

Version
July 2006

Program

RF-CAD

**Interface for RFEM
and AutoCAD**

Short Introduction

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1. Introduction

RF-CAD is a free tool offered by Ing.-Software Dlubal GmbH to link RFEM and AutoCAD. It provides a special toolbar with 4 functions in AutoCAD. These include the import of RFEM structures, the import of isolines and the export of RFEM structures, as well as the individual control of the import and export functions and the language setting.

2. Installing RF-CAD

2.1 Installing: Load Applications

RF-CAD is by default installed automatically with the RFEM installation. If you want to decide for yourself whether this program shall be installed you can select the customized installation. The program files will be stored in the Dlubal Program files under \RF-CAD. If you have already installed AutoCAD 2004 or 2005 on your computer, the RF-CAD toolbar will be registered automatically in AutoCAD and can be immediately used in AutoCAD.

As long as your user account is the administrator, who executed the installation, the RF-CAD toolbar will appear in AutoCAD automatically.

All other users have to integrate the RF-CAD toolbar manually. You have to assign the file RF-CAD.ARX to the Startup Suite. It will then be loaded every time you start AutoCAD. The command for this is *APPLOAD*. Click the button *Contents...* to enter the file RF-CAD.ARX.

Note: So far, RF-CAD can be loaded only in **AutoCAD 2004** or **2005**.

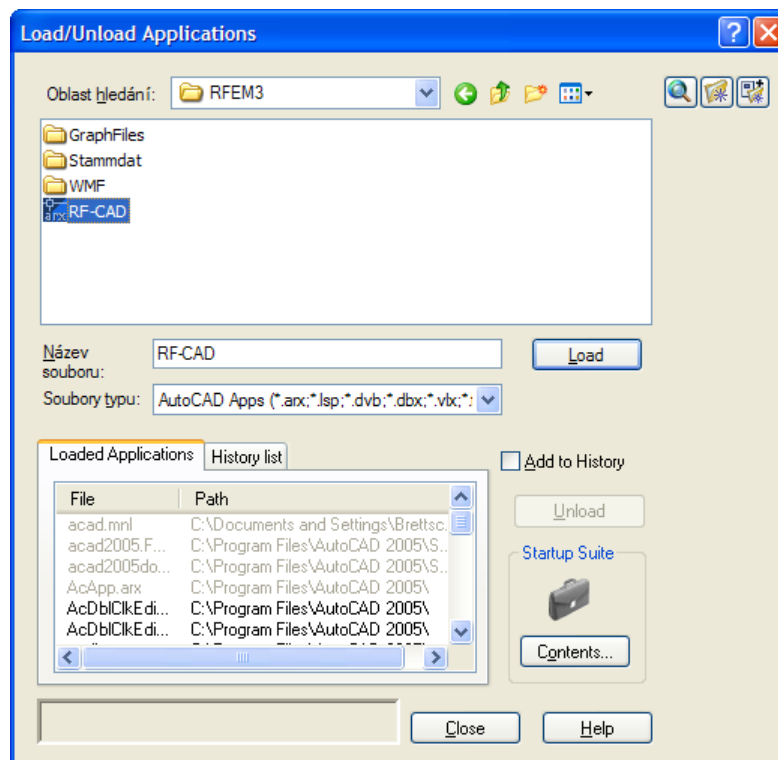


Image 2.1: Dialog Load/Unload Applications

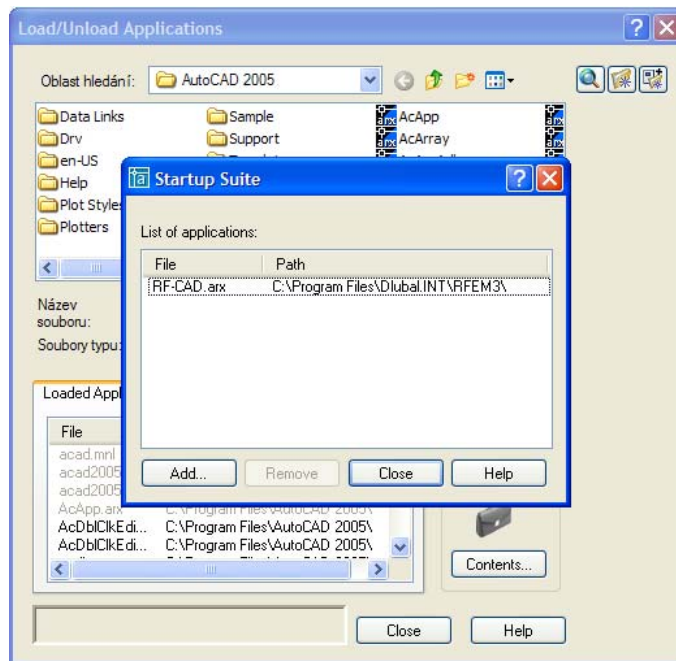


Image 2.2: Startup Suite

2.2 Uninstalling: Unload Applications

When uninstalling RFEM the RF-CAD files are deleted as well. However, the manually generated folder for CAD.ARX in AutoCAD will remain until deleted manually. For this, enter again the command *APPLOAD*, open the Startup Suite with the button *Contents* and remove RF-CAD.ARX.

