

Industrial valves in textile chemistry - a practical report

Textile chemistry and industrial valves

Widest range of demands on flexibility and safety

The manufacture of textiles has been known for thousands of years and is an important characteristic of human culture. Textile products - besides everyday articles, these include diverse textile materials for technical purposes - are manufactured from both natural and synthetic fibres and their mixtures. In many textile industry companies the route from the raw material to the ready-to-use finished product involves numerous concerted mechanical and chemical treatments in order to give the goods the required user properties, the specific character and a typical and fashionable appearance.



Reactor Textilcolor AG
Source: Textilcolor



Valve Units
Source: Textilcolor

Textile chemistry addresses chemical problems that arise in the textile industry during the processing of fibres. Textile auxiliary agents are special chemicals for the wide range of processing steps which ensure a trouble-free and effective production process. Further chemical challenges demand that they are neither toxic nor inflammable and that they do not pose any ecological problems.

The consequences of this are high requirements in the production of the industrial valves that are used. The Textilcolor AG Company in Sevelen / Switzerland, a company experienced in handling these requirements, will be taken as an example to demonstrate the benefits of specifically used valves.

At Textilcolor AG, particular attention is paid to safety aspects, reliable leakproofness of the valves and the resistance of the valve materials used with regard to durability and quality of the products that are being manufactured. The chemical materials used for processing such as stearic acid, paraffins and other chemical raw materials place different requirements on the valves. Formerly a variety of different valves were employed. This led to widely differentiated overhaul expenditure. Overhauling always means an interruption in production, a shut-down and costs. Not forgetting infrastructure products such as hot water and steam. These media admittedly do not pose any special challenges to the valves, but they involve other types such as flaps and on/off and control valves.



Valves Unit for Reactor
Source: Textilcolor



V-Port Segment Ball valve
Source: JDV Control Valves



Control Center
Source: Textilcolor

With the introduction of the process control system in 2003 and the associated modifications of the processes for improving the production profitability, the valves were also newly scrutinised and as far as possible standardised. The Textilcolor AG Company focussed essentially on compact ball valves and V-port segment ball valves (=segmented ball valves).

situation prior adjustment

A lot of different ball valve and valve types in the plant require very individual operational supervision and control. Revisions were complex due to many different types of valves, time consuming and associated with an extensive stock of spare parts. The operating conditions were not perfect for most of the chosen valve types, which resulted in short operation periods with cost intensive revision interruptions.

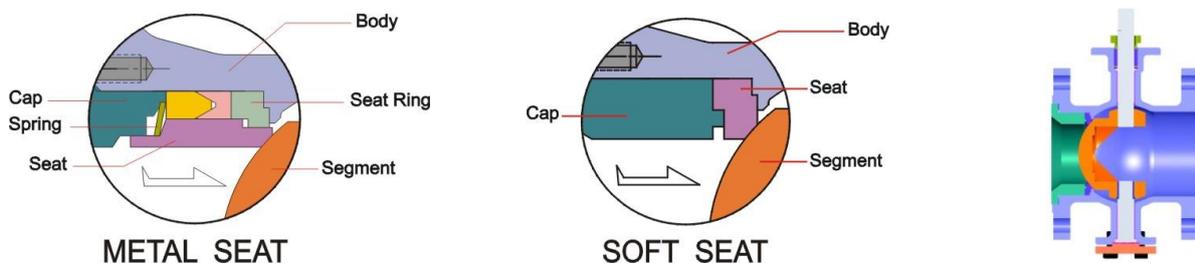
corrective measures

The analysis of the process conditions showed that two main types of valves are sufficient for all core processes. These types are compact ball valves and segment valves. The focus on these two types of valves allowed a reduced spare parts inventory, longer service life cycles of the valves, shorter and less frequent revision interruptions which resulted in a significant cost saving throughout the production process.

Facts and Figures

preliminary	afterwards
<ul style="list-style-type: none">• A lot of different Valve types• Short life cycle times of sometimes 2-3 months• Extensive and costly spare parts inventory• Increased error rate during revisions due to many different types of Valves;	<ul style="list-style-type: none">• Focus mainly on two types of Valves• New life cycle times of approx. 12-18 months• Reduction of spare parts inventory costs by approximately 40%• Reduction of the error rate during revisions down to <1 % due to routine- work ;

Especially in the case of the V-port segment ball valves, applications result with metallic and soft sealed versions. Metal sealed versions have a considerable benefit as a control function, particularly with steam dosing systems and powder feeding into the reactors. The production thus achieves greater flexibility and can manufacture a significantly wider range of products without approaching the limits of utilisation of the materials. And last but not least this flexibility allows Textilcolor AG to offer more specialised products from a single source and thus respond to the individual needs of the customer or to the diverse end products. The said V-port segment ball valves are not only fitted with soft or metallic seals, but also operate as both on/off and control applications and additionally in different housing materials. These requirements are guaranteed by the Zuercher Technik AG Company and the valve manufacturer JDV Control Valves Ltd. Zuercher Technik AG supports the user in case of any questions that arise.



It only remains to answer the question of how these said benefits are achieved.

In a nutshell - simple, robust and adaptable constructions, combined with the implementation of the most modern technologies, e.g. the HVOF coating process, as well as a simple but sophisticated seat construction.



One of the main focus for the manufacturer JDV Valves Ltd. are on the well known « HVOF »-process. The principle behind this is a combination of plasma and detonation processes for surface coating with cobalt-chromium compounds. Depending on the requirement, specific hardnesses can be achieved up to 70 HRC.

Apart from the criterion required by abrasion (powders, steam...), issues such as cavity pressure relief without ball holes and automatic readjustment of the seat are continually of central importance for safe and durable application. Here the spring-loaded construction is of central importance. The diagrams show an example of the metallic seat ring for these V-port segment ball valves.