VOLUME 29
SUMMER 1992
NUMBER 3

THE M.C.GILL DOORWAY

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Gilliners Make A Beautiful Bouquet

GILL CARGO

From polyesters to phenolics... leadership in developing Gilliners to fulfill the aircraft industry's requirements has resulted in unchallenged growth.

THE M.C. GILL FAMILY TREE OF CARGO LINERS

Whether recorded or not, every family has a family tree that traces its history through the years. Usually, it is a succinct history that lists the successful and not so successful members without comment as to the whys or why nots, the what was or what may have been. The family tree is as faithful as possible a depiction of the origins and their results over time until the present.

The M.C. Gill family tree of cargo liners is no exception and has two main branches — polyester and phenolic. The following genealogy is a bit truncated because some of the branches were perhaps not quite as strong and may have been lost in the windstorms of change.

THE POLYESTER SIDE OF THE FAMILY

Until the younger generations came along, polyester was the resin of choice for baggage compartment lining (cargo liners for short). It produces higher impact values than other resins and is less expensive to process.

Gilliner 1038 — Born 1946; first customer: Convair.

Gilliner 1018 — Born 1951; developed for the DC-6 and DC-7; first customers: Douglas Aircraft Company and Swissair.

Gilliner 1044 — Born 1958; a hybrid developed for Douglas Aircraft for the DC-8; half nylon and half fiberglass construction.

Gilliner 1066 — Born 1961; great grandfather of high performance polyester cargo liners; developed for early jet age aircraft (initially, the DC-8); first customers: United and Delta Airlines. While it didn't measure up in laboratory tests, it has one of the best in-service records of any cargo liner ever made.

Gilliner 1076 — Born 1965; developed for Boeing for the 707.

Gilliner 1100/1100G — Born 1969; original equipment for DC-9 (1100G) and DC-10 (1100).

Gilliner 1166/1266 — Born 1969; developed by M.C. Gill Corp. for Boeing 737; 1166 same construction as 1266 except that 1266 is Gillcoated for better abrasion resistance, endurance and appearance.

Gilliner 1338 — Born 1972; developed by M.C. Gill Corp. as a proprietary product and adopted as original equipment for Lockheed L-1011; first of the lightweight cargo liners.

Gilliner 1366 — Born 1972; developed by M.C. Gill

LINERS

ABOUT THE COVER

Planting the tree (as M.C. did almost 20 years ago) is only a beginning. It needs constant attention—feeding, watering, and a healthy dose of TLC. Likewise, our cargo liner. M.C.'s first efforts resulted in a product that was as good as, if not better, than any available—by 1950's standards. However, to ensure its steady growth, he still sits under that "tree" and nurtures it as it continues to produce the highest quality, best selling cargo liner available in the world today!

Corp. as a proprietary product; first used by United Airlines and later adopted as original equipment by Boeing and Lockheed; remains the ultimate high performer in polyester cargo liner.

Gilliner 1366T—Born 1978; also used as original equipment by Boeing; same construction as 1366 except for a one mil film of Tedlar® on one side for color and uniformity.

Gilliner 1566—Born 1980; Kevlar® reinforcement developed for Boeing by M.C. Gill Corp. as a lightweight proprietary liner and still used in DeHavilland aircraft.

THE PHENOLIC SIDE OF THE FAMILY

Although phenolic resin was invented in 1908 and the first entirely synthetic material to be produced in large quantities, it is the "new kid on the block" as a component for cargo liner. Its claim to fame is that it has extremely low smoke and toxic emissions in a fire—a trait that is becoming increasingly important in all sectors of the aviation industry.

Gilliner 1102—Born 1977; developed by M.C. Gill Corp. for McDonnell Douglas.

Gilliner 1067—Born 1980; developed by M.C. Gill Corp. for Boeing.

Gilliner 1167—Born 1985; developed by M.C. Gill Corp. and used as original equipment in McDonnell Douglas' MD-80.

Gilliner 1367—Born 1986; developed by M.C. Gill Corp. and used as original equipment in Boeing's 700 series aircraft.

Gilliner 1167B—Born in 1991; used as original equipment in McDonnell Douglas' MD-80 and MD-11; a lower cost hybrid version of 1167.

Gilliner 1367A—Born 1991; used as original equipment in Boeing series 700 aircraft; a hybrid version of 1367.

