DFT® INC.

CUSTOM Engineering Valve Solutions

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DFT Inc. has been around for over one hundred years and has been manufacturing in-line check valves for over seventy. Its engineered valve solutions focus on customization to specific customer needs and applications. We spoke with its Vice President and General Manager Arie Bregman.

Written by Mark Golombek

The roots of DFT Inc. go back to 1911 in New York City. In the early 1940s, due to customer need, the DFT inline silent check valve was developed by the company, which up to that point, had produced mainly gasket and seal materials, and pump components.

Check valves are essentially valves that allow flow in only one direction. One very simple example could be when several pumps are feeding water into a common header for some industrial application and pump A gets shut down, the plant will not want the output of pump B to redirect back through pump A. The check valve will ensure that the flow is only going in one direction. There are many many more applications for check valves, but this illustrates one very basic application that is quite common in industry.

"A check valve will either, through gravity, springs, or some other internal design feature, sense the decreasing flow rate going

through the valve or that the flow might start to reverse direction. When this happens the check valve will automatically close," says Arie.

Block valves or other types of control valves can also be used and be either manually operated or automatically operated. However, these valves, when open, can allow the flow to go in either direction. A check valve will ensure that the flow can go in only the intended direction.

This world-class manufacturer of check valves and control valves developed the method of forming their check valve disc from a stainless steel blank in such a way that they had more strength for high-pressure applications. Some of the first all-stainless steel valves were developed for use with cryogenic liquids and were used as part of the World War II research enterprise that produced the first nuclear weapons – the Manhattan Project.

"In the early 1940s DFT had branched into making some small

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sizes of screwed end products, which were these all stainless steel valves that were used in the Manhattan Project." says Arie.

One thing led to another, and over the next seventy years, the company expanded its product line from these small products to include a larger variety of check valves. The range of sizes of these valves was originally made for ¼" through 3" diameters. Presently, DFT makes sizes from quarter-inch valves to forty-two-inch valves with pressure ranges up to 5000 psi.

Most of what is produced by DFT is used in power plants, chemical plants, refineries, the oil and gas industry, natural gas transmission, wastewater treatment plants and the aerospace industry. DFT has about eighteen distinct market segments to which it sells, and there are literally thousands of potential application areas where DFT has successfully applied its products.

"Sometimes we get into very specialized services, like LNG (liquefied natural gas), with our check valves used in the extreme environments of cryogenic service. These valve applications may have a very basic function similar to what we make for everyday service but could be very specialized in their materials of construction, internal design features or have specialized end connections," says Arie.

DFT's products are often used in critical services in industries in which, if components are not working properly, substantial and costly problems can result for the company and the end user. DFT check valves are relied upon to allow for the flow to go in one direction only, so the valve must not only seal well but it must be very reliable as well.

The challenge is in getting a reliable, tight shut-off in a valve which has no external method of operation, such as an actuator, lever or handle wheel. Tightly-controlled, high-precision processes make sure that the valves are made accurately and are consistently of the highest quality.

"DFT also adheres to the quality standards put forth by the American Petroleum Institute (API), the International Standardization Organization (ISO) the American Society of Mechanical Engineers (ASME), the Manufacturers Standardizations Society (MSS), and in Europe, the governing body for valves and valve design is called the Pressure Equipment Directive (PED). All of these Quality Standards govern the entire manufacturing and quality process, describing minimum quality program requirements to help ensure that the highest quality standards are consistently met. "Quality system controls are in place starting with our raw material suppliers, and carry through the entire manufacturing process all the way through to how the valve is packaged and shipped to our end customers," says Arie.

DFT is also a long standing member of the Valve Manufacturers Association (VMA) which is a North American trade association, with members throughout Canada and the U.S. It is composed of members ranging from small companies with $5 million in yearly sales to the larger companies that claim $5 billion in sales. It gives all of its members – particularly the smaller companies – access to all kinds of information including economic forecasting as well as upcoming changes to laws, regulations and design standards.

The VMA also has an education group that provides instruction to not only member companies but also some end users and distributors that sell their products. This program teaches them the difference between different types of valves and applications, and even emerging new technologies.

"We also have a technical group within the VMA that puts on a seminar once a year – this year in Nashville – but that is restricted to just member companies. We will be talking about the evolution of design, new design tools, even quality standards for products," says Arie.

DFT is well-known for customization of its products. A very typical issue with check valves is that the flow rate through the valve is on the low end of what is needed to reliably operate the open and close functions. The solution is to apply sizing formulas for liquids, gases or steam, depending on what is flowing through the valve. Then, the determination is made as to whether the flow rate in a customer's application is going to be in the range in which reliable service of the valve can be expected.

If not, simple internal modifications are made to the valve to customize the flow capacity of the valve to the requirements of the application. "We'll take a valve that might wear itself out because of low flow and it might wear itself out in six months. We can customize that valve and it will last for ten years," says Arie.

DFT has been doing this for quite some time, and started long before other companies. This style of check valve is often called an axial flow style check valve. The flow will open the valve, but there is a spring on the other side of the valve disc which is trying to push it closed. Because it is flowing in that one direction, all DFT has to do is make some simple modifications to customize the valve for a particular flow circumstance and lengthen the lifespan of the valve significantly.

