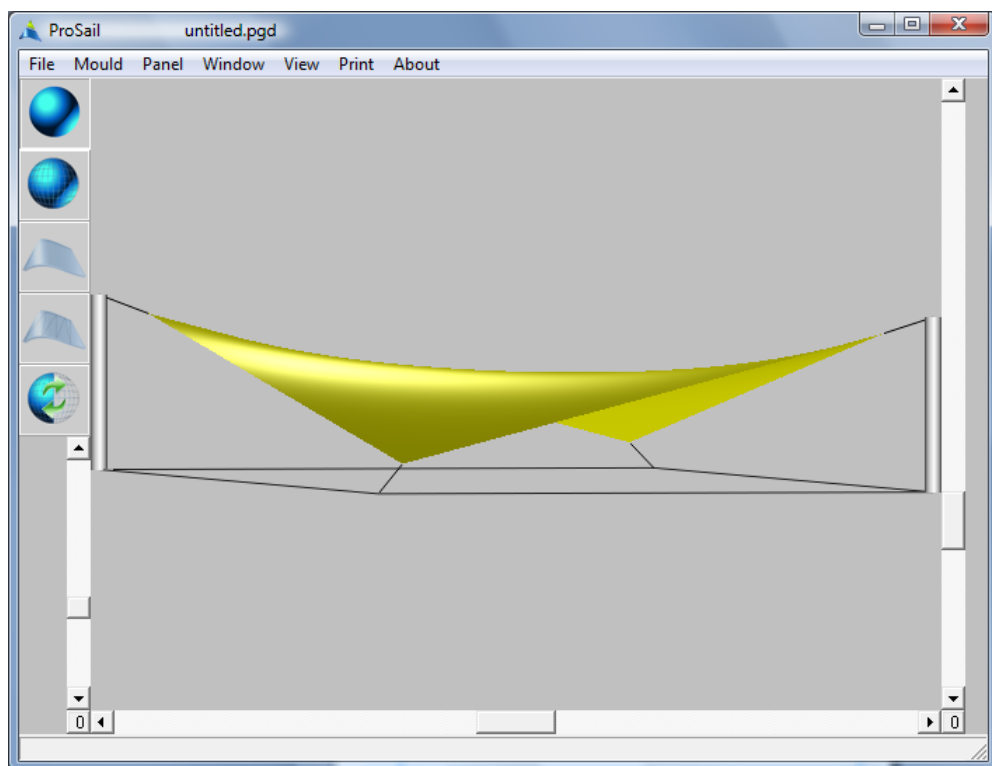


Pagoda/Hypar 3

Manual



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Dongle



A dongle is a small USB connector that plugs into a USB port on your computer.

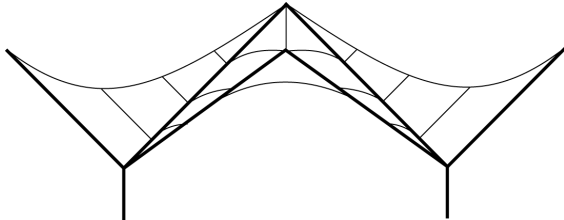
USB to Serial converter



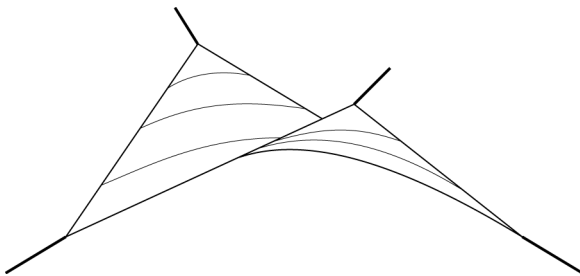
With the ProSail plotter mkIII or the ProSail digitiser, the dongle is an optional extra and is not supplied as standard. With these machines the software will run so long as the USB cable from the "USB to Serial converter" is plugged into

Introduction

Pagoda/Hypar is a mould-cut program. You design a 3D mould and Pagoda/Hypar will generate the 2D panel shapes required to make that 3D shape. The mould can be of two forms: Pagoda or Hypar.



Pagodas are symmetrical saddle type structures. Due to the fact that from a plan view they are exactly square they can be joined together as many times as desired to cover any area. The structure to the left is formed from four pagodas joined together.



Unlike pagodas, Hypars are not necessarily symmetrical and their four corners can be in any position or height.

