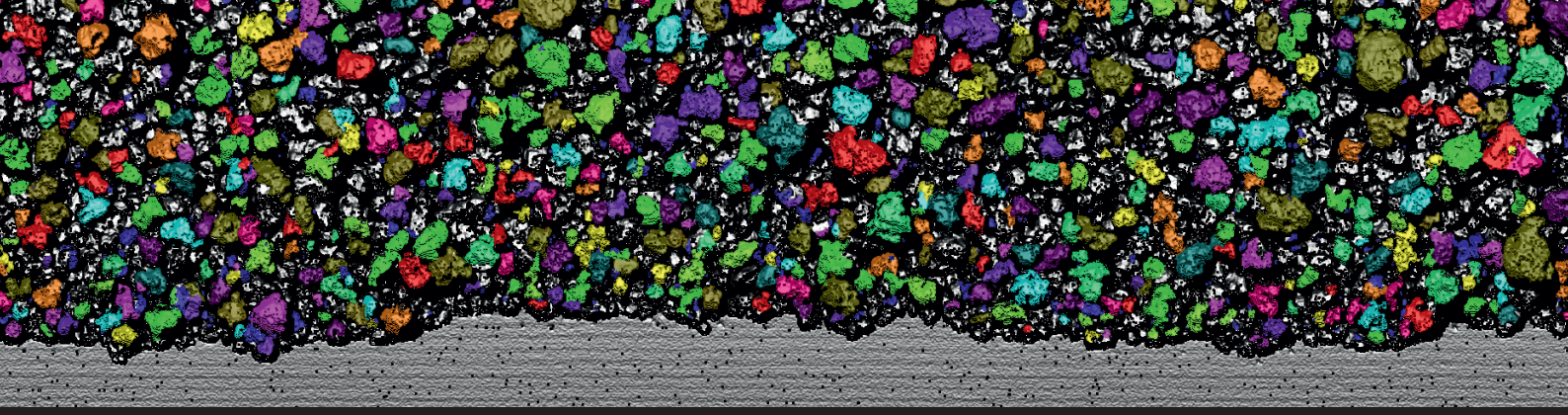
3DPM

3D Particle Measurement

Online particle size
distribution measurement
on conveyor belts

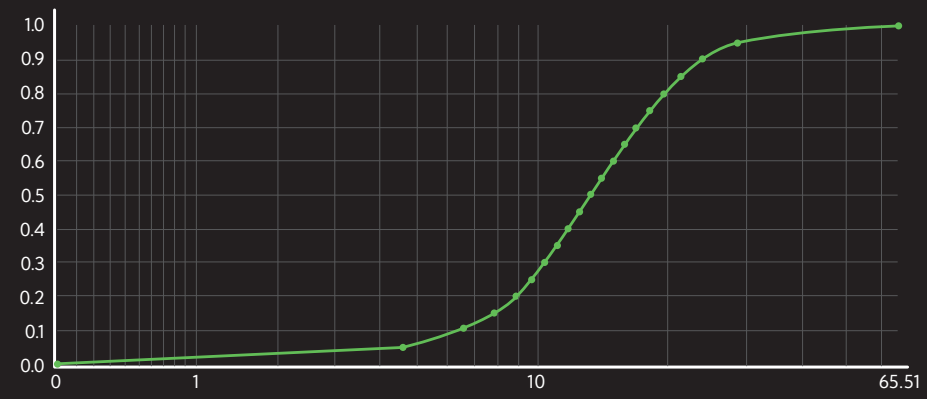
optimation

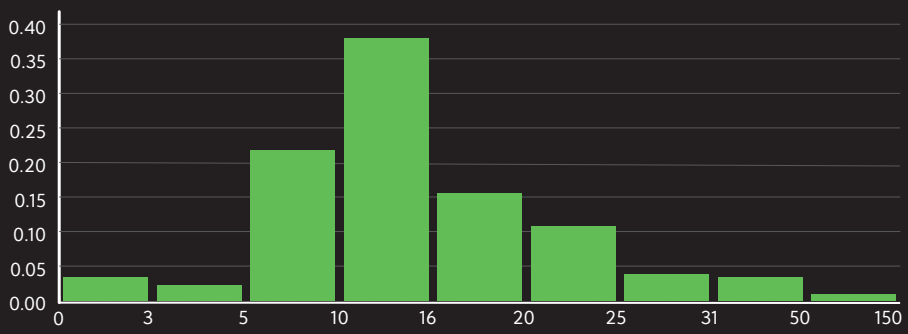


Optimise your process

3DPM is an automated online measurement system that provides particle size distribution estimations on conveyor belts. The system is designed to help companies in the process industry to keep particles such as crushed materials and granulates within certain size ranges, or in other words, to have control of the Particle Size Distribution (PSD).

