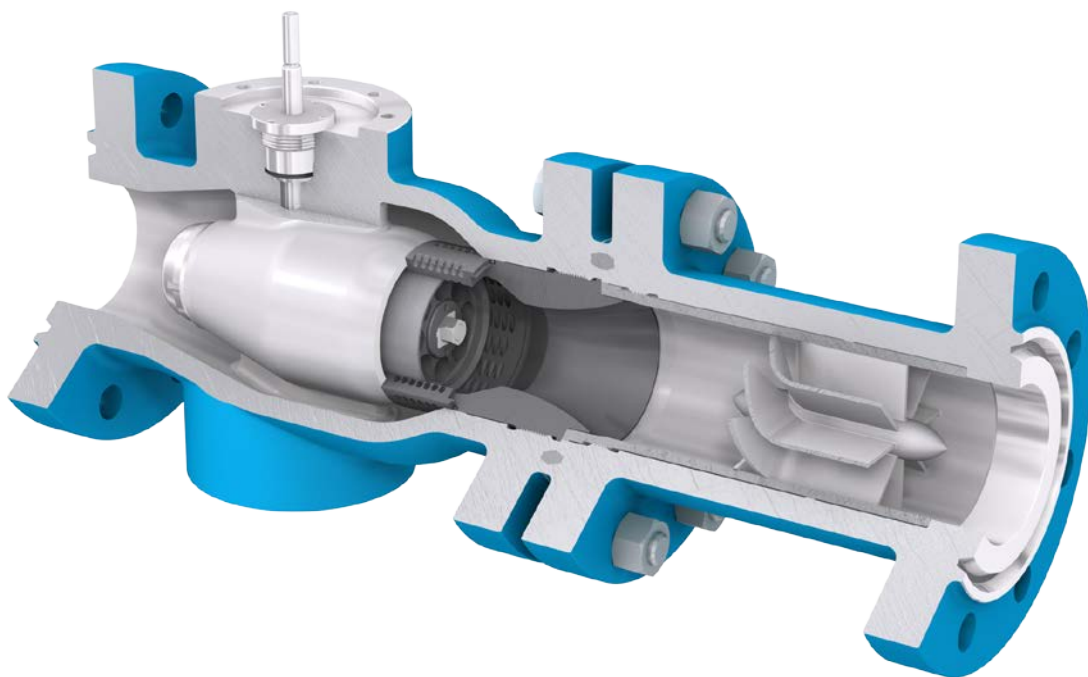


Typhoon[®] System

summary sheet

Type designation	Low shear control system
Mokveld model	RZD-R.....-LS / CHV-R.....-LS
Scope	Sizes 4" - 16", rating class ASME 150 - 2500 Other sizes and ratings upon request
In preference to	Multi stage labyrinth type valves (angle and in-line) Conventional globe control valve (angle and in-line) Conventional choke valve (angle and in-line)
Typical applications	Oil Production Level control Produced water Production choke



Low shear axial Typhoon System

Typhoon Systems offer the following main features:

- **Cyclonic axial flow** Emulsification and droplet breaking in petroleum phases are directly coupled to shear forces in throttling valves. Shear forces are a function of the volume involved in energy dissipation in the valve. The Typhoon System significantly reduces shear forces by increasing the volume involved in energy dissipation by means of the axial cyclonic flow pattern through the system.
- **Cleaner Production** An oil in water reduction of 30% to 80% is achievable (figure 1) for choke applications, dependent on the function.
- **Improved separation efficiency** The Typhoon System reduces oil in separated water and water in separated oil. There is less need for, or improved performance of process chemicals like emulsion breakers, flocculants and anti-foam.
- **Availability** Erosion resistant materials in the cyclonic flow area reduces erosion to improve operational lifetime, similar to the standard Mokveld choke valves.
- **Accurate control** Linear inherent characteristics allow optimum control for liquid level systems and flow control processes.
- **Compact** As a result of the low actuation force requirement, small actuators can be used; combined with a compact body design this minimizes the installation's footprint.
- **Process safety** In this cyclonic axial flow system the cage is inherently protected against direct impacts by foreign objects. The design further introduces a secondary method to reduce flow rate if cage collapse does occur.
- **Special features**
 - Custom-designed cyclonic control system for each application to maximize liquid droplets based on performance models established during development.
 - Full range of matching pneumatic, hydraulic and electric actuators are available.
 - Next to the axial Typhoon System, there is also the option for an angle Typhoon System (figure 2) which is interchangeable with existing Mokveld choke valves.



Figure 1: Example of water quality improvement between conventional valve (left) and Typhoon System (right)



Figure 2: Low shear angle Typhoon System

For more detailed information, please contact Mokveld.