

## **BRICK WALL**

Cinnabar Florida Inc. was given a contract to face a metal building that was built to house a major ride venue within a large theme park. The client wanted the building to have the appearance of a building from "old New York". All was left up to Cinnabar's engineering, design and production personnel to perfect the project and install it.

It was decided to make inter-locking wall sections by laying the brick and mortar on a reinforced plywood back board of some 12-feet in width and 10-feet in height. The brick was purchased and the four edges first "faced" on a grinder to insure draft on each, especially those that would become the "outside" units at the perimeter of the mold. The face of each the brick was "ground and artistically sculptured" to give the appearance of rough, used brick. The mortar mixed and the unit was constructed in a horizontal plane on a reinforced 1.00" plywood backing. Every other block on both of the 10-foot ends was cut and left out so that later, on final installation on the job site, and panel "A" was inserted next to panel "B" they would interlock. The two parts were checked to make certain that they were inter-locking along the 10-foot sides when joined.

The "Brick Plug" was profusely coated with multiple coats of mold release and final coats of PVA to insure the inorganic part would not stick to the mold when constructed. A special High heat Distortion Tooling Gel Coat and Resin System was procured to make the mold. These Tooling Materials have a "HDT" of 347-degrees F. [175-degrees C.] and will not distort or print under the exothermic temperatures given off during lamination of the parts.

A first laminate of 20-mil Veil was used for good surface appearance followed by multiple layers of Type E, Chopped Strand Mat were used as the reinforcement to achieve a thickness of 0.500" [12.7 mm]. Upon completion of the mold laminate, the part was further stiffened using 0.500" thick plywood braces by 6.0-inches in height and covered with two [2] laminates of fab-mat to insure that the final reinforced fiberglass mold of the brick wall remained in a flat plane and did not distort. The braces were placed around the periphery of the mold and also at "0" and "90"-degrees on 18-inch centers.

All surfaces of the molds were treated with a polymer mold release system. The entire perimeter of the mold's vertical brick surfaces were cover with Peel Ply to insure excellent adhesion when bonding finished panels on site erection. A Class 1, Fire Retardant Gel Coat of high thixothorpy, that matched the color of mortar was applied at a thickness of >0.010" and <0.015" to the "highs" in the mold that denoted the mortar line in the brick. A very short napped 2-inch paint roller was used for this task. Upon the mortar colored Gel Coat reaching a cure [slight tack] that could be over-coated, the entire surface was sprayed with a Class 1, Fire Retardant Gel Coat colored to match the basic brick was then sprayed to a thickness of >0.018" and <0.022".

Following cure [to a slight tack], the panels were laminated using a Brominated Unsaturated Polyester, Class 1, Fire Retardant Rein with two [2] plies of Binder-free Stitched Mat to a finished thickness of 0.070" [1.78 mm] that easily "bridged" the mortar lines.. All air was removed from the laminates with conventional 0.250" x 1.500" "Mini-Rollers". Upon reaching a gel, the surface exotherm of the part was measured with a non-contact, infrared thermometer to assure that the laminate reached its highest temperature of exotherm and receded to close to ambient. A third and later a fourth laminate of "18-ounce Fabmat" [a combination of 1.5-oz./sq. ft. chopped strand mat bonded to 18-oz./ sq. yd. woven roving] was applied by first wetting the back side of the reinforcement, and then the top. The laminate was hand rolled with the "Mini-Rollers" and "squeegees" to insure the wet laminate was inserted into all "corners", entrapped air removed and a high glass content [>45 %] was achieved by removal of all excess resin. Each laminate was "gel-trimmed" prior to the next one being applied. The final laminate was >0.250" in thickness.

Upon de-molding the part, Class 1, Fire Retardant Gel Coats were shaded to varying colors of mortar and umber. The brick facing was hand rubbed and stippled with a rag that had been wet with one or more of the colors [as you would to "antique" furniture] to give a varied, unique and weathered appearance.