Hypars are more common than Pagodas.

Designing a Pagoda or Hypar comprises three main steps:

1) Design a 3D mould

The mould is specified entirely by the **Dimensions** dialogue.

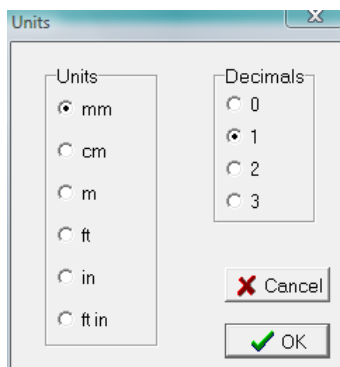
2) Develop Panels

Pagoda/Hypar will wrap the fabric around the inside of the mould to generate the 2D cross-cut panel shaping required.

3) Production

Send the panels to the Nesting Window for nesting and driving a plotter or cutter.

Selecting **Units** from the **File** menu :



This dialogue determines the current units and decimal places displayed in all of the dialogues throughout the program.

Although numbers will be displayed in these units they can be entered in any of the above units. For example if you want to enter 1.5 feet into a dialogue, you can enter 1.5f or 1.5' or 1f6i or 1'6". Then after pressing the Enter key it will be converted to the current units you selected in the Units dialogue. e.g. 457.2mm

If the current field is already displayed in the units that you want then when you enter a new number there is no need to add the units letters after the number. Just type the number.

Most dialogues have a % button that toggles between % and the current unit when you click in it.

If for example mm is displayed in the % button then fields in the dialogue will be displayed in mm.

If however % is displayed in the % button then some fields will be displayed as a %. Then if you enter a number into these fields it will be assumed to be a % unless you add the units letters to the end of the number.

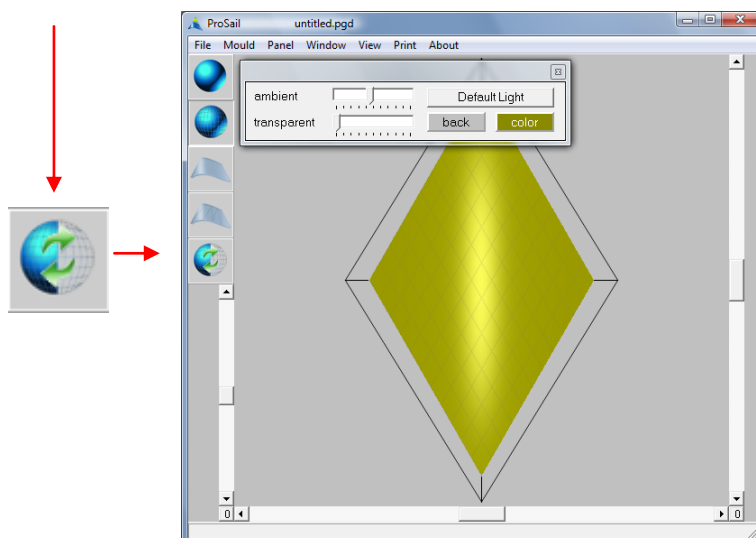
Some examples

<u>entered</u>	<u>converted</u>
4.2f	1280.2mm
1.4m	1400.0mm
4.2f - 7mm	1273.2mm
10i	254mm
100+10.7	110.7mm

Viewing

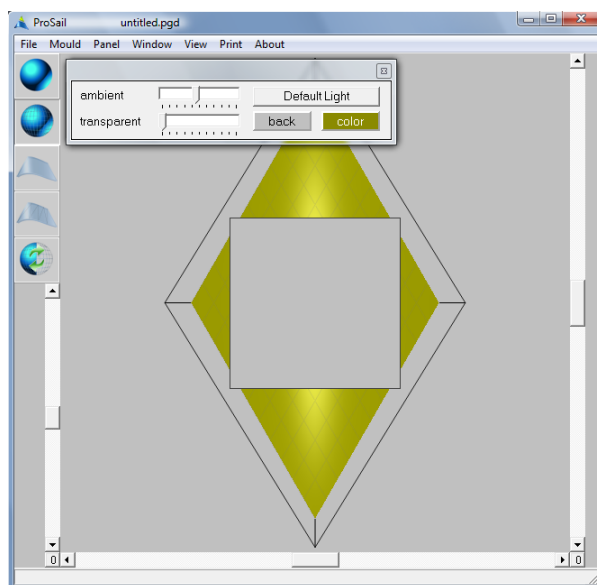
You can view your hydar as a 3D “wire frame” or as a “solid rendering”.

