



**Resource Analysis
of
Industrial Fiberglass and FiberSystems**

The purpose of this Resource Analysis is to help our customers better understand our capabilities - and how these capabilities can be brought into play in providing corrosion resistant composite equipment. This Resource Analysis bulletin should be used in conjunction with other Industrial Fiberglass and FiberSystems bulletins, including the bulletin entitled "Company Capability and Background Information".

Facilities:

A. Building Space: Industrial Fiberglass and FiberSystems, and their "sister" and support companies, currently have 5 facilities to service customers. The total floor space of these facilities is in excess of 123,000 square feet. Multiple production facilities exist in Ohio, with additional plants and engineering and design facilities in Florida.

The diversity of plants gives us the ability to meet the customer's needs for both specialized fabrication capabilities and rapid delivery response. This gives us the ultimate flexibility to "juggle backlog" to meet specific delivery requirements, and at the same time attempt to minimize freight costs.

Each of these facilities is well maintained, with a balance of working space, power and utilities, and support equipment (cranes, ovens, etc.). Some of these manufacturing plants were built specifically for the production of fiberglass corrosion resistant composite equipment.

Do not expect to see "fancy" plants and offices at Industrial Fiberglass and FiberSystems. All facilities are very utilitarian, and have been built and established with the viewpoint of keeping overhead burden to a minimum. Our strategy is to put our resources into equipment, technology and people. Our composites manufacturing and the support facilities are true "heavy" manufacturing, and are appropriate for their intended use.

B. Equipment: To provide our customers with reasonable cost and prompt delivery, all the manufacturing plants are fully equipped with modern efficient equipment. Separate pipe manufacturing machines are available for both filament winding and contact molding of pipe and duct. Tank winding stations are available for manufacturing both filament wound and contact molded tank shells.

Pipe, duct and conduit are produced on equipment that has been designed, engineered and built by our own people. Multiple pipe machines are available for producing all diameters of pipe from 3/8" through 168", in lengths up to 40 feet long.



Equipment for producing pipe and duct also includes the capability of producing contact molded and filament wound fittings in all sizes for which pipe is also made. For example, smooth radius, one piece elbows can be produced in sizes up through 48" diameter. For conduit, long radius sweep elbows are available up to and including a five foot radius.

The pipe producing equipment includes the ability for post-curing of FRP composite pipe and equipment.

Tank winding stations are such that a complete tank sidewall can be laminated or wound all at one time, for tanks up to 40 feet tall. In both the horizontal and vertical winding stations, tank heads and bottoms can be integrally wound or laminated to the tank sidewalls.

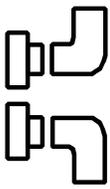
C. Tooling - Permanent: Industrial Fiberglass and FiberSystems maintain a wide range of permanent tooling for manufacturing of pipe and duct from 3/8" diameter through 168" diameter; and for tanks and vessels through 14 foot diameter. Pipe, flange, and fitting tooling is available for manufacturing nominal chemical process plant pipe diameters, and iron pipe o.d. sizes. A wide range of dished and coned bottom tooling is available for tanks and vessels. All tooling is ruggedly built for maintaining the quality of the finished product.

D. Tooling - Custom: Realizing that many customers require special FRP fabrications, Industrial Fiberglass and FiberSystems have a significant in-house capability of making tools and molds for these special requirements. We have senior pattern and tooling makers that have over 20 years experience at their trade. In addition, since we make all of our own tooling, this capability insures efficient, low cost and temporary tooling for building the "difficult ones".

Manufacturing Support: Extensive jiggging and fixtures are available for the assembly of pipe and duct isometrics and spool pieces. Well-equipped machine shops at all locations can handle even the most complex post-fabrication machining of fiberglass reinforced plastic composite equipment. Thread cutting, flange facing, back facing, cutting of grooves, etc. are every day occurrences. Probably no other company in the FRP composite field has our total in-house capability to do pre- and post-fabrication machining of composite laminates. For a partial listing of these machine shop capabilities, see the attached separate bulletin entitled "Machine Shop Capability". You will note that we can machine items up to 7 feet in diameter and up to 17 feet long.

We have what we believe to be one of the industry's most extensive selection of mandrels for building pipe. See our separate bulletin entitled "Pipe and Duct Sizes - Increased Capability".

Technology - General: As described on the company capability and background information sheet, Industrial Fiberglass and FiberSystems, and their sister companies, trace their "roots" back to 1946 and the original Carl N. Beetle Company. For his early achievements in pioneering in the area of corrosion resistant equipment, our founder, Carl Beetle, was elected to the SPI Plastics Hall of Fame.



