Customer Center
Bystronic Laser AG

Bystronic

Training manual Bysoft 6.x

Bystronic

Construction	Production	Administration
Flat part	Flat part	Machine
Tube part	Tube part	Material
Bend part	Stacking	Format
Unfolding		Raw material
Parts administration	Job administration	Customers

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Created by:	Verified by:	Released by:	Date of release:
B. Howald	Th. Zbinden	Th. Zbinden	02.06.2008

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Structure

Fig.   ***Bysoft**-Main window*

The **Bysoft** main window displays the three modules **construction**, **production** and **administration**.
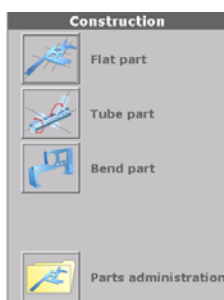
Bypart - Construction

Select the module **Construction** in order to create parts in one of the two modules.
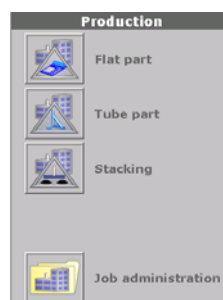
Bywork - Production

Select the module **Production** in order to create jobs (tasks) in one of the three other modules.
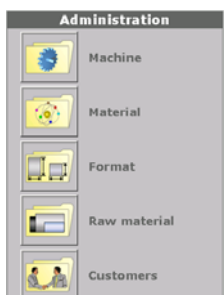
Bybase - Administration

The Administration module serves for organising and editing your data

The Administration module is included in **Bybase**. Select the indivdual database sections in order to edit your data.

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Getting started

System requirements

BYSTRONIC recommends requirements:

Intel Pentium processor 1 GMHz or higher

Microsoft Windows 2000, XP or Vista

At 256 MB RAM

80 MB available hard disk space (without database)

CD drive

800 x 600 graphics card

Exclusive access and access entitlement

If you are installing **Bysoft** on a Windows 2000, XP or Vista operating system, make sure that you have administrator rights. Without administrator rights you cannot install the HASP drive that is required for the **Bysoft** software dongle.

If you are working in a Network, make also sure that all other users have closed **Bysoft**. While you are installing a new program version, the database for the update process is opened exclusively for you.

Back-up copy

The following sub-directories of **Bysoft** contain data that you create or change when working:

Installation of Bysoft 6.0 and earlier versions

/ DB	Database
/ PARTDATA	Individual parts data
/ WORKDATA	Jobs data

Installation of Bysoft 6.1 and later versions

/ DATABASE	Database
/ PARTROOT	Individual parts data
/ WORKROOT	Jobs data
/ REPORTS	Work reports
/ MCPARAM	Machine parameters (no longer necessary from version 6.4)

Create a back-up copy of all data in these directories before installing a new version of **Bysoft**.

> **Note:**
>
> **BYSTRONIC Laser AG** strongly recommends that you carry out a data back-up every day.

Installation

Insert the **Bysoft** -CD in the CD drive of your computer. Open the Windows Explorer and select the CD drive. Open the directory **Bysoft 6.x.x** and start the Setup.exe-file by double-clicking.

Then, select your language.

Confirm with **OK**. Now the InstallShield®-Wizard which will guide you through the rest of the setup is being started.

1st dialog box: Installation information

You find information about the installation, such as exiting Windows programs and copyright issues.

Click on the **Next** button.

2nd dialog box: Destination Location

Here you can specify the path for the setup. As a standard, **Bysoft** is installed in C:\Program Files**Bysoft**6. If you click on the button **Browse** you can specify another path.

Click on the **Next** button.

3rd dialog box: Destination location for database
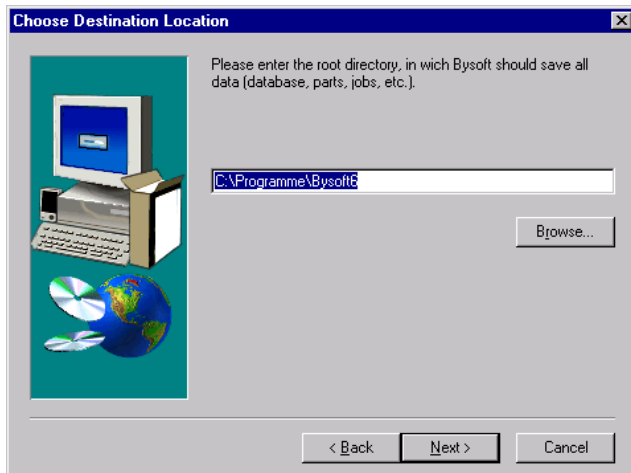
Specify the directory of the database (directories **database**, **partroot**, **workroot**). If work with the database on the network and install an additional licence on another PC, it is important that you assign the correct path here.

Click on the **Next** button.

4th dialog box: Select Program Folder
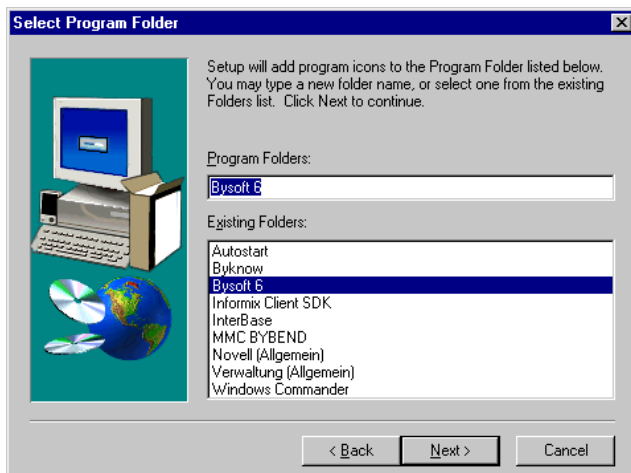
Define the name of the directory which will contain the **Bysoft** sub-directories.

Clicking on the **Next** button will finish the setup

Installation of copy protection

For the installation of the copy protection, please read the document **Bystronic License Manager** in Appendix II.

After the installation of the copy protection, you can start **Bysoft**. Click on Start in the task list, then Program Files and **Bysoft**6. Then select **Bybase** for working with the program or **Bydba** for defining new user. See first system logon.

First system logon

Start the program **Bydba** and enter **system** as your user name (lower or upper case). Enter **Bysoft6** for your password (lower case and no space after **Bysoft**). You are now logged onto the system as System user.

Creating a new user

Select the tab **User management** and click on the button **New**. This opens the dialog box for **Creating a new user account**. Enter the required name (e.g. XY).

To specify a password for the user, click on the **Set password** button (optional) and enter your password in the two input fields. Confirm by clicking on the **OK** button. Leave the dialog boc **Creating a new user account** with **OK**.

You now see the dialog box **Grants**. Activate the option **has SuperUser authorisation**, if you , i.e as superior, would like to create new users and distribute grants. Having no SuperUser authorisation means that you can neither create users nor distribute grants. All you can do is change your password.

Exit this dialog box with the **OK** button. Back in the user management, you can create other users or you exit **Bydba** with the **OK** button. Now you can run **Bysoft** with your own user name and password.

> **Note:**
>
> Note that the password is saved in the database in binary form and that for security reasons it is not possible to find out passwords once they are forgotten.

> **Note:**
>
> You can also run **Bysoft** with the user name **system** and the password **Bysoft6**.

Update

You can install the current **version** of **Bysoft** over an existing version. All **path specifications** and in-house parameters are retained. To do this, go to the **Select destination path** Setup window, select your existing **Bysoft** installation directory and click on **Next**.

Updating the database

When you run the new version of **Bysoft** for the first time after the update, you can start the **Bydba** program for updating your database from an appearing dialog box.

To perform the database update, confirm this with *Yes* .

Click on the **Update database** button in the window which then opens. After the update, close the window with **OK**. The necessary changes to your database are then performed.

Installation on a Network server

The standard setup installed the following directories in C:\Program Files **Bysoft**6

database	database with all data except geometries
partroot	part geometries (as soon as parts are created)
programs	folder with all program files
reports	files for workpaper printouts
samples	examples for practice
workroot	job geometries (as soon as jobs are created)

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You can start working right away, yet only you will have access to the database. If you want to have all data on a network server so that everyone can take data only from one source, proceed as follows.

Install **Bysoft** on all computers that you want to work on and where you have software keys.
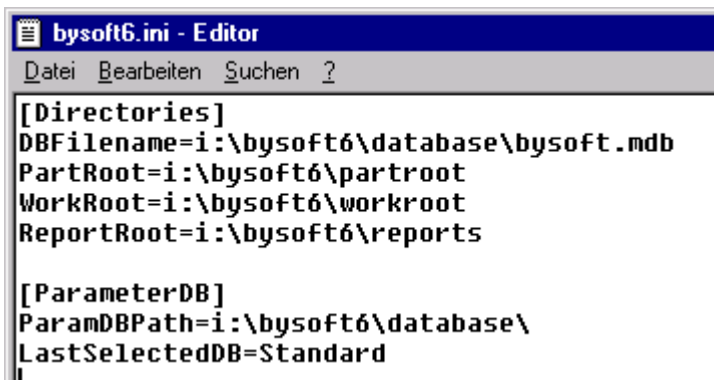
Create a directory for **Bysoft** on a network server, (e.g. <Network drive:\ **Bysoft**6). Please keep in mind that you need to have administrator rights to do this.

Copy the following directories from your drive C: to the new directory on the network.

database, **partroot**, **workroot** and **reports**.

C:\ Program Files**Bysoft**6\DATABASE   to e.g.   < Network drive >:**Bysoft**6\ DATABASE
C:\ Program Files **Bysoft**6\PARTROOT   to e.g.   < Network drive >:**Bysoft**6\ PARTROOT
C:\ Program Files **Bysoft**6\WORKROOT   to e.g.   < Network drive >:**Bysoft**6\ WORKROOT
C:\ Program Files **Bysoft**6\REPORTS   to e.g.   < Network drive >:**Bysoft**6\ REPORTS

Open the file **Bysoft6.ini** from the Windows directory (C:\Winnt or C:\Windows). In the six lines shown below, enter the path of the directory that you created before (bold characters). Do not change the other elements.

```
bysoft6.ini - Editor
Datei  Bearbeiten  Suchen  ?

[Directories]
DBFilename=i:\bysoft6\database\bysoft.mdb
PartRoot=i:\bysoft6\partroot
WorkRoot=i:\bysoft6\workroot
ReportRoot=i:\bysoft6\reports

[ParameterDB]
ParamDBPath=i:\bysoft6\database\
LastSelectedDB=Standard
```

You must adapt the **Bysoft6.ini** file on all computers that must have access to the **Bysoft** database.

Help

Where do I find help?

Use the following help sources:

Pulldown-menu **<Help/Help topics>** in the menu bar

Select **Help topics** in order to access the Contents, Index and Search menus.

Tutorial program

Beispiel These examples help you to get started with the program at the initial learning stage.

Menu bar in the Help window

Help Topics   *Button* **Help topics**

Select:

- **Contents,** search in a listing setup by menus
- **Index,** search in a listing setup by keywords
- **Search**, in order to search for any text extract that is not listed in the index but that you remember. The text in the Help file is reprocessed periodically by the program so that the full text search takes somewhat longer than the Contents or Index search.

Back   Back
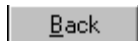
Return to the previous help topic. If the button is disabled, click on **Help Topics** in order to return to the **Table of Contents**.

Print   Print

Prints the current help topic. The dialog box for printer control is displayed.

Browse back   <<
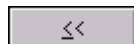
Switches to the previous topic in the current chapter of the Online Help.

Browse forward   >>

Switches to the next topic in the current chapter of the Online Help.

Each chapter in the contents list is a separate Help topic area. When browsing the topics appear in the same order as the one given in the contents list.

At the end of the chapter the **Browse forward** button is hidden. If you want to browse through the whole Online Help, click on the next chapter in the contents list. Then continue to browse through from there.

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Related topics | See Also |

Opens a pulldown-menu with related topics

Help in context

To obtain Help on the task in hand:

Function key F1

Context-sensitive help for currently selected function. Press the F1 key. The associated Help text appears.

? *Button* **Help**

Context-sensitive Help on all functions whose menu command or button is visible on the screen. Click on the button. The question mark now appears in addition to the mouse pointer. Now click on the command, symbol or text for which you seek help.

Status bar

If you move the cursor onto a menu command or onto a button, then a description of the function for this command appears in the status bar at the bottom of the window. Click on **Status bar** in the **View** menu if the status bar is not displayed in the **Bybase** module.

Dynamic jumps

- **Text sections written in green with continuous underlining:**

  Click on the underlined text section in order to jump to a related text. Click on the **Back** button in the Help menu bar in order to return to the previous topic.

- **Graphics**
  Graphics can contain jumps. Graphics with a jump address are identified by the hand symbol which appears when you move the cursor onto the graphic.

Operation

Running a function

A function is a sequence of commands executed by a program module. The following options are available for running a function:

Running:	Description:	Example: Function
Command	Run a function by entering a **letter sequence** in the **Command window**. Close the command with the **Enter** key or with the right mouse button.	**_REDRAW**
Menu command	Run a function by selecting the function from a menu. Run the function • using the mouse • via the keyboard with the ALT key plus the underlined letter in the menu (Hot key).	Display / Redraw
Click on button	Select the function required by clicking on the corresponding button with the mouse.	

Cancel

Press the ESC key to stop functions that you have run by mistake. The following message is displayed in the Input window: **Cancel.** If you want to cancel a transparent command as well as the command opened first, press **ESC** twice.

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Notes

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Bybase

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Bybase - The Bysoft Administration module

General

The programme module **Bybase** consists of seven database sections which are necessary for the operation of **Bysoft** and especially for the modules **Bypart** and **Bywork**. Therefore, several data in certain database sections must be recorded **BEFORE** the creation of your first part and **BEFORE** the production of the first job.

Survey

Module	Database section
	Part administration
	Database for the administration of parts (exporting, deleting, creating,…) situated in the working range Construction.
	Job database section:
	Database for the administration of jobs (exporting, deleting, creating,…)
	Machine database section:
	Database for recording machines
	Material database section:
	Database for recording new materials
	Format database section:
	Database for recording flat formats
	Raw materials database sections:
	Database for recording raw materials
	Customer database section:
	Database for recording customer data

You can reach the chosen database section by clicking on the above mentioned buttons or by choosing the command in the pulldown-menu **Administration**.

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### Structure of the database sections

Explorer survey

The database sections are structured in an explorer survey. The structure is the same for all database sections. It consists of the following areas:

Menu list

Action   Import/Export   Find   View   ?

Most **Bybase** functions are accessible through the menu list in all database sections. Depending on the database section you are in or on the processing state of your data, some functions are not available on this level.

Main toolbar
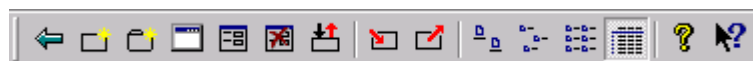
The most important **Bybase** functions are easily and comfortably accessible through the main toolbar. Depending on the database section you are in or on the processing state of your data, some functions are not available. The list of buttons can only be reached within the Explorer view. A detailed explanation of the individual buttons follows below.

Search toolbar

Code   LIKE   A*

A rapid and efficient search may be effected through the Search toolbar. A detailed explanation of the individual buttons follows below.

Tree view

- Parts database section
  - Customers
  - Other
  - Production
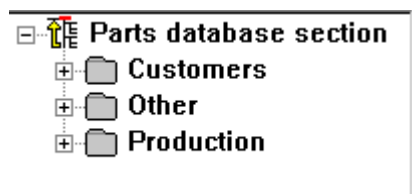
In the tree view all groups and sub-groups are displayed. Groups can be moved and newly arranged by Drag&Drop. You can add new groups and sub-groups to the tree view with the button **New group**.

The content of the selected group (red directory) will be displayed in the data window.

Data window

Code	Description	OID	Add. Info...	Creation d...	Create...
Customers	Customers	13...		01.03.02 ...	zb
Other	Other	13...		01.03.02 ...	zb
Production	Production	13...		01.03.02 ...	zb

In the Explorer's Data window you can see the content of the selected directory of the tree view with the following information.

Code, Description, OID, Additional Info, Creation date, Created by, Modification date, Modified by, in group

By clicking on one of the column titles, you can select an alphabetic sorting commencing either with A or with Z.

The column **Material number** only appears in the material database section. The column is designated for standardised material designation according to **DIN 17007**. However, it can be used for any other kind of entry according to the customer's need or even be left blank.

Should one or more columns be missing in the data window, then they are faded out. Select View / Original column widths to return all columns to their original width.

Graphic window
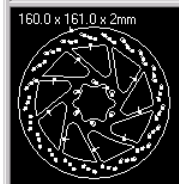
The Graphic window only appears in the **parts database section**. A selected part will be displayed there. Tubular parts will be displayed as unfolding. On top left in the graphic window, the measurements of the parts are indicated.

	Note:
☞	Only parts with technology set will be displayed.

Status list

In the status list, there is the display of some selected functions and buttons (i.e. NUM = "Num Lock enabled"). You will find it on the lower button of the screen.

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Working with Bybase

General features

When working with **Bysoft**, certain records from certain database sections are necessarily required. All these records are created in **Bybase**.

Accordingly, you can create new records, delete, search, import and export, directly start the application and make a proof of use of records. You can also create new groups where you save your records and therefore organize your database sections to your liking. All these things are dealt with in the Explorer view.

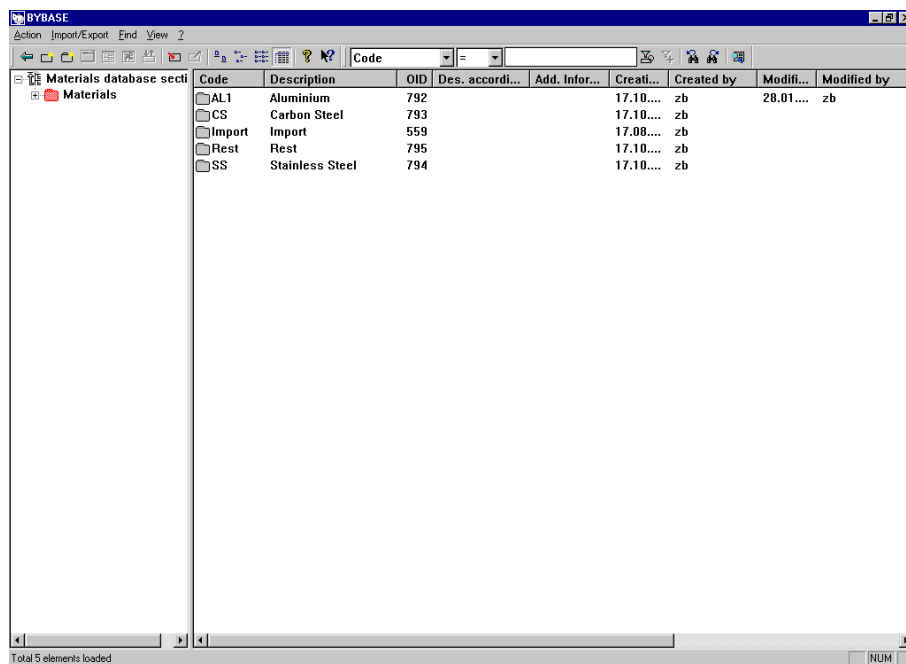### Working with records and groups within the Explorer view

Fig. *Explorer view **Bybase**(here: Material database section)*

The content of the selected (red) directory of the tree view is displayed in the data window. Here you can work with the data (delete, start an application, open form view, make proof of use, import and export). Clicking with the right mouse button on a selected record also enables you to execute these commands

You can move records and/or groups from the data window in a directory of the tree view by clicking on one or several marked records and dragging this selection with pressed left mouse button into the destination directory (Drag&Drop)

You can update the **Explorer view** with the **F5** button.

Functions

Back (Esc)

You move one step back within **Bybase** by clicking on this button.

Creating records (Ctrl + N) and groups (Ctrl + G)

Select the button **New record** or **New group** in any database section. In the **Parts** and **Job database section**, you must add if you intend to create a new record for flat or tubular parts.

Assign the requested data. In most database sections, **Code** and **Description** are necessarily requested. These information must be given, otherwise the program cannot save the record. Other information is voluntary or a default value will be set. If any entries are still missing, you will be told when trying to save the record.

A new group will always be created as a sub-group of the selected group in the tree view (red directory).

Calls application for... (Ctrl + B)

With this button which you can use in the **Parts** and **Job database section**, you can directly start the application for the selected record, either with **Bypart** or **Bytubepart** or with **Bywork** or **Bytubework**.

Open form view (Ctrl + F)

Select this button if you want to change entries in the form view of records or groups. You will see the form view of the selected record. If you double-click on a record in the data window, you will get the same result, i.e. the form view. This form view strongly ressembles to the form which you receive when clicking on **New record** or **New group**. If the **Code** is disabled the record is already used in another record (i.e. job) and can no longer be changed.

In the form view of the **Parts** and **Job database sections** you can launch the following applications by clicking on the buttons in the toolbar.

	Application	Description
	Bypart	only in flat part record
	Bytubepart	only in tube part record (optional)
	Bybendpart	only with flat job record
	Bywork	only with flat job record (optional)
	Bysort	only with flat job record (optional)
	Bytubework	only with tube job record (optional)

Deleting records (Delete)

You can delete records if they are not used in jobs. Two examples to illustrate:

You intend to delete the part with the code A001. Click on this particular part in the **Parts database section** and then click on the button **Deletes marked entries**. Confirm this in the following dialog box with **Yes**.

You intend to delete the part with the code A002, which is used in the job with the code J001. Since the part is used in the job, you cannot delete the part. The system tells you: If clicking on the **Yes** button in the dialog box **Proof of use** will be opened. There, you can see that part A002 is used in job J001. Click on this job and press the button **Go to**. **Bysoft** will now switch to the **Job database section** and display job J001. You can delete this job, click on the button **Back** to get back to the **Parts database section**. Now you will be able to delete part A002 since it is no longer existing in a job.

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Proof of use

For every record (not group, however), you can check where in **Bysoft** it is used. Click on the button after having selected a record. The dialog box **Proof of use** shows you the use of the record in other **Bysoft** database sections. Clicking on the button **Go to** takes you to the corresponding record in its database section.

Import data

You can import **Bysoft**-data as **Zip-file** in **Bysoft** database sections. During the import you can define whether existing records shall be overwritten or not. In the configurations for data import you can select between *only overwrite identical records, never overwrite records* and *always overwrite records*. Click on the button and assign the directory in the Windows dialog box, from which you get the data. Then click on **Open** and the data will be imported. Along with every record, there is also data from different database sections. An imported part, for instance, not only has geometric data but also information on material and customer. Without your doing anything, these data will be saved somewhere in the corresponding database section. In order to clearly define where to save these data, you can define **BEFORE** importing any data in which group you want this data to be saved. Select a destination directory in the tree view of the database section by clicking on it and select the command **Set as import group** from the pulldown-menu **Import/Export**; confirm the following dialog box and start the import only then. All data of this database section will then be saved in this import group.

Export marked entries

With the Export-function, you can export any **Bysoft**-record(s) as a **Zip-file**. Click on one or more records/groups either in the data window or in the tree view and click on the button **Export marked entries**. In the pulldown-menu **Import/Export** you can select different sub-commands which enable you to export not only marked entries but also entire groups or database sections.

> **Note:**
>
> If you are asked to send any data, as for example a part or job to the **Bysoft**-Hotline, do this as is described above.

Viewing options

Click on one of these buttons to change the view of the data window.

Help functions

Help in context (F1)

This button helps you to find the specific page out of the online help in any **Bysoft** program module. Click on the button, then click on that particular part of the screen which you want to know something about, be it a button, a pulldown-menu or some part of the screen. The corresponding page of the **Online help** will then be opened.

You cannot use this function in an active dialog box. However, you will most often find a button called **Help**, which takes you to the online help. Proceed as described above.

> **Note:**
>
> You also find this button in other **Bysoft** modules. The use is the same.

Help

This button opens the online help file in **Bybase**. Click on the books in the tree view to see their content. If proceeding via the button should fail (error message), then select the command **Help subjects** from the pulldown-menu **Help**. You find this pulldown-menu in every module.

> **Note:**
>
> Activate the help function via the **F1** key.

Search

The Search function is restricted to the presently opened database section. If e.g. you are searching for material you must start the search in the material database section, for parts, you go to the parts database section etc.

Search toolbar

You can use the following search functions:

Box for search

Here, you define what entries from the data window you are looking for. The pulldown-menu shows you all possibilities .

The entry **Material number** only appears in the Material database section.

You can also select entries, which you do not see in the data window since they are faded out. In the searching process these entries will nevertheless be taken into consideration.

OID stands for an identification number which will be given to every newly generated record in **Bysoft**.

Operator for search

With operators, you define the conditions the search must consider. The operators go as for numbers as for letters.

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In the pulldown-menu, the following operators are available:

=	identical	Search for records in which the filter criterion and column entries match precisely (also distinguishes between upper and lower case)
<>	different	Search for records in which the filter criterion does not appear in the selected column.
<	smaller than	Search for records with input which is smaller than the filter criteria
<=	smaller or equal	Search for records with input which is smaller than or equal to the filter criterion
>	greater than	Search for records with input which is greater than the filter criteria.
>=	greater or equal	Search for records with input which is smaller than or equal to the filter criterion
LIKE	similar	Search for records whose value in the selected column contains at least the input numbers or letters, but also any additional letters or numbers. The value must contain at least one wildcart (*)
A..B	Range	Search for records with input in the selected column in the desired range.

Value for search   String

Assign a value here which is to be searched for (here: "String"). The values can and partially must be combined with a wildcart (*).

Specify filter for type

Here you define which types of entries from the database shall be searched for. Mark the specific group. The symbol will be marked in red.
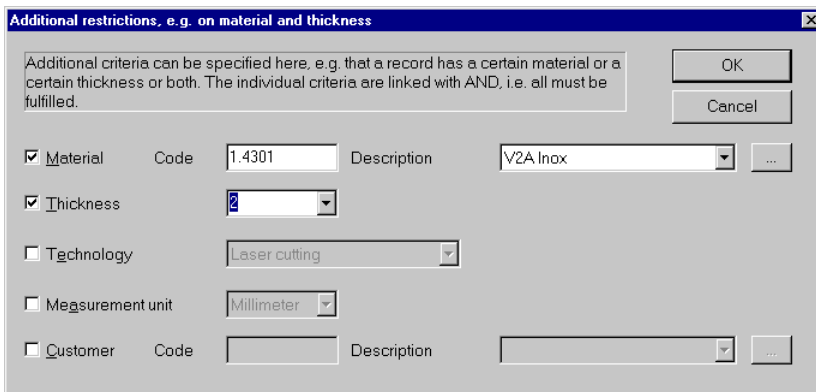
Select from the following options:

Search takes place in…

All entries	… groups and records
Parts group	… only groups
All types of parts	… all parts-records
Flat part	… all flat parts-records
Tube part	… all tube parts-records

Specify additional filter

This filter is only enabled in the Parts and Job database section!

Besides material and thickness, the search can also be additionally restricted to technology, measurement unit and customer. If you enable an additional filter type, the program will restrict its search to this criterion.

Fig.   *Additional restrictions, i.e. material and thickness*

Example:

The filter restricts the search to parts programmed with V2A in 2mm thickness.

Search previous

This function switches to the previously found record according to filter criteria (see also **Searching process**).

Search next

This function switches to the next found record according to filter criteria (see also **Searching process**).

Start search, display total result

This function starts the search in the database according to filter criteria and displays all records found (see also **Searching process**).

Back to tree view

This button is only active when a search has been executed with the function **Start search, display total result** and if search results have been found from different groups. During this action the tree view is disabled. The button allows the return to the normal tree view. The same applies to the command with the same name from the pulldown-menu **Action**.

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Open form view

This icon is only active in the selection dialog for parts, jobs, etc. The form you shows the form data for a selected record:

The field **Additional information** may contain up to 4096 characters to enable you to insert more substantial comments.

Fig. *Dialog window Open form view*

Searching process

Select the corresponding entries from the pulldown-menus **Box for search** and **Operator for search**. Assign a value for the search and start it by clicking on **Start search, display total result**. The groups and/or records corresponding to the filter criteria will be displayed in the data window. If you only click on **Search next** instead of **Start search, display total result**, only the first entry matching the search criteria will be displayed. Another click on the same button displays the next entry etc. Clicking on the button **Search previous** takes you back to the previously displayed entry.

Examples:

1. You want to search all parts with their description commencing with M, redgardless of material and thickness.

   Go to the explorer view of the **Parts database section**. Select with the pulldown-menus from the search toolbar **Description**, the operator **LIKE**, then type **M***. Disable all boxes in the additional filter, which you open by clicking on the button **Specify additional filter**. Then click on the button **Start search**.

2. You want to search all material which your colleague with the initials abc has changed.

   Go to the explorer view of the **Material database section**. Select with the pulldown-menus from the search toolbar **modified by**, the operator **=**, then type **abc**. Then click on the button **Start search**.

3. You want to see all jobs which have been created from 01.03.02 till 31.03.02 and which were processed with stainless steel in 3mm.

Go to the explorer view of the **Job database section**. Select **Creation date** with the pulldown-menus from the search toolbar, then the operator **A..B** and type **01.03.02..31.03.02** In the additional filter, which you open with the button **Specify additional filter**, you enable the filters for material and thickness and assign both with the pulldown-menus. Leave the additional filter, then click on the button **Start search**.

Note:

If records of whose existence you are certain are not shown, check both the group of filter and the additional filter for any restricting settings.

Database sections in Bybase

Database connections in Bysoft

→	compulsory data
⇢ (dashed)	not compulsory data
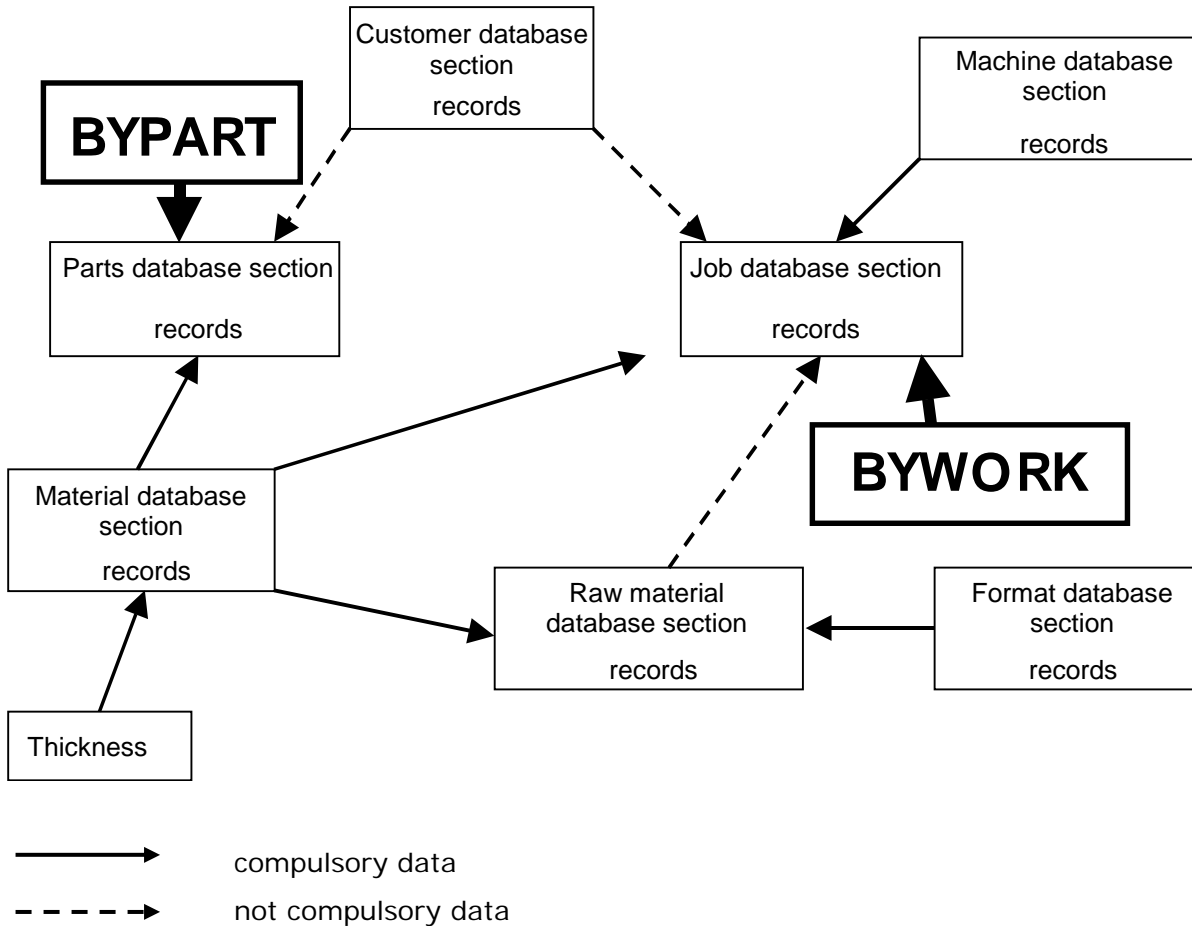
Fig.   *Database connections in **Bysoft***

General

The different database sections are structured equally (as already described above). The differences lie in the record form views. Nevertheless you find the following identical groups in every form view: **General attributes**, **Version info** and **In group**.