The finished parts are then post cured in Cinnabar's 36' x 18' x 16' oven at 170-degrees F. [76.6-degrees C.] to insure that all residual styrene monomer, methyl methacrylate or other residual combustible chemicals were "flushed" or extracted from the laminate. This is normally done by the resin and/or gel coat producer on making specimens to be used in Fire Testing and Cinnabar wants absolute duplication and insurance that all procedures are followed. After many test, it has been determined that this procedure is of utmost importance when producing a fire retardant part.

The panels were bolted to the building on site using a Vinyl Ester, Class 1, Fire Retardant Mastic Adhesive and 0.250", No. 316 Stainless Steel fasteners with 0.375" lock and flat washers set at 12.0" on center, located at the mortar lines to insure excellent bonding and resistance to winds and weather. The bolt heads are recessed and upon completion were covered with a putty the same color as the mortar.

When producing the "Granite Walls" the same procedure was used with the exception that the granite plug was "sculptured" from sheets of 4.0 PCF Polyurethane Foam and over coated with two laminates of 1.5-oz chopped strand mat and a final layer of 3.0-oz. fiberglass cloth. The laminates were then coated with Sanding Gel Coat until the desired finish was achieved. Once done, the "Granite Plug" was ready for coats of mold release and all phases proceeded in the same manner employed in constructing the mold and parts for the "Brick Wall".

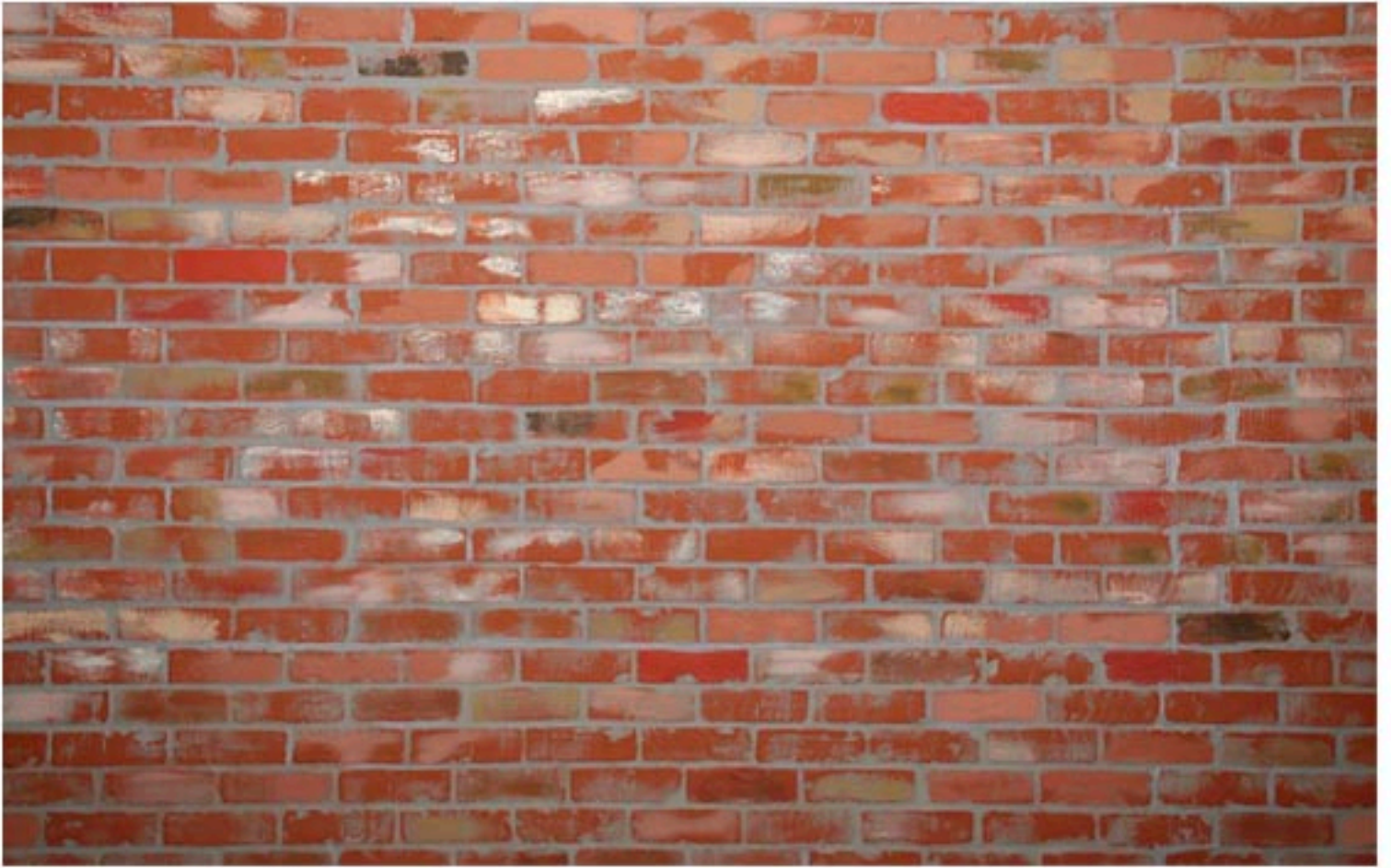
These systems of producing "walls or paneling" of Fire Retardant Composite can be used to make anything that the designer or architect might envision. "Dreams can be made real" through the use of Class 1, Fire Retardant Composites.