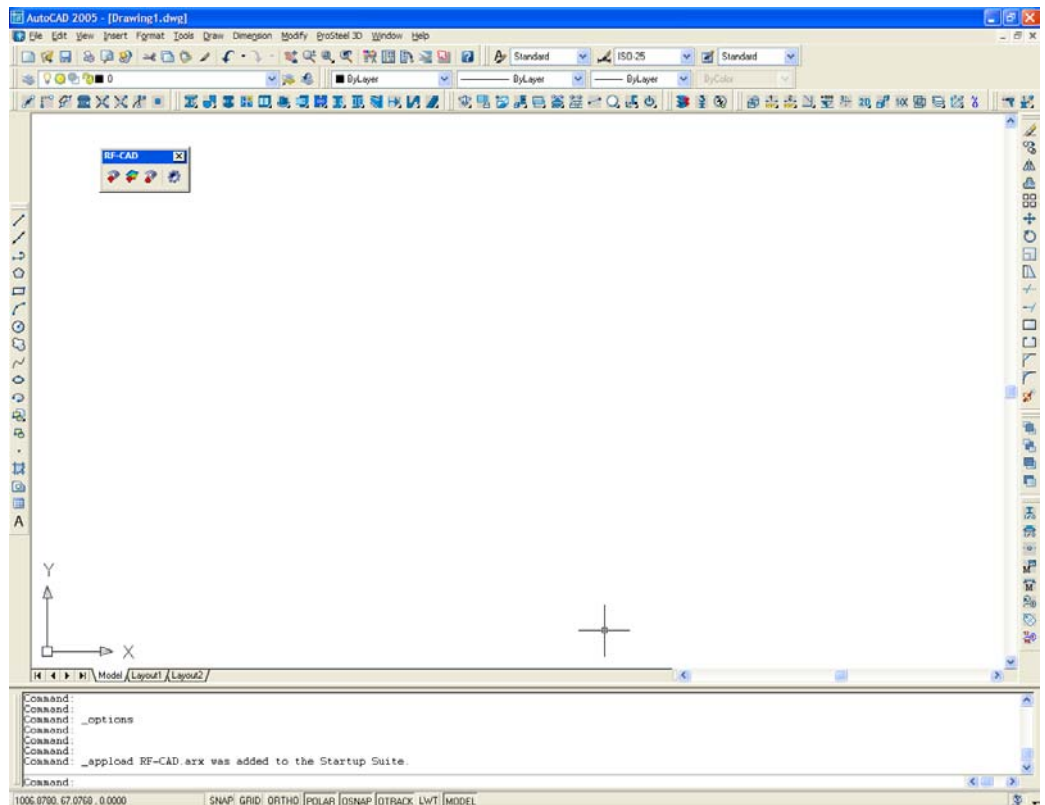


Image 2.3: Starting AutoCAD

3. RF-CAD Functions

The RF-CAD toolbar with 4 Icons should be displayed after starting AutoCAD. If the toolbar is not displayed, check in the Startup Suite whether RF-CAD.ARX was created correctly (*APpload* → *Contents*). Also check either in the pulldown menu View under Toolbars or with the right mouse button whether the toolbar has been selected. The RF-CAD toolbar belongs to the menu group ACAD, where you can activate the toolbar.

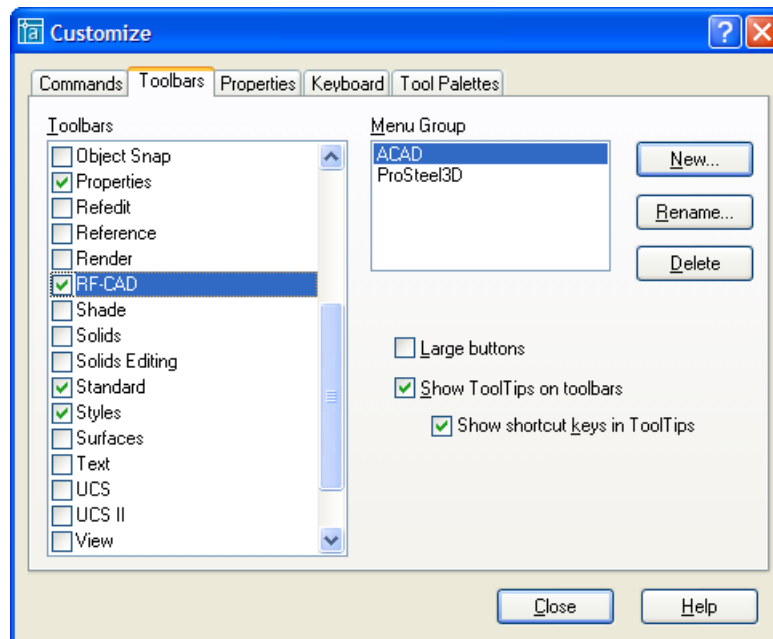


Image 3.1: Dialog *Customize* – selecting RF-CAD

The following tool bar is then displayed.