Webinars and new media platforms are being used to market the company. Arie gave a webinar last year on the importance of sizing check valves. "Because a lot of times the end user says, 'I've got a six-inch line, I guess I need a six-inch valve' They then proceed to buy the six-inch valve and put it in, sometimes with disappointing results. In my webinar, I explain what we do and the sizing formulas involved. It is a bit of a 101 level course, but it helps people to understand more about check valves, and it answers questions that they were perhaps afraid to ask," says Arie.

The next webinar in April of 2017 will concentrate on reducing or eliminating the phenomenon known as water hammer. Another unique feature of the DFT style check valve is that it shuts down the flow quickly. When the momentum of the fluid is still going in the forward flowing direction, the spring will close the valve as the flow decelerates. If the flow has to reverse to close the valve, it will cause a loud bang, called a water hammer. Water hammer can sometimes cause pipes to rupture or gaskets to leak. Arie will explain how to prevent water hammer and the advantages of the DFT axial flow design.

A strong U.S. dollar can make for an uncompetitive market position for U.S. manufacturers due to the relatively higher costs that result from unfavorable currency exchange rates. Therefore, U.S. manufacturers like DFT have to constantly be looking at ways to be more efficient in their designs and their manufacturing processes.

"You hear a lot about additive manufacturing in the news, and 3D printing is basically from that technology. We are busy incorporating the technology of 3D printing into how we make our products," says Arie.

The specialty work done by DFT, which could include a unique body design for a particular customer's application or a new product that needs to be produced quickly, can be aided by 3D printing technology. This would not be used to make metal parts but rather the molds used to make the cast metal parts.

Staying on top of technology is extremely important. Other technologies are being developed to be used for coatings and new alloys as well. Applications are constantly changing, placing more severe demands on valves and all components of the piping system. Companies like DFT have to constantly evolve to stay ahead of new advances in technology and to be prepared with new products, new technology and new design innovations. ■

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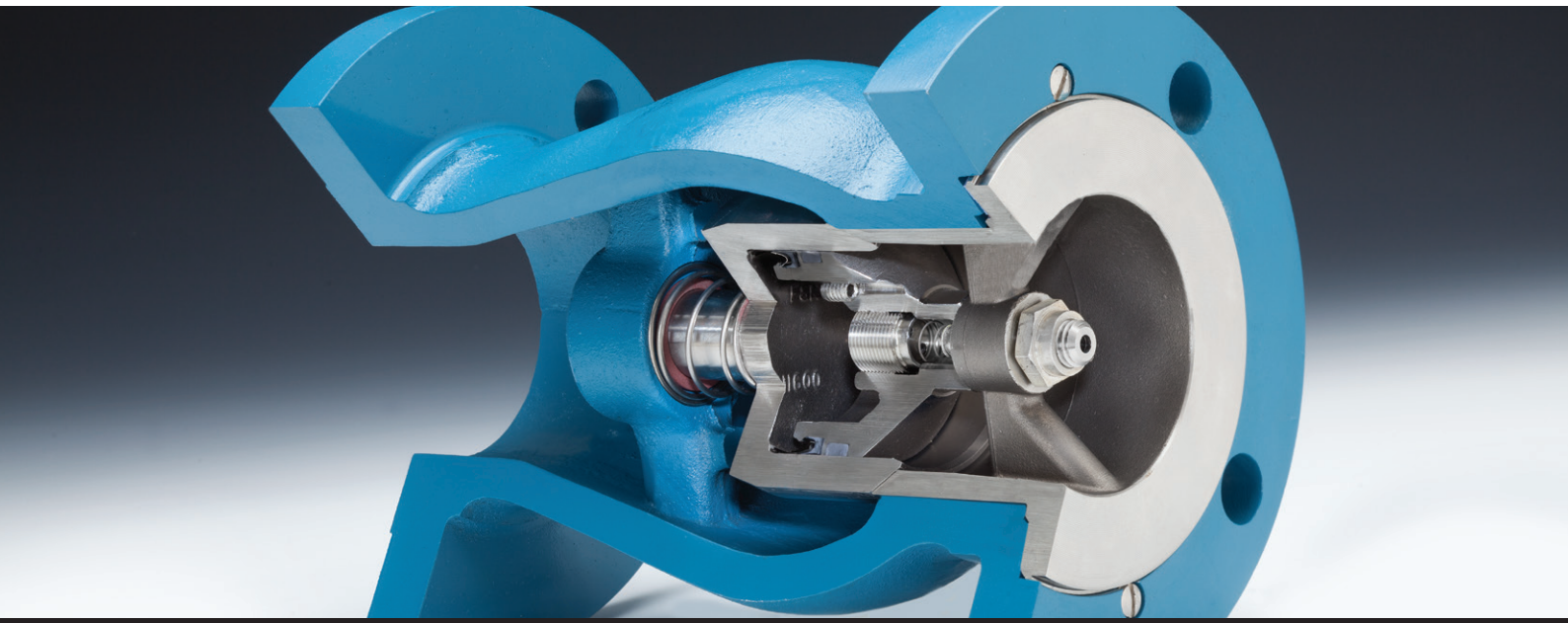

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