To switch between wire frame and solid rendering click the icon on the left of the screen.



The view direction can be changed by dragging any of the 3 scroll bars around.

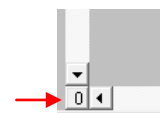
An easier way to change the view direction is with the Animate feature. Select **Animate** from the **View** menu (or click the “F1” key on the keyboard, or right click the mouse and click on **Animate**). A square outline will appear on the screen. As soon as the mouse enters the square the animate feature is activated. By moving the mouse from side to side and up or down you can rotate the view.



There are two animation modes when moving the mouse horizontally. It will either rotate the view in a horizontal plane or it will tilt the view clockwise/anticlockwise. To toggle between these 2 modes, press and release the Ctrl key on the keyboard while animating. This will redisplay the square outline. After moving the mouse into this square again, the mode will have changed.

To deactivate animation, click the mouse anywhere on the screen.

Clicking the small square at the bottom left of the screen will show the plan view.



Viewing

The maximum rotation of the view (either 180 or 360 degrees) is set in **preferences** from the **File** menu : **scroll bars 360 degrees**.



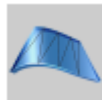
Displays the surface mould with minimal number of lines.



Displays the surface mould with a large number of lines.

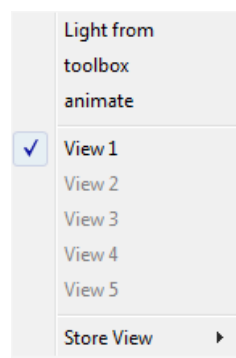


Displays the panels that have been generated.



Displays the panels that have been generated showing development lines.

Right clicking the mouse on the screen will display this popup menu :



Light from : Click on this to animate the direction of the light source. Works in a similar way to animating the view except it displays 2 arrows indicating the direction of the light source. The arrows are largest when pointing directly into the screen and change colour when at 90 degrees to this direction.

*There are actually 2 light sources - one directly in front which is fixed and another one that you can change the direction of using **Light from**.*

toolbox : Displays the lighting toolbox. See next page.

View1, View1, View3, View4, View5 : Click on one of these to go to that stored view. A quicker way is to use the "F2" key on the keyboard to loop through the different views you have stored.

Store View : Up to 5 different views including different light settings for each can be stored. Click **Store View** and select one of the 5 views to store the current view.

Toolbox



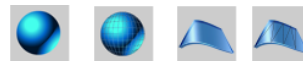
- Ambient:** Changes the intensity of ambient light.
- Transparent:** Changes the level of transparency of the surface.
- Color:** Changes surface color.
- Back:** Changes the background color.
- Default Light:** Changes **color**, light direction, **ambient** and **transparent** to the default values.

Zoom view

To zoom into part of the surface, hold down the Ctrl key on the keyboard and with it still held down press and release the Z key on the keyboard. Then release the Ctrl key. A horizontal and vertical line will be displayed at the mouse location. Move the mouse to the area you want to zoom in on. Click and hold down the left mouse button and drag the resulting selection box to encompass the area you want zoomed. When the mouse button is released, the selection box will be zoomed to fill the entire window.

If viewing the surface as a solid render, you are able to animate the view while it is zoomed. The point on the surface at the centre of the window will remain at the centre as you animate.

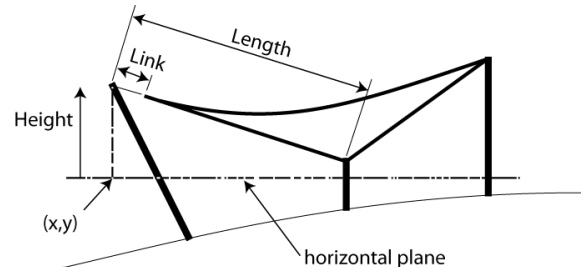
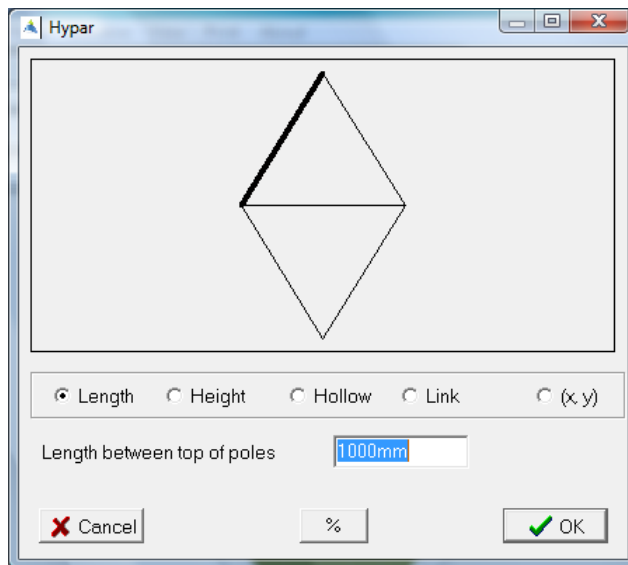
To unzoom, click on any of these icons :