Image 3.2: RF-CAD toolbar

This toolbar is by default displayed vertically on the left (see below) and the four icons have the following meaning:

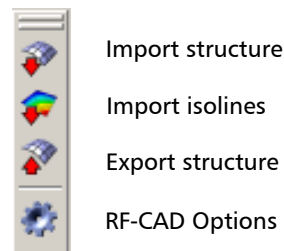


Image 3.3: RF-CAD and its four functions

4. Options

4.1 Options: Import Structure

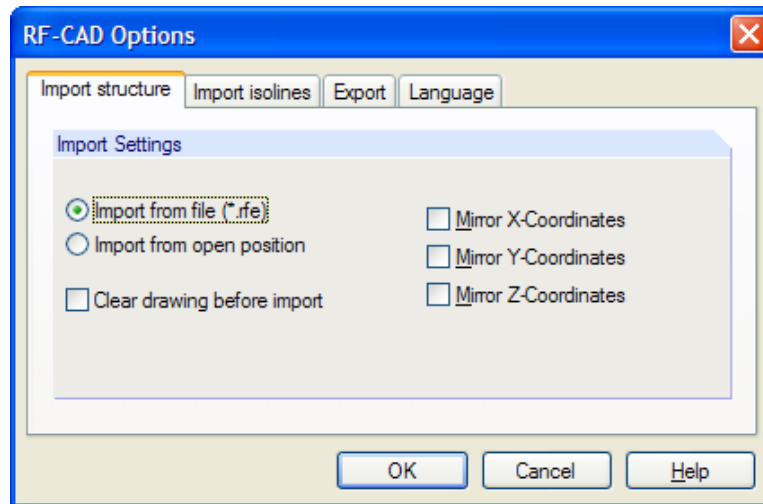


Image 4.1: Dialog *RF-CAD Options*, Register *Import structure*

Three general settings are necessary for the import of structural data. These concern the source of the import, the previous clearing of the drawing as well as the orientation of the axes.

Import from

You can decide, if you want to either import the structure directly from RFEM or from a *.rfe file.

Clear drawing

With this, the already active AutoCAD drawing will be cleared before the import. In case you want to import more than one structure into an AutoCAD drawing this option is not advisable.

Mirror coordinates

You can select the coordinates, you want to be mirrored for the import. The reason for this lies in the coordinate system of both programs. In AutoCAD, the z-axis is always orientated upwards and in RFEM by default downwards to enter loads positively. Therefore, the mirroring of the z- and y-coordinates becomes necessary when the z-axis was orientated upwards in RFEM.

4.2 Options: Import Isolines

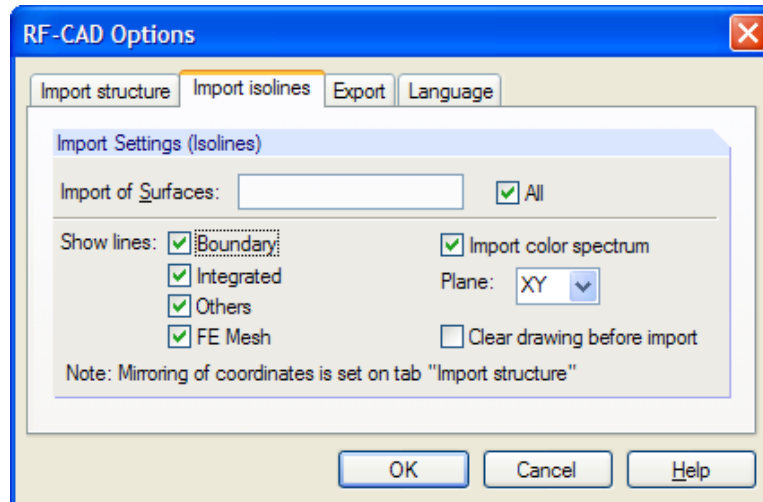


Image 4.2: Dialog RF-CAD Options, Register Import isolines

RF-CAD features several options for the import of isolines. These are always imported directly from the RFEM structure. The current internal forces, deformations or reinforcements will be transferred. Imports from *.rfe files are not possible.

Import of Surfaces

In this field you can enter the surface number, for which the isolines shall be imported. If a section and/or a filter was activated in RFEM, the isolines are only imported for the surfaces displayed in RFEM, even when the option "All" was selected.

The boundary lines, the integrated lines and the FE-mesh of these surfaces can be imported for the selected surfaces. Sections and/or filters in RFFEM2 have no influence on this.

Show Lines

There are four types of lines: Boundary lines, integrated lines, other lines and the FE-mesh. Boundary lines, integrated lines and the FE-mesh can be assigned to a surface (see import of surfaces). Therefore, all these lines are dependent on the option "import of surfaces". Other lines can not be assigned to a surface. This option is therefore independent from "import of surfaces".

Import color spectrum

With the import of the color spectrum you can also define the plane, in which the color spectrum will be stored. You can choose between the planes XY, XZ and YZ. The color spectrum can not be influenced by mirroring the axes in the register "import structure".

Clear drawing

The already active AutoCAD drawing will be cleared before the import. In case you want to import more than one structure into an AutoCAD drawing, you should not enable this option.

Mirror coordinates

The same settings as in "import structures" are used.

