

 RELEASE NOTES

Altair[®] Inspire[™] Extrude

2021.2, 2021.2.1, and 2021.2.2

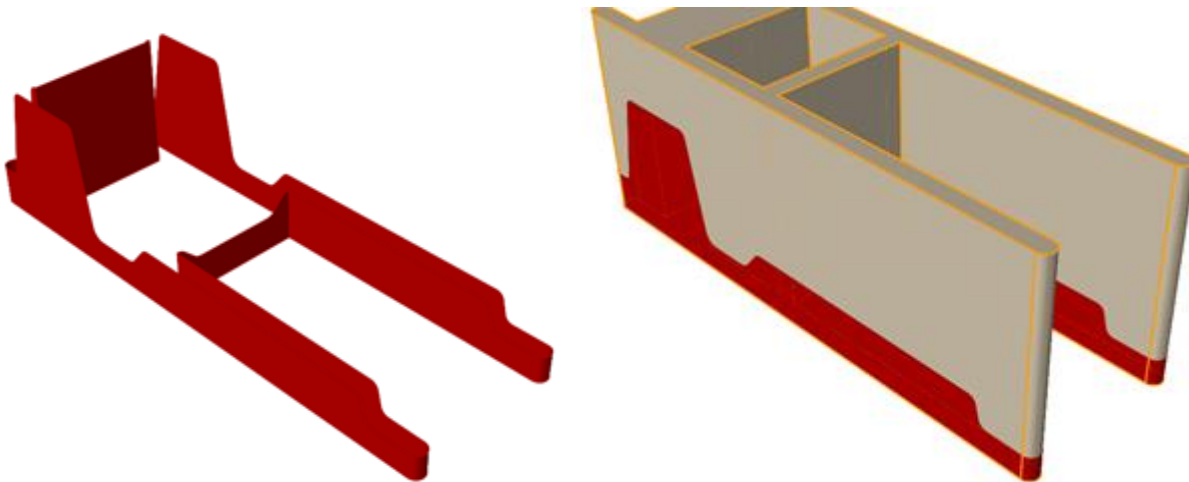
New Features and Enhancements 2021.2

The Inspire Extrude 2021.2 release includes the following new features and enhancements.

Metal Extrusion

Modeling Choke in Bearing Using Reference Surfaces

Bearing regions for complex profiles are often designed with varying choke, parallel, and relief regions along the periphery of the extruded profile. Meshing this region accurately and automatically using triangular prism elements is difficult. In this release, the bearing surface from the die assembly is extracted and accurately surface meshed. The solver will automatically extract the choke information from the surface mesh. This enables greater success in automatic meshing. In this release, the bearing surface is extracted from the tool geometry. This feature will enable any reference surface (not from the tool geometry). In the image below, the bearing reference surface is shown in red, and it is extracted for the die geometry.



Bearing Optimization Controls

The bearing correction nonlinear algorithm is controlled by two parameters: maximum correction iterations and the acceptable tolerance. Previously, users did not have access to these parameters and were using the default values. In this release, these parameters are exposed in the GUI, and users can modify them.

Temperature-Compensated Strain Rate

The temperature-compensated strain rate is also known as the Zener-Holloman parameter. It is more convenient to plot the natural logarithm of this value. In this release, Inspire Extrude results will include both the temperature-compensated strain rate and its logarithm as two separate results for ease of post-processing.

