BUTTERFLY
VALVES

VALVES AND TECHNOLOGY FOR WATERWORKS

MANUFACTURES | ASSEMBLY | REHABILITATIONS

ŠEVČÍK HYDRO

Introduction

Ševčík HYDRO s.r.o. specializes in the production of technological equipment and its installation, and in the reconstruction of hydraulic equipment and structures since 2003. Within its activities it utilizes the knowledge and expertise of employees who have an extensive experience in water management.

The company provides for complete deliveries of technological units and also the production of individual pieces of equipment, repairs, maintenance or refurbishment of existing facilities.

Manufacturing and all appropriate final tests are realized on the area of over 1,500 square meters, in four production halls which house all the necessary equipment for production. Main machinery includes CNC horizontal boring machines, CNC vertical lathe, welding machine, bending rolls, burning centre and other smaller machines such as lathes, CNC lathes, saws, drills, etc.

Finished products are stored in a storehouse with the area of almost 500 square meters.

In order to minimize cooperation and improve product quality, our company also has its own blasting and painting box. So our company is completely self-sufficient and all operations are carried out only in our own account, without any need for cooperation. Prescribed tests are performed for each product during its production and pressure, functional and other tests according to proper standards are also performed after its final completion. Customer may be present at the NDT testing itself during production. We prefer the presence of the customer at final product testing, so that he can verify personally the quality of the product before its shipment.

All materials used and other components needed for the production of products are purchased exclusively from European manufacturers, with appropriate accompanying documents and other certificates.

The company also has its own projection and design department, so it can response flexibly to all customer requirements.

Our company is a long-term holder of following certificates: ISO 9001:2008, ISO 14001:2004, ČSN EN ISO 3834-2:2006 and ČSN EN ISO 1090-2 EXC 2, which guarantee a compliance with all prescribed standards and procedures, and thus also the high quality of our products.

Why butterfly valves made just by Ševčík-HYDRO s.r.o.?

Ševčík-HYDRO s.r.o. specializes, inter alia, in the production of butterfly valves with flow-through disc. The disc is supported eccentrically in valve body on one or two spots. Design and production of this disc type aim to achieve a low loss coefficient without sacrificing the strength and stiffness of valve disc. Thanks to the low loss coefficient, the flow in the pipeline downstream the valve is affected only minimally and so the head available for turbine is increased and also its performance. The disturbance of flow of operating medium in the pipeline is really crucial as any non-uniformity of velocity field is transferred into a pre-distributor or distributor and subsequently into a turbine, when the valve is located just upstream the turbine. Increased performance of the turbine is then advantageous because of higher electricity production and total return on investments in waterwork.

For the cases, when low loss coefficient of the disc is not required, Ševčík-HYDRO s.r.o. manufactures the discs of butterfly valves in so called pinned variant. Individual variants are described in more details on following page.