4.3 Options: Export

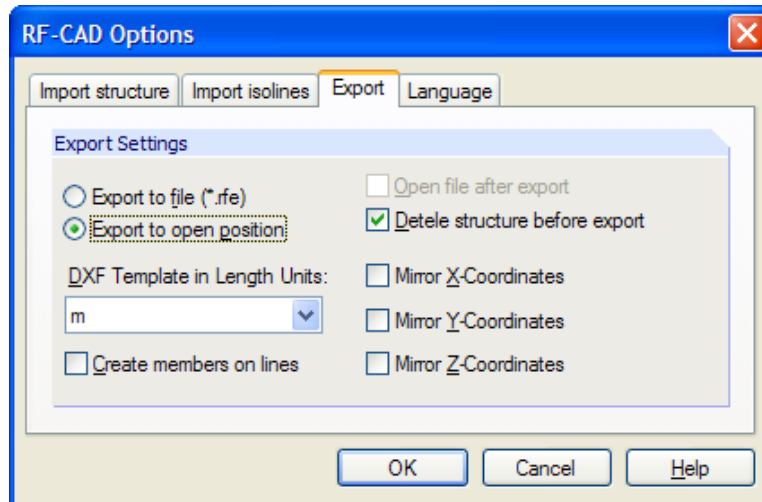


Image 4.3: Dialog *RF-CAD Options*, Register *Export*

The three general export settings concern the export target, the units for the export as well as the orientation of the axes.

Export to

You can decide, if you want to either export the structure directly to RFEM or to an*.rfe file. When exporting to a file you can also decide whether you want the file immediately opened in RFEM. The export in an open position allows for deleting the structure.

Mirror coordinates

You can select the coordinates to be mirrored. In AutoCAD, the z-axis is always orientated upwards but in RFEM by default downwards. Therefore, mirroring the z- and y-coordinates becomes necessary when the z-axis was oriented upwards in RFEM.

4.4 Options: Language Settings

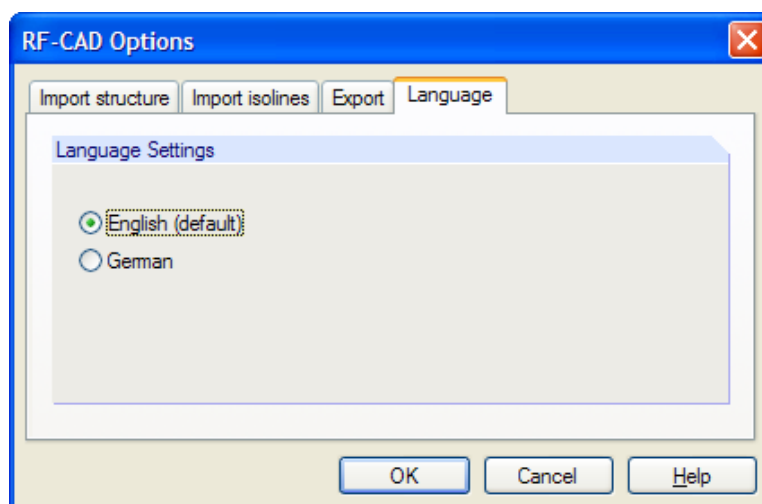


Image 4.4: Dialog *RF-CAD Options*, Register *Language*

Here you can select the language. After changing the language settings you need to confirm with OK and open RF-CAD again. Otherwise the previous language setting is left until the next opening of this feature.

5. Layers Created in AutoCAD

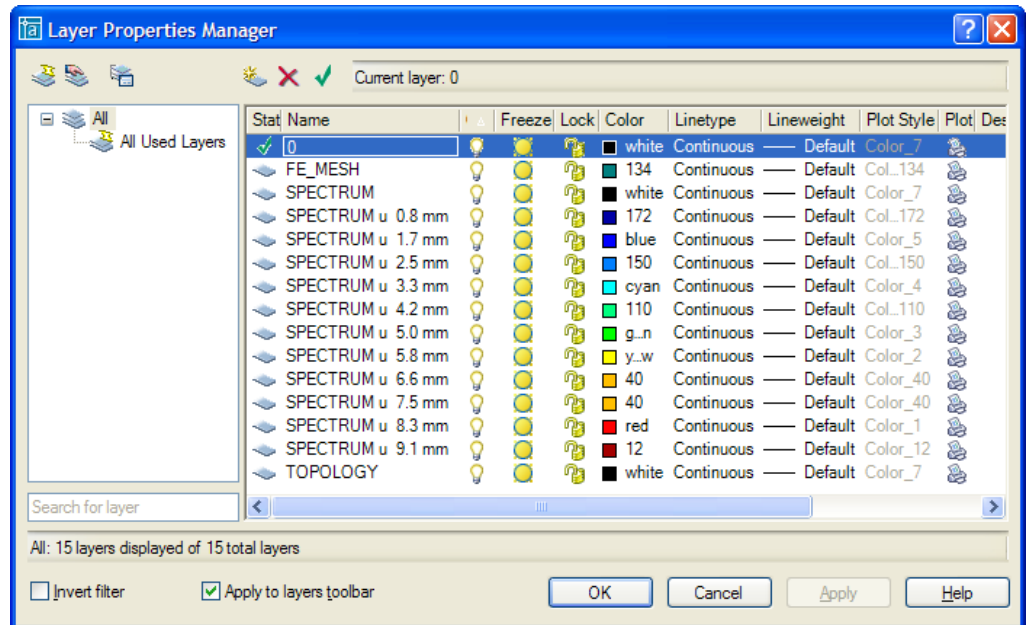


Image 5.1: Managing layers in RF-CAD

The layers are generated automatically with the import in AutoCAD. This has the advantage that individual parts can be switched off easily.

