PAOLI, PENNSYLVANIA

July 25, 1966

PLAINTIFF'S EXHIBIT

GP-1103

General Sales Bulletin #53-66

TO: ALL REGIONAL SALES MANAGERS
ALL AREA SALES MANAGERS
ALL SALESMEN
DISTRIBUTION DIVISION SALES PERSONNEL

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli
M. M. Powers, Paoli

SUBJECT: SPECIFICATIONS FOR "HOLLAND SYSTEM" OF DRYWALL APPLICATION OVER INSULATION ON EXTERIOR MASONRY WALLS

By: G. C. Moore, Paoli

RE: Holland Plastics Company
Gilman, Iowa

Attached are specifications for the "Holland System" of drywall application by the Holland Plastics Company, Gilman, Iowa. The "Holland System" involves the adhesive application of Thermco polystyrene insulation to a masonry wall between vertically applied Thermco Thermal furring strips spaced 4' on center.

The components of the continuous Holland System are Thermco Blue Dot FR Styrene Foam Boards and Thermco Thermal Strips.

The Holland System of drywall installation assures lasting, effective protection from heat, cold, moisture and noise. After securely anchoring these furring strips which consist of plywood with Thermo backing to a masonry wall, with Holland adhesive or with Bestwall Grabit and masonry nails, four nails in 8' height, Holland adhesive or Bestwall Grabit and drywall screws are used to apply the gypsum wallboard. The gypsum wallboard is applied horizontal and fastened with drywall screws spaced 12" on center.

Important advantages of the Holland System as compared to the competitive Dow Chemical Company's "Miller System" which involves use of job mixed adhesive and no means for mechanically fastening field of gypsum wallboard panels are:

1) Better wall alignment. Thermco Insulation is cut to butt fit between vertical furring strips, floor and ceiling.

2) Easier to apply. The polystyrene insulating board is set directly into place with hand pressure.

3) No "set-up" or cure time required between application of insulating board and gypsum wallboard - no shoring or bracing necessary.

4) Joints can be taped immediately after application of gypsum wallboard.

5) Less labor required. No job mixing of Holland's adhesive. Dow's Styrotac adhesive requires job mixing and consistency may vary.

Continued on Page 2..

6) More economical application. Using 1" Thermco and 1/2" gypsum wallboard, the installed cost is approximately 50¢-60¢ per square foot, ready to paint. This is an average of about 10%-20% less than wet mortar system or competitive drywall insulation applications.

For masonry wall construction, Thermco insulation is available in 4' wide x 8' long sheets and 1", 1-1/2" and 2" thicknesses. Holland Plastics Company also supplies all of the components for the "Holland System" - Thermco furring strips, adhesive, concrete nails and drywall screws.

Insulation Comparison. As compared to an uninsulated wall of 4" face brick and 8" concrete block ("U" factor 0.34 BTU) - same masonry wall with 1" Thermco (K factor-.23 BTU) and 1/2" Bestwall Gypsum Wallboard - "U" factor 0.13. When 1-1/2" or 2" Thermco is used on this wall construction, the "U" factor becomes 0.10 or 0.08 respectively.

Holland Plastics reports that they are securing acceptance of the "Holland System" from architects, with an increasing number of job specifications for this type of application, and drywall applicators like the "Holland System" and its advantages.

> Note: Although we believe the "Holland System" is superior to the "Miller System" being promoted by Dow Chemical and USG, we will approve the application of Bestwall Gypsum Wallboard in the "Miller System" provided it is applied in accordance with Dow Chemical Company's recommendations.

Promote the "Holland System" and increase your gypsum wallboard volume.

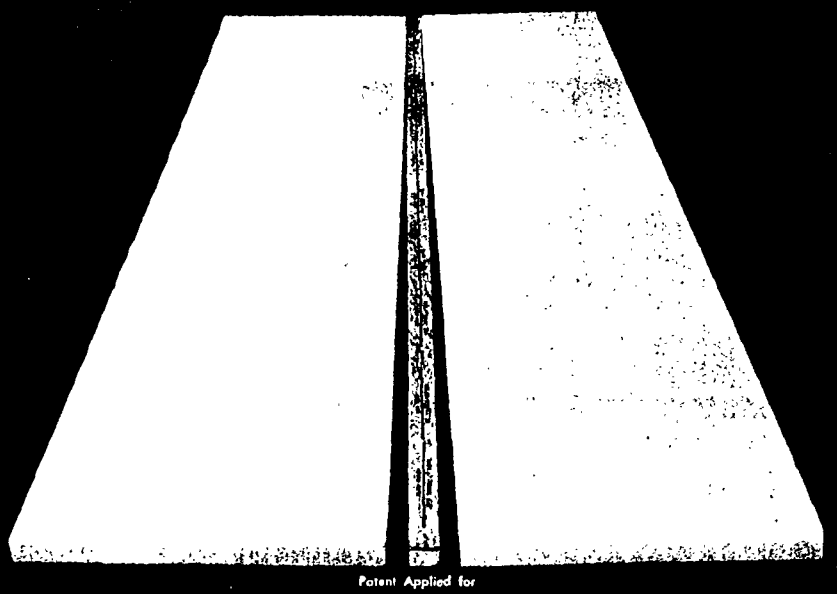
> Note: Bestwall will guarantee that the gypsum wallboard is free from manufacturing defects and is manufactured in accordance with applicable ASTM specifications. In this connection, the following disclaimer is applicable:
>
> "Characteristics, properties, or performance of materials or systems herein described are based on data supplied by others. Bestwall makes no warranties, expressed or implied, as to their characteristics, properties, or performance under any variations from such conditions in actual construction. The Bestwall Gypsum Division assumes no responsibility for the effects of structural movement".

