



## Machining interface

### *For fast set up of CNC machinery*

Where parts contain additional machining such as grooves, routs, drilling and cut-outs the Machining interface module is used to create and store the part drawings (via the Machining library) and also send the correct machining instructions for each part to the CNC machining centres.

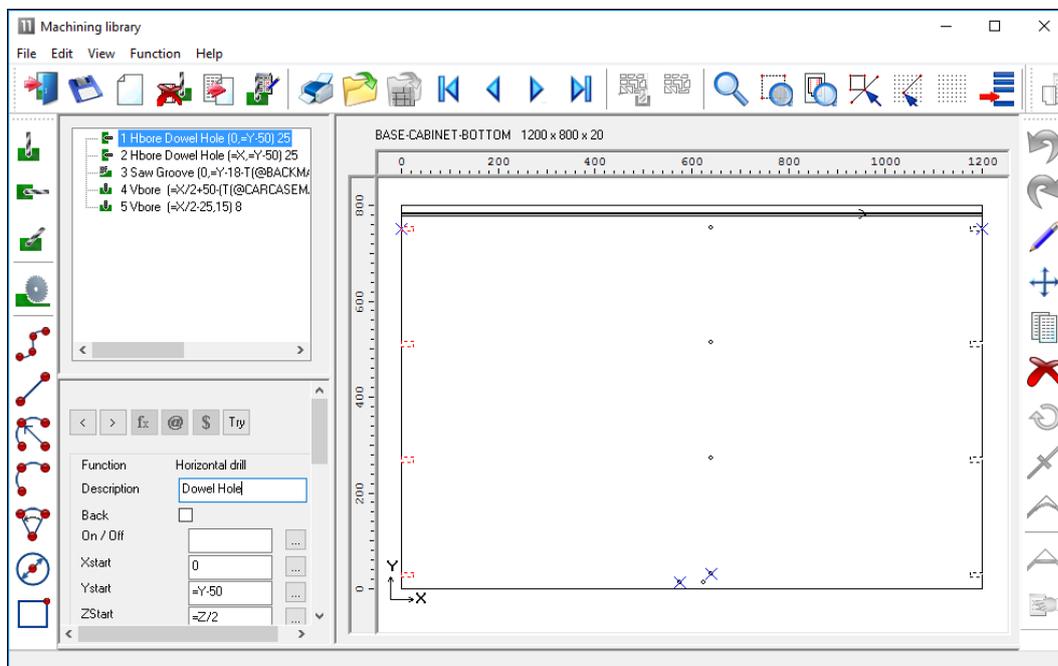
Most machining centre formats are supported including DXF, Homag/Weeke WoodWop, and other proprietary formats.

*The MI module requires one of the Optimiser modules SO, PO or the Nesting optimiser (NE) for shaped parts.*

The machining editor provides full facilities for creating machining drawings. A wide variety of machining functions are provided:-

- Saw groove
- Horizontal drilling
- Vertical drillings
- Cut-outs
- Arc router
- Circle router
- Pockets
- Contours
- Vacuum pods
- ...

The machining library contains the part drawing and instructions.



*Machining library*

The panes at the left show the details of each instruction and the full part is shown in the diagram at the right.

Drawings can be set up with formulae so they are fully parametric and automatically adjust if the part size changes. Common machining patterns can be dealt with by one drawing assigned to many different parts.

The above example shows a set of drilling and routing instructions for a part.

*Machining Instructions* - At the left of the screen is the FUNCTION toolbar to select the type of machining operation (such as drilling or routing).

Enter the details of each operation in the boxes to the right of the toolbar. The part drawing illustrating the machining is shown in the area to the far right of the screen. The drawing is built up as you enter machining operations.

For example, for a vertical drill operation enter the co-ordinates of the first hole - depth and diameter of the hole and the number, separation and direction of the repeated holes.

You can also enter the tool number and other machine specific details.

To move directly to a machine operation (for example to edit the details) click on the relevant part of the drawing. The current instruction is highlighted.

