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# Upon the Publication of the 90th Anniversary Special Issue

## Introduction

This special issue of *Valqua Technology News* celebrates the 60th anniversary since the first publication of its predecessor, *Valqua Review*. We sincerely thank all our valued customers and readers who have supported us through the years, and would like to tell you about our history upon the publication of this 90th anniversary special issue.

### 1. Historical background leading to the publication of *Valqua Review*

Nippon Valqua Industries was the first Japanese specialized manufacturer of seal products. At that time, industries were growing since World War I and needed to manufacture industrial products within Japan. In line with this trend, Nippon Valqua Industries was established for the domestic production of seal products.

Japan's petrochemical industry was also starting to grow at that time. However, major seal products were being imported from Europe and the U.S. due to the lack of technologies and related technical information in Japan. Determined to produce seal products in Japan, we studied and learned from imported products. As a manufacturer, we aimed to communicate with customers to meet their needs and build their trust in seal products. Over the years, we have helped to

revitalize industries under this policy and the spirit of value and quality, from which our company derives its name.

Under a contract with the Ministry of International Trade and Industry, we undertook several research projects to develop Japanese technologies, including high-temperature and high-pressure steam packings, packings for industrial use (asbestos joint sheets), aircraft packings primarily made from silicone rubber and Teflon<sup>®</sup>, and methods for manufacturing and processing tetrafluoroethylene resin. Our research produced some excellent results.

During the same period, we established a research association on fluoro-resin. Fluoro-resin was gaining popularity and eventually became widely used in various industries.

In contrast, seal products were not well known. According to reports at that time, "Although packings are important for maintaining the airtightness of fixed and moving parts of machinery and preventing leakage of processing fluid in a wide range of production plants, their value is overlooked due to their inconspicuous nature."

With this background, we decided to produce a technical journal as a 30th anniversary project, to raise awareness of packings that

was then called “obturators” through theoretical and academic content. We also wanted to disseminate information about packings and encourage universities and industrial high schools to offer courses on packings.

In December 1957, the first issue of *Valqua Review* technical journal was published.

## 2. *Valqua Review*

### 2-1) Inauguration of *Valqua Review*

The president at that time, Toshihisa Takizawa, explained the purpose of *Valqua Review* as follows: “We want to communicate with each valued customer, to learn from their honest feedback on our products, to improve based on their feedback, and thus to repay customers for their support. We also ask academic and industry experts to contribute articles to our journal. We want to introduce new ideas and information to our readers, in addition to information on our current and upcoming products.”

The background leading to the inauguration of the journal and its role were described by Mr. Takizawa as follows: “Nippon Valqua Industries has more than a 30-year history as a packing manufacturer. Our product line has always centered on packings but has also expanded to include other industrial goods. Thanks to our customers’ support, we are celebrating our 30th anniversary. During the postwar period, we provided various chemical products including fluororesin packings ahead of other companies. The excellent electrical properties of the resin allowed us to expand our business to heat-resistant and high-



frequency-resistant insulating materials. Thus, the journal articles cover a wide range of industrial goods including machinery, chemicals, and electrical products.”

Under such policy, for 44 years since its inauguration, *Valqua Review* has consistently been issued monthly; approved for third-class mail as a technical journal; distributed to customers, universities, academic institutions, and libraries to raise awareness of seal technologies; and actively welcomed contributions from external parties since it is not an in-house journal.

At the time of its inauguration, the journal received supporting contributions from academic and industry experts including Dr. Mataka Kurokawa, then director of the Agency of Industrial Science and Technology; Dr. Masao Yamagata, then academic dean of the Faculty of Engineering at the University of Tokyo; Dr. Uichi Hashimoto, then chairman of the Japan Society of Mechanical Engineers; and Dr. Shunichi Uchida of the Tokyo Institute of Technology. This wide range of contributors represented the high expectations for the journal.

Dr. Kurokawa expressed his expectations as follows: “This journal provides an appropriate framework at a time when few periodicals cover topics related to packings and insulating materials, which are important for industry. However, it is not easy to understand their characteristics and use them appropriately because they are made from various materials including metals, inorganics, and organics. Packings and insulating materials have become very diverse with the development of synthetic resin materials. I am pleased to see the inauguration of this journal, and I hope it will help overcome such issues.” The same year that the journal was inaugurated, 1957, the Petrochemical Industry Association (predecessor of the Japan Petrochemical Industry Association) started its activities. In the previous year, 1956, the Hydraulic Machinery Industry Association (predecessor of the Japan Fluid Power Association) was inaugurated. Since there was little knowledge of seal technology at that time, the need for systematic information on seal products started to emerge. *Valqua Review* emerged to meet those expectations.

## **2-2) Transition of articles in *Valqua Review* (December 1957 to June 2000)**

From its inauguration in 1957 to the 1960s, the journal featured articles to raise awareness of seal products. The articles ranged from basic research on fluororesin and the introduction of overseas technologies to contributions written from the viewpoint of seal users, such as “Accurate Utilization and Selection of Seals,” practice-based articles and eventually articles based on in-house data.

