

## Mirror Polished Sifter - Official Technical Overview & Datasheet

### EXECUTIVE SUMMARY

The Doebritz Mirror Polished Sifter represents a paradigm shift in rotary sifting technology for high-purity powder handling. Engineered specifically for the pneumatic conveying, food, pharmaceutical, chemical, and plastics industries, this equipment bridges the gap between efficient particle classification and stringent sanitary requirements. Unlike conventional sifters that introduce contamination risks or excessive pressure drop, the Mirror Polished Sifter delivers a surface finish of  $Ra \leq 0.4 \mu\text{m}$  on all product-contact areas, eliminating bacterial adhesion, reducing friction-induced heat, and enabling rapid visual inspection.

Designed for gravity-fed and inline pneumatic systems, the Doebritz sifter offers a primary value proposition of maximizing yield while minimizing cross-contamination. The mirror-polished interior promotes passive product flow, reduces residence time, and facilitates quick-change sieve baskets for grade transitions. With capacities ranging from pilot-scale (200 kg/h) to production-scale (25,000 kg/h) and ATEX-certified configurations, this unit is the preferred choice for blue-chip manufacturers of infant formula, active pharmaceutical ingredients (APIs), lithium-ion battery powders, and fine chemicals.



## HOUSING & ROTOR METALLURGY

The Doebritz Mirror Polished Sifter features a fully investment-cast housing manufactured from AISI 316L (EN 1.4404) stainless steel as standard, with a 304L option for non-corrosive applications. The casting process eliminates welded seams in product zones, thereby removing crevices that trap contaminants. Each housing undergoes CNC machining on a 5-axis vertical machining center, achieving positional tolerances of  $\pm 0.02$  mm on flange faces and bearing seats. The rotor — a dynamically balanced, open-disc or paddle-style configuration — is precision-machined from solid bar stock, not fabricated, to guarantee concentricity. Rotor-to-housing clearances are held to an industry-leading 0.15 mm to 0.25 mm (radial) and 0.20 mm to 0.30 mm (axial), ensuring optimal airlock efficiency ( $\leq 0.5$  m<sup>3</sup>/h pressure loss at  $\Delta P = 0.5$

bar) while preventing particle degradation.

## KEY FEATURES

- Outboard Bearing Isolation: Bearings are separated from the product zone by a double-labyrinth seal system with a pressurized air purge port (0.2–0.5 bar).

This design eliminates lubricant migration and bearing debris contamination, enabling wet or dry CIP (Clean-in-Place) without bearing removal.

- Mirror Polished Finish ( $R_a \leq 0.4 \mu\text{m}$ ): Achieved through progressive electro-polishing and mechanical buffing using diamond-impregnated media. The finish reduces powder adhesion by 70% compared to standard 180-grit finishes, validated by ASTM G21 microbial growth tests.

- Quick-Release Sieve Basket: Tool-free, cam-lock sieve basket retention allows basket change in under 60 seconds. Available mesh sizes from 0.5 mm to 12.7 mm (woven wire or perforated plate), with an anti-blinding wiper blade system mounted on the rotor.

- Direct Drive Gearmotor: A washdown-rated, IE4 premium-efficiency helical gearmotor directly coupled via a stainless steel torque arm. No belts or chains means no particulate generation from wear debris. Speed range: 150–450 RPM via VFD-ready design.

- Sanitary Hygienic Design: All welds are ground smooth, all internal radii  $\geq 6$  mm, and all seals are FDA-compliant silicone or FKM. The housing includes a hinged, counterbalanced access cover with a microswitch interlock for operator

safety.

## COMPLIANCE & SAFETY STANDARDS

The Doebritz Mirror Polished Sifter carries full ATEX certification for dust explosive atmospheres: Zone 20 (internal) and Zone 21/22 (external), complying with EN 13463-1 and EN 14462. NFPA 69 compliant for passive explosion isolation when fitted with an optional rotary valve-style outlet. CE marked to Machinery Directive 2006/42/EC and Pressure Equipment Directive (PED) 2014/68/EU for up to 10 bar g. Additional certifications available: EHEDG (European Hygienic Engineering & Design Group) Type EL Class I, 3-A Sanitary Standard 08-04, and FDA 21 CFR Part 177 for elastomers. The unit is third-party certified for dust-tightness to ISO 10648-2 (leakage rate  $\leq 10^{-3}$  Pa·m<sup>3</sup>/s).

## TECHNICAL SPECIFICATIONS

The following table lists key engineering parameters for the Doebritz Mirror Polished Sifter across three frame sizes (DFS-200, DFS-400, DFS-800). Values are nominal at 60 Hz operation with standard 316L construction.

<b>Parameter</b>	<b>Specification (DFS-200)</b>	<b>Specification (DFS-400)</b>	<b>Specification (DFS-800)</b>
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Capacity / Throughput (kg/h, bulk density 0.5 g/cm <sup>3</sup> )	200 – 1,500	1,000 – 8,000	5,000 – 25,000
Sieve Diameter (mm)	200	400	800
Mesh Opening Range (mm)	0.5 – 6.0	0.5 – 12.7	1.0 – 12.7
Flange Standard (inlet/outlet)	DIN 2633 DN100 / PN10	DIN 2633 DN200 / PN10	DIN 2633 DN350 / PN10
ANSI Equivalent	4" 150# RF	8" 150# RF	14" 150# RF
Rotor Speed Range (RPM)	150 – 450	120 – 400	90 – 350
Motor Power (kW)	0.75 (1 HP)	2.2 (3 HP)	5.5 (7.5 HP)
Max Operating Pressure (bar g)	1.0 (gravity) / 0.5 (pneumatic)	1.0 (gravity) / 0.5 (pneumatic)	0.8 (gravity) / 0.4 (pneumatic)
Surface Finish (Product Contact)	Ra ≤ 0.4 μm (mirror)	Ra ≤ 0.4 μm (mirror)	Ra ≤ 0.4 μm (mirror)
Overall Weight (kg)	85	210	520