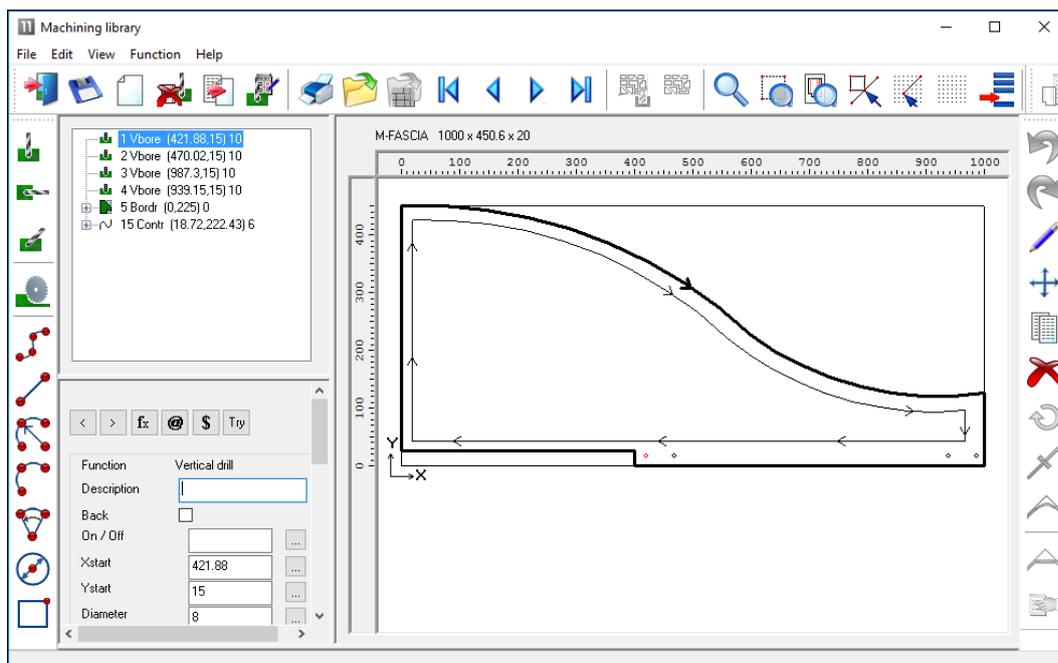
You can also use the mouse to enter instructions, for example, to specify the start and end of a groove.

*External drawings* – where the drawings are external files such as DXF or Homag/Weeke MPR(X) the Machining editor can still be used to view and adjust drawings and the drawing information is sent to a machining centre via the Machining Interface.

DXF drawings suitably layered can also be imported to the Machining library.

## **Shaped parts**

The drawing editor allows for contours to define shaped parts.



*Shaped parts*

Each machining instruction can include extra tooling information to allow for tool speeds, tool path compensation etc.



Use the mouse to quickly draw the function and use the boxes at the left to add the detailed measurements where required.



## **Machining parameters**

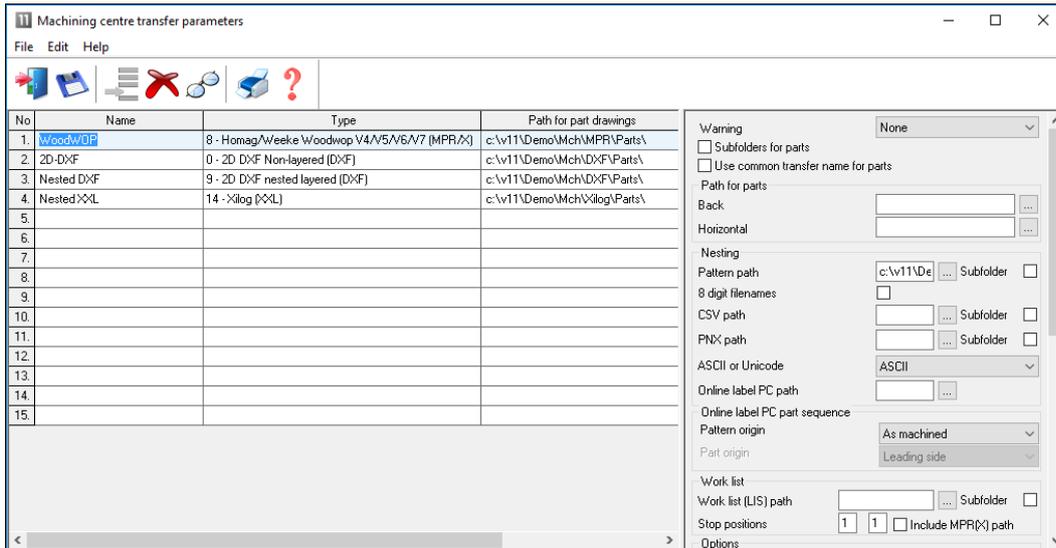
The transfer of machining data to CNC machines is set up via the following parameters:-