The early members of our family were the first in the country to make fiberglass grating, the first in the country to filament wind large diameter FRP tanks and vessels, the first in the country to filament wind large diameter pipe, the first in the country to make thermoplastic lined equipment, and one of the first - if not the first - to produce FRP equipment out of furan resin. But, we have not rested on our past achievements, and have continued to be an innovator employing the latest technology, know-how and manufacturing techniques.

Technology - Materials: Industrial Fiberglass and FiberSystems, and their sister companies, fabricate with all the commercial resin systems. Thus, we are able to provide the customer the system that best fits his application. We may "gently twist your arm" if you want to use one of the older and more obsolete resins, such as one of the bisphenols. We may try to encourage you to use one of the newer and more versatile resins. However, whether it be isophthalic and terephthalic polyester resins, the vinylesters, bisphenols, fire retardant resins, some of the newer high performance vinyl polyester resins, furans, or even epoxies - we can provide you the laminate system of your choice.

In addition, we work with the major resin companies, helping them evaluate resins that are still experimental, but that hold promise for the future. We also have abrasion resistant systems, conductive laminates, and high temperature resin systems for the "tough ones". When it comes to materials technologies, we can work with you to provide the optimum resin system, that will provide you your lowest cost per year of service life.

Technology - Engineering & Design: One of the areas that sets Industrial Fiberglass and FiberSystems apart from the "garage shop" fabricators is its ability to optimize the design of equipment through competent engineering analysis. Those in the top management of Industrial Fiberglass Specialties, and our sister companies, are all graduate engineers. We enjoy the challenge of working with our customers to provide them "an engineered solution". This approach provides you your "best buy". Over the years, we have formalized our engineering into a complete engineering and design manual. This provides an organized approach to the customer's problems. The engineering formulas and data we use have been validated by extensive strain gauge, physical and acoustical emission testing. We have, at all of our facilities, engineering computers for computer assisted design, engineering, manufacturing, scheduling and estimating.

We also maintain formalized relationships with other composites engineering companies. Again, our company's charter is specifically to support all of our FRP fabrication facilities with sound engineering of composites. This provides us the ability to provide the end user their lowest cost per year of service life.

Technology - Innovations: While Industrial Fiberglass and FiberSystems have built their business and reputation on providing sound, time proven know-how and technology - at the same time we have judiciously been one of the industry's leaders in innovative technology.



Our companies were one of the first to establish the relationship between the exotherm characteristics of certain resin systems, and the requirement for specific glass treatments. We have developed ways of armoring fiberglass laminates for improved abrasion resistance. We have learned how to make laminates conductive to prevent static build up. Our ability to build the impossible, such as one-stop fabricated thick filament wound laminates, is unequaled in the FRP composites industry.

This innovation carries over even into the areas of tooling, equipment and fixturing and jigs. The present management of Industrial Fiberglass and FiberSystems designed and installed the industry's first computer controlled pipe winding machine. We have developed equipment and fixtures for filament winding tee branches into headers up to 40 feet long. Elbows, laterals, tees, and even floor drains can all be filament wound in one piece construction for maximum physical strength.

If your requirements lend themselves to an innovative approach, Industrial Fiberglass and FiberSystems would welcome the opportunity to explore a "partnership" with you.

Financial: The fiberglass reinforced corrosion resistant market has a "low cost of entry". Over the years, the industry has seen many fabricators come and go. Over those same years, Industrial Fiberglass and FiberSystems, and our sister companies, have demonstrated our "staying power". The present management provides that continued stability and continuity.

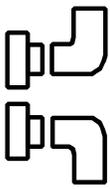
While we are not part of a large conglomerate, with unlimited resources, our companies are adequately funded and backed to tackle even the most arduous and long-term projects. We believe we fit the slogan: "Large enough to serve...small enough to care!"

We particularly welcome those continuing projects that run over a period of time. With Industrial Fiberglass and FiberSystems, you can count on us being around to finish the projects we start. You can count on our being there, year after year, to provide continuous support and service.

It has been demonstrated that massive size is not the key to longevity in the fiberglass industry, as evidenced by the "exit" of Owens Corning Fiberglass from the fiberglass tank market. As is the case with most of our customers and end users, the key to financial stability is continued profitability.

Management: The management of Industrial Fiberglass and FiberSystems are not "Johnnies come lately" in their field of expertise. The top six management people share among themselves 177 years of corrosion resistant reinforced fiber reinforced composite experience. This means that your orders are being guided through engineering, estimating, quoting, manufacturing, and out the door with experienced, knowledgeable hands.

Management Philosophy & Direction: Since it is the management that determines the direction of a company, it is important for our customers to have an understanding of our philosophy. It may be just as



important to understand what we are not, as it is to appreciate what Industrial Fiberglass and FiberSystems are, and can be.

