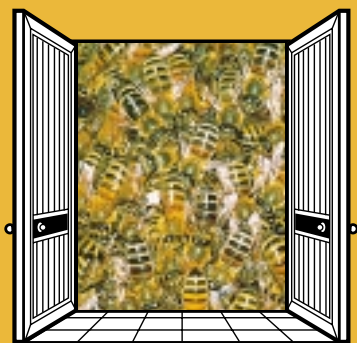


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THE M.C. GILL DOORWAY

"We try hard enough to make it happen"

M.C. GILL CORP., 4056 EASY ST., EL MONTE, CA 91731 • PHONE (818) 443-4022 • FAX (818) 350-5880 • FAX (818) 279-6051

*Our Bees are Busy
for Boeing*



GILLCORE[®]

for BOEING

The Largest Contract in Our 51-year History

It's all about the manufacture of an interesting product used in the aerospace industry. It concerns, in part, a customer's confidence in the M.C. Gill Corporation's ability to make a sizeable commitment. It's not the first time (or second, or third, or...) in the history of this pioneer - founded, family-owned composites company — that we've asked ourselves to make such a commitment. We've welcomed these challenges and up to now we've never had to go outside for capital to meet those commitments. This commitment is a three-year contract to supply the Boeing Aircraft Company with their Nomex honeycomb core material and it was awarded to the M.C. Gill Corp. just a little over a year ago. It is the largest contract in our history and established the company's standing as a major worldwide honeycomb supplier.

THE TIME IS RIPE TO TELL THE STORY

The story relates, in part, the extent to which we would go to ensure that Boeing gained another experienced, qualified source to manufacture a material critical to their operation; one that delivers on time, at a competitive price, and one to whom customer satisfaction is paramount. And finally, as a pioneer (since 1945) we offer proven problem solving ability, specialization in aircraft cargo liners and interior panels, and pride and confidence that our customers receive the best value available.

RFQ WAS JUST THE BEGINNING

Once OEM Sales Director Larry Russell convinced Boeing to include us in their list of bidders, our Engineering Department undertook a comprehensive planning exercise based on Boeing's RFQ (Request for Quotation). It revealed that if we met Boeing's requirements we were looking at a major expansion of our honeycomb facilities. We needed increased capacities in every phase of the operation — our

printer, press, expander, heat-set oven, dip tank, bake oven, pollution control system, and slicing capabilities. The initial cost estimate placed this expansion at roughly 15 percent of the contract! That would guarantee our meeting the added Boeing requirement with plenty of room to spare.

One troubling factor was that we still had to meet not only our existing customers' needs for honeycomb but also our own for the production of sandwich panels. Because of these commitments, we couldn't allow expansion to halt or slow existing Nomex production. In fact, M.C. Gill president and CEO, Stephen Gill mandated that we had to continue to serve our existing honeycomb customers AND maintain the output necessary for our own sandwich panel core needs before pursuing Boeing's RFQ.

So, we were looking at not only a major financial obligation but a potential scheduling nightmare... for Engineering to accomplish the expansion... Production to continue to provide a steady flow of honeycomb... and Human Resources to hire and train the additional employees required. Nevertheless, Stephen Gill made the decision to forge ahead and "try hard enough to make it happen."

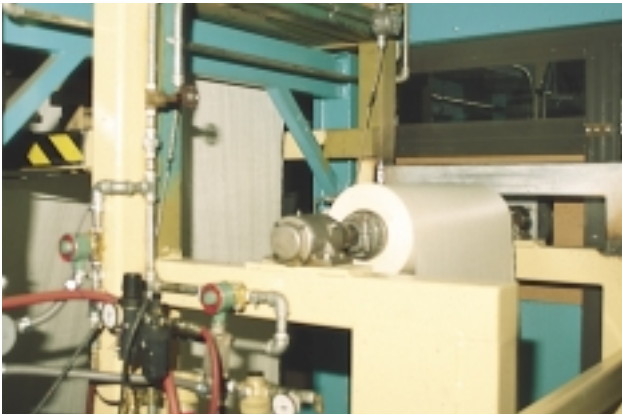
A LOT TO RISK...A LOT TO GAIN

This was the dilemma that has faced M.C. Gill since he founded the company. Typically, he has been willing to take risk ever since he made his first large cargo liner sale (\$60,000) for wider sheets to Douglas early in the company's history. From this he later plowed the profits back into the company to make longer sheets. He has always anticipated growth and had an eye for increases in facilities and equipment. Just as important, being a family-owned company, then and now, allowed Stephen to act quickly and take those calculated risks.