General attributes contain a code, a description and additional info. You must always type in a code (max. 30 characters)and in some form views also a description (max. 50 characters), but Additional infos are always voluntary (max. 255 characters). The following characters will not be accepted in the field **Code**: **\ / : * ! " < > |**. Where necessary, assign technology (laser or water cutting) and measurement unit (millimeter or inch). Complete other squares or take over information by clicking on buttons (see below).

Version infos are added by the program as soon as you save an entry or a modification. You cannot change anything there

In group shows you with a path in which directory you saved a record or a group. With the button on the right you can open a dialog box where you can assign the location for your record to be saved or you can create a new group.
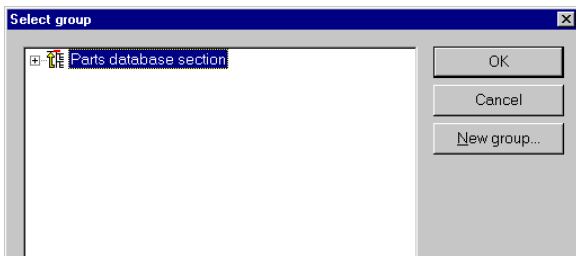
Fig. *Dialog box Select group*

If you click on **New group** you see this small dialogue box to create a new group. Assign both a code and a description.
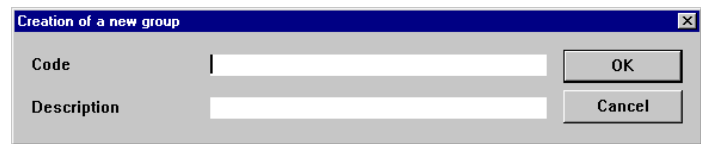
Fig. *Dialog box Creating a new group*

The form view for a group (here parts group) looks like this:

Fig. *Form view Parts group*

Parts database section

In this database section, information about your parts can be saved and modified.

Apart from a code, you must assign at least a material and a thickness. A description and a customer are not necessary, but optional. Besides thickness it is also possible to define the parts safety distance and the edge distance for this combination of thickness and material. For recommended values consider the document **Cutting Technology as of P6110**.

In this dialog, click on the **New** button, insert the thickness and – if requested – other values for protective distance etc and click on **Close**.

Already existing thicknesses can be deleted via the button **Delete**.

If you want to modify safety distances and edge distances later, click on the corresponding line and press the button **Modify**. You can then insert the new values in the dialog box.

Fig. *Dialog box for new thickness*

Fig.   *Dialog box for the defintion of additional values*

As soon as you have assigned one or more thicknesses, these appear every time when you use this material for an new part, job or raw material. When creating new parts or jobs, it is advisable to first assign the material and then select from already existing thicknesses.

Fig.   *Form view Part*

Job database section

Here, information about your jobs can be saved and modified.

You must complete the squares code, material, thickness and machine. The other squares are voluntary. A short name helps assigning file names to LCC-files when exporting cutting plans in **Bywork**. It can be left open since it will be filled automatically when you assign a short name while doing the LCC-export.

Fig.   *Form view Job*
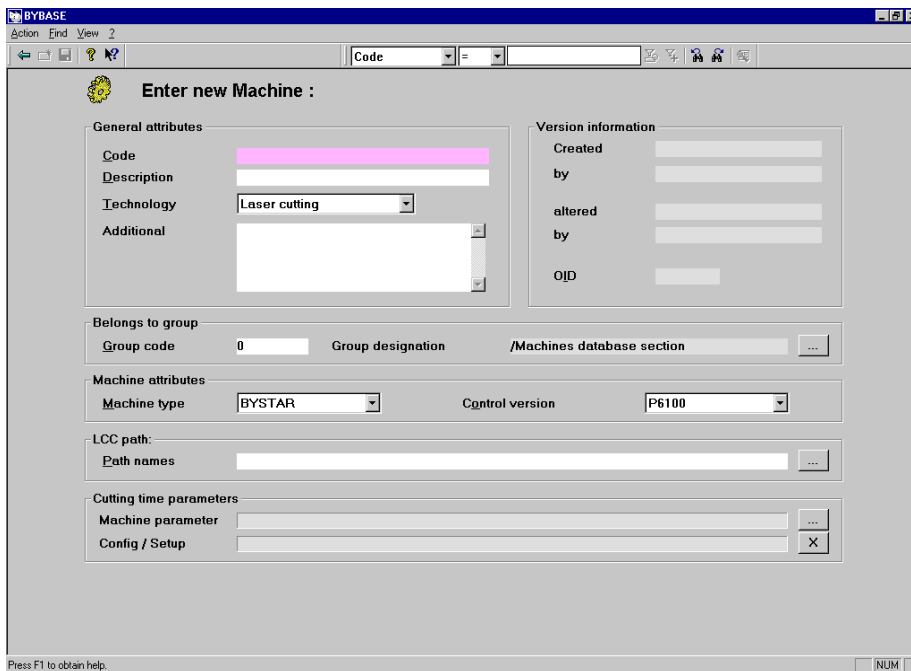
Machine database section

In this database section, information about your machine(s) can be saved and modified.

You must complete the squares Code and Description. Furthermore, you must assign the corresponding machine type and control version of your machine with the pulldown-menus. You find these data on your machine specification.

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Customers of water jet machines please consult chapter **Peculiarities of water jet machines**

In the area LCC path you can determine a folder in which the LCC cutting plans for this machine will be saved.

Optionally, you can leave that field empty and only choose the path in Bywork.
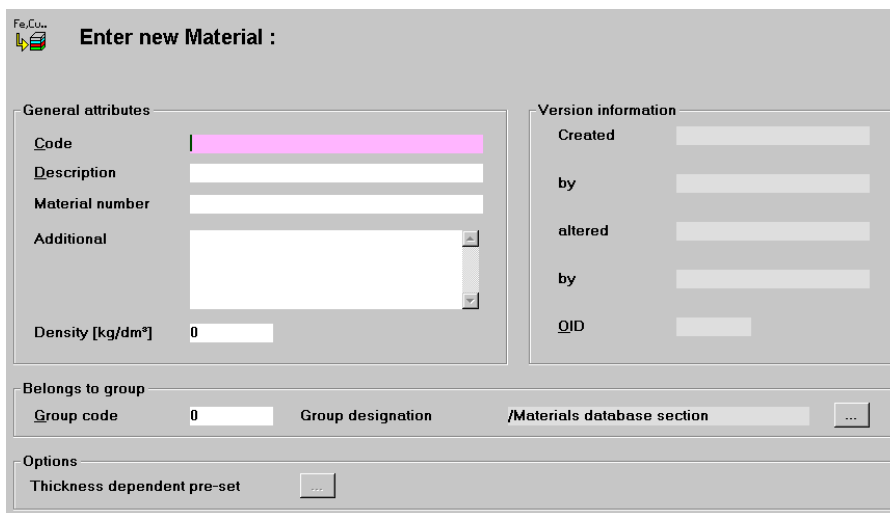
Fig.   *Form view Machine*

Material database section

In this database section you can save and modify information about material.

You register material according to your own norms. However, you must fill the squares **Code** and **Description**. The square **Material number** is a spare square. However, this square is of vital importance within the automatic cutting time calculation. You can find further information about this in the chapter **Bywork**, calculation.

When entering a density, **Bywork** will calculate the weight of parts and sheets.

Through the button **Thickness dependent pre-set** you can define the parts safety distance and the edge distance according to the material. For details about the dialog boxes see **Parts database section**.

Fig.   *Form view Material*

Format database section

Here, you can save and modify information about formats of your sheets.

Define a code in the corresponding form. Insert the dimensions of your flat format in X- and Y-direction.

When you create a new record, the cursor waits for input for an X and Y-direction in millimeter. With the arrow button, the **X-and Y-dimension** can be taken into the square **Description**. Should you forget this step, then the program will do it automatically when you save the record.

Fig.   *Form view Format*

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Raw material database section

Here, you can save and modify information about formats of your sheets.

In the raw material form you need definitions like **code**, **material**, **thickness** and **format**.

Similar to the format database section you can insert the information about material, thickness and format by clicking on the arrow buttons. However, it is also possible to overwrite this information. Should you forget this step, then the program will do it automatically when you save the record.

The price-calculation is not available with this **Bysoft** version.

The field Article no. may contain a number which Byvision sends to the storage system to order raw material.

Fig.   *Form view Raw material*

Customers database section

Here, you can save and modify information about your customers.

Required information is **Code, Description, Name and Town**.

Fig.   *Form view Customer*

Leftover-material management

You can access Leftover-material management in Bysoft via Bybase → Administration → Leftover material.

For the leftover material to be generated automatically from the Remaining sheet cuts and recorded in the Leftover-material management system, the Automatic management of leftover material option must be enabled in the menu Settings → Options → General.

In the leftover-material management it is possible to define the material, the thickness, the dimension, the number as well as the storage place.

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Notes

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Bypart

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Bypart - The construction module of Bysoft

With this program module you can

• construct a new part and prepare it for further treatment in **Bywork**

• import parts from other CAD-systems and prepare them for **Bywork**

Overview

Bypart
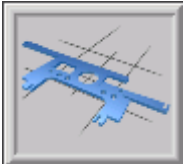
Flat part construction:

Click on this button in order to create a new flat part.

Hints for programming

This manual does not describe any Bypart functions in detail. However, the following information will give you an overview of basic programming procedures.

Command window

The command window is the most important communication platform between you and the PC. The PC tells you which insertions it expects you to enter for the chosen command.

There are different starting points for insertions:

Command	Icon	Message
Text	A	`Starting point`

Other messages:

`From point: First corner: Middle point:` etc.

If there is only one term in the lowest line of the command window, the PC is waiting for an insertion in the form of a co-ordinate. Insert an X and Y co-ordinate and separate the two values with a comma (do not use the decimal point of the number block. It is only needed for entering decimal values). Confirm your entry with **ENTER**. If the message "`Requires point`" appears, you have either forgotten to enter a second value or have not separated the X and Y co-ordinates properly.

Example: **50.1,14.85**

Command	Icon	Message
Fillet	⌐	`Radius: <0>`

Other messages:
`Length: Width: Height: Distance:` etc.

The PC expects you to enter a number. This time, not a co-ordinate but a value is required. Enter the appropriate value and confirm with **ENTER**. It is also possible to define a starting point by inserting a co-ordinate and an endpoint by inserting another co-ordinate. The distance between these two points will automatically be used as the length for the corresponding command – here the fillet.

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Command	Icon	Message
Arc		**Direction/<Starting point>**

If there are two or more terms in the command window, normally one of them is in brackets. This means that this suggestion can be directly confirmed with **ENTER**. If you would like to choose the other command, the capital letter(s) within this word have to be inserted (not necessarily the first letter). Confirm your insertion with **ENTER**.

Command	Icon	Message
Flange		**Flangegeom/Circular hole/Banana hole**

In this example there is no term in brackets. Thus, the only possibility consists in entering one of the capital letters and confirming it with **ENTER**.

Command	Icon	Message
Contour		**Automatic or Manual? (A/M) <A>**

This is a procedure which can either be executed automatically or manually. The letter A is in brackets and will thus go as the default value. You can press A on the keyboard or only press **ENTER**. If you press M and afterwards **ENTER**, you can modify the process manually.

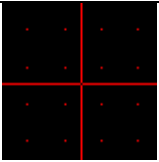| Command	Icon	Message
Erase		**Choose objects:**

The PC expects you to click on one or several objects by using the mouse and the small red object selection box. Move the cursor onto a line and click upon it with the left mouse button. The geometry object will now appear in dashed white lines. You can now choose other geometry objects in the same way. The object selection functions give you further possibilities for selection. After having chosen all objects, you have to confirm your selection with **ENTER** or with the right mouse button.
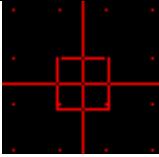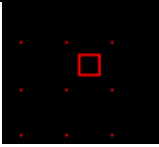
Command	Icon	Message
Clean		none

There is no message, the command is executed in the background of the programme. Hints for this are for example a dialogue window which pops up or changes on the screen. Moreover, you will see in blue letters the command which is behind every icon. In this case it is **_CLEAN**.

Cursor

With the mouse you move the cursor over the screen. Depending on the actual position of the mouse and on the command which has been chosen, the cursor will appear in different shape, either as a white arrow, as a red box or as red cross hairs.

	White arrow The cursor is on the menu bars or on the command window.
	Red crosshairs The cursor is on the drawing window, no special functions are active

	Red crosshairs with object trap box The cursor is on the drawing window and has been activated by an object snap function (see online help > object snaps). The size of the box can be modified in Settings > Options > General > Crosshair.
	Red box (object selection box) The cursor is situated in the drawing window and is ready for an object selection (see online help > object selection). The size of the box can be changed in Settings > Options > General > Crosshair

Mouse buttons

The left mouse button is for clicking on icons, choosing geometry elements, for setting points in the drawing window, etc.

The right mouse button has the same function as the key **ENTER**, assuming that you press on the right mouse button while the cursor is in the drawing window. This means that the right mouse button enables you to finish a command.

When the right mouse button is being pressed while the term "`Command`" is in the command window, the last selected command is called again. This is useful when the same command needs to be executed several times in a row.

Key Escape <Esc>

The escape key enables you to interrupt a command. Pressing the right mouse button directly after the Escape button reactivates the former command (see mouse buttons).

Home key

The contents of the drawing window can be moved by pressing the home key and moving the mouse at the same time.

Zoom functions

Choose the **zoom functions** in order to **move**, **enlarge** or **minimise** extracts from your drawing. These functions are transparent functions, which means that you can also use them in combination with any other function, for example while drawing a line, making a fillet, etc.

The following functions are at your disposal:

🔍	Window*	🔍	All
🔍	Limits	🔍	Previous
🔍	Larger	🔍	Smaller
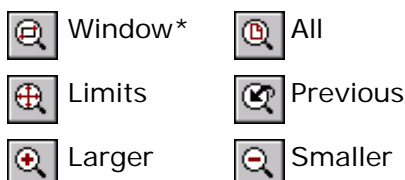
*Follow the instructions in the command window for the function **zoom window**.

See online help > Zoom Functions for a detailed description of the individual icons.

Object snap functions

Use the object snap functions in order to choose geometry points precisely while drawing and constructing. For example: for catching endpoints and middle points within lines, centres of circles, tangent points of circles or for middle points of poly lines.

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When the function **Snap** is active, **Snap** is being displayed in the **status line** below.

The following functions are at your disposal:

![icon]	**End point Basic element (Ctrl + 1)**		![icon]	**Intersection**	**(Ctrl + 2)**
![icon]	**Middle point**	**(Ctrl + 3)**	![icon]	**Nearest**	**(Ctrl + 4)**
![icon]	**Centre**	**(Ctrl + 5)**	![icon]	**Quadrant**	**(Ctrl + 6)**
![icon]	**Perpendicular**	**(Ctrl + 7)**	![icon]	**Tangent**	**(Ctrl + 8)**
![icon]	**End point of contour**	**(Ctrl + 9)**	![icon]	**Centre of gravity**	**(Ctrl + 0)**

You can also activate the snap functions with the key combination (Ctrl + <number>). Permanent object snaps (see chapter **Settings** as of page 79) can be enabled or disabled with Ctrl+F9 or through the menu Settings>Object snap.

Click on one of these icons **after** having chosen a drawing element. If you need for instance the intersection point of two lines as the starting point for another line, first click on the icon for line and immediately afterwards onto the icon **Pick intersection point**. The cursor will then be displayed as cross hairs with a box. Move the box over the intersection of the two lines and press the left mouse button. The function Snap will then again be deactivated.

See online help for a more detailed description of the individual icons.

Object selection functions

The object selection functions help you choosing objects as soon as the command `Select objects` appears in the command window. The choice can either contain a single or several drawing elements or contours. These functions are transparent functions, which means that they can also be used together with other functions, for example when drawing a line, making a fillet, etc.

The request `Select objects:` automatically activates the **Object selection box**. If you have to draw a window, the normal crosshairs appear, requiring the two corners of the window.

Selected objects are displayed with **white dashed lines**. The colour of the chosen objects stays the same.

The following functions are at your disposal:

![icon]	Window	![icon]	Cross
![icon]	Outside	![icon]	Class
![icon]	All	![icon]	Previous
![icon]	Last	![icon]	Invert
![icon]	Add	![icon]	Remove

See online help for a more detailed description of the individual icons.

Short summary of Bypart

The description of **Bypart** is consciously kept short since the online help covers most questions e.g. about buttons and drawing functions better than a manual does. Only the section about technology is presented in full detail. This manual tries to focus on the course of events which are used most often in **Bypart**.

Programming a new part takes seven steps:

1. Starting a new document in Bypart

2. Constructing the part

3. Creating the contour

4. Checking the contour

5. Setting technology

6. Controlling technology

7. Saving

If you construct your parts with another CAD-system (e.g. AutoCAD), you do not need steps 2 and 3. See chapter **Import** for further details.

Starting Bypart

Open the program module **Bypart** and choose New in the pulldown-menu **File**, press the button **New** or enter the short command **Ctrl + N**.

 *Button **New***

Fig.   *Extract from toolbar*

A dialog box opens where you must define preliminary information about your new part.
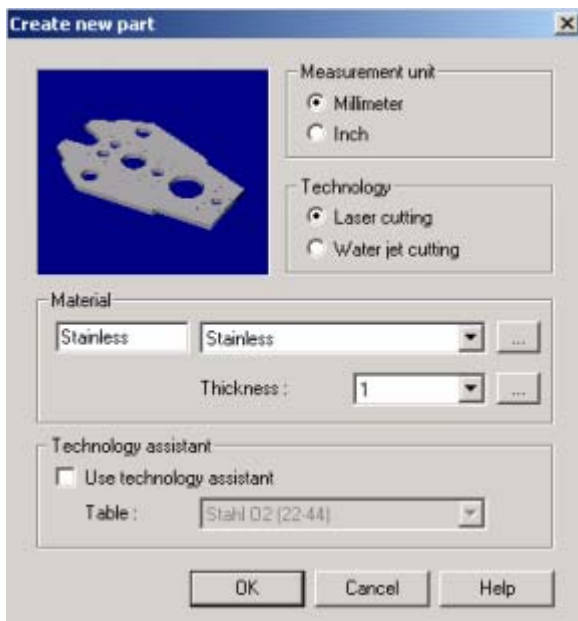
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Assign the **measurement unit** and **technology** with the pulldown-menus.

Select a material from the material database section and choose a **thickness**. If necessary, it is also possible to define a new **thickness**. Confirm with **OK**.

If you want to change one of these attributes later, you can get back to this dialog box with the command **Define new…** from the pulldown-menu **Technology**.

Fig.   *Dialog box Create new part*

Construction

Construct your part.

Note:

You will find no information in this manual on how to construct. Please use the online help for explanations of functions and tools. On request at the Bysoft-Hotline you will receive a construction manual for the first two training parts.

Creating the contour

Create a contour out of drawing elements by clicking on the button **Contour** or by selecting the command from the pulldown-menu **Modify**. In the command window (on the bottom of the screen) you are asked if you want to proceed automatically or manually. If you press the **Enter** key or type **"a"** for automatic, all drawing elements are transferred into contours, if you type **"m"** for manual, only those that you select will be transferred. All drawing lines become green, then.

     *Button **Contour***

Checking the contour

Every contour should be checked regarding open contours. Press **F5** or click on the button **Special view Options**.

In the appearing dialog box you define in the section **Geometry** on the right what the contour should be checked for.
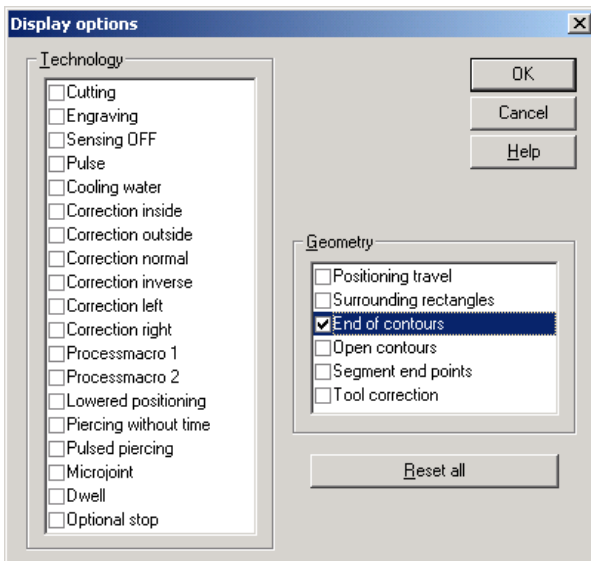
 *Button **Special view Options***

Fig.   *Dialog box Special display*

Positioning travel	indicates positioning paths (must be enabled for lowered positioning!)
Surrounding rectangles	shows the surrounding rectangles of all drawing elements
Open contours	shows open contours in another colour (magenta). The beginning of an open contour will additionnally be displayed with a white circle
End of contours	shows the beginning (line) and the end (arrow) of a contour
Segment end points	Shows the end points of every drawing element.
Tool correction	Shows the applied tool correction geometrically by drawing a straight line with a dot in the middle of the element. This line points in the direction of the tool correction (q.v. **Technology in Bypart**)

Enable **Open contours**, then click on the **OK** button. The display of the contours in the graphic window changes from green to grey. Should you see magenta-coloured lines and white circles, then this contour is not closed. Correct it before you set the technology. You get back to the normal display by pressing **F6** or clicking on the button **Special display**.

 *Button **Special display***

 Note:

The **Special display** only recognizes contours, but not drawing elements. Do not despair if after pressing **F6** or the button **Special display** all white lines disappear. Press **F6** or the button again to display the drawing again.

> **Note:**
>
> The gap in open contours is most often to be found in the area of beginning and end of contours. Sometimes, adjusting the **tolerances** makes these mistakes disappear. Change tolerances in the pulldown-menu **Settings/Options/Additional**. Dissolve the contours and create them again in order to make the new tolerances work. If the mistake persists, you may even have to change the construction.

Setting technology

As soon as the contours are o.k., you can set technology.

> **Note:**
>
> You can set technology on contours only, not on drawing elements.

Setting technology manually

Consult the document **Cutting technology as of P6110** (Optimized programming)

Basically technology is set as follows:

Process the element attributes.

Process the point attributes (microjoint, dwell or optional stop)

Process the centre punch attributes

Process the processing sequence

Process the initial and end cuts

The following chapter Technology in **Bypart** informs you in detail about the meaning and settings of the commands below.

Survey over thechnology buttons

Define	Set	Delete	Modify	
🔲	🔲	🔲	🔲	**Element attributes** (Cutting/engraving, tool correction, additions)
🔲	🔲	🔲		**Point attributes** (Machine commands)
🔲	🔲	🔲	🔲	**Centre punch attributes** (Engrave, Pulse, Cut)
🔲	🔲	🔲		**Processing sequence**
🔲	🔲	🔲		**Initial cuts end cuts**

You can also define all settings, then click on the button **Auto technology**. All settings except for point and centre punch attributes will be executed automatically according to the current definitions.

🔲 *Button **Auto technology***

Likewise, the button **Delete technology** enables you to completely remove the existing technology, so that only the contour remains. After clicking on the button, choose the objects from which you want to remove the technology.

🔲 *Button **Delete technology***

If technology is set, the line color changes from green to light blue. Since various element attributes can be set, but the line color is just light blue, it is difficult later on to say at first glance what is cut in what way or what is corrected. The **Special display** or the **F5/F6** keys can help here. The **Special display options** button or the **F5** key takes you to the familiar dialog window. To see which technology has been set, remove the check marks from all the check boxes and press OK. The operating modes and piercing types are shown in different colors.

The displayed dialog box can be shown/hidden using the option *Display color dialog box for Special display* (menu *Settings → Options → General*).
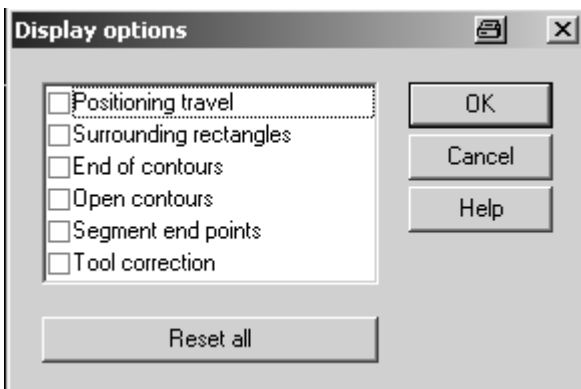

Fig.   *Dialog box Special view Options*

Range of attributes to check:

|	
Cutting	displays all cut contours
Engraving	displays all engraved contours
Sensing OFF	displays all contours for which there is no sensing
Pulse	displays all pulsed contours
Cooling water	displays all contours cut with cooling water
Correction inside	displays all contours where the tool will be corrected inwards
Correction outside	displays all contours where the tool will be corrected outwards
Correction normal	displays all normally corrected contours (largest contour = outer contour)
Correction inverse	displays all inversely corrected contours (largest contour = inner contour)
Correction left	displays all contours where the tool will be corrected to the left (for open contours)
Correction right	displays all contours where the tool will be corrected to the right (for

open contours)

Process macro 1	displays all contours with process macro 1 enabled
Process macro 2	displays all contours with process macro 2 enabled
Lowered positioning	displays all lowered positioning paths travelled
Piercing without time	displays the pierced cuts machined without piercing time
Pulsed piercing	displays all pierced cuts machined in pulse mode
Microjoint	displays all positions at which a microjoint is made
Dwell	displays all positions for which an additional dwell time is defined
Optional stop	displays where the machine stops with STOP SELECT enabled

Setting the technology using the Technology wizard

With the **Technology wizard** facility in **Bysoft**, it is easy for you to set the correct technology for the part you have drawn or imported. The wizard takes into account the material, the cutting gas and the laser power to set automatically the correct additional machining options such as pulsed cutting or process macro 1 for the relevant cutting contours.

The technology rules files are automatically installed in the directory **C:\Program files\Bysoft6\techassist** when Bysoft Setup is run. Enable the Technology wizard by selecting the file for your machine from the pull-down menu and then choosing the correct table via the ⬜ button. Example: the **Structural steel\Oxygen** table means that the optimum technology for steel cut with oxygen on a Bystar machine fitted with a Bylaser 4400 is set. As soon as the file and table have been selected, the Technology wizard can also be enabled/disabled via the menu Technology → Technology wizard or using Ctrl+A.
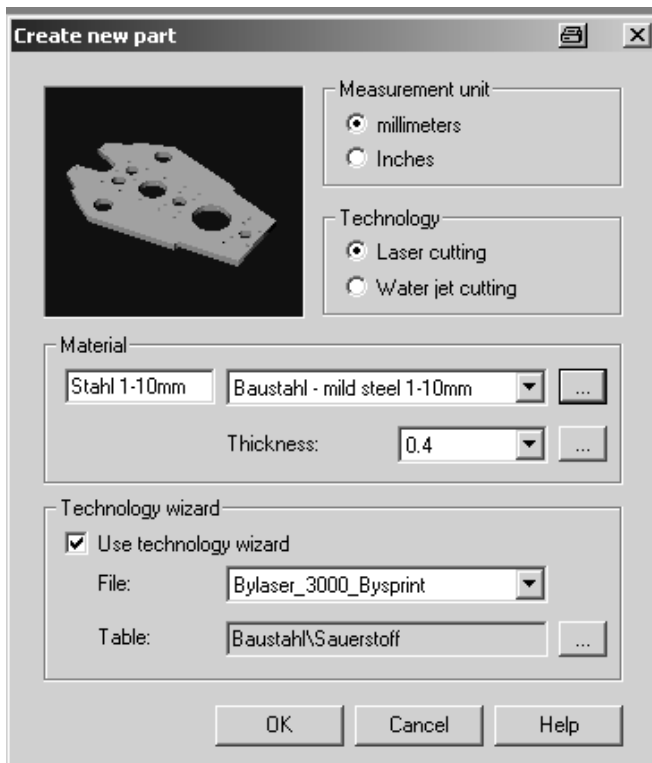
Dialog box Define new technology

Once you have enabled the **Technology wizard** and selected the correct file and table, press the **Set auto-technology** button to set the correct technology automatically on all contours.

The Technology tables can be edited, or new tables created, using the TAR Editor, which is opened via START → All Programs → Bysoft6.

 *Button **Auto-Technology***

With the special display **F5/F6** you can see which contours and initial/end cuts have been set with which additions (pulse mode, process macro, correction etc).

 Note:

Please note that you cannot engrave as long as the **Technology Wizard** is enabled.

 Note:

Inform your machine operator when cutting plans contain parts that have been processed with **Technology Wizard** (Macro parameter)
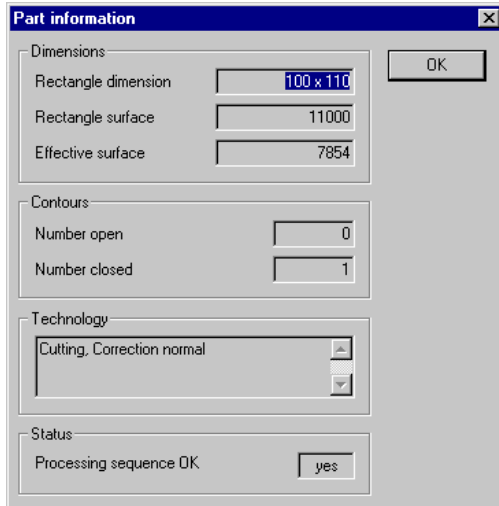

 Note:

Technology which has already been set does not change automatically when you alter the definitions. Only when you delete attributes and set them with the new definitions, changes will be accepted.

