



# Bytubework

**Edition: 07. 2005**

Erstellt von:	Geprüft von:	Freigegeben von:	Freigabedatum:
R. Glaus	B. Howald	Th. Zbinden	28.07.2005



## Table of contents

<b>BYTUBEWORK – THE TUBE PRODUCTION MODULE OF BYSOFT.....</b>	<b>4</b>
<b>GENERAL FEATURES .....</b>	<b>5</b>
<b>INSERT PARTS .....</b>	<b>6</b>
<b>INSERT RAW MATERIAL .....</b>	<b>7</b>
<b>JOB PARAMETERS .....</b>	<b>8</b>
<b>Parameter 1 .....</b>	<b>8</b>
Nesting .....	8
Common Cut .....	8
Length of clamping zone.....	8
<b>Parameter 2 .....</b>	<b>9</b>
General.....	9
Lance 9	
Time format .....	9
<b>Cutting plan export.....</b>	<b>9</b>
Zero point offset .....	9
Lift-off height.....	9
Engraved centre-punch marks.....	9
Common - Cut pulsed in-feed.....	9
Pulse contour in radius region .....	9
Invert processing sequence for turned parts.....	10
Export zero point offset .....	10
<b>NESTING .....</b>	<b>11</b>
<b>POSTPROCESSOR .....</b>	<b>12</b>
<b>CALCULATION .....</b>	<b>13</b>
<b>APPENDIX .....</b>	<b>14</b>
<b>Situation of the zero point on Bystar/Bytube - Flex mode.....</b>	<b>14</b>
<b>Situation of the zero point on Bytube - Hybrid mode.....</b>	<b>14</b>

### ***Bytubework – The tube production module of Bysoft***

After having programmed tube parts in **Bytubepart**, this program enables you to combine individual parts to a job, which can then be cut on either a **Bystar** machine with rotary axis or on a **Bytube** machine.



#### **Tube production:**

Press this button in order to create a new job or to modify an existing job.

### General features

Open the program module **Bytubework** and select **New** in the pull down menu **File**, click on the button **New** or press the shortcut **Ctrl + N**.

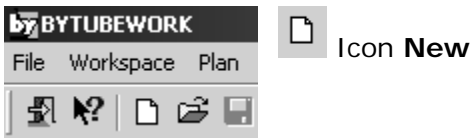
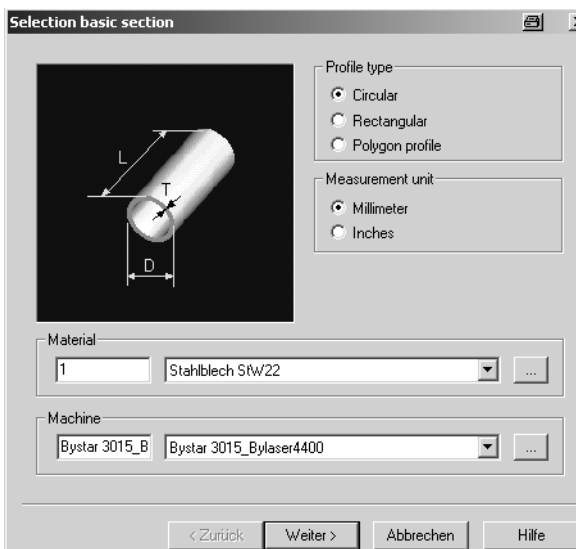


Fig. Extract from tool bar

In the appearing dialog window you need to determine important preliminary information about the job.







Define a **profile type**, a **measurement unit**, a **material** and a **machine** in the corresponding menus. Press **Next** in order to proceed to the following window.

If there is no **machine entry**, you will first need to enter a new machine record in the **machine database section** in **Bybase**.

