PTC **Express**

PTC

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Defining Custom Units by Editing Mathcad Unit Files

You can add built-in units to any of Mathcad's unit systems. These units can then be used in any Mathcad worksheet opened in a copy of Mathcad that has the modified unit files.

You must edit several of Mathcad's operating files to add unit definitions. The files to be edited can be found in your Mathcad installation directory.

To add a unit to the SI unit system, edit the files

- <Mathcad install>/units/unit-system-SI.xml
- <Mathcad install>/mpl/mcdunitsystemsi.mpl

Warning: Make a copy of these files before editing them. If the files are broken, Mathcad does not run. Be sure to save the original versions of the files, under the names **Oldunit-system-SI.xml** and **Oldmcdunitssystemsi.mpl** in their original folders so you can always revert to them.

The first file contains the unit symbols and quantities required for the **Insert Unit** dialog box. The second file contains the actual definition of the unit.

Example - Adding a Unit for Fathom

A fathom is an old British naval unit for measuring the depth of water. It is one-thousandth of an imperial nautical mile, 6.080 feet or 1.8288 meters.

1. Open the file **unit-system-SI.xml** from the units folder within the Mathcad folder.
2. Choose a quantity to associate with your unit. Fathom is a unit of length. You need not supply all translations for the <displayName> if you are only supporting a single language, but you must at least supply the English name, used as the default.

3. Create a new <unit></unit> entry in the file. These are listed in the file by quantity, so you can find the entry later. The easiest way to add a new unit is to copy and paste everything between a pair of existing <unit> tags and modify the new entry. So search for another unit of length such as angstrom. Copy the other unit entry, and change the unit name, symbol name, and display name to fathom and fath, its most common abbreviation.

4. You can add translations if you know them, or just use the English for the other languages.

```
<unit name="fathom" quantity-name="length">
        <symbol name="fath" xml:lang="en"/>
        <displayName xml:lang="en">fath</displayName>
        <displayName xml:lang="jp">尋</displayName>
        <displayName xml:lang="de">fath</displayName>
        <displayName xml:lang="fr">fath</displayName>
</unit>
```

5. Save and close the file.

mcdunitssystemsi.mpl

1. Open the file **mcdunitssystemsi.mpl** from the mpl folder within the Mathcad folder. New units are added with the prefix mc_<symbol> = rv(<value>); Copy a similar unit and replace the unit name so that the syntax and spacing is correct.

```
mc_N·m      = rv(newton *. meter);
mc_fath     = rv(1.8288 *. meter);
mc_N·cm     = rv(newton *. centi meter);
mc_N·mm     = rv(newton *. milli meter);
```
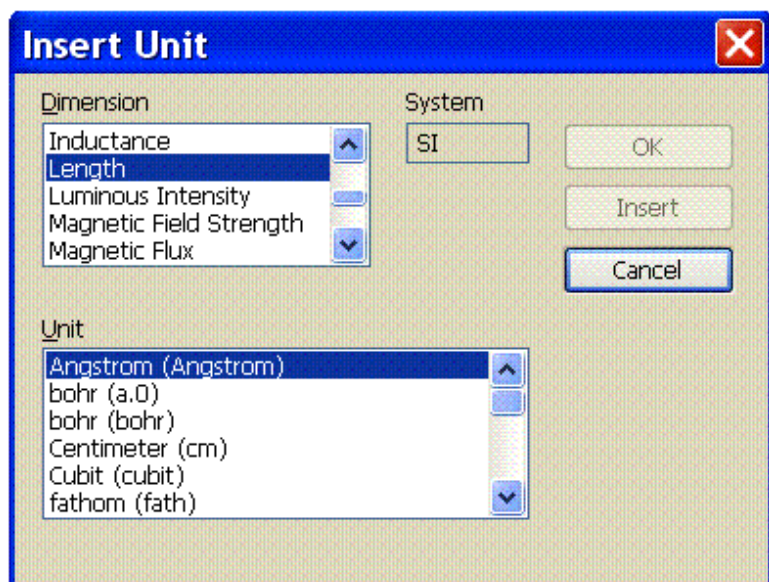
2. Save and close the file.

3. Restart Mathcad. Test the name by typing and evaluating it:

$$1 \cdot \text{fath} = 1.829 \, \text{m}$$

$$1 \cdot \text{m} = 0.547 \, \text{fath}$$

$$2 \cdot \text{fath} + 3 \cdot \text{m} = 6.658 \, \text{m}$$

Your unit now appears on the **Insert Unit** Dialog under the appropriate quantity:

Mathcad 14 Note

In Mathcad 14 these files are text files, but they are Unicode UTF-8 encoded, so use a text editor that can edit in Unicode. Notepad has difficulty displaying and editing Greek characters. Be sure to open and save the file as UTF-8.

Right-click, choose Save Target As, and change the extension to XMCD and File Type to All to **download Mathcad file**. (Mathcad 13)

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