Contribution: Congratulations on the 90th Anniversary Year of the Founding

Valqua Review was inaugurated in 1957 to promote and introduce our technologies under our core principle of value and quality, from which our company derives its name. We take pride in our technologies and have worked hard to develop various seal products ahead of other companies.
In this 90th anniversary issue, I would like to share with our valued readers a summary of the products we have developed.
I joined Valqua in 1958 as Japan was emerging from the post-World War II era and as the economy and society were starting to prosper. At that time, the energy source was switching from coal to oil. Accordingly, petrochemical complexes were built all around Japan and the production of petroleum derivatives started, creating a need for new seal products.

• Fluororesin Products

Fluororesin was developed in the U.S. and has unconventional heat and chemical resistance. We noted the benefits and aimed to incorporate fluororesin products into our product lines. To achieve this goal, we sent our employees to the U.S. in 1956, where they learned processing techniques, then we started to process fluororesin in our Atsugi plant for the first time in Japan. Thereafter, we started to develop and market chemically resistant fluororesin lining pipes and lining vessels. Also, we made use of the electrical characteristics of fluororesin, especially its high-frequency properties, to produce electric parts, and started manufacturing and marketing these parts.
However, since fluororesin is a resin, it was difficult to use it on its own as a seal product. So, we combined fluororesin with rubber, felt, and metal; designed the shapes of fluororesin products; and then produced and marketed seal products (including envelop gaskets). We received DuPont's prestigious Plunkett Award for our remarkable development of fluororesin products, and received the award again later.

• Lineup of Rubber Products

Regarding rubber, which is a seal material, new types of rubber material were developed and marketed one after another. Accordingly, training sessions on these newly developed rubbers and rubber additives were held, taught by various academics. We were lucky to attend such sessions to learn about techniques for rubber. To fully investigate whether each of these various rubber materials was suitable for use as a seal material, we combined each rubber material, vulcanized the combined products, soaked them in various chemical solutions, analyzed the changes in swelling rate and physical properties, and tabulated the results to determine whether the material could be used or not.

• Alternative Product to Asbestos

The major seal material since before WW II had been asbestos. Thanks to its heat resistance, chemical resistance, and low cost, asbestos had been used not only for various seal materials but also as a construction material. However, it was found that asbestos damages the respiratory organs, so its use started to be banned. The ban was then extended to the seal industry, so we needed to

develop non-asbestos products. The staff in our development department struggled to find appropriate substitutes for asbestos for joint sheet, Valquatight Gasket (spiral wound gasket), gland packing, and others. But thanks to their efforts, substitute materials were found including carbon fiber, foamed carbon, and aramid fiber. After repeated development and testing, our lineup of alternative products was finally completed.

• Products Associated with the Nuclear Power Industry

Around 1970, nuclear power stations started to be built throughout Japan under the energy policy of that time. Accordingly, seal materials for the nuclear power industry were developed one after another. Metal bellows, flectors, rubber boots, foamed-carbon products, inflation seals, and other products were developed. Other industries then started to use these products; flectors were often used as flexible joints for ducts of desulfurization equipment and NOx removal equipment.

• Automobile Industry

We have manufactured industrial braking systems since our establishment. As automobile technologies changed, we led the way and developed unique products including a clutch facing for automobiles, sealing-rubber products for electrical components (seals for harnesses), and oil sheet gaskets.

• Mechanical Seals

As a pioneering company, we have also developed and manufactured industrial mechanical seals domestically, and have focused on developing the main seal materials including mechanical seal materials for car coolers. We have also produced seal materials with excellent sealing properties which can be used instead of gland packings.

• Valve Production

We have long produced piston valves which used packings as seal materials. After the production of fluororesin started, we developed ball valves which used fluororesin as a seal material for the chemical industry and other industries, and started production. Many chemical firms have since used our ball valves. Also, for highly corrosive chemical solutions, we developed various lining valves made from fluororesins, and also developed our unique, long-life, cylinder-type valves which can open and close rapidly. These valves have been used in many iron-making machines and gas generators.

• Development of Corrosion-resistant Seal materials

Seal materials always come in contact with metals. When metal-corrosion problems at the contact surface occurred in Japan, the need for corrosion-resistant seal materials emerged. So, we worked with universities and other institutions to develop corrosion-resistant gaskets and packings. During these projects, we identified corrosive elements in seal materials and optimized the mix of ingredients and sealing properties ahead of other companies. Our pioneering achievements greatly influenced the concept of seal materials thereafter.

• Development of Seals for Construction Machinery

During the construction boom, construction machinery was produced one after another. Most machines were hydraulic-driven, and seals were used for most of the hydraulic machinery. Conventionally, such seals used to be fabric-filled packings, in which rubber had been reinforced with canvas and other fabrics. However, after the development of high-pressure-resistant urethane rubber, urethane U-packings became the main type. Urethane rubber has extraordinary mechanical strength and abrasion resistance and is ideal for high-pressure hydraulic packings. So, we conducted functional tests of urethane packings and decided to produce and market the product as an alternative to fabric-filled packings. At that time, we established Japan Elastollan Co., Ltd., a urethane manufacturer, to produce urethane. Urethane rubber has rubber elasticity and can be used for injection and extrusion molding. So, it started to be used for various purposes, including sport shoes and machine parts. Around 1955, even a new plant had no experience in developing seals, so functional and verification tests were required in order to develop seal materials. We could not build a plant only for these tests, so we made a testing machine to conduct basic tests. However, eventually we needed to conduct verification tests at actual plants. Fortunately, customers in those days let us conduct the final tests at their plants and collect data. Thanks to their cooperation, we could establish our seal products. We are deeply grateful for their steady support and will continue to appreciate them.

This article described the transition of our seal product lineup and development activities since around 1955. I hope it was interesting.

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