Note: there are two modes when dragging the selection box. Either the click of the mouse will correspond to one corner of the selection box or the click will correspond to the centre of the selection box. To swap between these two modes, press and release the Ctrl key while the selection box is visible.

Hypar Dimensions

Select **Hypar** from the **Mould** menu :



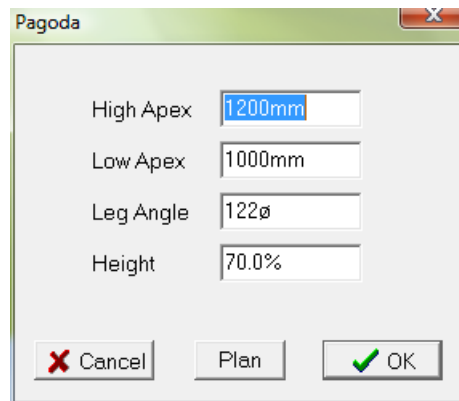
There are five dimensions that can be specified for each side (corner) of the Hypar. These dimensions can be selected by clicking on **Length**, **Height**, **Hollow**, **Link** or **(x,y)**. A given side or corner is selected by clicking the mouse in the picture of the hypar, or by using the left or right arrows on the keyboard.

- Length:** The straight line length between the top of the poles. This is the length you would measure using a string between the top of the poles.
- Height:** The height of each pole above a horizontal plane. The height is measured at 90 degrees to this horizontal plane. The horizontal plane could be the ground if the ground is perfectly horizontal.
- Hollow:** The amount of hollow on each side of the hypar. This is expressed as a percentage of the **Length** between the top of the poles. Note that this hollow is not visible on the screen until panels have been generated. Just like **Length**, **Hollow** needs to be specified for each side.
- Link:** The line lengths between each pole and hypar corner. Hence increasing **Link** will reduce the size of the hypar.
- (x,y):** The X and Y coordinates for the selected pole (in the horizontal plane). Note: Changing **x** or **y** changes **Length**. Hence either **Lengths** or **(x,y)** are specified.

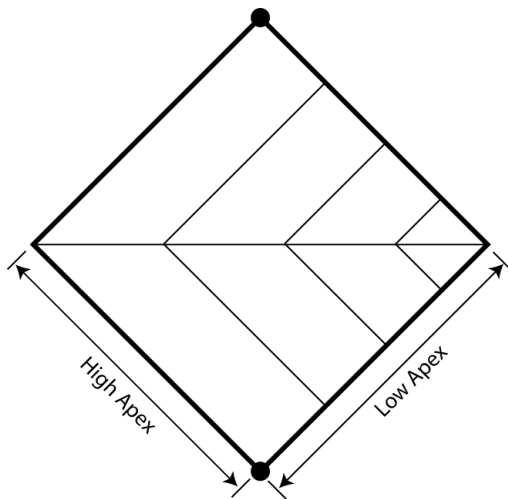
While in the process of entering information on **Length**, **Height**, **Link** or **(x,y)**, it is possible to enter values that do not produce a valid shape. For example you might be scaling a hypar from a small size to a large size. While entering the information the length of the first side may be many times longer than you currently have for the adjacent side. Hence temporarily these dimensions might not be valid. The Hypar program solves this problem by allowing you to enter dimensions that may be invalid but will display "Invalid Dimensions" at the top right of the dialogue. Every time you enter another dimension, Hypar will check to see if it is valid. After all the dimensions have been entered the "Invalid Dimensions" message should disappear.