THE EPOXY SIDE OF THE FAMILY

Although the use of epoxy resin and unidirectional reinforcement produces higher impact values than either polyester or phenolic, a puncture will propogate itself. The inability of unidirectional reinforcements to pass FAA burn-through tests was an insurmountable problem. Moreover, epoxy resin produces a substantial amount of smoke. As a result, this side of the family has few descendents.

Gilliner 1108—Born 1968; developed by M.C. Gill Corp. and qualified for Boeing aircraft in 1991.

The M.C. Gill Corporation sold its first order of cargo liner in 1946, but it wasn't until the fifties that the company really found a market niche for the product that launched us on the long and often bumpy road to Easy Street.

M.C. Gill received orders for cargo liner from his first two customers because he could make the product wider than his competitors. Essentially, he was willing to work with his customers and meet *their* requirements rather than impose inflexible parameters he established.

This philosophy and his ability to stay at least one technological step ahead of everyone else have given him the advantage he needed to remain number one in this field for almost fifty years. The company has not relinquished that advantage, nor does it intend to.

Steady Product Improvement and Testing Nurtured the Growth of our Cargo Liner Tree

Cargo liner serves many purposes, but its foremost function is to protect the outer skin of the aircraft and the myriad of wires, cables, and ducts that run between it and the outer skin. Unless the cargo liner selected has high impact (puncture) and pullout resistance and consistent uniform quality, a real danger potential exists if it is punctured.

The liner is a composite constructed from a resin and reinforcement—the former is the matrix—usually a polyester or phenolic—and the latter is the reinforcement—almost always fiberglass cloth.

Once combined, resin and reinforcement are subjected to heat and pressure, and the result is a multi-ply laminate that accomplishes the aforementioned function. As any airframe or airline design/maintenance engineer will attest, this is an over-simplification.

As they will also tell you, there are varying grades of reinforced plastic just as there are varying grades or alloys of steel and aluminum. Only the highest quality liner material will meet the exacting set of criteria set down by the aviation industry.

IT'S IN THE GENES

Often, when trying to fathom an individual's success (or failure), the phrase, "It's in the genes" is used when a more precise reason is not forthcoming. In the case of cargo liner, it's in the "properties."

There are at least a dozen or more physical and mechanical properties which must be certified before a cargo liner will even be considered by an airframe manufacturer for inclusion on its Qualified Products List.

In the early days, resistance to flame, self-extinguishing, corrosion, fatigue and dents; and, a "good appearance" were about the only properties that were required. The early days are history. But unlike others, we have remained in the forefront with steady product improvement.

Minimal values have been established for each of these properties and that they are continually upgraded. However, some properties are more important than others, and we believe the only true measure of those properties and the product's ability to perform is "in-service evaluation," where the product is subjected to actual useage day after day. Based on our experience from years of in-service testing we consider the properties discussed below as very important.

- **IMPACT, OR PUNCTURE RESISTANCE.** Basically, this property relates to the ability of the material to withstand penetration. Example: A hole in the cargo liner will not be created when the corner of a steel box strikes it with force. A hole in the liner exposes the area of the aircraft's interior behind it, including the aforementioned wires, cables and ducts. A hole will also allow smoke and toxic fumes to escape in the event of a fire in the cargo compartment.

Impact resistance is measured in foot-pounds (ft-lbs). It is the distance a pointed object on a given weight is dropped before it impacts the material. Obviously, the sharper the point, the more likely it is to penetrate the test specimen. McDonnell Douglas' test instrument point is more blunt than Boeing's, hence different values are obtained.

- **BOLTED JOINT PULLOUT OR EDGE BEARING STRENGTH.** This has to do with the cargo liner's resistance to the pressure, or force, required to elongate a fastener hole. If it does, the effect can be more serious than puncture damage.

Bolted joint pullout is measured by the total number of pounds required to elongate a fastener hole (McDonnell Douglas); edge bearing strength is measured in pounds per square inch (psi) required to achieve the same result (Boeing).

- **BURN-THROUGH.** This simply means that flames will not penetrate or burn through the material nor will the temperature above or behind the material exceed a predetermined maximum.

Burn-through is an extremely rigorous test but measurement of the results is very straightforward—the product either passes or it fails, there is no in-between. If the 1700°F flame does not burn a hole through the product within five minutes *and* the temperature above the test specimen does not exceed 400°F, the product passes. If either criterion is not met, the product fails.

