

ESI launches SYSWELD 2017

Virtual Engineering Software for Assembly, Welding and Heat Treatment

Paris, France – September 14, 2017 – [ESI Group](#), leading innovator in [Virtual Prototyping](#) software and services for manufacturing industries, announces the release of SYSWELD, ESI's software solution for Assembly, Welding and Heat Treatment. [ESI SYSWELD](#) is the most accurate Finite Element Analysis (FEA) multi-physics software on the market to simulate thermal joining (arc, electron beam, laser, friction stir, spot welding) and heat treatment (carburizing, carbonitriding, quenching). SYSWELD accurately predicts material characteristics, residual stresses and distortions of structures. By accounting for all relevant manufacturing effects and enabling the transport of simulation results from one manufacturing step to the next, SYSWELD delivers a truly predictive end-to-end solution for the manufacturing of welded and assembled industrial parts.

These unique capabilities enable manufacturers in ground transportation and other industry sectors — aerospace, heavy industries and marine — to reduce product development costs and time to market and ensure process automation and optimization. For example, COMIL, a major bus manufacturer in Brazil, employed SYSWELD to manage to geometrical distortions induced by welding and assembly of a bus door frame. According to **Thiago Sotilli**, Engineer at COMIL, it brings *“great benefit in dimensional distortion control of welded structures, allowing the study of different welding sequences. Results are fast and highly accurate, ensuring significant technological improvement for our company, and consequently reducing costs previously spent on prototypes and materials that were just scrapped when they didn't meet specifications.”*



Image: Inheriting details of the “as manufactured” components from the press shop, ESI SYSWELD simulates the entire assembly and welding process chain in the body shop; step by step.

With this latest release, ESI has enhanced the welding & heat treatment simulation capabilities of [SYSWELD 2017](#) to secure process feasibility and security, to control material characteristics and residual stresses, to keep distortion within specified tolerances, and to improve the performance of the product. The release includes new specific meshing capabilities to strongly reduce the time needed to create dedicated meshes for weld and heat treatment. To better support multi-pass welding, SYSWELD 2017 provides automatic control of the interpass temperature between each weld, ensuring better component integrity with a direct control of phase proportion and stresses. The new version also supports new manufacturing processes, including spot welding using spacers, friction stir welding and carbonitriding. New functionality allows the smart transfer of dedicated data from one simulation discipline to another, so that complete manufacturing processes can be simulated and used as input for performance. Furthermore, users of SYSWELD benefit from new core technologies to support the treatment of very large models, and to minimize the output file size.

[SYSWELD 2017](#) also brings new enhancements to simulate assembly in body shops. Benefiting from two years of developments aimed at the automotive industry, SYSWELD 2017 enables the modeling of the full stamp-welding-assembly simulation chain for fast distortion engineering in the context of car body manufacturing. Design engineers can now control the dimensional inaccuracies of hot and cold joined assemblies by accounting for the mechanical load effects during successive assembly processes, and heat effects induced by welding. This way, engineers can virtually manufacture, assemble and test physically realistic virtual components, long before their hardware prototypes are manufactured. Automotive manufacturers and their suppliers can consequently reduce the cost and delays caused by manufacturing planning, try-out and process validation.

For the ship building industry, [SYSWELD 2017](#) provides automation and optimization to reduce significantly the cost and time required to prevent or mitigate weld-induced distortions. New software developments ensure distortion control for large welded assemblies with thick plates and multi-pass welds, which are common in the marine industry. Aimed at shop floor production, the software can deliver the optimization of a weld sequence plan thanks to a streamlined and intuitive interface, offering dedicated automatic meshing functionalities and easy model set-up. Manufacturing engineers can thus quickly identify the welds that are mainly responsible for the distortion, and investigate the effects of changes to a variety of process parameters including sequencing, clamping and pre-heating.

For more information about SYSWELD, please visit: www.esi-group.com/SYSWELD

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About ESI Group

ESI Group is a leading innovator in [Virtual Prototyping](#) software and services. Specialist in material physics, ESI has developed a unique proficiency in helping industrial manufacturers replace physical prototypes by virtual prototypes, allowing them to virtually manufacture, assemble, test and pre-certify their future products. Coupled with the latest technologies, Virtual Prototyping is now anchored in the wider concept of the *Product Performance Lifecycle*™, which addresses the operational performance of a product during its entire lifecycle, from launch to disposal. The creation of a *Hybrid Twin*™, leveraging simulation, physics and data analytics, enables manufacturers to deliver smarter and connected products, to predict product performance and to anticipate maintenance needs.

ESI is a French company listed in compartment B of NYSE Euronext Paris. Present in more than 40 countries, and addressing every major industrial sector, [ESI Group](#) employs about 1200 high-level specialists around the world and reported annual sales of €141 million in 2016. For more information, please visit www.esi-group.com.

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