At the time, seals were manufactured in

various forms and used for high-temperature and high-pressure fluids. Thus, the demand for products changed from the time when those had been called “obturators.” That is, the recognition of leaks changed from simply a loss of energy to problems which hindered the manufacturing environment. Along with the raised awareness of packings for preventing leaks, seal manufacturers gradually started to resolve the problems.

In the 1960s, basic research was actively conducted worldwide, and in the 1970s, many polymer molecules were synthesized. In the field of fluororesins and synthetic rubber, new materials were developed one after another. Accordingly, *Valqua Review* featured articles on ways of developing systems to meet the emerging needs with new materials.

In the 1970s, the Japanese economy suffered turbulent times with the Nixon Shock, Oil Shock, and High-Growth Period. This led Japan to change its economic path from the pursuit of high growth to the pursuit of stable growth. The era witnessed remarkable developments in export industries including the auto, ship and vessel, and steel industries. Also, developments in the emerging atomic, space, and information industries were expected.

As industries pursued product development, systemization, and informatization, we shifted from the management of leaks to the following missions: systematization of seal products as seal engineering or technologies for machine elements and expansion of solution services by introducing diverse seal-related products. Thanks to many contributions from external parties, articles in *Valqua Review* were categorized by elemental

technology and edited as a series of technical data. Valqua aimed to help create not only in-house technologies but also a cross-sectional consortium. The resulting achievements were published as books by Kindai Henshu-sha: *O-Ring*, the O-Ring Society, 1969; *Gasket*, the Gasket Society, 1974; and *Air-Pressure Seal*, the Air-Pressure Seal Society, 1977. These greatly contributed to standardization of the industry.

The journal began to feature articles on various fields including electrical insulating materials using fluororesins, vacuum seals including bellows, and building materials using glass fiber. *Valqua Review* became a reputed technical journal and was highly evaluated as a technical resource.

When our company was founded, there were no sales engineers. However, as we grew, we started to hire and train sales engineers in the 1970s.

There have been many interviews with external experts in the journal since it was started. These articles covered topics ranging from prospects for technology to prospects for the future, including *New Year Random Talk - What future lies ahead in the 1980s* (January 1980) and *New Year Random Talk - Perspectives on China in the 1980s* (January 1981).

The specialty series of *Valqua Review* was serialized starting with *Bochu-Kanwa (talks during the breaks in one's work)* in April 1977 and ended as *Kanchu-Kanwa (a talk in free time) in May 2000*. The writer Tatsuya Imoto talked about his experiences as an engineer and garnered many readers, and readers looked forward to the series. A total of 188

articles were published in two independent books.

In the 1980s, industries started to focus on the following: streamlining, improvements in controllability and operability, improvements in safety, environmental protection and disaster prevention, and compliance with Japanese and international standards such as JIS and ISO. In addition, work began on advanced technologies that would support the coming economic system, leading to developments in biotechnology, space, semiconductor/electronics, and new-energy industries.

*Valqua Review* started to run lecture articles on seals. The journal increasingly featured articles on fluororesins and fluororubbers to reflect trends in new energies including those in their use in the atomic-power industry and their use at low temperatures in the LNG industry as well as semiconductor-associated trends in their use for chemical-liquid processing.

On the other hand, environmental regulations were being tightened and requirements for new registration of chemical substances were becoming stricter. Therefore, the pace of new-material development slowed and the materials used for product development started to be controlled. *Valqua Review* increasingly featured research on non-asbestos trends, polymer alloys, composite-making, and sophistication of compounding techniques.

In the 1990s, industries became more globalized. The semiconductor and electronics industries, which became major players, expanded through the digital revolution and fluctuations of these industries started to

greatly affect the economy. Environmentally, regulations on chlorofluorocarbons were introduced to curb global warming, the problems of dioxin that is associated with waste incineration as well as endocrine disrupter received much attention, and the first asbestos regulation was legislated in Europe ahead of other countries.

*Valqua Review* reported many studies on elastomers in the early 1990s, featuring hydraulic-pressure seals and tribology. Among the feature articles, Shinzo Koujiya, a professor of Kyoto University at that time, contributed a five-year series *Introduction to the Science of Rubber*, which was published by Nippon Valqua Industries in 1995. Regarding seals, the journal reported research on vacuum seals including spring-energized metal C-ring seals. For semiconductors, the journal systematically reported research on tank linings.

Along with diversifying needs and globalization, the journal started to report on efforts to enter new fields, and included technical reports associated with individual needs in the late 1990s. As the articles became more diverse and specialized, the contents of the journal became less consistent. Therefore, in the first year of the new medium-term plan New Valqua Stage 1, along with a renewal of the management philosophy The Valqua Way, the concept of *Valqua Review* was reassessed, leading to the rebirth of the journal as *Valqua Technology News*.

