

Doebritz Stainless Steel with Tungsten Carbide Coating Quick-release Rotary Valve - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

The Doebritz DBR-1237 Quick-release Rotary Valve represents a precision-engineered solution for high-wear, hygienic, and potentially explosive bulk solid handling applications. Designed specifically for powdered and granular materials that exhibit abrasive, corrosive, or adhesive characteristics, this valve integrates a rapid-disassembly hygienic housing with a durable tungsten carbide-coated rotor. This combination delivers extended operational life in pneumatic conveying and gravity discharge systems while meeting stringent clean-in-place (CIP) and ATEX Zone 20/21/22 requirements.



HOUSING & ROTOR METALLURGY

Base construction begins with certified stainless steel (SUS304 or SUS316L) contact surfaces, fully traceable to mill certifications. For extreme wear service, the rotor and internal housing bore receive a controlled tungsten carbide (WC) coating applied via High-Velocity Oxygen Fuel (HVOF) or equivalent thermal spray process. Finished coating hardness typically exceeds 70 HRC, with a dense, non-porous structure that resists penetration by sharp, hard particles such as titanium dioxide, carbon black, lithium battery materials, or mineral fillers. The valve body is fully machined from cast or fabricated stainless steel, with no exposed carbon steel on wetted surfaces.

KEY FEATURES

- Quick-release Clamp System: Tool-free removal of end covers and rotor, enabling rapid access for manual cleaning, inspection, or complete washdown. Supports online CIP (clean-in-place) and WIP (wash-in-place) protocols without full disassembly.
- Tungsten Carbide Wear Defense: HVOF-applied WC coating on all high-friction zones (rotor tip, vane faces, and housing bore). Extends component life 3x to 10x versus uncoated stainless steel in abrasive powder service.
- Precision Rotor-to-Housing Clearance: Maintained at 0.10 – 0.20 mm (0.004

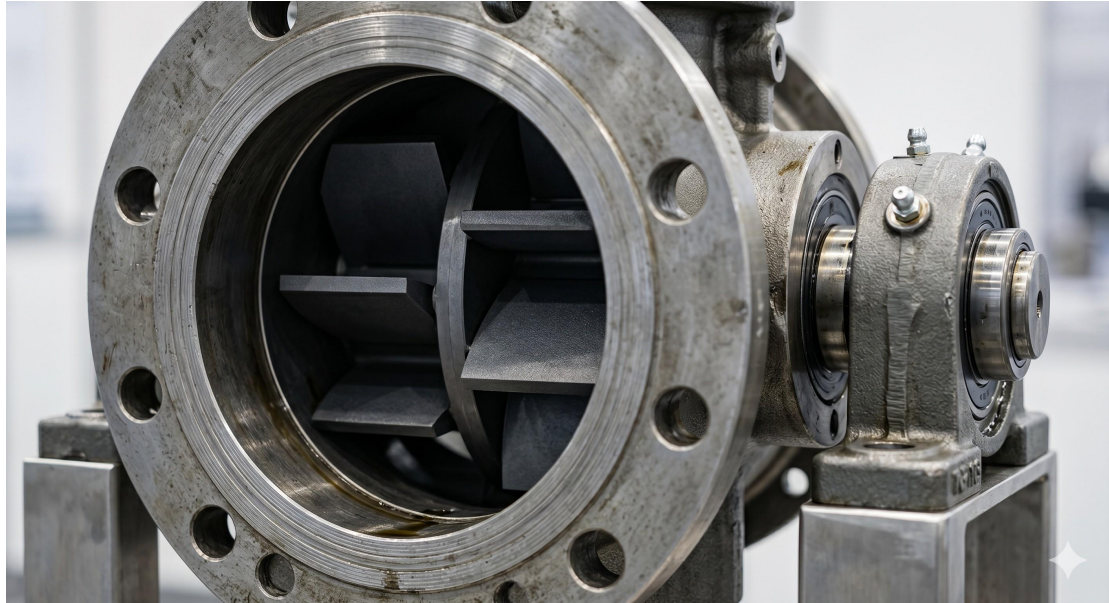
- 0.008 in) as standard, minimizing air leakage across the differential pressure zone without risk of thermal seizing.
- Airtight Shaft Sealing: Lip seal with pneumatic purge connection (air sealing) prevents dust migration to outboard bearings, eliminating product contamination and bearing failure.
- ATEX-Ready Configuration: Available with Ex-proof motor, 16 bar pressure shock resistance, and precision gap to quench flame propagation. Certified for Zone 20, 21, and 22 (dust) environments.
- Hygienic Design: Internal surfaces polished to $Ra \leq 0.8 \mu m$ (mirror finish $Ra \leq 0.4 \mu m$ optional). Free of crevices, dead zones, or threaded exposed fasteners. Suitable for Class C/D or 100,000-class cleanrooms.

COMPLIANCE & SAFETY STANDARDS

Doebritz DBR-1237 rotary valves carry CE marking, TÜV certification, and Statement of Conformity for the Machinery Directive and ATEX 2014/34/EU. Designed to NFPA 69 (explosion isolation) and EN 1127-1. Pressure shock resistance validated to 16 bar (232 psi) for explosion containment. All welds and material certifications documented per EN 10204 3.1.

TECHNICAL SPECIFICATIONS

Parameter	Specification
Capacity (displacement per rev)	1.5 to 110 Liters/rev (model dependent)
Flange Standard	HG20592 (DN50, DN100, DN150, DN200, DN300, DN350); optional DIN/ANSI
Drive Configuration	Direct drive or chain drive; VFD-ready; PLC control interface
Rotor-to-Housing Clearance	0.10 – 0.20 mm (0.004 – 0.008 in)
Shaft Sealing	Lip seal with pneumatic air purge (air-tight seal)
Max Operating Pressure	1.0 bar (15 psi) positive; -1.0 bar (29 inHg) vacuum
Explosion Containment	16 bar (232 psi) shock resistant
ATEX Zones	20, 21, 22 (dust)
Ambient Temperature Range	-15°C to +60°C
Maximum Material Temperature	120 ° C (with standard seals); water cooling jacket optional
Surface Finish (internal)	Ra ≤ 0.8 μm (mirror Ra ≤ 0.4 μm optional)
Coating (wear option)	Tungsten carbide (WC), HVOF-applied, >70 HRC



INDUSTRIAL DEPLOYMENT

Typical applications include pneumatic conveying and rotary feeding of lithium-ion battery cathode/anode materials, titanium dioxide (TiO_2), carbon black, silica fume, API powders, lactose, microcrystalline cellulose, cement additives, mineral fillers, and abrasive chemical intermediates. Field data demonstrates leak rates below $0.01 \text{ m}^3/\text{h}$ per bar differential pressure at 20 rpm when handling fine powders with mean particle size $5 - 200 \text{ } \mu\text{m}$. Doebritz provides full sizing, material compatibility review, and motor selection support for each installation.