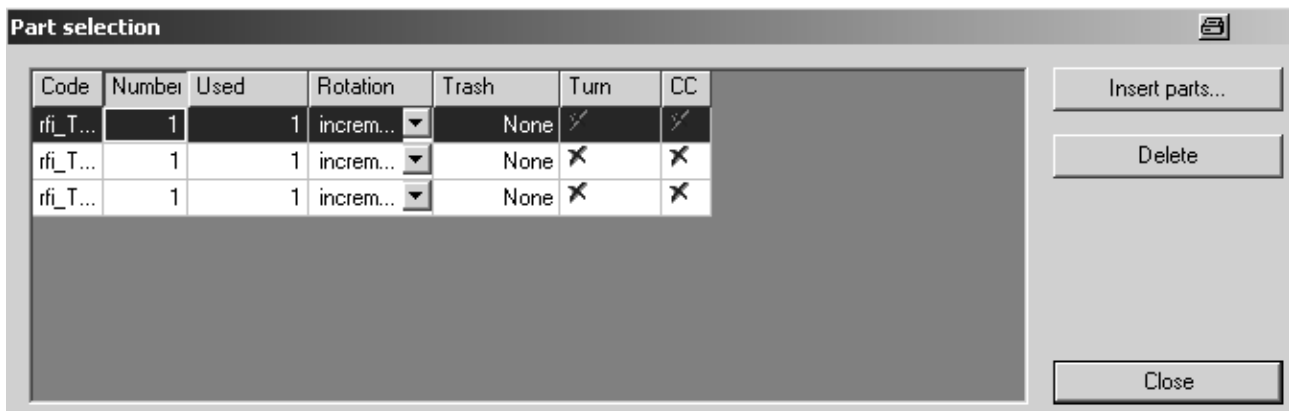
Fig. Dialog window *Selection basic section*

Define the dimensions of the selected profile type in the next window. A job is created in five steps, four of which are compulsory.

1.  **Insert parts (Strg+1)**
2.  **Insert raw material (Strg+2)**
3. **Nest job**
4.  **Postprocessor (Strg+3)**
5.  **Cutting time calculation (Strg+4)**

During the creation of a tube job you always work in the area Nesting. The other areas are visible as icons in the tool bar or as commands in the pull-down menu **Working range**. The first two steps are opened automatically during the creation of a new job.

### *Insert parts*



**Fig.** *Window Parts selection*

Select the necessary parts from the database and insert the required quantity. Determine a rotation angle for radial nesting in the column **Rotation**. If you are creating a job, which will be cut on a **Bytube** machine, the column **Trash** gives you the possibility to have the cut parts ejected on one of four possible positions. In the column **Turn** it is possible to allow axial turning during nesting. This is only recommended for jobs, which will be cut on a **Bystar** machine (also see the paragraph *Invert processing sequence for turned parts*). In the last column it is possible to allow the parts for **Common Cut** mode, i.e. they will be cut with a common cutting edge.

*Insert raw material*



**Fig.** *Raw material selection*

Insert the length and the amount of tubes in stock.

In the menu **Settings** ⇒ **Options** ⇒ **General** you have got the possibility to determine a standard length. While creating a cutting plan for a Bystar it is necessary to subtract at least 300mm from the actual length of the tube and at least 200mm for a Bytube in flex mode. See appendix and chapter **Job parameters** for more information.

### Job parameters

Before you perform either an automatic or manual nesting you should customize the **Job parameters** in the menu **Working range**:



or Menu **Working range** ⇒ **Job parameters**

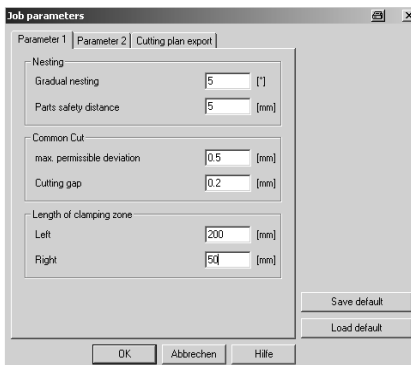


Fig. parameter 1

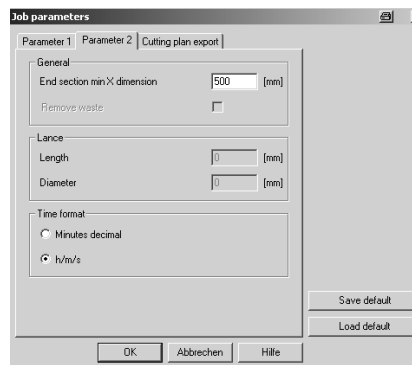


Fig. parameter 2

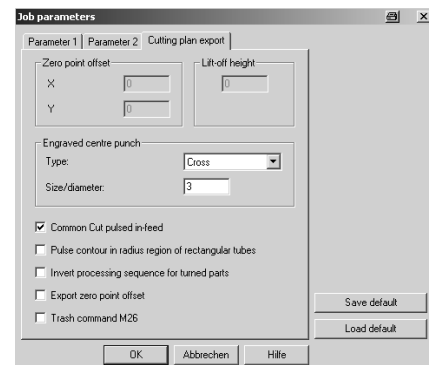


Fig. LCC-Export

## Parameter 1

### Nesting

In this register you define the angle of rotation stepwise, around which the part is turned during the nesting. With a little angle of rotation the nesting takes more time, but the result is better. This applies only if in the part selection rotating angle *increment* has been selected.