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Checking technology

With the command **Part information** from the pulldown-menu **File** you can check if the processing sequence is o.k. You can also use the shortcut **Ctrl + I**.

This dialog box displays at the bottom if the processing sequence is o.k. Furthermore, you can read additional information about the dimensions of the part, the number of open and closed contours, and the technology applied to the part.

Fig.   *Dialog box Part information*

Every part also has this information in its form view in the **Parts database section**.
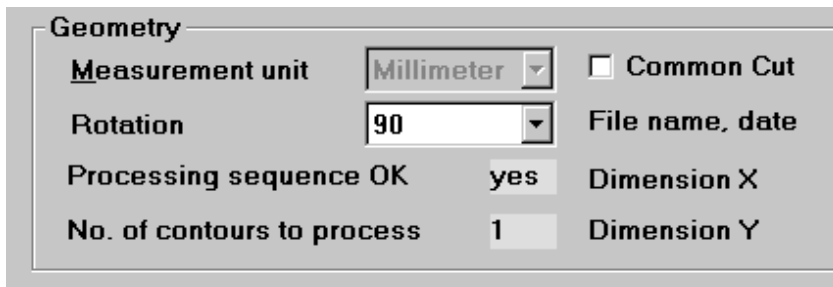

Fig.   *Form view Parts database section, below left*

Saving

Save your part according to your norms. Click on the button **Save**, press **Ctrl +S** or select the command **Save** or **Save as...** in the pulldown-menu **File**.

    *Button **Save***

Please note details in the chapter **Bybase** (Parts database section, form view)

Modifying parts attributes

The function **parts attributes** in the menu **File** gives you the possibility to modify the characteristics of the current record at any stage of the programming. The normal form view of the parts database section will be displayed.

Working with short commands

bypart.acm

Bysoft offers the possibility to reduce a command to a stroke of a keyboard key or a short combination of characters where there is a command window. You can define in advance that e.g. the character **r** should execute the command rectangle without having to click on the corresponding button.

Procedure:

In the directory **C:\Program Files\Bysoft6\programs** you find a file called **bypart.acm**. open this file with a text editor. You will find some short-cuts already. Keep or delete them. Now write a new line with one or several characters (letters/numbers) which you want to use as short-cuts (characters in combination with the Shift or Ctrl keys as well as function keys will not work). Please note that with numbers, you should always use another special character or a letter in order to avoid command collisions. Then add the equal sign (=) and the **complete command name** which appears in blue in the command window when you select the command conventionally.
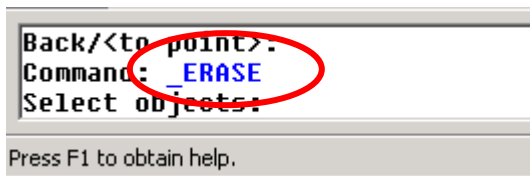
Use the complete name, including the underscore. In this example, it would be: **_erase**.
Case sensitivity is not respected.

Fig.   *Command window*

Some examples:

| Abkürzung	Funktion	Befehlsname	Zeile in bypart.acm
r	rectangle	_rectangle	r=_rectangle
rt	remove technology	_remtech	rt=_remtech
d	delete	_erase	d=_erase
li	line	_line	li=_line
*5	contour	_contour	*5=_contour

Note : You cannot use the characters **e** and **pi** for the acm-files since they have a mathematical function.

Other program modules

In C:\Program Files\Bysoft6\programs you only find a file **bypart.acm**. However, you can easily create an ***.acm-Datei** for any other module. All that is needed is a command window in that particular module.

Procedure:

Open the file **bypart.acm** with a text editor. Save the file with a new name using **File > Save as...** and inserting as name e.g. **bywork.acm**. The file type in the Windows dialog must be changed to **All files**. After saving you can start inserting the new command short-cuts.
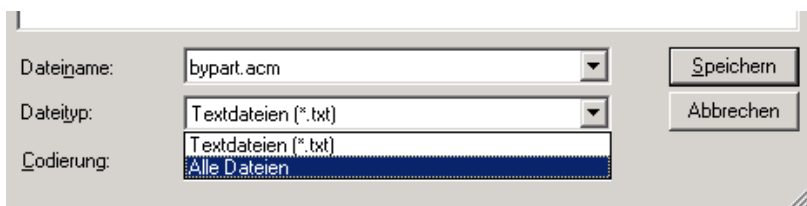
You can use the same combinations in different
*.acm-files

Fig.   *Partial view of Windows dialog Save as...*

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Technology in Bypart

Element attributes

Define element attributes

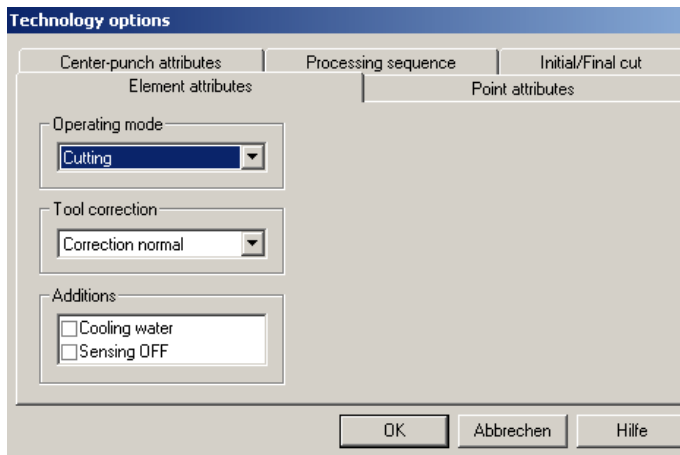The technology data to be assigned to the object are specified in this dialog box.

Fig.   *Dialog box Technology options*

Power

Defines the cutting parameters that apply to machining contours with the laser.

|	
Cutting:	The machine parameters for cutting the material are loaded.
Pulsed:	With certain materials or for tight contours, the heat generated with continuous laser power is too great to achieve optimum machining quality. Machining quality can be increased to some extent by machining using laser pulses. (For further tips see the Cutting technology document)
Engraving:	The machine parameters for engraving the material are loaded.
Process macro1; 2; 3; 4; 5	The process macros can be used, for instance, to change machine cutting parameters that otherwise could only be changed by loading a new parameter file. Process macros 1 + 2 can be used with CNC controller version P6103 onwards. **All 5 process macros can be used with CNC version P8100 (ByVision) onwards (process macros 3-5 are not available until you enable *Support for ByVision* in *Settings → Options → Advanced* in the pull-down menu).**

The following applications can be implemented using process macros:

- High-speed cutting where lower quality edges are acceptable
- Individual holes whose lead-ins are too short (process macro 1)
- Machining complex contours, difficult changes in direction etc. (process macro 2)

Tool correction

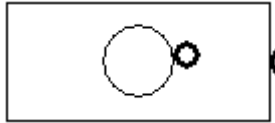The position of the tool correction can be defined here.
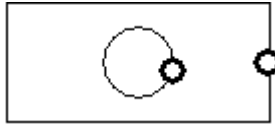
OFF: **No** correction performed.

Correction inside All selected contours are corrected **inwards**.
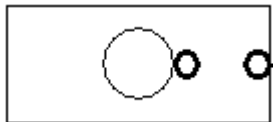
Correction outside: All selected contours are corrected **outwards**.
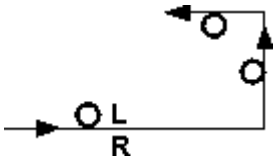
Correction normal: Internal contours are corrected inwards and external contours outwards so that the specified dimensions are always met precisely when cutting.
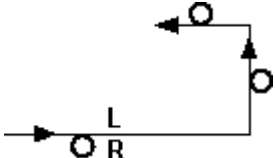
Correction inverse: Internal contours are corrected outwards and external contours corrected inwards.

Correction left: For open contours the tool correction is offset to the left in the direction of cutting.

Correction right: For open contours the tool correction is offset to the right in the direction of cutting.

Additions

The additional commands can be enabled in addition to the machine commands depending on the type of power set.

Cooling water

With certain materials or for narrow contours, heat generation during continuous laser processing is too great to achieve optimum quality. Processing quality can be increased to some extent by spraying cooling water. (Only with special equiment of the machine)

Sensing OFF

If the machine provides capacitive sensing, this must be switched off when cutting non-conductive materials.

If the machine has a tactile sensing system, this can be switched off for soft materials to avoid scratching the surface.

⚠	**Warning!**
	If sensing is switched off, the cutting nozzle and part may collide!

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Set element attributes

Click on the button, select a contour with the object selection box or any other object selection function and confirm with the **Enter** key or the right mouse button. The line colour changes to a **bright blue.**

Delete element attributes

Click on the button, select a contour with the object selection box or any other object selection function and confirm with the **Enter** key or the right mouse button. The contour becomes **green** again.

Modify element attributes

With this button, you can modify previously set element attributes. Click on the button and select a contour element with the object selection box. You can select entire contours, a range of elements (see below) or just single drawing elements (an arc, a circle o a line). Clicking on a contour element opens the dialog box **Technology options**. Modify the **operating mode**, **tool correction** or **additions**.
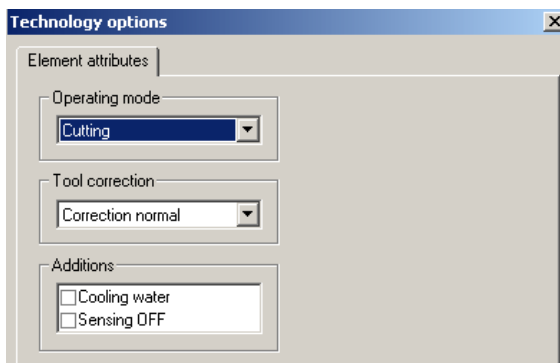

Fig.   *Dialog box Technology options*

Select an entire contour by pressing **c** for **Contours** after clicking on the button, then click on any part of the contour. If you want to select just a range of a contour, press **r** for **Range.**
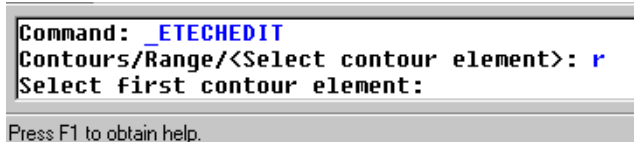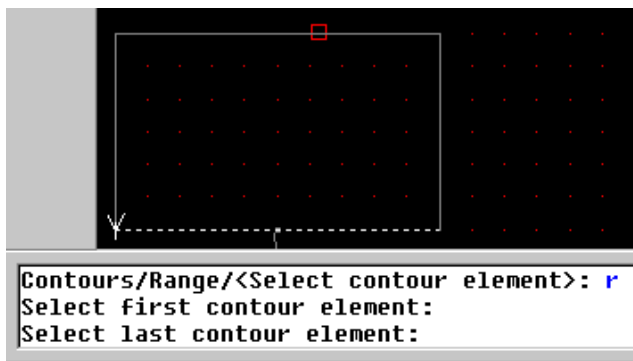

Fig.   *Display Command window*

Define the first contour element by clicking on it, then click on the last one. To make sure which element is first and which one last, you can make the direction of the contour visible by opening the **Special display** (**F6**) after having enabled **End of contours** from the dialog box **Special view Options** (**F5**)

On the left: Special display with already enabled first contour element and object selection box over last contour element.

Fig.   *Special view*

After clicking on the last contour element with the left mouse button, you are taken to the dialog box **Technology options** where you can make changes in technology.

Point attributes

Define point attributes

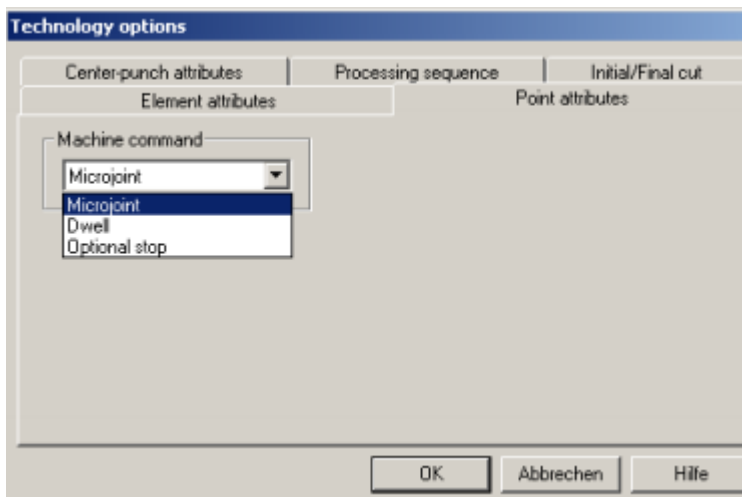Here you can define specific point attributes for special applications.

Fig.   *Dialog box Define point attributes*

Machine command

Microjoint

Microjoints prevent

- Shapes falling out or hanging down during automatic unloading
- Shapes hanging down during lowered positioning
- Material burning off during exit piercing when cutting stainless steel

Dwell

Wait time for the feed in corners. Allows molten material to be blown out so that the gas jet is no longer diverted by the molten material, but is directed vertically through the cutting gap. Used for thick sheets

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Optional stop

Defines an optional stop in the machining process. The command will only be executed when **<Stop select>** is enabled on the machine.

Set point attributes

Click on the button and set the previously selected machine command by clicking on the left mouse button on the appropriate place on the contour. A small yellow circle indicates the machine command.

Note:

Microjoints can also be set for waterjet technology. However, the CNC will always execute them on the end of the contour, not on the programmed point.
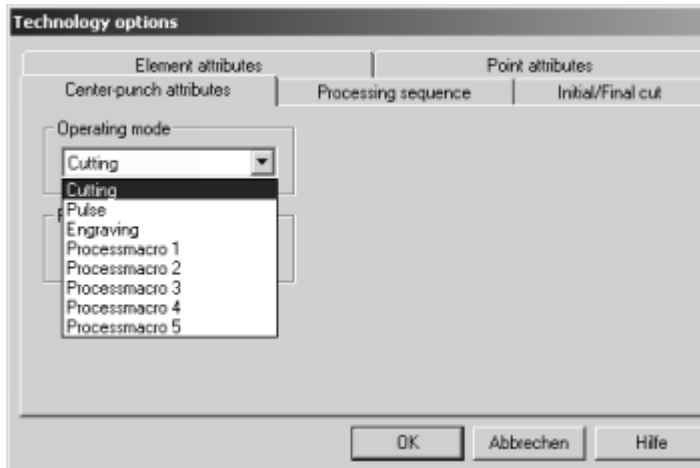
Delete point attributes

Click on the button and move the object selection box over the yellow circle you want to delete. Press the left mouse button and the circle will be deleted without confirmation.

Centre punch attributes

Define centre punch attributes

The attributes to be assigned to centre punch marks are specified in this dialog box.

Cutting	A set center punch mark is machined as a standard through hole with full power.
Pulse	A set center punch mark is machined as a through hole with pulsed piercing.
Engraving	A set center punch mark is machined as an engraved circle or cross. (See chapter Settings)

Processmacro 1+2

* additional user-defined Processmacros 3 to 5 for Byvision

Set centre punch attributes

Press this icon and click on a centre punch mark with the left mouse key. At this moment it still needs to appear in green colour.

Delete centre punch attributes

Press the icon and click with the left mouse key on a centre punch mark which has already been processed with technology. It appears again in green colour.

Modify centre punch attributes

Press the icon and click on a centre punch mark with the left mouse key in order to modify its technology attributes. The selection dialog for centre punch marks appears automatically. Confirm the modified attributes with OK.

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Processing sequence

Define processing sequence

The processing sequence can be set manually or automatically.

If you set the processing sequence manually, you decide on the sequence of processing the contours. If you proceed automatically you specify the processing sequence in this dialog box
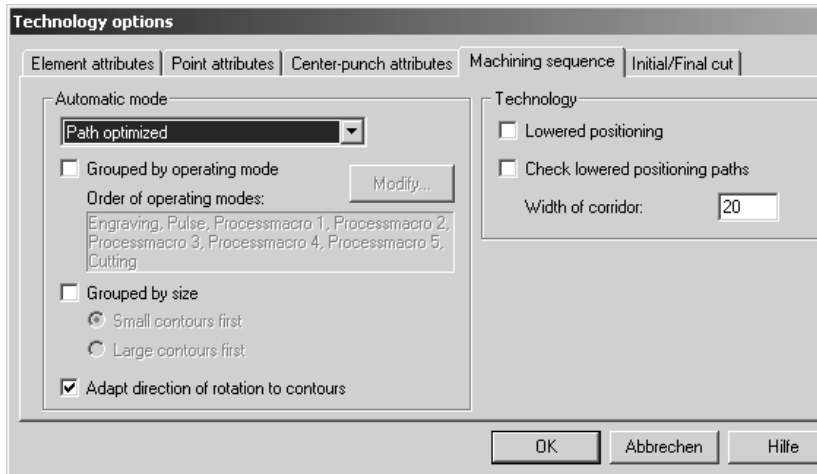

Fig.   *Dialog box Define processing sequence*

Construction sequence

The machine works through the contours in the order in which they were drawn.

Path optimized

The processing sequence is computed to give the shortest overall length for all positioning distances taken together.

Random order

The processing sequence is defined by a random sequence generator. Select Random sequence if laser cutting will lead to high heat generation for contours in small spaces or large sheet thicknesses. With Random sequence, a contour can cool off slightly while another contour is being cut in a different location on the work piece.

Vertical – from left to right

The selected objects are divided into vertical strips that are sorted alternately from top to bottom in Y direction. The processing sequence is executed from left to right.

Vertical – from right to left

Similar to above, the processing sequence being executed from right to left.

Horizontal – from bottom to top

The selected objects are divided into horizontal strips that are sorted alternately from bottom to top in X direction. The processing sequence is executed from bottom to top.

Horizontal – from top to bottom

Similar to above, the processing sequence being executed from top to bottom.
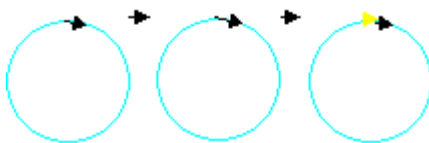
Adapt direction of rotation to contours

The direction in which closed contours are machined is adjusted so that when cutting without initial cut, the contour is not cut in the opposite direction to the positioning path direction. This helps avoid unnecessary braking and thereby increases the machining speed.

Without adjustment
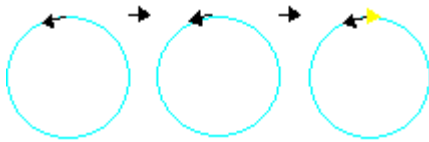
With adjustment

Grouped by operating mode

The sequence in which contours are machined can be grouped by operating mode, with the user selecting the sequence of the operating modes (*Edit* button and then use the arrows to change the sequence).

Grouped by size

The sequence in which contours are machined can be grouped by size. In this case, the contours are either worked through from the largest to the smallest, or from the smallest to the largest contour.

Lowered positioning

Lowered positioning between individual contours can be enabled here. The cutting head remains at the jet clearance height above the work piece between individual contours, even on positioning routes.

Check lowered positioning

When positioning with the head lowered, the system checks whether other contour elements are crossed by applying the **Width of corridor** (i.e. half the width right and left from the nozzle center point) along the positioning path. If this is the case, the head is raised over the positioning stretches concerned. This means that lowered and non-lowered positioning can occur within one part (display with special display).

This check is only made if the machining sequence is set fully automatically . No check is made when setting the sequence manually.

Width of corridor

The value to be used with the **Check lowered positioning** function is specified here.

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Set processing sequence

Click on the button. Decide if you want to continue automatically or manually. Press the right mouse button or the **Enter** key to confirm the default value **<A>** for **automatic.** Then, select the objects you want to be processed with a suitable object selection function.

For manual setting of the processing sequence, type **m** for **manual.** Select one contour after the other, taking the outer contour as the last one. You cannot use an object selection function here, that means that you have to click on every contour singly.

If you want to modify the processing sequence - be it for inserting a new contour in the processing sequene or if you simply want to change the sequence - you should proceed manually. Select **A** for **Append** if a contour is to be set as last contour of the processing sequence. Select **I** for **Insert** if a contour is to be put between two already machined contours.

```
Automatic or manual ? (A/M) <A>: m
Append or insert ? (A/I) <A>: i
Select succeeding contour:
```
```
Press F1 to obtain help.
```

Fig.   *View Command window*

Append: (no screenshot)

Click on the contour and confirm with the **Enter** key or the right mouse button. The selected contour will be set at the end of the processing sequence.
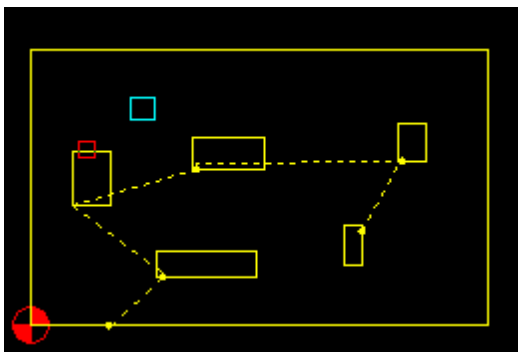

Fig.   *Inserting in an existing processing sequence*

Insert:

First choose the following contour, that is, the contour which is to be processed after the contour you want to insert (displayed on the left with the object selection box). Only then click on the contour (still fair blue, perhaps also green) in order to integrate it into the processing sequence. Confirm with the **Enter** key or the right mouse button.

Delete processing sequence

Click on the button, then click on the contour which you want to remove from the processing sequence, with the object selection box or another object selection function. Confirm your input with the **Enter** key or the right mouse button.

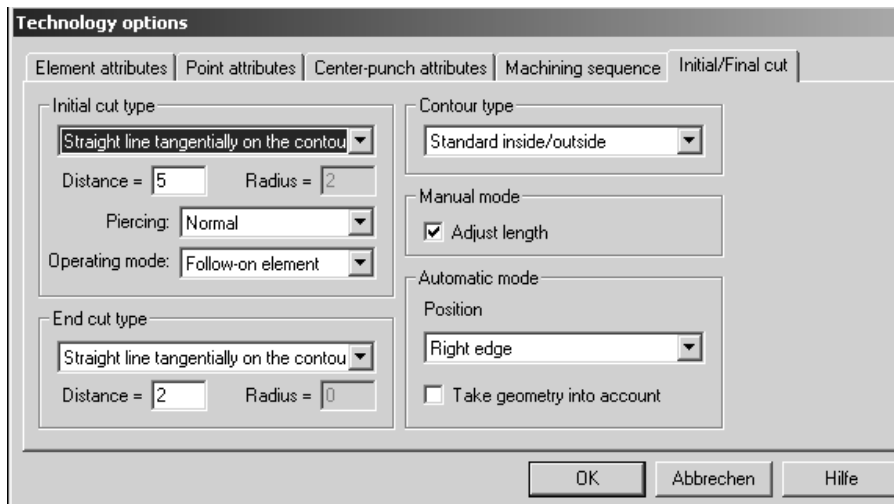## Initial cuts and end cuts

Define initial cuts and end cuts

Dialog box screenshot:

Technology options

Tabs: Element attributes | Point attributes | Center-punch attributes | Machining sequence | Initial/Final cut

Initial cut type
Straight line tangentially on the contou ▼
Distance = 5   Radius = 2
Piercing: Normal ▼
Operating mode: Follow-on element ▼

End cut type
Straight line tangentially on the contou ▼
Distance = 2   Radius = 0

Contour type
Standard inside/outside ▼

Manual mode
☑ Adjust length

Automatic mode
Position
Right edge ▼
☐ Take geometry into account

OK   Abbrechen   Hilfe

Fig.   *Dialog box Define initial cuts and end cuts*

Initial cut type

For proper processing of a contour, the laser should pierce the material outside of the working piece and join the contour as an initial cut. The definition for these settings occur in the pulldown-menu in the section **initial cut type**.

The optimal lengths and radius of initial cuts depend on material and thickness. See the document Cutting technology as of P6110 for further details.

Directly on the contour:		Machining begins directly on the contour, without initial cut.
Straight line at right angles on the contour:		Straight initial cut orthogonal to contour.
Straight line with arc on the contour:	1 2	1. Straight initial cut orthogonal to contour. 2. Joins the contour with an arc. If you enable end cut, the same radius will be used for the end cut.
Straight line tangentially on the contour:		Straight initial cut tangential to contour. The tangential initial cut is only for circles. The outside contours are defined.
Arc tangentially on the contour:		arched initial cut onto the contour. Suitable especially for BYSPEED machines.
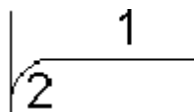
Distance:		The initial cut length is defined here for the following initial cut types:

- Straight normal to contour
- Straight with arc onto contour
- Straight tangential to contour
- Arc tangentially on the contour

Radius:		Here, the arc radius for the following initial cut types is defined:

- Straight with arc on the contour
- Arc tangentially onto the contour

Piercing:	Normal	Piercing at full power
	Without time	The piercing time stored in the equipment in the machine parameters is not taken into account.
		The controller waits only until the power and gas pressure required for cutting have built up. Then machining begins.
	Pulsed	Pierce with the parameters stored in the machine under Pulsed piercing. Pulsed piercing results in smaller holes than normal piercing.
Operating mode:	Follow-on element	The lead-in is machined in the same operating mode as the contour that follows the lead-in.
	Cutting Pulsed Engraving Process macro 1-5	The lead-in is machined in the selected operating mode, regardless of which operating mode has been applied to the subsequent contour.

End cut type

At the end of a contour the laser can be lead from the contour with an end cut. This can be defined here.

For water jet machines, an end cut is strongly recommended.
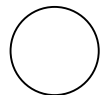
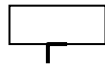|		
Directly on the contour:		Machining ends directly on the contour without end cut.
Straight line at right angles on the contour:		Straight end cut orthogonal to contour. The end cut has the same length as the initial cut.
Straight line with arc on the contour:		1. Straight end cut orthogonal to contour.
		2. Movement away from the contour is in an arc.
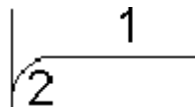
Following the contour:

Machining follows the cut gap already made. This lead-out can extend over a maximum of two segments.
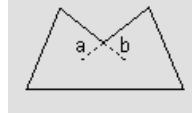
Arc tangentially onto the contour
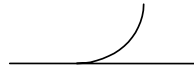
Arched end cut from the contour. Suitable especially for BYSPEED machines.

Straight tangential to contour
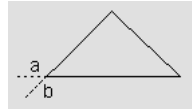
Straight end cut tangential to contour.

This type of end cut (**b**), in combination with the same initial cut type (**a**), creates clean corner cuts on inside and outer contours.

Length:

The end cut length is defined here for the following end cut types:

- Straight normal onto contour
- Straight with arc onto contour
- Following the contour
- Arc tangentially onto contour

Radius:

Here, the arc radius for the following end cut types is defined:

- Straight with arc on the contour
- Arc tangentially onto the contour

Contour type

Bysoft automatically recognizes inner and outer contours and assigns initial and end cuts according to the setting **Contour type**

Standard inside / Outside
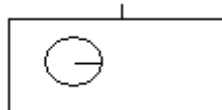
The largest contour found counts as the outside contour and is cut into from outside. Cutting of all other contours start from the inside.

Inside / Outside transposed
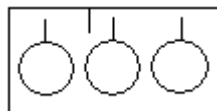
The largest contour found is considered the inside contour and is cut from the inside; all other contours are cut from the outside. Select this function if the sheet is the work piece and the cut-outs are filled with filler parts.

Generally inside:
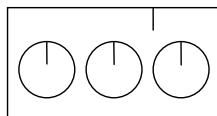
All contours are considered inside contours and cutting begins from the inside.

Generally outside:
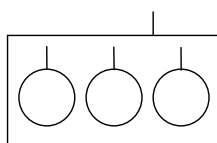
All contours are considered outside contours and cutting begins from the outside.
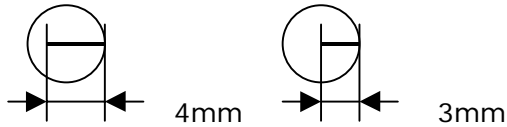
Manual mode

Adjust length

Hole diameter = 6mm, length of initial cut = 4 mm


4mm   3mm

Not adjusted   Adjusted

The **Initial cuts** and **End cuts** are adjusted to the dimensions of the contour if **Adjust length** is enabled. The length is always reduced to half the diameter of a contour. This only applies when an initial cut is set manually. When setting technology automatically, the length is also adjusted automatically.

Automatic mode

Along the cut sequence:
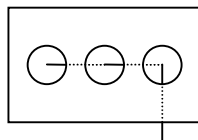
The program first calculates the shortest possible positioning route, and then places the initial cut automatically so that it lies in the direction of the next contour.

This prevents the tool from crashing into the holes of contours that have already been cut when it is travelling in lowered positioning mode.

First segment

Positions the initial cut onto the first possible segment. (Line segments are preferred)

Left edge

Positions the initial cut approximately on the farthest left point of the corresponding contour.

Right edge

Positions the initial cut approximately on the farthest right point of the corresponding contour.

Top edge

Positions the initial cut approximately on the limit point of the top edge of the corresponding contour.

Bottom edge

Positions the initial cut approximately on the limit point of the bottom edge of the corresponding contour.

Take geometry into account

With this option enabled, for automatic setting of lead-ins, the lead-in for a recognized shape (circle, rectangle, slot and polygon) is set at a predefined position and the set lead-in length is no longer reduced where possible. For an outer contour, the software also tries to set the lead-in in a recess.

Set initial cuts/final cuts ⊝

Click on the button and choose automatic or manual setting. If you select the defalt value **<A>** for **automatic**, all contours will receive an initial and end cut according to the definition.

If the processing sequence has not yet been set, you must select all objects to be processed with an object selection function.

If you type **M** for **manual**, you can specify the exact position of the initial cut

> **Note:**
>
> When setting the lead-ins or lead-outs manually, the permanent object snap option is not disabled automatically; this means that the lead-in or lead-out may always be placed at the end of a line or in a corner of the contour.

Delete initial cuts/final cuts ⊗

Click on the button and then with the object selection box or another object selection function on these objects (contour or initial/end cut) where you want to delete the initial and end cuts from. Confirm with the **Enter** key or the right mouse button.

Change initial cuts/final cuts ⊜

Press the button and select P for lead-in position, or click with the object-selection box or an object-selection function on those objects whose lead-in and lead-out you wish to change.

The settings defined for the selected contours are displayed and can now be edited.

Lead-in/Lead-out options

Initial cut type
Straight line at right angles on the cont
Distance = 5   Radius = 0
Piercing: Normal
Operating mode: Follow-on element

End cut type
Directly on the contour
Distance = 0   Radius = 0

OK   Cancel

If P is selected for lead-in position, a new position for the lead-in can be selected. The lead-in length and type remain unchanged.

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Standard technology settings
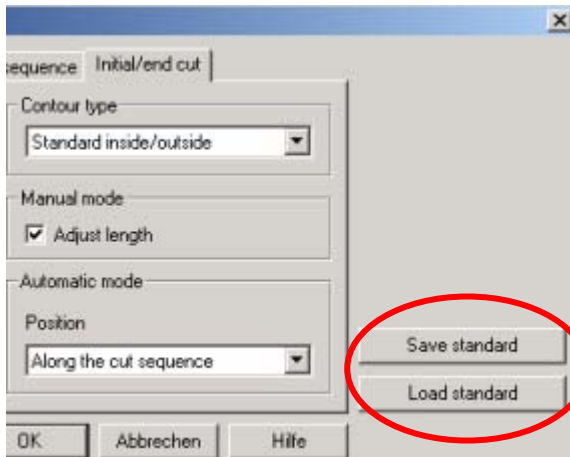
All settings are no longer saved with *OK*, but with the new icon **Save standard** which saves them permanently. Settings which have been confirmed with *OK* are only valid temporarily as long as the application is running. Additionally, the saved settings can be restored with the new icon **Load standard**.

