



Module 6

1. Mass Properties
2. Using the Materials Editor



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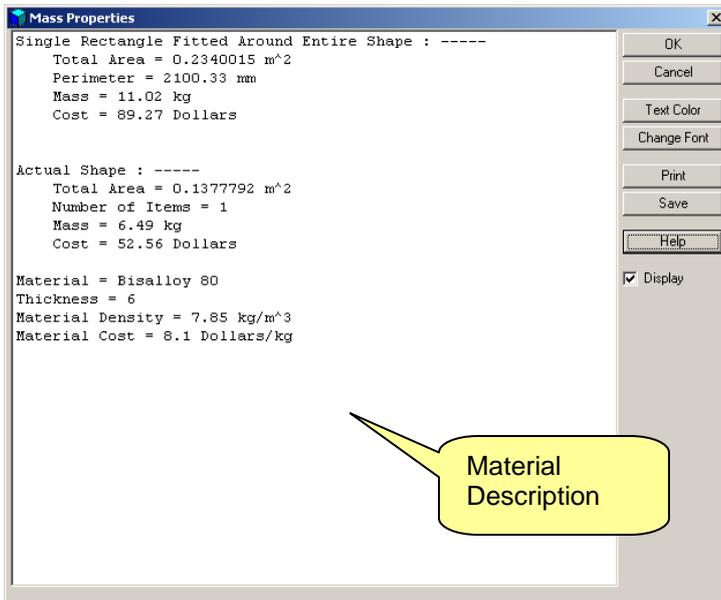
Mass Properties

Information to assist estimating the cost of a project is available through the Mass Properties feature. The shape must have been given a **thickness** setting and a **material** must have been selected from the **Properties** dialog. The Materials Table must be kept up to date with current prices for accurate cost estimates to be obtained (see Materials Editor below for instructions).

Click the material properties on the toolbar to display the **Mass Properties** dialogue box. This will show us the area, mass and cost of the shape in three modes:

Single Rectangle Fitted Around The Entire Shape. This provides the area, perimeter, mass and cost of material based on a rectangle fitted to the extremities of the entire shape. The rectangle includes spacing between each item if there are multiple items. It is the minimum rectangle from which the shape may be cut in the current position and rotation.

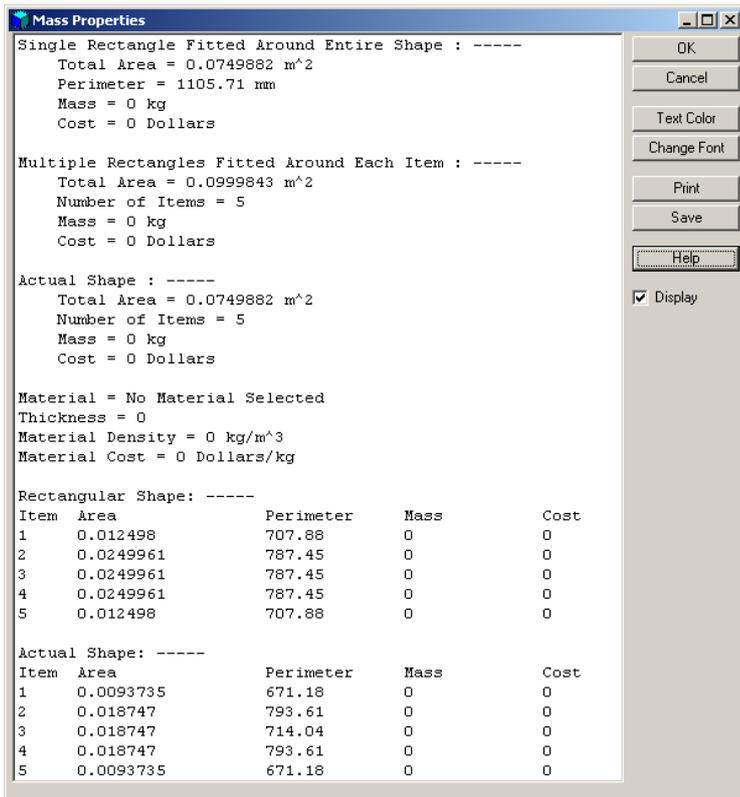
Actual Shape. This is the true area, perimeter and mass of the cut shape. If the shape is made up of multiple parts the area is the sum of the areas of the individual true shapes. This will be the mass of the finished item and may also be useful during the design phase of the project



If the “Apply Label” check box is ticked, the label information will be printed onto the drawing. Once the label is on the drawing, it can be moved simply by clicking on it and holding down the left mouse button while dragging.

Double click the label text to re-open the label dialog box. You may change the text color and font size. Hide the label by de-selecting the ‘Display’ check-box.

Important Note: If the material thickness is 0 (zero), then the mass and cost will also be zero. If this is the case, exit from the Material Properties dialog and set the material thickness. The program can now calculate the mass.



