

Release Notes 2021



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Introduction

Welcome to FEFLOW 7.4 within MIKE 2021

In this Release Note, you will find information about new features of FEFLOW, and what you need to know in order to install and get started.

Groundwater projects are becoming more and more demanding - requiring modelling software with more sophisticated capabilities than ever before. FEFLOW provides best-in-class technology for groundwater flow, contaminant, groundwater age and heat-transport simulations. With its efficient user interface and its yet unmatched range of functionality, FEFLOW has become a standard in premium groundwater modelling over the last 35 years.

FEFLOW comes with an extended Python interface support unleashing unlimited model parameter descriptions and dependencies to arbitrary properties. The full tensorial representation of hydraulic conductivity has also been extended in order to allow for Python and/or IFM descriptions.

FePEST presents new Cloud computing functions allowing easy job deployments on the Azure Cloud.

System requirements

The recommended minimum system requirements are:

Fully supported Windows operating systems *	Windows 10 Pro, version 1909 (64 bit) Windows Server 2016 Standard (64 bit) Windows Server 2019 Standard (64 bit)
Processor	x64, 2.2 GHz (or higher)
Memory (RAM)	4 GB (or higher)
Hard disk	5 GB (or higher)
Monitor	Full HD (1920 x 1080)

Graphics adapter	≥ 2 GB memory, ≥ 24-bit color, Shader version ≥ 1.30, minimum hardware accelerated OpenGL ≥ 2.0 / recommended hardware accelerated OpenGL ≥ 3.0 with fully supported Windows drivers
File system	NTFS
Software requirements	Microsoft .NET Framework 4.7.2 or later

* Fully supported operating systems are systems that have been tested in accordance with MIKE's Quality Assurance procedures and where warranty and software maintenance agreement conditions apply.

Installation

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DHI License Management - If you are installing on a computer or server where you will also install the license file, please also install the DHI License Manager. It must be downloaded separately.

To install FEFLOW, please go to the 'windows' folder inside the 'FEFLOW' product folder and execute the 'start.exe' file either on the MIKE 2021 USB or from the downloaded, un-zipped installation files. Press the 'Install' button to begin installation.

To start the FEFLOW installation, please click on 'FEFLOW Program Files'. It is recommended to allow the setup program to check for the latest patch on the MIKE Powered by DHI website to avoid any known and already fixed bugs.

All necessary FEFLOW files and folders will be installed on your PC. Additionally, a FEFLOW entry in the Start menu is created, containing links to FEFLOW itself and some supporting programs

License file and dongle

To use FEFLOW software in licensed mode, please refer to the DHI License Manager Release Notes. ([License Manager Release Notes](#)).

Product invocation

To start FEFLOW, double click on the FEFLOW 7.4 icon on your desktop or launch FEFLOW from the Windows Start menu and select the program you would like to start. Typically, this will be 'FEFLOW Standard (64-bit)' or the free viewer 'FEFLOW Viewer (64-bit)'.

Starting FEFLOW without a valid license, it is recommended to switch to demo mode via Tools - License Setup in the main menu. This mode is indicated by the word 'DEMO' in the header of the FEFLOW application window. Running in demo mode, file loading and saving is limited to 2500 nodes.

Support

For general support, please refer to our [FAQ](#).

If you experience any difficulties, or if you have questions, please contact our **Customer Success** team by e-mail or phone:

Customer Success
DHI A/S
Agern Allé 5
DK-2970 Hørsholm
Denmark

You can also contact your local Customer Success team for support in your local language. You can find the list [here](#).

New features and fixed issues

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Release 2021 (FEFLOW 7.4.3)

Every new release of FEFLOW consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find short descriptions of the most significant news in Release 2021 below.

New features

Module/type	New feature
FEFLOW	Improvements in the support of MS Office Excel and Access.
FEFLOW	General graphical Improvements for high resolution display.
Scripting	I/O methods through FEFLOW Python interface have been improved for cases with reduced number of time steps.
FEFLOW	Borehole Heat Exchanges (BHE) dataset and assignment was improved.
Scripting	Python API doc. enableParamRecording has been extended to unsaturated parameters.
FEFLOW	Visualization improvements for Multilayer Wells and Borehole Heat Exchanges (BHE).
FEFLOW	Improvement of graphical feedback for Move Node tool in Supermesh.
FEFLOW	New handling of SAMG error 211.
FEFLOW	New handling of SAMG for cases with topological changes during the model run.
FEFLOW	Inheritance improvement of arbitrary 1D discrete feature with mesh operations (refine, delete, move node and flip edge).
FEFLOW	Improvement of delete operations for discrete feature and dual-node connectors.