Import

You can import different file formats to **Bysoft**. Contrary to the zip-import in **Bybase**, this import occurs in **Bypart**. All import functions in **Bypart** are launched from the pulldown-menu **File / Import.**

Here a list of the different file formats:

AutoCAD.DXF

AutoCAD.DWG

IGES

MI1O/MI3O

BYPART.BXF

BYSTRONIC.DIN

BYSTRONIC.LCC

(Bytrace)

The CAD import button is provided for importing CAD files.

Note:

Always create a new part first before you start an import, otherwise the opened part will be overwritten.

AutoCAD.DXF

Import DXF-files from professional CAD system.

The import takes place in few steps.

Select the command **Import** from the pulldown-menu **File**, then **AutoCAD.DXF**. Search for the dxf-file in the Windows dialog box and click on the **Open** button.

The drawing of this dxf-file is displayed in the screen. Apart from the contour you might also see construction and dimensioning lines plus drawing information which you do not want to import. Therefore you must "isolate" the contour.

Note the command window at the bottom of your screen.

```
Command:
Command: _DXFIN
Normal/Layer/lineType/Color/Block/Filter/Auto/Manual/Exit <M>:

Press F1 to obtain help.
```

Fig.   *Command window*

What you see in the drawing window ist the drawing filters **Normal**. With the other four filters available, **Layer, lineType, Color, Block**, you can mark different drawing layers from the CAD system in different colours. The aim is to isolate the contours for further processing in one or two colours.

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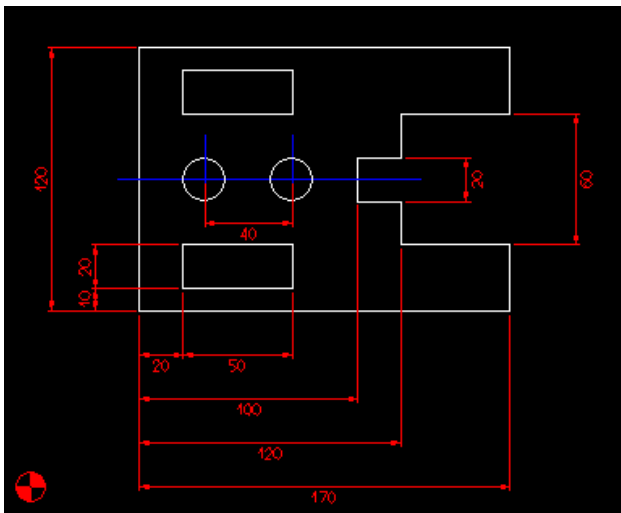
Press the hotkey of one of the five drawing filters and confirm with the **Enter** key or the right mouse button. The colour of the lines is likely to change. Continue pressing the other hotkeys if the result is of no further use. If you find the contour in one or two colours, proceed to the next step.

contours of the part   white

construction lines   blue

dimensioning lines   red

Fig.   *Example DXF-import*

Prepare the contours for the DXF-import by selecting them. Type **"M"** for **Manual** or simply the **Enter** key.

Now select the contours: You can either click on every single drawing element (line, arc, circle) or by clicking on a line in the corresponding colour with the object selection function **Selection class**. After confirming with the **Enter** key or the right mouse button, the selected lines become yellow, all other lines grey.

      *Button **Selection class***

Last step: Finish the import by pressing **"E"** for **Exit**.

Now the program executes various activities, which you have to define or check first. Open **Import / Export** from the pulldown-menu **Settings / Options**.
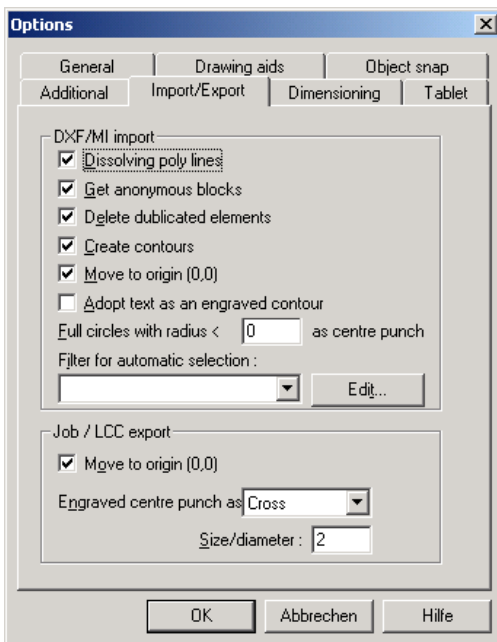
This is the default setting of this tab. When pressing **"E"** for **Exit**, these settings will be executed with the file, i.e. dissolving poly lines, deleting duplicated elements, creating contours and moving to origin.

You receive further information by clicking on **Help**.

Fig.   *Tab Import/Export*

Now you see the part as contour (green lines) and in the origin *(cf. Example DXF-import above).*
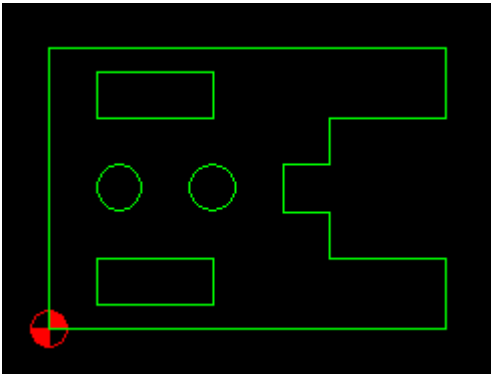
Check the part for open contours (**F5/F6**) and correct any mistakes if necessary.

Set technology and save the part. The name of the dxf-file is suggested as code for the part.

Fig.   *Example DXF-import as contour*

> **Note:**
>
> When you start an import and only see the cutting contour, you can directly press **"E"** for **Exit. Do not create contours before exiting the import**. Only when proceeding as described above, the import will be executed properly. Otherwise the likelihood of mistakes is far higher.

AutoCAD.DWG

Import data from AutoCAD in the *.dwg-format. The import works exactly like the DXF import.

IGES

This import works like a DXF import, too.

ME10/ME30 MI

Import MI-files from a Hewlett Packard construction system ME10 from version 5 (MI file version 2.11) to version 8.7 (MI file version 2.5).

The import of MI-files works exactly like the import of DXF-files.

BYPART.BXF

Import geometrical data from **Bysoft** 6.1-versions onwards in the construction module **Bypart** and exchange data between different program versions.

Select the command **Import** from the pulldown-menu **File**, then **BYPART.BXF**. Search for the bxf-file in the Windows dialog box and click on the **Open** button.

Technology attributes and construction lines remain as they were in the original drawing. Unfortunately, versions of the BXF data which are older than 6.1. can only be read by the same version.

> **Note:**
>
> This format does not change. Only data from version 6.1 onwards can be exchanged with later versions.

BYTUBEPART.BXF

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If you work with the option **Bytubepart**, the bxf-import is identical to **BYPART.BXF**. You can import a file **BYPART.BXF** in **Bytubepart** and vice versa.

BYSTRONIC.DIN

Import DIN-files from **Bysoft Version 5.0** onwards in the construction module **Bypart**. Technology attributes are taken over automatically.

Select the command **Import** from the pulldown-menu **File**, then **BYSTRONIC.DIN**. Search for the din-file in the Windows dialog box and click on the **Open** button. The part is displayed instantly and you can save it.

BYSTRONIC.LCC

Importing an LCC-file means that one of each part nested on an LCC-plan is imported in **Bypart**. That means: If you have a plan with 2000 identical parts, then only the one part (shape) will be imported. If you have a plan with 7 different shapes, 200 parts, then these 7 different shapes will be imported. They are imported with element attributes and initial and end cuts, but without processing sequence.

Select the command **Import** from the pulldown-menu **File**, then **BYSTRONIC.LCC**. Search for the lcc-file in the Windows dialog box and click on the **OK** button. All parts will be displayed in the graphic window with technology attributes except processing sequence. For further application, you must extract the parts. (see chapter **Export / Extract**)

Bytrace

Bytrace, which is an optional **Bysoft** module enables you to implement black and white or coloured image data in individual part geometries, to import and modify them in **Bypart**.

Auto-Import

Auto import enables simultaneous import of several equally constructed files. The following formats can be imported: *.dxf; *.dwg, *.iges, *.din; *.mi; *.bxf

First, you create a filter to show to the program how all other parts must be imported. For this, you start a normal import as described above: create a new part, select the file from File / Import / AutoCAD.DXF (or another file format), isolate the contour and select these contour elements. Please remember in which drawing display (Layer, Linetype or Color) you selected the contour elements. Now, instead of pressing **"E"** for **Exit**, you type **F** for **Filter**. Assign a name for this filter, for instance filter_1, then press **"E"** for **Exit**.

Enable this filter in the tab Import / Export, which you find in the pulldown-menu **Setting / Options**. Select "filter_1" in the pulldown-menu **Filter for automatic import**.

> **Note:**
>
> The filters do not necessarily process every file of that format in the same way. Different procedures of constructing in the CAD-system can create different results.

After assigning the filter, click on the **Edit** button on the right. The following dialog box appears.
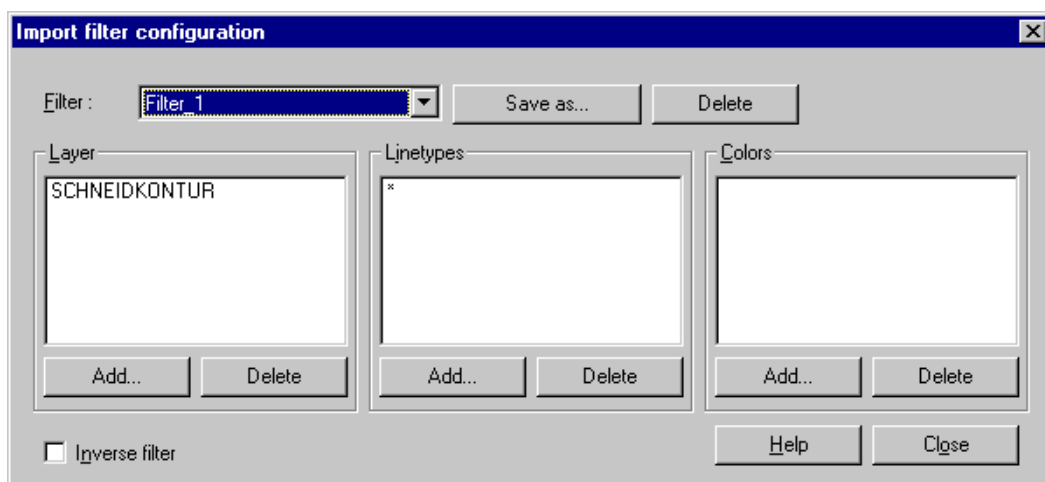
Fig.   *Dialog box Import filter configuration*

The three boxes display the names of the layers of the original construction system. In the case above there are two of them. Now you must recall the selection from the import with which you defined "filter_1". If it was **Layer**, you must delete the name or symbol in the other two boxes by clicking on the corresponding **Delete** button. If there was an entry in the box **Colors**, you would have to delete this entry as well. Now, only drawing elements from the remaining box will be imported, in our case from **Layer**. Leave this dialog box with the **Close** button.

Accordingly, if you defined the filter with **lineType**, you would have to delete the boxes **Layer** and **Colors**. The same applies to the definition with **Colors**.

Having made these settings you can begin with the Auto-import. Create a new part, then select the command **Auto import** from the pulldown-menu **File**. The following dialog box appears.

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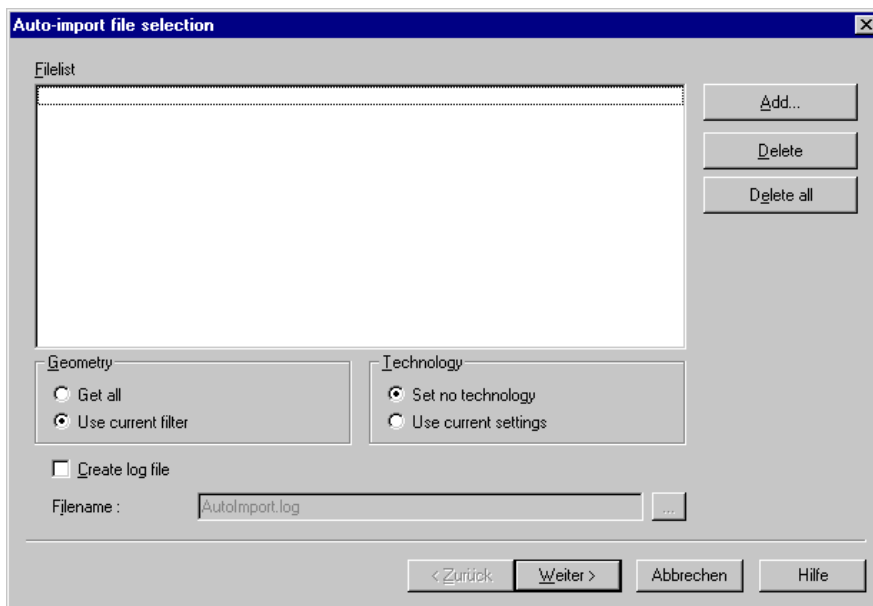
Create a **Log File** by activating the control box. Its contents are identical with those of the control box **Auto-Import-Log**, which concludes the auto import. Define the path for the file on the right side of the square **File name**.

Fig. *Dialog box Auto-import file selection*

Enable **Use current filter** in the section Geometry. In the section Technology, you specify if you want to **Set no technology** or if you intend to **Use current setting** according to the definitions of technology attributes in **Bypart**. Then click on the **Add...** button. Select all files from the Windows dialog box which you want to import in one turn. Leave this dialog box by clicking on the **Open** button. All files selected now appear in the file list. Click on the **Next >** button to see this dialog box:
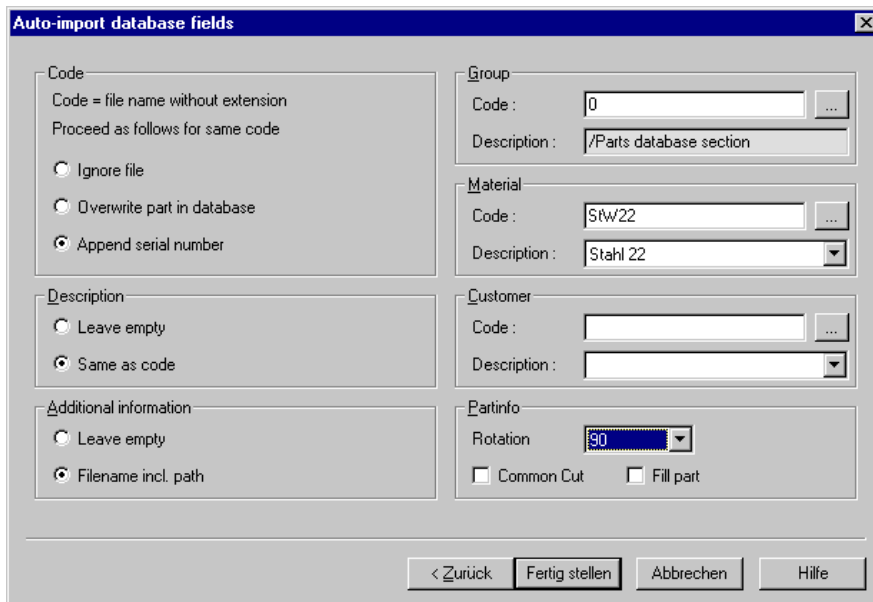
Fig. *Dialog box Auto-import database fields*

Define how the parts to be imported must be saved in the **Bysoft**'s parts database section. The different sections indicate various possibilities of registry. As for the code, you specify what the program must do if this code already exists. The other sections correspond more or less to the squares which you also have in the parts form view.

Remember: All parts imported in this auto import will be saved according to the settings of this dialog box.

By clicking on the **Finish** button, you start the auto import. A dialog box **Auto import log** displays the imported parts by indicating how many contours there are, how many are processed with technology and how many are still open. At the end, click on the **Close** button to quit the auto import.

Export

You can export parts data as the following file-types

AutoCAD.DXF, **Bysoft**-specific **BYPART.BXF ∕ BYTUBEPART.BXF**, **BYSTRONIC.DIN**, **BYSTRONIC.LCC** (ready-to-cut file for the machine)

The procedure is identical for all file formats. Unlike the *.zip-export in **Bybase**, the export of these file types takes place in **Bypart**.

Open the part which you want to export. Select the command **Export** from the pulldown-menu **File**, then the desired file format. Specify the destination folder in the Windows dialog box and save the part.

> **Note:**
>
> With the command **File ∖ Export ∖ BYSTRONIC LCC** you can cut an individual part without having to create a job in **Bywork**.

Extract

You apply the command **Extract** from the pulldown-menu **File** when you find several, non linked parts in **Bypart** (e.g. after a LCC-import)

Select the command and click on one of the several parts. Confirm your selection with the **Enter** key or the right mouse button.

Next, assign an origin. If you confirm with the **Enter** key or the right mouse button, the lower left corner of the part is defined as origin. You can also set the origin manually, either by left-clicking somewhere on the plan or by using an object snap function.

Having set the origin, the form view for a part from the parts database section appears. Save your part by typing a code and assigning at least material and thickness.

Press the **OK** button to get back to **Bypart**. The first part has been removed from the graphic window and has been saved. Extract all other parts exactly in the same way.

> **Note:**
>
> The processing sequence of a part imported from a LCC-file corresponds to the processing sequence of the LCC-file. Information on lowered positioning are being lost during the import.

Insert

Parts which are saved in **Bysoft** can be inserted in **Bypart**. Select the command **Insert** from the pulldown-menu **File**. The dialog box **Parts database section** appears where you can select the part to be inserted. Close the dialog box with **OK**.
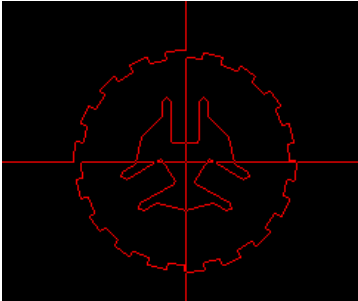
The part is displayed in red and caught by the cursor in its origin. Specify the insert point by typing coordinates or with an object selection function and assign – if necessary – a rotation angle.

Fig. *Part before being inserted*

Cutting time calculation

In the dialog **Cutting time calculation** the cutting time and length of a single part is calculated. You get to this dialog box by clicking on the button **Cutting time calculation** or by selecting the same command from the pulldown-menu **Extra**.

  *Button **Cutting time calculation***

The section **Settings** will be explained in the chapter **Calculation** in the module **Bywork** since it works identically in all **Bysoft** construction and production modules.

The lower sections display machining time and length as well as number and execution of piercings of the machine.

Fig. *Dialog Cutting time calculation*

 Note:

Cutting time calculation is only possible when technology has been set on the contours.

Settings

In **Options** from the pulldown-menu **Settings**, there are seven tabs. They will not be explained in full detail. Use the **Help** button on the right bottom of the dialog box to receive more detailed information.

General

Specify settings for screen, cursor or call-up for certain dialog boxes.

By activating the control box in the section **Input** you can define **diameter** as a standard value instead of **radius**.
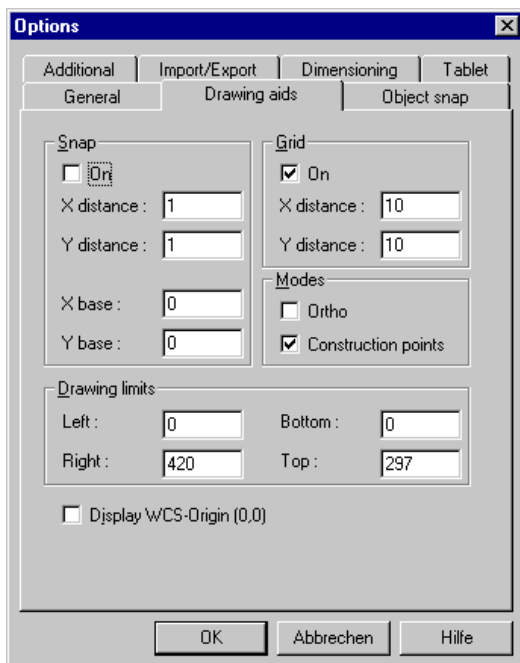
Drawing aids

Here, you can define grid distance and size (in the section Drawing aids), (de)activate construction points, etc.

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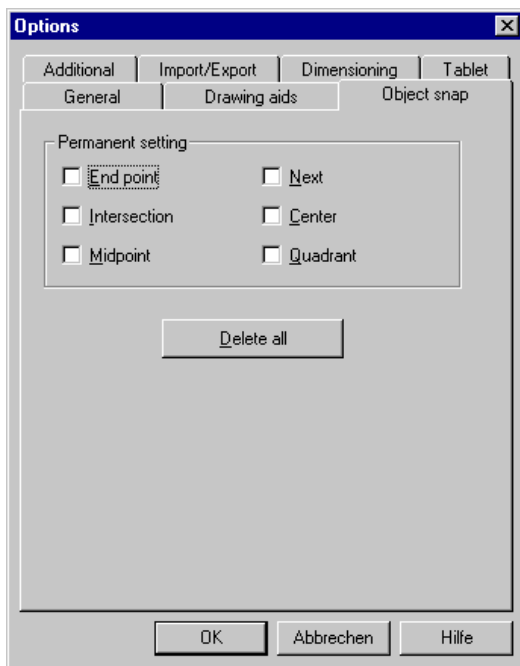
Object snap

You can enable and delete permanent object snap functions.

With certain functions (fillet, chamfer, manual setting of initial and end cuts) the permanent object snap is disabled automatically.

All object snaps can be enabled or disabled through **Settings > Object snap (Ctrl+F9)**.
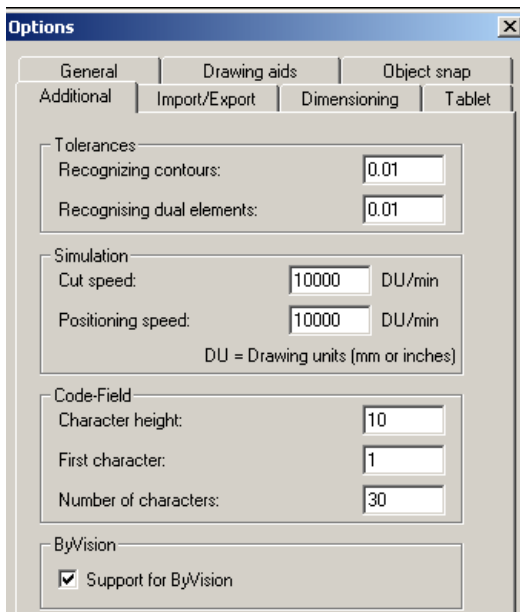
Additional

Specify the tolerances and simulation speed. (The simulation can be started with the command **Simulation** in the pulldown-menu **Display**). Moreover, you define the character height of the Code field (pulldown-menu **Draw \ Code Field**).

Define the character height of the code field (Draw > Code-Field). Furthermore you can define the starting position of the first character and the length of the code-field. There will only be accepted that amount of text of the parts code which lies within the limts of the field. If the part code is modified the code field will be adapted automatically.

If the option **Support for Byvision** is enabled the operating modes process macro 3 to 5 are added.
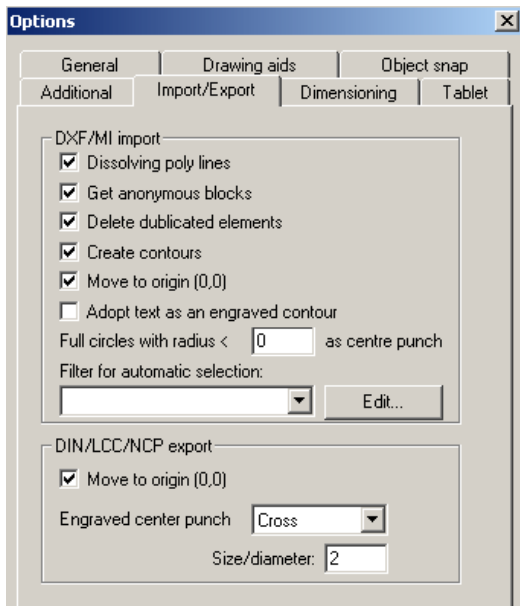
Import/Export

This is of importance with import of DXF/DWG/IGES and MI import, Auto import and DIN/LCC-Export. See these chapters for more information.

The option **Adopt text as an engraved contour** transforms text elements, which are contained in the dxf, automatically into an engraved contour.
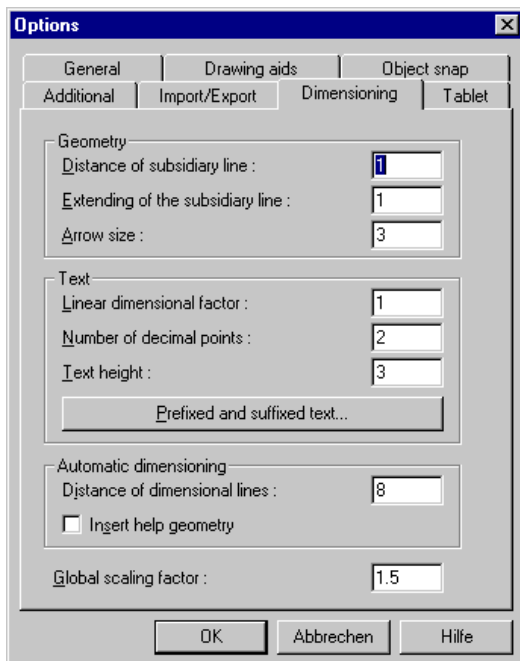
Dimensioning

If you construct large parts which you want to dimension, then we recommend to set the global scaling factor to 3 or 4.

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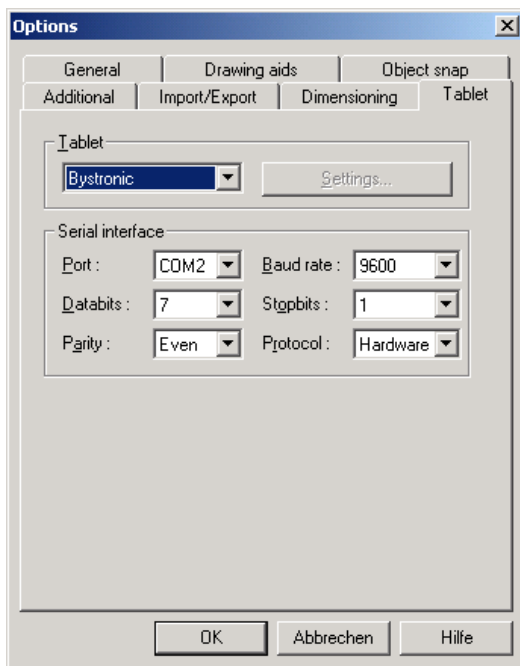
Tablet

If you work with a digital tablet, you can make the necessary settings here.

Notes

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Bywork

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Bywork - The Bysoft production module

With this programme module you are able to create a new job or to modify an existing job.

Bywork

Flat part manufacture:

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

Survey

Open the **Bywork** programme module and choose **New** in the pulldown-menu **File**, click on the button **New** or press **Ctrl + N**.

 Button **New**

Fig. *Extract of toolbar*

There will appear a dialog box in which you will have to define important preliminary information about a job.
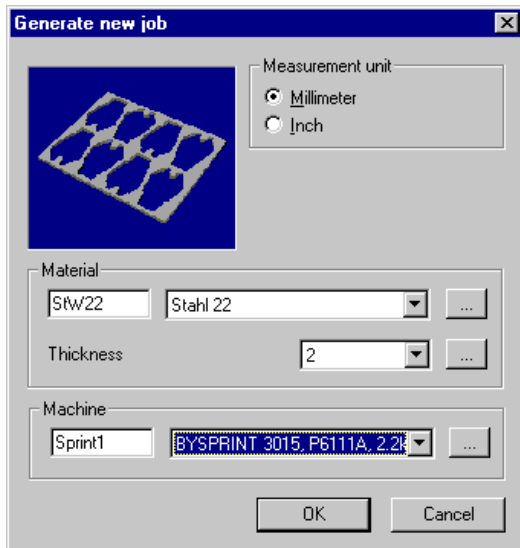
In the following dialog box you must define a **Measurement unit**, a **Material**, a **Thickness** and a **Machine** by selecting the appropriate data in the menu bar. Quit the dialog box by clicking on the **OK** button.

If no entry has been defined in the section **Machine** so far, you will have to create new **Machine data** in the **Machines database section** in **Bybase** before generating a new job.

These settings will be saved in the job record of the **Job database section**.

Fig. *Dialog box Generate new job*

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When generating a job you proceed according to five steps of which you necessarily have to go through the first four chronologically.

1. **Parts selection**

2. **Raw materials selection**

3. **Nest parts**

4. **Postprocessor (data export for the machine)**

5. **Cutting time calculation**

These five sections are visible as buttons in your toolbar or as commands in the pulldown-menu **Working range** throughout the whole procedure in **Bywork**.

    *Extract of **Working range** toolbar*

The following functions can be disposed of:

 Parts selection

 Raw material

 Nest Parts

 Postprocessor

 Calculation

Insert parts

When opening **Bywork** , you automatically reach the Working range **Parts**. In this section you select any parts and a desired quantity of parts that you need for your job. You can always claim the Working range **Parts** by means of the command **Parts** in the pulldown-menu **Working range** or through the appropriate button. Another possibility is the short command **Ctrl + 1**.

Button **Parts**

Here you can see an information box and a graphic box as well as the title bar for a part table.
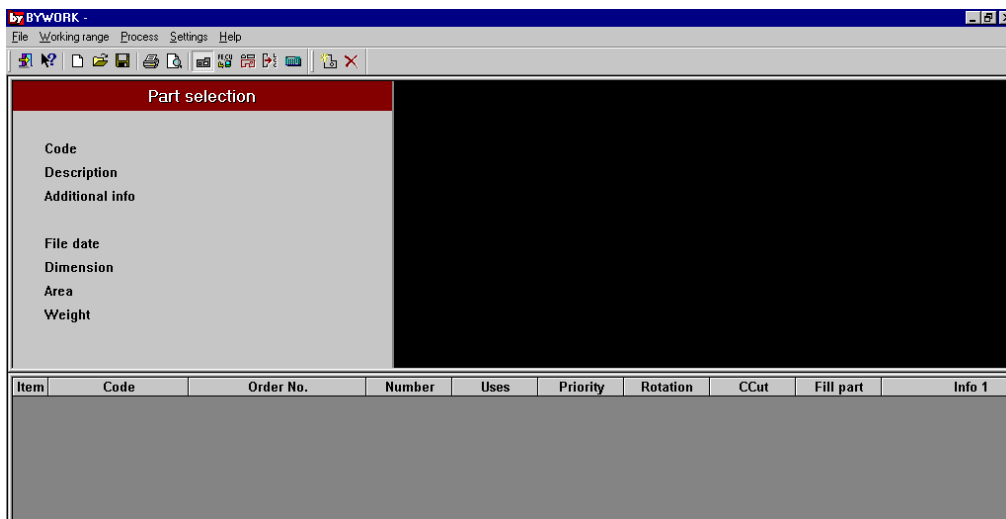
Fig.   *Working range Parts selection, without parts*

Select the command **Insert part** in the pulldown-menu **Process**, press the button **Insert parts** or press the short command **Ctrl + I**.

