

How much does a gasket really cost?

When calculating total cost of ownership, it's worth going into detail

When selecting a jet valve, dosing quality, process reliability, and purchase price are usually at the top of the list. One seemingly minor detail, however, is easily overlooked: the cost of wear parts. Yet the seal, in particular, illustrates why it pays to look at the details when considering total cost of ownership (TCO). After all, what matters is not just how much a seal costs, but also the impact of replacing it during ongoing production.

Who actually keeps track of the TCO? There is no universal formula for the total cost of ownership (TCO) of a dosing system. Systems, fluids, cycle times, production models, and requirements vary too widely. In practice, however, the real problem often lies elsewhere: The information needed for a realistic TCO analysis is spread across multiple departments within the company.

Process engineering focuses on dosing quality, process windows, and reproducibility. Purchasing knows the capital costs and part prices. Production and maintenance know how often wear parts need to be replaced and how long the system is actually shut down for that purpose. Quality management is aware of potential impacts on scrap and customer complaints. And financial control can assess the cost of one hour of system downtime.

So everyone knows part of the equation. However, the economically critical link between these pieces of information does not emerge automatically. A seal for a jet valve is a good example of this.

How much can a gasket really cost? The unit price of a gasket alone is manageable. For the TCO, therefore, it is often not the decisive factor. A more interesting question is: "What does it cost to replace this gasket regularly over the valve's entire service life?" This is because, in addition to the cost of the material, there are replacement time, labor costs, readjustment of the valve, and, above all, plant downtime. In automated production lines, the resulting costs can exceed the price of the actual wear part many times over.

A simplified example illustrates the effect: Suppose a seal must be replaced once a week under the given production conditions. For one valve, the replacement—including all necessary work—takes five minutes; for another design, it takes 30 minutes. This results in a difference of 25 minutes per replacement.

With 52 replacements per year, that amounts to: 25 minutes × 52 replacements = 1,300 minutes, or approximately 21.7 hours of additional downtime per valve per year. With ten valves in use, the difference already adds up to approximately 217 hours per year.

And this does not even take into account additional costs, such as those for adjusting the valves.

The specific values, of course, depend on the particular process, fluid, valve design, and maintenance interval. However, the example illustrates a fundamental relationship: An inexpensive wear part can have a significant impact on TCO if replacing it is time-consuming. In practice, this often leads to seals being replaced too late. As a result, dosing quality suffers, and eventually the valve itself becomes worn out. The cost of a replacement valve is disproportionately high.

he price of the part is only one part of the bill – so when evaluating the total cost of ownership (TCO) for wear parts, it is not enough to simply compare the prices of two seals. A simple annual calculation might look like this, for example:

Annual maintenance costs = number of replacements × [material costs + labor costs per replacement + downtime costs per replacement]

Depending on the application, other factors come into play – such as setup time, cleaning, scrap, or the risk of unplanned downtime. Especially in highly automated systems, this shifts the economic focus. It is not the seal itself that is expensive; rather, the process required to replace it can become costly.

Ease of maintenance becomes a TCO factor – this relationship becomes even more significant when processing abrasive or highly filled media. Such adhesives, sealants, pastes, lubricants, and other fluids place high demands on the metering technology used. Wear and

Practical Tip by Julian Greiner



If you focus only on the major cost drivers when considering TCO, you can easily overlook the small components that regularly cause a system to shut down. A seal, for example, illustrates why a dosing system's maintenance plan makes a significant difference over the years..

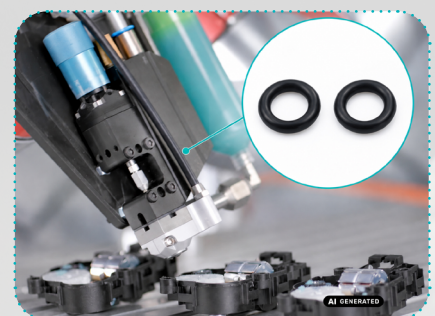
tear increases. This makes it all the more important to consider how a valve is designed to handle these conditions.

For the PDos X1 jet valve, therefore, the focus was not limited to the actual dosing performance. Maintenance and wear parts were also taken into account in the design considerations.

