

DE BEERS GROUP

TECHNOLOGY

RhoVol

The RhoVol machine is a densimetric measurement system that determines the density of an ore sample, by measurement of the mass and volume of the sample, on an individual particle basis.

The machine processes batches totally autonomously and data is displayed live as it is captured, as well as in a standard spread sheet format on a per particle basis.

The Machine is material independent and density measurement range is programmable but not restricted.

SORTING - OPTIONAL

- Segregates particles in up to 10 bins
- Allows the user to sort according to any of the captured feature data



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FEATURES

- No toxic heavy liquids
- High speed weight measurement
- Auto calibrate capability
- External vibration compensated
- Semi-portable
- Safe and easy to use
- Hands free process
- Small sample size requirement
- High measurement repeatability
- Useable data format
- Material type independent
- Particle shape independent
- Adjustable top or bottom cut-off in density range measurement
- Specialized reconstruction algorithm to determine shape information
- Multi-pass functionality
- Sorting capability: Fines unit (-8mm +3mm) and Coarse unit (-25mm +8mm)

SPECIFICATIONS

- 1000 particles/hour average processing time
- Sample batch capacity 2 litres or less (-8mm +3mm), 8 litres or less (-25mm +8mm), dry, dust free
- Single particle feed regime
- 6 mg minimum particle mass
- 200 µg mass repeatability
- 150 g maximum particle mass (Fines)
- 250 g maximum particle mass (Coarse)

DATA AVAILABLE PER PARTICLE

- Weight
- Volume
- Density
- Sieve size (square and round)
- Flatness
- Elongation
- Compactness
- Roller gap size

AVAILABLE UNITS

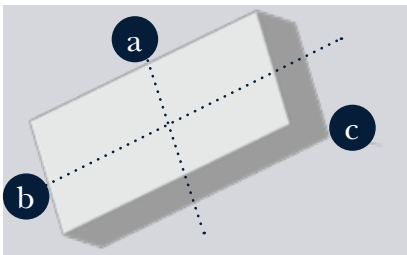
Model	Size range	Availability
RhoVol Ultra Fines	-3mm +1mm	Mid 2020
RhoVol Fines	-8mm +3mm	Currently available
RhoVol Coarse	-25mm + 8mm	Currently available



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DEFINING THE SHAPE FACTORS



Square sieve



Minimum enclosed sphere

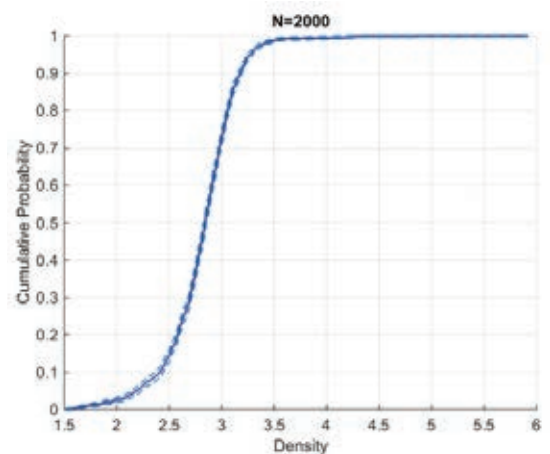
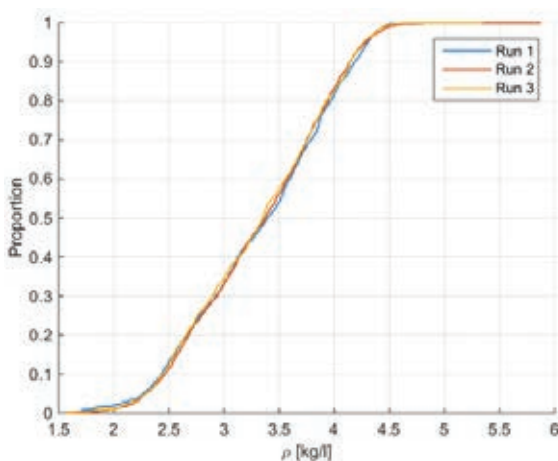