MAKING NOMEX® HONEYCOMB IS A LENGTHY PROCESS WITH MANY CRITICALLY-CONTROLLED OPERATIONS

We thought there might be some interest in what is entailed in the growth process, ergo the pictorial on this and following pages. The result is a substantial increase in Nomex honeycomb core capacity —MORE THAN ENOUGH to meet

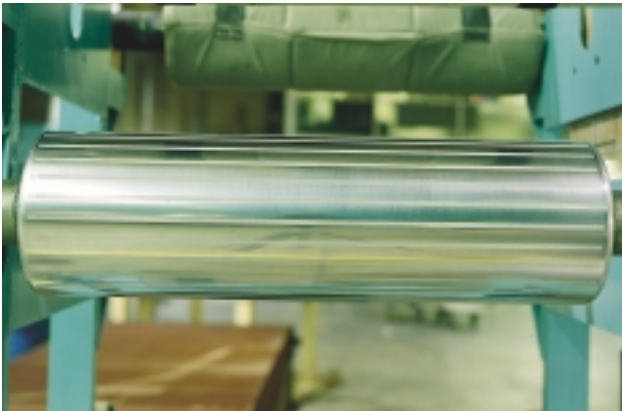
our contractual obligations. One final thought: we were delighted to receive the Boeing award but we will ALWAYS be there for the smaller orders of ones and twos. We savor them as a customer service opportunity, then and now.



1. *The honeycomb print line had sufficient capacity but had to be widened 50% larger than shown here to accommodate 36" Nomex paper. The paper feeds from the let-off reel into the printer oven.*



2. *The master control panel regulates print roller and cutter, paper humidity, and printing oven in the processing that follows.*

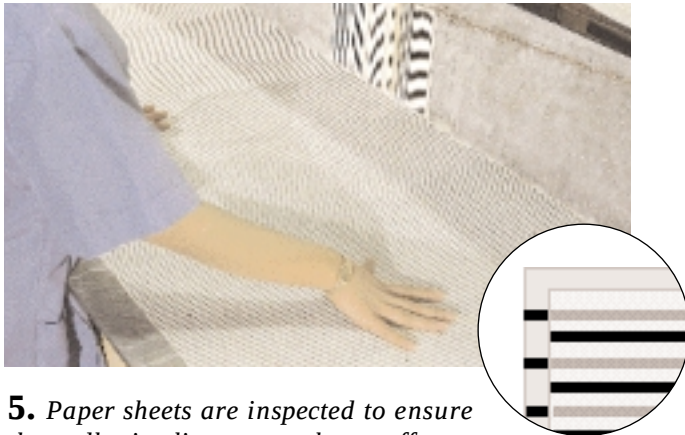


3. *A print roll applies adhesive lines to the paper—these lines are necessary for bonding the individual sheets during the pressing process (shown on the next page) to be later expanded into hexagonal honeycomb cells.*

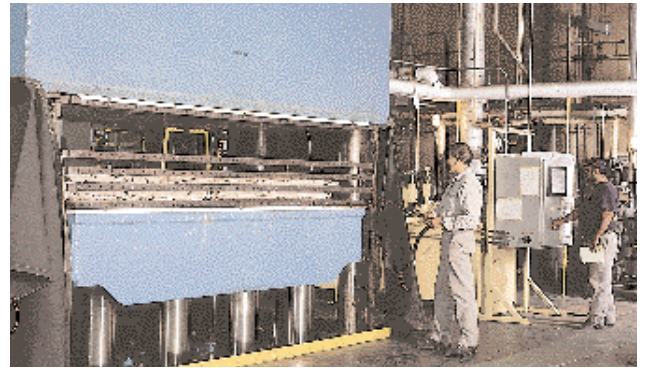


4. *The printed paper comes out of the printer conveyor where it is automatically cut off in sheets and stacked, preparatory to inspection and loading into the press.*

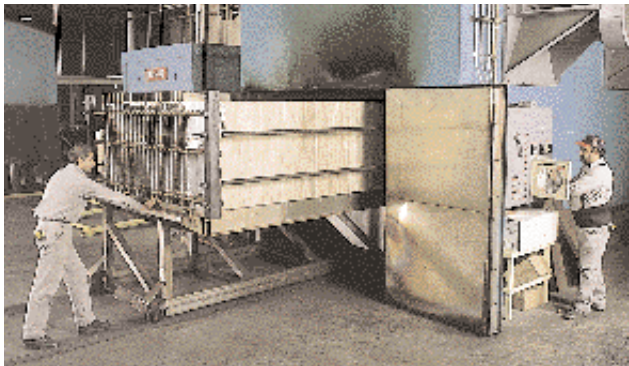
MAKING HONEYCOMB (Continued)