Standard seals are used for the seal replacements that are required on a regular basis. Trained employees can perform the replacement in less than five minutes and

The System in the Video

Should dosing be based on the process or on demand?



The valve requires only two standard NBR seals, which make all the difference in terms of cost (Image: perfecdos GmbH)

Replacing the seal: easy in five minutes

Seal type: Standard with high availability

TCO impact: high

then readjust the valve. This is intended to keep both maintenance costs and the associated downtime to a minimum.

The economic benefit thus stems not only from the price of the wear part, but from the combination of availability, easy maintenance, and short replacement time.

Availability is also a factor to consider – Another factor has gained importance in recent years: the availability of replacement and wear parts. A technically suitable component is of little use if it is not available on short notice when needed. In the worst-case scenario, supply bottlenecks for key components can lead to a production shutdown. Standardized components can therefore also offer advantages from a TCO perspective: They reduce dependencies and can open up additional procurement options. In addition to price, delivery routes, lead times, and long-term availability should therefore also be taken into account when selecting a system.

Questions to Consider When Selecting Valves – If you want to compare different dosing systems from a cost-effectiveness perspective, you should take wear and maintenance into account early in the evaluation process. This doesn't necessarily require a complex TCO model. Often, a few specific questions are all it takes:

- Which wear parts need to be replaced regularly?
- How often do they need to be replaced under actual production conditions?
- How much do the wear parts cost?

- How long does the replacement take, including cleaning and readjustment?
- Can our own staff perform the work?
- How long will the system be out of service during this time?
- What costs does this downtime incur?
- How reliably and over the long term are the required parts available?

Only once this information is compiled can different valve designs be compared in a way that makes economic sense.

The better question is: What does the change cost? – The example of the seal shows why it's worth paying attention to seemingly minor details when calculating TCO. A component whose price is negligible relative to the entire production line can have a measurable impact on maintenance costs, equipment availability, and operating costs over the years. When selecting a jet valve, the question should therefore not be: "How much does the seal cost?" The more relevant question is: "How much does each seal replacement cost – and how often will this expense occur over the entire service life?"

This is where the practical approach of the PDos X1 comes into play – Precise, non-contact dosing using a valve design that takes maintenance requirements, wear

I'd be happy to help you with your project

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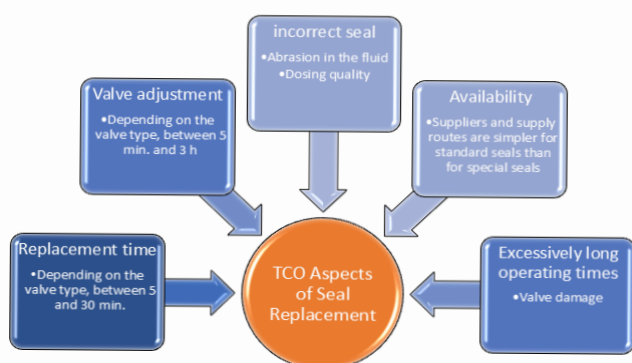
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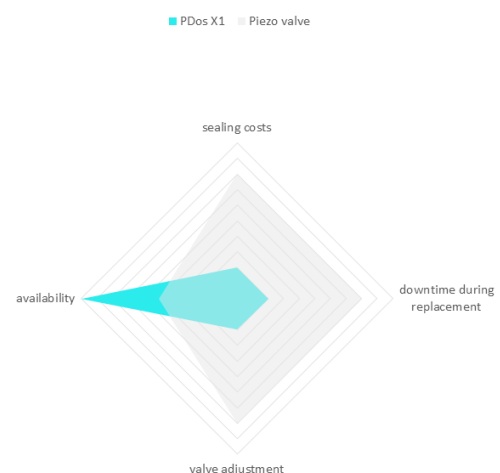
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parts, and changeover times into account from the very beginning



Common TCO Factors That Are Often Overlooked
(Image: perfecdos GmbH)



Replacing Seals: A Comparison of Jet Valves—Preliminary Assessments Based on Practical Experience (Image: perfecdos GmbH)