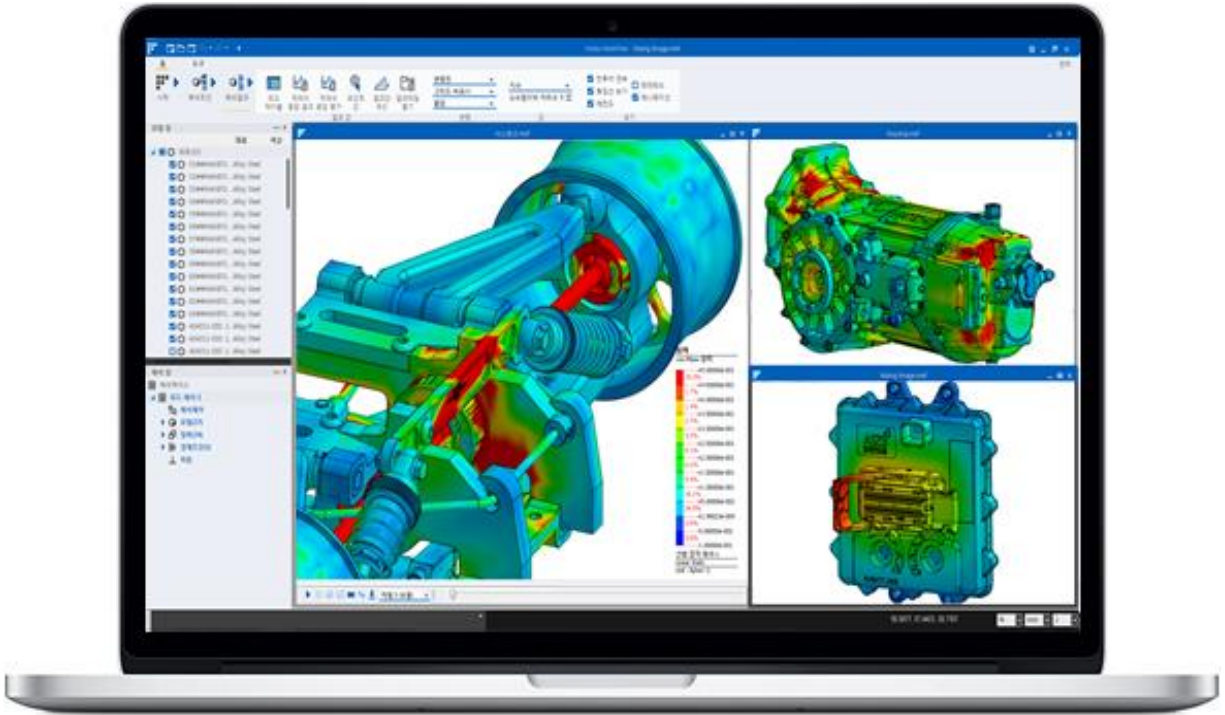# MIDASIT

MeshFree 2024 Release Note

Contact with the new world

In August 2018, we released MeshFree 1.0 with slight changes to the existing CAE technology. Smaller technological changes that are freer to create meshes have innovatively overcome FEM-based technical limitations that have occupied the CAE market for more than half a century. MeshFree leads the change in the CAE process in the design stage, which allows design engineers to perform analysis by themselves using the beautiful model prototypes designed by design engineers to verify the performance of design products and perform optimal design. In MeshFree 2023, to establish itself as a more reliable partner, the ease of use has been strengthened, and efforts have been made for continuous improvement to improve reliability.

Improvement of Geometry-Fitted Grid Application Functionality

MeshFree generates the grid based on the IBM (Implicit Boundary Method) algorithm and proceeds with the analysis. In the previous version, an issue was identified where the geometry-fitted grid application only worked correctly when slender members with large cross-sections compared to their thickness were aligned such that the X, Y, Z axes were rotated 90 degrees relative to the global coordinate system. This issue has been resolved to ensure proper grid generation for thin plates and other geometries with misaligned orientations. The coordinate system alignment has been improved to handle these cases correctly.

