ASTEC INDUSTRIES ENHANCES INDUSTRIAL EQUIPMENT DESIGN WORKFLOWS WITH NVIDIA RTX

Image courtesy of ASTEC Industries

"Using Altair EDEM with NVIDIA RTX GPUs, ASTEC has been able to optimize the design of our aggregate dryer to increase efficiency. This provides ASTEC and our customers a competitive advantage with lower running costs and reduced emissions."

—Andrew Hobbs, Head of Simulation and Modeling, ASTEC Industries, Inc.

Manufacturing company uses the computational power of NVIDIA RTX A6000 to simulate realistic particles faster than before.

CHALLENGE

ASTEC Industries is a global OEM serving the infrastructure and mining industries. Hot mix asphalt plants are a key product line for ASTEC, and customers use ASTEC plants to produce the mix for roads all over the world. Drying and heating aggregate (various sizes of crushed rock and sand) is a necessary but energy intensive stage in the process of producing hot mix asphalt, but it can be very energy intensive. So improving thermal efficiency is a key priority to make asphalt plants more sustainable. Simulation like discrete element method (DEM) has helped ASTEC improve their designs. Many discrete element method (DEM) codes use spherical or clumped spherical particles to simulate materials like aggregates, which can be irregularly shaped. ASTEC wanted an advanced solution that could not only improve the realism of the material shape representation in their aggregate simulations, but also help them do more upfront simulations to evaluate concepts, see trends and eliminate weaker designs early in the product development cycle.

SOLUTION

Spherical particles models based on spheres are typically easier to compute, but to accurately match realistic shapes a large number of clumped spheres are required. The **NVIDIA RTX A6000** provides more computational power that allows ASTEC to simulate more realistic polyhedral particles without increasing computation time. When testing the NVIDIA RTX A6000 running on the CUDA-based solver, ASTEC experienced 90x faster performance over the previous solver when simulating realistic particle shapes. Using **Altair EDEM** with NVIDIA RTX GPUs, ASTEC has been able to optimize the design of their drum dryer to improve efficiency. This provides ASTEC and their customers a competitive advantage with lower running costs and reduced emissions. Instead of sphere-based particles, the CUDA-based polyhedral solver in Altair EDEM allows for more realistic particle shapes, and the A6000 provides the enhanced speeds that make simulating at the industrial scale achievable.

IMPACT

By using EDEM with **NVIDIA RTX** GPUs, ASTEC has optimized the design of their dryer to increase efficiency, providing ASTEC and their customers a competitive advantage with lower running costs and reduced emissions. With greater thermal efficiency, lower emissions are released into the atmosphere and less fuel is used. Reduced fuel consumption makes ASTEC plants more profitable for customers. For example, a 1% improvement in thermal efficiency can lead to tens of thousands of dollars in savings over the course of a year for a single plant. The ability to perform complex simulations much faster using NVIDIA RTX GPUs enables ASTEC to troubleshoot equipment problems in the field helping customers improve plant operations and reduce downtime. More importantly, it helps ASTEC simulate many of these potential worst-case scenarios during the design phase, reducing the risk of expensive field failures.

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