Button **Insert parts**

In the now appearing dialog box **Parts administration** you choose the required parts. If no parts appear in the dialog box you will have to check the filters in the Search toolbar (see **Bybase / Search)**.

Select the required parts and press the button **>>** . The part codes are transferred into to the display on the right and, provided that the technology has been set completely, they are visible in the graphic window. You can also add any parts to your choice by double clicking on the part. By means of the button **X**, you can remove the last listed part from your choice. Conclude your choice with **OK**.

If some of the chosen parts are not correctly programmed, an error message appears and the faulty parts are removed from the list.

After leaving the dialog box, all selected parts appear in the table.

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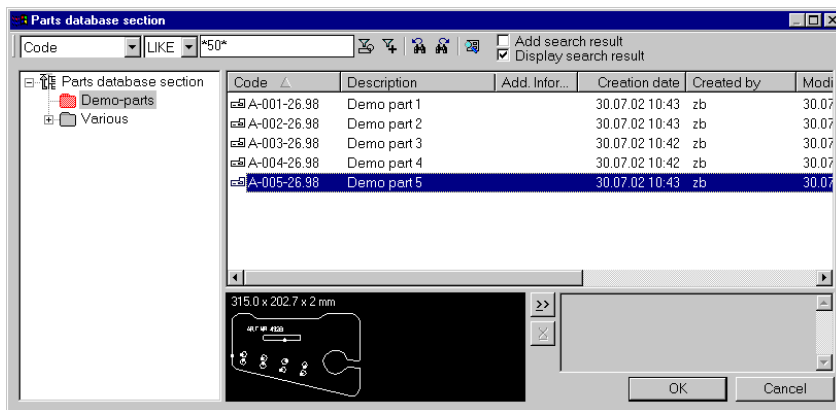
Fig.   *Dialog Parts selection*

The activated part is displayed in the window and on the left side there is the part information. The table consists of the following columns:

Pos.   Total of parts in ascending sequence.

Code   Shows the code of a part.

Order No.   This number can be selected freely.

                      If you do not wish to enter an Order number you can leave the space empty or insert any other text instead of an Order number.

Number   Defines the number of parts that have to be manufactured.

Uses   Shows the number of parts which have already been nested.

Priority   With **Priority** you define in what order the various parts are to be nested. This function only applies while nesting automatically in the menu **Nest parts**.

                      For the priority insert a number between **1** and **99**. **1** stands for the highest and   **99** for the lowest priority. By inserting **0**, no priority is being defined.

                      Entering a priority is optional. You might as well define priorities for certain parts only, while leaving the other parts without priority.

	Warning:
	When using different priorities, the cutting plan will usually not be nested with a good result.

Rotation The entry which has been saved in **Bybase** will appear as the given rotation.

So as to change the allowed rotation, select it in the drop down menu in the column **Rotation**.

If you use the rotation **increment**, you can define the angle of rotation stepwise in **Working range / Job parameters / Nesting** (see chapter **Settings**)

> **Note:**
>
> The entry **increment** makes sense with geometrically asymmetrical parts which would otherwise be difficult to nest.

Common Cut Activate the option **Common Cut** if you want to admit the part for commun cuts.

Using the function Common Cut you are able to cut parallel lines of two different parts together as one outer contour.

In order to define the rule according to which the programme proceeds in the menu **Nest parts**, select **Working range / Job parameters / Common Cut**. (see chapter Settings)

The following conditions have to be fulfilled if Common Cut nesting is to be performed:

The outer contour has to be closed.

Lopsided lines must be exactly parallel so as to be recognised as a common cut.

> **Note:**
>
> The tool correction of the selected parts must not differ from each other.

Fill part Activate the option Fill part if you would like to fill remaining areas in a plan or if the part is often needed in a big but not necessarily exact quantity.

Choose **Working Range / Job parameters / Nesting / Fill part** in order to define if a remaining sheet cut is to be performed or if the remaining sheet is to be filled with **Fill parts**.

Fill parts are marked by an overflowing container in the graphic window.

Bending part This column specifies whether or not a part is a bending part.

Info 1 - 3 The columns **Info 1 - 3** may contain any kind of text. In these columns, additional information about the part can be given.

Text of the fields mentioned above can be copied and inserted with Crtl + C and Ctrl + V to other lines and columns

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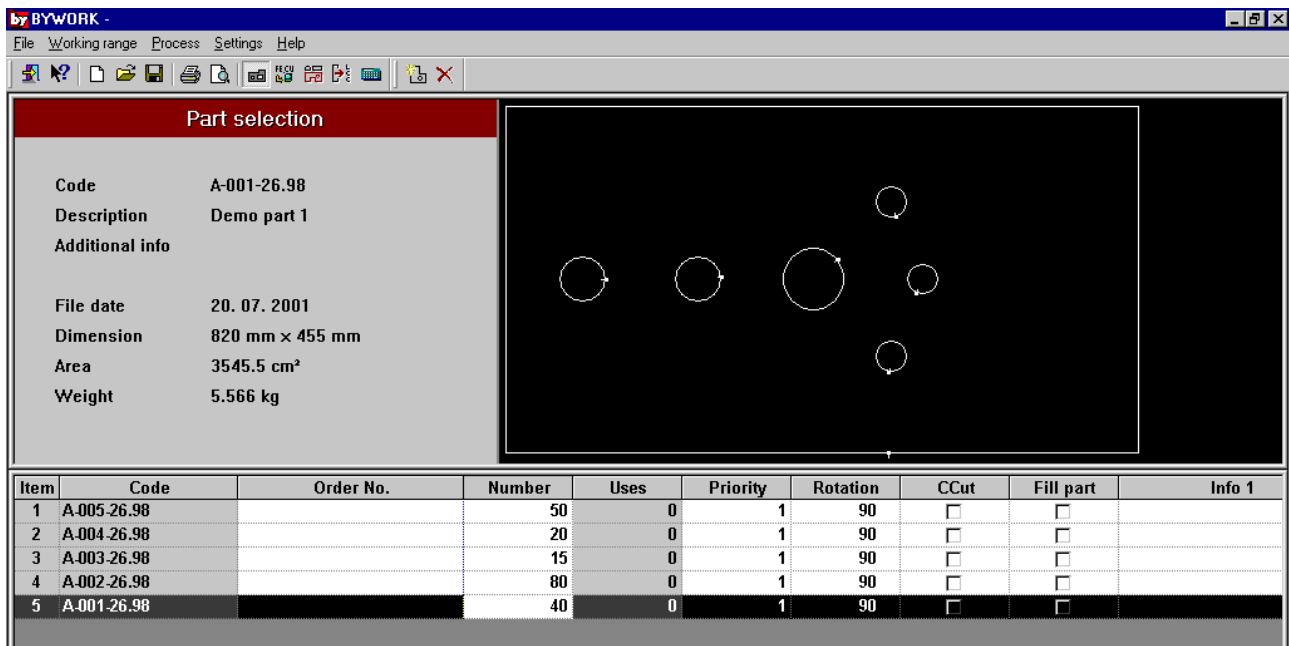
Fig. *Working range Parts selection with table of the inserted parts*

You can add new parts anytime and remove parts even if the job has already been nested. Select the part in the table and press the button **Delete part**.

  *Button **Delete part***

Parts which have been inserted after the nesting process will have to be nested additionally. Deleted parts leave gaps in the nested plans. In this case, a new nesting makes sense. For further information see paragraph **Nest parts**.

You can copy certain parts in the table if you want to manufacture a certain quantity of a desired part while using the same part as a fill part. To do that, activate the appropriate part, select **Copy part** in the pulldown-menu **Process** or with the short command **Ctrl + Q**.

Import parts list

It is also possible to import a parts list from an existing job. Select the command **Import parts list** from the pulldown-menu **File** and select the job from the appearing **Job database section** window. Click on the **OK** button to import the list.

  *Button **Copy Part***

This function can be used to copy parts so that they appear as 2 items in the Parts selection.

  *Button **Edit with BYPART***

This function can be used to open BYPART with the current selected part. All changes made and saved in BYPART are then adopted automatically in BYWORK.

Insert raw material

In this working range you insert the required raw material for the production.

Select the working range **Raw material** via the pulldown-menu **Working range**, the corresponding button or via the short command **Ctrl + 2**.

*Button **Raw material***

On the left side you can see an information window with raw material details which you have defined when opening a new job. Similar to the **Parts selection** you see a graphic window and the title bar of a table.

Now select the command **Insert raw material** in the pulldown-menu **Process**, press one of the icons to insert **raw material** or select the short command **Ctrl + I** or **Ctrl + B.**

Button **Insert raw material**
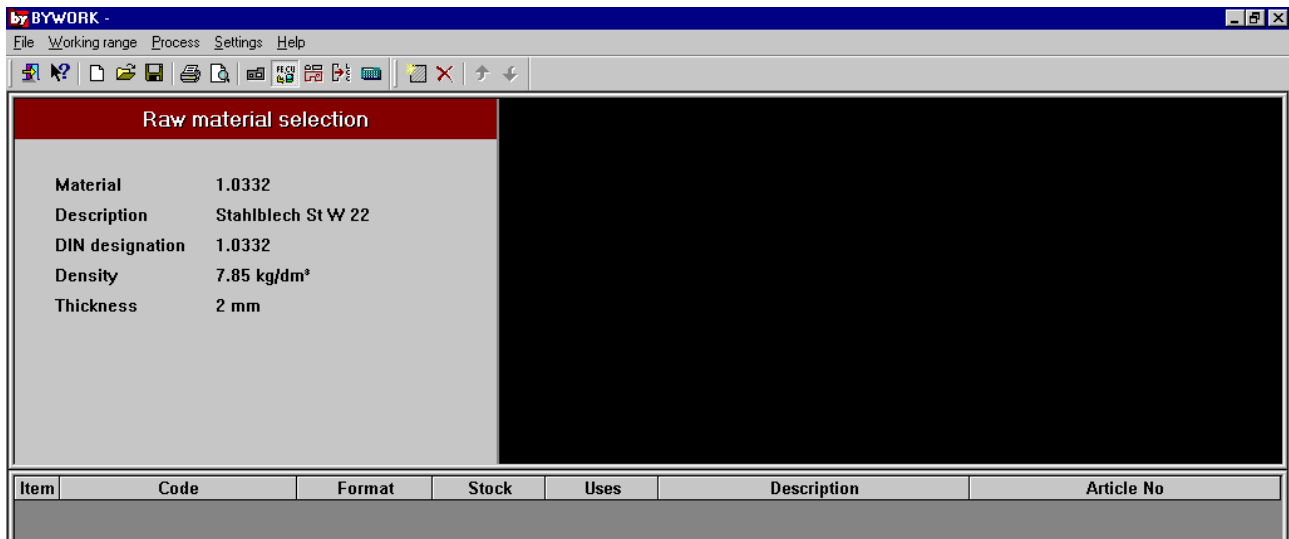
Fig. *Working range **Insert raw material**, yet without inserted raw material*

The now visible dialog box shows you the raw material which is available in the raw materials database section in ***Bybase*** and which corresponds with the chosen thickness and material of your job. Select the needed format and quit the dialog box with **OK**. If there is no raw material available, you can either create a new raw material record in **Bybase** or define your own raw material, which can only be used for this job, however (command **user-defined raw material, Ctrl + B**). This format will not be saved in the raw materials database section.

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Button **User-defined raw material**

Fig. *Dialog box User defined raw material*

When you have selected the raw material confirm your choice with **OK**.

Button **Insert leftover material from leftover material database**

The dialog window that opens shows you the leftover material available to you in **Leftover-material management** in **Bybase**. Click on the format with the required thickness and the required material and close the dialog window with **OK**.

Fig. *Working range **Insert raw material** with raw material inserted*

The selected raw material format is now visible in the graphic window, on its left side there are details about the raw material itself and the table displays this information:

Code	Shows the code of the raw material
Format	Shows the dimensions of the raw material sheet.
Stock	Here you define the number of sheets which you want to use for nesting the selected parts.
Uses	Shows how many of the sheets in stock have already been used for nesting.
Description	Shows the employed material, its thickness and its dimensions.
Article No.	The article number of the raw material is written as a comment into the NC code.
Batch no.	Any batch number for identifying the material can be entered in this field.
Info 1-3	The columns Info 1-3 can contain any text you want, providing additional information on the raw material.

You can use different raw materials for one job. When nesting automatically, the top format will be used up completely before the next one is used. With the arrows **Move raw material** you can change the position of the raw material. When nesting manually, you specify which format is to be employed. For further information consider the following paragraph **Nest parts**.

 Button ***Move raw material***

It is possible to remove raw materials from the table on condition that the chosen format has not yet been used for nesting. Press the button **Delete raw material**. If some sheets of the required format have already been nested, you will have to delete the plans before being able to remove the raw material.

 Button ***Delete raw material***

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Nest parts

In this working range, the parts are optimally nested onto the raw material sheets.

Select the working range **Nest parts** via the pulldown-menu **Working range**, via the corresponding button or by pressing the short command **Ctrl + 3**.

*Button **Nest parts***

There are three windows visible: the big plan window, on its righthand side the parts window and below the command window.
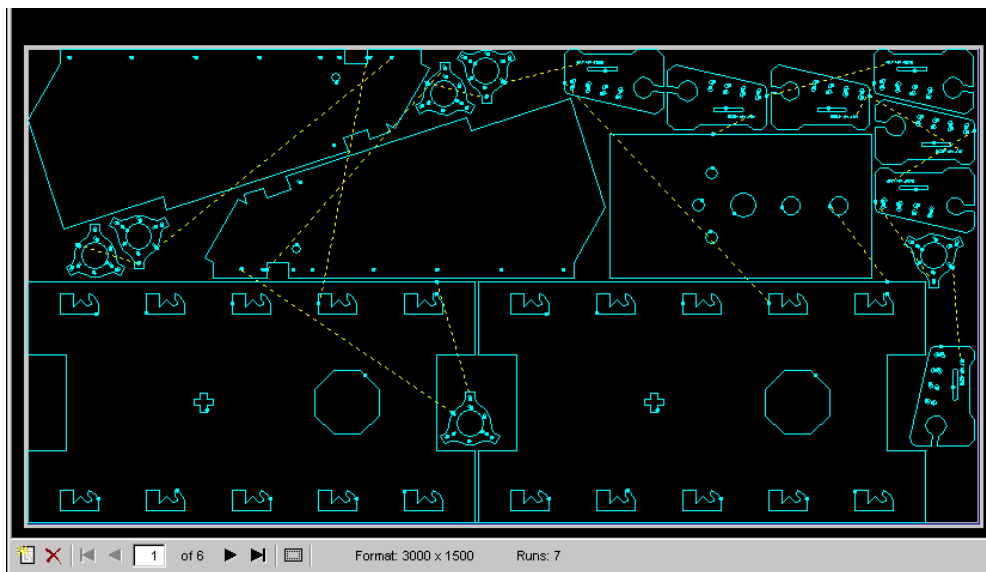
Fig.   *Plan window in the working range **Nest parts***

Underneath the plan window there are the buttons **New plan** and **Delete plan** as well as the buttons for moving among the different plans. Further details are the format size plus the number of runs of the present plan. The number of runs indicates how many times this plan is going to be cut.

Buttons

New plan

Delete plan

To first plan

To previous plan

To next plan

To last plan

Change distance from edge

All these commands can also be found in the pulldown-menu **Plan**. In addition there is the command **Delete all** which has no corresponding button. By selecting this command all plans belonging to a job can be deleted at once.

You see the chosen parts in the parts windows. The dimensions are not to scale. If you wish to display them to scale, activate the control box **Parts list to scale** in **Settings / Options / General**.
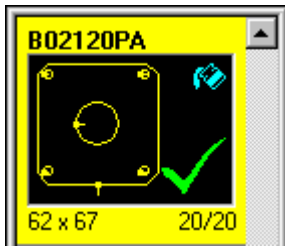
Fig.   *Parts window*

Top left	Code (here: B02120PA)
Middle	Part geometry
Bottom left	Part dimension (here: 62x67)
Bottom right	Number of nested parts / number of parts to be nested (here: 20/20)
Graphic	Green confirmation mark
bottom right	Appears when the requested quantity of the part has been nested
Graphic	Red cross
bottom right	Appears when the quantity for the part has been defined as 0.
Graphic	Fair blue overflowing container
top right	Appears when the part has been defined as fill part in the part list.

Nesting functions:

It is possible to nest as follows:

automatically

semi-automatically

manually

Toolbars

   Buttons for automatic and semi automatic

   Buttons for manual nesting

Before nesting for the first time it is advisable to modify certain characteristics in some tabs of the working range **Job parameters**. For further information study the chapter **Settings**.

Automatic nesting functions

Nest a job automatically

You can have a job nested with only one operation. Press the button **Nest job** or select the command **Job automatic** in the pulldown-menu **Nest**.

*Button **Nest job***

Semi automatic nesting functions

You can have parts and plans nested semi-automatically.

Nesting parts semi-automatically

To begin, a plan must be opened. Press the button **New plan**, select the command **New** in the pulldown-menu **Plan** or enter the short command **Ctrl + I**. If no plan is ready, the message **"No plan present"** will appear.

If required, insert a plan description, define the **Plan limits** (don't forget a clamping zone for **BYSPEED** and **BYJET**) and select the required raw material format. Quit the dialog box by pressing **OK.**

Exception:

If you nest a job **automatically** you do not have to open a plan. The programme "helps itself" by taking a sheet of the first format of raw material available in the list of raw materials. If this format is used up, the next format is being used until the job is completed or until the raw material is used up. In the latter case, the message **"Raw material used up"** appears. In the working range raw material you can always add additional raw material.

Fig.   *Dialog box Create new plan*

Once the plan is selected and displayed, select a part in the part windows. Then press the button **Nest current part** or select the command **Part automatic** in the pulldown-menu **Nest**. The visible plan is now being nested with the selected part only until either the plan is complete or all parts have been placed on the plan. When nesting a circular part, it is possible to select the command **Disk nesting** in the pulldown-menu **Nest** or to press the corresponding button. State whether you want to nest **automatically** or **manually**. When nesting manually you have to define an area (two points of a window) where **Disk nesting** is to be performed.

*Button **Nest current part***

*Button **Disk nesting***

> **Note:**
>
> Disk nesting **does not** recognize already nested parts. Make sure that no other parts are in the area in which you want to nest since the disk nesting will put the parts over already set parts.

Difference

Standard Nesting   **Disk nesting**
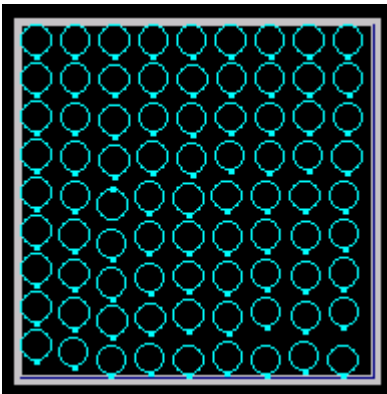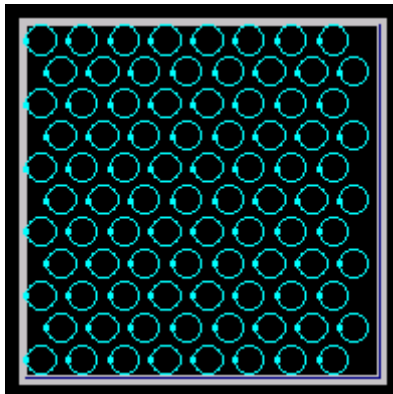
81 parts   **88 parts**

Nesting plans semi-automatically

Open a plan, press the button **Update current plan** or select the command **Plan automatic** in the pulldown-menu **Nest**. The plan will be nested mtaking into consideration of all the remaining parts.

Plans which have not yet been fully nested can be completed by using the same command: Press the button or select the command from the pulldown-menu **Nest**. The plan will be nested efficiently with the remaining parts

Button **Update current plan**

Manual Nesting functions

Open a plan. Double-click on a part in order to be able to insert it into the plan. The part appears in the colour red and is held by the crosshairs. You can insert the part anywhere on the plan when pressing the **left mouse button**. You can rotate the part with the arrow keys.

←   Rotate the part **anticlockwise** around increment.

→   Rotate the part **clockwise** around increment.

↑   Rotate the part around **90° counterclockwise.**

↓   Rotate the part around **90° clockwise.**

Place the part ideally in X- and Y-direction with the combination Ctrl + arrow key.

Ctrl+← Move the part into the smallest X-coordinate

Ctrl+→ Move the part into the biggest X-coordinate

Ctrl+↑ Move the part into the smallest Y-coordinate

Ctrl+↓ Move the part into the biggest Y-coordinate

The first command **Ctrl+←**moves the part temporarily into the smallest X (Y-direction not yet fixed), the second command, e.g. **Ctrl+↓** definitely places the part into the smallest X **and** into the smallest Y referred to its Y-position at the moment of pressing the command.

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You can **insert, copy, shift, delete** or **rotate** parts or nest them with the command **Series**. The commands are the same as in the **Bypart** module.

A short summary:

Insert   Choose a part, then select the **Inserting** button or select the command through the pulldown-menu **Nest**. Nest the part according to the description above.

      Button **Inserting**

Copy   Press the **Copy** button or select the command via the pulldown-menu **Nest**. Select the part, confirm with the **Enter** or key with the right mouse button. Define, e.g. with an object snap function, a **Base point** in which the part will be caught. Set the part as described above. You can set the part in any number until you conclude the command with the **Enter** key or with the right mouse button.

      Button **Copy**

Move   Press the **Move** button or select the command via the pulldown-menu **Nest**. Select the part and confirm with the **Enter** key or with the right mouse button. Define, e.g. with an object snap function, a **Base point** in which the part will be caught. Move the part and set it where you want it by pressing the left mouse button.

      *Button **Move***

Delete   Press the **Delete** button or select the command via the pulldown-menu **Nest**. Select the part or define an area by using an object snap function and confirm with the **Enter** key or with the right mouse key. This will delete your choice.

      *Button **Delete***

Rotate   Press the **Rotate** button or select the command through the pulldown-menu **Nest**. Select the part and confirm with the **Enter** key or the right mouse button. Select the part and define, e.g. with an object snap function, a **Base point** in which the part will be caught. The part or the selected area will also be rotated around this base point. You can now rotate the part by moving the mouse, but it is also possible to insert a specific angle. Place the part either by inserting an angle and by confirming with **Enter** or by clicking in the left mouse button.

      *Button **Rotate***

> **Note:**
>
> If your part has been given the rotation angle of 90° in the **parts selection**, it can only be set on the plan within these limits. If you want e.g. an angle of 60° you have to change the rotation to **Increment**.

Series   Press the **Series** button or select the command via the pulldown-menu **Nest**. Either select a new part and set it onto the plan or select one or several placed parts and confirm with the **Enter** key or the right mouse button. Define the number of columns (vertical arrangement), afterwards give the number of lines. Do not worry about too big numbers since the command is limited to the selected plan. The distances between the columns and the lines will be given automatically. They consist of the part's length and of the double safety distance. Either confirm these details with the **Enter** key or with the right mouse button or insert a specific value.

 *Button **Series***

Undo   If you click on this button or select the command in the pulldown-menu **Nest**, you can undo the last action on a plan.

 *Button **Back***

Set window / Set inverse window / Delete window

It is possible to define areas on a plan in which a nesting either is to be employed or not. Select the command **Set window** in the pulldown-menu **Nest** and define the required area with the cursor or by inserting coordinates. Then select one of the following **semi-automatic** nesting functions: **Nest current part, Update current plan**.

With the function **Set inverse window** you can define an area outside a defined window to be nested. First define the window where you want no nesting as described above. The area outside this window turns grey. Then select one of the nesting functions from above.

Delete a window by choosing the corresponding command in the pulldown-menu **Nest**.

Parts reference clipboard

It is possible to **Cut** or **Copy** parts **to clipboard** or to **Insert** them **from clipboard**, similar to the functions in the Microsoft Office programs. Thus, it is possible to cut, copy and insert parts over several plans.

Toolbar:
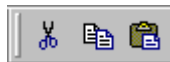
Select **Parts reference clipboard** in order to copy or move single parts or groups of parts through the clipboard within one plan or over several plans. The following functions are available:

Buttons

 Cut

 Copy

 Insert

Select **Cut** or **Copy** via the button or the corresponding commands in the pulldown-menu **Parts reference clipboard**. Select a part or an area with a suitable object snap function and confirm your choice with the **Enter** key or with the right mouse button. Define a **Base point**. **<Bottom left>** is given as standard position. Confirm with the **Enter** key or insert your **Base**

point manually or with an object snap function. The chosen zone is now being copied to the clipboard and is available for all plans of the **same job**. In order to insert the parts, select the **Insert** button or choose the command in the pulldown-menu **Parts reference clipboard**. The parts appear in red colour in the plan and can be moved with the cursor. Insert the selection with the left mouse button or by assigning coordinates.

Set passes

When a single plan has been nested manually or semi-automatically, it is possible to set passes, to reset or maximize runs. These commands can be found in the pulldown-menu **Plan**.

Maximize runs	Choose this command to copy plans until one part can no longer supply the amount needed for another plan or until all parts have been nested. At the bottom of the plan window you see the number of passes for the current plan.
Reset passes	Set the number of runs per plan back to 1.
Set passes	Define how often this plan is to be cut. The program indicates the maximum number of passes,

Example:

You nest a job with 4 different parts. There are 100 parts A, 200 parts B, 50 parts C and 80 parts D. You nest one plan with **Plan automatic**. 4 parts A, 45 parts B, 10 parts C and 10 parts D are nested on the plan. If you select **Maximize runs**, you will receive 4 passes. The reason for this is that there are not enough parts B available for a fifth plan.

Collision check

Select the command **Collision check** in the pulldown-menu **Plan** as soon as a plan has been nested manually. In the case of colliding parts, their outer contours are marked with broad red colour. Correct with appropriate functions.

It is possible to define a permanent collision check in **Settings / Options / LCC**) which will take place during the LCC-Export (see chapter **Settings**)

Set technology

Technology in **Bywork** means the following:

Residual grid cuts

Remaining sheet cuts

Processing sequence
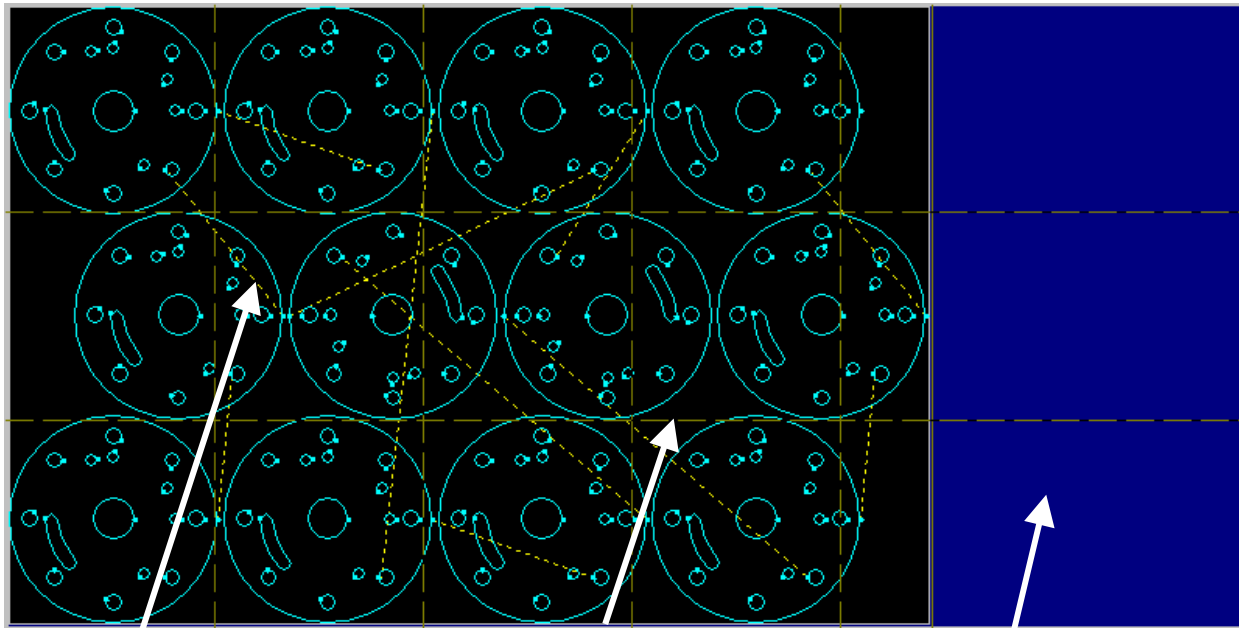
Processing sequence (yellow lines)   Residual grid cut (brown lines)   Remaining sheet cut blue
with cut)

Fig.   *Example technologies* **Bywork**

Automatic

Technologies can only be set automatically and according to the settings in **Job parameters** if you nest automatically.

Manual

Singly nested plans must be completed manually or semi-automatically. Either select the following commands out of the pulldown-menu **Plan** (advisable if only one of the three technologies is to be set) or use the button **Sets technology** or the command **Auto technology** in the pulldown-menu **Plan**.

Button **Sets technology**

> **Note:**
>
> The technology is only being set on the currently displayed plan but not on the whole job.

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Residual grid cuts

You can **set**, **delete** or **move** residual grid cuts in the pulldown-menu **Plan**. The relevant settings have to be defined in **Job parameters** in the pulldown-menu **Working range** in the tab **Residual grid / -panel** (see chapter **Settings, Job Parameter Residual Grid/Cuts**).

Setting residual grid cuts

Residual grid cuts are being set with the command **Set residual grid cut** in the pulldown-menu **Plan**. You can choose between automatic and manual setting. When setting manually, you first have to decide between vertical or horizontal arrangement of the cut. Define the position of the cut by giving coordinates or by pressing the left mouse button. It is possible to set several cuts in a row.

Delete residual grid cuts

If you wish to delete residual grid cuts press the corresponding command in the pulldown-menu **Plan**. Mark the required cuts and confirm with the **Enter** key or the right mouse button.

Move residual grid cuts

Move residual grid cuts by selecting the command **Move residual grid cuts** in the pulldown-menu **Plan.** Then mark the required cut, confirm with the **Enter** key or with the right mouse button, define a base point and now move the red coloured line into the new position. Place the cut with the left mouse button.

> **Note:**
>
> Note that the residual grid cuts should not be in too close vicinity to parallel part contours.

