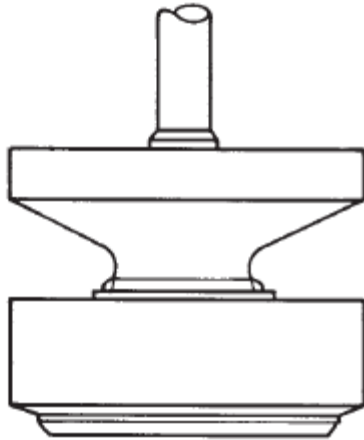




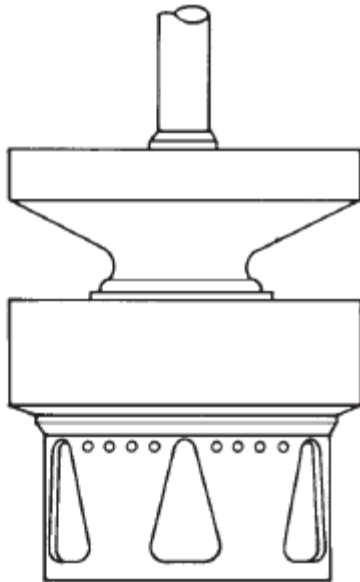
*Flowserve – Anchor Darling  
Globe Valves in Severe Throttling Service*

# Globe Valves in Severe Throttling Service

Standard Plug-Type Disc



Cage-Type Disc



## Problem

Applications in power plants where globe valves that were originally purchased with plug-type discs that are required to perform some severe throttling.

## Solution

The plug-type disc can be replaced with a particular disc—generally, a cage design.

## Abstract

A globe valve's throttling capabilities are very versatile. They depend upon the type of disc supplied with the valve. Although there are many different disc designs supplied in globe valves today, they are all variations of two basic types:

- Plug (or quick-opening) type discs
- Throttling (or cage) type discs

While some applications are not in the range of pressure-reducing valves, the flow reductions required are beyond the capabilities of a plug-type disc. As a result, the disc and the adjacent body surfaces may experience cavitation and erosion. In some instances, the problem has been severe enough to cause failures of the disc and the stem.

The cage-type disc, with its additional guiding and specially designed flow passages, can handle the higher flow velocity without damaging the valve internals. It should be noted that for cage-type discs to be most

effective they must be designed for the precise flow conditions to which the valve is subjected, i.e., each disc must be designed for the specific application.

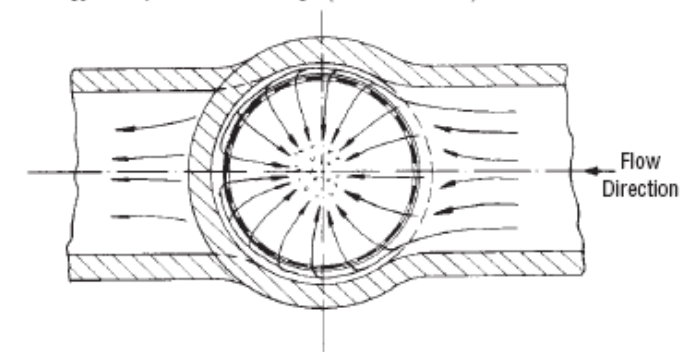
In addition, **globe valves with cage-type discs work properly only with flow over the disc.**

Since globe valves are normally installed with flow under the disc, to effectively throttle flow, the valve should be reversed in the line.

Various services in power plants require close throttling of the globe valves that regulate the flow. The installation of cage-type disc globe valves in these applications will improve flow control characteristics and eliminate the requirement for frequent maintenance.

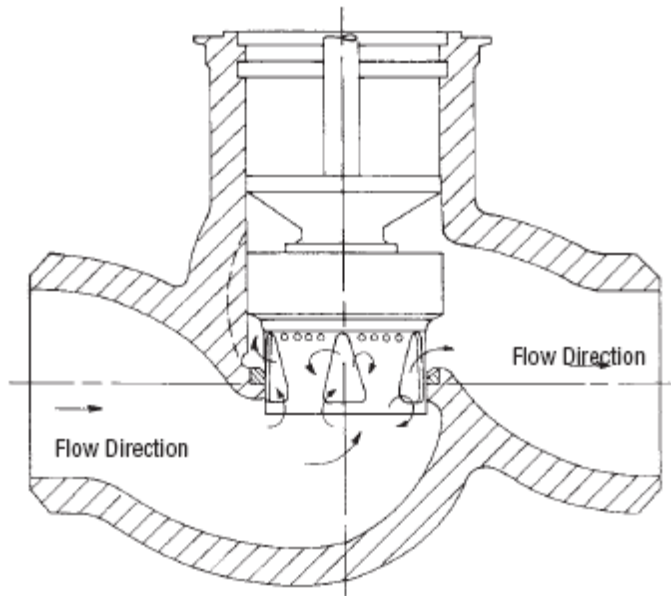
When should a specially designed disc be considered for throttling service? Each application should be reviewed in detail. However, a general rule of thumb is, "Anytime the valve is required to reduce the mass flow to less than 20 percent of the full open capacity of the valve, a special disc should be considered."

*Energy dissipation inside cage (flow over disc)*



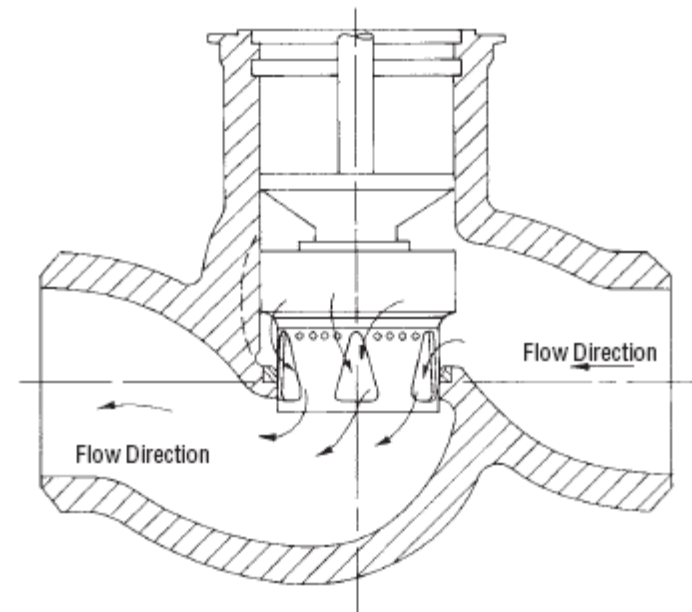
# Globe Valves in Severe Throttling Service

*Globe Valve with Flow Under Cage-Type Disc*



- Bad energy dissipation
- Cavitation due to fluid impingements (high velocity fluid sprays through cage passageways)
- Body erosion through fluid impingements (high velocity fluid sprays through cage passageways)

*Globe Valve with Flow Over Cage-Type Disc*



- Good energy dissipation inside cage
- Minimum cavitation
- Low erosion



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**Flowserve Corporation**  
**Flow Control Division**  
Edward & Anchor/Darling Valves  
1900 South Saunders St  
Raleigh, NC 27603 USA

**Toll – Free Telephone Service**  
(U.S. and Canada)  
Day: 1-800-225-6989

**After Hours Customer Service**  
1-800-543-3927

**U.S. Sales Office**  
Phone: 919-832-0525  
Fax: 919-831-3369

**Website:**  
[www.Flowserve.com](http://www.Flowserve.com)