Machining centre parameters  
Machining centre transfer parameters

The machining centre parameters set up the general features for the machining drawings/instructions such as the Drawing origin, and specific features for proprietary machines such as the 'Park mode' for Homag/Weeke WoodWop.

*Machining centre parameters*

The Machining centre transfer parameters control the transfer of data to the machining centre. File format, where files are located and whether there are separate files for Front and Back instructions.

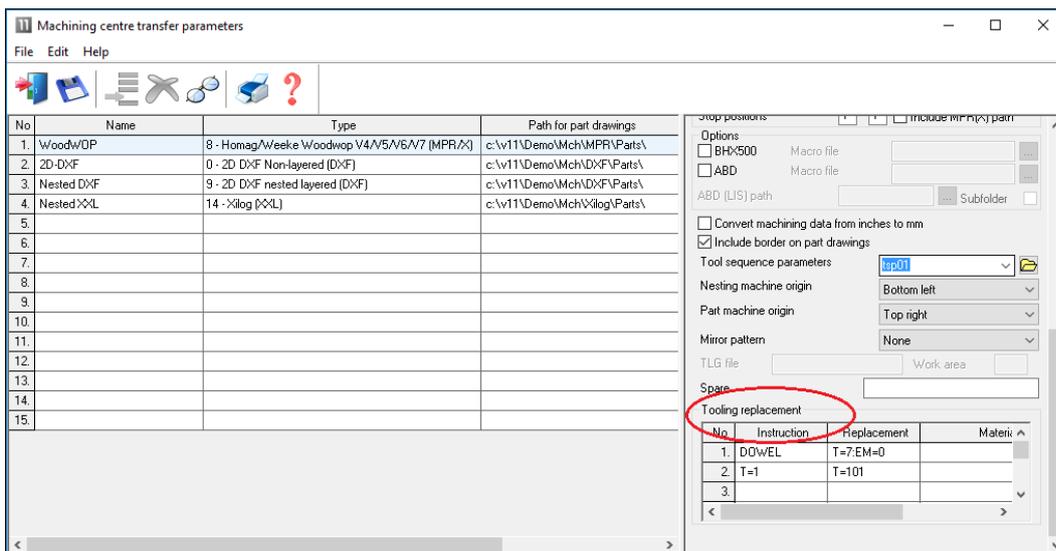


Machining centre transfer parameters

A wide range of transfer formats are supported:-

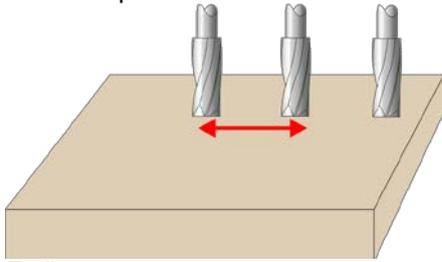
- Homag/Weeke WoodWop V4/V5/V6/V7 (MPR(X))
- Homag Weeke WoodWop V2.5 (MPR)
- 2D DXF non layered
- 2D DXF layered
- D DXF layered
- Biesse RoverCad (CID)
- Morbidelli Aspan V3.2 (ASC)
- Morbidelli Aspan V4.0 (ASC)
- Busellato Autolink (DXF)
- ASCII/Unicode PTX
- MDB PTX

The machining centre transfer parameters also include a 'Tooling replacement table', so that tooling instructions can be translated to a specific format for a machine. This allows for a single set of drawings which can then be interpreted for different CNC machines.