The layers **TOPOLOGY**, **SPECTRUM**, **FE_MESH** and one layer per isoline value are created by default. You can define the color and the line type for each layer. Also, the layer can be frozen or locked.

- Structure → TOPOLOGY
- Color scale → SPECTRUM
- FE mesh → FE_MESH
- Results → For every isoline value one separate layer is created.

6. Example: Importing Results

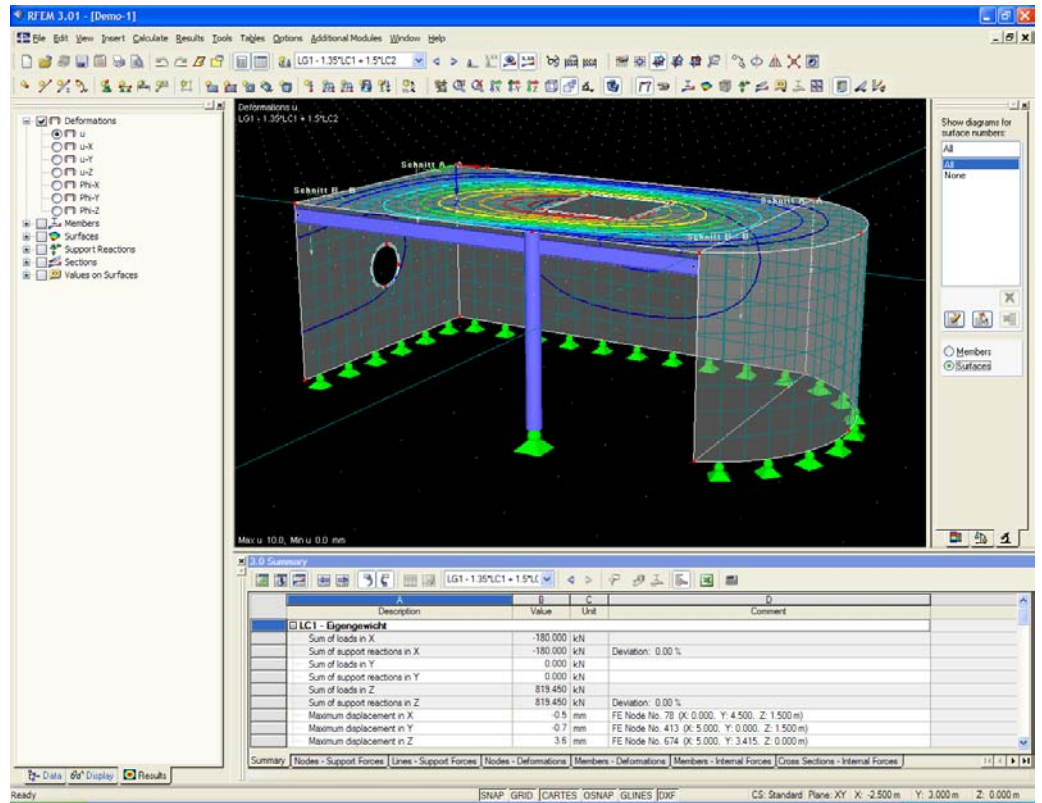
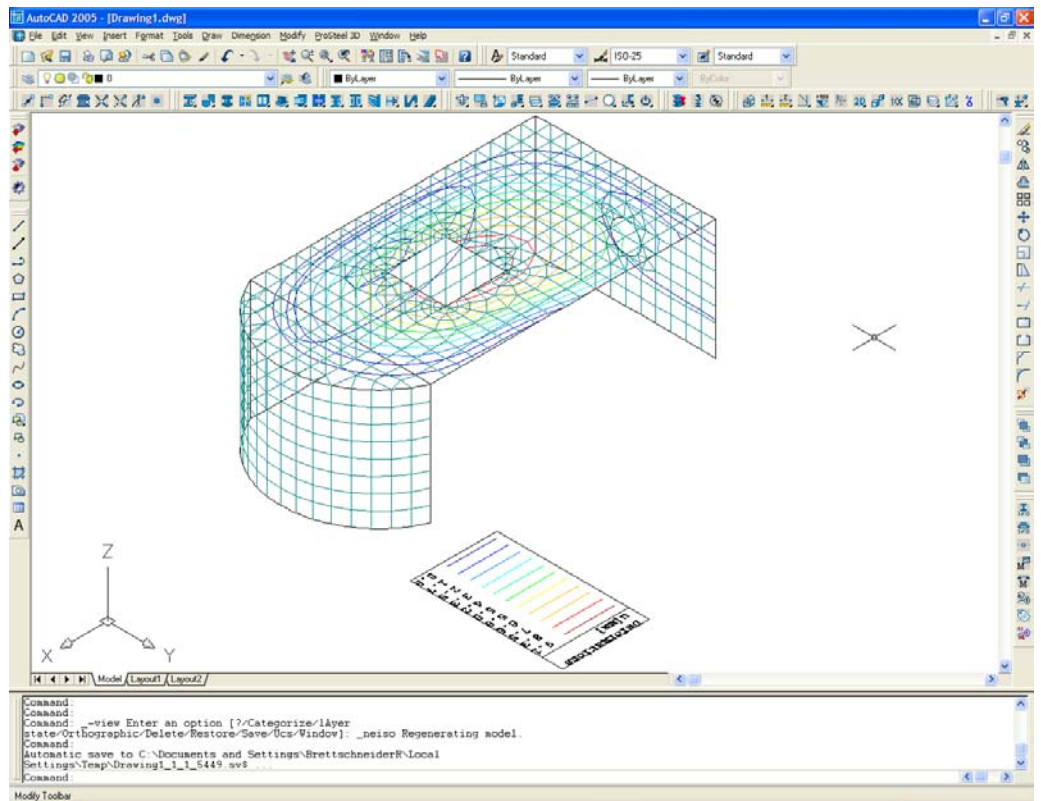
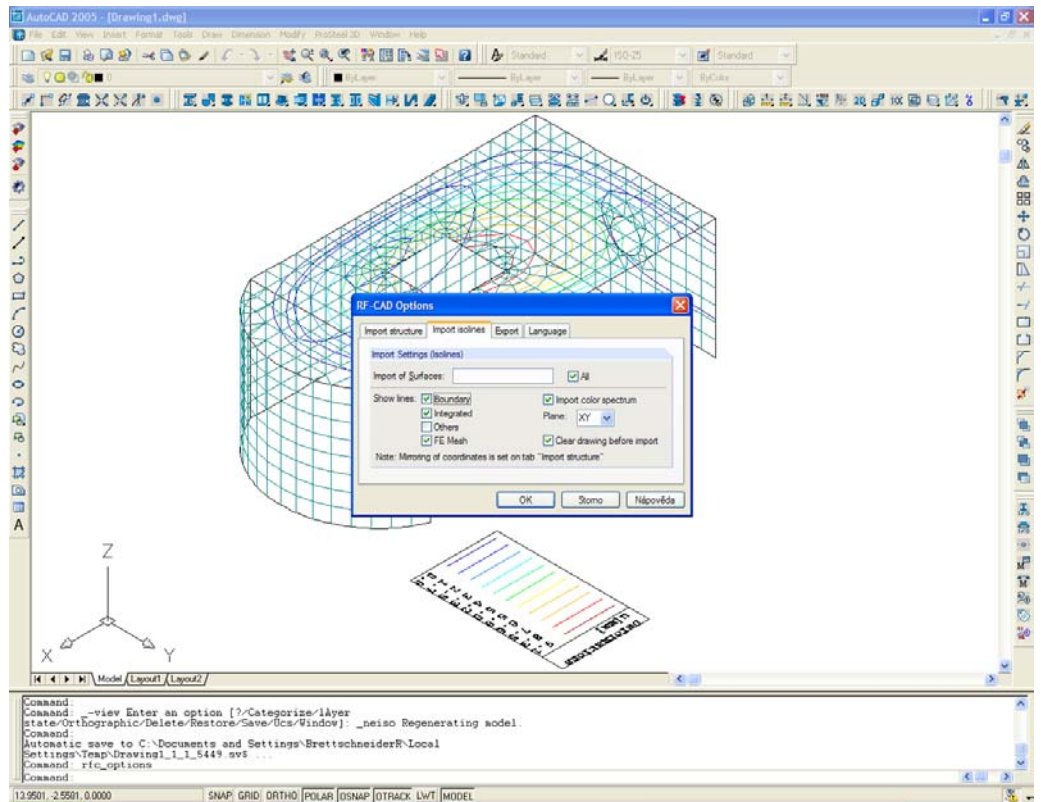
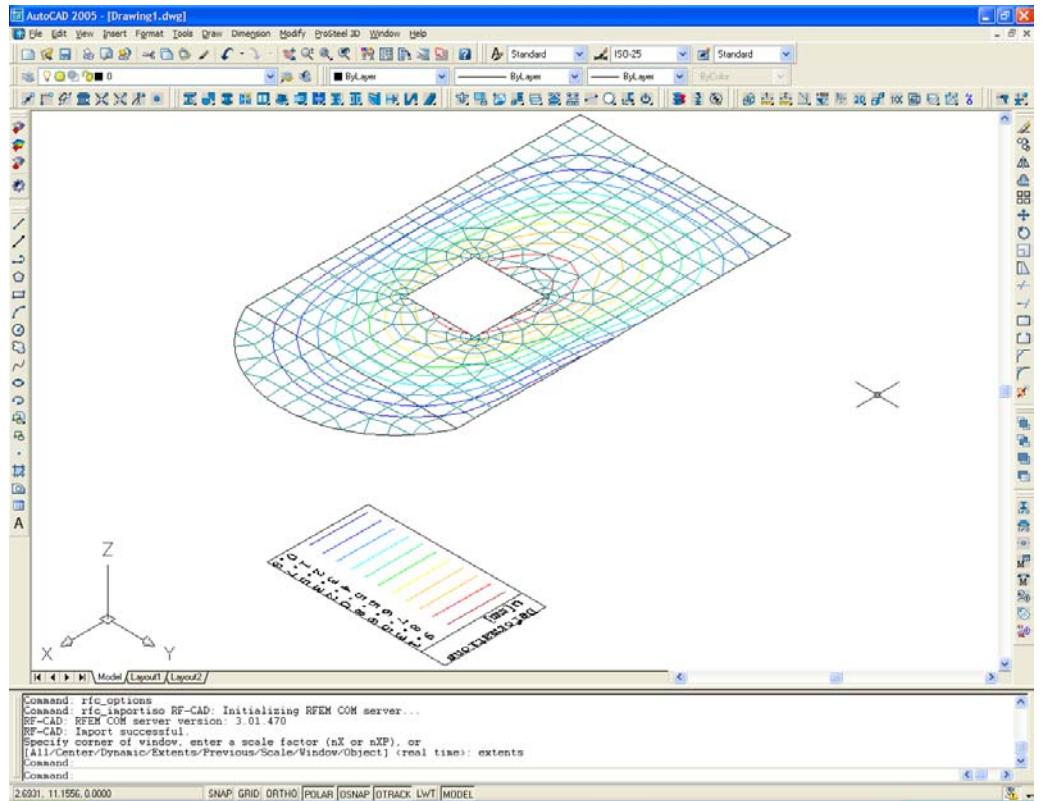
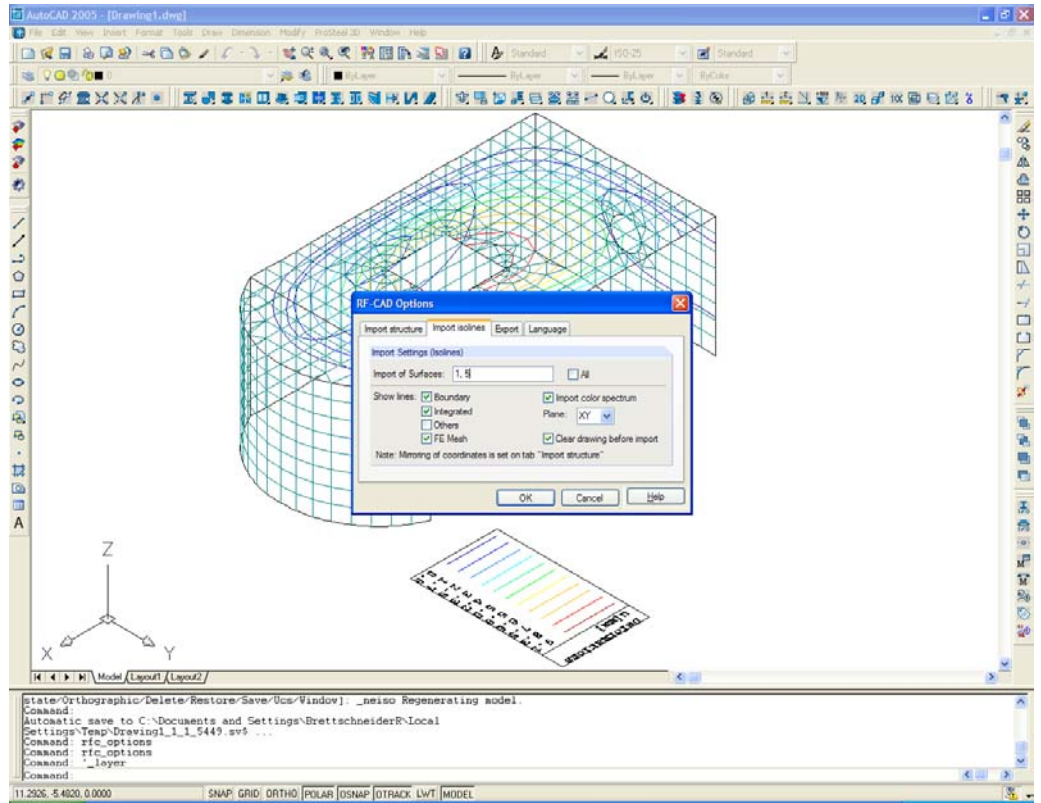


