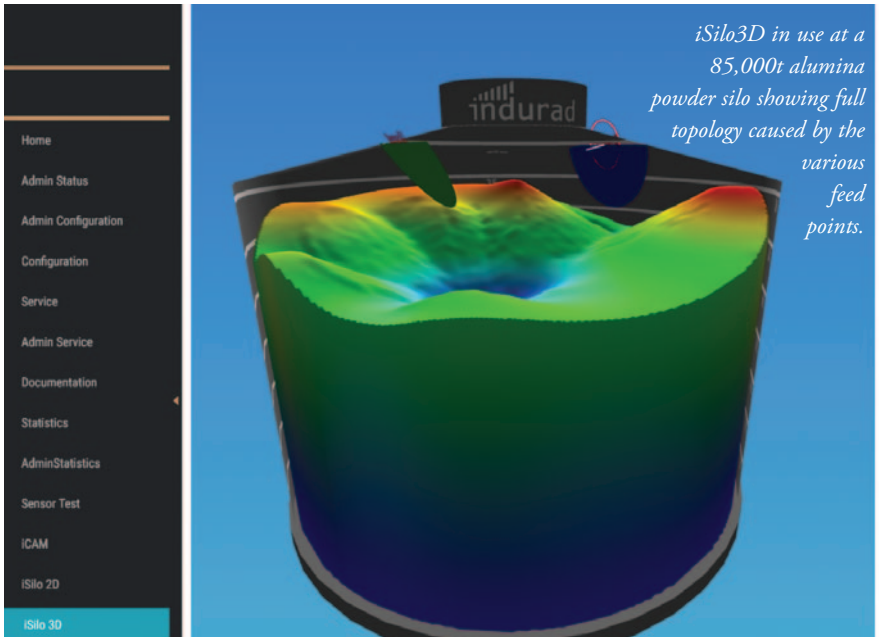
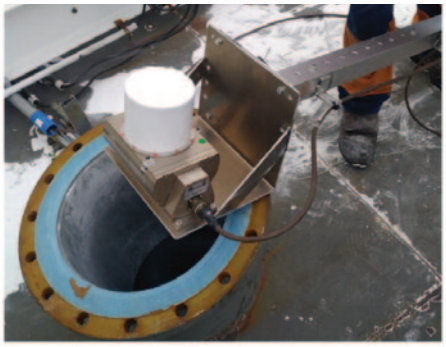
indurad sensors for a streamlined stockyard



iSilo3D in use at a 85,000t alumina powder silo showing full topology caused by the various feed points.



indurad develops and manufactures unique 2D and 3D radar sensors in Germany and is a market leader in industrial imaging radar solutions. Since its foundation in 2009, the company's radar sensors have mostly been used to improve mining and bulk material handling.

During Covid-19, indurad has benefited from its global presence and by having its manufacturing facilities near its primary Germany-based supply chain. Through an extensive partner network close to customers and its own sales and service centres — in Chile, Brazil, Canada, US, South Africa and Australia — indurad was able to provide solutions to customers and service them almost without interruption.

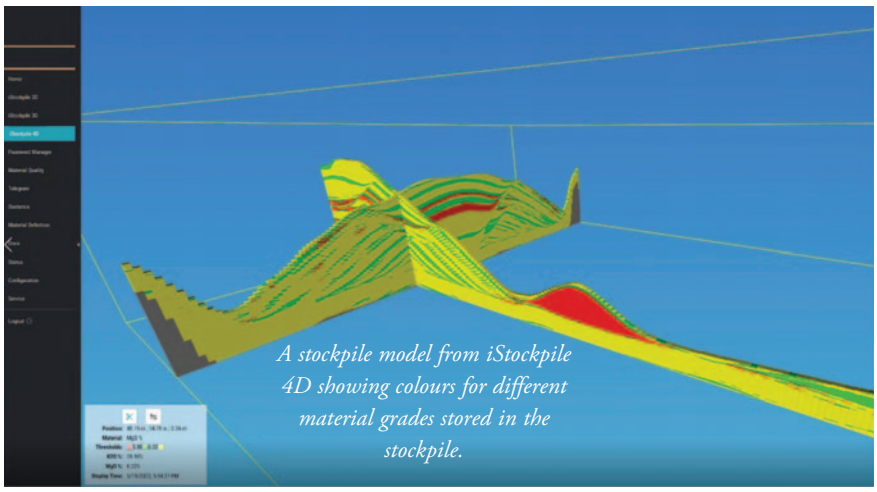
Furthermore, during this time, the company invested in a focused development to mature its product portfolio. New radar sensors were developed, adding significant value by enabling user configuration and 3D views of material in the user interface which runs on a web browser via an HTML5 page hosted locally on indurad's processing unit. Two examples of this are the belt volume scanner (iBelt) and the silo material scanner (iSilo3D) which can now be commissioned by integrators or even customers. This significantly reduces the cost to customers as installation, travelling and commissioning times are reduced.

The iSilo3D system has recently been installed at several sites with fantastic feedback from customers, stating that it provides them "peace of mind," "finally connects us with our inventory" and "First time we understand what's happening in the silo and can optimize the process to reduce segregation." The reduced price now allows these products to address further applications beyond mining, such as cement, biomass and alumina.

The most significant improvement in the software, however, was an upgrade of the stockpile scanning system — iStockpile4D. It is now also available with a material and quality tracking tool that is considered a game changer for many operations. The system is based on a permanent 3D stockpile scan which is used to create a 4D Voxel-based model of the stockpile where time is the fourth dimension. This allows all data associated to the material (such as material quality, source, age, etc.) to be stored in a versatile database. It also permits the incorporation of data from cross belt analysers, other devices and even lab results into the 4D Model at any time, even weeks after the material was deposited.

Each of the Voxels has a dynamic height, which allows an increase in accuracy compared to other mathematical models. The permanent 3D scan also allows the software to measure pile compression over time. This means that the stockpile model represents the material quality distribution, while taking material changes into account (dewatering, compression etc.).

When the reclaiming begins, the iStockpile solution calculates the volume of the material to be reclaimed, including the assigned material quality. This allows operations to dispatch exactly the material quality the customer ordered without accidentally delivering a higher quality. Customer savings are in the millions of dollars here, as can easily be imagined. "Being able to deliver a robust ground truth across the full process chain from ROM piles, crushing, screening [up to] product stockpiles allows our customers to optimize the process control, logistics, reconciliation and working capital in the mine," says Dr. Christian Augustin.



A stockpile model from iStockpile 4D showing colours for different material grades stored in the stockpile.