## MOLD MATERIALS AND SUPPLIERS

1. HHD TOOLING GEL COAT, LHB3350, BLACK.....HK Research, Inc.
2. HHD TOOLING RESIN, VE-RESIN, "R-SERIES" .....HK Research, Inc.
3. SANDING GEL COAT, GRAY, LHB9062.. .....HK Research, Inc.
4. COLORANTS FOR GEL COAT "ANTIQUING", H-SERIES.....HK Research, Inc.
5. FIBERGLASS REINFORCEMENT – 20-MIL VEIL..... Schmelzer Inds.
6. FIBERGLASS REINFORCEMENT – CHOPPED STRAND MAT. "ADVANTEK", M705 ...Owens Corning][
7. FIBERGLASS REINFORCEMENT – 24-OZ FABMAT, #2515.....Fiber Glass Inds.
8. POLYMER MOLD RELEASE SYSTEM.....Loctite Corp.
9. Norox CATALYST – MEKP –9 (USE W/ GEL COATS).....Norac, Inc.
10. NOROX CATALYST – MEKP-925-H (USE W/ V E RESINS).....Norac, Inc.
11. ABRASIVE AND POLISHING COMPOUNDS.....3-M

## PRODUCTION MATERIALS AND SUPPLIERS

1. POLYMER MOLD RELEASE.....Locktite Corp.
2. PEAL PLY.....Air Tech Intl.
3. GEL COAT, CLASS 1, FIRE RETARDANT, 'LFS-SERIES" .....HK Research, Inc.
4. VINYL ESTER RESIN, CLASS 1, FIRE RETARDANT - #K022-AAA [ADHESIVE BASE].....AOC Resins
5. BrUPE RESIN, CLASS 1, FIRE RETARDANT - #752-4423.....Hexion Chemical
6. REINFORCING GLASS FIBERS for ADHESIVE, #3075, 0.125" [3.175 mm]..... PPG Inds.
7. 3-M MICROSHPHERES FOR ADHESIVE, 2,500 PSI B/S.....3-M
8. THICKNER & FIRE RETARDANT ADDITIVE – ATH – #632.....J. M Huber Corp.
9. NOROX CATALYST – MEKP-9 (USE W/ POLTESTER RESINS & GEL COATS).....Norac, Inc.
10. NOROX CATALYST – MEKP-925-H (USE W/ VINYL ESTER RESINS).....Norac. Inc.
11. ABRASIVES AND POLISHING COMPOUNDS.....3-M
12. FIBERGLASS REINFORCEMENT- 20-MIL VEIL.....Schmelzer Inds.
13. FIBERGLASS REINFORCEMENT- 1.5-OZ. STITCHED MAT, #E-M-0020-7.....Vectorply
14. FIBERGLASS REINFORCEMENT – 18-OZ. "FABMAT", #1815.....Fiber Glass Inds.



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