OML-Multi 6.2
– getting started

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Introduction

OML-Multi is an atmospheric dispersion model, used to assess air pollution from sources such as stacks and area sources. It can be used at distances up to around 20 km from the sources. OML-Multi is a modern Gaussian plume model, based on boundary layer scaling instead of relying on Pasquill stability classification such as older models do. The OML model is maintained by Aarhus University (AU) in Denmark. The model was originally developed by the National Environmental Research Institute (NERI), which in 2007 became part of Aarhus University.

The OML model is frequently applied for regulatory purposes. Thus, it is the recommended model to be used for environmental impact assessments when new industrial sources are planned in Denmark. The model is used to demonstrate that planned facilities comply with the *Danish Guidelines for Air Emission Regulation*. Furthermore, the model is used in the context of the regulations concerning *Approvals for Livestock Holdings.*

Besides studies on compliance, the model can be used for environmental assessments where air pollution has to be mapped for an entire urban area.

OML-Multi version 6 has two major new features compared to previous versions. Firstly, it is possible to perform calculations for a 10 year time series of meteorological data. This is of particular interest in the context of the Danish regulations concerning Approvals for Livestock Holdings. Secondly, in version 6 it is possible to use OML-Multi for deposition estimates. This is of particular interest in relation to so-called "VVM assessments" (Environmental Impact Assessments of large projects) in respect to impact of new facilities on terrestrial and aquatic ecosystems.

Use the help facility!

The user interface is in English. The user can switch to Danish if desired. There is a help facility within the programme. **It is highly recommended to make extensive use of the help facility**. The present *Getting Started* guide is quite brief, whereas the help facility contains much more detailed information.

You can download updates to the programme and the help text at the web site
http://www.au.dk/oml-international

System requirements

The following equipment is required in order to run OML-Multi:

- A PC with Windows operating system (Windows 7, 8 or 10).
- 30 MB free disk space.
- Possibly a DVD drive (depending on the media for the OML package)
- A screen with a minimum resolution of 800 x 600. It is recommended to use a higher resolution, however.
- When installing the software administrator privileges are required. The program can be installed so it is accessible for a single usere or for all users of the machine.
- Concerning network: The program should be installed locally on every machine where it is used.

Installation

Media

The OML model is delivered as a package of files, here referred to as the "OML package". The package can be delivered on one of several media: CD/DVD, USB key or as a zip file.

All three types of media have the same content, which usually includes a license key (a file which is specific for each user and contains company address etc.). In some cases, the license key is delivered separately. The license key is typically located in the folder "License" in the OML package.

First-time installation

You must be logged on your operating system with administrator privileges.

- Close running programmes.
- The next step has slight variations depending on the media:
  - **DVD**: Insert the OML DVD. Normally, installation will automatically begin.
    Otherwise: Select **Start / Run** and write **D:setup.exe** (assuming that your DVD drive is D:).
  - **USB key**: Open the contents of the USB key and doubleclick Setup.exe

  Zip file: Unpack the zip file (OML package) in a location of your choice on the hard disk or network drive. E.g., you may unpack them to a new sub folder named *OML-Multi-Installation* in your user folder (c:\users\<username>). After unpacking the files doubleclick Setup.exe.

- Follow the instructions on screen.
  On most PC's, installation takes only a couple of seconds.
  After installation an icon for OML-Multi 6.2 becomes available on your desktop. Furthermore, OML-Multi can be accesssed from Start / Programs.

Assigning a license file
- When you start OML-Multi for the first time you must assign a valid license file to the programme. Go to the menu *Help* and choose *Change user license*. This allows you to navigate to the location of your license file. Typically, it is in the folder *License* within the OML package (you may also have received it by mail).

- When you use the programme it is pertinent to place your own data in a folder for that purpose. During installation such a folder is created – by default as *C:\OML_data*.

Optionally install Adobe Acrobat

If you haven't installed the program Adobe Acrobat Reader, it is recommended that you do so. Some supplementary material concerning OML in is in PDF format, and the Acrobat programme or an equivalent app is necessary in order to read such files.

Supplementary material

There is various supplementary material (such as reports with guidance on regulatory use of the model, some of them in Danish) in the OML package in the folder *OML_Supplement*. This material is not installed on your hard disk, but you may copy it if you wish. In the folder there is a file called *Overview.txt* describing what is available. (Furthermore, the help text topic *Supplementary information* also provides such a description).

Meteorological data

When you install the program, two sets of meteorological data from Denmark will be copied to your hard disk. International users of OML-Multi may find other meteorological data sets in the OML package in the folder Met_data. For instance, registered users in Latvia will find a data set from Riga in that folder.