Pagoda Dimensions

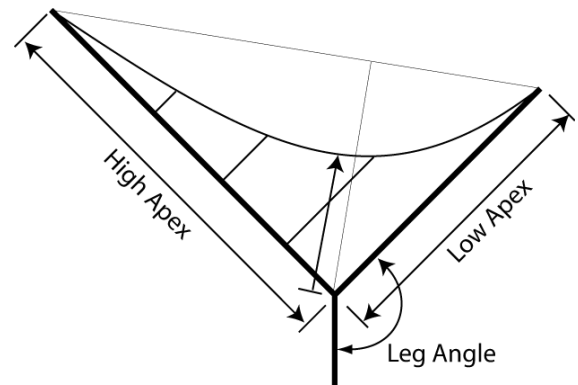
Select **Pagoda** from the **Mould** menu :



A dialog box titled "Pagoda" with a close button (X) in the top right corner. It contains four input fields: "High Apex" with the value "1200mm", "Low Apex" with the value "1000mm", "Leg Angle" with the value "122°", and "Height" with the value "70.0%". At the bottom, there are three buttons: "Cancel" with a red X icon, "Plan", and "OK" with a green checkmark icon.

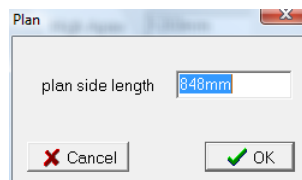


In plan view a pagoda is always a perfect square.



Leg Angle is the 3D angle measured between the Leg and the Low Apex Arm. Not a 2D projection.

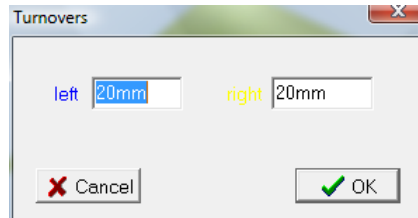
High Apex and **Low Apex** are the true lengths of the sides in 3D. If you wish to specify the projected lengths of these sides in plan view, click on the **Plan** button to display the following dialogue :



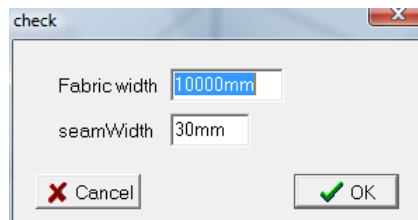
A dialog box titled "Plan" with a close button (X) in the top right corner. It contains one input field: "plan side length" with the value "848mm". At the bottom, there are two buttons: "Cancel" with a red X icon and "OK" with a green checkmark icon.

Panel Development

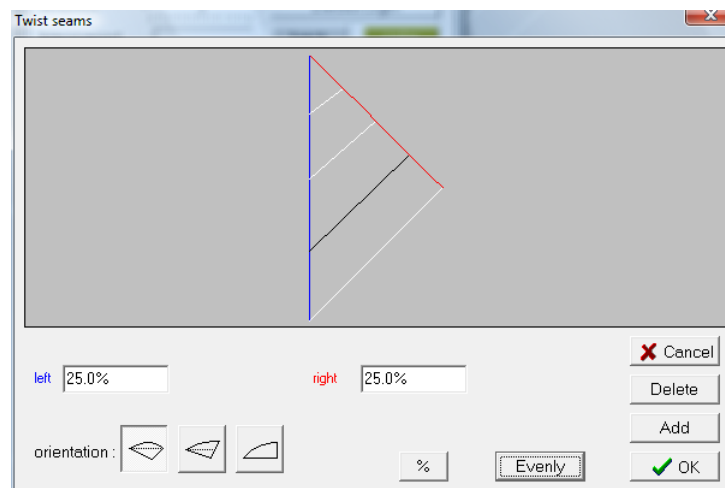
Select **New** from the **Panel** menu. The Turnover dialogue will be displayed asking for the extra material (turnover seams) required around the Pagoda/Hypar. If developing panels for a Pagoda they will be called **centre** and **outer** seam widths. If developing panels for a Hypar they will be called **left** and **right** seam widths.



After clicking **OK** the next dialogue to be displayed asks for the **seam width** required for joining the panels together. The **Fabric Width** is merely a value that Pagoda will use to test that the resulting panels are within. If the resulting panels are wider, it will warn you.



If developing panels for a Pagoda the following twist seam dialogue will be displayed defining development for the right hand side of the pagoda. The left hand side will be the same due to symmetry.



