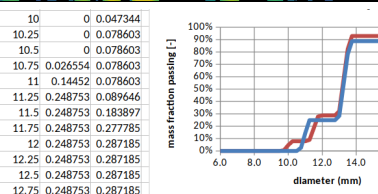
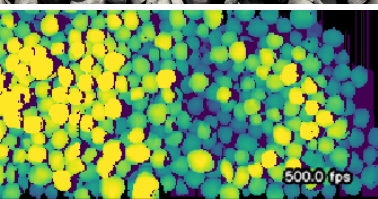
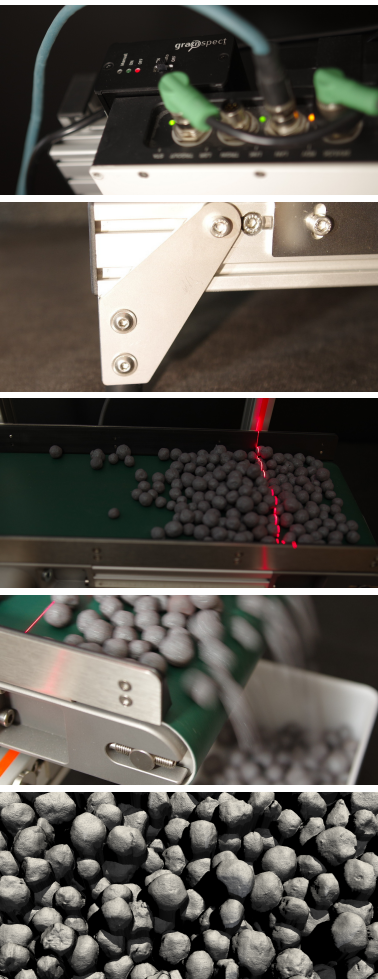


An important statistical characteristic of any granular material is the Particle Size Distribution, the **PSD**. PSD is evaluated using variety of methods, from sieve analysis to computer vision.

Laser-based evaluation is **fast, precise**, and can capture even **small pellets** (≥ 2 mm).

It can also estimate **sphericity** and the amount of **cracked** and **broken** pellets. Output data is ready for machine processing.



Laboratory PSD scanner

We are offering a lab-scale turnkey solution for fast, precise, small-sample 3D-laser-based PSD analysis. It comprises:

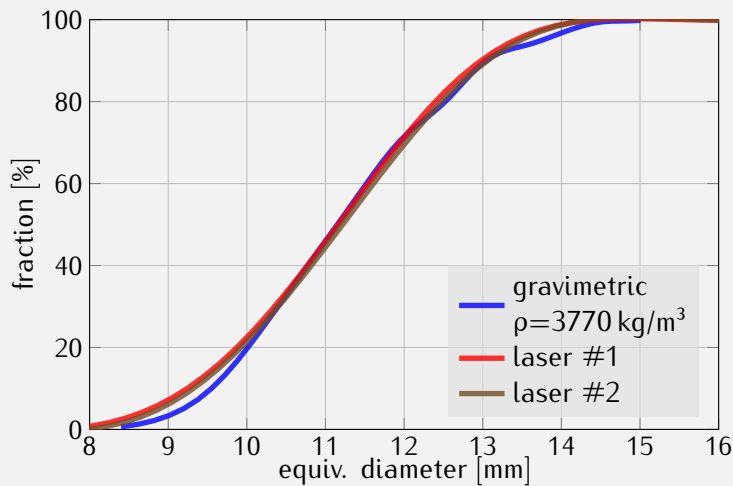
Integrated device with

- conveyor band (16cm width, 40cm length; precise velocity control and auto/manual start/stop)
- high-precision 3D line scanner;

Custom software for stream-lined control of the measurement:

