

## FAQS

### What does the Magnetic Resonance Analyser “sense” in ore?

Whereas some other sensors measure characteristics of ore like density, surface composition/colour, or permittivity/conductivity, the Magnetic Resonance Analyser is capable of delivering real-time readings of the weight of the target mineral in the ore. This is combined with data collected from a weightometer to deliver accurate grade measurement of the ore stream on a metre-by-metre basis.

### What accuracies can Magnetic Resonance measurements achieve?

The Magnetic Resonance sensor has delivered sensing resolutions less than 0.05% copper\*.

### How is NextOre’s technology different from competing sensing and sorting technologies?

Magnetic Resonance is a true bulk sorting technology. Because the radio waves easily penetrates tens of centimetres into the ore, it does not need a direct line of sight to each particle. The sensor can be mounted to existing conveying equipment without the requirement for special preparation. Sorting of ore at conventional mining rates exceeding 5,000 tonnes per hour is achieved without the requirement for complicated and costly materials handling and preparation equipment.

The sensor delivers highly accurate, real-time grade measurements and instructs a diverter to selectively remove material below a cutoff grade as opposed to estimating whether material should be rejected or not based on characteristics of the sensed material.

\* Sensor performance quoted for copper as chalcopyrite at full production rates.

### What size material can be measured and sorted?

Primary crushed ore with top size below 350mm is recommended.

### Can a single Magnetic Resonance sensor be configured to measure more than one target mineral?

Yes, in some cases the Magnetic Resonance Analyser can be configured for simultaneous detection of multiple minerals, if required.

### Does the presence of magnetic or paramagnetic material interfere with the measurement?

No it does not, the measurement is tolerant of high levels of magnetic minerals such as pyrrhotite and magnetite.

### Will Magnetic Resonance-based sorting work for my operation?

The main characteristics to assess when determining the applicability of Magnetic Resonance-based sorting are ore mineralogy and the variability of grades within the ore, called heterogeneity. The very first stage of analysis by NextOre will include an assessment of the minerals for detection, the in-situ heterogeneity of the ore, and the expected ore “mixing” that will occur as a result of operations prior to sorting.

### Are there any safety restrictions associated with the use of Magnetic Resonance sensing?

No, the technology uses low energy radio waves similar to those of a microwave or AM radio and are easily shielded with thin metal sheets.

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NEXT  
ORE



MAGNETIC RESONANCE  
TECHNOLOGY  
DEVELOPED BY CSIRO



# NEXT ORE

BREAKTHROUGH ORE  
SORTING TECHNOLOGY



## BELT-MOUNTED ORE SENSING AND SORTING

NextOre's unique Magnetic Resonance technology, developed over the past 20 years by CSIRO, measures the grade of primary crushed ore in real-time as it passes through the sensor on any conventional conveyor belt. The sensor autonomously directs a downstream diverter to selectively sort "pods" based on measured grade.

### Magnetic Resonance Analysis

- Delivers direct measurement of weight percentage grade
- A genuine bulk sorting technology, capable of sensing at rates over 5,000 tonnes per hour on a single belt
- Real-time measurements delivered in seconds
- No ongoing calibration required
- Primary crushed ore - no further preparation needed
- Easily installed onto existing belts.



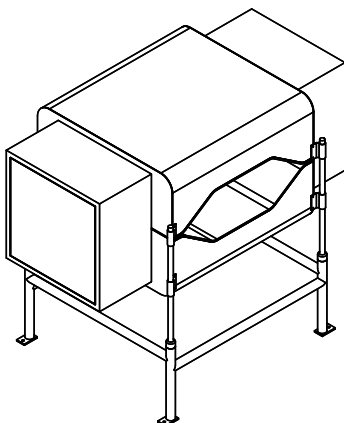
## HOW IT WORKS

Magnetic Resonance is a form of radio frequency spectroscopy that can be used to count the atoms of a target metal in a sample.

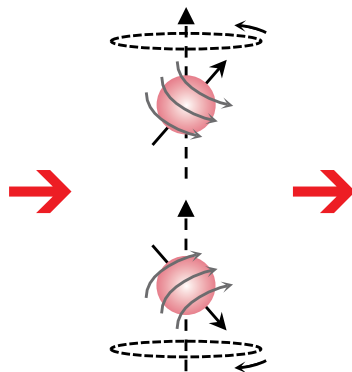
The NextOre Magnetic Resonance sensor is mounted around a conventional conveyor belt. As ore on the belt passes through the sensor, it is subjected to pulses of radio waves set to the signature frequency of the target mineral.

The resonating ore produces a radio field burst, known as a "spin echo" which is quantitatively measured by the sensor. The data generated by the Magnetic Resonance analyser presents as real-time weight measurements of the target metal which, combined with weightometer readings, provides real-time grade as weight percent of the material.

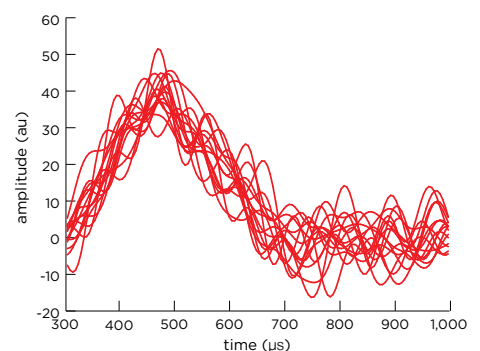
Electromagnetic pulses sent into ore stream



Atoms within the mineral resonate at their signature frequency



The "spin echo" response is received by the sensor



## VALUE FROM SORTING - MINING

### Improved economics for remote pits

- Reject waste material prior to transport
- Reduce trucking fleet sizes and costs
- Unlock value from satellite orebodies

### Extended life in mature operations

- Gain value from low grade stockpiles or Resources of declining grade without displacing higher value material

### Increased Mine Recovery through decreased mining cut-off grade

- Lower grade material can be improved prior to being sent to the mill
- Overall mining recovery improved without displacing higher grade feed
- Delivers effective reductions in strip ratio and associated mining costs on a per unit of metal production basis

## VALUE FROM SORTING - ENVIRONMENTAL & COSTS

### Reduce processing plant size

- Lower overall capital cost to achieve the same metal production
- Eliminate or reduce requirement for capital expansion projects to maintain output

### Reduced energy and water consumption

- Comminution, flotation and leaching account for the vast majority of energy and water usage at mine sites
- Feed tonne reductions deliver proportionate reductions in energy and fresh water requirements

### Smaller tailings footprint

- Tailings storage and rehabilitation are major ecological and cost considerations throughout the life of mine
- Sorting allows operations to materially reduce the overall footprint of tailings facilities and processing facilities