Note: The FAA has established standards that materials used in passenger cabin must meet for smoke emission and heat release (discussed below) but not for cargo liner. However, our liners have been tested and exceed the standards that the agency has established for passenger cabin materials. We conducted the tests in anticipation of the FAA eventually establishing comparable standards for cargo

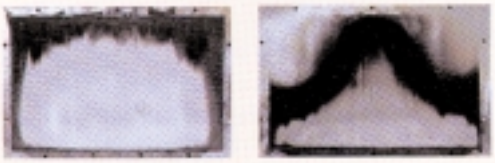
liners. The M.C. Gill Corporation has always been, and will continue to be, in the forefront of new product development. It's our living.

• **NIST (NBS) SMOKE EMISSION.** This property relates to the amount or density of the smoke that results when a material burns. The higher the density, the thicker the smoke and the harder it is to see and breathe.

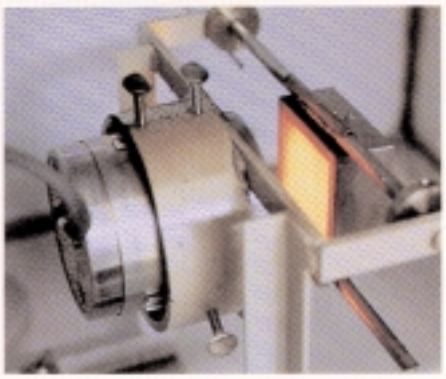
The smoke density test as described above, measures the optical density of the smoke generated by the test material when it is flaming.

• **OSU HEAT RELEASE.** This concerns the amount of heat released over given surface dimensions (square feet, meters, etc.) in fire conditions. (OSU simply stands for Ohio State University, where the testing procedure was developed.)

The test for heat release is conducted by exposing a material to a total radiant heat flux of 3.5 watts per square centimeter in a test chamber. The test measures (1) the total quantity of heat released during the first two minutes of exposure and (2) peak release rate. The current maximum for each measure is 65 kilowatt minutes per square meter and 65 kilowatts per square meter. These requirements are often expressed using the shorthand version, 65/65. To put this measurement into perspective, when a piece of oak flooring is used as a test sample, the amount of heat released is twice the above standard—130/130.

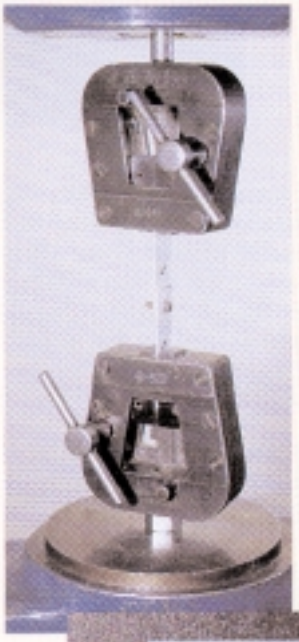


BURN-THROUGH TEST. *If flame burns a hole through test specimen the test is considered a failure.*



NIST (NBS) SMOKE CHAMBER TEST *measures smoke density of cargo liner when exposed to heat and flame.*

OSU HEAT RELEASE TEST *measures the amount of heat dispersed over a given dimension in fire conditions.*



BOLTED JOINT PULL-OUT TEST *measures the cargo liners edge bearing resistance to force.*

Boeing Test Method

Both of these samples were tested to failure.

McDonnell Douglas Test Method

IMPACT OR PUNCTURE RESISTANCE TEST *indicates the cargo liner's ability to withstand penetration.*

Looking Ahead to Future Cargo Liners

It sometimes seems that complaining about today's generation has supplanted baseball as our national pastime, but in each successive generation the progeny usually exhibits qualities that surpass those of its forebearers. We believe that cargo liner is no exception.

UPGRADES AND NEW DEVELOPMENTS. Existing products will be upgraded or new ones will be developed to meet increasingly exacting requirements. For example, Gilliner 1066 evolved over the years and resulted in 1366T. Gillfab 1367 was developed in response to a mandate for a low smoke/low toxic emission cargo liner but with no sacrifice in other key properties. The M.C. Gill R&D lab is currently working on a new generation cargo liner that will weigh approximately 15 percent less with no sacrifice in existing properties. Our customers will be the first to know.

