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# THE M.C.GILL DOORWAY

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## *The Story Behind Gillfloor at British Aerospace*





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hat do the Sopwith Camels, the World War II Spitfire fighter planes, the M. C. Gill Corporation, and Insoleq Ltd. have in common? Why, British Aerospace, of course. That company was the driving force in the development and manufacture of the Camel and Spitfire—two of the world's best known aircraft, the former thanks to *Peanuts*' Snoopy, and the latter to the RAF. And although both planes preceded M. C. Gill and Insoleq, these two firms currently are very closely associated with British Aerospace (BAe).

## *It Started With a Phone Call from Belfast*

The story, as they say, goes something like this. In October, 1987, M.C. Gill's Marketing Department received a telephone call from a gentleman with a decided Irish accent. He was calling from Belfast, Northern Ireland and posed the question, "does M.C. Gill Corporation make aircraft-grade sandwich panels?" The answer was an unqualified "yes." The

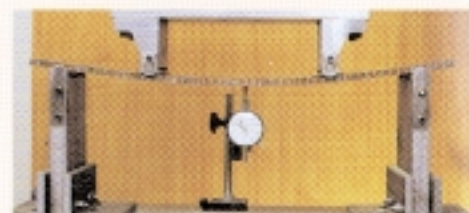


### *From Testing to Fabrication through Installation.*

A climbing drum peel test on Giffab 4109 measures the force necessary to peel the facing from the core.



M.C. Gill technician inspects the break on a 4109 sample as another sample (right) is tested for load bearing capability. Note: 4109 passes BAe's specification but we test samples until failure.



Filling edges of a pre-cut section of Giffab 4109.



A section of 4109 flooring being installed in the BAe 146-200.

caller, Bruce Wilson, Insoleq's Managing Director, went on to explain that a customer of his was looking for an alternate source to provide the firm with flooring panels. Although Wilson was associated with the aircraft industry—his company made sound dampening kits for aircraft interiors—he knew very little about the M.C. Gill product line.

He only knew of M.C. Gill at all because, three years prior to his phone call, he had been given a copy of our Product Catalog by another of his customers with the suggestion that he hang onto it because it might come in handy sometime. Come in handy, indeed!

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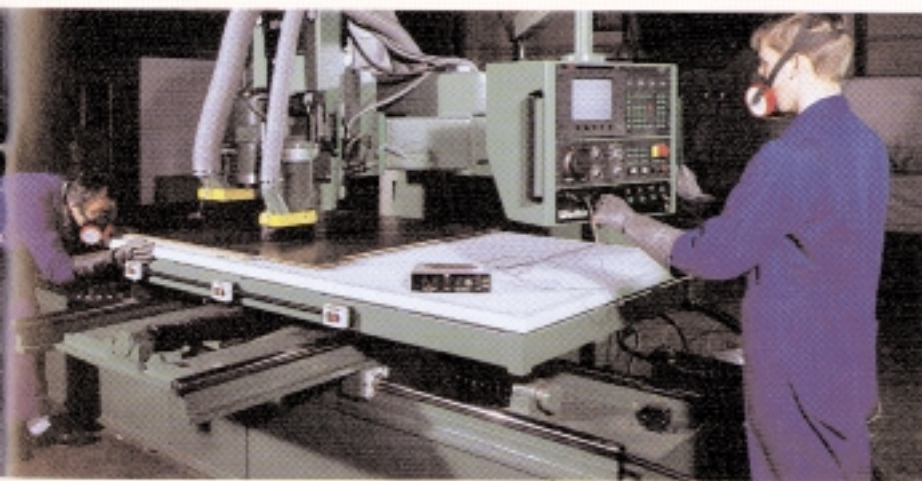
### *B Ae Selects M. C. Gill's Flooring Panels*

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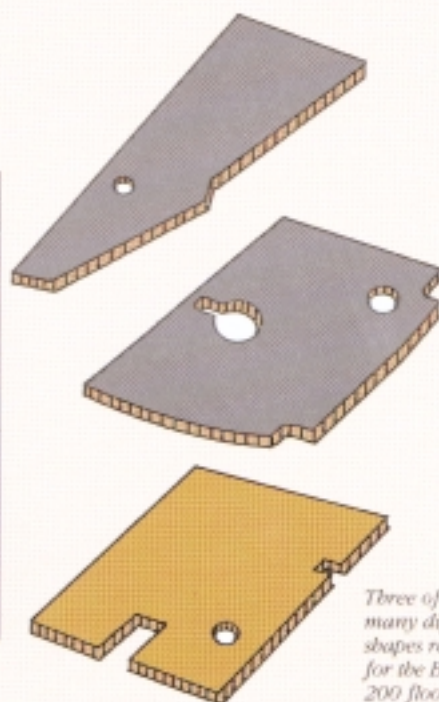
As a result of that phone call M.C. Gill Corp. and Insoleq Ltd. are now supplying completed ship sets of flooring panels to British Aerospace for use in

their BAe 146-200 and ATP (Advanced Turboprop) aircraft.