Round sieve



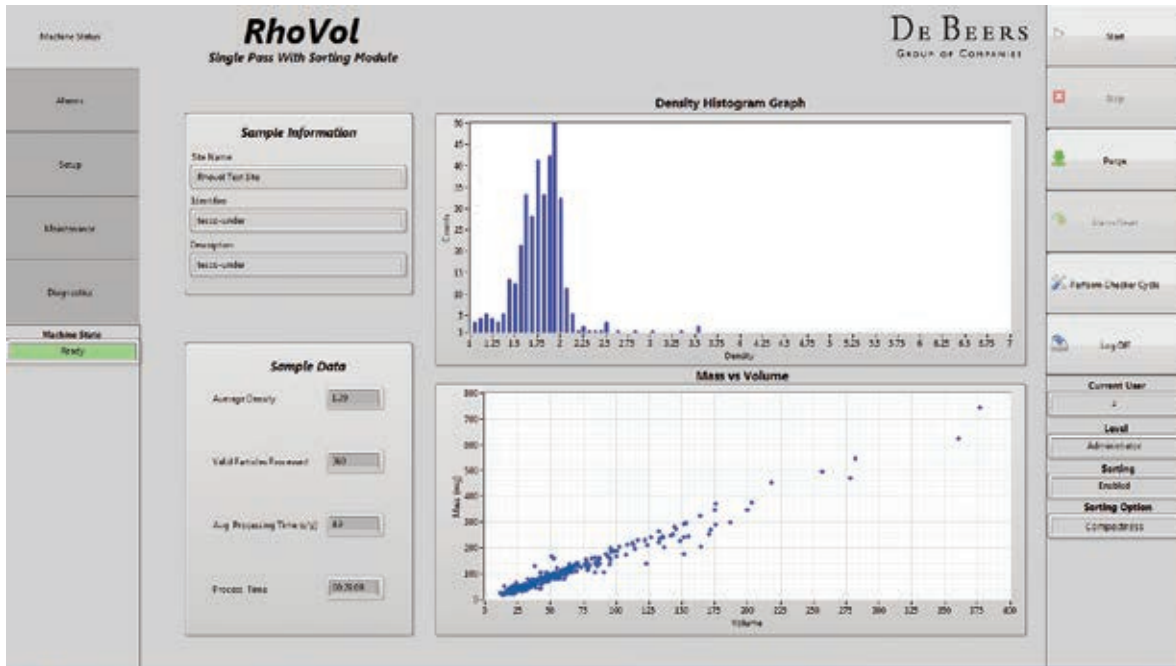
Calliper

- **a, b, c:** Calliper diameters along each of the particle's principal directions, resulting in 3 orthogonal measurements where 'a' is the longest calliper, 'b' the intermediate and 'c' the shortest. Measured in millimetres.
- **Flatness:** A value larger than 1 related to the flatness of the particle and defined by the ratio of b:c. A sphere has flatness equal to 1.
- **Elongation:** A value larger than 1 related to the elongation of the particle and defined by the ratio a:b. A cube and a sphere have elongation equal to 1.
- **Compactness:** A value smaller than 1 related to the compactness of the particle and defined by $\left(\frac{bc}{a^2}\right)^{1/3}$. A cube's and a sphere's compactness measures 1.
- **Volume:** The volume of the 3D model of the particle. Measured in cubic millimetres.
- **Smallest sieve size:** This measurement emulates the physical process of sieving using a square or round aperture sieve. Measured as the edge size of the smallest square or round hole through which the particle will pass straight through in millimetres.
- **Smallest gap size:** This measurement emulates gap sizing. Measured as the smallest gap that the particle will pass straight through in millimetres.



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DATA PRESENTATION



Measurement output online display

SORTER



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