Remaining sheet cuts

You can **set**, **delete** or **modify remaining sheet cuts** in the pulldown-menu **Plan**. The required settings can be defined in the **Job parameters** in the pulldown-menu **Working range** in the section **Residual grid / -panel** (see chapter **Settings, Job Parameters Residual Grid / Cut).**

Set remaining sheet cuts

Set remaining sheet cuts via the command in the pulldown-menu **Plan**. You can proceed manually or automatically. When setting a cut manually, you will be asked for a **Limit point**. Click into the plan window right overneath the top right part. Should there be a collision with an already set part, the operation will be ignored.
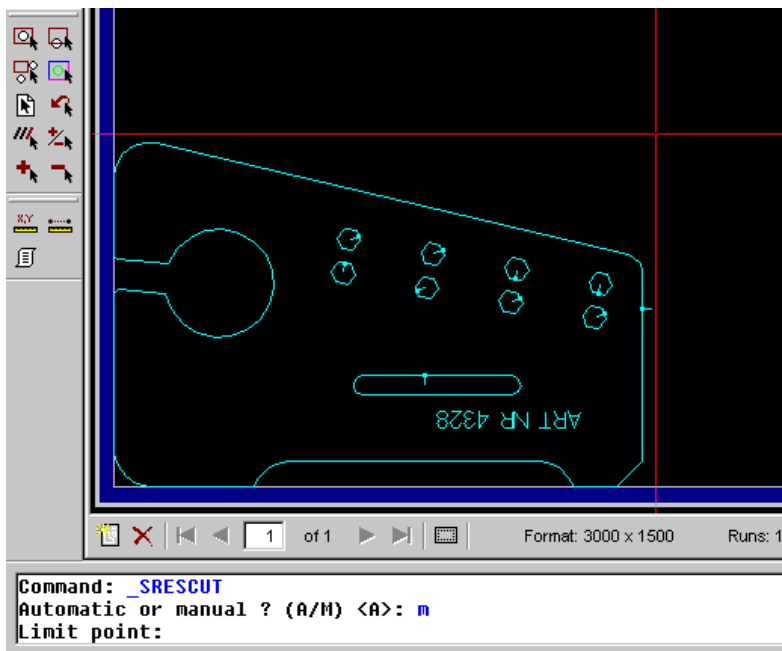
*When setting remaining sheet cuts manually, define a **Limit point** like that:*

Fig.   *Example: set limit point manually*

Delete remaining sheet cuts

Select the command in the pulldown-menu **Plan** and the remaining sheet cut will disappear.

Machining remaining sheet cuts

With **Machining remaining sheet cuts** you can adapt automatically set cuts. The following options are available:

None   deletes all cuts

Horizontal defines a horizontal cut only when there are remaining sheets above the parts.

Vertical   defines a vertical cut only when there are remaining sheets beside parts.

Both   asks if you wish to cut through horizontally or vertically in case of remaining sheets above **and** beside parts.

Cutting sequence

Set Cutting sequence

Set the cutting sequence for all plans which have not been nested automatically. Choose the command **Set Cutting sequence** in the pulldown-menu **Plan**. You can do this manually or automatically. When setting manually you have to mark part after part or select the required parts with an object snap function.

> **Note:**
>
> If you forget to set the **Cutting sequence** this will automatically be done in the **LCC-Export**.

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Delete Cutting sequence

You delete the cutting sequence by selecting this command in the pulldown-menu **Plan**. Then select the parts which you want to remove from the cutting sequence. You can also use an object snap function. If you would like to reset the cutting sequence you are able to either insert or append parts which have not yet been considered. When inserting please note that first the succeeding and only then the part in question has to be selected.

Postprocessor

In the working range **Postprocessor, Bysoft** data are being converted into machine data in a LCC or NCP format.

Select the working range postprocessor via the pulldown-menu **Working range**, the corresponding button or by pressing the short command **Ctrl + 4**.

*Button Working range **Postprocessor***

In the display (see below) you can see an information window with settings, a graphic window and a table.

Information window

Offset X, Offset Y	If zero point offset values for the plan have been defined in **Working range / Job parameters / Zero point offset**, these figures are shown here.
	With **Offset** you can move the whole plan in X and/or Y direction.
Control type	Here, the **Control type** which has been assigned to the current machine in **Bybase / Administration / Machines** is shown. The control type is linked with the machine type which you have selected when generating the job.
	For control types **<=P8100** the postprocessor generates the NC-code in the LCC format, for control types **>=P8100** it automatically generates an NCP file.
Cutting parameters	Here you see the path where the machine parameter file is saved, yet only if you enable the control box **Machine parameters in LCC file** in the tab **Postprocessor** of the **Job Parameters**. The path will only be written in the LCC or NCP file if you do the cutting time calculation before the export.
CNC-Data path	Here you see the data path to which you send the cutting plan data. Either assign the path in the machine record of **Bybase** or click on the button on the right to select.
Plan Filename	Insert a short name (file name base) that will then be completed by **Bywork** with a serial number (together, short name and number form the file name). Up to 99 characters can be used. Select **Generate** in order to have the file names assigned automatically by **Bywork**. A serial number will be attached to the file name according to the number of plans.
	If the short name is not defined, *Plan* is used as the short name. You can define your own default short name under *Settings → Options → Postprocessor*.

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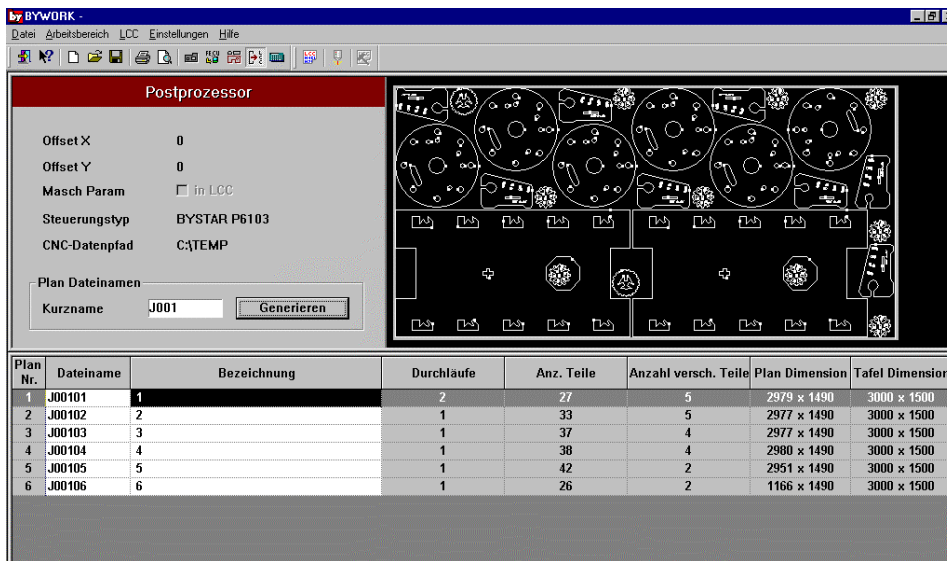
Fig.   *Working range **Postprocessor***

The graphics window shows the plan selected in the table. The currently selected plan is retained when switching between the Nesting work area and the Postprocessor work area. A plan can still be deleted or moved in the Postprocessor work area. Menu *Cutting plan → Delete plan* or *Plan up / Plan down*.

The table itself gives overall information about the job.

Table

Plan number	The plan number is set automatically in serial numbers. You cannot modify this display.
Filename	Insert a filename. A maximum of 99 characters is possible.
	It is also possible to insert a short name in **Plan Filename**. Select **Generate** in order to assign a short name to every plan. (see above)
Description	Insert any additional information about the cutting plan. This information is going to be visible for the machine operator after loading the cutting plan in the **MMC**.
Runs	Number of repetitions of the same plan. Each run requires one sheet.
Number of parts	Number of parts per plan. This display is only informational.
Number of different parts	Number of different parts per plan. This display is only informational.
Plan dimension	**Maximal dimensions of the plan** in X- and Y-direction. This display is only informational.
Panel dimension	**Dimension of the plan** in X- and Y-direction. This display is only informational.

LCC / NCP Export

Press the button **Export cutting plans** or select the command **Export all plans** from the pulldown-menu **Cutting plan**. The data is now converted to the machine code. You can also export single plans. Select the required plan in the table then select the command **Export current plan** in the pulldown-menu **Cutting plan**.

Button **Export cutting plans**

With the export, certain attributes can be assigned to the plans, which might be useful for production depending on material and thickness. In this case, no major program changes have to be executed in **Bysoft** or at the machine. In the section **Postprocessor** in **Job parameters** (pulldown-menu **Working range**) you can set pre-cutting for a whole plan or have corners treated in a special way (with radius, looping or normally). For further details see chapter **Settings**.

Now, an NC code has been generated for each plan. You can load this file in the panel PC of your machine either via network cable or data carrier.

Byview

In the sub-program **Byview** you can now look at the **marked plan** in a simulation (Button or command **Simulation Byview** in the pulldown-menu **Export cutting plan**). You can handle the simulation with the buttons which are the same as in a video recorder or via the pulldown-menu **Simulation**.

Button **Starts Byview**

Fig. *Sub program* **Byview**

Engraved contours are displayed in magenta, cutting contours in cyan.

Calculation

In this working range you can calculate the cutting time for your job, the single plans and every single part.

Select the working range **Calculation** from the pulldown-menu **Working range** by clicking on the button or by entering **Ctrl + 5**.

*Button **Calculation***

From version 6.4.0 all parameter files are saved in a parameter database (*.pdb). This enables a central file storage of all parameter files. This database is used for all program modules concerned (**Bypart**, **Bywork**, **Bytubepart** and **Bytubework**)

The access to the cutting time calculation in the construction module **Bypart** differs slightly from the access to the production module **Bywork** (see below) since machine and material data are already defined in **Bywork**.
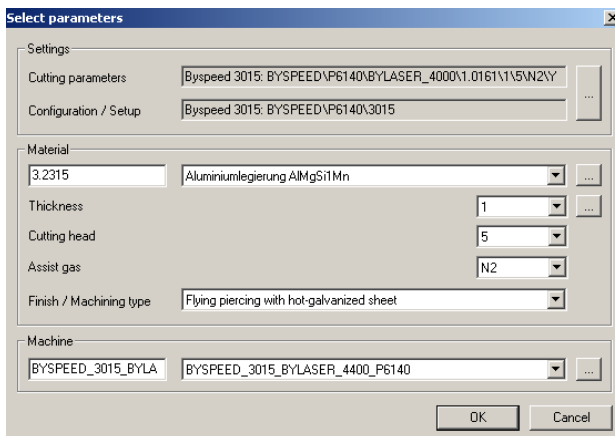
| **Fig.** | *Dialog box Cutting time calculation **Bypart*** |

| **Fig.** | *Working range Calculation **Bywork*** |
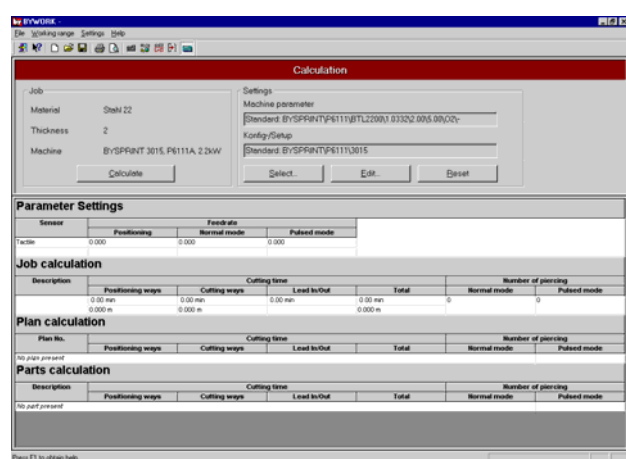
In both windows you see the section **Settings** with the parameter paths and the possibility of selecting, editing and resetting them. The remaining sections comprise machining time and machining length as well as information about piercings. **Bywork** also displays indications about job data such as material, machine and calculation results for all plans and the entire job.

On machines with a ByVision controller, the process downtimes are also included in the cutting time calculation in **Bywork**. These times cover nozzle cleaning, edge detection, cutting-head calibration, table interchange and repositioning. The parameters required for this are taken from the Setup file for the machine concerned.

Parameter selection

The selection of machine parameters necessary for the cutting time calculation takes place in a dialog box that is identical for all modules mentioned above. This dialog box is opened when clicking on the **Select** button.
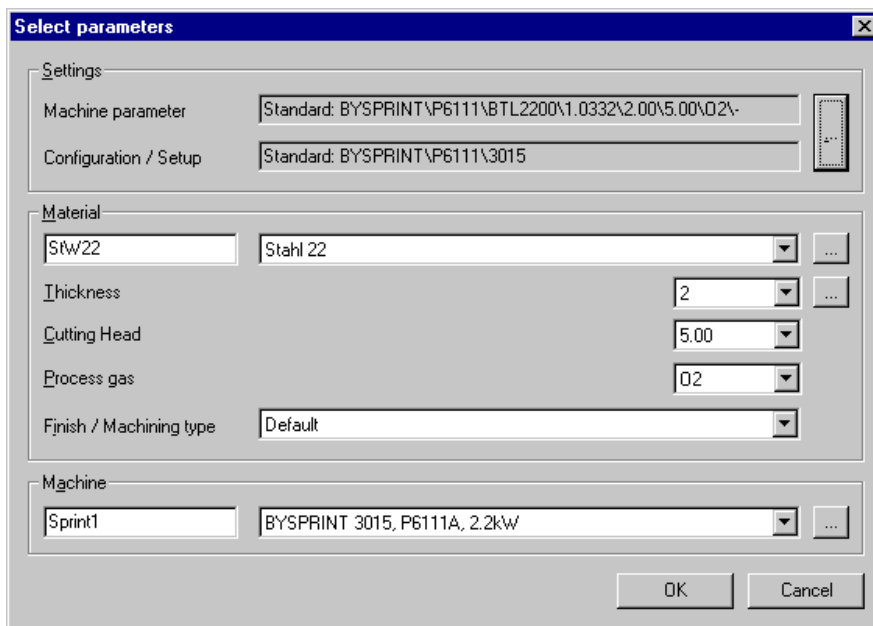
Fig. *Dialog box Select parameters*

The section **Settings** indicates the path for the machine parameters as well as the path for **Configuration/setup**. "Standard" at the beginning of both lines means that the files have been selected from the database called "Standard" which is the default database installed during the setup. Both paths consist of the following information:

Machine parameters	Name of database: machine type \ control version \ power \ material number \ thickness \ cutting head \ processing gas\ finish/machining type
Config/Setup	Name of database: machine type \ control version \ work area

The section **Material** is required for setting parameters depending on the material, i.e. thickness, cutting head, processing gas and finish / machining type. These data are linked to the machine parameters and form the second part of the path. The system automatically searches for a matching parameter in the database. If it fails, this symbol ⊞ will be displayed on the left side of the line indicating a non-existing parameter file (see below: manual parameter selection). If you want to calculate a part or a job with another setting (e.g. thickness) you can click on the arrows on the right of the lines to display all available entries. You could even create a new thickness by clicking on the button on the right of the line. If the symbol ⊞ appears you must change one of the other settings (e.g. cutting head) directly with the pulldown-menus or manually as described below.

The section **Machine** displays the machine designated when opening the job (**Bywork**) or the last machine used (**Bypart**). The machine is also linked to the machine parameter file and forms the first part of the path, i.e. machine type, control version and power, resp. work area.

Manual parameter selection

If this symbol ⊞ appears on the left of one or both of the paths in the section **Settings** you must complete the corresponding path(s) manually. Clicking on the button displayed below takes you to the following dialog box:

⊡   *Button for access to manual parameter selection*

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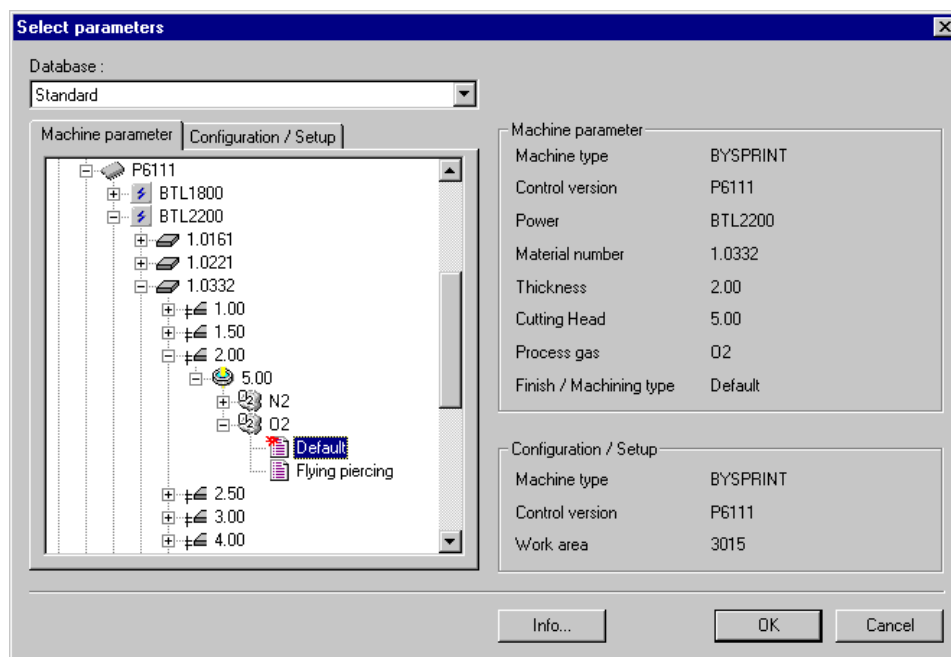
Fig. *Dialog box Manual parameter selection*

In this dialog box the path can be selected manually. This is done according to the hierarchical tree structure, divided into two tabs, one consisting of 8 levels for the machine parameter files and the other of 3 levels for the selection of configuration/setup files. Select - one after the other - the necessary data (machine type, control version, power, material number, thickness, cutting head, processing gas, finish/machining type) and click on the last possible entry in the tree view. By doing this, the data from the tree view is transferred to the right side of the dialog box. Repeat - if necessary - the same procedure in the tab Config/Setup (machine type, control version, work area). Clicking on the **OK** button saves both paths and takes you back to the dialog box **Select parameters**.

> **Note:**
>
> The absence of this symbol 🗒 means that the selected parameter path is available as a parameter file in the database. However, the displayed path may refer to the previously used parameter file with other material and thickness. Therefore, make sure **BEFORE** starting the calculation that material number and thickness correspond to the intended calculation you want to execute.

Settings for automatic selection

Certain settings in **Bybase** enable partial automation.

Open the machine record saved in the machine database section of **Bybase**. You can pre-define the first three levels of the parameter path for machine parameter and config/setup in the section **Cutting time parameters**. Click on the button ⎕ and specify in the two tabs machine type, control version and power or rather work area. The button ⎕ allows deleting these paths.
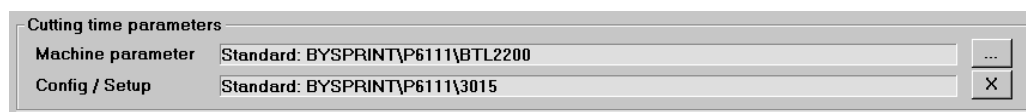
Fig. *Section Cutting time parameters in machine database section **Bybase***

Having determined the paths and saved the record, this information is available for the cutting time calculation for all program modules.

This step accounts for the automatic setting of the first three levels of the parameter tree view. For a further automation, the system requires a material number which must be listed in the corresponding records of the material database section. This number must match the number from the tree view and must be inserted in the square **Material number** in the material database section.

Materials, for which no parameter files exist, must be determined with material numbers of similar materials that are saved in the database.
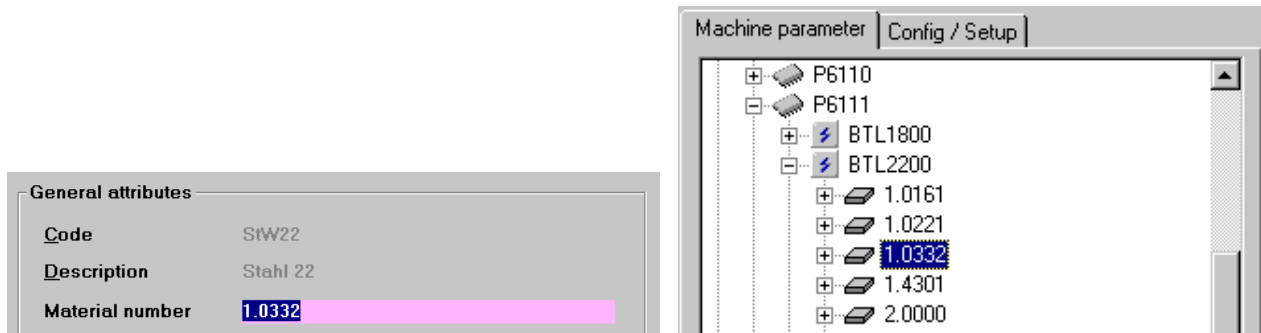
Fig. *Section General attributes in material database section of **Bybase***

Fig. *Tree view parameter selection*

Back in the cutting time calculation, having completed these settings, the parameter selection can be done with the pulldown-menus in the section **Material**. A manual selection is only necessary if the symbol appears. Combinations of material, thickness and machine are saved by the system. If the same combination of material, thickness and machine is applied again, the corresponding parameter file is automatically recalled.

Edit parameters

Click on the button **Edit** in the dialog box **Cutting time calculation**.

Parameter	Value	Units
Lead in		
CW piercing	Nozzle distance ▼	[ ]
Piercing time continuous wave mode	0.3	[s]
Piercing time pulse mode	1	[s]
Lifting height, nozzle	20	[mm]
Nozzle distance cutting	0.7	[mm]
Nozzle distance piercing	1.5	[mm]

Fig. *Dialog box Edit parameters (partial view)*

Change the values of process parameters for cutting time calculations in this dialog box. These values are saved with the part in **Bypart**. However, these changes have no influence on the cutting parameters on the machine. In order to reset the changed values to standard values click on the button **Reset** in the dialog box **Cutting time calculation**.

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👉 **Note:**

Precision of cutting time calculation!

Cutting time calculations are being performed on a basis of theoretical figures. These are often connected with a certain tolerance. Thus, the calculated figures might differ from the actual time at the machine.

Compensation claims due to miscalculations (faulty or unprecise calculations) are thus declined by **BYSTRONIC Laser AG**.

Survey of material numbers

BYSTRONIC Laser AG uses these material numbers for cutting time calculation:

Material Number	DIN - Name	Description
1.0161	St 37 - 2	Structural steel
1.0221	QST 37 - 2	Cold forming
1.0332	St W 22	Steel sheet
1.4301	X5CrNi 18 9	V2A (Stainless)
1.4571	X6CrNiMoTi17 122	V4A (Stainless)
2.0000	Cu	Copper
2.1000	CuZn40	Brass
3.2315	AlMgSi1Mn	AC 110 Anticorodal
3.3535	AlMg 3	Peraluman - 300
3.7035/3.7000	Ti	Titanium
9.1200	Holz	Plywood
9.1300	Holz	Structural timber
9.3500		GFK
9.5000	PMMA	Acrylic glass
9.6000		Glass
9.7100		Marble
9.7200		Granite

Settings

In **Bywork** there are two possibilities to alter settings. Firstly, in **Job parameters** in the pulldown-menu **Working range** and secondly in **Options** in the pulldown-menu **Settings**. They can also be called at any stage of the programming through the icon **Job parameters**. In this document, only the settings which have already been mentioned in this manual will be explained.

📝   *Icon **Job parameters***

The **Job parameters** consist of nine sections which contain important settings for the work with several **Bywork** functions.

All sections displayed (except for **Separate** and **Microjoint**) show the standard setting.

Job parameters General

Area calculation

- This influences the calculation of part area, plan dimension, Scrap and Weight. Click on the **Help** button for further information.

- Deactivate the option **Count remaining sheet cut** if you do not want to include the surface of the remaining sheet in the scrap.

Time format

- This changes the time format

Edge distance,

- Here, you insert settings for edge distance which will be displayed in the dialog box **Create new plan** in the working range **Nest parts**. If you have **Edge distances** related to material thickness (defined in **Bybase**), these values will be displayed.

  If enabled, the option **Take into account for window nesting** will also use these settings with window nesting.

- If you are working with a **BYSPEED** machine you can enable **Clamping activated**. If this option is activated, no residual grid/panel cuts will be generated in X-direction.

- Please note that with clamping activated the left edge margin must be changed manually.

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Job parameters Nesting

Part

- The **Parts safety distance** refers to an individual part. The distance between two parts thus is twice the parts safety distance.

- If the control box **Take into account first/end cuts** is not ticked, longer initial cuts could loom over other parts. Therefore, define the parts safety distance at least as big as the **length of the initial cut** (for recommended figures see document **Cutting technology**).

- In **Angle of rotation stepwise** you define the angle around which a part is allowed to be rotated (Rotation **increment** for this part is required in working range **Part selection)**

- **Minimum surface inner contour** indicates how large an inner contour must be to be taken into account for inner contour nesting. If you do not wish an inner contour nesting, assign the value 0.

Nesting strategy

- Specify other relevant nesting settings in the pulldown-menus:

Nesting type	Contour	Each part is nested with its part safety distance around
	Rectangular	A bounding rectangle is set around each part, then the nesting takes place with this rectangular shape
	Pavement	Nests the parts optimally on the plan (takes time, not recommended with several different parts or incremental rotation). If the option is used with a CommonCut part, a message will appear to point out that Pavement nesting cannot be used with CommonCut.
	Automatic	Applies all three strategies above and keeps the best result (takes time due to pavement nesting)
Fill figures	Whole panel	Fill parts fill the remaining space on a panel

	Residual panel	Fill figures only fill the area that is not occupied by residual panels.
Nesting source	Bottom left	The nesting begins on the left bottom (for better operator access with few parts on **BYSTAR** and **BYSPEED** machines)
	Top left	The nesting begins on the left on top (for better operator access with few parts on **BYSPRINT**-machine)
Strip width	fine, optimal, coarse	The nesting program shifts each part to be nested along the strip edge until the new part no longer touches a nested part. The unused sheet area within a strip is not taken into consideration.
		Set the strip width to fine. If you have insufficient computing capacity then increase the strip width.

- **Variation panel format**

  Activating the control box takes different **raw material formats** into consideration when executing a nesting.

  If the option is enabled, the raw material (area of sheet) is nested in increasing, decreasing and original order. With every run, the whole Job is nested, the best result will be kept.

- **Several nesting attempts**

  With the option enabled, every plan is calculated the number of times you define in **Number of passes**. This option usually results in better nesting results, however it is dependent on computing capacity.

Rotate plan 180°

Activate this option if you nest for a Byspeed and want to use the clamps. If you turn the plan 180° after the automatic nesting, there is usually enough space to place the clamps on the residual material and you do not need to set an additional edge distance on the left side of the plan before nesting.

There is an additional icon for this function in the section **Nesting**.

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Job parameters Cutting sequence

- Define the cutting sequence for nesting. The **Help** button of this dialog box offers a graphic display of the different options.

Job parameters Common Cut

- The width of the laser cut here corresponds with the parts safety distance of Common Cut parts.

- An **Overcut**, whose length can be inserted in mm, can be executed for CommonCut parts. This may be useful for waterjet machines to make sure thet parts are really cut out.

- Use **Piercing without time** as standard, especially when you work with thin sheets. Press the **Help** button to get further information.

- Pulsed piercing is not recommended when cutting stainless steel or aluminium.

With Common Cut nesting, parts with common cuts are nested first. The parts distance corresponds to the width of the cutting gap. The remaining parts are nested with the originally specified parts safety distance.

Job parameters Residual grid/panel

Residual grid cuts

- Define a value for a distance in X- and Y- direction. If these two spaces contain 0, no residual grids will be set when nesting automatically.

- In **Contour distance** insert up to 0.3mm for a Laser machine, 1mm for a Waterjet machine.

- Enable **after parts**, if you want to perform the residual grid cuts after the cutting of the parts (not recommended)

Residual panel:

- With these data, a remaining sheet cut is performed if there is at least a specific area in X and Y direction (here 500mm), which has not been nested. If only 400mm of the sheet remain unnested, no remaining sheet cut will be made. If you insert 0mm in both spaces, no remaining sheet cuts will be performed when nesting automatically.
  If the option Invers is enabled, the remaining sheet cut will be executed from the top to the bottom or from right to left

General:

- Specify overcuts for the residual grid and panel cuts for all edges of the sheet.

- If you enable **Pulsed piercing**, all piercings for residual grid/panel cuts will be pulsed. However, pulsed piercing is not recommended when cutting stainless steel or aluminium.

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Job parameters Postprocessor 1

Pre-Cutting

- Pre-cut individual parts or whole plans so as to prevent the sheet from overheating especially in thick material. With the option **Path optimized** enabled, Bysoft will calculate the shortest possible positioning path between the piercing positions.

Origin offset

- Specify a zero point offset. However, it is recommended to programme zero point offsets on the machine, not on the computer.

General

- If you want to send the machine parameter with the cutting plan, tick the control box on the bottom of the window (see below).

- If you have a machine with a newer control type than P6103 with RomRam4, you can increase the maximum cutting plan size up to 340'000 words and save this as standard.

Cutting parameters in cutting plan

If the machine parameters are issued to the machine with the NC code, the machine searches and loads the corresponding parameter by itself when reading the LCC file. However, it is imperative that the parameter path has been set correctly in the working range Postprocessor. Both machine and PC must therefore have access to the same network directory.

Job parameters Postprocessor 2

Job parameters
Residual grid/panel · Postprocessor 1
General · Nesting · Cutting sequence · Common Cut
Postprocessor 2 · Reposition · Microjoint

Vaporization
- No vaporization
- Complete part
- Lead-in only

Operating mode: Engraving

Engraved centre punch
Type: Cross
Size/diameter: 2

Automatic numbering
- Automatic numbering enabled

OK   Abbrechen   Hilfe

Vaporization

The function **Vaporization** can be used for sheets with plastic-coated foil in order to prevent the foil from bloating. Either the **complete part** or the **lead-in only** can be processed with engraving technology or with Processmacro 1 or 2. For **Byvision controls** Processmacros 1 to 5 are available.

Engraved center punch

- Define here how engraved center-punch marks are to be machined for an LCC or NCP export.

Automatic numbering

- Automatic parts numbering has been implemented in Bywork. In the Parts work area, the necessary settings can be made using the Edit → Parts parameters function. If a plan is exported, the part numbers are generated using these settings. A corresponding numbering field must have been programmed as a placeholder in BYPART before parts numbering can be performed.
  BYPART → Draw → Data field → Numbering field

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Job parameters Postprocessor 3

Technology wizard

- The function **Use technology wizard** can be used if you program in Bysoft for different machine types. With this function it is possible to decide only before the export of the plan on which machine you are going to cut it and to set technology according to your selection.

- **Overwrite existing technology** needs to be activated if you did set a different technology in Bypart, then the one you set on the cutting plan in Bywork.

- **Always pulsed piercing** can be activated to make pulsed piercings on the whole plan, even if parts without a programmed pulsed piercing were nested

Corner mode

- If you select fillet, all 0° corners are automatically rounded off. The technology table selects the radius according to material and thichness. It is as well possible to automatically create loopings in the edges if you need to have 0° corners on your parts.

Job parameters Reposition

This section is only required for machines with repositioning option.

Detailled information about repositioning can be found in the document **Specialities repositioning machines** (see appendix)

Job parameters Microjoint

This tab is only valid for old machines which do not support microjoints (before control type P5712)

- A microjoint is only generated if the contour is within the minimal and maximal measurements. Engraved or open contours will not be given any microjoints.

- Settings for outer and inner contours can be selected separately.

Note:

Only use this option for old machines which do not support microjoints. If this option is used for machines that support the option **Microjoints**, the specified width of the microjoints will be added to the one specified at the machine.

Options

The dialog box **Options** consist of four tabs.
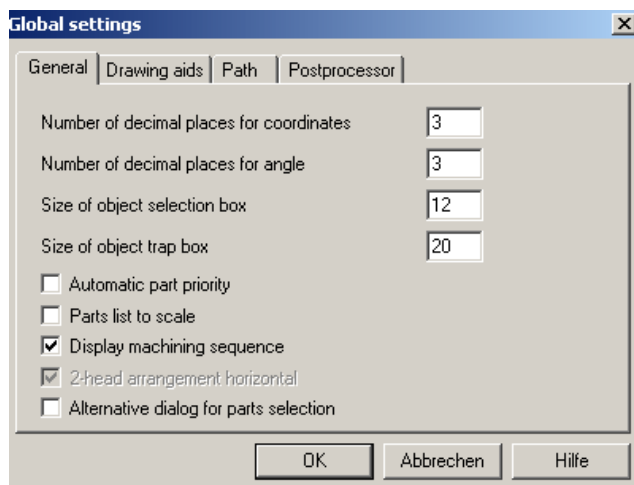
General

- Specify some display settings.