Click near a seam to highlight it and display its **left/right** position and its fabric **orientation** allowing them to be changed.

- Add :** Add a new seam.
- Delete :** Delete the currently selected seam.
- Evenly :** Make all seams evenly spaced.

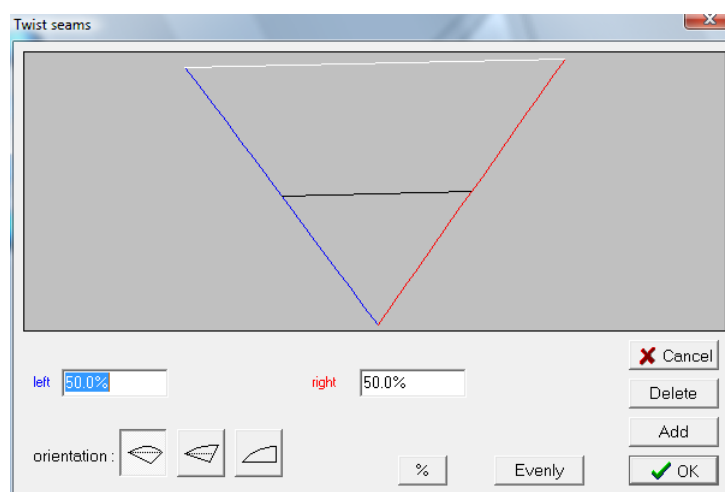
Panel Development

If developing panels for a Hypar the twist seam dialogue will be displayed twice.

First for the top half of the Hypar :

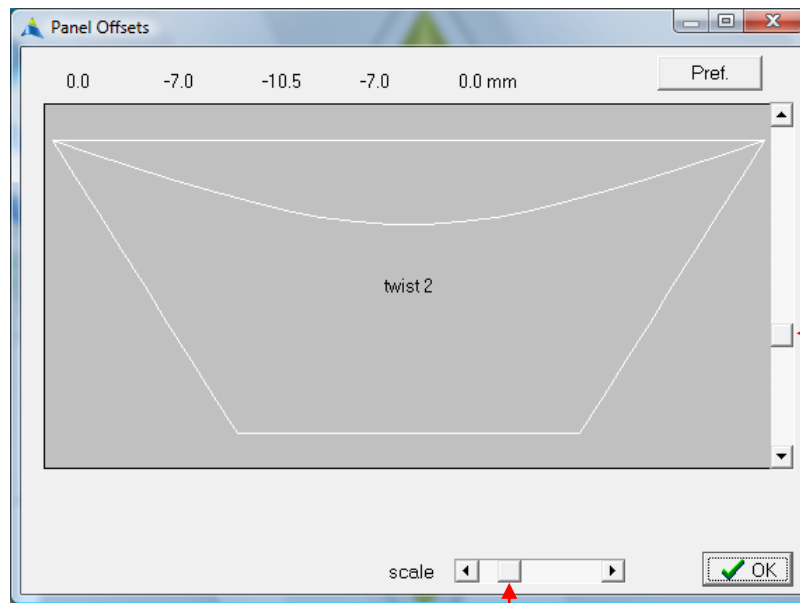


Then for the bottom half of the Hypar:



View Panels

Select **panels** from the **Window** menu.

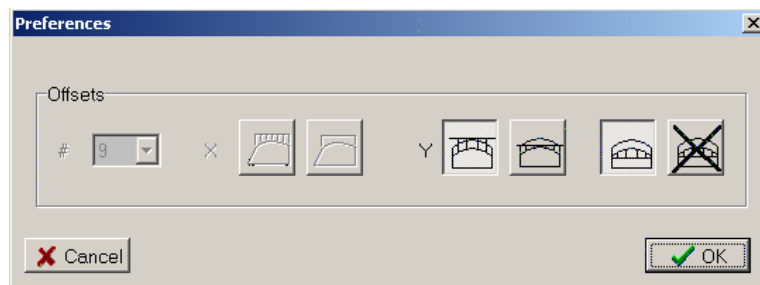


Loops through all the panels.

Visually exaggerates panel curves for ease of viewing.

The offset numbers correspond to 0, 25, 50, 75 and 100% locations.

To specify the way the panel offsets are displayed, click on the **Pref** button to display the following :



Offsets are measured up from a flat line between the ends. Most common.



