

# WEIGHING INSTRUMENTS PROVIDE SUPPORT IN IMPROVING MINERAL EXTRACTION PROCESSES

Minerals such as gold, platina and zinc are extracted from mines and quarries. The extraction process involves equipment ranging from heavy machinery to all kind of weighing instruments. Weighing instruments always have been used to measure the mass of the extracted materials to ensure fair trade. More recently, new accurate weighing technologies are developed to contribute to safer and more efficient mineral extraction, positively influencing the profitability.



## EXAMPLES OF WEIGHING INSTRUMENTS IN MINERAL EXTRACTION

The main use of weighing instruments in mineral extraction is weighing the mass of the minerals. This can be the total mass of the ores or only the extracted minerals. Depending on the process and needs the weighing options vary. Ores can be weighed via static and dynamic weighbridges for vehicles and on rail. The heaviest off-road trucks with a gross weight up to 250 tonne are weighed on special robust platforms and sensors to withstand the highly concentrated loads and occasional overloaded vehicles. When rail cars are used the coupled in-motion rail scale eliminates coupling and uncoupling of rail cars. Axle weighing occurs accurately whilst cars are moving on the scale at slow speed making it faster and safer than using the static weighing.

Other solutions like on-board weighing systems in the trucks transporting the ores, weighing sensors installed in silos, belt weighers or continuous weighing systems used at the extraction sites contribute to covering all needs.

In assay laboratories activities such as handling regulus, lead buttons and ore samples require precision work and reliable high-precision instruments are available for these purposes.

Weighing instruments also contribute to higher efficiency, by measuring output all over the mine. With systems that weigh the load of each machine handling the ores the performance of an operator can easily be measured. Based on these measurements improvements can be suggested, such as avoiding under-loading which requires the machine to move more with less material. Another option is to combine the measurements with fuel consumption data, to analyse how to improve fuel efficiency.

## THE FUTURE OF MINERAL EXTRACTION AND THE ROLE OF WEIGHING INSTRUMENTS

New weighing technologies will gather more and more data in the future and this data will be integrated in data systems. The dataflow will make it easier to optimize processes as real-time data on aspects, such as stocks and traffic flows, can be constantly shared. This will increase profitability and have positive environmental benefits by reducing operational inefficiencies. Additionally, constant developments of weighing instruments, such as more accurate dynamic weighing will allow for faster weighing which will speed up the weighing process.

