

‘When the going gets tough, the tough get going.’ This phrase could be the motto of Koso Parcol. The Italian company, acquired by Nihon Koso in 2018, is specialised in control valves, engineered to particular customer requirement and able to cope with demanding process parameters and harsh media.

By Lucien Joppen



## When the going gets tough...

**V**alve World sat down with Managing Director Dave Edmonds and part of his management team, Alberto Re Fraschini (Operations), Stefano Conti (Engineering), Marcel Schmid (Sales Engineering) and Gianni Miani (Service), to discuss various aspects of the business of Koso Parcol, the markets the company serves and the synergy with its ‘mother company’ from Japan. It soon becomes clear that Edmonds, a California-native, emphasises the heritage of Koso Parcol, being in the heart of the Italian valve valley, the area around Milan-Bergamo.

“In the antiquities, the phrase ‘all roads lead to Rome’ was a well-known proverb to indicate the power and reach of the Roman Empire. One of the major roads, connecting Rome to northern

Europe, ran close to where our company is located. The ancient city of Mediolanum, present-day Milan, became the new capital of the Empire in later days and was at the centre of the crossroads from East to West, and North to South.”

### Demanding process conditions

The well-organised Romans and their proficiency in (civil) engineering might have provided some sort of blueprint for the Italian (valve) manufacturing sector in the region mentioned above. Today, two millennia later, the speciality control valve company, Koso Parcol S.r.l., sits at this same crossroad in central Europe, just north of Milan, in the Italian town of Canegrate, and ships its products in every direction to customers across the globe.



As mentioned before, Parcol designs and manufactures control and isolation valves that are custom-made, being able to cope with demanding process conditions. “In this region, Parcol is a black swan,” Edmonds says. “The area surrounding Milan has been one of the world’s largest manufacturing regions for many types of valves. Many companies manufacture valves, the most common type being on-off (or manual) valves.”

### Extreme pressure drops

Koso Parcol is virtually the region’s only company that has focused exclusively on control valves, for the regulation of fluids in critical service applications. The range of valve designs extends from linear angle, globe, zee pattern, to rotary ball and butterfly, and safety valves. Pressure classes and speciality materials of construction for a pressure range from full-vacuum, to the highest pressures, and temperatures from cryogenic to over 600° Centigrade, are typical parameters for their products.

Extremes in operating conditions, high rangeability, high-pressure drops and tight shutoff, are typical services for the company. Gianni Miani, Service Director, says: “We serve four industry sectors that have to deal with high(er) temperatures and pressure, extreme pressure drops and harsh media. These sectors are desalination, oil and gas (midstream, upstream), power generation and ammonia/urea plants. All of the above sectors rely on custom-made valves in parts of their processes that are critical for process optimisation and safety. This is where we can make a difference.”

### Avoid ‘dead zones’

Koso Parcol has been developing product solutions for the ammonia/urea sector since the company was established in the late 1940s. Along the years, the company has come up with, for example, a valve pressure vessel (body and bonnet) heating conduits to prevent process fluid crystallisation. This process should be prevented as the crystals could go into the valve internals and wreak havoc. Engineers from Koso Parcol also re-designed the shape. They increased the wall thickness of body and bonnet to avoid ‘dead zones’ that are a cause for corrosion since carbamate in urea strengthens its corrosive action in any dead zones due to the failure of oxygen protection (passivation). “Proprietary materials are only available from approved sources, that comply with the Urea Licensor specifications,” according to Stefano Conti, Engineering Manager. “By continuously improving design and material specifications, Koso Parcol has emerged as the industry leader in this sector for control, butterfly and safety valves in critical services.”

### Optimum precision fluids flow control

Good news for Koso Parcol, particularly as this sector is expected to grow in emerging economies, mainly to address higher demand for fertilisers by the agricultural sector.



Parcol’s ‘Limiphon’ multi-stage, multi-path disc stack.

“The fertiliser industry will increase in size by fifty per cent over the next 10 years”, Edmonds says. “Currently, 200 million tons of urea are produced per year, and this will grow to 300 million tons by 2030. With a view to this significant market growth, Koso Parcol is working to continue to be the number one preferred valve supplier in these new plants scheduled to be built.” As for oil and gas, Koso Parcol is active in the up- and midstream segment because of the harsher, more demanding operating conditions. Over the years, its control valves have been installed throughout Europe, Russia, Africa and Asia, in refineries, gas pipelines, coal-to-liquids facilities and FPSO-facilities.