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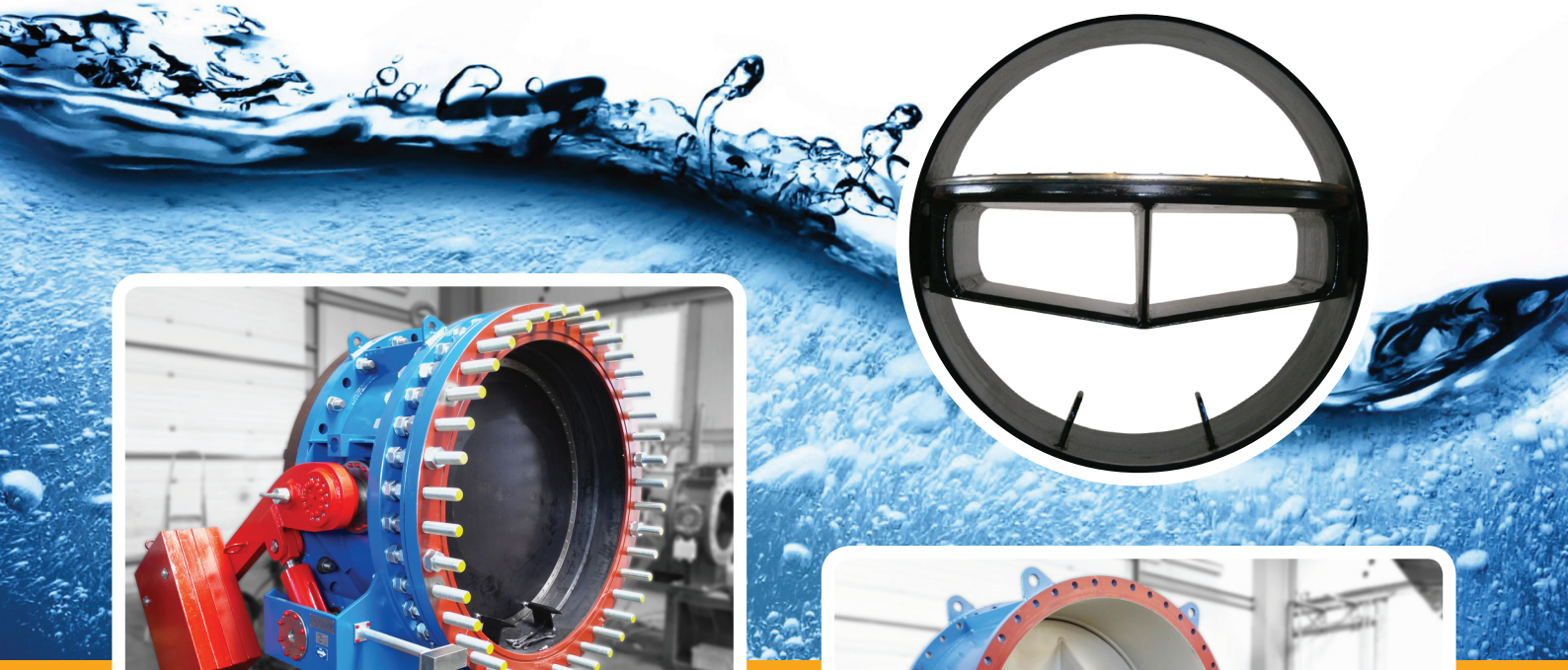
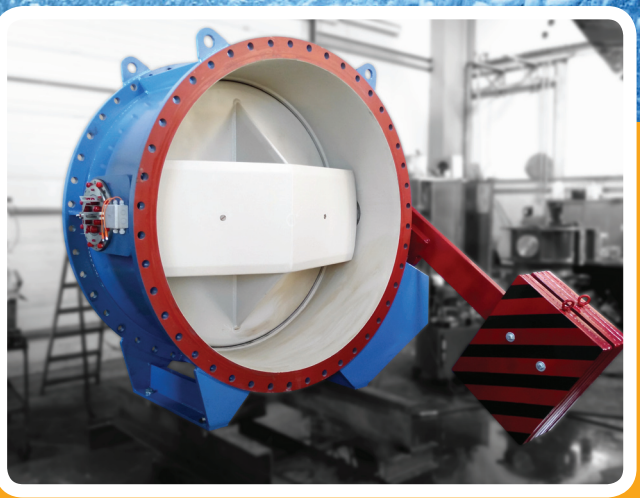
- low loss coefficient under 0,12 ζ
- designated as the closures in front of the turbine
- flows edge profile of the disc is designed for lowest loss coefficient to achieve a maximum flow rate
- assembly joint is part of closure
  (easier installation into the pipe, the lower price of the set)





The concepts of discs and pivots for butterfly valves

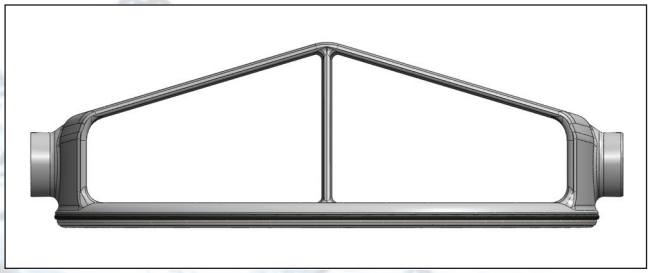
In Ševčík – HYDRO s.r.o., the discs and pivots for butterfly valves are manufactured in 2 variants:

1. Flow-through (low-loss) disc

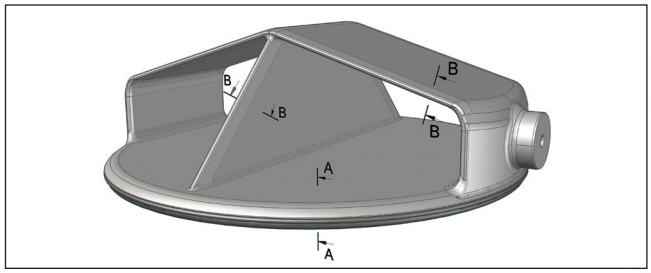
The pivots with hubs and disc form one unit. The pivots made of structural steel are completely welded in the hubs and machined so that ideal upstream and downstream edges are formed with minimal losses. Stainless-steel deposits are used in the places where bearings and seals are seated.

Just the design of upstream and downstream edges of the disc play very important role, as the disc hubs and pivots represent the places where the flow of operating medium is most disturbed and so the loss coefficient increases. The edges of plate and all ribs are milled so as to form smooth chamfers and radius (Pic. 3, 4). Smooth upstream and downstream edges are provided also for the sealing ring in the valve body (Pic. 5). This concept is suitable especially for the installations where low loss coefficient of the valve is required, together with minimal disturbance to the flow of operating medium downstream the valve. It can be a case of the valve installed upstream the turbine or at a bottom outlet so as to achieve maximum capacity or when it is installed at outlet downstream the pumps etc.

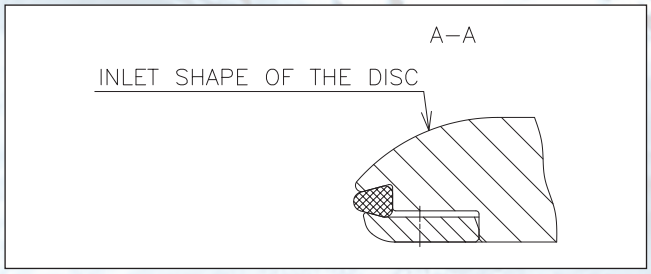
Advantages: more compact design of the disc, low loss coefficient of the disc



