



Marc[®] and Mentat[®] 2023.4

Release Guide

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U.S. Patent 9,361,413

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C O N T E N T S

Marc and Mentat Release Guide

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Overview

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Introduction

The Marc 2023.4 release is the fourth Marc release in calendar year 2023. In this release, some new solver functionality is introduced, the performance of the GUI has been improved, and a number of defects found in past releases have been addressed.

Overview of New Functionality

The new functionality in Marc 2023.4 can be summarized as:

- Improved performance of Mentat.
- Cracking energy density based fatigue analysis for elastomers.
- Higher order elements and thin sections in remeshing.
- Secant coefficient of thermal expansion.
- Temperature and contact pressure induced bonding.
- Structural increment frequency control in Diffusion (Pressure)/Thermal/Structural analyses.
- Position of the Triad.

Details can be found in the What's New section of the Mentat help.

Marc 2023.4 is based upon the compiler version oneAPI 2022, and is compatible with Intel XE 2020.4. Details can be found in the [List of Build and Supported Platforms - Marc 2023.4 Release](#).

Marc 2023.4 requires the "Helium" release of MSC Licensing which uses FLEXlm 11.16.3.0. Please refer to the [Marc and Mentat: Installation and Operations Guide](#) for more details.

List of Known and Corrected Defects in the 2023.4 Release

For more details on fixed and corrected defects please visit: [MSC Marc and Mentat Error List](#)

List of Build and Supported Platforms - Marc 2023.4 Release

Marc Platforms

Type	OS	Hardware	Fortran Version	Default MPI
Linux (64 bit)	RHEL 7.9/8.6 and SUSE 12SP5/15SP3	Intel EM64T or AMD Opteron	oneAPI2022 ²	Intel MPI 2021.7 ³
Windows (64-bit)	Windows 10 ¹ Windows Server 2019	Intel EM64T or AMD Opteron	oneAPI2022 ²	Intel MPI 2021.7 ³

¹ Also works on Windows 11.

² When using user subroutines, oneAPI 2022 and Visual Studio 2022 or Intel Fortran XE 2020.4 and Visual Studio 2019 must be installed.

³ Supports also Microsoft MPI program version 9.0.

Mentat Platforms

Vendor	OS	Hardware
Linux (64-bit)	RHEL 7.9/8.6 and SUSE 12SP5/15SP3	Intel EM64T or AMD Opteron
Windows (64-bit)	Windows 10 Windows 11 Windows Server 2019	Intel EM64T or AMD Opteron

On Linux, GLX version 1.3 or higher is required to run Mentat on screen resolutions higher than 2560x1440. To find the GLX version on the machine, please use the following command:

```
glxinfo | grep "GLX version:"
```

If the GLX version does not meet the requirement, then as a workaround, the X server or VNC server can be run in 16-bit color mode by providing the `-depth 16` option, as follows:

```
vncserver -depth 16
```

All platforms support Python 3.10.8

Mentat Graphics Card Support

The following graphics boards have been certified to work with the Mentat 2023.4 release:

Graphics Board	Graphics Driver Version
AMD FirePro V4800(FireGL V)	15.201.2401.0
AMD FirePro W4190M	21.19.142.32768
AMD Radeon Pro WX 4130	21.19.384.3
AMD Radeon Pro WX 4130	21.19.384.3
AMD Radeon Pro WX 4150	21.19.384.3
AMD Radeon Pro WX 7100	21.19.384.3
AMD Radeon Pro WX4150	16.40.3801.1002
AMD Radeon WX2100	22.19.640.2
AMD Radeon WX2100	22.19.640.2
AMD Radeon WX3100	22.19.640.2
AMD Radeon WX3100	22.19.640.2
AMD Radeon Pro WX 3100	23.20.787.768
AMD Radeon Pro WX 3200	19.Q2
AMD Radeon WX4100	17.10.1730.1004
AMD Radeon WX4100	22.19.640.2
AMD Radeon WX4100	22.19.640.2
AMD Radeon WX5100	17.10.1730.1004
AMD Radeon WX7100	17.10.1730.1004
AMD Radeon WX9100	22.19.640.2
AMD Radeon WX9100	22.19.693.256
AMD Radon Pro WX3100	26.20.13028.13
AMD Radon Pro WX3200	26.20.13028.13
AMD Radon Pro WX4100	26.20.13028.13
AMD Radon Pro WX5100	26.20.13028.13
AMD Radon Pro WX7100	26.20.13028.13
AMD Radon Pro WX8200	26.20.13028.13
AMD Radon Pro WX9100	26.20.13028.13
AMD Radeon Pro W6600M	31.0.12026.3004
Nvidia Quadro M1000M	10.18.13.5461
Nvidia Quadro M1200	21.21.13.7586
Nvidia Quadro M1200	377.43
Nvidia Quadro M1200	377.43