Future generation cargo liners will have even greater improvements in serviceability. Areas of major concentration that will improve serviceability include higher impact resistance, lighter weight, greater flex strength and flex modulus, stronger edge bearing, better fatigue resistance, new surface coatings with lower flammability, smoke and toxic emission characteristics, and better abrasion resistance. Also, improvements in automated cargo handling systems will result in less wear and tear on cargo liner, thus extending its life.

Of more immediate concern is the development of a cargo liner patch system that will pass the FAA's burn-through test, *and* is quick and easy to apply. Although there are two or three systems that satisfy the former (and most important) criterion, they do not fulfill the latter. The M.C. Gill Corporation's R&D Department is currently working on a system that will meet both, much like the Gillpatch that has been the industry standard for almost three decades.

Although we certainly would not rule out new material technology, the M.C. Gill Corp. plans to focus on its in-house expertise working in concert with state-of-the-art resins and reinforcements that we develop to achieve the desired improvements in properties that undoubtedly will be sought by the airframe manufacturers.

LIGHT WEIGHT. Foremost among these improvements is lighter weight. It can be attained but there is a point at which the tradeoff between lower weight and higher cost to obtain same becomes unacceptable.

FIRE AND ASSOCIATED DANGERS. A second major area of ongoing improvement is the properties related to flammability, heat release, and smoke and toxic emissions associated with the dangers in post-crash fires. Although the FAA has four FAR's (Federal Airworthiness Regulation) relating to fire, as of this writing that Agency has established no test procedures or minimum standards concerning heat release, smoke or toxic emissions for cargo liner. With regard to smoke emissions, the FAA has stated, "Flammability is a more significant factor in survivability than smoke alone. It would, therefore, be inappropriate to establish test procedures and standards for smoke in lieu of flammability." (Federal Register, Vol. 51, No. 139, pp 26026-26220.) Similar reasoning is applied to toxic emissions.

Granted that establishment of standards for smoke and toxic emissions is difficult, it has been and is our opinion that at some point in the near future, the FAA will address these issues and establish appropriate standards for cargo liners. Many in the aviation industry contend that the hazards posed by these dangers in post-crash conditions are as great, if not greater, than fire itself.

Perhaps in anticipation of forthcoming Federal standards, the two major domestic airframe manufacturers have adopted smoke emission standards for cargo liners installed as original equipment. These standards, just like any other requirement, must be met before a lining material is accepted as qualified to the given specification. ASTM E662-83 is the accepted test method and depending on thickness, Gillfab 1167 and 1167B are qualified to McDonnell Douglas specification DMS 2226. Likewise, Gillfab 1367 and 1367A are qualified to Boeing specification BMS 8-223, Class 2, Grade B, Type 13 through Type 70.

Interestingly, but not coincidentally, Gillfab 1167 and Gillfab 1367 were developed prior to the formal adoption of the aforementioned specifications. The M.C. Gill Corp. is extremely proud of the milestones we have achieved with our products' compliance with the airline industry's safety standards—especially when that conformance precedes the formal adoption of such standards! However, we will not rest on our laurels. We have worked long and hard to achieve our position of leader in the manufacture of aircraft cargo liner and we intend to keep it.

Properties of Selected M.C. GILL Cargo Liners

Test results for selected M.C. Gill cargo liners and the airframe manufacturers' specifications to which they qualify are shown in the table below. Prior to a review of that table a brief explanation of the test measurements is in order.

In addition to the previously discussed key properties, we conduct tests for other property values. These are also essential for qualification to airframe manufacturers and airlines' specifications, and include the following.

FLEXURAL STRENGTH AND FLEXURAL MODULUS. These are measures of the stiffness properties of cargo liners. To test, the specimen is tested in flexure as a simple beam supported at two points and loaded at the mid-span. The test material is loaded until rupture occurs (maximum stress occurs in the outside fibers at mid-span). A deflectometer is placed at the center of the specimen to obtain a load-deflection curve, which is used to calculate modulus (stiffness).

HARDNESS. This test measures indentation hardness using a model GYZJ 934-1 Barcol Impressor. Because each test reading is only accurate to ±10 percent, ten readings are taken and averaged.

WATER ABSORPTION. This test determines the relative amount of water absorption by liner when immersed. Test results provide a guide to the effects of exposure to water or humid conditions when the product is in actual service. The material is measured and weighed, and immersed on edge in a container of distilled water at a temperature of 73.4°F, ±1.8°. At the end of 24 hours it is removed, wiped dry, immediately weighed to the nearest 0.001 grams, and percentage of weight increase calculated.