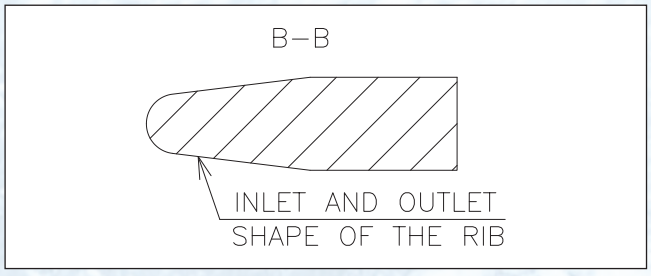
Pic. 1 | Design of flow-through disc



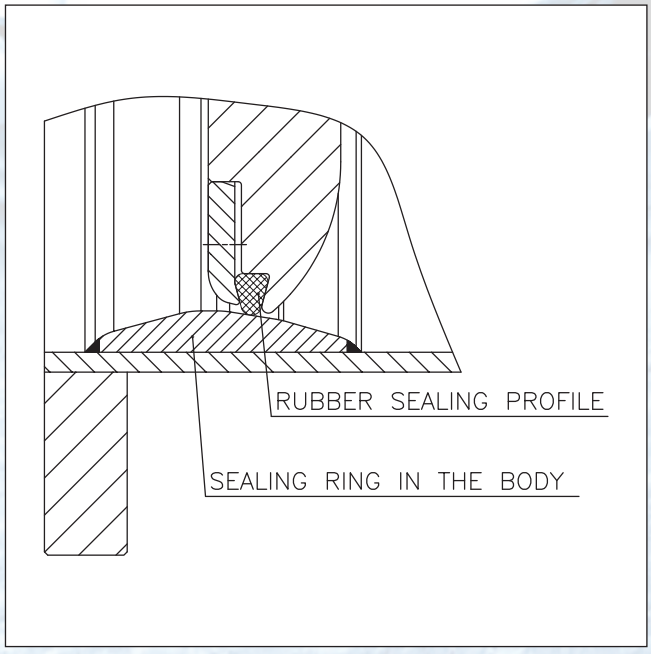
Pic. 2 | 3D model of flow-through disc



Pic. 3 | Section of leading edge of the disc



Pic. 4 | Sections of upstream and downstream edges of flow-through disc



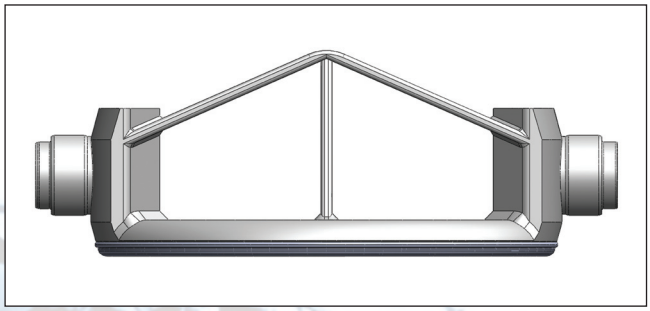
Pic. 5 | Section of sealing ring in valve body

2. Pinned disc

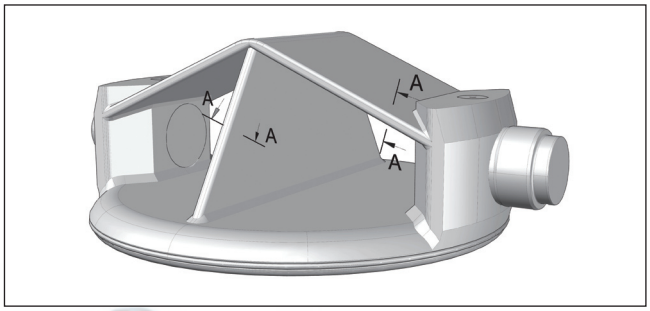
It is dealing with less expensive variant of a disc for butterfly valve. In this case, stainless-steel pivots are inserted into disc hubs and pinned. This concept requires the utilization of more robust plate and hubs, which results in higher loss coefficient and higher disturbance to the flow of operating medium downstream the valve. Upstream and downstream edges of ribs and sealing ring do not have such an ideal shape (Pic. 8) as in the case of flow-through disc.

This type is suitable especially for the installations where low loss coefficient of the valve is not required.