<Before Improvement>	<After Improvement>
Stress result	
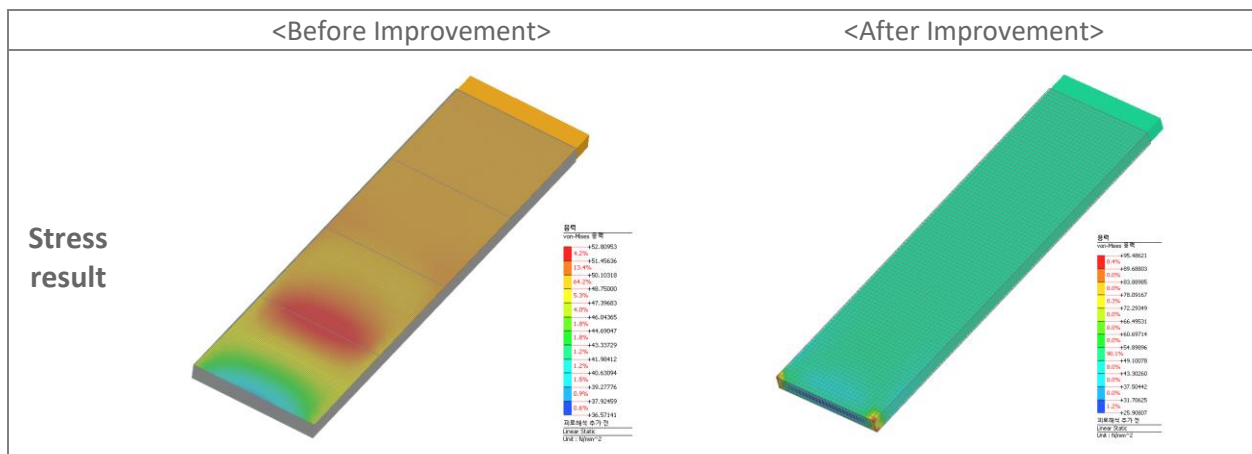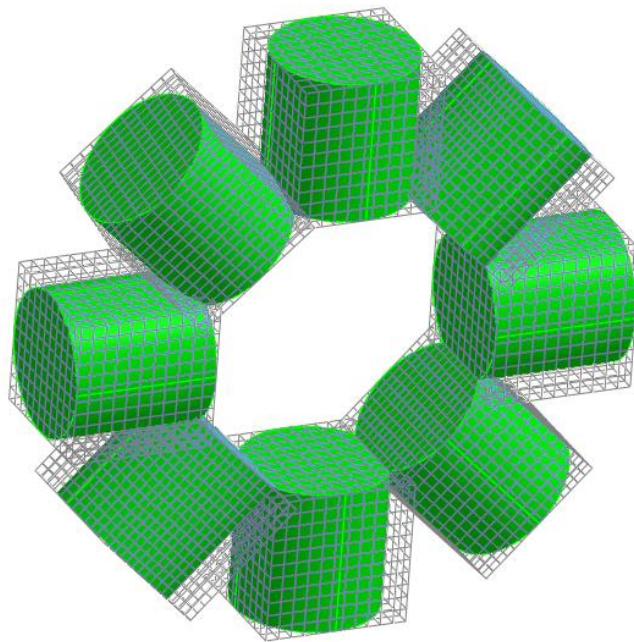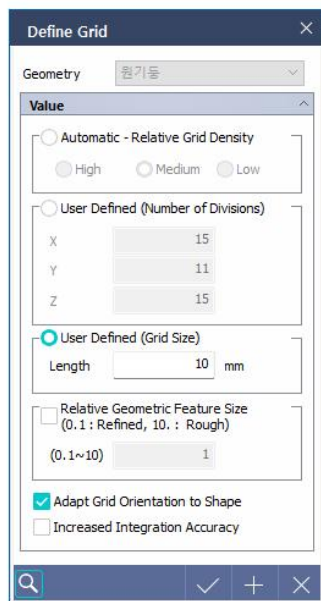
Other Bug Fixes

< Improvement of Negative Coefficient for Hyper-elastic Material Distortion Constant>

An issue was identified where it was not possible to apply negative coefficients for higher-order terms related to the distortion constant of hyper-elastic materials. This has been fixed, allowing both positive and negative values to be applied.

< Addition of Reaction Force Results for Rigid Body Master Nodes>

It was found that reaction forces at rigid body master node locations were not being calculated, making it impossible to verify reaction force results. This calculation procedure has been added, and results can now be checked.

< Improvement of Plastic Strain/Stress Results for Elastoplastic Materials>

Abnormal values were observed at certain discontinuous locations for elastoplastic materials. Improvements have been made to the accuracy of plastic strain calculations and the equivalent stress calculations related to the strain-stress curve.

< Addition of Exception Handling for Convection Conditions in Linear Contact >

In thermal analysis, convection conditions are set for external air contact surfaces. However, with increasing geometric complexity, manually removing these conditions at contact locations has been inconvenient. This has been improved so that convection conditions are automatically ignored when linear contact conditions (bonded, sliding) are present.

< Application of Unit System to Reference Points for Distributed Loads and Edit Box Revision >

An issue was identified where reference point coordinates for distributed loads were calculated with a fixed unit of millimeters. The unit system issue was addressed for the entire edit box, including this location, and has been corrected and verified.

CAD Interface Update

Type	Extension	Version
Parasolid	x_t, xmt_txt, x_b, xmt_bin	9.0 ~ 36.0
ACIS	sat, sab, asat, asab	R1 ~ 2024.1.0
STEP	stp, step	AP203, AP214, AP242
IGES	igs, iges	Up to 5.3
Pro-E / Creo	prt, prt.*, asm, asm.*	16 ~ Creo 10.0
SolidWorks	sldprt, sldasm, slddrw	98 ~ 2024
CATIA V4	model, exp, session	4.1.9 ~ 4.2.4
CATIA V5	CATPart, CATProduct	V5 R8 ~ V5-6R2024
Unigraphics	prt	11 ~ NX2306
Inventor Part	ipt	V6 ~ V2024
Inventor Assembly	iam	V11 ~ V2024
SolidEdge	par, asm, psm	V18 ~ SE2024

Support for the latest version of the CAD interface may be delayed depending on the supplier's update environment. If the newest version is not supported, please convert it to a neutral file such as Parasolid or STEP file format. We will do our best to reflect on the latest version of CAD quickly.