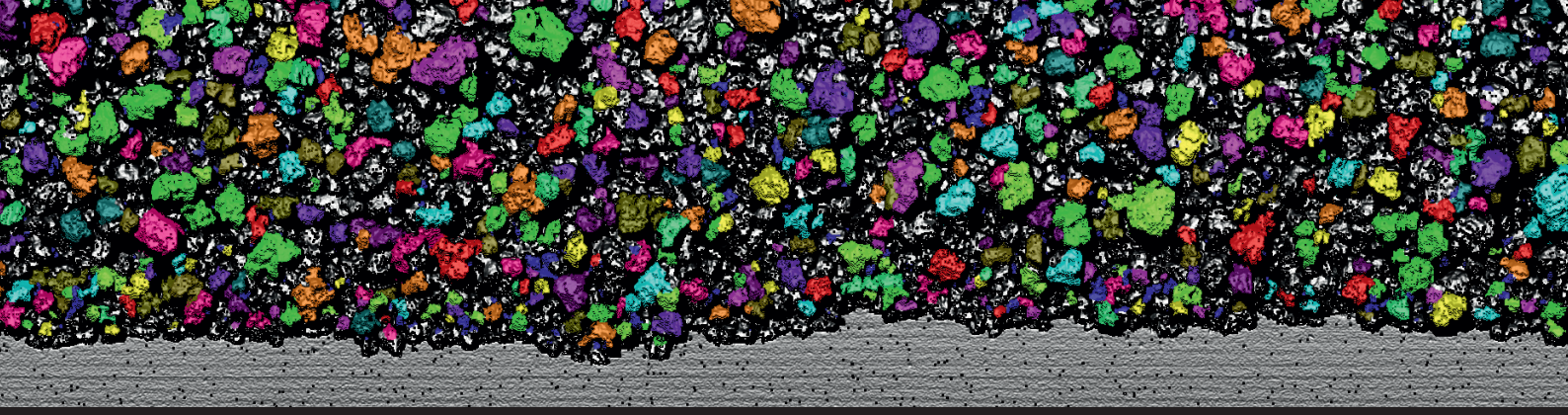
The system uses a robust laser and camera system that provides non-contact measurement of the 3D surface profile of piled particles. Advanced algorithms analyse the measured surface to detect individual particles and areas of fines to estimate the particle size distribution.





Online particle size distribution measurement allows

- New knowledge and new optimisations
- Knowledge about your process operation over days, weeks, months
- Size distribution monitoring, through complex transportation & storage chains
- Automatic control for crushing, grinding mills, pelletizing, agglomeration, kilns and other particle processes



Key benefits

- No calibration towards manual sieving is needed
- Reliable data over time since no re-calibration is needed
- Robust data despite process variations
- Only analyses fully visible objects – avoiding undersize errors
- Detects areas of fines – avoiding oversize errors
- No perspective distortion – avoiding size errors due to bed height variations
- Rugged equipment specifically designed for harsh environments
- Low maintenance over years of operation
- Highly accurate measurement regardless of conveyor belt and material colour variations
- Volume flow measurement included
- Bulk centre of gravity included