Some 488 volumes of *Valqua Review* containing 1,707 reports were published. Of the 1,707 reports, 1,061 were technical papers. A total of 824 external contributors, including



280 academics, wrote articles for the journal. We sincerely thank all contributors for their invaluable support.

### 3. *Valqua Technology News* (From Autumn of 2001 to present)

*Valqua Technology News* was inaugurated in the autumn of 2001 as a quarterly journal, focusing on articles. The goal of the renewal was to promote our unique skills to the public more clearly. Upon its inauguration, Toshikazu Takizawa, the president of Nippon Valqua Industries, commented, "We will strive to introduce our excellent technologies, particularly our core area of seals, in an easy-to-understand manner, and to offer customers diverse solutions."

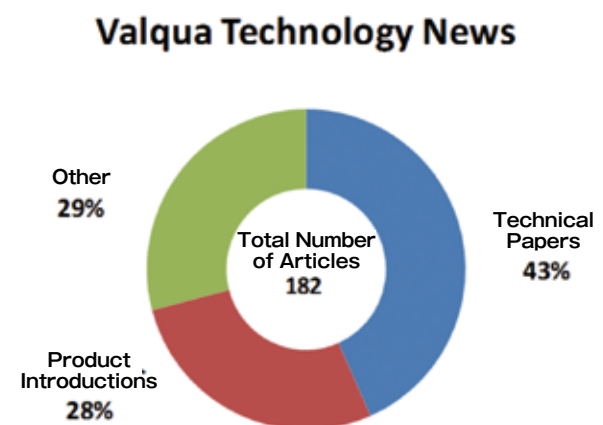
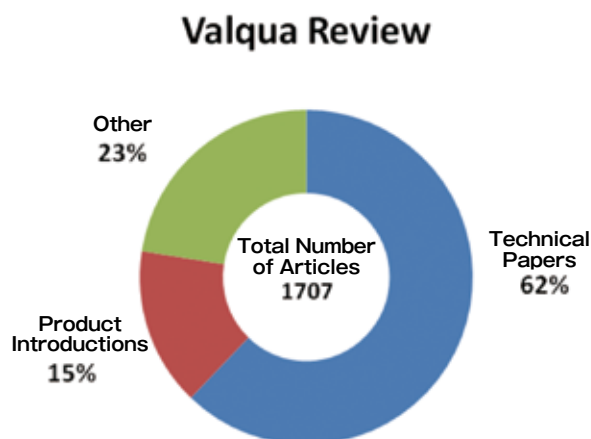
To date, a total of 32 volumes including this issue have been published, including 182 articles and 79 technical papers. Since the journal focuses on reporting Valqua's technologies, the number of external contributions has decreased. Nevertheless, there have been articles from 15 contributors including 9 academics.

The 2000s was a significant transition period regarding measures to address global environmental problems and global procurement/international specialization. In industry, miniaturization of semiconductors, enlargement of liquid crystal displays, increase in information technology capacity, introduction of clean energies, and life-science and nanotechnology started to flourish.

*Valqua Technology News* aims to clarify the company's direction through its articles. Its reporting covered performance-assessment research on non-asbestos gaskets of various types; development of highly functional elastomer series suitable for the miniaturization of semiconductor devices; and the development of vacuum technologies for the nano-development environment. We have worked to increase the value of our products for society through modularization and 'componentization.' The journal has also reported our work on vacuum components, hydraulic systems as a next-generation power source, membrane filters, millimeter-wave products, waste-fluid recycling systems, and reticle automated transportation systems. The period since 2010 is difficult to describe.

However, rapid social developments have created social challenges including environmental problems, resource problems, and urbanization. These problems are started to interact with each other on a global scale. To resolve the challenges, open innovation through collaboration among academia and industry is certainly appropriate.

In this environment, the journal is increasingly featuring articles on the existential meaning of Nippon Valqua Industries as a seal-engineering manufacturer. Finite element analysis (FEA) technology comprehensively analyzes the varying life of seals on the basis of experimental data. Progress in FEA technology allows customers to intuitively understand issues through visualization. The technology has also been used to write many articles. The technologies have been integrated to offer solution services on the basis of users' comprehension of the system. We are endeavoring to expand our business to technical training which integrates hard and soft aspects to meet the demands of the times, and to enter the field of trouble prevention diagnosis. The journal covers all these areas.



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## 4. Conclusion

In this 90th anniversary year since Nippon Valqua Industries' inauguration, we looked back at our history spanning from *Valqua Review* to *Valqua Technology News*. The publication has always maintained its original

spirit of contributing to industry. We hope you will understand how that spirit has been inherited. We will strive hard to keep providing the technical information sought by our valued readers. We look forward to continuing to serve you with future editions.

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Editorial board of the 90th anniversary special issue of *Valqua Technology News*