



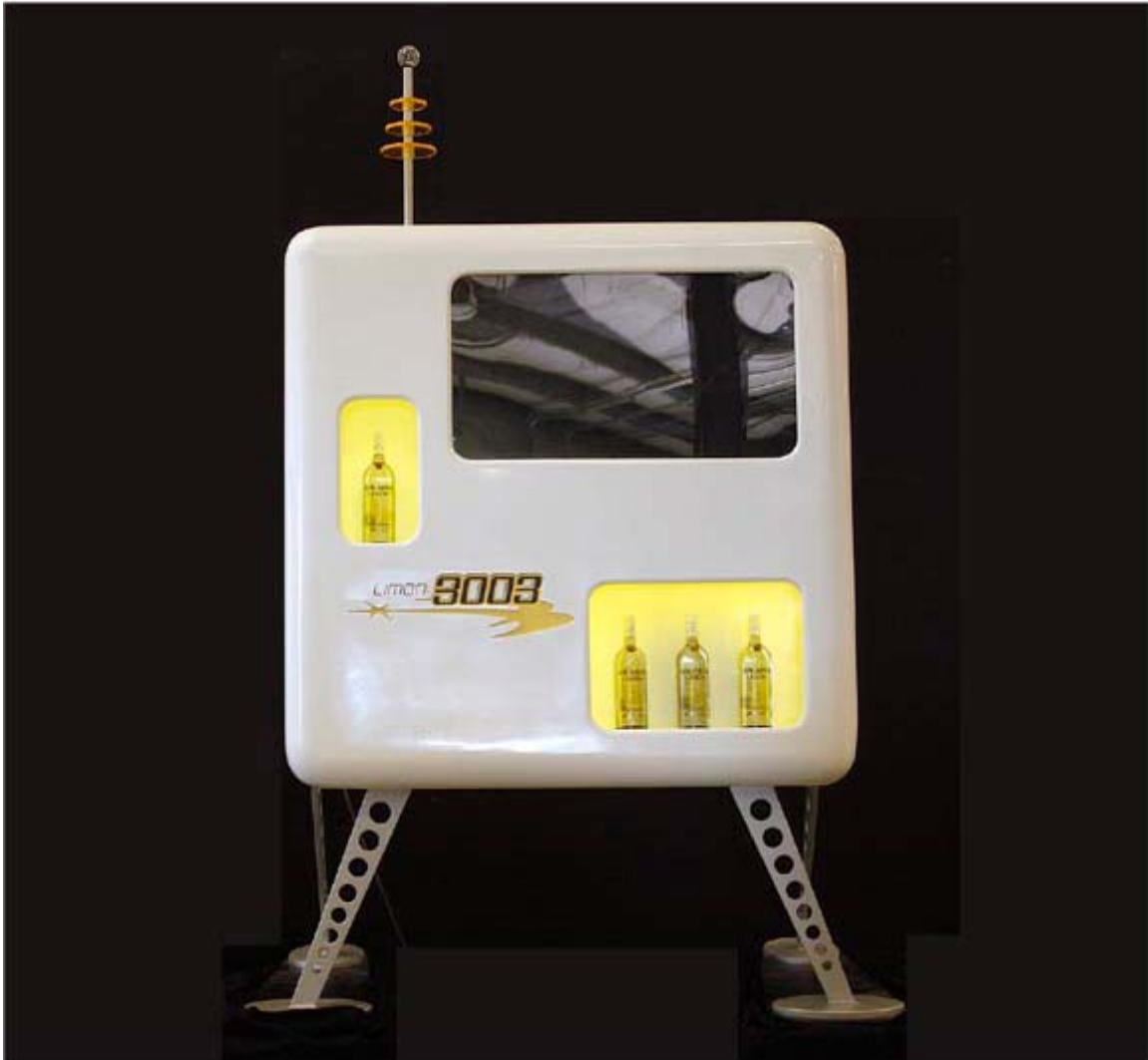
Bacardi-Limon Entry portal



Bacardi-Limon Bar-Back wall



Bacardi-Limon Robot with Sign



Bacardi-Limon Video display

BACARDI-LIMON EXHIBIT

Cinnabar Florida, Inc. was awarded the project of constructing multiple exhibits for Bacardi Rum that could be shipped to various cities and erected in the major night clubs as a promotion of their new "Bacardi Limon" drink. A design conception was presented by the "Bacardi Team" that was augmented by Cinnabar's staff of design, engineering and manufacturing personnel to plan construction using drawings done by their computer to three dimensional scale drawings insuring the size and fit of each of the items to be produced from the original non-scaled "sketches".