M.C. Gill and Insoleq proved to be the right combination to supply British Aerospace. Long recognized as a leader in aircraft flooring, M.C. Gill had the capability and capacity to design, develop and produce the raw stock panels that would meet or exceed BAe's exacting requirements. Insoleq's contributions include the expertise and state-of-the-art equipment for fabricating the panels so that they are ready for immediate installation upon delivery; existing contacts among British Aerospace's engineering and purchasing departments; and a geographic proximity to BAe's facilities in the United Kingdom. The latter was particularly important because it allowed for an immediate response to any potential problem areas that might have arisen. As a result of this association, the changeover by British Aerospace to M.C. Gill and Insoleq was accomplished in a relatively short period of time and with a minimum of difficulty.



*Insoleq technicians cutting raw stock 4109 to a finished piece.*



*Three of the many different shapes required for the BAe 146-200 flooring.*

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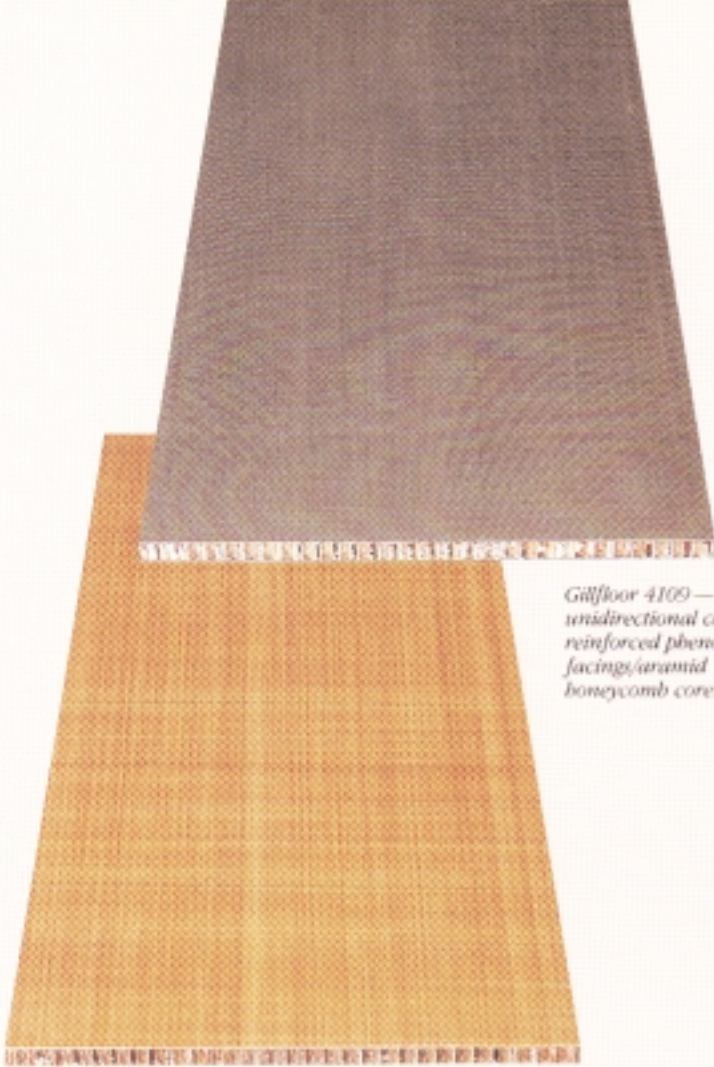
## *Light Weight = Economy*

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In addition to the low noise characteristics of the 146-200 and ATP, British Aerospace places substantial emphasis on the fuel efficiency of both aircraft. Light weight and fuel savings go hand-in-hand but it was equally important that strength not be sacrificed. That's why the airframe manufacturer selected a graphite skin, aramid honeycomb core sandwich panel as the flooring of choice for the passenger compartment. Graphite is very light in weight, yet is stiff, and with modification has relatively high impact resistance.

Because some areas of the passenger compartment floor, notably the entryway, galleys, and restrooms, are subject to much more abuse than aisles and underseat areas, BAe selected an S-2 glass\* faced aramid honeycomb core panel. The S-2 glass is quite high in impact strength, is resistant to corrosion and, when coupled with the aramid core, meets the light weight requirement BAe insists on for both aircraft.