Offsets are NOT measured up from a flat line between the ends. They are measured down from the maximum depth point on the curve. The following 2 icons determine whether this includes the seam allowance.



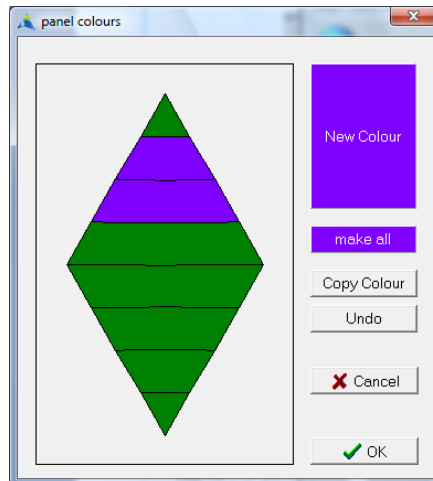
Includes seam allowance.



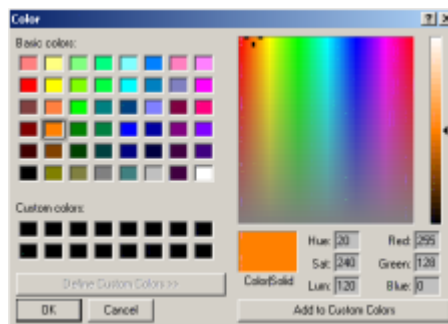
Does not include seam allowance.

Colour Panels

Select **Colour Panels** from the **Window** menu:



Click on the large **New Colour** button to display the following :



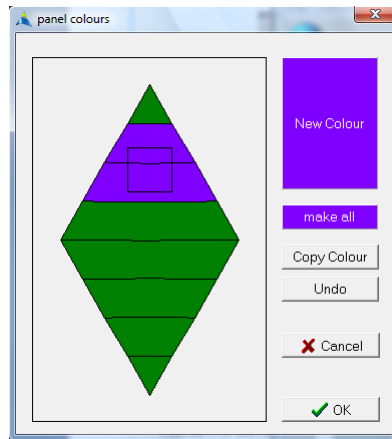
You can either select a colour by clicking in one of the boxes under the heading **Basic Colors** or under the heading **Custom Colors**. Click **Ok** to leave the dialogue. Or you can define (and store) your own custom colours.

To define your own custom colours :

- 1) First click in one of the empty boxes under the heading **Custom Colors**. This is where your custom colour will be stored. It is important to click here before defining the colour otherwise it will by default be stored in the first location which might overwrite one of your previously stored colours. Very annoying.
- 2) Then click the closest colour to the colour you want in one of the colours under the heading **Basic Colors**. Alternatively you can click on the large rainbow coloured square in the right half of the dialogue.
- 3) You can then modify the colour using the controls on the right half of the dialogue. The far right vertical scroll bar is useful for specifying luminosity (intensity). Red, Green, Blue give the relative mix of each of these colours that creates the resulting colour. These vary between 0 and 255 and you can enter them directly if you wish. The colour black corresponds to Red, Green, Blue all being 0. White corresponds to them all being 255.
- 4) Once you are happy with your colour, click on **Add Custom Colors** to add this colour to the original position you selected at point 1). Click **Ok** to leave the dialogue.

Colour Panels

To make a panel the same colour as the **New Colour** button (current colour), simply click in that panel. Do this for all the panels you want to make that colour. You can also click (and with the mouse button still down) drag a selection rectangle across multiple panels. All the panels that intersect that rectangle will become that colour.



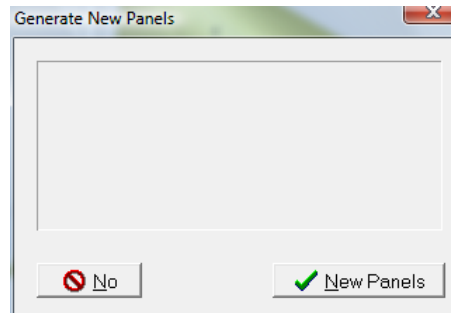
To make all the panels the current colour click the **make all** button.

To make the current colour the same colour as one of the panels, first click the **Copy Colour** button and then click on that panel.

