

## What's New In Simcenter FLOEFD 2021.3

### SmartPCB

- When conducting a DC drop simulation with HYPERLYNX™ software, the “High Accuracy” option of HYPERLYNX is now used. This option creates a finer mesh in HYPERLYNX which increases the accuracy without a significant increase of calculation time.
- A Joule Heat Global Goal is added for DC drop simulations with HYPERLYNX. This allows for monitoring the total Joule heat coming from a HYPERLYNX DC drop analysis.
- You can now visualize net outlines. This helps to better understand the temperature distribution.
- Batch Results Processing (BRP) can now save SmartPCB layer plots as images without prior visualization in the graphics area. Running BRP automatically after finishing the calculation creates all the SmartPCB layer plots (temperature, conductivity, power map). You can edit image settings in the Save As dialog available for SmartPCB. In addition, SmartPCB plots can be saved in a Scene plot.
- Homogenization allows for memory and time effective structural analysis of a PCB. Unlike the explicit mode where all the traces and vias are resolved directly, homogenization uses a larger hex mesh with effective orthotropic material properties obtained by conducting a structural simulation for each single element of the hex mesh. As the effective material properties are calculated from the direct explicit simulation of an element, the accuracy of a homogenization simulation is close to a direct simulation while taking significantly less time and requiring much less of physical memory.

### Electromagnetic analysis

- For AC Current and Voltage boundary conditions you can add an additional electrical resistance and Inductance to emulate parts of a coil not represented as a solid geometry.
- Standard CAD boolean geometry handling mode can now be used for an electromagnetics analysis. Previously enabling electromagnetics analysis automatically switched the geometry handling to the “Improved geometry handling” mode. Starting from this version the standard CAD boolean geometry handling mode is used. You can always switch to “Improved geometry handling” mode from the Simcenter FLOEFD project tree or set the default mode for new projects in the Simcenter FLOEFD Options.

### Fans

- Tangential and Radial velocity dependency on flow rate can be specified as a property of a fan curve for a Fan Curve type of fan in the Engineering database. These dependencies fully define the swirling flow of the fan.

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## Structural analysis

- A new Sliding contact between bodies or set of faces can be defined. Simcenter FLOEFD automatically detects contacting elements which belong to selected faces or bodies and applies the sliding contact condition to these elements.
- A new Ball joint constraint allows rotation of the selected geometry around a central point. If a spherical face is selected the sphere center will be considered automatically.
- A new option for the Hinge constraint allows or prevents moving along an axis.
- A new postprocessing “Contact type” parameter can be used to visualize resulting contact types between surfaces. This is helpful to check the mesh quality.
- Standard CAD boolean geometry handling mode can now be used for a structural analysis. Previously enabling structural analysis automatically switched the geometry handling to the “Improved geometry handling” mode. Starting from this version the standard CAD boolean geometry handling mode is used. You can always switch to “Improved geometry handling” mode from the Simcenter FLOEFD project tree or set the default mode for new projects in the Simcenter FLOEFD Options.

## Porous Media

- Volumetric Heat Exchange coefficients can now be specified as a function of the Specific mass flow ( $\text{kg/s/m}^2$ ). By using dependency on Specific mass flow, the heat exchange between a fluid and solid porous matrix is dependent on the density and velocity, which increases accuracy for compressible fluids, such as gases.

## Simcenter FLOEFD Project tree

- Projects and Goals can now be sorted alphabetically or chronologically.

## LED

- For external LED databases used in the Engineering Database you can choose to hide LED properties, so they are not shown to other users. When hidden the users will only see the names of the LEDs and can use them without seeing their properties. This is helpful to hide confidential information when sharing models between different organizations. Displaying the hidden LED properties is password protected.

## Parameters

- When creating parameters, the units of parameters and goals the parameter depends on are checked for consistency.

## Parameter Editor

- You can expand and collapse Project trees and sub-trees.

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## Plots

- For Surface plots, Cut plots, and Mesh plots you can restrict plots to be visualized only for a specific Solid material or for a specific fluid region defined by either a fluid or fluid subdomain. This can significantly simplify the way you display necessary images, for example for a heat exchanger with different fluid subdomains you can easily display surface fluid temperature only for one fluid, thus eliminating the need for time-consuming selection of all surfaces that belong to the subdomain of interest.

## Cut Plots and Surface Plots

- Streamlines can now be visualized with arrows for Cut Plots and Surface Plots.

## Flux Plot

- You can now display incoming and outgoing conduction, radiation, and convection heat fluxes for the whole task and ambient. This option allows you to easily get an understanding of the energy balance for the task.

## Remote Solver (Linux)

- You can configure remote solver calculations on Linux clusters by adding special parameters to the running scripts using the “Linux solver configuration file” option (Tools > Options > Remote Solver). This file allows you to add the name of the user who runs the solver and any user defined parameters defined as environment variables.

## CAD Systems

- Siemens NX™ 1992 and 1996 (series 1980) are now supported.
- Siemens Solid Edge® 2022 is now supported.
- Dassault Systèmes CATIA® V5-6 R2021 (R31) is now supported.
- PTC Creo® 8.0 is now supported and support for Creo 2.0 is cancelled.
- PTC Creo Perspective view is now supported for results visualization.

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