In order to use such additional meteorological data sets, the data should be manually copied to your hard disk; you may put them anywhere on your disk, but the suggested location is in the folder C:\OML_data.

If you use other meteorological data than the standard data set supplied with the model, then you must make sure that the settings within the "Special settings" menu are correct – see the section "Getting started" for details.

Upgrading OML-Multi

If you have an existing installation of OML-Multi you can proceed in the same way as for a first-time installation. The previous version will be uninstalled if required. Such uninstallation will not affect any data files you may have created yourself.

Setup files with small upgrades to the program may become available through the Internet at http://www.au.dk/oml-international

License key

Keep the DVD in a safe place

The OML package normally contains a licensing key with the user's company name. The OML package including the license key should be kept in a safe place, because it may be needed for later upgrades or reinstallations of the product. In the chapter *Installation* it is explained how to assign the license key to the program.

The licensing conditions resemble those of many other programs. However, note the conditions concerning the number of users for one license:

The license is for a specific physical location

The licensing conditions for OML-Multi gives the licensee right to use *any number of copies of the program* on any number of PC's, as long as they are *physical present at the address of registration*; also included by the license are portable and home computers for employees working at the specified address

Note that a company having branches at several physical locations is required to have separate licenses for each branch where the program is applied.

Getting started

Example, step by step

You can get started with a set of OML computations by following the steps outlined below. There is further explanation in the Help text under the heading "Getting started".

- Start OML-Multi by double-clicking the OML-Multi icon on the Desktop.

- Select **Files | New project** . If you are not in the folder where you wish to save your project data, you should navigate there by using the folder tree in the right panel.
  For *Project name* enter *Test* and click OK.
  This will lead you to the window *File names assigned to the project*. Here, you can just accept the names suggested and click *Save project*. This will save the names of the project files, but the files do not yet exist. Visually, this is indicated by grey - not black - file names.

You must now enter source data and receptor data (in any order) before you can make a set of calculations.

- Select **Sources | Point sources**.
  You may enter comments for the source for your own internal use (shown on-screen only). Then, fill in the remaining source data. You can move from field to field by using the Tab or the Enter key. Use the Help button to get help when you fill in the various fields. One of the more difficult issues in practical applications of OML-Multi is the specification of building data. Here, you may seek guidance in a separate note: "Handling the influence of buildings in the OML model", which is available through the help text.
  When you're done use *Save all sources*.
  Click *Yes* to leave the sources menu.

- Select **Receptors**. This allows you to specify the receptor grid (points where calculations are made), both in respect to position and to the terrain characteristics. You can choose either to use a circular or a rectangular receptor grid. You can enter your own data, or accept some or all of the default values. Use the Help button to get help for the various fields.
  When you're done use *Save*.

- Click **Calculations**. Then click *Save* and confirm with *Yes* that you wish to continue with the calculations.
  When the calculations are over you will get an on-screen message.

- Close the message. The button *Results* leads you to a window, where you can choose the extent of the results you wish to see. You may also chose to see the results visualised in a simple graphical format.

Use of local meteorological file

Danish users will typically not need to worry much about the meteorological file, because the OML model comes bundled with two standard sets of data which is normally used for regulatory purposes in Denmark. One set is a meteorological time series with one year's worth of data (the year of 1976 from the airport of Kastrup), and the second a time series with 10 years of data (airport of Aalborg, 1974-83). For stack height determination of industrial stacks according to the Danish *Guidelines for Air Emission Regulation* the set of one year's data is normally used, whereas for calculations related to regulations concerning *Approvals for Livestock Holdings* the 10-year series has come into use from 2014 (concurrently with version 6.0 of OML-Multi).

Users outside of Denmark will need a pre-processed meteorological data set representing local conditions. The OML meteorological pre-processor can generate such data from measured meteorological data (there is more information in the help text). Alternatively, a meteorological model such as MM5 can be used to create the necessary data, or data originally prepared for other dispersion models can be converted to OML format. Such data generation or conversion software is not part of OML-Multi. You may enquire about current possibilities.

International users of OML-Multi may find relevant meteorological data sets in their OML package in the folder *Met_data*. They will also find a *Readme* file. For instance, registered users in Latvia will find a data set from Riga in that folder.

In order to use such additional meteorological data sets, the data should be manually copied to your hard disk; you may put them anywhere on your disk, but the suggested location is in the folder C:\OML_data.

If you use other meteorological data than the standard data set supplied with the model, then you must make sure that the settings within the "Special settings" window are correct with respect to resolution of wind direction and meteorological year. This information appears from the relevant readme file for the meteorological file.

You can find the Special Settings window by selecting **Calculations,** and then click on the "Special settings" button.