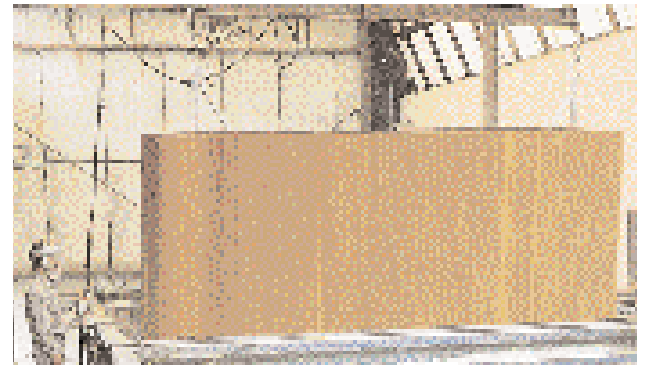
5. Paper sheets are inspected to ensure that adhesive lines on each are off-set (see inset) so that when bonded, honeycomb cells will be formed after the expanding process.



6. Stacks of Nomex paper (surrounded by fiberglass blankets for insulation) are heat-set under pressure to bond sheets together at the adhesive lines. This new press increases capacity 2½ times, with larger sheets and loaves.



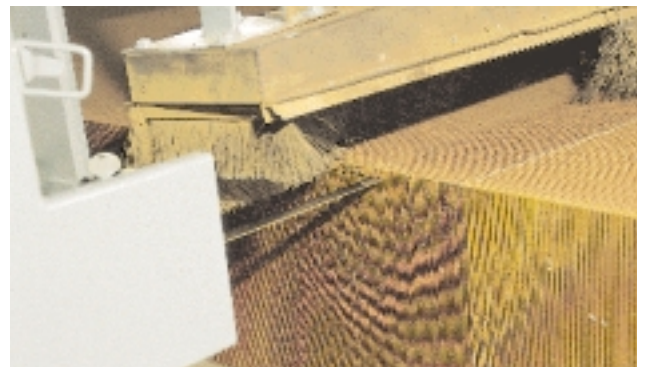
8. Once expanded, the loaf is placed in this new heat-set oven. It accommodates loaves roughly twice as large (5' x 12' compared to 4' x 8' originally). A loaf is heat-set in virtually the same amount of time, but with better product uniformity.



9. After a loaf is heat-set it is dipped several times in a tank of phenolic resin. The new dip area is more than 2½ times larger than the original. Total time to dip a loaf is reduced by 2-3 hours and yields have been increased by 10 to 15 percent.



11. After the dipping and baking processes are complete, the loaf is tagged as to the cell size, density, and date of manufacture. This information is vital for traceability and for inventory control.



12. Electronically-controlled horizontal band saws cut loaves into slices of various thicknesses. They cut material up to 60" wide to virtually any thickness, to a tolerance of $\pm .005$ " across the entire sheet.

Quality Control



7. After pressing the sheets into loaves they are expanded to the proper length to achieve the dimensional cell size specified (see inset). The revamped expander turns out a larger finished loaf in the same amount of time.



10. After each dip, the loaf is placed in this new bake oven until the resin is cured. This process is repeated until the desired density is attained.



13. The volume increase from the Boeing contract and substantial growth in sandwich panel sales necessitated the purchase of two additional saws, thus tripling our capacity!



Roller Cart Test measures the fatigue resistance of floor panels including honeycomb core. (The clear skin was used for photographic clarity).



Dial Indicator Table monitors consistency of honeycomb thickness along entire length.

Gillcore HD and OX Gillcore HD are routinely subjected to an exhaustive series of quality control tests, usually to customer specifications. The following tests are performed on every block (or lot).

CELL COUNT. Ensures that cell sizes and shapes are consistent within any given loaf. The cell shape is important because it materially affects the strength where it is needed.

COMPRESSIVE STRENGTH. Measures how much force is necessary to crush the core after it has been bonded in a sandwich panel configuration. For example, a fully supported Gillfloor 4417, Ty 1 flooring panel will support 846 psi before it fails in compression.