A. Quality: Industrial Fiberglass' and FiberSystems' names have long been synonymous with quality FRP fabrications. We make no claim of being infallible. We certainly do try harder than many. We understand that most fabricators claim that elusive customer benefit of "quality". It is often difficult to separate the "wheat from the chaff" when it comes to boasts of quality. We quietly lay our record on the table. Our various companies' longevity and loyal customer base, dating back to the mid-1940's, are the best testimonies we can submit. (See attached bulletin entitled "Pipe and Fittings End User List".)

Our customers and potential customers are always welcome at our plants for a plant tour and inspection. You will find that we are a very open company, willing to discuss our strengths and, yes, even our non-strengths.

B. The Tough Ones: Over the years when a customer has had a "tough one", where the service is critical, where the ultimate quality is a must, and where the environment is operating on the borderline of current technology; then Industrial Fiberglass and FiberSystems have been called upon to build this equipment. We make no claims of being "all things to all people". However, if your project involves the "tough one", it would pay for you to talk to Industrial Fiberglass and FiberSystems first - and then last!

C. Your Best Buys: While our prices are competitive, it is doubtful if we will ever be the lowest bidder on a given project. We are as efficient as most other fabricators. Our labor costs are reasonable for the skilled craftsmen we employ. We purchase our raw materials in a cost effective manner. (We are willing, and do pay a premium for service and support.) And, considering the support capabilities we can offer our customers, our overhead is lean and trim.

But, we do know our costs. We do know that quality does not come free. All things being considered, when our pricing is compared on the basis of the lowest cost per year of service life, we can offer you, our customer, your "best buy".

D. EMSC: Over the years, Industrial Fiberglass and FiberSystems, and our sister companies, have built millions of dollars worth of corrosion resistant FRP equipment under our Engineering and Manufacturing Service Contract (EMSC). The EMSC approach involves an act of faith on our part in opening up our complete books - charging the customer only for the actual materials used, man-hours expended, and a reasonable contribution to profit.

Just as with our customers, it is long-term profit that has allowed Industrial Fiberglass and FiberSystems to still be there year after year, providing support and service. If you want to know how to save money on your next FRP project, ask us for details on the Engineering and Manufacturing Service Contract. A bulletin describing this unique approach to project management is attached.



E. Types of Customers: Industrial Fiberglass and FiberSystems can best serve those customers that have critical processes, and where the cost of unplanned lost production will more than offset the small extra cost involved in buying "the best". We prefer to work with those customers that have taken the time to develop detailed and concise specifications, and who are able to differentiate between the resources and capabilities of the various fabricators. We are not afraid of "detailed" inspections and fussy inspectors. The more knowledgeable our customer, the easier it is for us to establish a sound "working partnership".

F. Business Direction: In summary, Industrial Fiberglass and FiberSystems' business objective is to serve those customers that are discerning buyers of corrosion resistant fiber reinforced plastic composite equipment. We can best support those customers who are able to recognize the importance of quality fabrications, and are willing to pay a fair and reasonable cost for receiving their "best buys".

People: The bottom line of all the resources we have to offer our customers is people. Any company can go out and lease or build a new building. Any FRP fabricator can go out and purchase or build equipment, tooling and mandrels. But it is people that are our most important resources.

The corrosion resistant fiberglass reinforced plastic industry is unique. Despite all of the advances in technology, there is still a lot of art, experience and first-hand knowledge involved in producing quality FRP equipment. An analogy we have often cited would be if the steel tank and pipe fabricator had to produce his own steel plates and sheets from raw material, instead of buying them from a steel company where they have been produced under controlled conditions. In the FRP composite industry, we are always starting "from scratch" with the very basic raw materials.

Over the years, Industrial Fiberglass and FiberSystems have maintained a loyal, dedicated work force. The people are skilled craftsmen who take pride in providing their "mark of excellence" to our customers. The median years of experience of our core group of craftsmen is 16 years. When it comes to fiberglass fabrication, these craftsmen know what they are doing! We take pride in the fact that our plants have not had the high turnover of laminators experienced by many FRP composite manufacturing companies.

Manufacturing supervision, which sets the tone for our quality emphasis, has an average of over 20 years experience in this industry.

For years GE used the slogan "People are our most important asset". Nowhere is this more true than in the FRP composite industry. Anybody can buy buckets of resin and rolls of fiberglass reinforcement. But it is people that take those raw materials and turn them into a finished composite laminate for handling nasty chemical environments and critical fabrications.

At Industrial Fiberglass and FiberSystems it is the people - from the craftsmen on the floor to the experienced sales and distributor representatives in the field, to top management - that are dedicated to employing all of our resources toward providing you, our customer, your "best buy" in corrosion resistant FRP equipment.