TENSILE STRENGTH AND TENSILE MODULUS. Measures the strength properties of cargo liner under tension. The sample is measured and placed in test machine grips which are tightened to prevent slippage during the test. The specimen is aligned with the direction of pull and the speed set at the prescribed rate. An extension indicator is attached to obtain a load-extension curve. Maximum load is measured at the yield point, if one exists, and/or break.

PROPERTY AND TEST METHOD	GILL PRODUCT NUMBER AND SPECIFICATIONS TO WHICH THEY QUALIFY							
	1076	1066 Proprietary	1100 DMS 1946	1138 LAC-C-22-1249, CL 1	1266 Proprietary	1167* DMS 2226	1366* BMS 8-2 CL 2, Gr. A LAC-C-22-1249, CL 3	1367* BMS 8-223 CL 2, Gr. B
Impact Resistance								
Douglas pendulum tester #2 (24 lbs.) (.045" laminate), ft.-lbs.	**	66	40	40	40	34	66	40
Boeing dart tester #3 (12 lbs.) (.030" laminate), ft.-lbs.	**	10	5	10	10	N/A	18	16
Bolted joint pull-out, per DMS 1946 (.060" lam.), lbs.	365	400	350	420	420	350	350	N/A
Edge bearing strength, per BMS 8-262 (.030" lam.), psi	23,000	27,000	35,000	30,000	31,000	32,000	30,000	33,000
NBS Smoke Emission D_S @ 4 minutes flaming (thickness)	140/200/475/600 (.013"/.023"/.045"/.059")	150/300/550 (.016"/.030"/.060")	NYA	NYA	NYA	40/50/60 (.016"/.025"/.030")	** N/A	50/50/50/50/50/50 (.013"/.020"/.030"/.040"/.050"/.070")
Burn-through, per FAR 25.855, APP. F, Part III, Amend. 25-60	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
OSU Heat Release, (kw-mins./M^2 and kw/M^2)	NYA	NYA	NYA	NYA	NYA	38/35 (.030" thick)	52/42 (.030" thick)	25/19 (.030" thick)
Flexural Strength, psi	30,000	18,000	70,000	32,000	45,000	25,000	35,000**	28,000
Flexural Modulus, psi x 10^6	2.0	1.2	2.9	2.2	2.0	1.4	2.0**	1.5
Tensile Strength, psi	40,000	38,000	45,000	42,000	45,000	54,000	47,000	54,000
Taber abrader, grams lost, 2000 cycles, CS10 wheel	.035	.075	.028	.028	.040	.060	.0625	.060
Weight (.030" lam.), lbs.-ft^2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Water Absorption, % maximum	1.0	2.5	0.65	0.5	0.5	0.5	2.0	10.0
Barcol Hardness, minimum	45	30	60	50	50	**	45	N/A
Resin Content, % average	35	37	33	33	33	33	33	32

*Proprietary product subsequently adopted by and qualified to specifications shown. **No requirement in specification. N/A—Not Applicable. NYA—Not Yet Available.
Note: The Boeing impact weight is more pointed than the McDonnell Douglas weight; therefore test results differ.

STRAIGHT FROM THE HORSE'S MOUTH
...M.C. Speaks Out

Prior to the jet age, cargo liner specifications were written without the benefit of in-service experience. Specs were written to exert some control over the manufacture of the material and ensure some semblance of uniformity of appearance.

Although some of the current laboratory tests relate to significant end use properties, to this day we know of no specification that requires in-service evaluation.

The manufacture of cargo liners relies heavily on a thorough knowledge of synthetic resin chemistry. Even we simply cannot keep abreast of the required technology without emphasis on our in-house R&D support, in-service testing, and a sincere concern for customer satisfaction.

Calling upon our 47 years of experience, we'd like to help you evaluate and select liners that best suit your primary requirements, be they resistance to puncture, abrasion, lighter weight, lower first cost or longer service life.

Therefore, if you will install one or two types of our liners in one or several of your airplanes, *we will be happy to provide them at no charge!* Also, if the aircraft comes into Los Angeles, we'll be pleased to inspect the cargo holds and report to you on the condition of the liners you've selected. In this way we can serve you better and we will both become more knowledgeable as to what liner best suits your operation. *All cargo liners are not alike!*

A Few Gilliner Basics

M.C. Gill manufactures cargo liner in two modes—raw stock sheets (or rolls) and fabricated parts. "Raw stock" means that the end product is available in sheets or rolls of premeasured lengths, widths and thicknesses. Although we'll supply you with almost any length or width you wish, standard dimensions are 36", 48", 60", or 72" widths; 8', 10', 12', and 14' lengths. Generally, roll stock is available in widths up to 60" and lengths up to 150 linear feet. If you require dimensions smaller than these standards, they are cut from the next largest size.