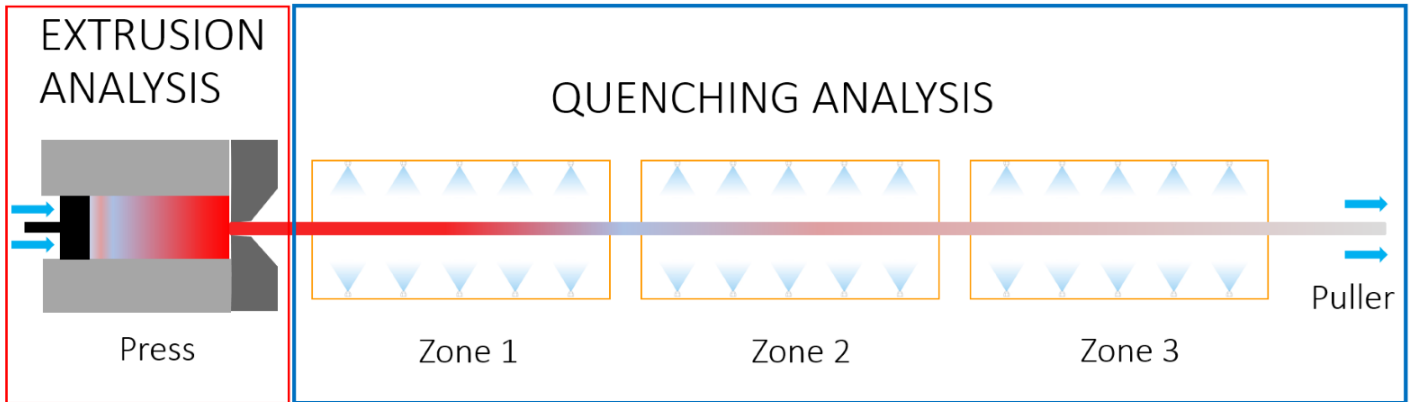
Batch Meshing Improvements

Models with a choke in the bearing regions require special meshing methods to mesh this region with triangular prism elements. This meshing is accomplished using HyperMesh. However, when these models included the tool assembly, there were issues in meshing the whole model in HyperMesh instead of SimLab. This issue is addressed through improvements to the batch meshing process. This enables selectively meshing the bearing and profile parts in HyperMesh and the rest in SimLab.

Quenching

Map Extrusion Results

Extrusion and Quenching analyses are connected. Profiles extruded from the press then go through quenching systems to cool the high exit temperatures of the die to room temperature and allow for subsequent heat treatment and finishing operations. Ideally, the exit conditions of the profile extruded from the die become the initial conditions of the profile entering the quenching systems.

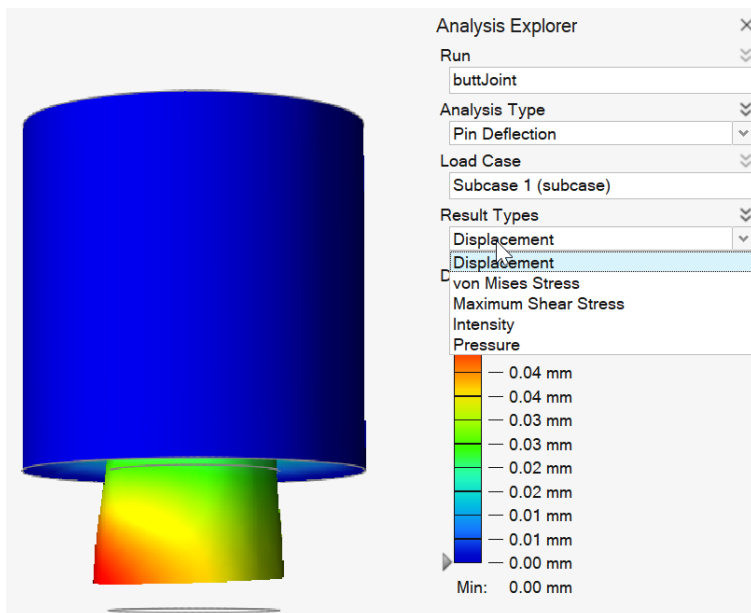


Users now have the option when running a Quenching Analysis to consider the profile temperature and grain size from a previous Extrusion analysis in the quenching simulation.

Friction Stir Welding

Pin Deflection Analysis

FSW analysis is useful in understanding stresses acting on the welding pin and any pin deflection it may cause. In this release, Inspire Extrude will automatically launch the pin stress analysis after the FSW analysis using OptiStruct, and users will be able to post-process the results in Inspire Extrude itself.



