

# Switch To Metal Bellows Seal Valves Benefits Chlorine Handling Operation

**Eliminates packing corrosion problems, cuts downtime and product losses**

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Smooth changeover of plug valves to bellows seal globe valves at Rhone Poulenc's pesticide plant in Institute, W Va., strengthened anti-pollution measures, significantly cut maintenance man-hours, downtime and product losses.

Many hundreds of tons of chlorine are used annually in the production of pesticides at the 460-acre site. Storage, transfer and processing of the chlorine require miles of pipe and hundreds of valves.

For many years, conventional packed ball, globe and globe plug valves were used for chlorine service. However, in the early 1980's, Rhone Poulenc decided to upgrade the safety, efficiency and economy of its chlorine handling operations.

Deteriorated packings were causing leakage of chlorine from valve stems. Several hundred valves were involved. In addition to the plug valves in chlorine service, the plant was also using ANSI 600, 800 and 1500 Class metal bellows seal valves on such diverse and demanding services as steam and heat transfer fluids.

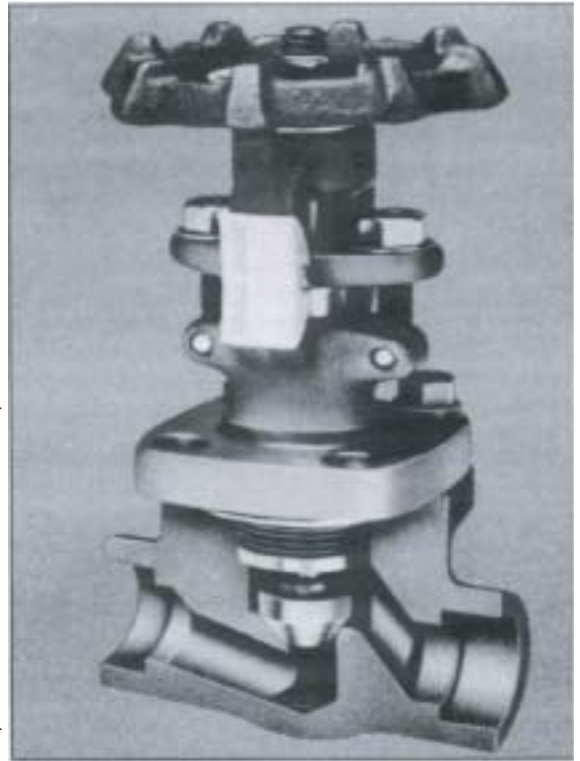
Rhone Poulenc's engineers and the valve manufacturer's sales engineer had previously solved a leak problem of packed plug valves on a methyl mercap- line, which had to be opened daily for sampling of the extremely malodorous tracer gas. All the bellows seal valves in use had proven consistently dependable over a three-year period on severe

services. Engineers in the upgrading project started replacing plug valves on the chlorine line with ANSI 300 Class bellows seal globe valves.

The valve is inherently leaktight. The bellows, welded to the stem above the disc and to the body (Figure 1), acts as the primary stem seal. Passage of fluids is completely blocked, in or out.

In order to achieve the upgraded performance of the bellows sealed valves, engineers had to accommodate the difference in flange-to-flange dimensions between the conventional plug valves and the ANSI bellows seal valves. Considering the multiplicity of valves and the amount of pipe involved in the changeover, this could have meant a costly interruption of processing operations. Instead, the manufacturer supplied versions modified to meet ANSI dimensions.

Initially, the bellows seal valves were specified and supplied with forged carbon steel bodies, Inconel® bellows and Monel® trim. However, Tyson wanted an extra margin of protection against moisture in the liquid chlorine as delivered from its manufacturer. Rhone Poulenc selected all-Hastelloy® bellows seals. All the valves used on the aboveground tanks, into which the liquid chlorine is off-loaded from the supplier's barge, have stems, discs, bellows and bellows holders of Hastelloy® C-276. The valves are used on feed lines, and to control flow to liquid level gauges, pressure gauges, etc.



*Figure 1. Metal bellows seal is specifically designed for chlorine handling applications requiring maximum corrosion resistance*

The upgrading program is proceeding smoothly, with up to 500 plug valves throughout the plant slated for eventual replacement by bellows seal valves.

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Bellows seal globe valves

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