- **Part priority automatic** means that the biggest parts will be of prime importance and will therefore be nested first.

- Activate the control box **Parts list to scale** in order to show the parts in the parts list (working range **Nest parts**) to scale.

- Display the machining sequence as a dash yellow line between parts.

- Select an alternative dialog for parts selection. Here, you only insert the code to search for parts.
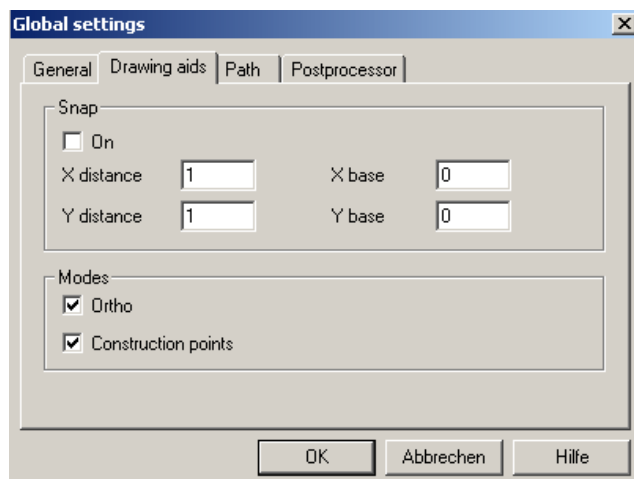
Drawing aids

Here, define the settings for the plan window of the working range **Nest parts**.
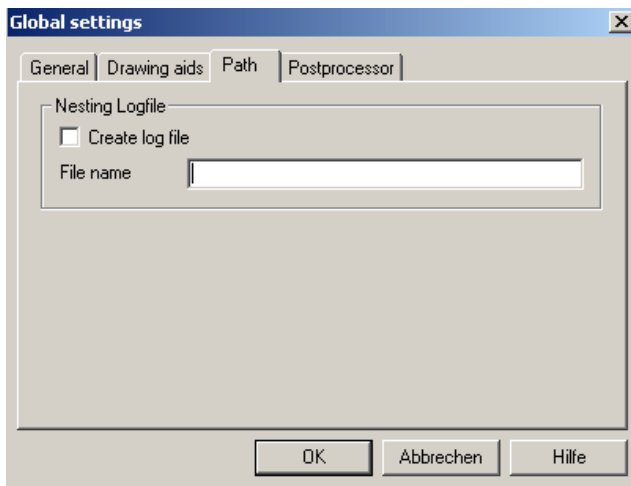
Path

Generate a log file of the nesting. As a default it will be saved in C:\Program Files**Bysoft**6\ programs.

Send this file to the **Bysoft** hotline if you notice inexplicable irregularities in the automatic nesting function in new software versions, or if the nesting aborts prematurely.
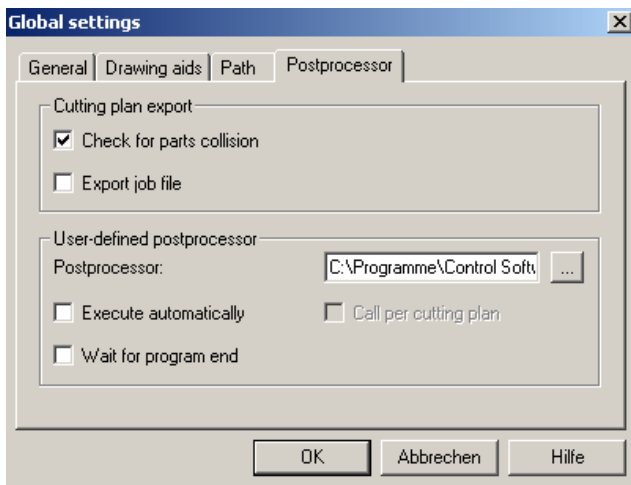
Postprocessor

- The control box **Export job file** generates a job file (*.job) for each LCC-Export. This file is saved in the same place as the LCC data.

- The control box **Collision check** is very useful. Tick it to activate this function. A collision check is automatically carried out in every LCC-Export. In case of a collision, the programme tells which plan is affected. Correct the mistake in the working range **Nest parts**.

- An external postprocessor for compiling the plans in machine code can be selected in the section **User-defined postprocessor**. This program can be selected using a browser by clicking on the button on the right.

- The option **Execute automatically** starts an external postprocessor (if available) when clicking on the button LCC export. In addition to this the postprocessor can be executed separately for each cutting plan with the option **Call per cutting plan** enabled.

- If the option **Wait for program end** is enabled, work can only continue in **Bywork** once the external processor has finished processing. This prevents any changes to the current cutting plan being followed by the postprocessor during editing. Only the currently selected plan is ever transferred to the external postprocessor.

Working papers and Labels

With the button **Preview of working papers** or the command **Page preview** in the pulldown-menu **File** you can display the working papers which give information about job data, plans and parts.

The menu bar contains the following functions:

First / Last	Use these buttons to switch to the first or last page. These buttons are only enabled if there is more than one page.
Next / Previous	Use these buttons to switch to the page immediately before or after the current page. These buttons are only enabled if there is more than one page.
Zoom in / Zoom out	**3 zoom functions** are available: The magnifying glass labelled with a **plus** sign doubles the size of the image. The magnifying glass labelled with a **minus** sign halves the size of the image. Clicking on the **1:1** symbol returns the page to its original size.
Print	There are two print options available:

- The first print button prints the current page.

- The second print button prints all prepared pages.

Save as	The current page can be saved externally. Either the preview is copied onto the clipboard or it can be saved as an *.EMF file.
Close	Closes the preview window and returns to **Bywork**.

There are two standard patterns available that can be selected via **File / Page setup…**
Should you want to adapt the working papers to your personal use, please contact the **Bysoft** hotline.

Printing work papers
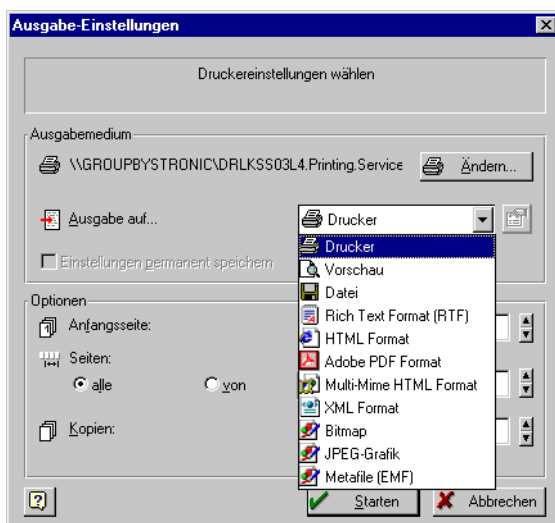
Work papers can either be printed or edited as a file in different formats.

Select the command **Print** from the pull down-menu **File** and select the required file format next to **Direct to…**

Select the destination folder, assign a name and click on the **Save** button.

Fig. *Dialog box Printing options*

It is also possible to print labels. You can define these through the command **Setup** in the menu bar **File**.
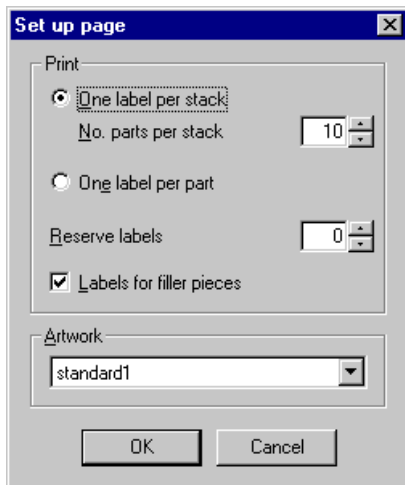
Select **File / Labels / Setup** to set the print options for label print out. Choose between **One label per stack** (with number of parts per stack) and **One label per part**.

Chose between two artworks for the printout.

Quit the dialog box with **OK**.

Select **File / Labels / Preview** if you want to check the label layout again before printing. This opens the **Print preview** dialog box for the **Bywork** module. Select **File / Labels / Print** in order to print the labels.

Fig.   *Dialog box Page setup*

Adapting workpapers to the company's needs

Company logo or name in Bypart and Bytubepart

Standard workpapers of **Bypart** and **Bytubepart** contain a blank box on the lower right bottom. You can insert your company logo or your company name as a jpeg-file there.

Procedure:
Create a jpeg-file of your logo or your company name and rename it as **logo.jpg**. Save it in the directories **bpd** (for **Bypart** workpapers) and/or **btd** (for **Bytubepart** workpapers) of your copy reports directory (by default in C:\Program Files\Bysoft6).

Company address in Bypart and Bytubepart / Bywork and Bytubework

Standard workpapers of the construction modules **Bypart** and **Bytubepart** and of the production modules **Bywork** and **Bytubework** contain a footer with the address of "Bystronic Laser AG". You can delete this line and replace it with your company's address. However, your address must fit on one line only.

Procedure in Bypart and Bytubepart:
Open with a text editor (e.g. Notepad) the file **Standard1.crd** from the directory **bpd** (for **Bypart** workpapers). For the workpapers of **Bytubepart**, you select the file **Standard1.crd** from the directory **btd**.
Select the command **Search**, then insert „Bystronic" and press **Enter**. The program now jumps to the line with the Bystronic address. Replace the text within the inverted commas with your company's address. Remember that there is only one line available. Save the file. Repeat these steps for **Standard2.crd** (Bypart only)

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Procedure in Bywork and Bytubework:
Open with a text editor (e.g. Notepad) the file **Standard1.lst** from the directory **bwd** (for **Bywork** workpapers) or **btwd** (for **Bytubework** workpapers). By default, these directories are installed in C:\Program Files\Bysoft6\reports.
Select the command **Search**, then insert „Bystronic" and press **Enter**. The program now jumps to the line with the Bystronic address. Replace the text within the inverted commas with your company's address. Remember that there is only one line available. Save the file.
If you wish to, repeat these steps for **Standard2.lst**, **Standard3.lst** and for the label templates **Standard1.lbl** and **Standard2.lbl**.

Notes:

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Byparam

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Byparam - Parameter database

Byparam is the module where the cutting time parameters are saved.

> **Note:**
>
> During the installation of Bysoft 6.5.x, only an empty parameter database will be installed. You have to create your own parameter database.

Bysoft 6.6.0 only installs an empty parameter database. All parameter databases established since **Bysoft 6.4.x** can be updated so that they can still be used. The database installed as of **Bysoft 6.4.x** exclusively used standard parameters established by **Bystronic**, which provided a cutting time calculation. However, if the user did not work with his own optimised parameters from the machine, this calculation only provided approximate values. As of **Bysoft 6.4.x** it was possible to execute the cutting time calculation with the customer's effective cutting parameters under the condition that they were primarily imported with **Byparam**. In order to keep the current version of the parameter, though, these had to be re-imported periodically.

The new solution guarantees that the cutting parameters are automatically linked with the parameter database that is being used for the cutting time calculation. Thus, the user needs to import his parameters (probably already existing ones) into **Byparam** after having installed the software. Consequently, only the path to the cutting parameter's directory, but not the files themselves are imported. This procedures enables the user to take into account modified parameter values automatically during cutting time calculation and thus always calculate with the current parameters.

The following procedure has to be observed for the preparation of the above:

- Machine(s) and programming computers need to be connected to a network and have access to a common directory (e.g. I:\Laser\Parameter). **It is compulsory that this directory is the same in which the operator is going to save his cutting parameters.**

- The user creates a new parameter database in **Byparam** and imports the cutting parameters into it (machine parameters as well as Config/Setup files). The selection is based on files, although the paths are saved.

- If a user is working with **Bystronic** for the first time or has not connected his machines to a network, it is possible to copy the **Bystronic** standard parameters for his machine combination (machine type/resonator, e.g. Bystar 3015, 4.4kW) into the respective network directory and then import these files as described below (as a zipped file on the CD in Other\mcparam\ cutting_parameter.zip)

> **Note:**
>
> The Readme file contains an interactive demo explaining how to install a central database (**Byparam**) for the cutting parameters and configuration files.

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Creating your own database

Start **Byparam** with **Start\Program Files\Bysoft6\Byparam**.
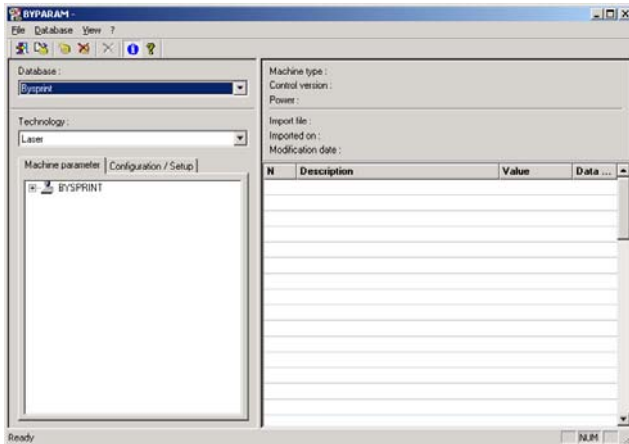
Select the command **Creating empty database** from the pulldown-menu **Database**. Assign a name in the following dialog box and confirm with **OK**.

At any time you can rename your database. Select **Rename database** from the same pulldown-menu.
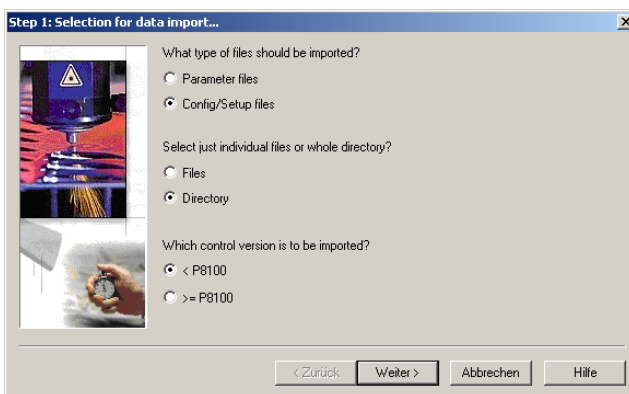
Now, select the command **Import files** from the pulldown-menu **File**.

In the appearing dialog box, activate what kind of files you want to import: **Parameter files** or **Config/Setup files**. You will need both, but you cannot import them at the same time.

Simultaneously you can decide whether to select only single files or entire directories. You also need to define here whether you are going to import files for a control which is older or newer than P8100 (CNC 90 / 96 resp. Byvision).

Click on the **Next** button

Note:

All dialogs of the File Import Wizard have a **Help** button to call up the context sensitive online help.
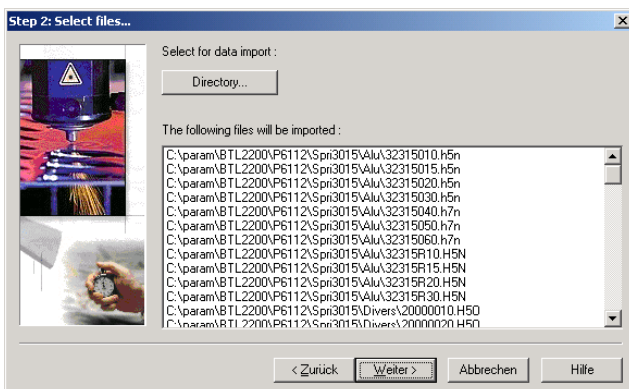
Selection **Directory**:

Select the directory from which to import the parameter files. This should be the directory where you save your own parameters from the machine All files from the last selected directory are displayed in the dialog box window.

Note:

The selection of the files, especially the location of the directory from which the parameter files are imported is very important. **Byparam** is saving the path and will always look for this directory. If you have linked your machine to a network, Bystronic recommends to save the parameters on a network directory where both programmer in the office and operator on the machine have access to (see also **Survey cutting parameters**)
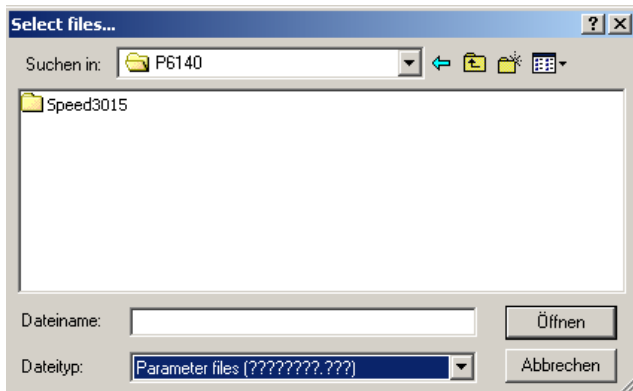
Selection **File**:

If you only want to import single files, select the option **File** in step 1. Select the corresponding files from the Windows dialog.

Click on the **Next** button
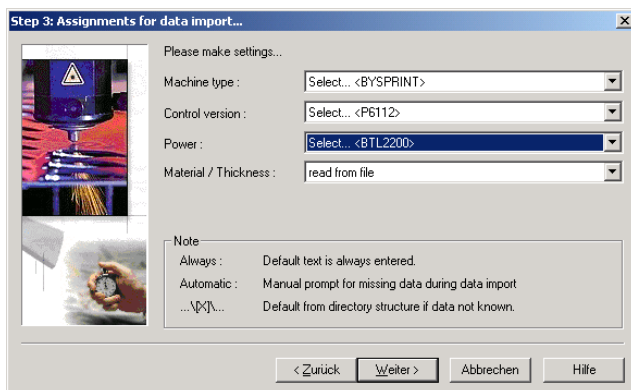
For structuring purpose, you must now assign machine type, control version and power as well as how information on material and thickness should be imported.

For **machine type**, **control version** and **power** use **Select <Empty>** and specify these attributes manually according to the configuration of your machine (e.g. BYSPEED, P6140, Bylaser 5200 ARC). For **Material/Thickness**, you must assign the entry **read from file**. This option does not exist for controls **>=P8100**.

Click on the **Next** button.
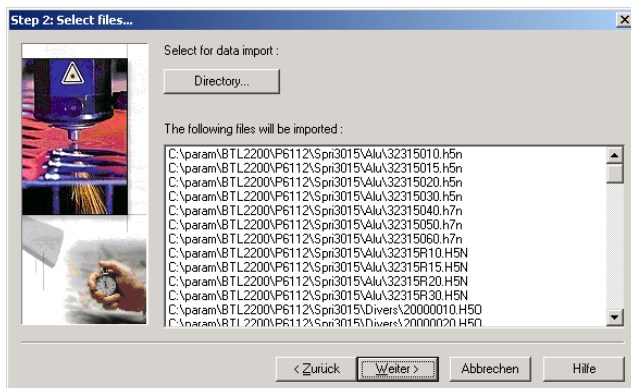
Finally, all your settings for the data import will be displayed for checking.

Correct these if necessary by clicking on the **Back** button or, if everything is correct, start the import with the **Finish** button.

Repeat this procedure for the configuration/setup files of your machine. For controls **<P8100** import the files Config.cfg and Setup.cfg; for controls **>=P8100** import the corresponding setup file ***.stp**. Example: *Byspeed3015_8100.stp*

The newly created database needs to be selected for cutting time calculations. The easiest way is to adapt the corresponding machine entry in **Bybase > machine database section** (see also **Bywork**, Calculation).

Read material and thickness from filename

Procedure for controls <P8100

You can name your parameters so that Bysoft can read material and thickness information from the file name and save it in the parameter file. However, you must respect the name's convention: the thickness must be separated from the material name with a hyphon and should only be up to three characters long.

XXXXXXXX-YYY[Z].KKK

XXXXXXXX   = Material name (Example: 1.0332, StW22, HRSXYZ, Alu)

YYY   = Thickness (Example: 1, 10, 010)

[Z]   = Optional value for Finish/Machining type (Example: r = flying piercing)

KKK   = Extension as usual (A5N)
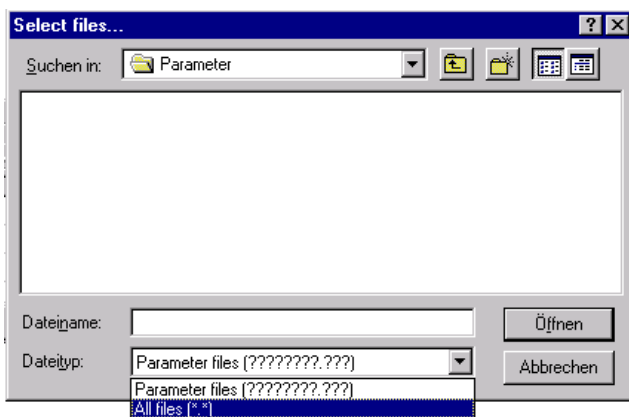
Start the parameter import as described above

If you import **Files** instead of a **Directory**, you may have to change the file type from **Parameter files (????????.???)** to **All files (*.*)** when selecting the parameter files in the Windows dialog (see left).

If you import via **Directory**, all parameter files will be selected. However, during the import, those files not matching the name's convention will be ignored and thus not imported.
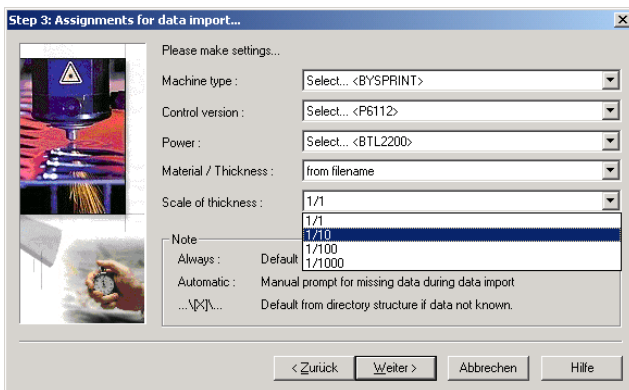
With step 3, **Assignments for data import**, assign the attributes of your machine for **Machine type**, **Control version** and **Power** (e.g. BYSPRINT, P6111, BTL2200) via the pulldown-menu entry **Select <Empty>**. With **Material/Thickness** you assign the entry **from filename**. Now, another line appears where you specify the scale for the thickness. The entries 1/1, 1/10, 1/100, 1/1000 are the factors for material thickness.
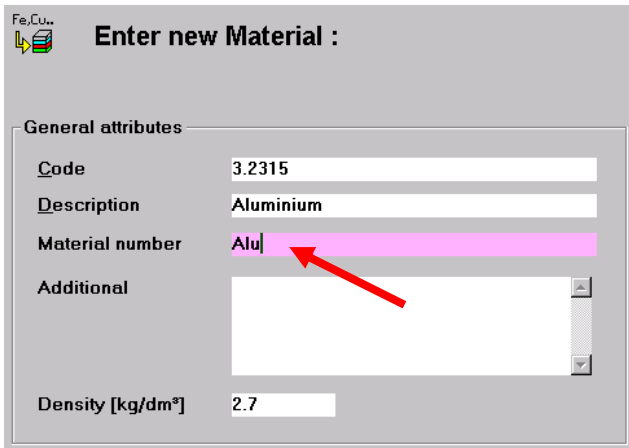
Example: If your parameter has the thickness defined as *-010, the effective thickness with scaling factor 1/1 is 10mm, with 1/10, it is 1mm etc.

Finish the import as described above.
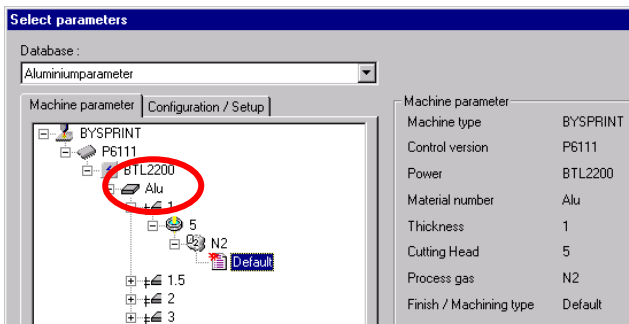
The name of the material will then be displayed in the path of the parameter database, which means that if you import a parameter file called Alu-010 according to the indications above, you will see the entry **Alu** in the manual parameter selection of the cutting time calculation.

For further automation in the cutting time calculation, insert the material name in the line material number of Bybase's material database section when you first import a paramater with this specific material.

Open the corresponding material record of your Aluminium in **Bybase.** Write **Alu** in the field material number. Save and close the record.

You can modify the material number at any time. **Code** and **Description**, however, can only be modified if the material has not been used in a part, a job or raw material.

Procedure for controls >=P8100

Byvision parameters can also be saved in such a way as to enable Bysoft to read the material name and the thickness from the parameter. Rename the original parameter according to your material designation before you import it into Byparam. The importing procedure is otherwise the same as for the original parameters.

Example:

SPEED3015_8100_5200_1.0332_1_5_N2_r.par

Original parameter with the DIN no. **1.0332** used as material designation

SPEED3015_8100_5200_Steel_1_5_N2_r.par

Modified parameter with **customized material** designation which will be displayed in the cutting time calculation instead of the DIN number.

Note:

Please note that the material number according to DIN **must not** be modified if you work with a storage system. The material scan in automatic mode is done according to this number.

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List of database symbols with their meaning

Laser		Water jet	
Symbol	*Meaning*	*Symbol*	*Meaning*
BYSTAR	Machine type	BYJET	Machine type
P6110	Control version (CNC)	P6104	Control version (CNC)
BTL3000	Power (Watt)	BJD4000	Power (bar)
5.00	Cutting head (inch)	Granat	Type of abrasive
O2	Processing gas	1.4301	Material (Material number)
1.4301	Material (Material number)	2.00	Thickness (mm)
2.00	Thickness (mm)	Produktionsschnitt	Cut quality
Standard	Finish / Machining type	3015	Work area
3015	Work area		

BYSOFT 6.5.0 Cutting time calculation

Parameter values for cutting time calculation

MMC

Import path for parameter file, e.g. I:\Laser\Para-meter

Bysoft key values

Machine Control version Material Thickness ......

Parameter modification by machine operator

Directory on server
e.g. I:\Laser\Parameter

Parameter database (1)
<customer>.pdb

Import with BYPARAM
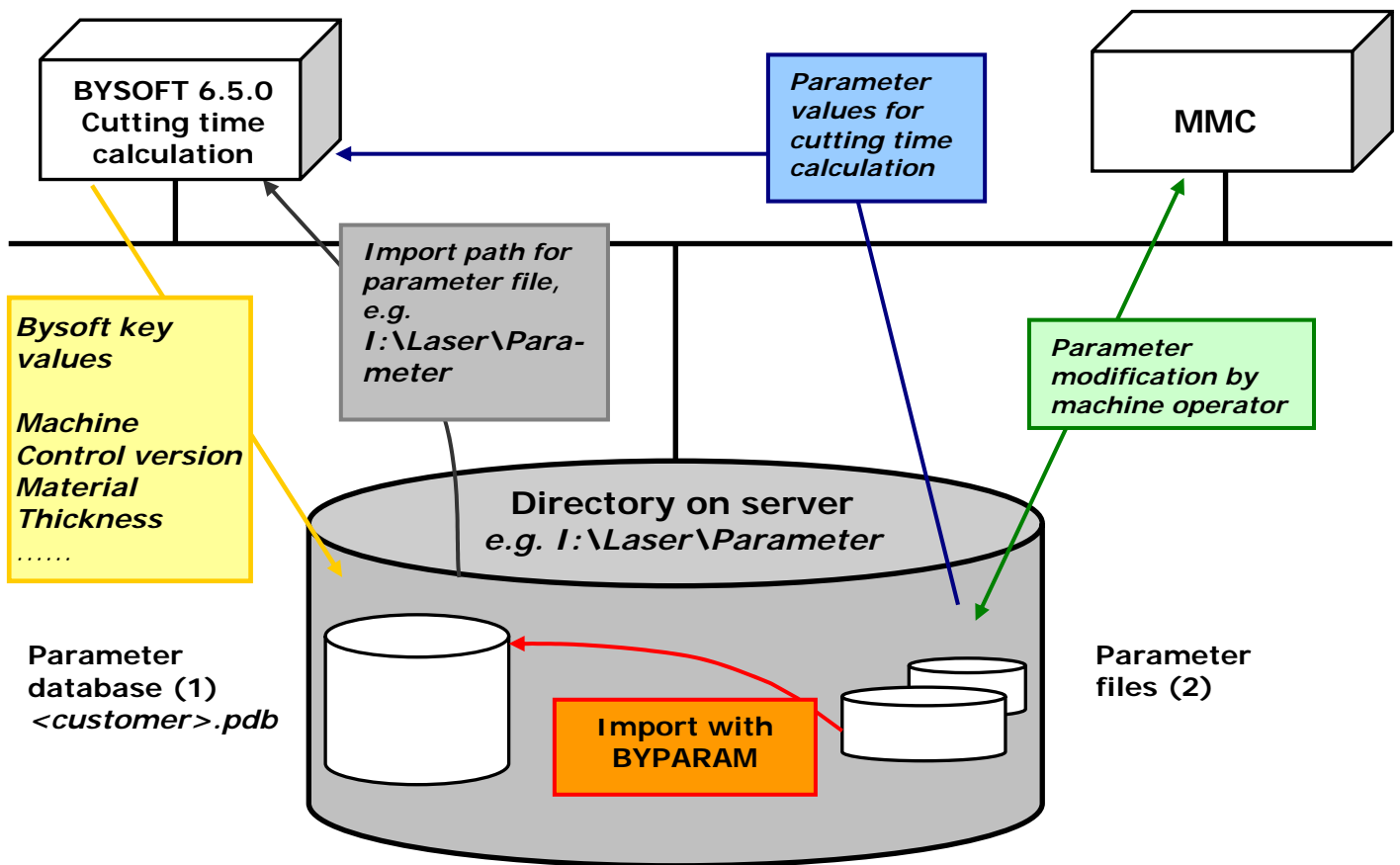
Parameter files (2)

(1) Database is installed without parameters

(2) Machine parameter and config-/ setup files must be imported to the database (1) once.

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Byconvert

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Byconvert - Geometry import wizard

Byconvert is a program that is used to import CAD drawings in any **Bysoft**-compatible format, and to furnish them automatically with the technology required for **Bysoft**. The element attributes can be defined per layer or color and assigned to the respective geometries. The machining sequence and the lead-ins and lead-outs can be controlled, if required, by the Technology wizard. The finished part is then saved in the **Bysoft** database. All settings can be saved in multiple project files.
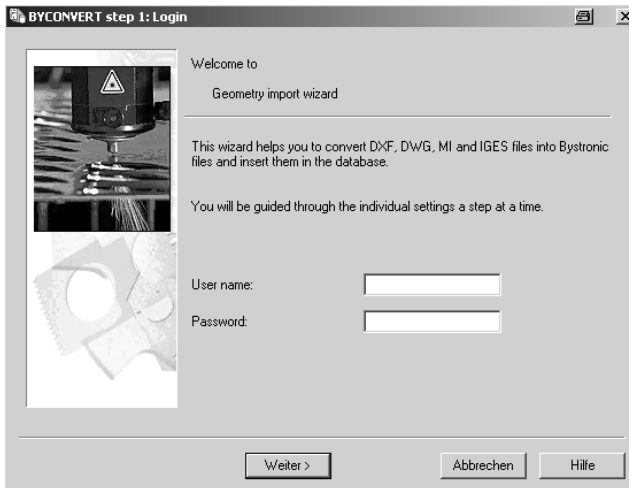
Start **Byconvert** via **Start\All Programs\ Bysoft6\Byconvert**

Login using your usual **Bysoft** user name and password.

