



FloEFD™ Release Highlights

Software Version FE16.0.0

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Introduction

This document provides a high-level summary of this release. It includes a summary of the new features in this release, any authorization code changes required, any major installation changes, and any transitioning issues you should be aware of before installing.

This document is located on the top level of the DVD and on SupportNet. Changes may be added to this document after the release. Refer to the Release Highlights documents on SupportNet for the most up-to-date release information.

New Features

The following new features are available in this release.

- **Absorption of water vapor by solids.** Many solid materials, in particular polymers, can absorb water vapor from humid air. This moisture can be also released from solids. Taking into account the effect of absorption of moisture by polymers is essential for simulation of film condensation, fogging, or moisture prediction. You can now take into account this phenomenon by providing sorption properties of the solid material under consideration. Available in the LED/Lighting and Advanced module.
- **Conditions Linked from Components.** The design of complex devices often assumes a multi-level simulation approach: you may start an analysis from a simple component level, then follow that with an assembly of components and finally work on a full system which may include many sub-assemblies. Now if you move from level to level you can re-use task definitions of a component in the assembly. This saves a lot of time since you do not need to repeat the definition for each component and each sub-assembly again and again. You just link to the component's project (which can take just in a few seconds). It also minimizes the risk of user mistakes and simplifies the pre-processing of complex assembly models. Moreover one can create a library of components by saving model components together with FloEFD conditions for later use by other engineers in the company. To add conditions from a component's project to an assembly project use **Tools, Add from Components** tool. By default the added conditions will be linked to the definition in the component, so by changing conditions in one component you can easily update all conditions in the assembly linked to that component. Conversely, to edit conditions for a particular component you can also break the link.
- **Transient Explorer.** With the new Transient Explorer data compression technology you can minimize transient data saved on your disk and dramatically speed-up access to the data. In the **Calculation Control Options** dialog you can define time moments to save results. By default a full set of parameters is saved (the **Full Results** option). Alternatively for different time moments you can now save only **Selected Parameters**. Saving selected parameter at a higher frequency allows you to easily explore transient results (for example for making instant animations) while minimizing the computational data stored. To get access to the selected parameters results you need to switch to the new mode using the **Results, Transient Explorer** command.

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- **Radiation Intensity depending on angle (radiation pattern or radiation polar diagram).** For a directional radiation source you can now define an angular dependency for the radiation intensity. In addition to a 3D vector, the main radiation direction (which corresponds to zero degrees in the polar diagram) can now be defined as a normal to a planar face or plane.
 - **Spectrum for directional source.** For a directional radiation source you can now define a wavelength dependency for the radiation intensity. Available in the LED/Lighting module.
 - **LED non-linear compact model.** The new extension of the LED thermal-optical compact model allows LED characteristics to be specified by a tabular dependency so a non-linear dependence of the LED's voltage, radiant and luminous flux on can now be considered. Available in the LED/Lighting module.
 - **LED Goal Dependent Forward Current.** The value of the forward current boundary condition for an LED can now be set depending on a goal. Now you can control the LED driving current based on a sensor temperature defined as temperature goal. Available in the LED/Lighting module.
 - **LED Customizable Callout.** You can customize which resulting parameters you want to see in the LED output callout. Available in the LED/Lighting module.
 - **Rays to stop at reached surface.** While displaying rays (for the Monte Carlo radiation model) you can optionally end rays at the surfaces they reach to hide reflected rays. Available in the LED/Lighting module.
 - **Ray import.** You can define a radiation source by importing a special ray file containing information on a ray's starting point, wavelength, angle and energy. (Beta feature, available on demand).
 - **Spectral plot at a point.** Provides an opportunity to display spectral distribution of the radiant flux at specified points on irradiated surface (Beta feature, available on demand).
 - **UVGI.** Now FloEFD has the capability to estimate the response of microorganisms to UV light. The new calculation parameter **ultraviolet germicidal irradiation** allows predicting irradiation germicidal efficiency and effective germicidal dose due to absorption of ultraviolet radiation (200-320 nm) by water, air or a surface. Available in the LED/Lighting and Advanced module.
 - **Solution adaptive mesh refinement based on radiation criteria.** A new solution adaptive mesh refinement is based on incoming radiant flux. This type of refinement can be activated to automatically refine the mesh during a calculation in the area of a hot spot due to radiation, thus providing a more accurate prediction of the maximum temperature in the spot.
 - **Phase change for refrigerants.** Flows of refrigerants with liquid to gas (cavitation/boiling) and gas to liquid (condensation) phase change (e.g. refrigerant flows in heat exchanger or air conditioning systems) can now be simulated. Available in the ADVANCED module.
 - **Cavitation in compressible liquids.** You can now consider cavitation in compressible liquids.

