PHÖNIX Experience since 1910

Bellows Sealed Globe Valve Model 350 - protected bellows design

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Successful Concept

The industrial success of PHOENIX bellows sealed globe valves in critical service applications is based on:

- Over 40 years experiences in bellows sealed technology worldwide and nearly 100 years in valve manufacturing
- Own manufacturing in Germany with a huge manufacturing penetration
- Manufacturing with latest in machining and technology using a wide range of high performance CNC-machining equipment
- Many years of working in umpteen national and international committees like EURO CHLOR, Chlorine Institute, …
- Over 200 well qualified and dedicated employees
- Our certificates and approvals like ISO 9001, HP0, PED 97/23, Euro-Chlor, API, GOST, Fire Safe, KTA 1401, CE 0525, UOP, Stoomwezen, …

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Research and Development

Over 20 well-qualified engineers in our engineering department develop solutions to customers problems every day. Latest calculation and CAD programs and Phoenix‘ own valve testing facility allow for permanent improvement of our products.

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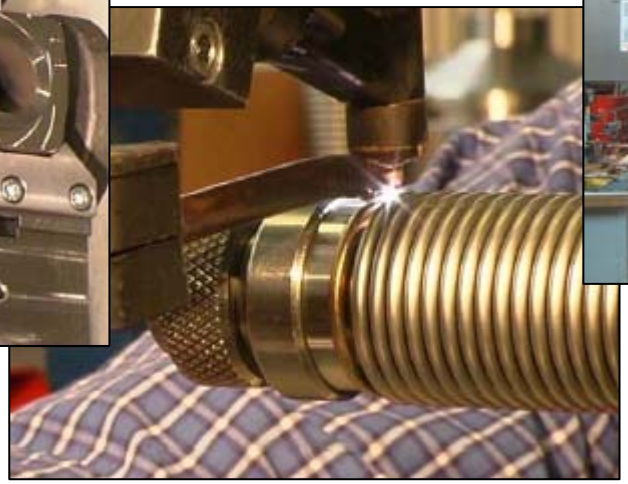
Fabrication “Made in Germany”

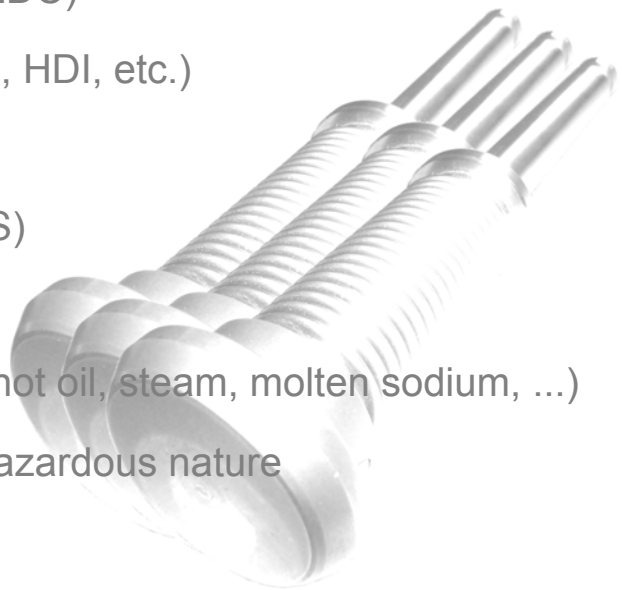
PHÖNIX valves are developed and made in Germany with latest in machining and technology. Our deep fabrication’s penetration based on high performance CNC machines for wide range of special products as well as serial production.



Application

The most common applications for PHOENIX bellows sealed globe valve model 350 are critical services involving lethal, toxic, corrosive, inflammable, volatile, radiating, or expensive fluids. For example:

- Dry chlorine (Cl_2)
- Anhydrous hydrogen chloride (HCl)
- Ethylene dichloride (EDC)
- Isocyanites (MDI, TDI, HDI, etc.)
- Ammonia (NH_3)
- Hydrogen sulfide (H_2S)
- Benzene (C_6H_6)
- Heat Transfer fluids (hot oil, steam, molten sodium, ...)
- and fluids of similar hazardous nature



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Design Features

PHOENIX bellows sealed globe valve model 350 has many special design features that make it especially suitable for named services.