After lengthy preliminary discussions with M.C. Gill and Insolex personnel, British Aerospace agreed to pursue with evaluations of Gillfab 4109 for passenger compartment flooring and Gillfab 4004A for the higher abuse areas mentioned above. Although both panels have stood the test of time with the same applications in different types of aircraft, British Aerospace insisted on submitting both products to



*Gillfab 4109 —  
unidirectional carbon-  
reinforced phenolic  
facings/aramid  
honeycomb core.*

*Gillfab 4004A —  
unidirectional S-2 glass-  
reinforced phenolic  
facings/aramid  
honeycomb core.*

## *The BAe 146-200*



Originally designed to fill a need for a regional jet to fly short hauls between 120 and 400 miles economically (with a range of approximately 1,700 miles), the BAe 146-200 made its first flight on August 1, 1982. It was granted type certification by the British Civil Aviation Authority on February 4, 1983, and made its North American debut with Air Wisconsin on June 27, 1983, following approval by the Federal Aviation Administration. It carries up to 112 passengers and takeoff requires only 5,000 feet of runway at sea level.

The BAe 146 is one of the quietest jet airliners in the world and this characteristic has proven to be very profitable for many of its operators because they can increase the frequency of late evening and early morning departures in populated areas sensitive to noise. The low noise signature has been accomplished by a combination of advanced wing design and modern technology, high-bypass-ratio, turbofan engines.

their own test procedures. After a period of testing, to ensure qualification to their specifications, both panels were selected as the flooring of choice for the 146-200 and ATP passenger compartments.

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### *Flooring Panels That Smoke Less*

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Gillfab 4109 is a low smoke flooring panel made from unidirectional carbon—reinforced phenolic facings bonded to an aramid honeycomb core. As mentioned previously, the facings are modified for better impact and covered with a thin fiberglass layer to prevent galvanic corrosion. It is very light weight and stiff, and has low smoke evolution in a fire. It qualifies to BAER 3231 Issue 1D, Grade L and Grade M. Gillfab 4109 qualifying to Grade M has an eight pound per cubic foot density core and is used by BAe in the aisles where foot and rolling cart traffic is high, thereby generating more wear on the panel. Grade L is lighter (4 pcf) and is used under the seats and other low traffic areas of the BAe 146-200 and ATP.

Gillfab 4004A is made from unidirectional S-2 glass reinforced phenolic facings bonded to an aramid honeycomb core. It has very high impact values, corrosion resistant facings, light in weight, and low smoke emission in a fire. It is qualified to BAER

3232, Issue 1D. At the outset, BAe ordered the panel with the top facing covered with a thin sheet of aluminum to improve impact. The company later rescinded this requirement because the original panel was deemed strong enough to be placed in service without the aluminum. Gillfab 4004A is also used as flooring for cargo compartments—further testimony to its high impact strength.

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### *Distance Is No Barrier*

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Both 4109 Grades L and M, and 4004A are manufactured at M.C. Gill's El Monte, California plant. The raw stock panels are then shipped to Insoleq Limited's facility in Belfast, Northern Ireland where, using the latest in cutting, routing, and drilling equipment, they are fabricated with exacting precision. When BAe receives the finished parts they can be installed without further refinement directly into the aircraft as they move down the assembly lines at Manchester, England. The logistics of coordinating manufacturing, fabrication and installation over a distance of some 7,000 miles may appear to be less than smooth; in fact, BAe was somewhat skeptical at the outset. However, the logistics have been accomplished with far greater ease than originally envisioned by any of the parties involved. And, as a result, we look forward to a long, mutually profitable association with British Aerospace.