Fabricated stock is tailored, or cut, in shapes other than rectangles or squares. To supply you with these shapes we require a drawing(s) showing precise dimensions and tolerances. We enter these data into the CAD (Computer Aided Design) program which creates the profiling pattern of the surface, calculates a tool path for cutting, transfers that program to the profiler which then machines the part on our 5-axis heads CNC profiling machine. We can also program the machine to drill holes for inserts or rout cutouts.

We can supply virtually any thickness, which generally is dependent on a particular airframe manufacturer's specification and repair manual or, if there is no specification, its location in the cargo compartment of the aircraft, i.e., the closer to the floor, the thicker the material.

If you'd like additional information, we have prepared a six-page bulletin on "How to Order M.C. Gill Products." For a copy, just write, phone or fax the Marketing Services Department at 4056 Easy Street, El Monte, CA 91731; phone (818) 443-4022; or fax (818) 350-5880.

At the University of Southern California

THE FIRST RECIPIENT OF THE M.C. GILL CHAIR IN COMPOSITE MATERIALS

Dr. Phil Muntz, Chairman of the Aerospace Engineering Department has been selected as the first recipient of the M.C. Gill Chair in Composite Materials. The Gill professorship will extend three years. In addition, the M.C. Gill Corporation is providing start-up funds to recruit two assistant professors to enhance USC's research in composite materials.

"There has always been a lack of adequately trained people in the plastics industry, and we're trying to do something about it." This quote is taken from remarks made in 1978 when M.C. pledged $250,000 to USC's Engineering Department for the study of polymeric materials. It was one of the first contributions of its type and was typical of his foresight and attitude toward the future of composite materials as a resource that, in his words, "...should be given the same emphasis as such other structural materials as steel, aluminum, wood, and ceramics."

Just as the M.C. Gill Corporation has always been in the forefront of advanced composites development and the leader in its field, M.C. has always believed in promoting the reinforced plastics industry. He has long believed that it has received short shrift in university curriculae and his endowments to USC over the years have been made with the view of correcting that oversight. From the outset, his generosity has been meant to help the plastics industry, USC, and, in the process, the M.C. Gill Corporation.

KELOWNA GIVES NEW MEANING TO THE WORD STRETCH

Modifying aircraft to an all cargo configuration is nothing new to Kelowna Flightcraft Ltd, an aircraft repair, overhaul, and modification facility located in British Columbia, Canada.

Kelowna has been in the business for 22 years, and some time ago, in conjunction with a team of General Dynamic engineers, developed an STA certified 122" cargo door modification for a Convair airframe. The company has completed this modification numerous times, but about a year ago, it embarked on a first-of-its-kind project that, to date, has been a resounding success.

In response to the growing need for courier services aircraft by its Air Charter sister company, Kelowna located a military C-131 (Convair 580) and began work. This was no ordinary modification though. In addition to two new Allison 501-D-22G engines, a complete rewire of the electrical systems, and the installation of the latest avionics package, **the decision was made to stretch the fuselage by 14 feet!**

As stated, the modification was conceived and completed with Kelowna Flightcraft Air Charter in mind and the original plan was to convert two 580's (now dubbed the 5800) for that purpose. However, the aircraft, with its flexibility and adaptability to courier-type services, has generated such an appeal to other airlines that the first two converions will probably be sold with the third going to Air Charter.

Although a small DC-9 or an older 737 are somewhat comparable to the 5800, with a payload of 21,000 pounds it offers several distinct advantages including lower operating costs and far less noise than jets, thus allowing it to operate late night flights at many airports.

The first 5800 is now undergoing flight testing and then will return to British Columbia for final outfitting. Included in that last step before entering service will be the installation of Gilliner 1066 throughout the entire cargo compartment. Not so incidentally, Gillfloor 5040 was selected as flooring material for the aircraft, but that's a story for another day.