PLATE OR CORE SHEAR. Measures the core's resistance to being delaminated or sheared from a panel's facings when the facings are moved parallel and in opposite directions. Failure results in deformation of the material which weakens it and causes a spongy floor panel.

DENSITY, in pounds per cubic foot. Ensures that densities remain consistent throughout every sheet of every block, or loaf, and are within tolerance.



Gillcore HD

In response to requests from many of our customers, about two years ago we developed OX (over-expanded) Gillcore HD and it, too, can be purchased as core-only or as part of a finished sandwich panel. The core itself contains the same raw materials as Gillcore HD—aramid fiber paper and phenolic resin—but the cells are over-expanded from the traditional hexagonal to a rectangular shape.

The over expansion allows the honeycomb as well as sandwich panels using it for core to be curved or formed into compound configurations in the "W" (warp, or width) direction. This feature results in a multiplicity of additional honeycomb applications where light weight and rigidity are required. Utilizing this forming capability, the following represent just a few of the simple contoured shapes which can be provided:

- Curved interior aircraft panels for sidewalls, ceilings, galleys, and lavatories
- Environmental systems ducting
- Radomes
- Exterior aircraft panels including trailing and leading edges, flaps, ailerons, access panels, and doors
- Ship and boat panels such as those dividing berthing areas and staterooms
- Pleasure and racing boat hulls.

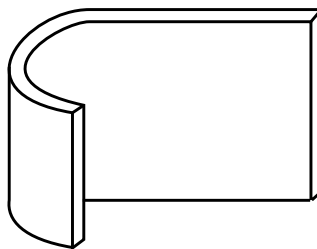


OX GILLCORE HD WITH RECTANGULAR CELLS

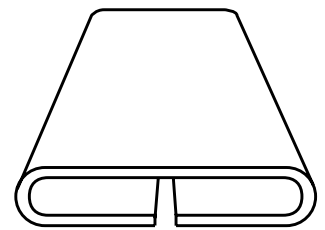


GILLCORE HD WITH HEXAGONAL CELLS

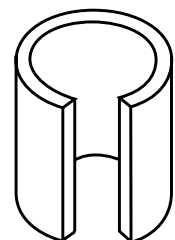
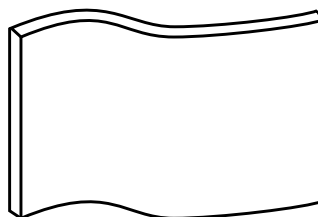
RECTANGULAR CELLS ALLOW FORMING AND CONTOURING



OX CORE MAKES SIMPLE CURVATURE EASY



USE OX CORE FOR RADICAL CURVATURE



Gillcore Features

Except for OX core being formed into compound contours, both it and Gillcore HD share the following features.

- High strength-to-weight ratios
- Thermal tolerance to 325°F
- Low densities, i.e., 1.8 and 3.0 pcf (in 3/16" cell size)
- Corrosion resistance
- Conformance to rigid smoke, toxicity, and flammability standards
- Excellent fatigue and impact absorbing resistance (dependent somewhat on panel facings).

Qualified to Meet Specs

The success attained as the result of our 15 years' experience manufacturing Gillcore is evidenced by the following qualifications in that relatively short period of time.

- Boeing BMS 8-124
- McDonnell Douglas DMS 1974
- Lockheed LCM 28-1041
- Lockheed C28-105
- Lockheed G28001
- Vought 10425.1957
- Cessna CMNPO83
- Raytheon/Beech (SPEC #)
- WMS 711, Weber Aircraft
- Naval Sea Systems Command Drawing No. 803-5959189
- Bell Helicopter (Textron) 299-947-103
- Northwest Technical NMS 200
- FAR 25.853

Also, Gillcore meets the requirements of Mil-C-81986 and Rockwell LB0130-022.

Gillcore Availability

Gillcore HD can be sliced in sheets as thin as .060" or in blocks as thick as 36". With our electronically controlled horizontal band saws, honeycomb slices have the aforementioned standard tolerance of .005" across the total area of the sheet, although the typical thickness variation is controlled to .0015" of the desired thickness. Without splicing, Gillcore HD is available in lengths of 144" and widths up to 60". In addition to the cell size and densities mentioned above, Gillcore HD is also available in 1/8" cell size in densities from 1.8 to 9.0 pcf and higher; 3/16" cell in densities from 3.5 to 6.0 pcf and higher; and 1/4" cell in densities from 1.5 to 4.0 pcf and higher.