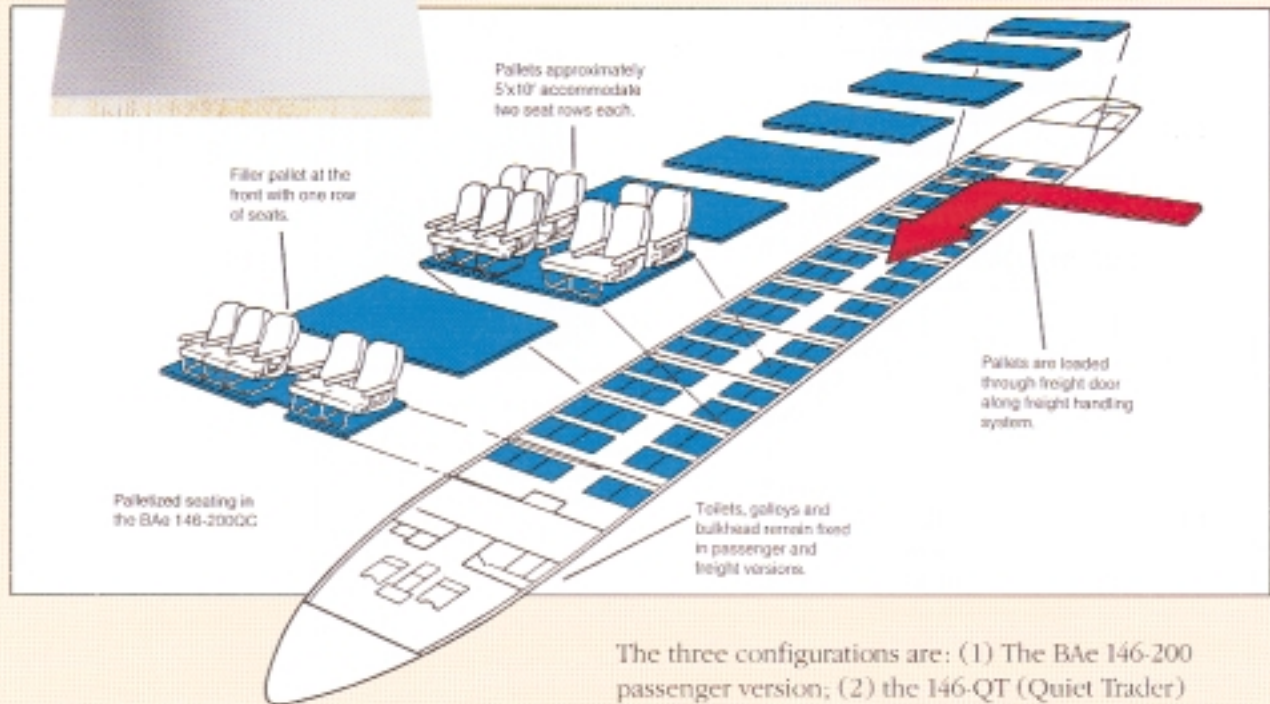
The BAe ATP is a second generation twin-turboprop and was designed to fit the needs of lower density short haul operations. Depending on configuration, it seats from 64 to 72 passengers. Like the 146-200, the ATP has a very low noise footprint which also enables regional airline operators to extend their operations into the evening and early morning hours in areas with stringent noise regulations. According to British Aerospace, the aircraft has a break-even point of 21 passengers, thereby offering a greater profit potential than any other plane in its class.

The ATP qualified for type certification to European Joint Airworthiness Requirements and the first aircraft was delivered to British Midland in April 1988. FAA type certification was granted in September 1988 and Air Wisconsin again became the first North American customer when it began service in March 1990 with the first of 14 ATP's the airline has on order.

### *The BAe ATP*



*Gillfab 5040, used as the passenger seat pallets, is an integral component of the BAe's 146-200 QC (Quick Change) model.*



*The 146-200 is available in three basic commercial configurations.*

The three configurations are: (1) The BAe 146-200 passenger version; (2) the 146-QT (Quiet Trader) freighter configuration with a capacity of six standard pallets each measuring 108" x 88" with space for an additional half pallet; and (3) the 146-QC which serves as a passenger carrier by day and can be quickly converted to haul freight at night. This rapid conversion is made possible by affixing the passenger seats to pallets and actually rolling the pallets out of the aircraft so that freight can be unloaded. The pallets are fabricated by Ancra Corporation, Hawthorne, California. They use Gillfab 5040, an aluminum faced end grain balsa wood core sandwich panel manufactured by none other than M.C. Gill Corporation (the Fall 1989 Doorway carried the full story on this quick change feature). One might observe that we really have the 146-QC's floors covered.

## *Truly World Wide*

*Like British Aerospace, M. C. Gill Corporation products are in service on all major continents, Antarctica being the only exception. That will change this summer, if all goes according to plan, when LanChile, Chile's flag carrier begins regular tourist charter service from Punta Arenas to the Teniente Marsh Chilean Air Force Base located in Chilean Antarctic territory on King George Island. M. C. Gill and Insoleq are both pleased and proud to proclaim, thanks to British Aerospace and its 146-200, theirs are the first products of their kind (on a commercial aircraft basis) truly to be used on every continent in the world!*



## ROYAL PLASTIC DIVISION GETS AIR FORCE BLUE RIBBON AWARD

*"WR-ALC appreciates your efforts to supply the biggest quality items and deliver them on-time. The first Blue Ribbon Contractor day was held here at WR-ALC on 26 Sep 90 to honor your achievement and encourage others to achieve this same level of excellence."*

Formally translated, this rather terse statement is saying that Warner Robbins Air Logistics Center, Warner Robbins, Georgia, has selected Royal Plastic along with fifteen other suppliers, as a Blue Ribbon Contractor. Not bad, considering the Center does business with thousands of contractors a year. However, only the best get to wear the Blue Ribbon.