Kelowna has been a long time advocate and user of 1066—a reinforced fiberglass woven cloth polyester cargo liner developed by M.C. Gill in 1961 for the early jet age aircraft. It has been used by airlines all over the world for 31 years and, judging by current sales figures, shows no sign of being ready for retirement. It's the benchmark of all cargo liners.

We are pleased and proud that Kelowna Flightcraft Ltd has made Gilliner 1066 the cargo liner of choice for the first Convair stretch of its kind. We've been party to a lot of firsts since 1945 but this one ranks right at the top of the list. Thank you Kelowna!

QUICK REFERENCE TO M.C. GILL COMPOSITES

Our Customer Service personnel are often asked which of our products should be used on specific aircraft. For example, a customer will tell us that he is modifying a DC-9 and needs to know which cargo liner is specified for that job.

To make ordering easier and quicker, we compiled the following table for use as a quick reference. It lists passenger aircraft, the M.C. Gill product most often recommended for specific applications, and the manufacturers' specifications to which our products are qualified. We have not included all M.C. Gill products that qualify to airframe manufacturers' specifications — only those that are most current. Nor, have we included those products that have been

AIRFRAME MFG. & AIRCRAFT MODEL	APPLICATIONS	SPECIFICATION	M.C. GILL PART
AIRBUS INDUSTRIE			
A300 and A310	Passenger flooring	TL53/5000/79	4105
	Bulk cargo flooring, Containerized cargo flooring	TL53/5000/79	5007A
A320 and A321	Passenger flooring	5360MIB000100	4205
	Containerized cargo flooring	5360MIB000100	4322
	Bulk cargo flooring	5360MIB000100	4323
BOEING			
All 700 series	Cargo liner	BMS 8-2 Cl 2	1366 & 1366T
All 700 series	Cargo liner — low smoke	BMS 8-223 Cl 2	1367 & 1367A
747	Cargo liner (ceiling)	BMS 8-2 Cl 1	1076A
All 700 series	Nomex honeycomb core	BMS 8-124 Cl IV	Gillcore HD
BRITISH AEROSPACE			
146-200 and 146-300, ATP, and 1000	Passenger flooring (under seat)	BAeR 3231	4109 Gr L
	Passenger flooring (aisle)	BAeR 3231	4109 Gr M
	Cargo flooring (aisle)	BAeR 3232	4004A
Jetstream 31 and 41	Passenger flooring	MAT 006	4004B
	Passenger flooring	MAT 003	4017A
EMBRAER			
EMB-110, 120, and 123	Passenger flooring (aisle)	GPS 4009	4009
	Passenger flooring (under seat)	MEP-15-020	5417
	Galley or bulkhead	MEP-15-017	4117
	Galley or bulkhead	GPS 5040	5040
	Galley or bulkhead	GPS 4122-A	4122A
	Galley or bulkhead	GPS 4030	4030
	Galley or bulkhead	GPS 4017-II	4017 Ty 2
	Nomex honeycomb	MEP-15-010	Gillcore HD

DESIGNED AND QUALIFIED FOR MAJOR AIRCRAFT

in-service tested for years and meet the requirements of but are not formally qualified to many of the specifications found below.

The table is intended as a quick reference. Therefore, we have not included obsolete specifications, all airframe manufacturers nor, unless necessary, such details as product type and grade, dimensions, core densities and cell size, etc. Our Customer Service Department can provide this information if you do not know or are unsure.

If you would like additional copies of this Quick Reference please contact our Marketing Services Department and we will be pleased to provide them.