- Bellows protected in extended bonnet against direct impingement from product flow
- High-cycle, multiple wall hydroformed bellows
- Stuffing box packing as secondary sealing element
- Bodies are forging or casting with larger than required wall thickness
- Body bonnet joint gasket is fully confined to prevent gasket flow or blowout
- Extended bonnet provides for good thermal insulation
- Guided stem design reduces stem vibrations
- Replaceable disc for low maintenance cost
- Knife edge metal-to-metal hardfaced seat for bubble-tight shutoff
- Two piece stem protects bellows against torque stress
- Design eliminates stem bearings

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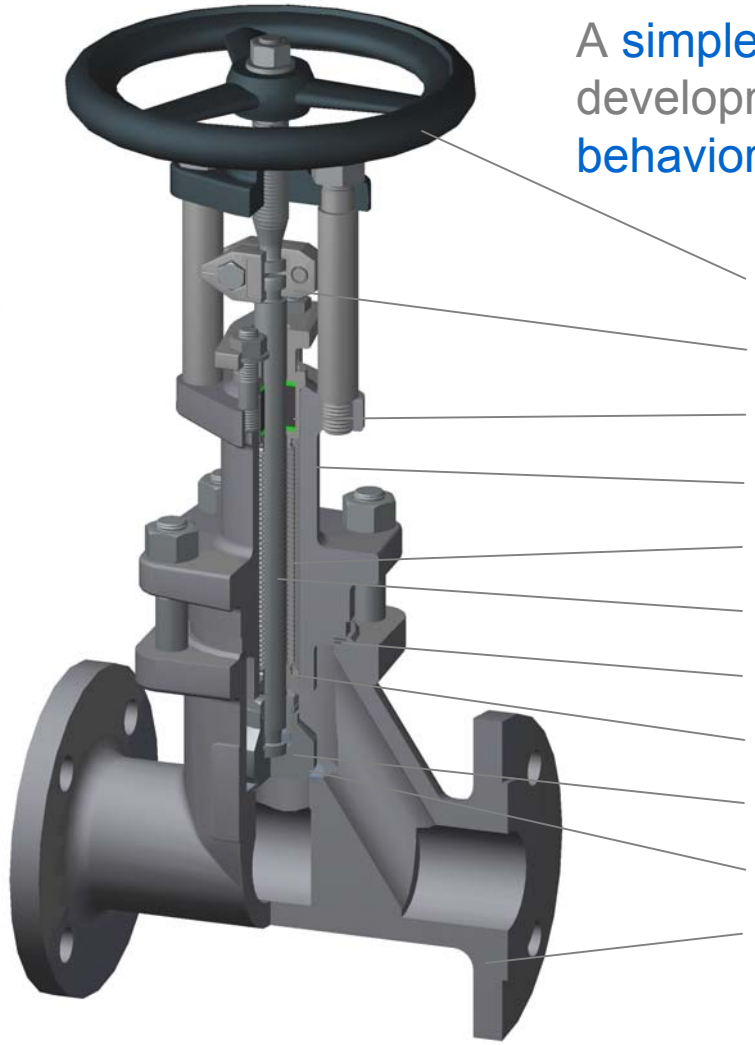
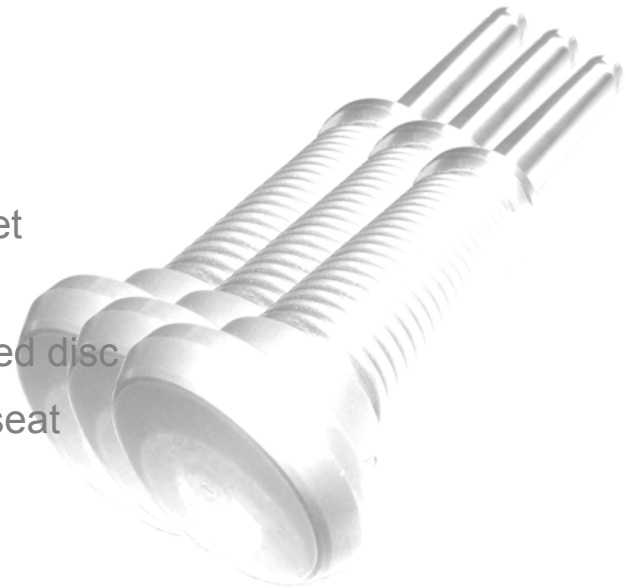
Technical Details of Model 350



A simple design and structure was the target for development because it guarantees an optimal behavior in service.