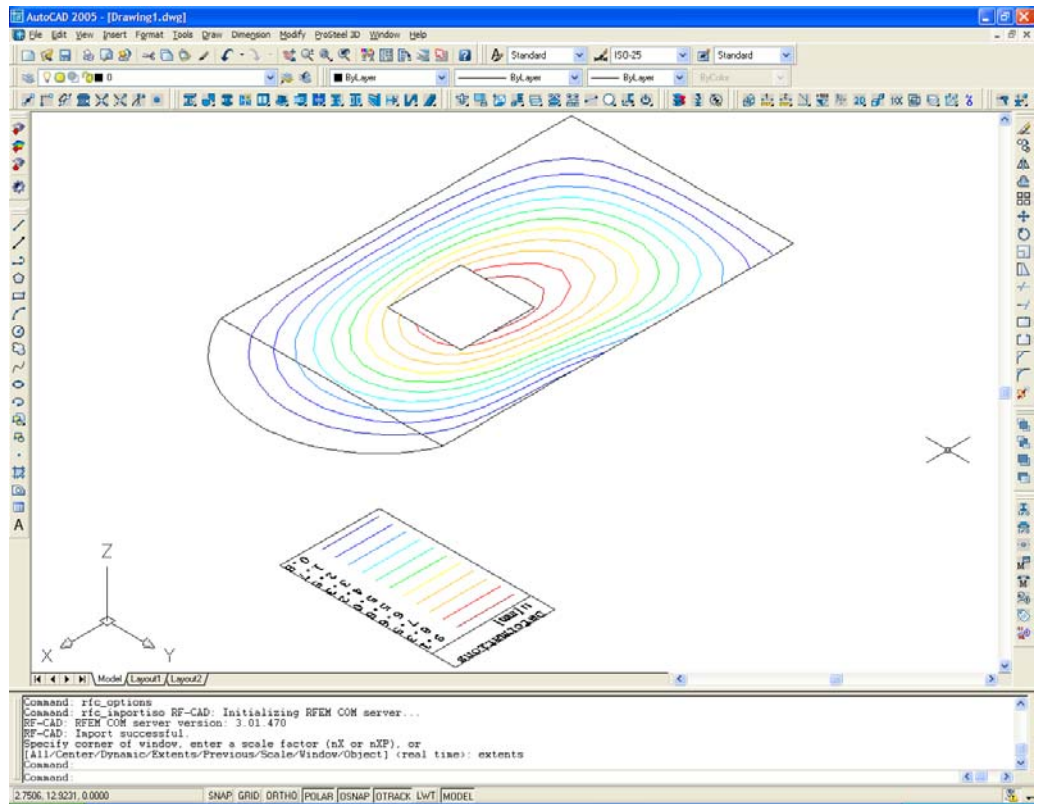
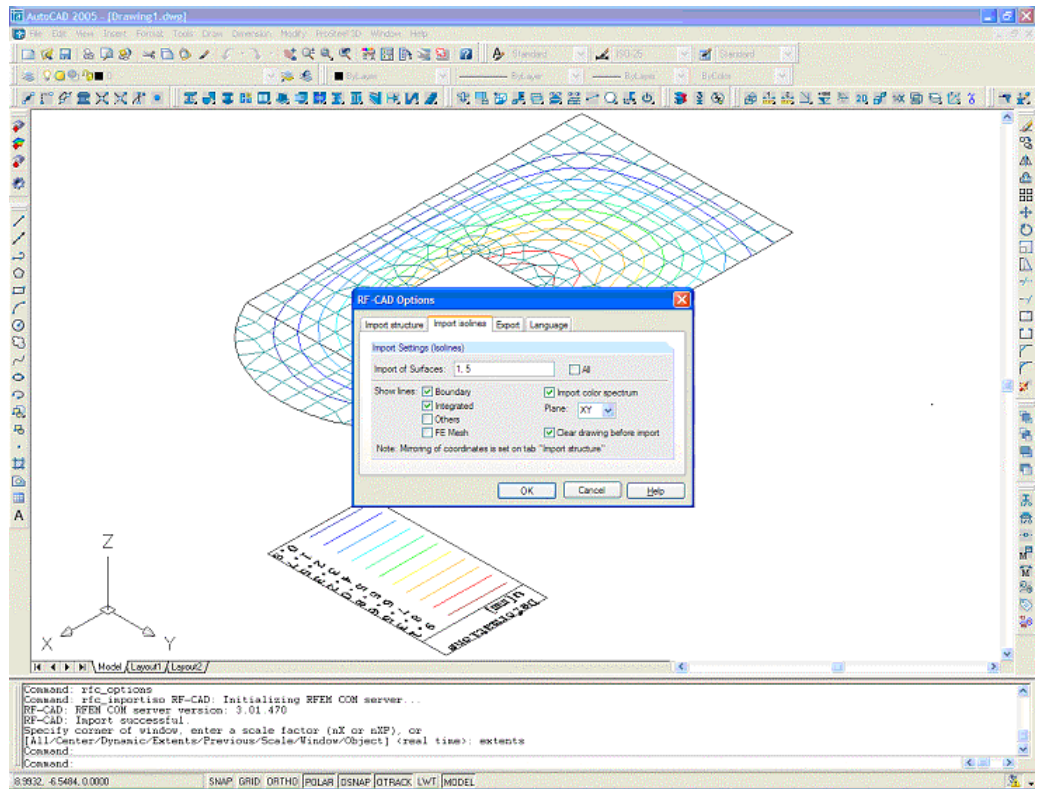
Image 6.1: RFEM structure with FE mesh and deformations



Images 6.2 and 6.3: AutoCAD import - structure with FE mesh and all results of the deformations



Images 6.4 and 6.5: Import of surfaces 1 and 5 only, including the FE mesh and the deformations



Images 6.6 and 6.7: Importing the deformations of surfaces 1 and 5 without the FE mesh