

# "Simufact Welding 7" speeds up simulations of sheet metal structures

Simufact from Hamburg/Germany, an MSC Software company, brings to market "Simufact Welding 7", the next version of its solution for the simulation of welding processes. Functional novelties such as solid-shell elements, simplified calculation methods for resistance spot welding processes and the more flexible consideration of clamping concepts: "Simufact Welding 7" promises shorter processing times, more accurate results, and a more intuitive operational use of the software.

Through the use of solid shell elements, assemblies made of thin sheets can be calculated more quickly because the required number of elements in the model drops significantly.

The software can also convert many models with hexahedron elements into solid-shell meshes. For this, "Simufact Welding 7" checks whether clear upper and lower surfaces are present. If these specifications are identified by the conversion function, the previous hexahedron mesh can be converted to solid-shell mesh.

The parallel segment-to-segment calculation implemented in the new solver allows

faster and more efficient calculation of large models with many contact surfaces. This contact description is paralysed by DDM (Domain Decomposition Method) parallel computation framework which utilised parallel computation efficiently.

In "Simufact Welding 7", Simufact introduces the simplified calculation method "Thermal Cycle" for resistance spot welding processes. Using this method, which is already used for other welding processes, complex and large assemblies can be calculated in a shorter calculation time.

If the shape of the nugget is already known from process models or measurements, the user can simplify the calculation by directly predefining temperatures inside the nugget without previous calculation.

With a few mouse clicks, users can add new welding robots with multiple welding paths, heat sources and fillets to their models. The user is typically confronted with many welds when simulating large structures or multi-part assemblies. The robot assistant simplifies the model set up for the user, since he can process all steps in one dialogue.

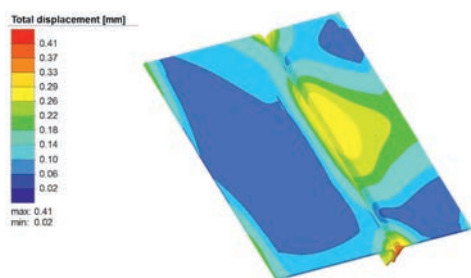
While welding large assemblies, usually several hundreds of clamping tools are required which, like the welding itself, have an influence on distortions and residual stresses on the workpiece. Until now, the stiffness of the clamp could be described exclusively perpendicular to the contact surface. With the implementation of the definition of clamping tools with translatory and rotational stiffness, version 7 additionally takes into account possible rotations and the movements of the tools along the surface.

Users compare their simulated model with their target design or with 3D measurement data as a reference model. They import the reference model from the measurement software into the user interface of "Simufact Welding 7" and can then compare the simulated workpiece with the target design. If the user overlaps both workpieces, they can determine the deformation. This shows the deviation between the simulated and the target design.

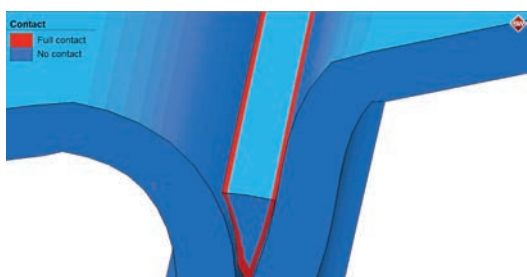
Material properties influence the result quality of resistance spot welding processes especially if it comes to resistances of the material. "Simufact Welding 7" now provides data of 16 common coatings, which enable the user to take into account the electrical properties of coated sheets and to further increase the quality of the simulation. No effort is required to determine the resistance data.

"Simufact Welding 7" can import UNV files - improving the compatibility of the welding software with third-party software and interoperability in the process chain. The user can import result data from third parties such as from forming or casting simulation into Simufact Welding in order to edit these files or use them for subsequent calculations.

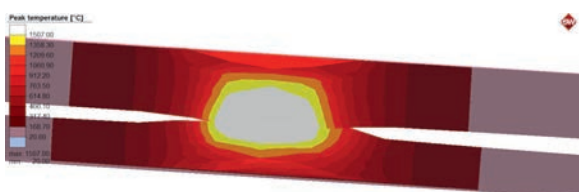
Using the transformation matrix, engineers can position and move the workpieces quickly and individually in the software. The user can position the same workpiece independently in several models. A contact positioner helps during the positioning of components relative to each other. With this function, the users are able to save time since manual corrections are no longer required. (According to press information from Simufact)



◆ Solid-shell elements reduce calculation time of thin-walled sheet metal parts.



◆ Segment-to-segment allows faster and more efficient calculation of large models.



◆ Simplified calculation method supports a quicker simulation of resistance spot welding processes.