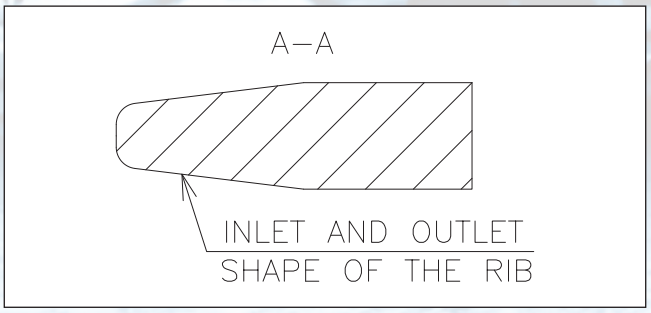
Advantages: lower price



Pic. 6 | Design of pinned disc

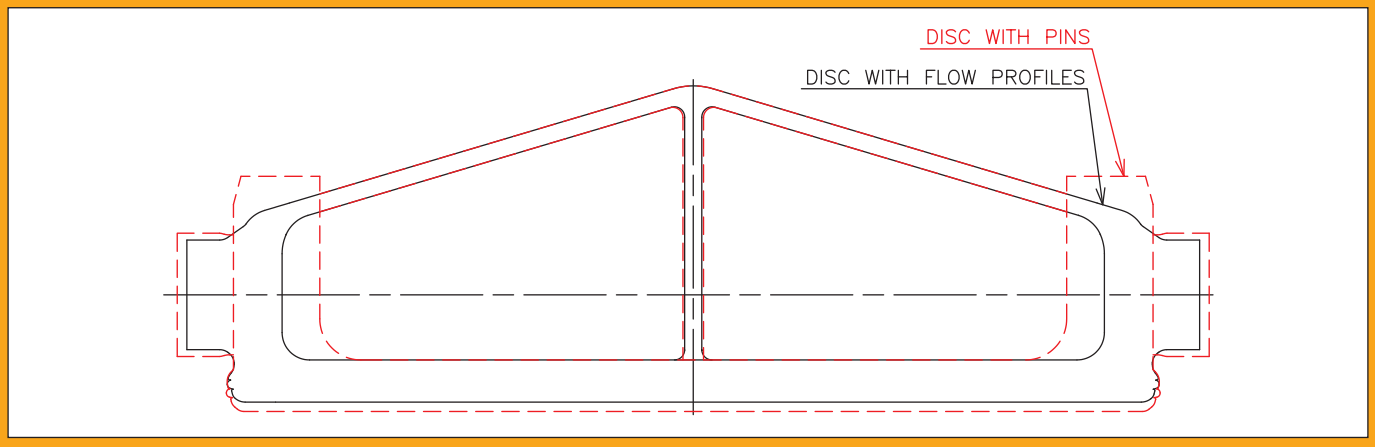


Pic. 7 | 3D model of pinned disc



Pic. 8 | Sections of upstream and downstream edges of pinned disc

Comparison of individual disc variants



Pic. 9 | Comparison of the profiles of flow-through and pinned discs with same operational parameters (DN and PN)