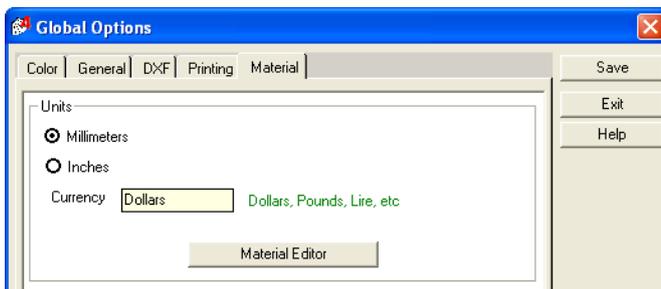
If the shape consists of multiple patterns, such as an elbow, segmented bend or breach, additional information is provided that details the individual patterns.

The properties information may be added to the pattern drawing, printed or saved as a text file. If it is printed or saved the Project ID, shape name, time and date are added.

Materials Editor

For the mass and cost to be accurate, some preliminary work is needed.

First, go to the 'Tools' pull-down menu and select 'Global Options'. Click on the 'Material' Tab. Click the option button to select 'Inches' or 'millimeters'. Also enter the unit of currency required if your national currency is not dollars. Click the 'Save' button if you wish to save these settings as "defaults" for future shapes.



Next, click the '**Material Editor**' button. Some sample data has been entered into the **Materials Editor** for testing purposes and this should be replaced with current data from your material supplier.

Note: The materials editor may also be accessed directly from the '**Tools**' pull-down menu.

It consists of a table of '**Description**', '**Mass Per Unit Area**' and '**Cost Per Unit Area**'. In the case of the **metric units**, the area is converted to square meters to reduce the size of the numbers. The value "**Kg/sq. m**" is the mass in kilograms of a square meter of the material **per 1 mm of thickness**. The program works by multiplying this value by the thickness dimension applied to the shape.

The screenshot shows the 'Materials Editor' window. It contains a table with the following data:

Description	kg/m ²	Cost/kg	Remarks
Aluminium 5251 H34	2.7	33.074	Confirm current price with your supplier
Aluminium 5083 H321	2.7	36.698	Confirm current price with your supplier
Mild Steel Plate - 4	7.85	3.223	Confirm current price with your supplier
Mild Steel Plate - 5	7.85	3.279	Confirm current price with your supplier
Mild Steel Plate - 8	7.85	3.293	Confirm current price with your supplier
Mild Steel Plate - 10	7.85	3.766	Confirm current price with your supplier
Mild Steel Plate - 12	7.85	3.573	Confirm current price with your supplier
Mild Steel Plate - 16	7.85	3.445	Confirm current price with your supplier
Mild Steel Plate - 20	7.85	2.389	Confirm current price with your supplier
Mild Steel Plate - 25	7.85	2.803	Confirm current price with your supplier
Galv Sheet - 0.4	8.504	5.35	Confirm current price with your supplier
Galv Sheet - 0.55	8.942	3.73	Confirm current price with your supplier
Galv Sheet - 0.75	8.585	3.74	Confirm current price with your supplier
Galv Sheet - 1.0	8.154	3.44	Confirm current price with your supplier
Galv Sheet - 1.15	8.288	3.68	Confirm current price with your supplier
Galv Sheet - 1.55	8.147	3.55	Confirm current price with your supplier
Galv Sheet - 1.95	8.215	3.42	Confirm current price with your supplier
Galv Sheet - 2.5	7.982	3.15	Confirm current price with your supplier
Galv Sheet - 3.0	7.951	3.15	Confirm current price with your supplier
Hot Rolled Sheet (H.R.C.) - 1.6	7.874	3.23	Confirm current price with your supplier
Hot Rolled Sheet (H.R.C.) - 2.0	7.874	3.44	Confirm current price with your supplier
Hot Rolled Sheet (H.R.C.) - 2.5	7.863	3.21	Confirm current price with your supplier

Material table - Metric

Some steel merchants quote the density of material per cubic meter (this is typically 7850 kg/cubic meter for steel). If this is the case, divide it by 1000 to get the mass per mm of thickness. The cost is in dollars (or your currency) per kg.

Look at the table opposite and notice that mass per square metre is equal for each Mild Steel plate thickness (7.85 kg/m²). This is because the mass is entered for 1 mm of thickness in each case.

Because the **cost of steel differs depending on its thickness** we must enter each material on a separate row so that this cost difference will show in our cost calculation. If the cost of steel was the same for all plate sizes we would only need one general entry in our table.

Useful Tip

This is useful since it allows us to have an approximate value that can be used when the exact price is unknown. For example we may decide to have a "Material" named "Mild Steel Plate – All other thicknesses" and apply a price of, say \$3.20 per kg/m².

Important

The Materials data may also be modified using Microsoft Access, however be careful not to change field names or leave blank rows or blank values within a row. The name of the file is Materials.mdb

Note that the materials data file, **Materials.mdb**, must be backed up regularly. This **file will be overwritten when you install a program update from the web-site.**