OF THE SCREWS AS SPECIFIED UNDER ITEM 5.

CANADIAN GYPSUM COMPANY-TYPE FRX

UNITED STATES GYPSUM CO-TYPE FRX

4B. GYPSUM BOARD +- (AS AN ALTERNATE TO ITEMS 4 AND 4A)-5/8 IN. THICK 2 FT. WIDE, TONGUE AND GROOVE EDGE, APPLIED HORIZONTALLY AS THE OUTER LAYER TO ONE SIDE OF THE ASSEMBLY. SECURED AS DESCRIBED IN ITEM 5. JOINT COVERING (ITEM 7) NOT REQUIRED.

CANADIAN GYPSUM COMPANY-TYPE SHX

UNITED STATES GYPSUM CO- TYPE SHX.

USG MEXICO S A DE C V-TYPE SHX.

5. FASTENERS- (NOT SHOWN)-TYPE 5 OR 5-12 STEEL SCREWS USED TO ATTACH PANELS TO STUDS (ITEM 2) OR FURRING CHANNELS (ITEM 6). SING LAYER SYSTEMS: I IN. LONG FOR 1/2 AND 5/8 IN. THICK PANELS OR I-1/4 IN. LONG FOR 3/4 IN. THICK PANELS, SPACED 8 IN. OC WHEN PANELS ARE APPLIED HORIZONTALLY, OR 8 IN. OC ALONG VERTICAL AND BOTTOM EDGES AND 12 IN. OC IN THE FIELD WHEN PANELS ARE APPLIED VERTICALLY TWO LAYER SYSTEMS: FIRST LAYER 1 IN. LONG FOR 1/2 AND 5/8 IN. THICK PANELS, SPACED 16 IN. OC. SECOND LAYER-1-5/8 IN. LONG FOR 1/2 IN., 5/8 IN. THICK PANELS OR 2-1/4 IN. LONG FOR 3/4 IN. THICK PANELS SPACED 16 IN. OC WITH SCREWS OFFSET 8 IN. FROM FIRST LAYER THREE-LAYER SYSTEMS: FIRST LAYER-I IN. LONG FOR 1/2 IN. 5/8 IN. THICK PANELS, SPACED 24 IN. OC. SECOND LAYER-1-5/8 IN, LONG FOR 1/2 IN, 5/8 IN THICK PANELS SPACED 24 IN. OC. THIRD LAYER 2-1/4 IN. LONG FOR 1/2 IN., 5/8 IN. THICK PANELS OR 2-5/8 IN LONG FOR 5/8 IN. THICK PANELS, SPACED 12 IN. OC. SCREWS OFFSET MIN 6 IN. FROM LAYER BELOW. FOUR-LAYER SYSTEMS: FIRST LAYER-I IN. LONG FOR 1/2 IN. 5/8 IN. THICK PANELS, SPACED 24 IN. OC. SECOND LAYER-1-5/8 IN. LONG FOR 1/2 IN. 5/8IN. THICK PANELS SPACED 24 IN. OC. THIRD LAYER 2-1/4 IN. LONG FOR 1/2 IN. THICK PANELS OR 2-5/8 IN. LONG FOR 5/8 IN. THICK PANELS SPACED 24 IN. OC. FOURTH LAYER-2-5/8 IN. LONG FOR 1/2 IN. THICK PANELS OR 3 IN. LONG FOR 5/8 IN. THICK PANELS, SPACED 12 IN. OC. SCREWS OFFSET MIN 6 IN. FROM LAYER BELOW:

6. FURRING CHANNELS-(OPTIONAL, NOT SHOWN, FOR SINGLE OR DOUBLE LAYER SYSTEMS)-RESILIENT FURRING CHANNELS FABRICATED FROM MIN 25 MSG CORROSION PROCTECTED STEEL, SPACED VERTICALLY A MAX OF 24 IN, OC, FLANGE PORTION ATTACHED TO EACH INTERSECTING STUD WITH 1/2 IN. LONG TYPE 5-12 STEEL SCREWS. NOT FOR USE WITH ITEM 4A.

7. JOINT TAPE AND COMPOUND-VINYL OR CASEIN, DRY OR PREMIXED JOINT COMPOUND APPLIED IN TWO COATS TO JOINTS AND SCREW HEADS OF OUTER LAYERS. PAPER TAPE, NOM 2 IN. WIDE, EMBEDDED IN FIRST LAYER OF COMPOUND OVER ALL JOINTS OUTER LAYER PANELS, PAPER TAPE AND JOINT COMPOUND MAY BE OMITTED WHEN GYPSUM PANELS ARE SUPPLIED WITH A SQUARE EDGE.

8. SIDING, BRICK OR STUCCO- (OPTIONAL, NOT SHOWN-ALLMINUM, VINYL OR STEEL SIDING, BRICK VENEER OR STUCCO, MEETING THE REQUIREMENTS OF LOCAL CODE AGENCIES, INSTALLED OVER GYPSUM PANELS, BRICK VENEER ATTACHED TO STUDS WITH CORRUGATED METAL WALL TIES ATTACHED TO EACH STUD WITH STEEL SCREWS NOT MORE THAN EACH SIXTH COURSE OF BRICK.