### Common Cut

**Bytubework** is able to fit the end cuts of two parts on each other, in order to execute a common cut. Define here the maximum permissible deviation of the programmed cutting curve. The width of the cutting gap depends on the material thickness.

### Length of clamping zone

The required length depends on if the plan is executed on a Bystar or a Bytube.

Machine / Situation	Clamping zone left	Clamping zone right
<b>Bystar</b>	0	Min. 50
<b>Bytube/Hybrid/Lance</b>	170	5
<b>Bytube/Hybrid/Chuck</b>	300	5
<b>Bytube/Flex</b>	0	Min. 50

These differences are a result of the different material constructions and the CNC mode of operation. See appendix.



## ***Parameter 2***

### **General**

Define here the minimum length, which an end-cut needs to have in order not to be considered as waste but as spare tube, which goes back to the store. Bytubework will set a flat end-cut. The function **Remove waste** is only available on the Bytube. In this case the trash is collected and ejected in a pre-defined position.

### **Lance**

When cutting round tubes on the **Bytube** it is possible to use a lance as a protection of the opposed side of the tube. Its length restricts the use of the lance.

Define here the length and the diameter of the lance you want to use. After the nesting you can check in the menu **Extras -> Test lance length**, if all the parts can be cut with the help of the lance.

### **Time format**

Select here the required time format for the display of the calculated cutting time.

## ***Cutting plan export***

### **Zero point offset**

In the lower part of the window you can select whether you want to export the zero point or not. It is used in case of a special clamping device between the chuck and the part. A zero point offset needs to be defined if you want to execute the plan on a machine, which is equipped with a CNC control version 6103 or older. It comes up to the distance between the zero point of the flat and the tube processing. The distance was measured when mounting the system and is enlisted in the acceptance report.

### **Lift-off height**

The lift-off height is arisen by this value, which is a safety function. Its use is reasonable when cutting irregular rectangular profiles and in case the section does not fall out directly and runs the risk of colliding with the cutting head when the tube is turning.

### **Engraved centre-punch marks**

Select here, how you want the engraved centre-punch marks to be executed.

### **Common - Cut pulsed in-feed**

If parts are executed with common cut, there are no lead-ins anymore; the in-feed is made directly on the contour. Activate the function ‚pulsed in-feed‘ to destruct the contour as little as possible

### **Pulse contour in radius region**

Activate this option, if you need a very good cutting quality in the edges.

### **Invert processing sequence for turned parts**

This is an important function if you want to cut round tubes on a Bytube. In the parts selection you have the possibility to allow the parts to be turned, which enables the program to find a better nesting but has the disadvantage that the parts need to be executed from left to right. To avoid a damaging of the end support, the working piece or the machine, the processing sequence can be inverted. The positions of the initial cuts are not changed.

### **Export zero point offset**

If you select this function the fields **zero point offset** and **lift-off height** are active.

### *Nesting*

After having selected the parts and defined the raw material, you can see the parts and the indication of the number you want to nest, in the upper part of the screen. The lower part of the screen is still empty.



#### **Nest job**

The whole job is nested automatically.



#### **Insert**

First open a new plan. Now you can see the tube in the lower part of the screen. Activate the function **Insert** and select the part, which you want to insert. If you click inside the tube now, the part will be moved to the right edge. It is as well possible to put a part in-between two parts, which are already set.



#### **Turn**

With this function you can turn a part, which has already been set. Click into the part, which you want to turn.