Conti: “The primary applications for the more critical flow conditions are compressor recycle (Anti-Surge), pump minimum recirculation flow and gas to flare. These process markets are all under stress to operate more efficiently and reduce pollutants and emissions. For all these higher equipment demands, Koso Parcol control equipment is well-suited to achieve optimum precision fluids flow control, zero internal leakage, and zero fugitive emissions.”

### Engineering-intensive process

Dave Edmonds, appointed by Nihon Koso as the new Managing Director at the time of acquisition in 2018, began his association with the Nihon Koso owners more than 20 years ago. His previous assignment for the company was managing the company’s business development in the Asia-Pacific region. Edmonds, a Southern California native, started his career in the valve industry in 1979 with a division of Combustion Engineering in Tulsa, Oklahoma. “Over the past forty-one years, I have worked with virtually every kind of valve and actuator, in practically every industry sector,” Edmonds says. “In particular, I appreciate control valves above other types, because you must begin with a customer’s datasheets, and then design the valve to produce the required performance results. It is an engineering-intensive business process.”

Edmonds’ managing team consists of 7 people: the Director of Operations, Alberto Re Fraschini, has been with the company for 15 years, and the Service Director, Gianni Miani, is a company veteran of 25 years. Emanuela Carnevali, the Human Resources Director, has 24 years of service, and the Finance Director, Nadia Robbiani, is with the company for 10 years.



*Koso Parcol, an SME with a global reach under the umbrella of Nihon Koso.*

### Global desalination market to double

For the time being, desalination is mainly an issue in the MENA-region. However, due to climate change and increased demand for fresh potable water for consumption, agriculture and industry, Edmonds expects this type of activity to spread out to other territories. "It is already happening in my home state California where around 11 plants are already in operation, and 10 more are proposed. Given the advance of desalination, it's no surprise that growth projections are positive. The global desalination industry is forecast to almost double from \$18.5b in 2019 to over \$32b by 2025."

Specifically for desalination, Parcol has a designed large-diameter butterfly valve of over two meters in diameter. With anti-cavitation drilled-hole 'wings' on the disc edges, it is a specialised design for applications that include brine recirculation, steam-to-brine heater and seawater make-up.

"Our brand has been a preferred product by many EPC's active in new desalination plants, and by end-users who have experienced problem-free performance with the large population of installed Parcol-valves."

### Robust construction

Power generation is potentially the largest market for Koso Parcol and its parent company. The company is one of the largest suppliers of turbine bypass systems, desuperheating, and critical valves, such as boiler feed pump recirculation, feedwater regulator and drum level control. "We have adapted our products to be most suitable for different power plant designs such as subcritical and (ultra)supercritical thermal power, single cycle (simple cycle) power, combined cycle power and concentrating solar power (CSP)."

According to Marcel Schmid, Assistant to the Managing Director, Koso Parcol is one of the leading control valve suppliers to the traditional subcritical boiler designs. "Compared to some alternative valve designs, Parcol's robust construction seems a bit over-engineered but with a life performance expectancy of twenty, and even thirty years, the owner/operators of these demanding thermal power processes attribute great value to our designs."

### Proven flow control technology

Boiler designs for ultra supercritical power plants have the highest pressure/

temperature conditions. Conti: "For the high-pressure drops in USC applications, the Parcol 'Limiphon' multi-stage, multi-path disc stack well-handles these severe inlet/outlet conditions, avoiding the destructive problems of high-velocity erosion, noise, and vibration. The Limiphon-solution is a proven flow control technology for many years. It is an essential addition to the other Nihon Koso severe service portfolio, including the 'Vector' disc stack design."

Ultra Supercritical boiler designs are one of the main 'clean coal' technologies, with much higher heat rate achievement (kilowatts produced per kilogram of coal). "These facilities are more expensive to build compared to subcritical plants. However, due to their efficiency, these facilities become more cost-effective over the years. In Japan, USC is more or less the norm, whereas China is opting more for subcritical plants. From an environmental view (CO<sub>2</sub>-emissions, pollutants), USC is a preferred option to replace less-economical, more polluting subcritical facilities."