- Handwheel
- Coupling and position indicator
- Packing as secondary sealing element
- Bonnet
- Bellows
- Lower stem
- Fully confined gasket
- Guide ring
- Renewable hardfaced disc
- Hardfaced integral seat
- Body



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Technical Details of Model 350

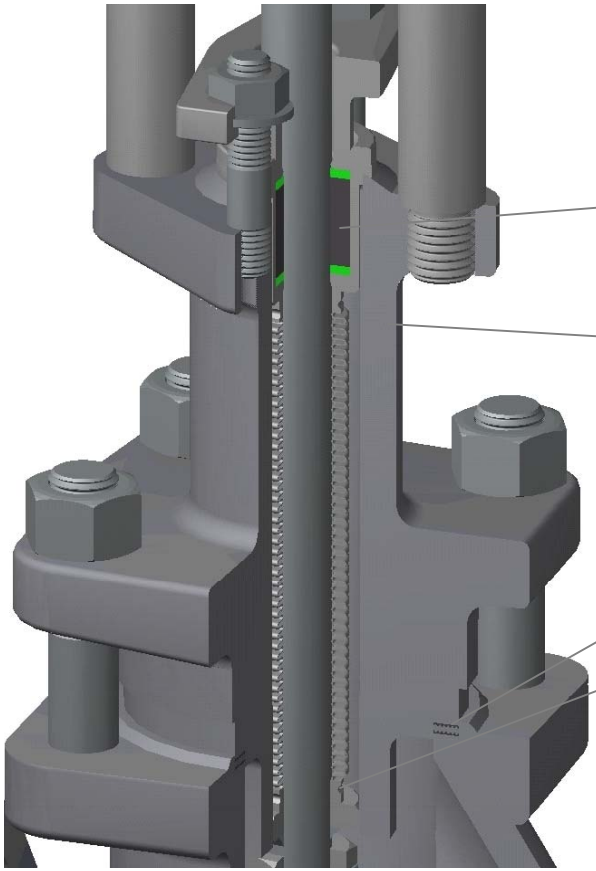
Valve body design is available as forged or cast construction with different end connections. End connections can be combined as necessary. End-to-end or face-to-face per ISO, ASME (globe and ball) or customer requirements.

Available Materials:

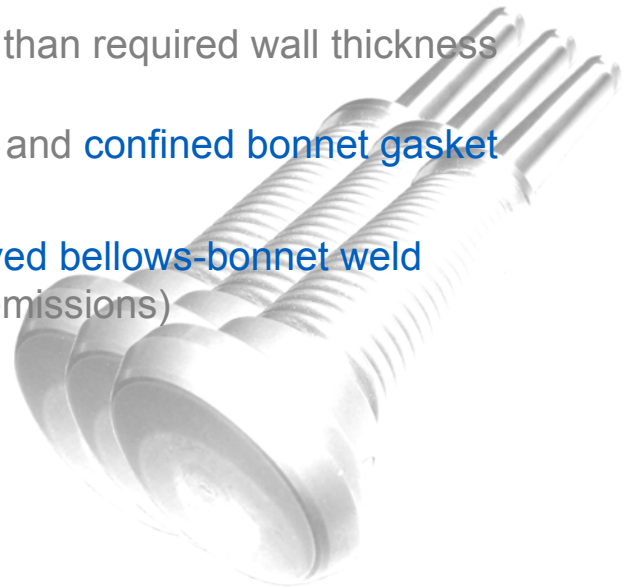
- Carbon steel
- Low temperature carbon steel
- Stainless steel
- Hastelloy
- Monel
- Inconel
- Pure nickel
- Titanium
- other special materials

Technical Details of Model 350

Long extended bonnet design guarantees a safe embedding of the super-long PHÖNIX bellows.