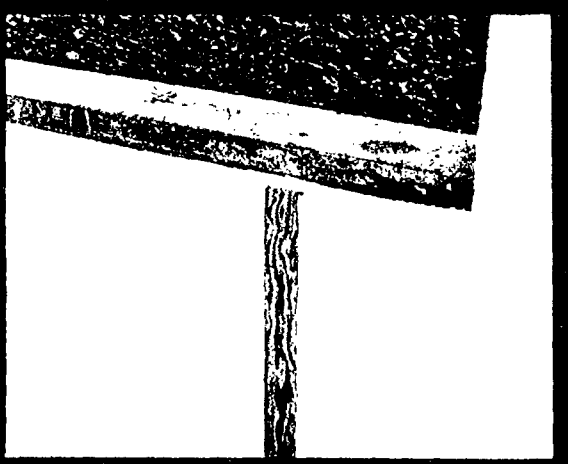
G. C. M

/jw
Encl.

"HOLLAND SYSTEM"

OF DRY WALL APPLICATION







BLUE DOT
Thermco®
'STYRENE FOAM INSULATION

SGP 0025622

HOLLAND PLASTICS COMPANY
GILMAN, IOWA

"HOLLAN



COMPONENTS OF THE "HOLLAND SYSTEM"

1. THERMCO® 'styrene Foam Insulation.

2. THERMCO® Thermal Strips — Furring strips composed of insulation board laminated to 3/8" exterior grade plywood and manufactured in 1", 1½" and 2" thicknesses and 8 ft. lengths, all in 2" widths.

3. An adhesive approved by Holland Plastics Company and meeting the requirements of G. D. C. 1.

4. Dry wall screws. (1" self tapping Phillips head — National Lock recommended).

5. Concrete nails. (6D, 8D, 10D for 1", 1½" and 2" systems. Wheeling LaBelle cut masonry nail recommended). (See Figure 3).

INSTALLATION OF THE "HOLLAND SYSTEM" DRY WALL INSULATION AND THERMCO® THERMAL STRIP

Apply a bead of adhesive on the foam side center line the full length of the THERMCO® Thermal Strips.

Mount strips vertically on masonry wall on four-foot centers. Secure with concrete nails. On poured concrete, use four evenly spaced nails starting at top and bottom. On block walls, place spaced nails in the mortar joint. Drive nails slightly into furring strip surface. If masonry is exceptionally hard, pilot holes should be drilled.

THERMCO® Insulation Board is cut to butt-fit between fur strips.

A bead of adhesive is applied to the THERMCO® Insulation Board, according to the adhesive instructions and specifications. The board is then put in place and set with hand pressure to insure adhesive contact to the masonry.

INSTALLATION OF WALL BOARD OVER THERMCO®

1. A bead of adhesive is applied the full length (on center) of the Thermal Strip, being careful to cover all nail heads.

2. The wall board is precut (if necessary) and an adhesive bead is applied according to adhesive instructions and specifications. (See Figure 2).

3. The wall board is installed horizontally with edges on the Thermal Strip center lines.

4. Hand pressure is applied to assure adhesive contact.

5. Phillips head drywall screws are placed top, bottom and two evenly spaced in between, wherever a Thermal Strip is located. (12 screws per 8' x 4' wall board).