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- **Network Assembly.** The new compact thermal model implemented in FloEFD allows for the simulation of electronic packages as a thermal resistor network consisting of a number of nodes. Available in the FloEDA Bridge module.
 - **Volume Heat Source Import.** You can now define a volumetric heat source (W/m^3) or temperature volume source as a cloud of points distributed in the selected volume. The value of the source applied is interpolated from the values in the points. The point values and coordinates can be set manually or imported from a CSV file.
 - **New mesh refinement criteria for channels.** This new option ensures a uniform mesh in channels of different heights. It allows for the achievement of an equally refined mesh of a specified refinement level within channels of a specified height or smaller.
 - **Improved goal convergence analysis.** Goal convergence is now analyzed when the achieved number of travels equals two analysis intervals. By default an analysis interval is equal to 0.5 travels, so the goal convergence is analyzed after 1 travel has passed. By decreasing the analysis interval value goals are checked for convergence earlier so calculations do not need to wait until 1 travel is reached.
 - **Broadband noise estimation.** You can now estimate the acoustic power level generated by isotropic turbulence in accordance with Proudman's definition.
 - **Faster surface plot creation for complex geometries.** If the **Results Processing Speed-up Data** option is enabled in the **Component Control Options** dialog, FloEFD saves additional data during preparing geometry which allows for faster creation of surface plots with the "Use CAD geometry" option enabled.
 - **Show XY-plots and Goal plots in the graphics area.** You can now display XY plots and Goal plots in the graphics area. The plots are updated with each loaded time moment.
 - **Response surface optimization.** DoE (Design of Experiments) capability has been extended with the Response Surface Optimization method which can be used to find minimum, maximum or search for a specific value based on the calculated set of experiments.
 - **Interface to External optimizer.** Allows for controlling FloEFD from external optimization tools to perform multi-parametric optimization. Uses text based data exchange and command-line driven executable to run FloEFD.
 - **Korean GUI and Help.** GUI and online help are now available in Korean.

Authorization Codes

You may request new authorization codes whenever you are ready to transition to the newest releases of FloEFD by logging in to SupportNet at <http://supportnet.mentor.com> and opening a Service Request (remember to choose the "Other Request Type" radio button, then select "New License Request"), or by contacting your local Mentor Graphics office. Turn around time from Order Fulfillment will be 48 hours from the receipt of the request. You will need to provide your system's host ID before your MSL codes can be created. You can use one of the commands at http://www.mentor.com/products/howto_hostid to retrieve your host ID. Please include this ID in your New License Request.

Installation Information

For additional information on installation, refer to Installation Instructions manual and the help system within the installation software. You can view this manual in the Manual directory at the top level of the DVD.

Support Information

If you have questions about this software release, please log in to SupportNet. You may search thousands of technical solutions, view documentation, or open a Service Request online at:

<http://supportnet.mentor.com/>

If your site is under current support and you do not have a SupportNet login, you may easily register for SupportNet by filling out the short form at:

<http://supportnet.mentor.com/user/register.cfm>

All customer support contact information can be found on our web site at:

<http://supportnet.mentor.com/contacts/supportcenters/>

Supported Platform

- Microsoft Windows 7 Professional, Ultimate or Enterprise 64-bit edition, Windows 8, Pro or Enterprise 64-bit, Windows 10 Pro or Enterprise 64-bit
- For solver: Microsoft Windows 2012 Server x64, Windows 2012 Server R2 x64, Linux RHEL 6.6, Linux SUSE SLES 11
- Microsoft Office 2013, Microsoft Office 2010, Microsoft Office 2007
- Microsoft Windows Media Player 7.0 or higher
- Ethernet network adapter
- Mouse or other pointing device
- DVD-ROM drive
- 1024 MB RAM minimum, more recommended
- 5,3 GB of free hard disk space, more required for simulation models