AIRFRAME MFG. & AIRCRAFT MODEL	APPLICATIONS	SPECIFICATION	M.C. GILL PART
McDONNELL DOUGLAS			
All models	Cargo liner — low smoke	DMS 2226 Ty 1 DMS 2226 Ty 2	1167/1167A 1167B
All models	Nomex honeycomb core	DMS 1974 Gr A	Gillcore HD
DC-8, DC-9	Cargo liner	DMS 1722 Ty 2	1066
DC-9, 50 series	Passenger flooring	Dwg BZZ 7002	4017T
DC-9 and early MD-80's	Cargo liner	DMS 1946 Ty 1 and Ty 2	1100, 1100G
MD-80 series	Passenger flooring (aisle) Passenger flooring (under seat) Cargo flooring Cargo flooring	Dwg BZZ 7002 Dwg S3932194 Dwg S00096 Dwg S00486	4017T 4106 5242 5242C
DC-10 series	Cargo liner Passenger flooring (galleys) Passenger flooring (under seat — lower density than galleys) Passenger flooring Cargo flooring Cargo liner trim strip	DMS 1946 Ty 1 and Ty 2 Dwg S3933941 Dwg S3933942 Dwg BZZ 7002 Dwg 3932195 Dwg 214D0001	1100, 1100G 4022C 4022C 4017T Ty 1, Ty 2 5042B 3017
MD-11 series	Passenger flooring (aisle) Passenger flooring (under seat) Passenger flooring (outboard) Cargo flooring Cargo flooring Cargo flooring (low traffic)	Dwg 7954400 Ty I Dwg 7954400 Ty II Dwg 7954400 Ty III Dwg S3932193 Dwg S3932195 Dwg S4929905	4109 Ty 1 4109 Ty 2 4309 5042B 5042B 5042B
	(Note: Specification call out depends on skin thickness for above three products — check with our customer service representative if you are unsure.)		
	Cargo flooring	Dwg 7954401	4004
LOCKHEED			
L-1011	Passenger flooring	LAC-C-28-1386	4017
L-1011	Cargo liner Cargo liner Nomex honeycomb core	LAC-C-22-1249 Cl 3 LAC-C-22-1249 Cl 1 STM 28-105	1366/1367 1138 Gillcore HD

NEWS RELEASE

Based on the Boeing Airplane Company's audit findings, "M.C. Gill has demonstrated procedural compliance to all sections of D1-9000 and on-site compliance to sections 2.1 and 2.2, and is hereby qualified to the document." What this statement means is that M.C. Gill's quality control procedures and system have been approved by Boeing regarding the certification of our products for use in their aircraft. An integral part of Boeing's Advanced Quality System (AQS) program concerns the setting of standards for their suppliers. It is no easy matter to comply and the M.C. Gill Corporation is pleased that its time and efforts to do so have been recognized by this approval.

THE FUNNY SIDE

Pharmaceutical companies have you coming and going. You have to take their vitamins so you can open their prescription medicine containers.

★ ★ ★

All teenagers have one thing in common. If they aren't arguing, they aren't listening.

★ ★ ★

A museum guard, investigating a loud crash found that a visitor had accidentally knocked a piece of ancient pottery off its pedestal. "You've broken an urn that's more than 1,000 years old!", he cried. "Thank goodness it wasn't new," replied the visitor.

★ ★ ★

History repeats itself because we weren't listening the first time.

★ ★ ★

In prehistoric times, cave men used to beat the ground with clubs while uttering spine-chilling cries. Scientists call this a primitive form of self-expression. Modern men go through the very same ritual. Today, we call it golf.

The little girl was asked what she was going to give her brother for his birthday. "I don't know," she replied. "What did you give him last year?" "The chicken pox."

★ ★ ★

A father took his small son to visit the family's new arrival in the hospital nursery. From where he stood, the boy could see 15 cribs, 13 of which held newborns. "Look, Daddy!", he exclaimed. "They've got two more traps set."

★ ★ ★

The new bride called the food editor of the local newspaper and asked for help. Seems she was having her husband's parents, his boss, and his wife for a special dinner. "I've bought a nine-pound turkey and I want everything to turn out just right. How long should the turkey cook in my new microwave oven?" "Just a minute," replied the editor, reaching for his reference book. "Oh, thank you," she said. "You've been a big help. Good-bye."

TRIVIA

Seventy-eight percent of all Americans have been in a shopping mall in the last thirty days.

★ ★ ★

Sixty-seven percent of American teenagers say they believe in the existence of angels.

★ ★ ★

In 1929, Earl Averill of Cleveland became the first future Hall of Famer to hit a home run in his first at-bat in the majors. The only other Hall of Famer to accomplish the feat was knuckle ball pitcher Hoyt Wilhelm for the New York Giants in 1952. In his second at-bat, Wilhelm tripled. He went on to play in the major leagues for 20 years without ever again hitting a home run or a triple.

★ ★ ★

When Americans' alarm clocks go off:
- Before 6 a.m. — 25%
- Between 6 a.m. and 7 a.m. — 32%
- Between 7 a.m. and 8 a.m. — 14%
- After 8 a.m. — 10%
- Do not set alarm — 19%

★ ★ ★

Thirty-four percent of all college students believe being a millionaire before age 35 is important.

★ ★ ★

Percentage of American workers with flex-time: 14.