Release 2021 (FEFLOW 7.4.2)

Every new release of FEFLOW consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find short descriptions of the most significant news in Release 2021 below.

New features

Module/type	New feature
FEFLOW piHMC	Several improvements to hydro-mechanical coupling. Now module includes calculations of consolidation.
FEFLOW	API setParamRecording was extended for the recording of user distributions.
FEFLOW	Performance of K-Tensor ellipsoid was improved.
FEFLOW	Handling of parameter In/out-flow on top/bottom (IOFLOW) was improved for the case of transient values, inactive elements and parameter expressions.
FEFLOW	Improvements in the calculation of heat rate-budget for cases with groundwater recharge (IOFLOW).
FEFLOW	Cross-section area (Dual-Node Connectors) used for scaling of conductive heat flux for was implemented.
FEFLOW	Handling of history-chart curves for Wells and Multilayer-Wells was improved.
FEFLOW	Software stability was improved in several cases of parameter association (links).
FEFLOW	Several improvements of visualization (inline labels, BHE dataset links, maps rendering, etc.).
FEFLOW	Several improvements in charts: better recording of Content History-Charting, group/ungroup, labeling of curves, etc.
FEFLOW	Handling of parameter expressions with custom times was improved.
Scripting	Stability improvements for Random-Walk Particle Tracking in Python.

Release 2021 (FEFLOW 7.4.1)

Every new release of FEFLOW consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find short descriptions of the most significant news in Release 2021 below.

New features

Module/type	New feature
FEFLOW	Unlimited number of user distributions (nodal / elemental) is now supported in GUI.
FEFLOW	Extended Qt dynamic mode for OpenGL detection (switch "-glengine software").
FEFLOW	Extended test for validity of hysteresis methods for unsaturated problems.

Release 2021 (FEFLOW 7.4.0)

Every new release of FEFLOW consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find short descriptions of the most significant news in Release 2021 below.

New features

Module/type	New feature
FEFLOW	Improved OpenGL stability and UHD support (up to 3840 x 2160).
FEFLOW	Improved workflow for chemical reactions: Expanded software capabilities for reactive transport. In particular, the possibility to include a flexible definition of the reactive transport species (individuals or entire system) and their chemical associations via a new FEFLOW Species Definition file.
FEFLOW piHMC	New Hydromechanical Coupling Plugin Ability to evaluate changes in effective stress due to pumping via the application of modified Hooke's Law (evaluates the hydro-dispersive parameters hydraulic conductivity, porosity and storage coefficient as a function of effective stress).
FEFLOW	Ability to print curve labels in tooltips.
FEFLOW	System and user metadata support in FEM and DAC files: ability to document system, model-specific and user-specific information in the FEFLOW files (meta information can be documented from the GUI, FEFLOW Console and FEFLOW Python interface).
FEFLOW Console	Additional command line operations (for version, SAMG and meta).
FEFLOW	Support for the latest SAMG solver version (v. 2019).
FePEST	New FePEST improvements: <ul style="list-style-type: none"> • The concept of Preferred Value used for Tikhonov Regularisation has been extended • Optimised graphical interface • Optimised XML format project file (*.fps) • Python support for user-defined scripts
Scripting	New API features and improved documentation (requires Python \geq 3.5): <ul style="list-style-type: none"> • Improved vectorized access to model parameters • Better control of the simulation engine • Setting history charting for selections • Particle tracking For more details please see https://github.com/DHI/ifm/blob/master/tutorials/whats-new-in-ifm7400.ipynb
IFM	New IFM functions for: <ul style="list-style-type: none"> • Conductivity anisotropy • Handling selections • New parameter access by ID and sub-ID • Parameter expressions • Budget and content diagrams • WGEO coordinate system • Simulations times All new functions are also accessible via Python interface.

New module	<p>MODFLOW 6 to FEFLOW Extractor (Preview Release)</p> <p>The MODFLOW 6 (MF6) extraction tool has been developed to convert grids/meshes developed in MF6 to FEFLOW's FEM format, facilitating the migration from MODFLOW 6 to FEFLOW. Aquifer parameters stored in MF6's Layer Property Flow (LPF) and Storage (STO) packages can be also converted and saved on the FEM file as reference distribution. In addition, the extraction tool stores the original MF6 cell indexes in the FEM file, which can be used for manual importing of boundary conditions and other MF6 inputs and outputs.</p> <p>While this tool has been tested in many different models, it is currently available in a pre-release version only. We encourage all users to try this new tool in order to notify MIKE Development of any errors, as well as feature and workflow suggestions.</p>
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