Graphics Board	Graphics Driver Version
Nvidia Quadro M2200	21.21.13.7586
Nvidia Quadro M2200	377.43
Nvidia Quadro P1000	377.11
Nvidia Quadro P2000	377.11
Nvidia Quadro P2000	23.21.13.8908
Nvidia Quadro P3000	21.21.13.7586
Nvidia Quadro P3200	23.21.13.8908
Nvidia Quadro P4000	21.21.13.7586
Nvidia Quadro P4000	377.11
Nvidia Quadro P4000	385.69
Nvidia Quadro P5000	21.21.13.7586
Nvidia Quadro P5000	377.43
Nvidia Quadro P5000	377.11
Nvidia Quadro P600	377.11
Nvidia Quadro P600	23.21.13.8908
Nvidia Quadro P6000	377.11
Nvidia Quadro P620	23.21.13.9077
Nvidia Quadro RTX 5000	25.21.14.1917
Nvidia Quadro RTX 6000	25.21.14.1917
Nvidia Quadro RTX 4000	25.21.14.1917
Nvidia Quadro P2200	26.21.14.3064
Nvidia Quadro T1000	25.21.14.2591
Nvidia Quadro RTX3000	25.21.14.2591
Nvidia Quadro RTX5000	25.21.14.2591
Nvidia T600	30.0.15.1298
Nvidia RTX T550	31.0.15.1713
Nvidia RTX A500	31.0.15.1713
Nvidia RTX A1000	30.0.15.1298
Nvidia RTX A2000	31.0.15.2667
Nvidia RTX A3000	30.0.15.1298
Nvidia RTX A4500	31.0.15.2667
Nvidia RTX 2000 Ada	31.0.15.3696

Peripheral Devices

3DCONNEXION's SpacePilot PRO, SpaceMouse PRO and SpaceNavigator products, have been tested with Mentat. For Linux based systems, see the [Marc and Mentat: Installation and Operations Guide](#) for additional information.

Security Notes

The 2023.4 release requires the FlexLM 11.16 (Helium) server version and stores the license manager (lmgrd) by default in the directory C:\Program Files\MSC.Software\MSC Licensing\Helium\lmgrd for Microsoft Windows and for Linux platforms it is /msc/MSC.Software/MSC Licensing/Helium/lmgrd. The default location for the license file is MSC Licensing/Helium.

The capabilities that require a license are given below with feature names as required in the license file.

1.	MARC	license required to run one single processor job or one instance of a multiple processor (parallel) job.
2.	MARC_Parallel	license required per processor in a parallel run (either DDM, or parallel element assembly and stress recovery, or parallel CASI).
3.	MARC_Mesh2D	license required for each run requiring automatic 2-D remeshing feature in Marc.
4.	MARC_Mesh3D	license required for each run requiring automatic 3-D remeshing feature in Marc.
5.	MARC_ShapeMemory	license required for each run using shape memory model.
6.	MARC_MetalCutting	license required for each run modeling metal cutting operation.
7.	MARC_Electrical	license required for Joule-Mechanical, Coupled Electrostatic- Structural, and Piezoelectricity.
8.	MARC_GPU	license required to use the GPGPU solver capability.
9.	MARC_CASI	license required to use the CASI iterative solver.
10.	MARC_Hexmesh	license required for each instance of Hexahedral mesher.
11.	MARC_MatFit	license required for advanced material data fitting.
12.	MARC_PhaseTrans	license required for MICROSTRUCTURE phase transformation model.
13.	MARC_CoSim_Adaptor	license required to run a co-simulation analysis with MSC CoSim.
14.	Mentat	license required for each instance of Mentat.
15.	Mentat_Parasolid_CAD	license required for each instance of Parasolid when working (import/export/meshing) with Parasolid based models. This license does NOT allow the creation of solid geometry or the modification of solid geometry through Boolean operations, blending, and/or feature recognition and removal.
16.	Mentat_Parasolid_Modeling	license required for each instance of Parasolid when working (import/export/creation/modification/ meshing) with Parasolid based models.
17.	Mentat_ITI_Access	license required for each instance of, or exporting a file using the DXF, IGES, or VDAFS translators.
18.	Mentat_CMOLD	license required for each instance of CMOLD when working (import/export) with CMOLD based models.

19.	Mentat_Geometry_Translators	license required for import of Parasolid, IGES, IDEAS, ACIS, STEP, STL to Parasolid Geometry with cleanup of model.
20.	Mentat_CATIIV4_Access	license required for import of CATIIV4 model to Parasolid Geometry with cleanup of model.
21.	Mentat_CATIIV5_Access	license required for import of CATIIV5 model to Parasolid Geometry with cleanup of model.
22.	Mentat_Creo_Access	license required for import of Creo and Pro/E model to Parasolid Geometry with cleanup of model.
23.	Mentat_Inventor_Access	license required for import of Inventor model to Parasolid Geometry with cleanup of model.
24.	Mentat_JT_Access	license required for import of JT model to Parasolid Geometry with cleanup of model.
25.	Mentat_NX_Access	license required for import of NX model to Parasolid Geometry with cleanup of model.
26.	Mentat_SolidWorks_Access	license required for import of SolidWorks model to Parasolid Geometry with cleanup of model.

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2023.1 Release Highlights

The functionality in Marc 2023.1 can be summarized as:

- Support for the hybrid node-to-segment contact method in analyses using the domain decomposition method.
- New post-processing quantities Material Forces and Eshelby Stress tensor, that can be used in the study of inhomogeneities.
- New Selective Post option to post-process a subset of the elements and free nodes in the model.
- New option in design of experiments to export the results if some experiments have not run to completion.
- Improved support for high-resolution screens.

2023.2 Release Highlights

The functionality in Marc 2023.2 can be summarized as:

- A new enhanced remeshing method for 3-D tetrahedral meshes.
- A coupled diffusion/thermal/structural analysis class including pyrolysis.
- Contact slip and contact opening result quantities.
- A result inspector in Mentat.
- An option to suppress dynamic model movements while executing procedure files.
- Improved performance of Mentat.

2023.3 Release Highlights

The functionality in Marc 2023.3 can be summarized as:

- Cross-hairs in the graphics area.
- Minimum edge length of contact body.
- Close all opened pop-menus.
- Updated icons for translate and rotate.
- Default element type for rubber material.
- Licensing for stress-life and strain-life fatigue.