Resolved Issues

The following issues have been resolved for the 2021.2 release:

Common features:

- **Constraints Incorrectly Created in Local Coordinate System.** The solver expects the constraints to be created in the global cartesian coordinate system. Sometimes, the constraints were created incorrectly on the part's local coordinate system. This issue is resolved now by creating them directly in the global reference system.
- **Option to Remove Imprints in Boolean Icon.** Added "Remove imprints" Option to cloned Extrude boolean context: IEXT-2507
- **A Symmetric Model gives Asymmetric OptiStruct results.** The solver writes the loads on the workpiece-tool interfaces to perform the stress analysis using OptiStruct. These loads are computed by performing the extrusion analysis up to the specified convergence. The loss of symmetry could happen for a few different reasons, such as asymmetric mesh and numerical oscillations. In this particular case, the projection and mapping algorithm was improved to address this issue in the reported model.
- **Incorrect Heating During Dead Cycle Time.** The dead cycle time is divided into two parts. In the first part, the hot billet is outside the container. Therefore, it should lose heat, and the container also should lose heat. The solver was showing the container gaining heat due to incorrect convection reference temperature. This issue is resolved by correctly setting the reference temperature.
- **Truncated Status Message resolved.**

Polymer Extrusion:

- **Random Memory Errors.** Sometimes, the solver was encountering random memory errors. Its underlying cause was identified and resolved.

New Features and Enhancements 2021.2.1

Inspire Extrude 2021.2.1 includes the following new features, enhancements, or resolved issues.

Resolved Issues

Common features:

- Remote Job Submission. Remote jobs on the Linux machines were failing due to a regression in the launcher, and the solver folder was missing some shared library files. These issues are resolved now.
- Remote Job Submission Using HX Job Manager. HX Job Manager is our legacy job submission tool, and its use can be enabled from Preferences. It is not the default option. Enabling this feature from the Preferences dialog was causing a crash, and it is resolved in this hotfix.
- Error While Encountering Surface Meshes with Mixed Element Types. The solver implemented a new feature to avoid writing H3D files in both SI and User units. This inadvertently introduced an issue of not supporting BC surface meshes with both TRIA3 and QUAD4 elements. This was leading to solver error exit. This issue will affect both metal and polymer extrusion. This issue is resolved now.

Metal Extrusion:

- Solver Crash for Model with Billet Skin. Models containing billet skin were crashing in the solution stage, and this critical issue was caused by a new feature implemented to export face elements. This issue is resolved now.
- Solver Crashes While Estimating Choke from BRS. The metal extrusion solver was enhanced to determine the choke angle at an integration point of the bearing surface using a BRS (Bearing Reference Surface) mesh. This feature was crashing when the surface provided did not extend past the bearing curve region. This issue is resolved now. The solver will assume the choke angle as 0.0 if it is unable to locate a corresponding point on the BRS.

Resin Transfer Molding:

- Solution Failure with Drape Analysis. RTM solver runs with drape analysis were sometimes failing to complete the simulation. This was caused by the solver being launched before draping computation was fully completed. This issue is now resolved by adding appropriate status validation at every stage of the simulation.

New Features and Enhancements 2021.2.2

Altair Inspire Extrude 2021.2.2 includes the following new features, enhancements, or resolved issues.

Resolved Issues

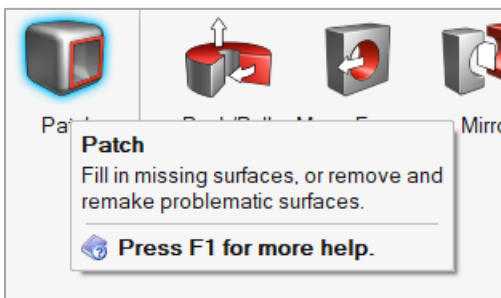
- Integrated new log4j (version 2.17.1) files to address security vulnerabilities.
- Fixed an issue connecting to the Altair licensing system. [IN-26652]

