

Iris valves explained

Iris valves are very much niche items in the world of flow control. Nevertheless, such valves can be the ideal solution for more applications that might be imagined. For some inside information, VWIME visited Emile Egger in Switzerland, home of the Iris® diaphragm control valve, where we spoke to Marketing Manager Mr. Thomas Bleif.

By David Sear

Like so many technological breakthroughs, the Iris diaphragm control valve came about when an engineer was asked to solve a problem. The engineer in this case was a Mr. Emile Egger, who had founded his own pump manufacturing company in 1947. In the late 1950s, some of his customers in the pulp and paper business started to ask if he could help them to improve control of the paper stock. They wanted a more stable flow which, as Mr. Egger quickly ascertained, simply couldn't be realised with the pump or valve technology available at the time.

What exactly happened next is open to debate but, according to popular legend, Mr. Egger sat down to think about possible solutions and lit up a cigarette. Seconds later he took immediate inspiration from his ashtray which featured a metal container with a segmented top for easy opening and closing!



Marketing Manager Mr. Thomas Bleif says the Iris valve has a performant, quite linear operating characteristic curve and can be used for the precise and energy-saving control of liquids, gases, and media containing particles.

High flow capacity

Wherever the spark of inspiration came from, the resulting valve is an engineered product which finds use in a great many applications, as Mr. Bleif explains. "As you can see the valve comprises six interlocking segments which on opening retract into the casing. This means that the Iris valve has a completely centred flow without any casing parts to obstruct the fluid. Hence, the unwanted pressure drop is very low indeed and the efficiency of the control valve very high. This enables an energy-saving control of high flow rates at low pressure drop. At the same time, thanks to design changes over the years the valve can also handle higher pressures and can be equipped with different monitoring systems such as leakage or buffer fluid control or with drainage ports. Finally, the valve also benefits from an equal percentage flow characteristic and can be used equally well on both liquids and gases, even those that contain particles."

Mainstream applications

As this editor was able to confirm when visiting the production centre, the Iris valve is

very easy to operate as the six moving parts fit together perfectly. Other benefits are understood to be the high flow capacity, suitability for frequent stop-start usage, and turbulence-free and hysteresis-free performance.

Asked to provide examples of usage, Mr. Bleif mentions gases, municipal and industrial wastewater, slurries, viscous materials, paper pulp, sugar suspensions and drinking water. However, the main application for the Iris valves delivered by Emile Egger is aeration control in wastewater treatment plants. "In a wastewater treatment plant, fully 40 to 60 per cent of all the energy used is consumed by the blowers for the aeration plant. That's a very high cost so there is a clear financial benefit to be had by installing an Iris valve which can reliably deliver a smooth and stable flow of air."

Summing up, Mr. Bleif notes that the third generation of the Iris valve is set to be launched later in 2022. "All told, we are very proud of Mr. Egger's invention and can see this Iris valve being used in more and more mainstream industrial applications."

For a video showing how the Iris valve opens and closes, please visit: vimeo.com/31839128



Case history: Chemnitz WWTP

As part of an energy optimization at the wastewater treatment plant (WWTP) in Chemnitz, Germany, a total of 30 control valves were replaced by Iris diaphragm flow control valves. By using the Egger Iris valves, the oxygen concentration accuracy in the aeration tanks could substantially be improved ($\pm 0.1 \text{ mg O}_2$), which resulted in considerable energy savings.

Thanks to the high flow control precision over the entire control range of the Iris valve and thanks to the replacement of disk diffusers, the compressor pressure was reduced by about 20 mbar.