### 'Turbogas' control and stop valves

Compared with coal, gas-firing is by far the most attractive option from an environmental standpoint. Combined cycle plants are the primary choice for the addition of new generating capacity around the world due to their unrivalled efficiency. "Heat rates of over sixty per cent are now achievable. The lower price of natural gas as the fuel is another big driver for selection of combined cycle plants. Koso Parcol is active with most of the new projects around the world. The strong reputation and competitive proposals from Koso Parcol's EU location (Certificate of

### Koso Parcol: facts & figures (and a bit of history)

Parcol was established in the late 1940s by two local business partners, Misters Parini and Colombo, hence the name. The company has always focused on specialised technical flow control products. As the decades passed, the children of the founders took over the business. The third generation of private shareholders took ownership, and finally, in June 2018, the company's assets were acquired by Nihon Koso Co. Ltd., which is headquartered in Tokyo, Japan.

Koso Parcol S.r.l. has 170,000 square meters of covered factory and office space, on 300,000 square meters of property. In 2020, there are more than 160 employees. The Koso Group has 135,000 square meters of factory and office facilities around the world, on 300,000 square meters of property, with almost 2,200 employees, all primarily dedicated to control valves.

Origin, ed.) are some of the main points of attraction to contractors and end-users.” A specially focused application for gas turbines is the ‘Turbogas’ control and stop valves, which Parcol developed for high-precision fuel gas supply to the turbines. “These valves ensure that the correct air/fuel mixture is delivered to the turbine for optimum combustion results.”

### CSP forecasted to expand

Concentrating solar power (CSP) is another ‘combined cycle’ approach to electricity generation. Various plant designs use mirrors to bundle the sun’s rays to heat a fluid, which is run through a steam generator. The steam produced is then run through steam turbines as a typical Rankine cycle process. While still a smaller segment of the electric power market, CSP is forecast to continue to expand as part of the multi-pronged solar power solutions that will be implemented. “Koso Parcol has invested many years in developing special service control and isolation valves required for the most demanding CSP plant design, which is based on molten salt as a medium. Special valve design characteristics of Koso Parcol valves for this service include corrosion resistance, bellows sealing, trim drain ability, high-temperature non-graphite gaskets and packing, valve heating at start-up to prevent salt freezing, cold circuit temperature up to 370 °C and hot circuit temperature up to 595 °C.

### Fraternity

Given Koso Parcol’s expertise, the company leans heavily on its engineering clout or as Edmonds calls it “the fraternity of control and isolation valves”.

With the acquisition by Nihon Koso, this pool has been expanded to 175 engineers



Parcol's urea fertilizer control valve PRDS control valves



and an additional group of 100 engineers who are active in sales and applications for the four industry sectors mentioned before. “All companies under the Nihon Koso-umbrella have managed to join forces across the globe - Italy, Japan, UK, India, North-America - to benefit from each other’s expertise. We also are working closely to streamline our product range in terms of individual parts. Looking at control valves, some companies within our group use different parts with similar properties, for example, diaphragm and piston actuators. We are categorising this list and will decide on the best, standardised option. Ultimately,

we will be able to simplify our supply chain while opting for the best solution.”

### ‘Valve people’

The acquisition of Koso Parcol by Nihon Koso has combined and strengthened the human resources pool, as Edmonds has explained. The companies also profited from each other’s geographical/territorial reach. “With Koso Parcol, Nihon Koso has a foothold in the European market, with the ability to deliver Certificate of Origins for its products/brands (Koso, Hammel Dahl, REXA actuators) to clients. In turn, Koso Parcol has a base in China, facilitating easier market entry and manufacturing opportunities. Nihon Koso is now planning to build a new factory in Wuxi, in addition to their existing large factories and state-of-the-art foundry, to serve the burgeoning Chinese market. The facility is expected to be up and running in 2022.” The acquisition also means continuity. For owners Yuichi Ikegaya, Nihon Koso’s President and CEO, and Chairman Takasahi “Ike” Ikegaya, control valves is a core business, Edmonds states. “For over fifty years, their focus has been on specialised valves and controls, actively supporting the design, direct OEM supply chain sourcing from their foundries, and in-house manufacturing. The owners are ‘valve people’ who continually reinvest the business profits back into their companies – enabling more research & development and business process improvements.”