Learn More About Inspire Extrude

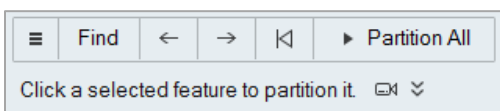
You can learn more about new and existing features in Inspire Extrude using the following resources:



In-Application User Assistance

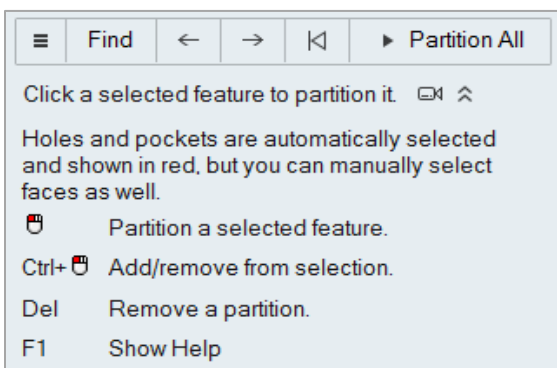
Inspire Extrude provides two types of user assistance. **Enhanced tooltips** appear when you hover over icons and other features. They describe what the tool does.



Workflow help appears when you select a tool that opens a guide bar or microdialog. The text prompts you what to do next.

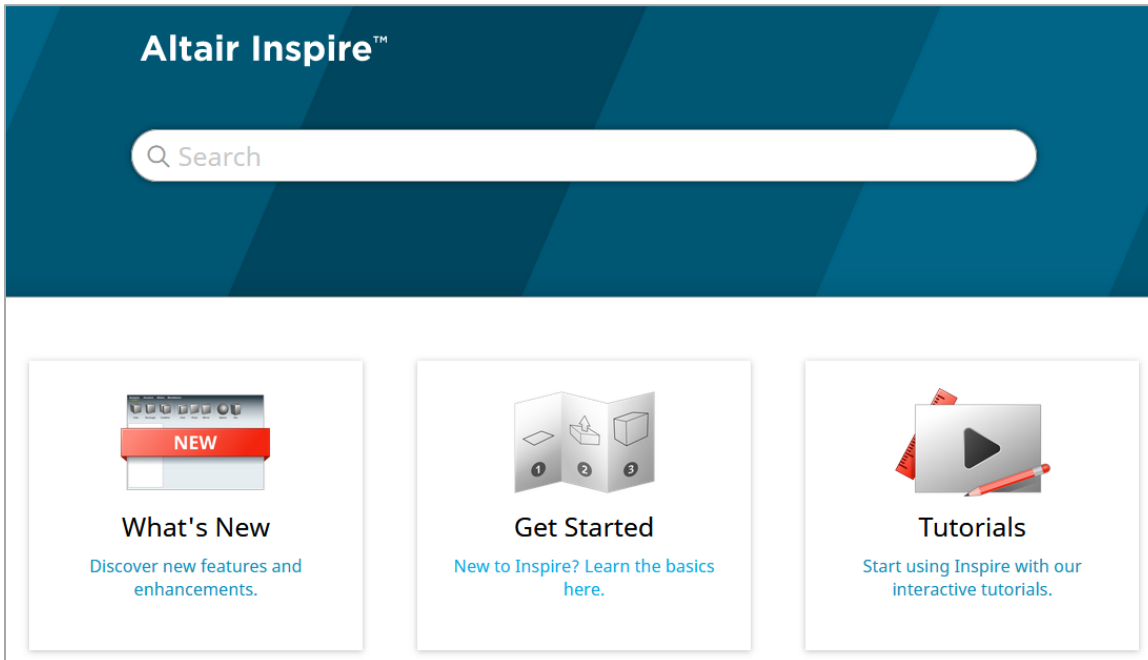


Click  to view additional tips and shortcuts. Some tools also include a video .



Online and Offline Help

Press **F1** or select **File > Help > Help** to view the online help.



You can download an offline version by selecting **File > Help > Download Offline Help**. An internet connection is required to download.