6. Tape and finish Gypsum Board in accordance with proper industry practices.

THERMCO® BLUE DOT ENGINEERING DATA

	THERMCO FR (Flame Retardant)	THERMCO REG.
PHYSICAL PROPERTIES		
Density (lbs./cu. ft.)	1.1-1.25	1.1-1.25
Compressive Yield Strength	12-16	12-16
Flexural Strength	31.4 PSI	31.4 PSI
Shear Strength (lbs./sq. in.)	127	127
WATER RESISTANCE PROPERTIES		
Water Absorption, % by Volume	.25	.25
Water Vapor Transmission, Permeance	2.0	2.0
Capillarity	None	None
Buoyancy in Water (lbs. cu. ft.)	60	60
THERMAL PROPERTIES		
Burning Characteristics	FR	
Lineal Coefficient of Thermal Expansion, in/in °F.	0.000018	0.000018
Thermal Conductivity (BTU-Inch) Per Sq. Ft. per Hr. per °F. Mean Temp. 40°F. Average (K Factor)	.23	.23
Total Resistance (R Factor) 1" THERMCO	4.35	4.35
Heat Distortion Temperature (Max. for continuous use) °F.	170.0	170.0
BOND STRENGTH/ GYPSUM PLASTER lbs. sq. ft.	1640	1640
[redacted]		
DUSTING	None	None

[redacted]

SGP 0025623

DRY WALL APPLICATION

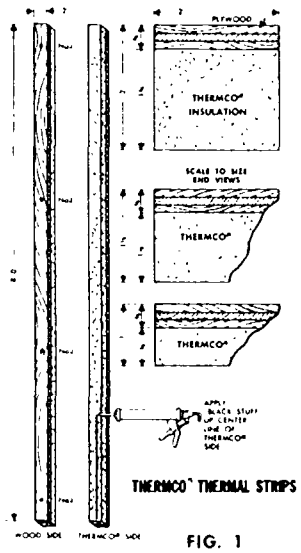


FIG. 1

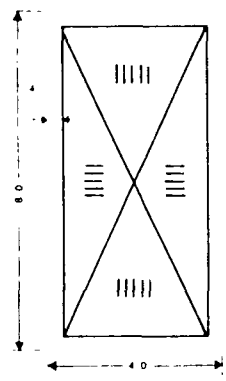


FIG. 2

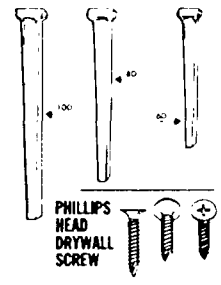


FIG. 3

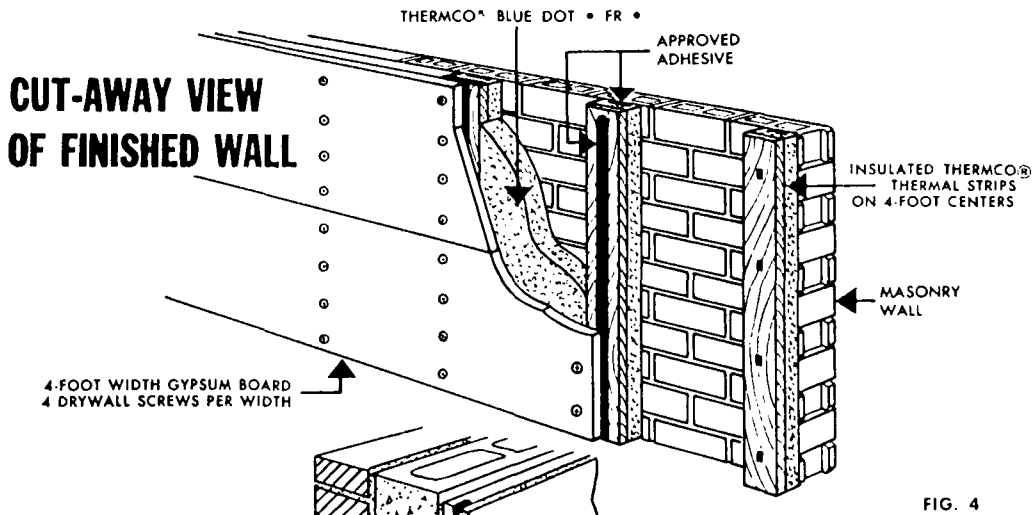
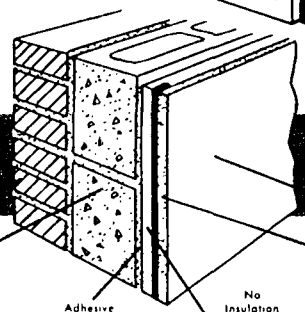


FIG. 4



U FACTOR FORMULA

Outside Air Surface 15 m p h Winds R	4" Face Brick R	4 Con Blk L W Agg R	Adhesive R	No Insulation R	½" Gypm Dry Wall R	Inside Air Surface R	1 000 / 3 29	= 0 30 "U"
17	0 44	1 50	05	0	45	68		
Outside Air Surface 15 m p h Winds R	4" Face Brick R	4 Con Blk L W Agg R	Adhesive R	1" Thermco® R	½" Gypm Dry Wall R	Inside Air Surface R	1 000 / 7 83	= 0 12 "U"
17	0 44	1 50	05	4 54	45	68		
Outside Air Surface 15 m p h Winds R	4" Face Brick R	4 Con Blk L W Agg R	Adhesive R	1½" Thermco® R	½" Gypm Dry Wall R	Inside Air Surface R	1 000 / 10 10	= 0 9 "U"
17	0 44	1 50	05	6 81	45	68		
Outside Air Surface 15 m p h Winds R	4" Face Brick R	4 Con Blk L W Agg R	Adhesive R	2" Thermco® R	½" Gypm Dry Wall R	Inside Air Surface R	1 000 / 12 37	= 0 08 "U"
17	0 44	1 50	05	9 08	45	68		