Machining centre transfer parameters Tooling

For most parameters there is a clear picture of the setting involved and examples of the set up.



Tooling

### Machining summary and costs

The summary reports in Review runs, for example, Job costing, include the details for machining where these are relevant.

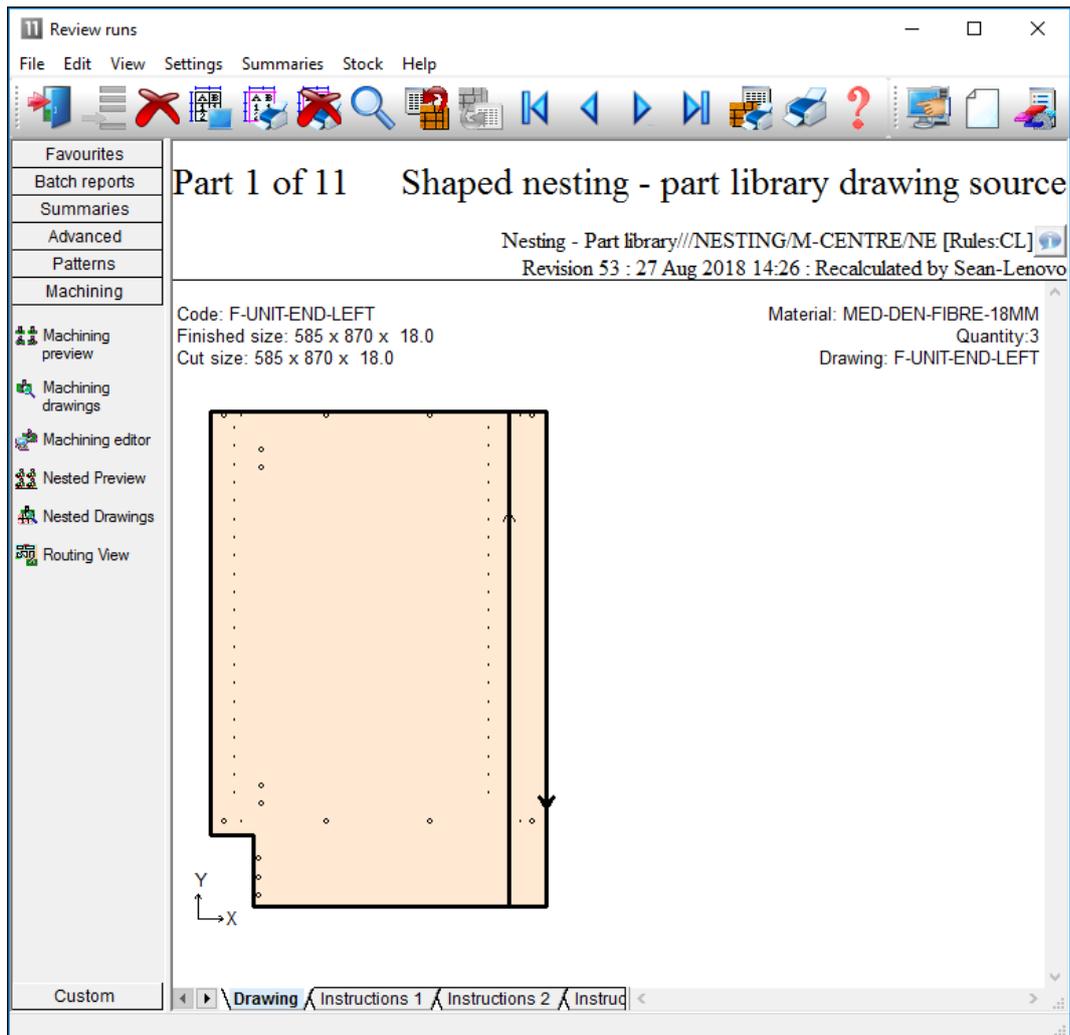
| Code             | Description                   | Quantity        | Linear       | Area          | Cost                 | Total          |
|------------------|-------------------------------|-----------------|--------------|---------------|----------------------|----------------|
| <b>Board</b>     | <b>Material</b>               | <b>Quantity</b> |              | <b>Area</b>   | <b>Cost/m2</b>       | <b>Total</b>   |
| MEL-CHIP-15MM/01 | MEL-CHIP-15MM 3050.0 x 1220.0 | 5               |              | 18.605        | 2.590                | 48.187         |
| MEL-CHIP-15MM/02 | MEL-CHIP-15MM 2440.0 x 1220.0 | 1               |              | 2.977         | 2.560                | 7.621          |
|                  |                               | <b>6</b>        |              | <b>21.582</b> |                      | <b>55.808</b>  |
| <b>Operation</b> | <b>Description</b>            |                 | <b>hh:mm</b> |               | <b>Cost per hour</b> | <b>Total</b>   |
| Nesting          |                               |                 | 1:10         |               | 50.000               | 58.069         |
|                  |                               |                 |              |               |                      | <b>58.069</b>  |
| <b>Total</b>     |                               |                 |              |               |                      | <b>113.877</b> |

