

## Valves

# Optimal control of product flows

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(1) This means the impeller valves can be retrofitted to existing systems without the need for any major adjustments. (2) The Inflas sealing system was developed for valves used with heavily abrasive or highly sensitive substances. (3) The Vidos-valve keeps the product in motion.

**Ever-increasing production plant capacities mean specially adapted valves are now required to meet the increased demands for service life, monitoring and easy-care maintenance. Manufacturers are thus increasingly becoming system suppliers offering a range of interdisciplinary services.**

In the past, system operators would typically have their own, well-staffed departments of qualified engineers and technicians, who were very familiar with their own products and would keep a constant eye out for

any new advances offered by suppliers of production plant and related components. However, with the paradigm shift in HR policy occurring at the top level of company management, the traditional approach is becoming a thing of the past. In the wake of these changes, planning departments and in-house service providers in particular have incurred staffing cuts and some departments are now completely outsourced. In-house expertise now been lost and often has to be provided by external sources.



The enormous time and cost pressure placed on developers of new products and processes mean project managers have little opportunity for any thorough appraisal of what suppliers of system components currently offer. Against this backdrop, reliable partners and long-term working arrangements based on mutual trust are now essential.

### **Assuming new roles**

System developers who once supplied sound, individual components for a production plant are thus increasingly being confronted with technical processing challenges that cannot be resolved without substantial investment in experienced professionals and qualification measures. Engineering firms that used to provide advisory services only are becoming system suppliers with overall responsibility for the procurement of production technology.

Ebro in Hagen is not immune to this trend. As a long-standing manufacturer of high-performance butterfly and control valves, the company now has broad-spectrum engineering capacity in almost all areas of gas-liquid and solid materials handling.

Pneumatic and electric actuators have been developed in-house for many years now and adapted for energy-efficient use with company-manufactured valves. Position feedback systems and entire control components through to complete networks now form an integral part of the product range. As a result of handling specific application certification procedures and providing full service documentation of all components, Ebro has established a reputation worldwide as a system supplier with all-round capacity, including after-sales service.

Ebro has developed additional expertise in the bulk goods area in particular, offering many special features for particular applications.

### **Pneumatic sealing system**

The Inflas sealing system was developed for valves used with heavily abrasive or highly sensitive substances. The liner is pneumatically pressed onto the valve disc in closed position, which allows it to compensate for any abrasion-related leakage of the liner.



Once the valve opens, the sealing liner relaxes and opens an initially narrow slit between the valve plate and the liner. Friction is greatly reduced in the process and minimal torque is required to open the valve disc. Once the valve closes, the integrated control mechanism performs a validity check within fractions of a second and then assumes control of the process, moving the valve disc into the “closed” position. Due to the fact that the annular gap is still open at this point, no abrasive substances are pressed into the sealing liner and no sensitive product is crushed in the process. Only once the product has stopped flowing altogether will the liner gently press up against the valve disc.

Inflas is particularly recommended for use in pressurised systems, as pressure impacts can make even the smallest crevices expand into seriously harmful channels. Inflas is available for all soft-sealing Ebro butterfly valves with interchangeable liner, in nominal widths of DN 80 to DN 600.

Cycle control is performed either by the host control or the adaptable micro controls produced by Ebro to fit the valves concerned. This means INFLAS valves can be retrofitted to existing plants without having to make any changes to the relevant PLC. The initial signal is given by the run command of the existing valve. The usual positional response is preserved. On request, an electronically or optically detected error signal can also be provided to significantly improve the amount of preventative maintenance required.

### **Valves for system pipes**

Over the past few years, a steady trend towards the use of system pipes has been discernible in pipeline construction. For both new systems as well as existing production lines, welded pipelines are being replaced by modular piping elements joined together with clamping rings. This saves time and simplifies the assembly process. The risk of fire is eliminated and adjustments no longer need to be made by expensive welding specialists accompanied by the requisite supervision. Ebro has been addressing this trend now for many years. CK butterfly valves have clamp ring

connections on the flange side that allow the valves to be built into the piping systems. This completely eliminates the need for any DIN flange or accompanying bolts. Elastomer-coated discs ensure the butterfly valves create a perfect seal at the passage point. In many application areas, however, sealing can be dispensed with. CK-M butterfly valves are a recent advance, where the valve has a metal seal, making them product-safe but not gas-tight. Such valves are primarily used as aspiration and control valves in suction pipes and exhaust piping. Even these particularly cost-effective valves are required to meet the usual Ebro standards of manufacturing quality and longevity.

### **Even flow**

Rotating impeller valves are used to regulate the flow of bulk goods to ensure evenly paced discharge of material from silos, bulk containers, weighing tanks, mixers, etc. By controlling the speed of rotation, these impeller valves work as a volume-based dosing mechanism and also prevent downstream processes from being flooded with material. For instance, spiral conveyors or vibrating feeders are consistently supplied with the optimal amount of product, without any risk of clogging or compaction. In the case of rapid-flowing products, a pair of impeller valves interrupts the product stream at brief, regularly timed intervals, which effectively prevents any products from overshooting the mark. When the impeller valve is used in pneumatic conveyor systems, it regulates the product stream. Yet the installed height of the impeller is about the same as that of a standard butterfly valve. This means the impeller valves can be retrofitted to existing systems without the need for any major adjustments. Pipe sections also remain cylindrical, so there is no need to switch to square flanges.

From a design point of view, the six vanes of the impeller wheel only run through the zero axis of the casing. The discharged product is neither scraped along the walls and compressed nor banked up. Any granules thus retain their shape and are not crushed into the sides. This means the impeller valve works in an extremely product-friendly and energy-efficient manner.



Ebro impeller valves can be enhanced with an optional stop function. After the lock is “closed”, the next pair of vanes close off the impeller in the zero position and shut the pipe. The designers of this valve placed particular emphasis on the bearing system of the shaft. The entire unit is completely encapsulated and can be uninstalled without having to remove the impeller valve from the plant.

### **Minimal wear and tear**

The valves of the new TW-M provide a number of special features. Originally designed for use as hard-wearing butterfly valves for silo vehicles, these valves are now being used in many areas where a gas seal is not strictly necessary, but where a higher degree of abrasion-related wear and tear is experienced. Unlike inserted or vulcanised elastomer liners, the tough metal rings offer sufficient resistance to any sharp-edged granules or fast-flowing media. This means the service life of the plant can be significantly increased and plant outages and maintenance periods reduced.

### **Almost cavity-free**

The one-piece, precisely slotted shaft and flat shape of the valve disc used at the centre of rotation prevent any passing material from being dragged through. This makes the new butterfly and control valves almost cavity-free. No frequently changing batches are mixed together and the purity of conveyed goods is thus preserved. The casing of the TW-M is made out of lightweight metal with an irremovable, built-in stainless steel ring. This means that, despite its minimal weight, all components in contact with the passing material are corrosion resistant and FDA-approved. For transport containers and silo vehicles, metal seal valves with a customs-approved, bonded plate can be supplied. The option of being able to lock the disc does not have to be dispensed with in such cases. The high-precision axial lock ensures the disc sits perfectly in any position, even when vibration or jolting occurs and the long-life shaft seal helps keep maintenance to a minimum.

The seal between the surfaces of the flange and the opposing flange is achieved via O-ring seals on both sides. All available sealant materials can be used for this purpose without any problems and there is no need at all for any additional, hard-to-insert, flat seals. The large-scale flange surfaces support both customer-specific, individual drill patterns as well as standard drill profiles as per DIN, ANSI, JIS and other industry standards.

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