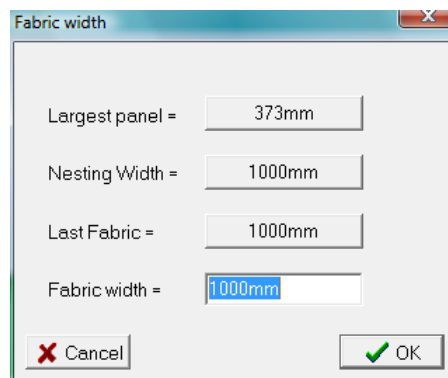
At any stage if you make a mistake you can click the **Undo** button. Undo can be used as many times as required.

Nesting

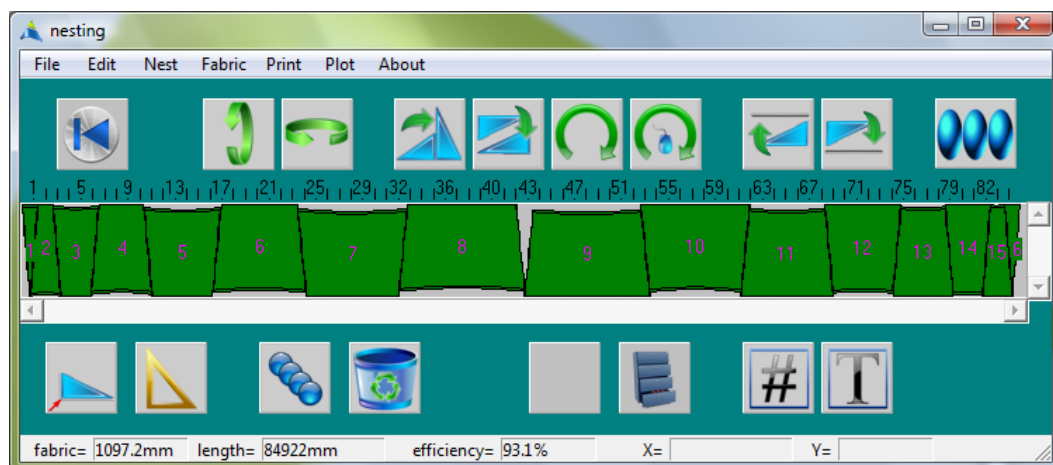
After developing panels, select **Nesting** from the **Window** menu to take the panels to the nesting window.



Click **New panels** to take the developed panels to the nesting window. If you click **No**, the panels on the nesting window (if any) will not change.



Enter the desired **fabric width** to be used. See the PanelMaker & Nesting manual for details.



IMPORTANT : If go back to the 3D viewing window and redevelop panels, you have to select **Nesting** from the **Window** menu again to load these new panels on to the nesting screen. If you just click on the nesting window to bring it to the front, it will still have the previous panels on it.

File

New		: Create a new Pagoda or Hypar mould file.
Open	Ctrl O	: Open an existing mould file.
Save	Ctrl S	: Save the changes made to the current mould.
Save As.		: Save the current mould with a new name.
Units		: Displays the Units Preferences dialogue.
.....		
Zoom	Ctrl Z	: Zoom in.
.....		
Preferences		: Displays the general preferences dialogue.
.....		
Quit	Ctrl Q	: Leave Pagoda.

Mould

Hypar	Ctrl D	: Displays the Hypar Dimensions dialogue.
.....		
Pagoda		: Displays the Pagoda Dimensions dialogue.
.....		
Show/hide poles		: Show or Hide the poles.

Panel

New	Ctrl P	: Display the Panel Layout dialogue for developing panels.
Open	Ctrl W	: Open a previously saved Panel Layout and develop panels.
Save		: Save the current panel Layout.
Save As.		: Save the current Panel Layout with a new name.
.....		
Preferences		: Display the Panel Preferences dialogue.
Show numbers		: Show or Hide panel numbering on the panels.

Window

Panels	Ctrl A	: Enter the panel window for viewing panel shapes.
Colour Panels		: Enter the Panel Colouring window.
Nesting	Ctrl N	: Enter the Nesting window.

View

Animate	F1	: Animate view.
.....		
Toolbox		: Display lighting toolbox
Light from		: Change light direction
Next view	F2	: Loop through stored views.
Show scrolls		: Show or Hide the viewing scroll bars

Print

Offsets		: Display the panel offsets for sending to the printer.
.....		
Screen		: Prints the screen.

About

About		: Display information about software version etc.
Bug Report		: Creates a problem report file that can be e-mail to Armstong-White for problem support.