Machining job costing report

There are several specific reports and options for Machining under the 'Machining' tab.

### Machining drawing

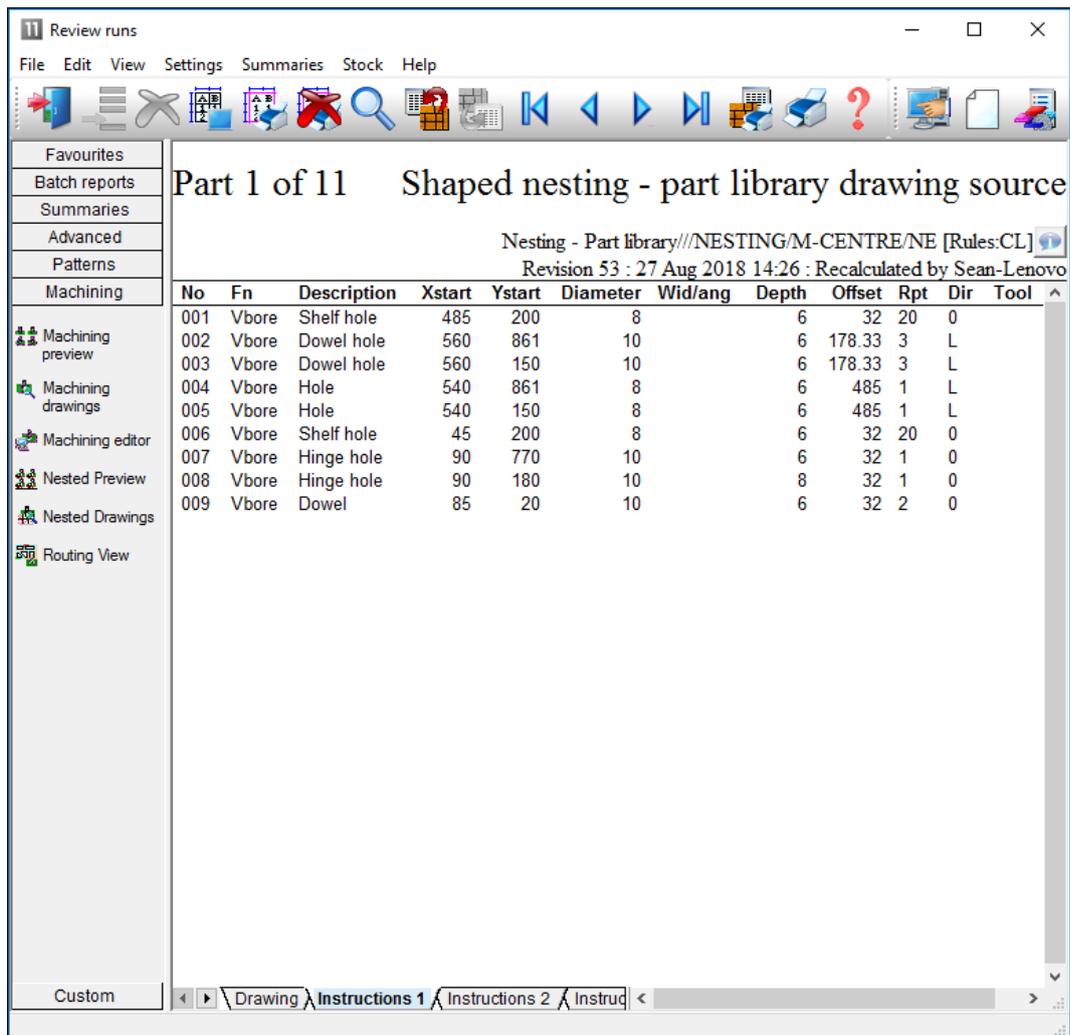
The machining drawing shows each drawing fully resolved.