Considerations in Selection

End use almost always dictates cell size and density.

If high strength and load bearing properties are indicated, the choice will be small cell size and high density. Flooring in commercial passenger aircraft is an example of an end use that defines core parameters. Aisles, galleys, lavatories, and entries receive the most fatigue in flexure and require properly configured panels—usually with an 8 to 12 pcf core and 1/8" cell size. Heavier densities (5 pcf and up) are usually made with an 1/8" cell. Vertical surfaces, where weight is more critical than flexural strength, utilize large sized cells and lower densities. This type of end use may be characterized by panels for galleys, and food and beverage carts. Cart panels are non-structural and weight is important because the lighter the cart, the less wear and tear on the aisleway carpeting and the flooring panels beneath.

Greater Flexibility

The Boeing honeycomb contract award is the latest in a series of successes the M.C. Gill Corp. has experienced since the company started making its own aramid fiber honeycomb (Gillcore) about fifteen years ago.

In retrospect, the decision to make Gillcore enabled us to better serve our own sandwich panel needs, plus provide a service for our core customers. We have greater flexibility in making delivery commitments of the most popular types, because we carry a larger inventory of the many cell sizes and densities for our internal use. Thus, we can respond more quickly to small core-only orders for those types.

We also found we can maintain control over the consistency of and certify to our quality, and remain price competitive as well. These benefits to core-only customers also apply to the core that is manufactured for use in making our sandwich panels.

We can accept larger orders and offer shorter lead times to sandwich panel customers. We are not at the mercy of an outside supplier whose delivery schedule and commitment to our customers' satisfaction most likely does not coincide with ours. Having laminated honeycomb core panels even before 1955, we know the quality level of the raw materials, including core, required to satisfy each end use.

Given that the M.C. Gill Corp. is reputed to be one of the two largest aerospace quality sandwich panel manufacturers in the world, we believe that our attention to detail, and quality, backed by 50+ years of experience, have proven our capabilities.

Career Day at M.C. Gill

In March, we welcomed six La Canada (CA) High School students as part of the school's Career Day Program. The students have the opportunity to select a company and experience a specific area, e.g., Marketing, before graduation. They selected four areas—chemistry, research, marketing, and accounting. Department heads provided a schedule so that the students could observe and participate in a department's daily routine. The students were enthusiastic about the program and what they learned during their visit. The time here gave them a better understanding of the workplace. Also, our employees who spent time with them came away with the interest to ensure our continued participation.



Stephen Gill explains part of the boneycomb manufacturing process to the students.

THE FUNNY SIDE

The world is full of willing people— some willing to work, the rest willing to watch them.

★★★★★

Foods that are the same color can be substituted for each other and they have exactly the same caloric content, e.g., pistachio ice cream for spinach or white chocolate for mushrooms. Brown is a universal food color so chocolate can be substituted for anything.

★★★★★

The shorter the time between flights, the greater the distance between gates.

★★★★★

Bingo is easier said than won.

★★★★★

Take up in-line skating and you'll make a whole new set of friends— ambulance drivers, emergency room technicians, and physical therapists.

★★★★★

Tell someone his father was dishonest and he'll get mad. Tell him his great-grandfather was a pirate and he'll boast.

★★★★★

The journey of a thousand miles begins with wondering if you turned out the lights.

★★★★★

The trouble with cats is that they have the same look on their faces whether they're looking at a moth or a serial killer.

★★★★★

Two wrongs don't make a right but they do make a good excuse.

Trivia

If you think constantly and anxiously about your health you're a valetudinarian.

★★★★★

It takes 200,000 frowns to make a wrinkle.

★★★★★

61 percent of Americans earning less than \$30,000 a year believe "the meek shall inherit the earth". 36 percent of those earning more than \$60,00 also believe it.

★★★★★

A cow eats approximately 100 lbs of grass a day.

★★★★★

There are 11,000,000 milk cows in the U.S.

★★★★★

The average number of squirts in a gallon of milk is 345.

★★★★★

Your tax dollars at work:
\$34.6 million for screw worm research.
\$11.5 million to modernize a power plant at the Philadelphia Naval yard, which is targeted for closure.

An unspecified amount spent by HUD to operate 500 housing units in Philadelphia which did NOT exist.

\$1 million to Sudan for delivery of powdered milk which was found unfit for human consumption.

★★★★★

There are 110 different meanings for the word "run"; 91 for the word "take"; and 84 each for the words "break", "turn" and "set".

★★★★★

All mammals have tongues.

