

# RUSSELL MINERAL EQUIPMENT

## AUTOMATING MILL RELINING SYSTEM DEVELOPMENT WITH SOLIDWORKS SOLUTIONS



Russell Mineral Equipment relies on SOLIDWORKS design, simulation, product data management, and technical communication solutions to accelerate development of its world-leading RME Mill Relining System products for the hard rock mining industry.



**RUSSELL**  
MINERAL EQUIPMENT

### Challenge:

Automate and accelerate the design and manufacture of mill relining machines and associated equipment, comprising large assemblies of as many as 6,000 parts, to shorten turnaround times and increase throughput.

### Solution:

Implement SOLIDWORKS design, SOLIDWORKS Premium design and analysis, SOLIDWORKS Simulation analysis, SOLIDWORKS Simulation Professional analysis, SOLIDWORKS Enterprise PDM product data management, SOLIDWORKS Electrical design, SOLIDWORKS Composer technical communication, and SOLIDWORKS Gold Partner DriveWorks design automation software solutions.

### Benefits:

- Shortened mill relining machine design time from three months to seven days
- Reduced proposal and quoting preparation time from a week to a day.
- Cut proposal and quote drawing generation time from six hours to 15 minutes
- Increased production volume fourfold

Russell Mineral Equipment (RME) is the world's leading manufacturer and supplier of specialized equipment and services for the hard rock mining industry. RME Mill Relining System products and services make the maintenance of grinding mills faster and safer, and have boosted the productivity of mine sites in more than 45 countries. Headquartered in Toowoomba, Australia, RME exports roughly 90 percent of its equipment, which is distributed through its global network of regional service centers in North America, South America, Australia-Pacific (also serving Eastern Europe and the Middle East), and South Africa.

According to RME Engineering Manager Andrew Limpus, RME adopted 3D CAD technology in 1997, when the company decided to upgrade from AutoCAD® 2D design tools to 3D. RME management understood the immediate benefits of 3D as well as how the maturation of 3D design technology carried the potential to provide additional automation opportunities.

"Most of our business is based on custom development of mill relining systems," Limpus explains. "Each grinding mill is different and requires a custom, one-off design. However, we believed that 3D would ultimately let us utilize a range of standard components, configurations, and subassemblies, and that eventually we would be able to further automate the design and configuration of each system. Moving to 3D would allow us to speed up turnaround on proposal development, design, production, and assembly."

RME chose to standardize on SOLIDWORKS® design software because it's easy to use, fully integrates additional design and engineering solutions, and provides the best value. Since 1997, RME has expanded its SOLIDWORKS implementation to include additional solutions and today has 39 SOLIDWORKS Standard, two SOLIDWORKS Premium, one SOLIDWORKS Simulation Standard, three SOLIDWORKS Simulation Professional, 50 SOLIDWORKS Enterprise PDM (EPDM), 10 SOLIDWORKS EPDM Viewer, three SOLIDWORKS Electrical 2D, two SOLIDWORKS Electrical 3D, and one SOLIDWORKS Composer™ licenses. RME has also added SOLIDWORKS Gold Partner DriveWorks® design automation software.

### FASTER QUOTING, DESIGN, AND TURNAROUND

Since implementing SOLIDWORKS and DriveWorks software, RME has achieved substantial efficiency improvements at each phase of RME Mill Relining System development, including proposal and quoting preparation, machine design, and machine production and assembly. By automating the design and configuration of its systems, RME can output proposal drawings in minutes, complete a machine design in seven days, and deliver a machine in half the time required when using more traditional methods. These productivity gains have enabled RME to increase its production throughput fourfold without adding headcount.



**"With SOLIDWORKS solutions,  
we've grown from a  
project-based company  
into a production company."**

**— Daniel Haines, RME SOLIDWORKS Coordinator**

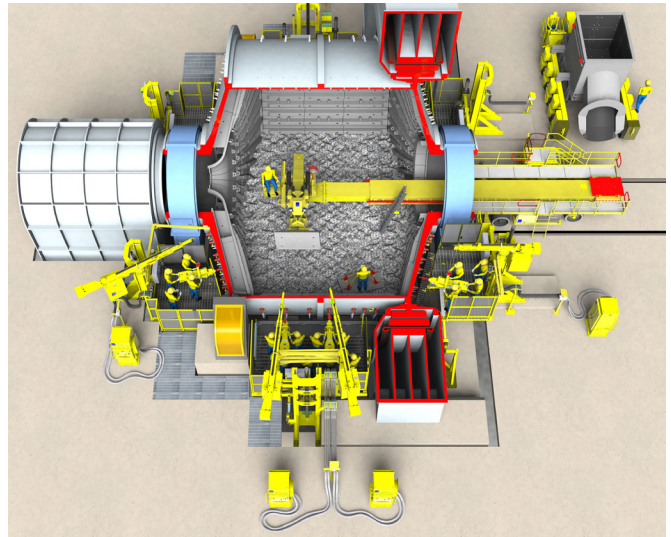
"When we receive a mineral concentrator plant layout, we use SOLIDWORKS and DriveWorks software to automatically configure an RME Mill Relining System specific to that particular plant and create the models, including interference checks and dimensioning. We then output drawings, which are included with the proposal and quote," says RME SOLIDWORKS Coordinator Daniel Haines. "That process used to take a week. Now, it only requires a day. Drawings that used to take four to six hours to generate, now take 15 minutes, and once our proposal is accepted, we can complete final machine design, which used to take three months, in seven days."



## AUTOMATING WORKFLOWS WITH EPDM

RME has achieved significant productivity advances by combining the performance of SOLIDWORKS sheet metal, weldments, and large assembly design capabilities with the workflow automation afforded by SOLIDWORKS EPDM software. Although RUSSELL Mill Relining Machines can include more than 6,000 individual parts, the company does not have to lightweight parts or utilize cutback assemblies when designing large assemblies, aided by the 64-bit performance improvements of SOLIDWORKS software. While SOLIDWORKS and DriveWorks software accelerate design configuration, the SOLIDWORKS EPDM system automates final design release to production planning, manufacturing, and assembly processes.

"With SOLIDWORKS solutions, we've grown from a project-based company into a production company," Haines emphasizes. "EPDM software formalizes and controls our actual procedures and workflows, from initial proposal development through design, production planning, and release of drawings and models to production. We currently have more than two million files in our EPDM Vault, which totals over 2.4 terabytes of data."



In addition to taking advantage of multiple SOLIDWORKS product development solutions, Russell Mineral Equipment leverages SOLIDWORKS Gold Partner DriveWorks design automation software to automate development, realizing dramatic time savings as a result.

## FEA IMPROVES QUALITY

Using the finite element analysis (FEA) capabilities of SOLIDWORKS Simulation software, RME has improved the quality of its products and has greatly reduced the number of assembly errors. "We run a complete FEA structural analysis across critical assemblies on every project before cutting steel," Limpus notes. "We're able to do this more efficiently because we can run a SOLIDWORKS Simulation study in just an hour or two."

"By incorporating SOLIDWORKS Simulation FEA into our process, assembly markups are negligible and have become rare," Haines adds. "The ability to predict the stresses in every part of a RUSSELL Mill Relining Machine and put the assembly through range of motion studies not only gives us more confidence in the design, it results in better quality products."

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