The drawings were assessed to not only be easily crated for shipment, but also of a size that would be light in weight, but strong enough to handle the rigors of transportation, set-up and abuse that would occur in this most "unruly" setting in a public building and constructed using only Class 1 Fire Retardant Materials.

The entry was designed that would "close-off" the exhibit area from the rest of the night-club, but be uniquely modern in appearance, have the ability to stand alone without being knocked over, have flashing lights to draw the patrons attention and most important be constructed of Fire Retardant Composite materials.

Upon entering the exhibit, an 8-foot tall robot greets the patrons. Centered in the robot's chest area is a television camera that, when "activated" by shaking his hand, emits his "greeting" and a "commercial" shown on the TV. The voice message is given through speakers mounted in his chest and throat areas. Needless to state, the robot must be light in weight, robust in construction and have the utmost of Fire Resistance in its Composite Construction. Because of the interior location within a "public building" and the vast array of electronics with his body, the possible instance of fire must be of paramount importance and Class 1 Fire Retardant materials used throughout its construction.

Included in the exhibit is a free standing Bacardi Limon Video display with a plasma television that repeats a program extolling Bacardi and the new drink. Unlike most displays Bacardi wanted to be "free" of any fire contingency and the unit was therefore constructed using Class I Fire Retardant Composite materials.

A free standing bar with lighted highlights to serve the new drink was constructed of Class I Fire Retardant materials.

MANUFACTURING PROCEDURES

Plugs were constructed using sculpturing foam, phenolic faced laminate and various other materials to simulate the structures to be molded. Upon producing the necessary shapes, each was evaluate by Bacardi's design personnel for acceptance. Molds were produced using standard industry procedures, but the Gel Coat and Tooling Resin were of specially formulated High Heat Distortion materials. The "HDT" of them is 347-degrees F. [175-degreesC.]. These are temperature that would never be reached during the exothermic reaction of the laminating resin that would be used in the molds and would not distort or print.

The parts were conventionally molded by hand lay-up using a Class I Fire Retardant Gel Coat and Brominated Unsaturated Polyester Resin Systems with a ply of Single Strand Veil against the Gel Coat to give an excellent appearance. The Veil was followed with two [2] plies of Chopped Strand Mat the first of 0.9 oz./ft. sq. and two [2] plies of 1.5 oz./ft. sq. These were followed by two [2] plies of a Mat/Quadaxial that was produced by stitching a Copped Strand Mat [8.1 oz./yd. sq.] to a quadaxial composed of 6.4 oz/yd. sq. @ "0", plus 12.84 oz./yd. sq. @ each of two [2] "45" to give total weight of each laminate of 34.18 oz./yd. sq. This light weight laminate proved to be exceedingly strong for its weight, had excellent contouring and was laminator friendly. The glass content of the part was >50-percent produced through the excellent wetting characteristic of the resin and quadaxial combination giving the laminator the ability to squeegee the excess resin from the laminate.

Where multiple part moldings were used, as in the robot, the bar and the video display, the areas to be bonded were surfaced with Peel Ply for the best of adhesion. They were mechanically joined following application of both parts with a paste adhesive based on the Fire Retardant Gel Coat. The joints were covered with the same Fire Retardant Paste, sanded and polished to a finish and appearance equal to the gel coat.

It's not well "advertised" and not contained in some Technical Data Sheets, but most producers of fire retardant unsaturated polyester resins and gel coats post-cure their specimens prior to fire testing at temperatures as high as 225-deg. F for as long as 48-hours to "flash" or extract any unreacted styrene and methyl methacrylate monomers and other residual flammable chemicals that might be retained in the laminate and give poor test results. All of Cinnabar's production parts, following cure at ambient temperatures [77-degrees F.] are, as requested by the resin suppliers, post-cured in their 36' x 18' x 16' oven at 170-degrees F. for a minimum of 16 hours. This is to insure absolute duplication of the manufacturer's original testing originally performed to pass the Fire Tests.