9. CAULKING AND SEALANTS *- (OPTIONAL NOT SHOWN)-A BEAD OF ACOUSTICAL SEALANT APPLIED AROUND THE PARTITION PERIMETER FOR SOUND CONTROL.

UNITED STATES GYPSUM CO-TYPE AS

***BEARING THE UL CLASSIFICATION MARKING**



1. Wall Assembly - The 1 or 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features: A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2

- by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. B. Gypsum Board* - 5/8 in. (16 mm) thick, 4 ft (1.2 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual
- U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5 in. (127 The hourly F rating of the firestop system is equal to the hourly fire rating of the wall assembly in
- which it is installed 2. Through Penetrants - One nonmetallic pipe or conduit to be centered within the firestop system. A nom annular space of 1/4 in. (6 mm) is required within the firestop system. Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used: A. Polyvinyl Chloride (PVC) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC
- pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system B. Rigid Nonmetallic Conduit+ - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 or 80 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
- C. Chlorinated Polyvinyl Chloride (CPVC) Pipe Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe
- for use in closed (process of supply) piping systems. D. Acrylonitrile Butadiene Styrene (ABS) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or
- foamed core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. E. Fire Retardant Polypropylene (FRPP) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. 3. Firestop System - The firestop system shall consist of the following:
- A. Fill, Void or Cavity Material* Caulk (Optional) Caulk forced into annular space to max extent possible. Caulk shall be installed flush with both surfaces of wall assembly. L Ratings apply only when caulk is used. SPECIFIED TECHNOLOGIES INC - SpecSeal 100, 101, 102, 120, 129 or 105 Sealant, SpecSeal LCI Sealant, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant
- B. Firestop Device* Galv steel collar lined with an intumescent material sized to fit the specific diam of the through-penetrant. Device shall be installed around through-penetrant in accordance with accompanying installation instructions. Device incorporates anchor tabs for securement to each surface of wall assembly by means of 1/8 in. (3 mm) diam by 1-3/4 in. (45 mm) long steel molly bolts in conjunction with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) diam steel fender washers. The F and T Rating of the firestop system is dependent upon the fire rating of the wall and size of the firestop

device as tabulated below:							
	FIRE RATING OF WALL Hr.	NOM. DEVICE SIZE In.	F Rating Hr	T Rating Hr			
	1	1-1/2	1	1			
	2	1-1/2	2	1 1/2			
	1	2	1	1			
	2	2	2	1 1/2			
	1	3	1	1			
	2	3	2	2			
	1	4	1	1			
	2	4	2	2			

SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Collar, SpecSeal LCC Collar, or SpecSeal SSC Collar, When SpecSeal LCC Collar or SpecSeal SSC Collar are used, the max annular space shall be 1/8 in, (3 mm) for max 2-1/2 in. (64 mm) diam pipe and shall be max 1/4 in. (6 mm) for pipe larger than 2-1/2 in. (64 mm) diam. The T Rating equals the hourly F Rating when SpecSeal LCC Collar is used. *Bearing the UL Classification Mark





I. WALL ASSEMBLY - THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

- A: STUDS WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM. 2 BY 4 IN. LUMBER SPACED 16 IN. O.C. STEEL STUDS TO BE MIN. 2-1/2 IN. WIDE AND SPACED MAX. 24 IN. O.C. B: GYPSUM BOARD + - TWO LAYERS OF NOM 5/8 IN. THICK GYPSUM WALLBOARD, AS SPECIFIED IN THE INDIVIDUAL WALL AND PARITION DESIGN. MAX DIAM OF opening 15 2 in.
- 2. THROUGH PENETRANTS ONE METALIC PIPECONDUIT OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE, CONDULT OR TURBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALIC PIPECONDUIT OR TUBING MAY BE USED:
- A: STEEL PIPE NOM I IN. DIAM (OR SMALLER) SCHEDULE 5 (OR HEAVIER) STEEL A NOM ANNULAR SPACE OF 5/16 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM.
- B: CONDUIT NOM I IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR RIGID CONDUIT.A NOM ANNULAR SPACE OF 5/16 IN. IS REQUIRED WITHIN THE FIRESTOP
- SYSTEM C: COPPER TUBING- NOM I IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER
- A NOM ANNULAR SPACE OF 5/16 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM. D: COPPER PIPE- NOM I IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
- A NOM ANNULAR SPACE OF 5/16 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM. 3. FIRESTOP SYSTEM-THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING: A: FILL, VOID OR CAVITY MATERIAL *- PUTTY-MIN. 1-1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, ON BOTH SURFACES OF WALL. ADDITIONAL FILL MATERIAL TO BE INSTALLED SUCH THAT A MIN 1/8 IN. CROWN IS FORMED AROUND THE PENETRATING ITEM. EGS NELSON FIRESTOP-TYPES FSP PUTTY AND FSP FIRESTOP PUTTY PADS.
- * BEARING THE UL CLASSIFICATION MARKING