Just by adding 1" of THERMCO® Expanded Polystyrene Insulation Board, we have reduced the "U" factor by 40%.

"HOLLAND SYSTEM" OF DRY WALL APPLICATION

ADHESIVE SPECIFICATIONS

1. Black Stuff (a fortified rubber cement complying with G. D. C. I. Specifications) is applied in a ¼" bead to the THERMCO® Thermal Strip from top to bottom on the insulation side of the strip.

G. D. C. I. TEST

Test results in compliance with specifications for Adhesive Fastening System for Gypsum Wallboard Erection.

Materials Bonded: Gypsum board — Plywood
Gypsum board — Metal Studs

PARAGRAPH	REQUIREMENTS	TEST RESULTS
3.1	75% transfer of adhesive after 30 min. open time	Conforms
3.2	Wetting characteristics	Conforms
3.3.1	Shear Strength Development	
	a. 10 psi after 24 hours	14 psi
	b. 40 psi after 14 days	75 psi (with 100% gypsum failure)
3.3.2	Shear strength after laboratory cyclic exposure 80% of 3.3.1 (b)	65 psi (with 100% gypsum failure)
3.3.3	Static load in shear 40 psi for 24 hours at 23°C.	one week — no failure
	20 psi for 24 hours at 30°C.	48 hours — no failure
3.4.1	Tensile Strength development	
	a. 15 psi after 24 hours	19 psi
	b. 25 psi after 14 days	30 psi (with 100% gypsum failure)
3.5	Bridging characteristics	Conforms
3.6	500 hours at 70°C. (158°F.) (adhesive is bent around a ¼" mandrel)	Conforms
3.7	Freeze-thaw stability	Conforms

This is to certify compliance of Fuller's "Black Stuff" to "Specifications for Gypsum Wallboard Erection."

The Black Stuff is allowed approximately 5 minutes to "tack" up and for most solvents to dissipate. Black stuff must be tacky to touch when applying to the masonry or cement block wall. Press strip firmly in place and nail as specified.

Note: Masonry wall must be clean, dry and sound with all loose particles removed. Poured Concrete Walls must be dry and free of form coatings, latents and any foreign material. Temperature of surfaces being glued should be 50 F. or more. Black Stuff can be used below grade if wall is dry and sound.

2. Black Stuff is then applied to proper size sheet of THERMCO® Insulation in the following manner. A ¼" bead is extruded around the perimeter of the sheet. (See Figure 2). A ¼" bead is extruded diagonally in an X pattern from one corner to the other. Four ¼" beads, 5" long, of Black Stuff are put at random in the four triangles formed by the "X". Black Stuff is allowed to "tack up" for approximately five minutes and the sheet of THERMCO® pressed firmly in place on the wall and snuggly between the THERMCO® Thermal Strips. NOTE: You can expect 392 lineal feet of ¼" bead from one gallon of Black Stuff. 108.8 square feet of finished wall will be realized per gallon as per Figure 4. Do not use excessive amounts of Black Stuff to level irregular walls. More than a ¼" bead can cause trapped solvents which may result in foam collapse.

3. Wall Board is applied by using both screws and adhesive. Apply Black Stuff in a ¼" bead around perimeter and in an X pattern as outlined in Figure 2 to wallboard. Four ¼" beads, five inches long, should be applied in each triangle formed by the X. Again, allow Black Stuff to tack up, then place wallboard sheet adhesive side to THERMCO® Insulated Wall in a horizontal position. Press firmly and screw as specified.

BLACK STUFF SPECIAL HANDLING NOTES!

- Keep Pails Covered to Avoid "Skinning" Over and Solvent Evaporation.
- Store in Temperature of 50 F. to 90 F.
- Apply to Surfaces 50 F. or Above.

BLACK STUFF STRENGTH CHARACTERISTICS

	MAPLE TO MAPLE SHEAR	MAPLE TO MAPLE TENSILE
48 Hours	144.2 sq. in.	52.1 sq. in.
7 Days	153.2 sq. in.	59.15 sq. in.
18 Days	183.3 sq. in.	154.25 sq. in.

Curing levels off, but strengths do increase for 30 days.



SGP 0025625