- Stuffing box, backup packing as secondary sealing element
- Larger than required wall thickness
- Round and confined bonnet gasket
- Approved bellows-bonnet weld (Zero emissions)



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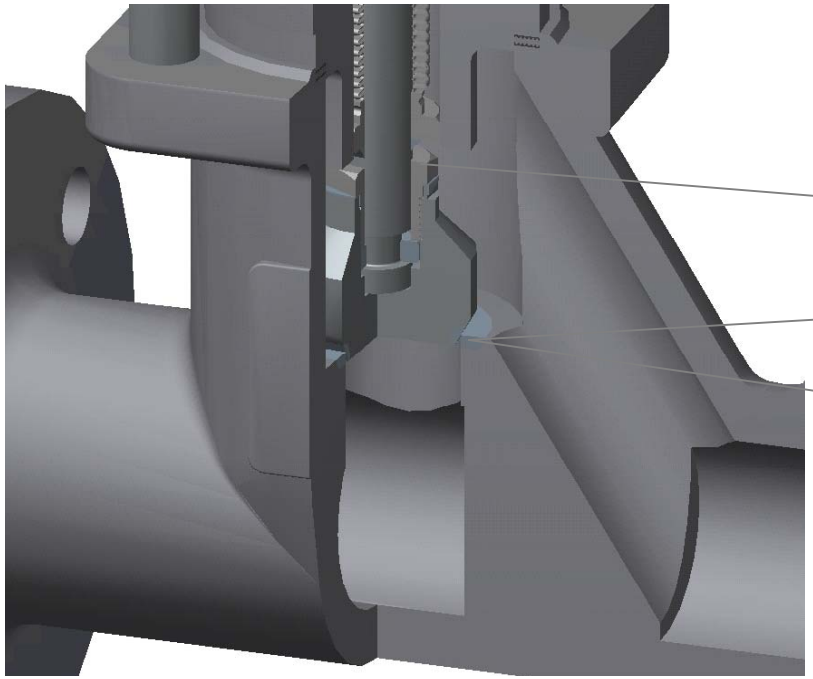
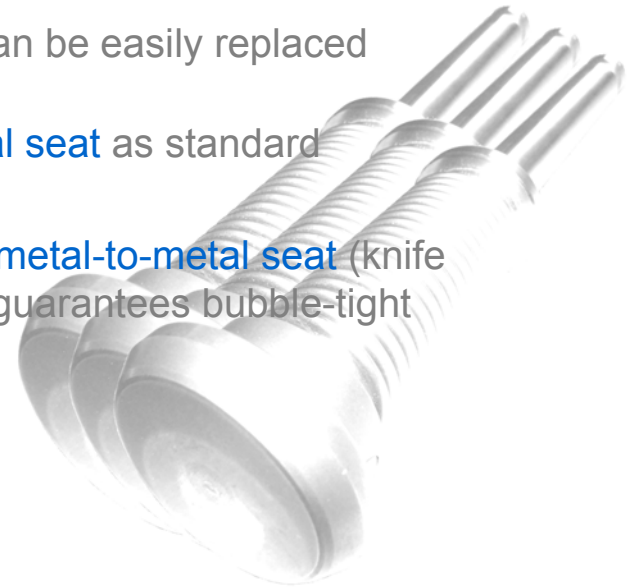
Technical Details of Model 350

The standard disc-seat combination for named services is an integral seat with 18% Chromium hardfacing and a hardfaced 13% Chromium disc. For sophisticated applications and services a combination of Stellite 21 and 6 will be offered.



- Disc can be easily replaced
- Integral seat as standard
- Conic metal-to-metal seat (knife edge) guarantees bubble-tight shutoff



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Technical Details of Model 350

Bellows welded on both sides to stuffing box sleeve above and guide ring below guarantees reliable and long lasting zero emission performance.