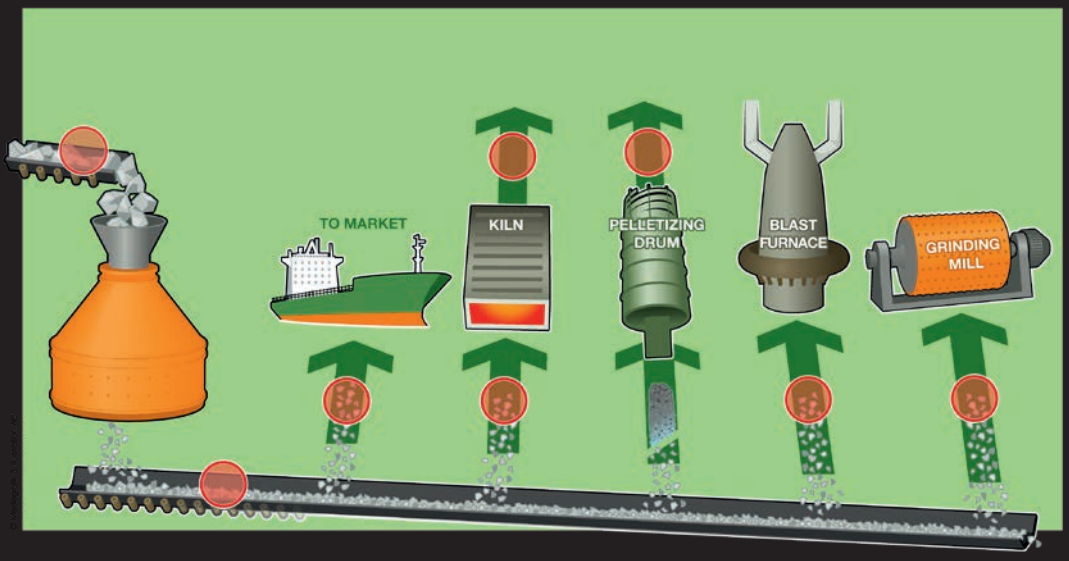
Result outputs

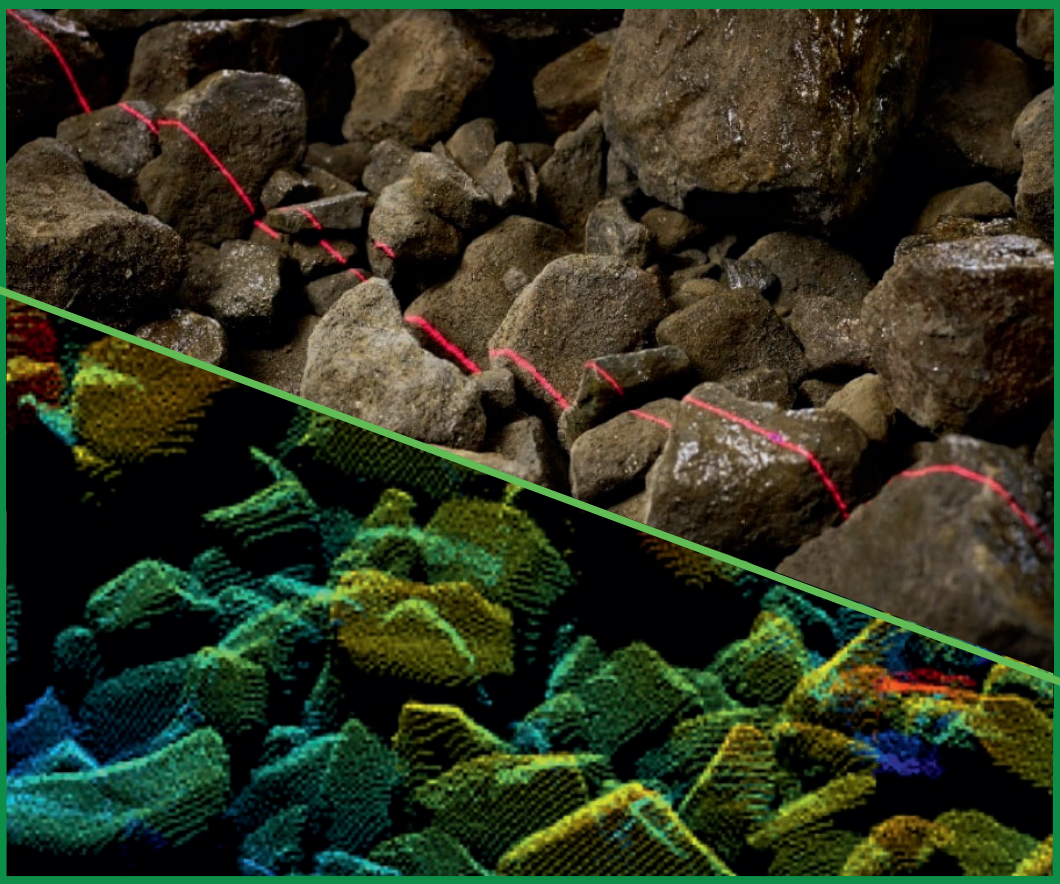
- PSD per customisable size class or as percent passing values
- Results as instant values and averages for monitoring trends
- OPC or Modbus interface for communication with PLC
- Web interface for easy access to results and system state
- Customised result output for your needs

Options

- Boulder detection
- Rock bolt detection
- Dust prevention
- Water cooling
- Electrical cooling
- Electrical heating

Possible 3DPM measurement positions





Client case

SAG mill closed loop control
IGO Limited, the owner and operator of the Nova Nickel Operation in Western Australia greatly improved grinding mill efficiency and stability using predictive control based on 3DPM® online particle size distribution (PSD) measurement. The company decided to purchase 3DPM after a successful trial.

The purpose of 3DPM is to increase knowledge and understanding of the material flow and thereby improve the production efficiency and quality in the mine. Commissioning of 3DPM was done smoothly by remote connection.

IGO Limited uses the 3D measurements size distribution (PSD) measurements of rock and bulk on conveyor belts as a "disturbance variable" in a model predictive controller for a SAG mill. The model can predict the effect on the SAG mill weight by up to 100 seconds in advance. This has greatly improved the stability of the grinding circuit as well as increased the energy efficiency of the Mill.

3DPM extras at IGO Nova Nickel operation
The rock bolt detection feature detects rock bolts in real time, alerting the operator and allowing them to stop the feed to remove the rock bolt. This feature enables IGO to act quickly and avoid unplanned downtime and costly damages.

REFERENCES

Country	Company / Industry	Material	Description
Australia	IGO	Nickel ore	SAG mill control
Australia	Rio Tinto	Iron ore	Mill feed Crusher verification
Finland	Pigment Industry	Agglomerated pigments	Automatic control
Ireland	Boliden, Tara	Zinc ore	Mill feed
Japan	Nippon Steel	Coke, Iron ore	Blast furnace feed
Japan	JFE Steel	Coke	Blast furnace feed
Sweden	Boliden, Aitik	Copper ore	Mill feed Crusher verification Oversize detection
Sweden	LKAB	Iron ore pellets	Pelletisation control
Sweden	Nordkalk	Limestone	Ship loading
Sweden	Boliden, Garpenberg	Complex ores	Mill feed, oversize and rock bolt detection

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