The drawing shown has been resolved to absolute values fready for transfer.

### Machining Instructions

At the foot of each machining drawing are a set of tabs showing the full machining instructions.



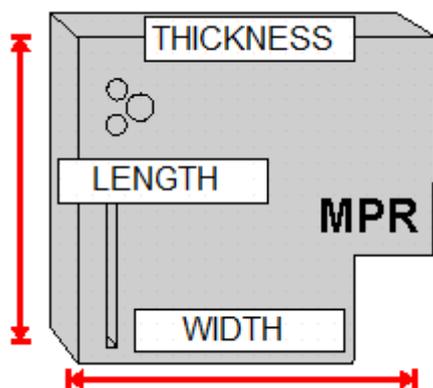
At Review runs the instructions are resolved to absolute values.

With the parts and labels feature route cards or labels for each machined parts can be printed at the office.

| Optimised Parts   |   |  |  |   |
|---|---|--|--|---|
| Run: Nesting - Part library   |   |  |  |   |
| Edgebander setup time: 0:00 Saw setup time: 0:00  |   |  |  |   |
| Part code: F-UNIT-END-LEFT<br>Material code: MED-DEN-FIBRE-18MM<br>Length: 585.0 Width: 870.0<br>Quantity: 3 Non Grained<br>Ref. Code: MEDF-U3  |  | Bottom edge:<br>Top edge:<br>Left edge: WHITE-TAPE-22MM<br>Right edge: | Drawing name:<br>0011429F<br>Part Volume:<br>LOW |  |
| Part code: F-UNIT-END-RIGHT<br>Material code: MED-DEN-FIBRE-18MM<br>Length: 585.0 Width: 870.0<br>Quantity: 2 Non Grained<br>Ref. Code: MEDF-U2 |  | Bottom edge:<br>Top edge:<br>Left edge:<br>Right edge: WHITE-TAPE-22MM | Drawing name:<br>0011430F<br>Part Volume:<br>LOW |  |
| Part code: N-BTH-WORKTOP<br>Material code: MED-DEN-FIBRE-18MM<br>Length: 1500.0 Width: 620.0<br>Quantity: 3 Non Grained<br>Ref. Code: MEDN-B3   |  | Bottom edge:<br>Top edge:<br>Left edge:<br>Right edge:                 | Drawing name:<br>0011431F<br>Part Volume:<br>LOW |  |
| Part code: N-OCT-TABLE<br>Material code: MED-DEN-FIBRE-25MM<br>Length: 965.0 Width: 965.0<br>Quantity: 3 Non Grained<br>Ref. Code: MEDN-O3      |  | Bottom edge:<br>Top edge:<br>Left edge:<br>Right edge:                 | Drawing name:<br>0011432F<br>Part Volume:<br>LOW |  |

With the pattern editor last minute adjustments can be made to any drawing before sending the data to the CNC machining centre.

*External drawings* - The drawing editor and transfer of data to a CNC machine can be integrated with the use of external drawing files such as DXF and MPR(X).



In this case the stand-alone drawings can be used with parts so items do not have to be duplicated in the machining library or drawn twice.

### Summary of Machining Interface

|   | MI    |
|---|-------|
| Machining Drawings                      | 99999 |
| Machining functions (drill, route, ...) | •     |
| Support for proprietary formats         | •     |
| Support for DXF                         | •     |
| Transfer to Machining centre            | •     |
| Shaped drawings                         | •     |

|                     |   |
|---------------------|---|
| Labels for drawings | • |
| Parametric drawings | • |