- Hydroformed, multiple-wall design
- 50,000 operations guaranteed
- Welded to stuffing box sleeve and guide ring, guide ring welded to lower stem
- Approved welders and welding processes
- Bellows, stuffing box sleeve and guide ring made from same material
- Long bellows, protected in extended bonnet

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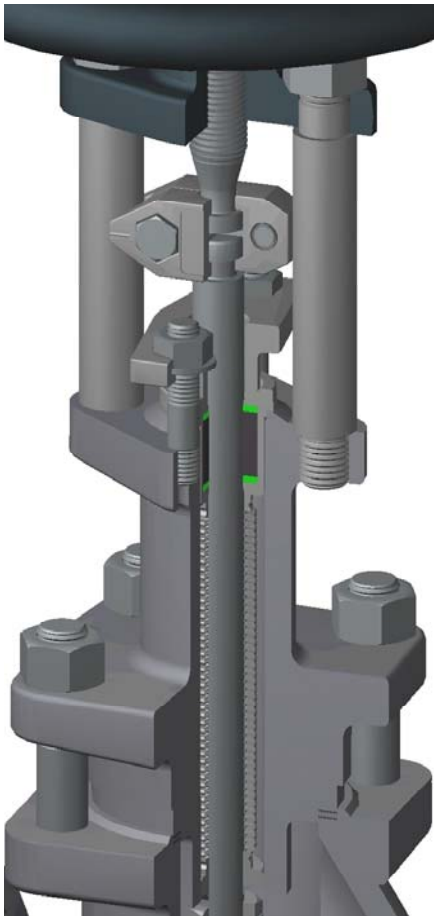
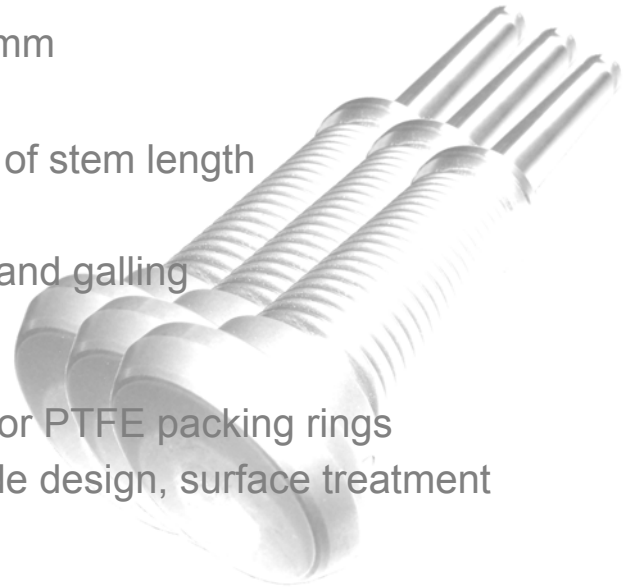
Technical Details of Model 350

The stem properties guarantee a perfect guide and lowest friction.



- Rising non-rotating lower stem
- Surface roughness 0.4 µm (polished or cold rolled for improved hardness)
- Eccentricity < 0.01 mm
- Linearity > 0.005 % of stem length
- Prevention of wear and galling
  - Material selection
  - Special Graphite or PTFE packing rings
  - Special stem guide design, surface treatment



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Technical Details of Model 350

The coupled stem design protects the bellows against torque stress, eliminates stem bearings along with their maintenance needs and allows easy adaptation for any type of actuation.

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Standard Materials of Construction for Model 350

Part	Carbon	Low temp. Carb.	Stainless steel
Body & Bonnet	A105 / WCB	LF2 / LCC	F316 / CF8M
Integral seat with hardfacing	18 Cr	18 Cr	
Renewable disc	420 / A105	316Ti / LF2	316Ti
Disc hardfacing	Min 13 Cr	Stellite 6	Stellite 6
Bellows	316 Ti	316 Ti	316 Ti
Upper stem	431	431	431
Lower stem	316 Ti	316 Ti	316 Ti
Handwheel	Cast iron / Steel	Cast iron / Steel	Cast iron / Steel
Packing	Graphite	PTFE-Rings	PTFE-Rings
Bolts	A193 B7	A320 L7/L7M	A193 B8M
Nuts	A194 2H	A194 4	A194 8M

Model 350 is obtainable as Special Class Valve !

Testing and Preservation

PHOENIX has a standard test procedure that is performed on every assembled valve prior to leaving the factory. Additional testing (e.g. Helium leak test) will be performed per customer specification. Inspection certificates and material test reports are available upon request.