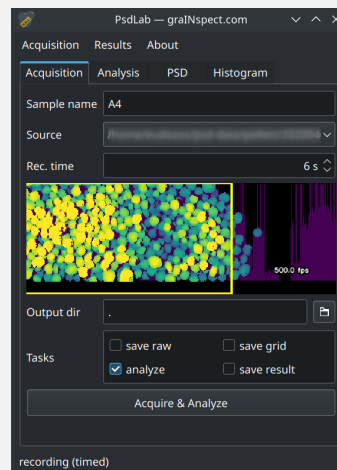
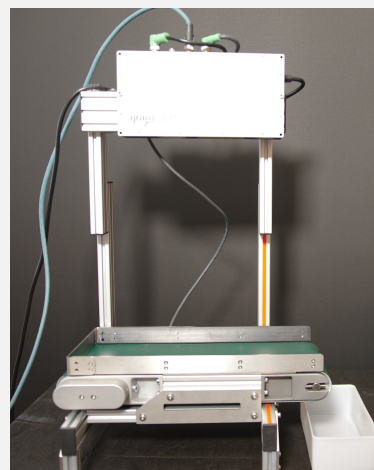
- calibration (optional; to match specific PSD sub-type);
- acquisition (tare, automatic start/stop trigger based on bulk on the band);
- analysis (based on advanced numerical analysis)
- result visualization and export (CSV, XLS, ...)

The analysis uses advanced mathematical methods to precisely describe bulk material scanned. The results were validated against lab-measured PSD (gravimetry with hydrometric/pycnometric density measurement) and through reproducibility.

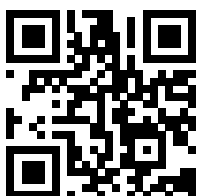


Technical specifications

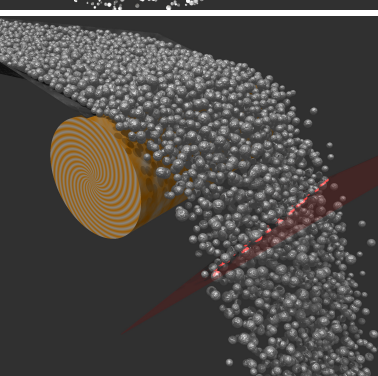
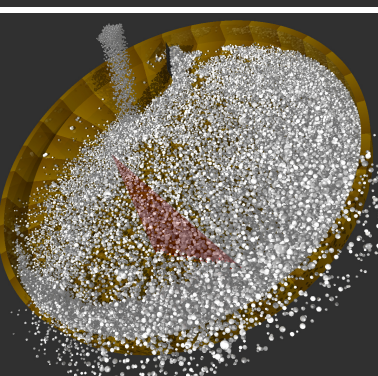
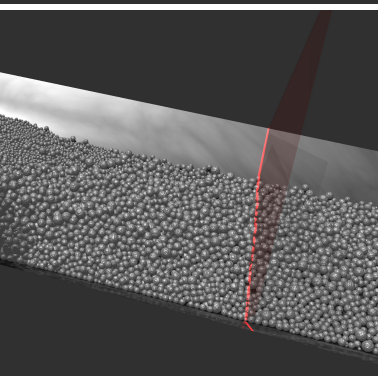
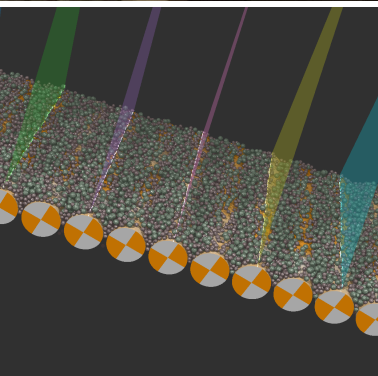
sample size: ≈ 0.2 –2 kg; **scanning time:** a few seconds, band travels at 50 mm/s; **analysis time:** ≤ 1 s; **grain size:** 2mm–40 mm (user-settable); **scanning resolution:** ≤ 0.1 mm; **cabling:** 110–240 V AC for band controller and scanner; GBit LAN (RJ45) for computer connection; **device weight:** 10 kg; **transport box:** 55×45×30 cm (wheeled; contains conveyor, stand, laser scanner; assembly time with included tools: 10min); **data security:** operates fully offline.



Visit our website for videos and further information on **gra(n)spect Lab**.