"We're trying to reward the contractor who produces quality products on time," said Major General Richard E. Gillis, Warner Robbins ALC commander.

The program, implemented throughout the Air Force Logistics Command three years ago, formalizes the contracting officer's authority to exercise business judgement in awarding spares contracts. It involves putting contractors in a competitive frame of mind based on delivery time and quality requirements. By meeting the criteria, the contractors establish themselves as an elite group of suppliers in the field of government contracting.

"Contractors qualify (for the Blue Ribbon award) if they deliver 90 percent of products on time and meet the

continuing high standards for quality criteria," said General Gillis.

Although Royal has supplied Warner Robbins with ducting and shields for the F-15 and F-18 for some time, the company was not selected for any particular contract it has been awarded or for any given part it has produced. Rather, Royal met the ALC criteria for contractors and has continued to do so, hence the Blue Ribbon status.

*Royal Plastic is no stranger to awards for excellence. In 1986, the firm was given the PATH (Partners Advancing To New Horizons) award by McDonnell Douglas—only two suppliers received the award that year. Like Warner Robbins, McDonnell Douglas decided, in 1985, to institute a program that would recognize a select number of their suppliers who had performed "over and above" what is normally expected of sub-contractors.*

A list of criteria for the PATH award was developed that included history of quality, on-time delivery, price and the willingness to cooperate in such matters as stepped up delivery dates and changes in specifications.

Royal is moving to larger quarters... maybe just in time. It has been rumored that Lloyd Monthey, Royal's general manager, is determined to devote at least a portion of that 24,000 square foot building to a trophy room! Congratulations, Royal. We're proud of you!



*Royal, a division of the M.C. Gill Corporation, makes contoured parts for the aerospace and aircraft industry.*

Royal's overall success historically has been due, in no small part, to its commitment to low tooling costs, high quality, on-time deliveries, and lower overall costs, particularly for short production runs.

## *Stephen E. Gill* NAMED CHIEF EXECUTIVE OFFICER



*From left to right — Stephen Gill, Phillip Gill and M.C. Gill*

At age six, he referred to M.C.'s garage-headquartered operation as "the plant" and vowed that some day he'd be President of the company. Stephen E. Gill realized that goal in 1982, and on January 1, 1991, carried it one step further when he was appointed Chief Executive Officer of the M.C. Gill Corporation. He succeeds his father and company founder, M.C. Gill, who remains Chairman of the Board.

### *Career Begins Early*

Stephen began his career with the company in 1957, working during the summers of his high school years and continued on a part-time basis until he received his degree in Industrial Management from the University of Southern California and went to work full time in 1965. In his 34 years with the company, he has served in virtually every capacity of the company's operations including production scheduling, shipping and receiving, foreman of the laminating press line, and marketing manager.

### *President of Royal Plastic*

In 1980, the M.C. Gill Corporation acquired the Royal Plastic Manufacturing Company in Minden, Nebraska and Stephen was named President of the wholly-owned subsidiary, now an operating division. He successfully made the transition between the manufacture of flat sheet laminating to the molding of complex-shaped products, Royal's forte.

### *Named President of M.C. Gill Corp.*

In 1982, Stephen was named President of the M.C. Gill Corporation, assuming responsibility of the firm's day-to-day operations. He was and is ably assisted by his brother, Phillip Gill, who last year was elevated to the position of Vice President, Operations.

### *New Duties*

In addition to his existing duties, as Chief Executive Officer, Stephen will be responsible for operational and strategic planning on a company-wide basis including future acquisitions, market expansion and new facilities' locations.

"The opportunities facing the M.C. Gill Corporation in the coming years are enormous and I welcome the challenges they present," said Stephen. "Filling M.C.'s shoes will not be an easy task but I am looking forward to continuing the basic operating philosophy he established many years ago—make a quality product for a reasonable price and offer your customers the best possible service available anywhere. We will continue to give 110 percent effort so that we can maintain our position as the largest company of our kind in the world," he concluded.

Stephen Gill's track record to date leaves little doubt that M.C.'s philosophy will remain as the guiding force in the company's operation and that he will maintain the company's current position as the largest continuously operating manufacturer of fiberglass reinforced thermoset composites in the world.



M.C. GILL CORP. • SINCE 1945