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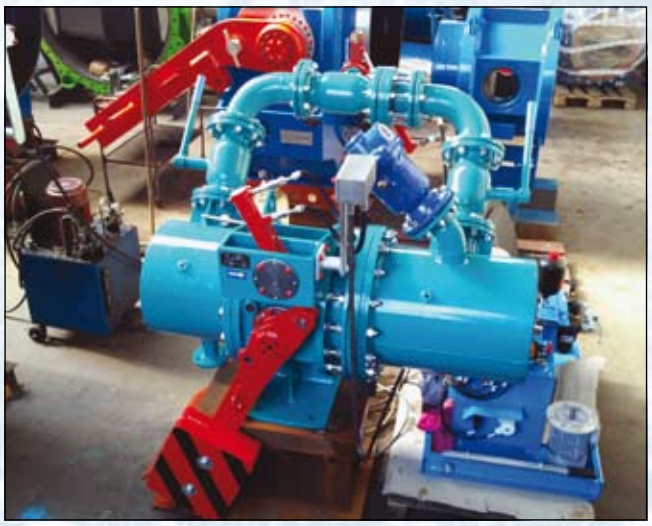
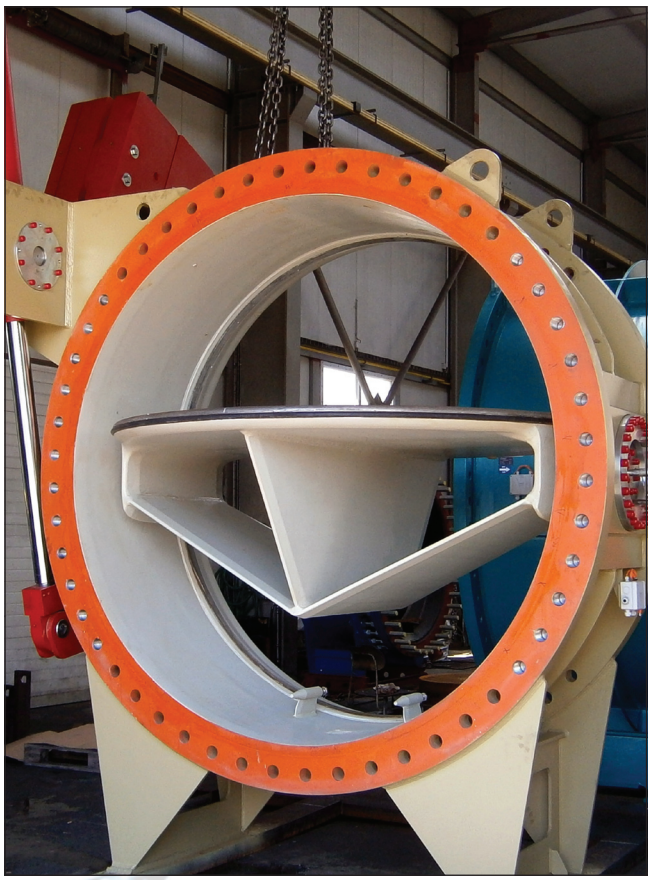
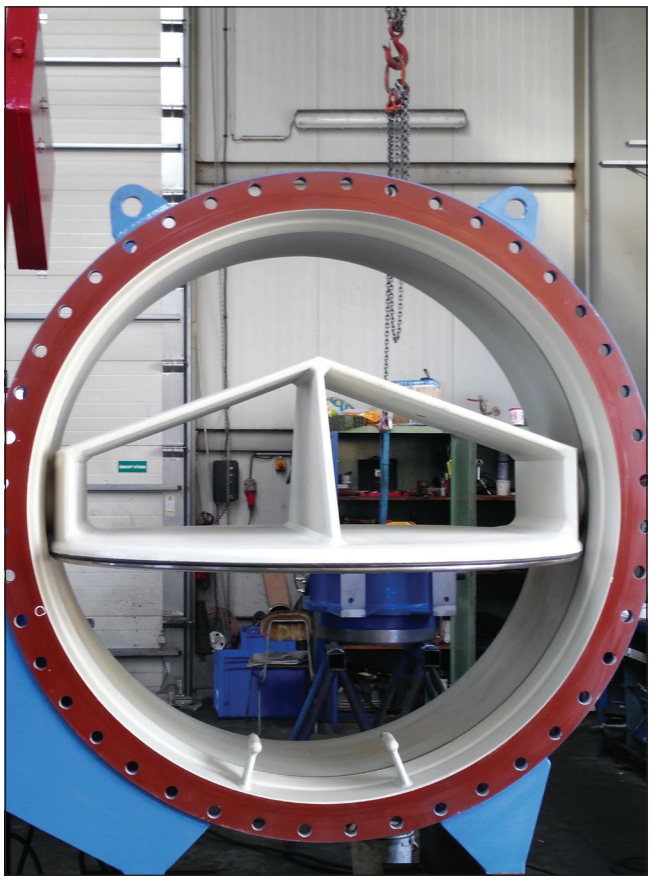
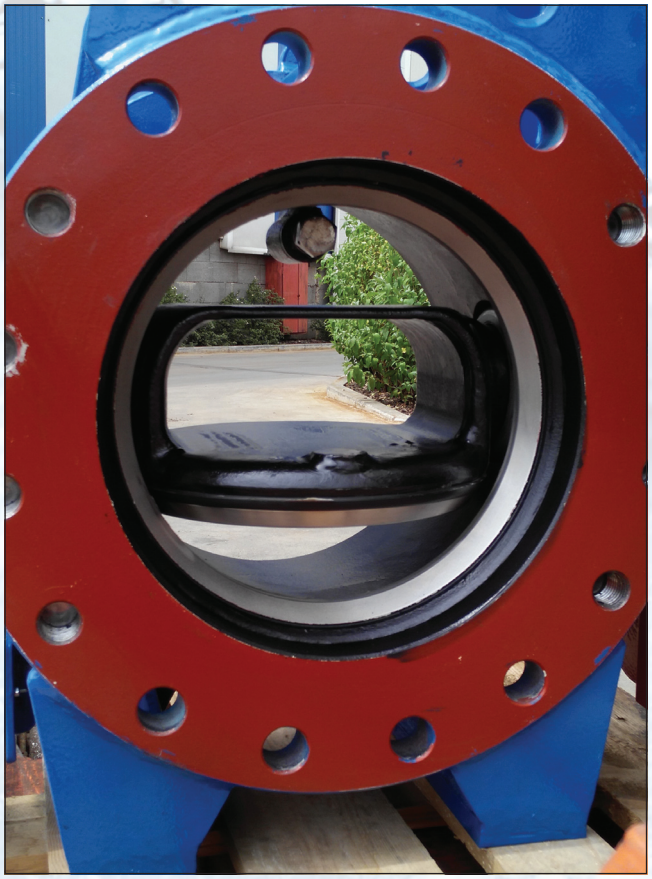