Reliable data acquisition is a vital ingredient for Industry 4.0 — for monitoring, regulation, tracking.



Conveyor / transfer point / chute monitoring

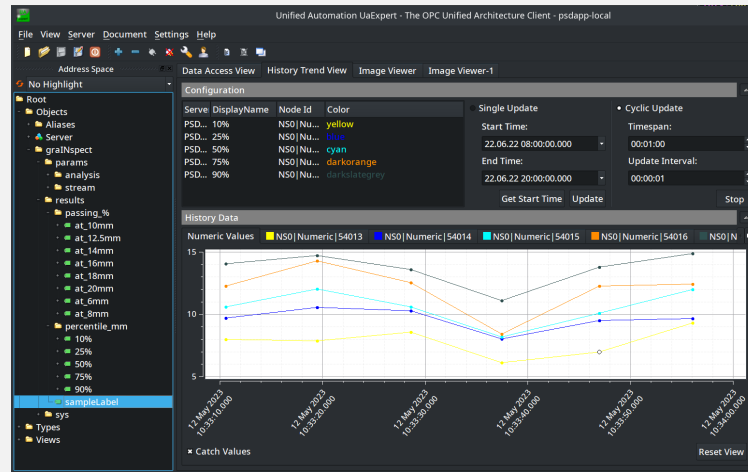
Turnkey solution for real-time, continuous, high-precision PSD monitoring. It comprises:

Laser scanner

- to be mounted 30–150cm away from moving bulk material (model-dependent);
- protected by enclosure with airblade;
- bulk speed can be arbitrary and irregular (such as in falling material, on pelletizing disc, ...);
- ad-hoc (handheld) operation possible

Electrical cabinet

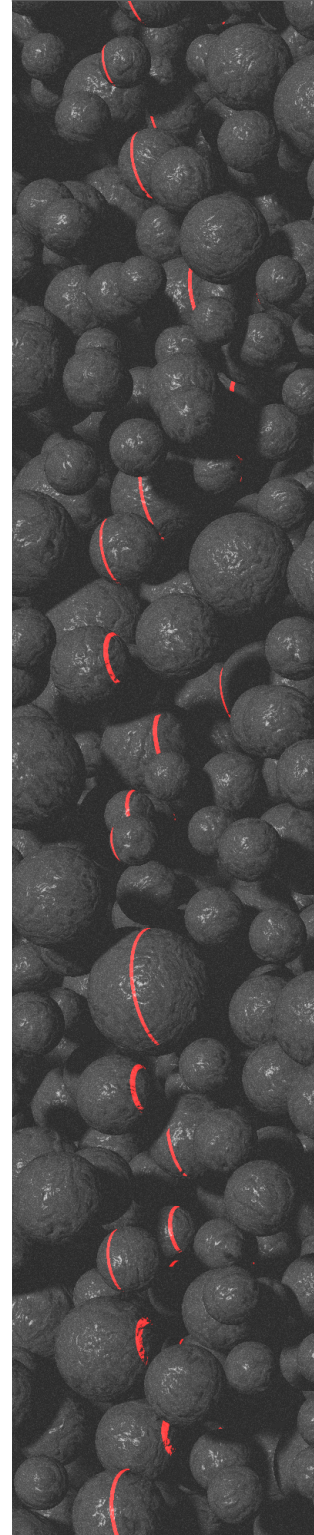
- connected to the scanner with power supply and LAN cables (up to 100m);
- passively-cooled IPC acquiring data from the sensor and exposing results over OPC/UA to the consumer;
- one cabinet with IPC can server more sensors;



Technical specifications

sampling width: sensor-dependent, 40cm—1.5m possible (resolution ≤ 0.1 mm); **mount:** 30–90cm above conveyor or chute (side-ways possible), enclosure with airblade; **laser class:** 2M or 3R depending on light conditions and sampling width; **weight:** < 10kg; **analysis rate:** every few seconds (configurable); **grain size:** 2mm—40 mm (user-settable); **interface:** results available in real-time over OPC/UA; **data security:** offline operation, no data being stored.

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