

## **Kammerer slide gate valves in the PU-Foam-Can-Recycling**

### **Brief profile of PDR Recycling GmbH + Co. KG**

PDR Recycling GmbH + Co KG has been focused on the recycling of waste materials for over 25 years. Guided by the idea of climate protection and resource conservation, their goal is to enable the return of these materials into the production cycle. PDR operates the only plant in the world that recycles both the residual contents and the packaging of PU foam cans.

In addition, PDR develops customized recycling solutions for a functioning recycling management.

### **Shut-off solutions in the plant for PU-Foam-Can-Recycling**

This user report is about the use of Kammerer shut-off solutions at PDR Recycling GmbH + Co KG. The focus is on the recycling plant in which PU foam cans are disassembled by shredding. This process places very demanding requirements on the slide gate valves: they have a very high switching frequency, must reliably open, close and seal under the influence of the shredded tin cans as well as the remaining corrosive and adhesive contents. Emil Kammerer GmbH has designed a 3-part sluice especially for this purpose, through which the metal parts pass before being further processed in a nitrogen atmosphere. The sluice slide gate valves perform approx. 2.3 million cycles before maintenance is required.

A particularly high-quality stainless steel alloy was selected for the manufacture of all the slide gate valves used. Below you will learn more about the process and function of the Kammerer slide gate valves in this application.

### **PU-Foam-Cans and Metals**

The solid components of the PU foam cans are broken down into their individual parts by a shredding process. The remaining ingredients, on the other hand, are separated and cleaned in a chemical process. Finally, PU prepolymer and propellant

gas are obtained by passing through several stages. The material recycling rate is around 80%.

### **Task to be solved for Kammerer slide gate valves Operational challenges in the recycling process**

**Design of the Kammerer slide gate valves** In this application, the Kammerer slide gate valves are used as inlet and discharge sluice. Such a sluice system consists of three slide gate valves, with two drop shafts in between, which are flooded with nitrogen. On the one hand, this prevents pollutants from escaping from the plant atmosphere. On the other hand, the explosion protection of the plant is ensured by running it under oxygen exclusion and thus no explosive atmosphere is formed. The Kammerer slide gate valves have a cycle time of approx. 3 seconds. They are set into operation by electric or pneumatic drive.

**Kammerer slide gate valves in the plant** The pre-sorted PU foam cans pass individually through these nitrogen-flushed sluices into a cutting unit. Both the contents and the packaging parts enter a solvent bath. The solids are washed in a solvent bath in several stages. By means of evaporation through heated nitrogen, a final cleaning process of the solids takes place. They then fall into a nitrogen-purged exit sluice, from where they are conveyed onward for re-sorting.

The PU solvent mixture, which has also accumulated under the cutter, is pumped into the receiver tank for PU recovery.

The blowing agents released from the PU foam cans during the shredding process are extracted and sent for recovery.

**Requirements for the slide gate valves in the plant** The slide gate valves themselves are subjected to pressure surges, curing PU foam and metal. In the event of an sluice malfunction, the Kammerer slide gate valves must be able to cut through the metal PU foam cans without damage.

In this application, a Kammerer slide gate valve has a service life of approx. 2.3 million cycles. This is followed by a revision.

Characteristics such as leak-tightness, reliable operation, precise cutting of the metal cans, robustness and long service life are the special features of the Kammerer slide gate valves in this application.

### **Brief profile of Emil Kammerer GmbH**

For 75 years, Kammerer slide gate valves have been synonymous nationally and internationally with shut-off solutions that combine reliable technology with top quality. Innovative developments of a wide variety of shut-off solutions are constantly taking place here, oriented to customer requirements. If required, the range is completed by expert service personnel and a correspondingly well-stocked spare parts warehouse.

The product portfolio mainly comprises the standard nominal sizes DN 25 to DN 600. All slide gate valves are leak-proof from the outside. The standard range for design pressure is from  $10^{-4}$  mbar to 25 bar, and the span of standard design temperatures includes  $-20^{\circ}\text{C}$  to  $300^{\circ}\text{C}$ . The housings are usually made of stainless steel and aluminum. Sealing materials are based on technical and chemical requirements.

Shut-off solutions for requirements that go beyond the above criteria will be gladly discussed in a personal meeting and the best possible solution will be presented promptly - if implementation is possible.



### **Emil Kammerer GmbH**

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