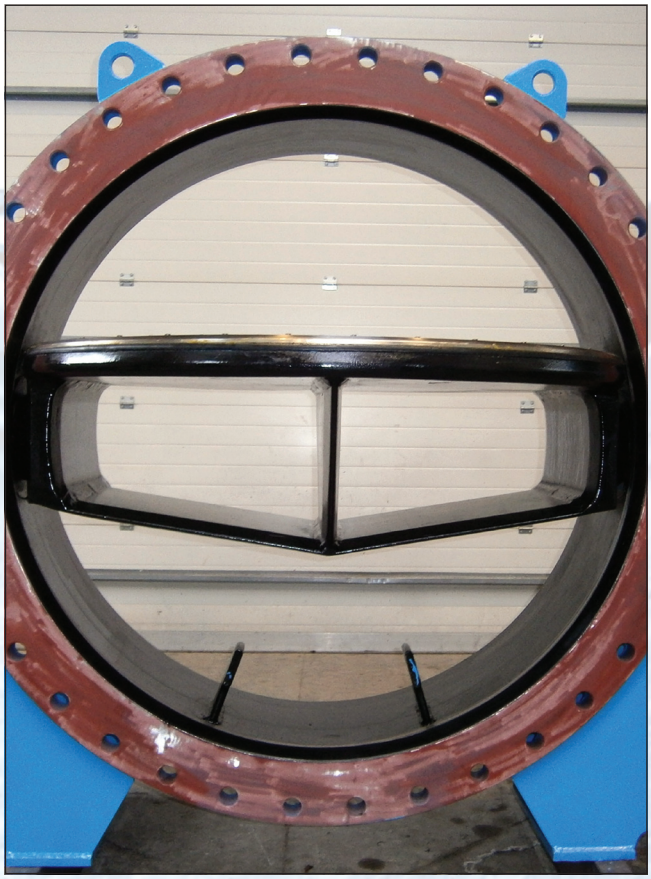
Pic. 10 | Butterfly valve DN2300 PN10
with low-loss disc



Pic. 11 | Butterfly valve DN1800 PN10
with low-loss disc



Pic. 12 | Butterfly valve DN350 PN25
with low-loss disc



Pic. 13 | Butterfly valve DN1600 PN16
with low-loss disc

Our design of valves significantly differs from the products of other companies.

Approximate comparison of loss coefficient for individual variants of discs made by Ševčík – Hydro s.r.o.

	Loss coefficient ξ	
	Flow-through disc	Pinned disc
DN2800 PN4	0,08	0,13
DN500 PN6	0,11	0,15
DN800 PN6	0,10	0,15
DN1400 PN10	0,11	0,2
DN2300 PN10	0,11	0,28
DN800 PN16	0,12	0,2
DN1100 PN16	0,11	0,22
DN1400 PN30	0,18	0,4
DN400 PN25	0,13	0,25

Alternative variants of butterfly valves

Optionally, the butterfly valves can be delivered as a SET including assembly joint that forms an integral part of the valve body. This arrangement has following advantages: smaller final dimensions, simpler on-site installation, lower price when compared with separately produced butterfly valve and assembly joint.

The butterfly valves can be delivered with actuation by means of worm-gear unit and handwheel or electric drive.

Pic. 14 | Butterfly valve including assembly joint (SET)

Pic. 15 | Butterfly valve actuated by worm-gear unit and electric drive