### *Postprocessor*



or Menu **Workspace** ⇒ **Postprocessor**

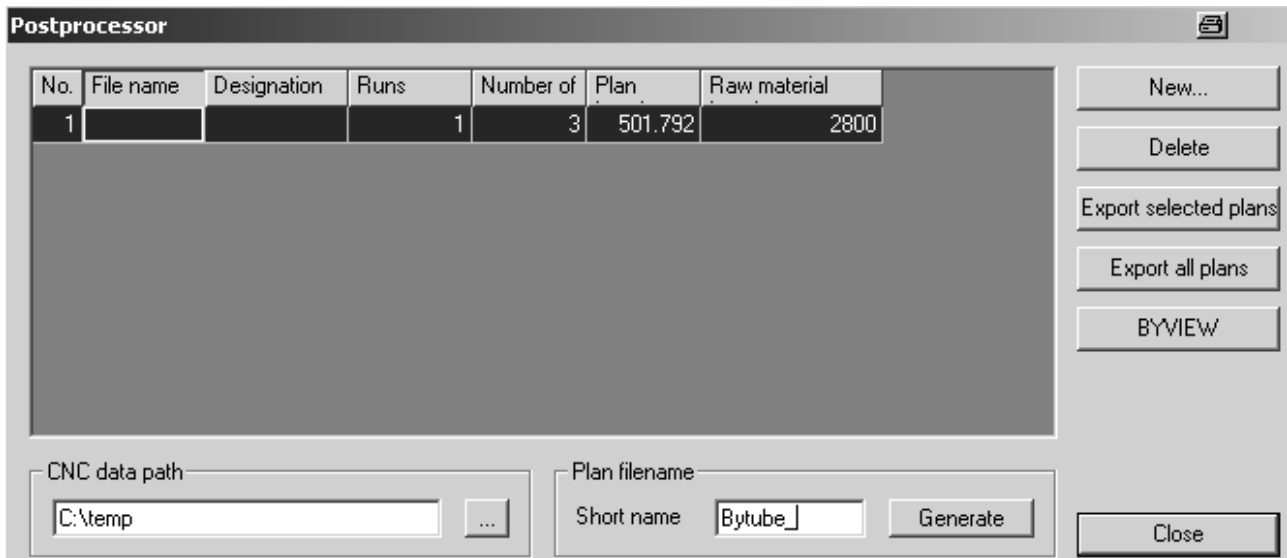


Fig. *Window postprocessor*

With this function you can create the cutting programs for the machine. You can give each program a different file name or create it automatically with the function **plan filename**. Indicate the required location in the field **CNC data path**. Export selected (**Export selected plans**) or all plans (**Export all plans**) to the selected register. You can simulate exported plans with the function **BYVIEW**.

## Calculation



or Menu **Workspace** ⇒ **Calculation**

The screenshot shows a software window titled "Calculation" with a standard Windows-style title bar (minimize, maximize, close buttons). The window is divided into several sections:

- Job:** A section containing two fields: "Material" with the value "1" and "Machine" with the value "Bystar 3015\_Bylaser4400".
- Settings:** A section containing two fields: "Cutting parameters" with the value "Bystar 3015: BYSTAR\6114\BYLASER\_4400\1.0332\3\5\02\" and "Configuration / Setup" with the value "Bystar 3015: BYSTAR\6114\3015". Below these fields are four buttons: "Recalculate", "Select...", "Edit...", and "Reset".
- Job calculation:** A section containing a table of calculation results. The table is organized into two columns. The left column lists various time components, and the right column lists machining distances. The values are as follows:

Job calculation	
Code	
Machining time	
Positioning	0.15 min
Cutting	0.72 min
Lead In/Out	0.32 min
Total	1.19 min
Number of start cuts	
Normal mode	22
Other	0
Machining distances	
Positioning	4.098 [m]
Normal mode	2.901 [m]
Pulsed mode	0.000 [m]
Engraving operation	0.000 [m]
Pulsed mode	5
- Plan calculation:** A section containing one field: "Plan No." with the value "1".