Cinnabar has found this to be of utmost importance to achieve maximum fire performance in the "real life" with their finished composites.

MOLD MATERIALS AND SUPPLIERS

1. HDT TOOLING GEL COAT, Black - # LHB-3350.....HK Research
2. HDT TOOLING RESIN, VE, OFF-WHITE - # "R-SERIES, VE-HDT.....HK Research
3. SANDING GEL COAT, Gray - LHB-9062HK Research
4. FIBERGLASS REINFORCEMENT- SINGLE STRAND VEIL - 20-MIL.....Schmelzer Inds.
5. FIBERGLASS REINFORCEMENT- CHOPPED STRAND MAT, "M705"Owens Corning
6. FIBERGLASS REINFORCEMENT -JIG - 24-OZ FABMAT, # 2515.....Fiber Glass Inds.
7. POLYMER MOLD RELEASE SYSTEM.....Loctite Corp.
8. Norox CATALYST - # MEKP-9Norac, Inc

PRODUCTION MATERIALS AND SUPPLIERS

1. POLYMER MOLD RELEASE SYSTEM.....Loctite Corp.
2. PEAL PLY.....Air Tech Intl.
3. FIRE RETARDANT GEL COAT, CLASS 1, LFS-SERIES..... HK Research
4. HI-STRENGTH COLOR ADDITIVES, "H-SERIES CONCENTRATES"HK Research
5. POLYESTER RESIN, CLASS 1, BrUPE, FIRE RETARDANT, #752-4423.....HEXION Specialty Chemical
6. ADHESIVE ADDITIVE, CHOPPED STRAND FIBERGLASS, PPG #3075, 0.125"(3.18mm) ...PPG Industries
7. ADHESIVE ADDITIVE, 3-M MICROSPPHERES, 2,500 P.....3-M
8. ADHESIVE FIRE RETARDANT & THICKENER, ATH-632.....J. M. Huber
9. ABRASIVES & COMPOUNDS.....3-M
10. NOROX CATALYST FOR GEL COAT - # MEKP-9 (Use w/ #752-4423 & GelCoat).....Norac, Inc.
11. NOROX CATALYST - FOR VE RESINS - # MEKP-925H..... Norac, Inc.
12. FIBERGLASS REINFORCEMENT-CHOPPED STRAND MAT, M113, 1.0 & 1.5 OZ./FT2.....PPG Industries
13. FIBERGLASS REINFORCEMENT - 24-OZ - E-LTM-2408-BIAXIAL.....Vectorply

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American Composites Manufacturers Association – Fire Committee

Case History: Architectural Applications Involving Fire Performance

*Describe results to demonstrate that composites “win” versus alternative materials
(advantages gained, such as reduced maintenance, increased production or quality, cost savings, improved safety and/or environmental — see examples below)

*Are there any photographs, charts, or graphs available for use in the story?
 Yes No (“X” fills; spacebar clears)

*Has customer given permission to use their name in story?
 Yes No (“X” fills; spacebar clears)

*Will customer allow us to quote a management representative in the story?
 Yes No (“X” fills; spacebar clears)

GENERAL BENEFITS EXAMPLES

- Fire Performance
- Light weight – reduced weight
- High strength
- Corrosion resistance
- Weather resistance
- High impact strength
- Radar transparency
- Non-magnetic
- Non-conductive
- High strength-to-weight ratio
- Design flexibility
- Energy efficient
- High dielectric strength (insulator)
- Dimensional stability
- Small to large part geometry
- Customized surface finish
- Environmentally sound or safe
- Others

RESULTS MESSAGE EXAMPLES

- Rapid installation – modular components, easier handling because it is lightweight
- Reduced or Low maintenance – no painting because color is molded in
- Reduced inspection – easier to inspect
- Parts consolidation – faster assembly and reduced installation time
- Lower operator fatigue
- Affordable
- Cost savings / cost effective– lower installed or life-cycle costs
- Reduced personal safety – less on the job injuries
- Long term durability – extended service life
- Influenced styling/design – sculptural form providing design versatility
- Increased performance
- More attractive, functional, durable
- Reduced environmental risk - leading to reduced disposal issues
- Others