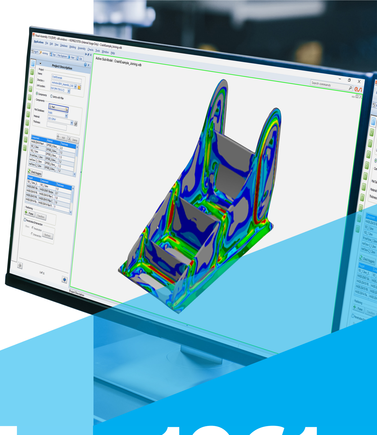
Six reasons why Heavy Machinery Manufacturers trust ESI SYSWELD

See how **welding simulation** helps deliver consistent quality and optimal durability.



+49% Growth

By 2030, it is expected the global construction equipment market size will have grown from **$157B to $234B**. That's a lot of welding and assembly.[1]

11.5 Million

This is the material tonnage that an average articulated truck might be expected to shift in its lifetime. **That's more than the weight of the Eiffel Tower.**[2]

1961

The first ever industrial production robot welded cast parts onto car bodies. Now, heavy equipment makers rely on **robots for up to 70% of welding.**[3]

In an era of transformative change marked by the rise of electric vehicles and a growing emphasis on environmental sustainability, **heavy machinery manufacturers face strategic challenges like never before.** The industry strives to deliver machinery that is not only robust and productive but also environmentally friendly and safe. Meeting these objectives necessitates innovative solutions, and at the forefront is ESI SYSWELD, a proven welding and assembly simulation software.

These are the top 6 benefits of ESI SYSWELD for heavy machinery manufacturing.

1 Minimize the time and cost to market by shorting product development cycle.

Harnessing the power of advanced virtual planning and defect analysis before production empowers designers and engineers to expedite the development of optimal components or products with precision and efficiency.

2 Reduce the need for physical prototyping.

ESI SYSWELD provides a robust virtual simulation environment; by accurately modeling welding and assembly processes, it allows for thorough testing and validation, reducing the need for costly, time-consuming, late-stage physical prototypes or try-outs, enhancing efficiency and productivity.

3 Control and optimize material characteristics, production process, and product quality.

Advanced simulation enables detailed analysis and manipulation of parameters like material properties, welding parameters, and process conditions. By fine-tuning these factors in a virtual environment, engineers can rapidly achieve optimized results, superior weld quality and efficient utilization of materials.

4 Keep distortions within specified tolerances.

ESI SYSWELD simulations assist designers and engineers with meticulous prediction of distortion potential - facilitating proactive refinement of designs and processes to ensure the product conforms to dimensional and structural specifications. The result: less costly rework and enhanced product quality.

5 Enhance product performance and overall service life of the welded structures.

Engineers can optimize various parameters such as clamping positions, welding directions and sequences, and heat inputs for improved weld integrity, reduced residual stresses, and enhanced structural durability. Ultimately, ESI SYSWELD helps you deliver an extended service life of the welded structures, positively impacting the product's reliability.

6 Accelerate cross-process innovation.

ESI SYSWELD can examine processes - even non-standard or not-yet-in-production and deliver an in-depth analysis so you can experiment and explore various scenarios without needing to establish expensive physical or intricate testing setups. This functionality reduces costs and accelerates the testing and experimentation phase, enabling a more efficient and agile approach to process optimization and innovation.

75% Saving

A heavy vehicle manufacturer optimized their processes with welding simulation software – **reducing distortion by 75%** and totally eliminating rework.[4]

$1000 Per Hour

That's the estimated cost of a mining dump truck downtime – "and an excavator costs even more." **Can you afford for your welding to fail?**[5]

4-6 Times

A welding robot may be faster and more productive than a skilled human welder – **but both play an important part in Heavy Machinery manufacturing.**[6]

See how ESI SYSWELD delivers:

- **Distortion Control for Body and Chassis Assemblies**
- **Heat Treatment Simulation**
- **Weld Quality and Performance**

Learn more

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1 - Source: Statista, Precedence Research 2023 - https://www.precedenceresearch.com/construction-equipment-market
2 - Source: Calculation at 40T capacity truck running 10 hours a day, 240 days a year, for 20 years
3 - Source: Guinness World Records website "First industrial production robot" - https://www.guinnessworldrecords.com/world-records/41556-first-industrial-production-robot
4 - Source: ESI Group customer example Cyntel Onibus - https://www.esi-group.com/customer-successes/cyntel-onibus-reduces-distortion-by-75-using-weld-planner-simulation-software
5 - Source: Mitigating the cost and perils of downtime in mining - https://www.engineeringnews.co.za/article/mitigating-the-cost-and-perils-of-downtime-in-mining-2022-06-29
6 - Source: Calculating ROI for Automated Welding Equipment - https://www.assemblymag.com/articles/94629-calculating-roi-for-automated-welding-equipment