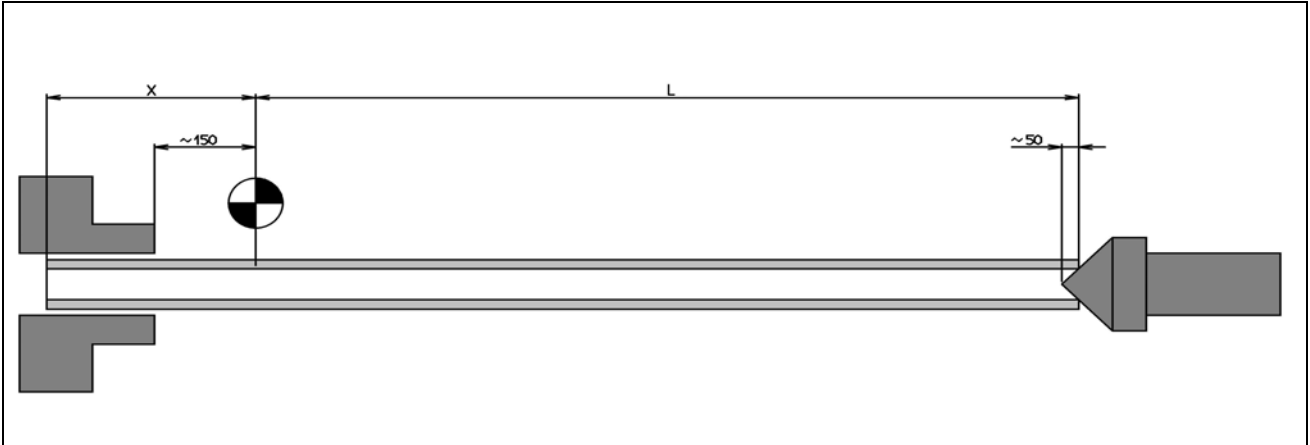
At the bottom right of the window are two buttons: "Close" and "Help".

**Fig.** *Window calculation*

With this function you calculate the cutting time. Click **Select** to select the appropriate parameter from the database.

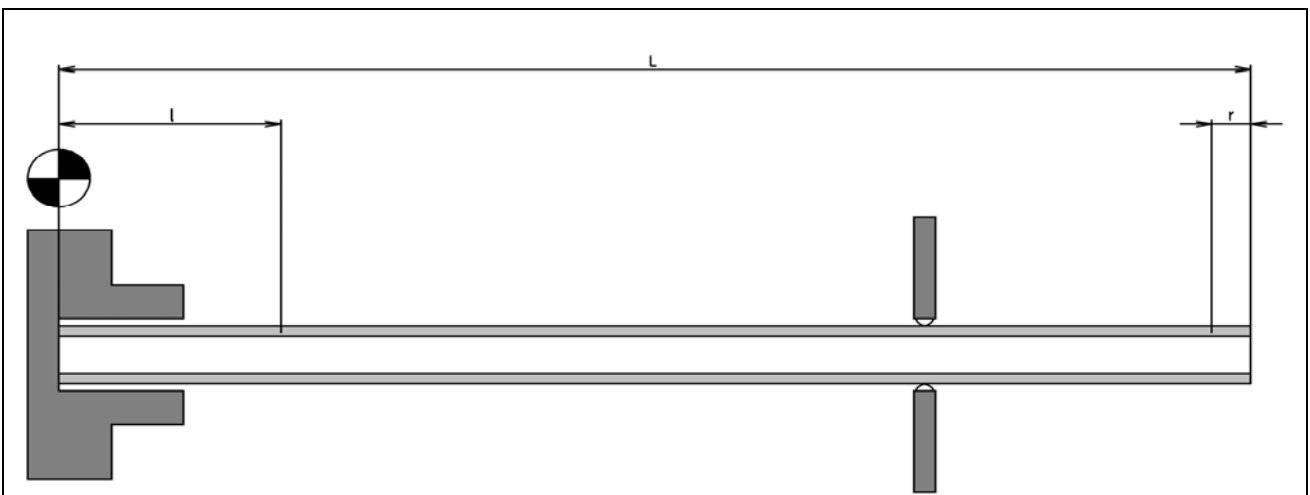
*Appendix*

*Situation of the zero point on Bystar/Bytube - Flex mode*



The zero point of the machine (as well as of the cutting plan) has a distance of about 150mm to the chuck. The distance can vary, please take the exact value from the acceptance report of the machine. The length L, which is defined in the raw material selection of **bytubework**, does not correspond to the actual tube. The actual tube is longer (value L plus value X).

*Situation of the zero point on Bytube - Hybrid mode*



On the Bytube in hybrid mode the tube length defined in Bytubework corresponds to the actual raw material length. Please take the recommended length of clamping zone right and left from the chapter *Job Parameter*