Click on the **Next** button.
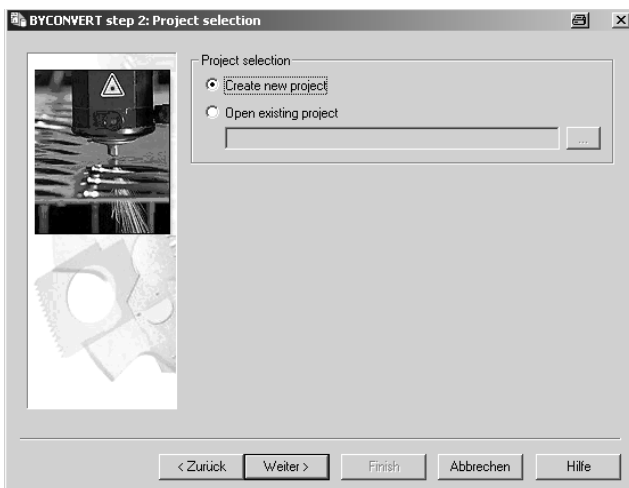
Select either the **Create new project** option or the **Open existing project** option. To open an existing project, press the button to open the Windows dialog box where you can find your existing project.

If you are creating a project for the very first time, an error message is displayed. Ignore this. Once you have defined a project as the default project (Step 8), this error message will no longer appear.

Click on the **Next** button.

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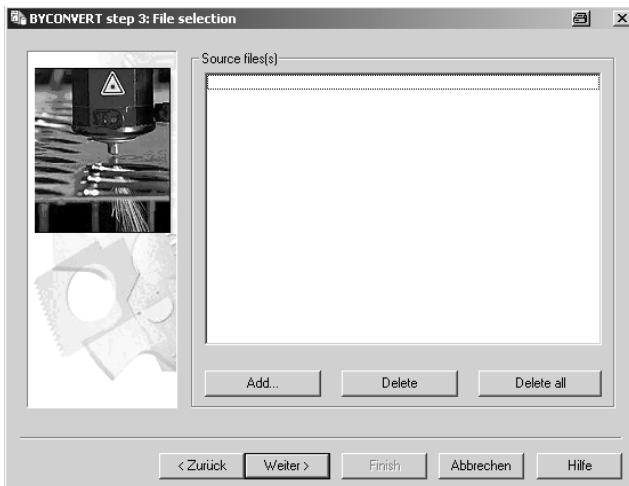
Click on Add and select the parts that you wish to import.

Click on the **Next** button.
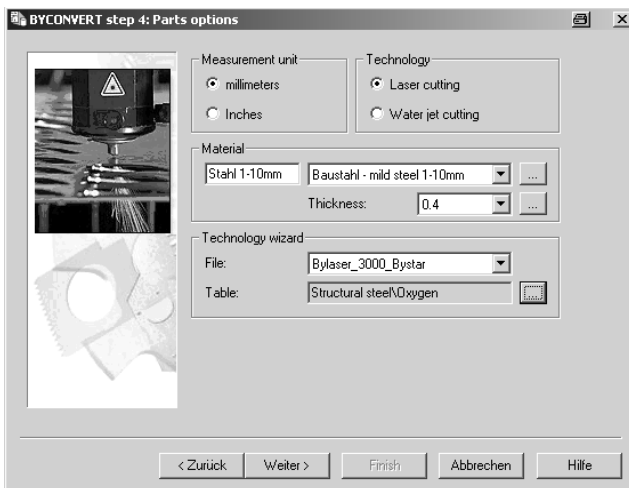
Select the units and the technology (laser or water jet cutting).

Assign the material and thickness, and the required technology file and table.

Click on the **Next** button.
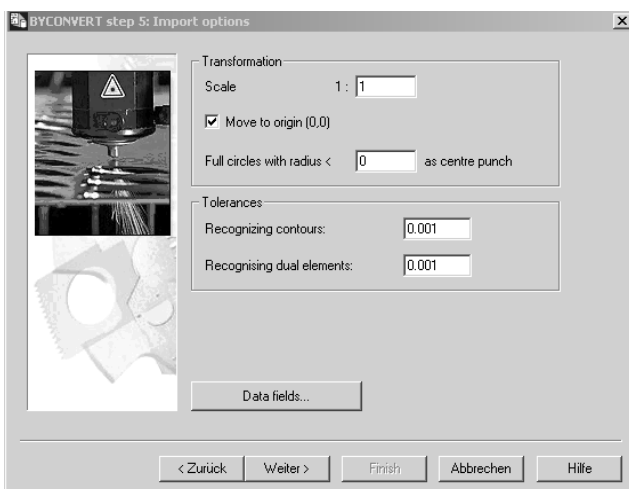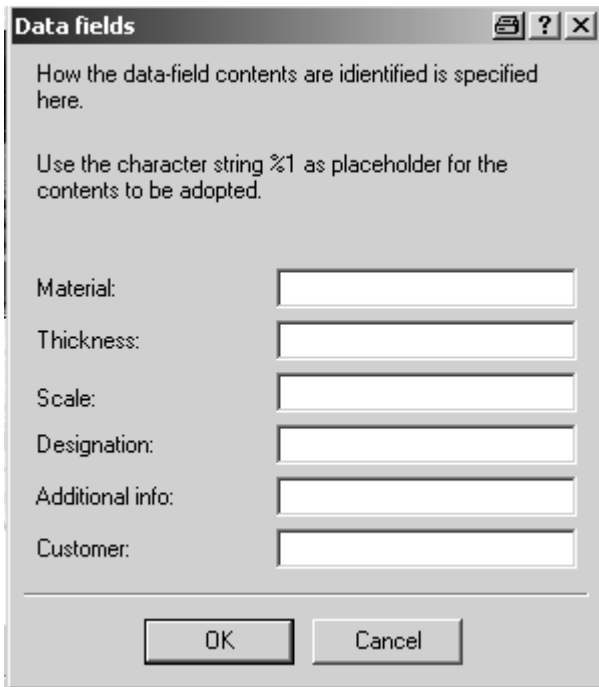
Specify the **scale** in which the part shall be imported, whether the part should be moved to the **origin**, and whether circles up to a certain radius should be machined as **center punch** marks.

If necessary, adjust the **tolerances** for detecting contours and dual elements.

Use the **Data fields** button to adopt values from CAD-defined text fields automatically.

The following example shows you how to use the Data fields facility.

Click on the **Next** button.
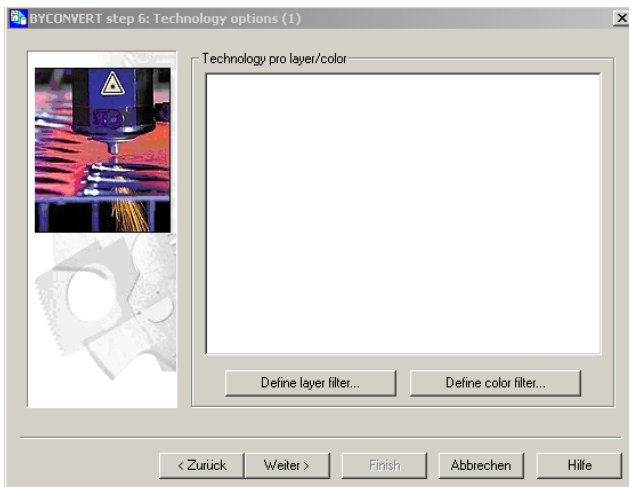
An example: you use the expression **Sheet gage** instead of **Thickness,** and use this expression in every CAD drawing. Now enter **Sheet gage** in the field to the right of the **Thickness** line. At import, the value that lies beside this data field is adopted automatically in the **Bysoft** database.

Existing data fields are given priority over default values.

Here you can edit the layers or colors by pressing the appropriate button.

Click on the **Next** button.

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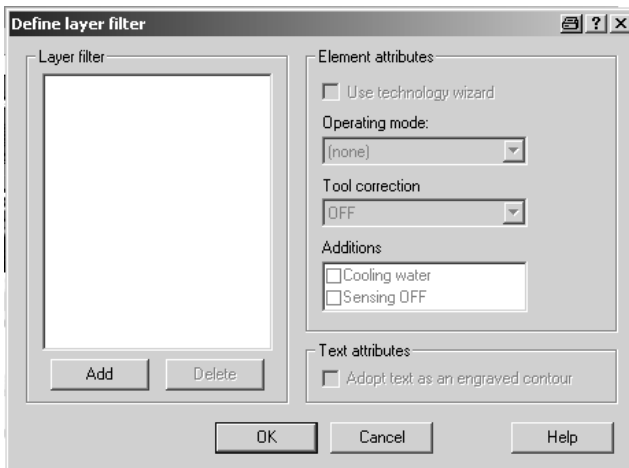
All possible operating modes for **ByVision** are supported by **Byconvert**: the operating modes Process macro 1 to 5 are available for the element attributes for the layer and color filters.

Specify here different layers or colors (depending on what you have selected in the previous dialog window), and assign the required attributes to them.

Select a layer by pressing the **Add** button. Enter the name of the layer from your CAD program and confirm with **OK**.

Select whether you want to use the Technology wizard for setting the operating mode for the selected layer. If not, assign the operating mode, the tool correction and any additional options manually.

Text drawn on a specific layer can be converted automatically into an engraved contour by enabling the option **Adopt text as an engraved contour** for a specific layer or color.

You can now follow this procedure to define further layers.

Click on **OK**.
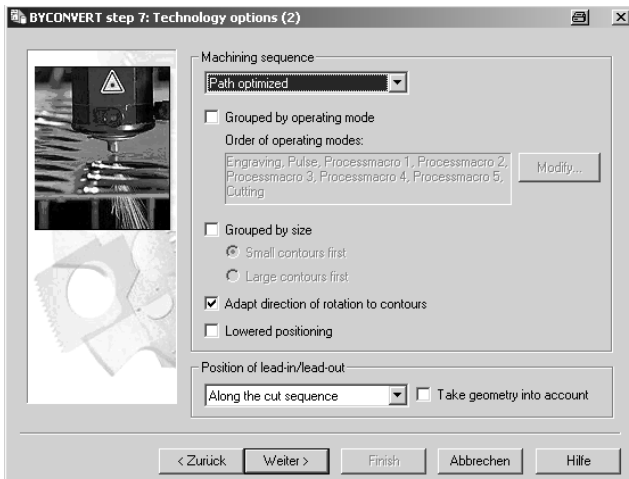
Now make any settings required for the machining sequence.

Define the position of the lead-in/lead-out.

Click on the **Next** button.
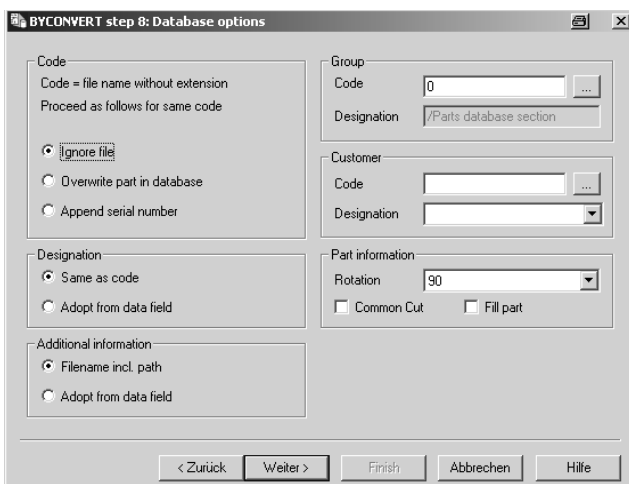
In an initial step, define how you want the parts to be saved in the **Bysoft** database as regards code, additional information, group, customer and parts information.

Click on the **Next** button.
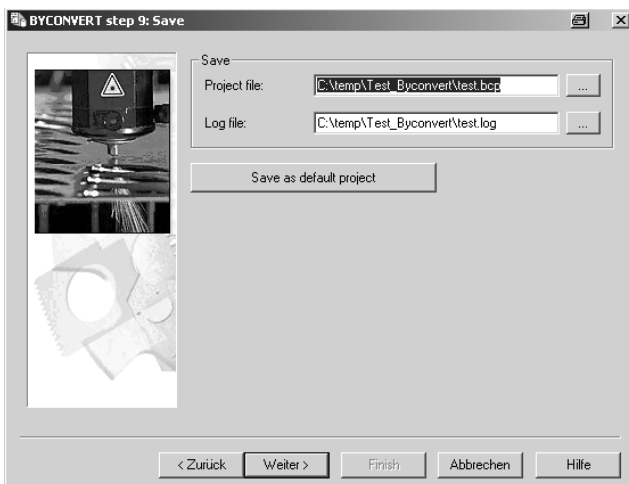
If you want a **log file**, enter the path for the required directory. Do the same for the project file if you want to save this project. You can re-open this project at a subsequent import. In Bysoft 6.7 onwards, the project file has the extension *.bcp.

You can save the project that you are editing as the default project, so that when the program is run again, all the settings are opened as defaults.

Click on the **Next** button.
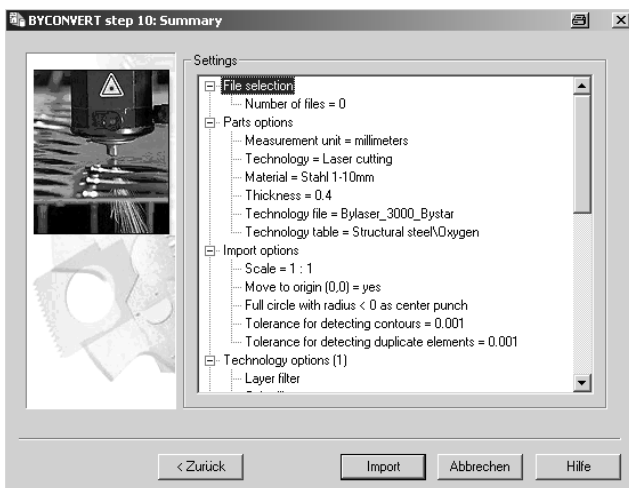
Your settings are summarized on this page and listed in an Explorer view.

You can use the Back button to step back through the import settings to make any changes.

Press the **Import** button to start the import.
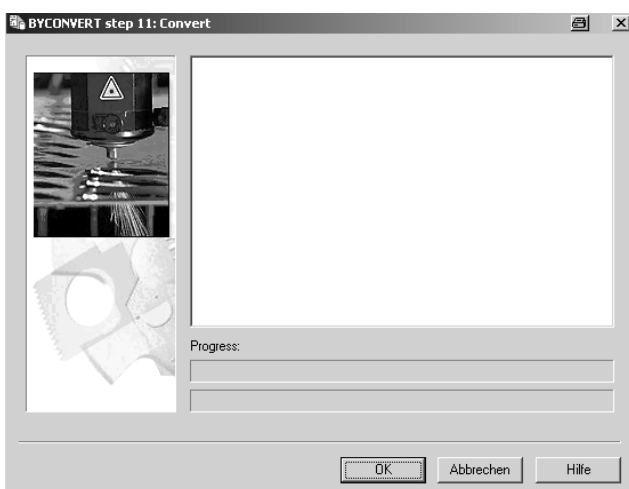
In the last step, the contents of the log file are displayed. The bars underneath show the import progress: the upper bar shows the progress of individual files, the lower bar the progress of the whole project.

Press the **OK** button to close **Byconvert**.

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Bydba

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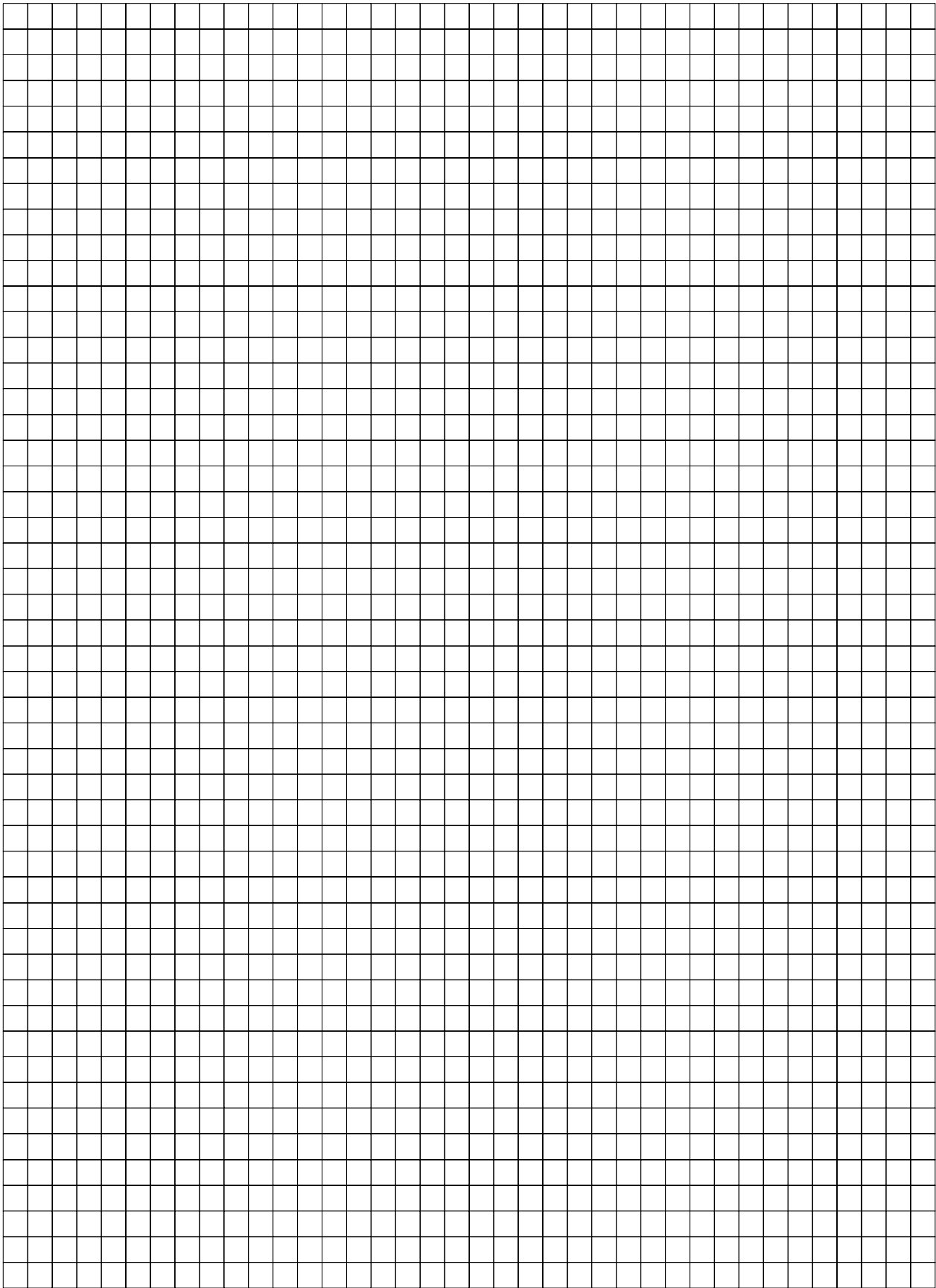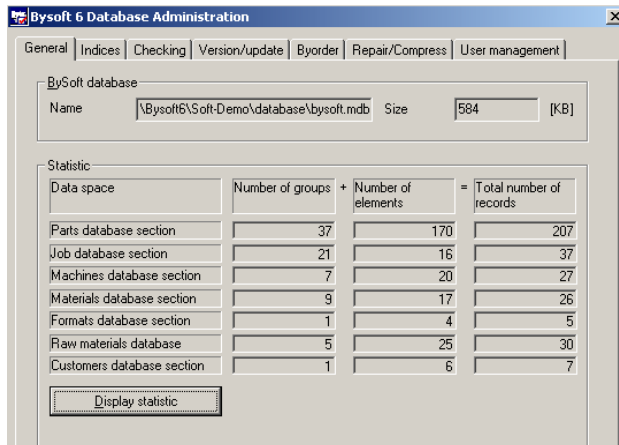
Bydba – Database Administration

The **Bydba** module allows a simple handling of the database. You can administer your users, solve problems or simply use it for statistic purpose.

Bydba consists of 6 tabs which will be described now:

General tab

This tab shows general statistical data

Bysoft database

This line shows the directory containing the database that has just been used. The size of the database file in KB is specified at the end of the line.

Statistics

This field contains several rows and columns with general information. Data on the various database sections and entries in the database can be displayed. The fields are all empty when you first select the General tab.

Data space

The area referred to in the database line

Number of groups

This shows how many groups there are in the current data space (similar to directories in Windows)

Number of elements

This specifies the number of effective data records distributed amongst the groups shown (similar to files in Windows)

Total number of records

This gives the total from the two previous columns. This is because the database does not distinguish between a data record that is a group or a single data record.

Display statistics

Click on the **Display statistics** button to display the data. Once this has been done, the figures remain, even when switching to other tabs, until the **Bydba** program is closed again.

Indices tab

Card with index settings for the database

Here you can set various index data for the database. The index information is used for relocating items in the data structure more easily and quickly.
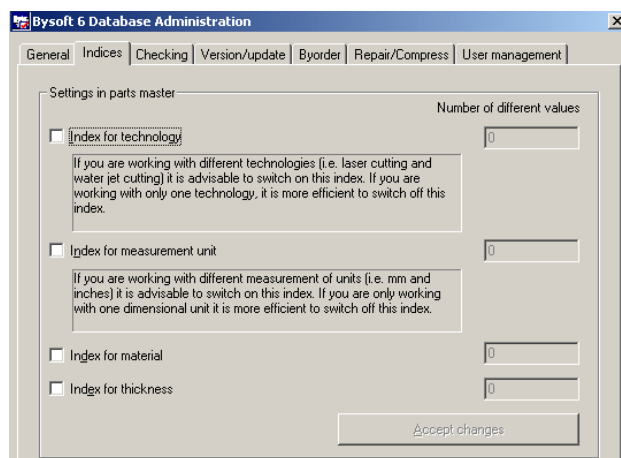
Settings in the parts database section

Index for technology

If you frequently mix technologies (laser and water jet), it is useful to enable this index. If enabled, the number of items present appears below **Number of Different Values**.

Index for dimensional unit

If you work with a mix of millimeters and inches, then you should enable this index. If you work mainly or exclusively with just one of the measurement systems, you can leave this index disabled. If enabled, the number of items present appears afterwards below **Number of Different Values.**

Index for material

If you work with a large number of different materials (more than 50), then you should enable this index. If you tend to work with no more than 50 entries in the material database section, you can leave this index disabled. If enabled, the number of items present appears below **Number of Different Values**.

Index for thickness

If you work with a large number of different thicknesses then you should enable this index (no matter what material, each thickness only counts once). If you tend to work with only a few different thicknesses, you can leave this index disabled. If enabled, the number of items present appears below **Number of Different Values**.

Checking tab

You can use the functions available here to check the database and automatically correct any errors.
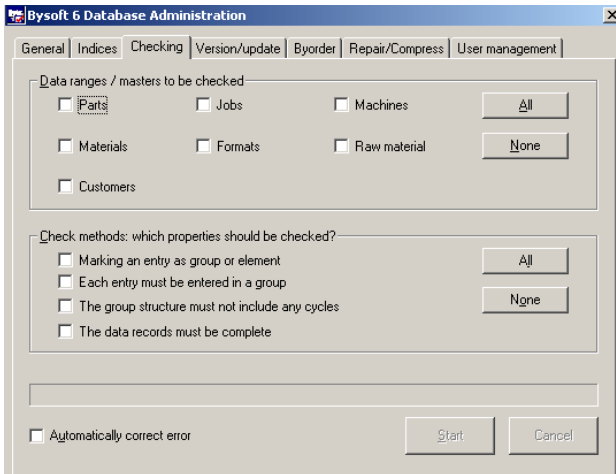
Use the **Start** button to start the procedure once you have selected the required data section and checking options in the relevant windows.

Data ranges / master to be checked

Here you can select which areas are to be looked at in a check. One area, several or all areas can be selected. You can select or deselect all existing entries using the button on the right labeled All or None respectively.

Checking methods: which properties should be checked?

Here you can select the properties to be checked. Using the **All** button you can select that all these properties are always checked as standard, which is the recommended option. If specific problems have emerged in a specific area or database, please contact the **Bysoft** Hotline.

Automatic error correction

Always enable this option. If errors are found in the data structure / database, then they can be corrected automatically in this way. If a correction is not possible automatically, then an error message is displayed at the end of the check, similar to the statistical information on the **General** tab, from which one can see where correction was possible and where it was not.

> **Note:**
>
> Note the information about repairing of the database in the following chapter **Correct procedure for repairing the database**.

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Version/Update tab

In this tab, you can see information about your **Bysoft** version and you can update your database to a later version.

Bysoft database

Here you can see which directory contains the database that you are currently working on. The size of the database is also displayed at the end of the line in KB.

Version information

Interface version: This refers to the version of the data seen in the database. If something has changed on the essential input forms in the database, this version number is incremented.

Database version: This specifies, under **Current**, the version number that you are working with. This is followed by **Minimum required** which displays the minimum version required in order to work with the current software.

Update database

After a software update, the database can be brought up to date here. The update is launched by clicking on the button Update database. This can take several minutes. Before performing the update, make sure that no other users are logged into the database, and take the precaution of making a data back-up to keep a copy of the database status before the update.
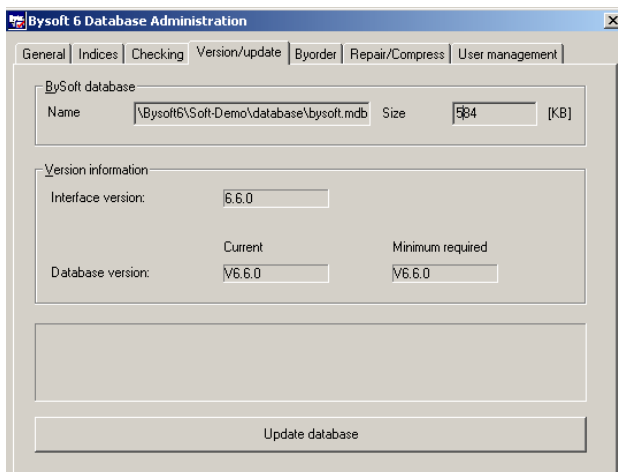
Note:

Before performing the update, make sure that no other users are logged into the database, and take the precaution of making a data back-up to keep a copy of the database status before the update.

Byorder tab

This tab provides information about the version and in case of an update it is possible to actualize the **Byorder** database. Thus, existing orders will not be deleted but can be taken over into the new **Byorder** database.

Repair / Compress tab
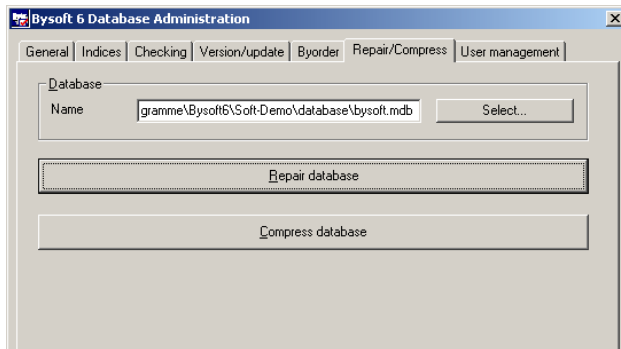
Select

This button opens a file selection window in which you can select other database files (*.mdb) in other directories.

Repair database

This button allows you to repair a defective database which can apparently no longer be opened in **Bysoft**. The repair functions are extensive and should be able to correct most errors in the database (more comprehensive than those in the Checking tab). If an error cannot be corrected here, please contact the **Bysoft** Hotline.

Compress database

This button optimizes and compresses the database. This process involves optimizing the indices and releasing memory space from deleted data records. Compression is only recommended for large quantities of data or after deleting data records. This function does not affect work with the database.
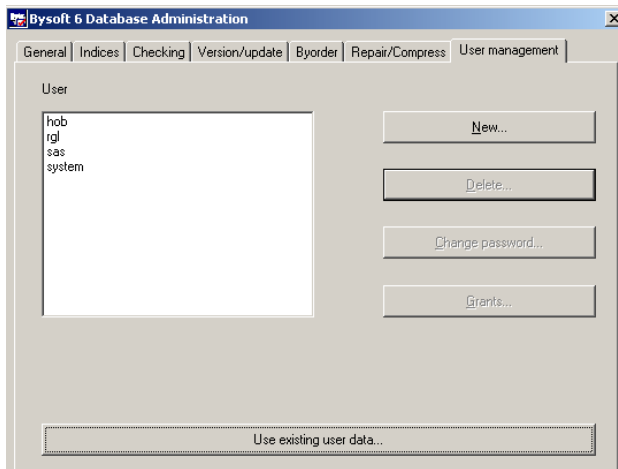
> **Note:**
>
> Note the information about repairing of the database in the following chapter **Correct procedure for repairing the database**.

User management tab

User management is employed to manage users registered in the database.

User

The user field shows the name of the registered user.

New

This function is used to create a new user (see "Creating a new user").

Use employee names or initials that you already use in the company. This makes it easier to match up users to actual people. Using short names means that they take up less room when displayed in the database tables. User name input is not case sensitive.

Delete

Select the **Delete** button if you want to remove users from the administration system. A message appears describing the deletion process.

If you confirm with Yes, this user is removed from the user management system. The data for a user remains stored in the system under his/her name, even if he/she no longer exists in the administration system.

Change password

This function can be used to assign a password to a user, or change a password. To do this, enter the relevant password and close the process with **OK**.

Use a password that you can remember easily but not one that is easy to guess. One option for making passwords secure is to use combinations of alphanumeric character strings or to include special characters. The password is case sensitive.

Grants

The authorizations for existing users are displayed on this page, and can be changed here (see below).

Use existing user data

This function is used for adopting user data that already exists on the system but may have been deleted from the administration system, or for adding user data to the administration system that existed before the update. No password is issued when the users are adopted.

If you want to adopt users from an existing database, make sure that you issue corresponding passwords and notify the users of these. If this is not done then the new users will not be able to work with the new database. Also note that all users that are found will be added to the database administration system, i.e. including those who may have been deleted at one time, but still have created or changed data in the database in the past. Thus this function is only useful if you are adding a database that is older than version 6.2.

Grants

Fig.   *Dialog box Grants*

User

The name of the user and the SuperUser authorization are displayed on one side at the top of the screen. The option **has SuperUser authorization** means that all rights are unrestricted. In particular, the SuperUser can create other user accounts, and can change all existing authorizations or issue new ones (except his/her own authorizations).

User's grants

This shows what rights the current user has in particular data spaces. Different rights can be assigned to the different data sources. For instance there might be little sense in granting every user the right to make changes to the Machines, Material and Format database sections. On the other hand, most users need to be able to add information to the Parts, Job and Customer database sections.

If you want to select or deselect all authorizations, you can use the All or None buttons, that let you deal with all options in a column at once.

Read

This means that the user has the right to read the data in the data spaces enabled here. If this entitlement is not granted, then the user is not even allowed to read the corresponding areas. A suitable message appears if one tries to select a disallowed function or a barred data space.

Edit

This means that the displayed user has the right to modify, save data etc. in the data spaces enabled here. If this authorization is not enabled, then nothing in these areas can be edited. However, one can still read the data as long as read authorization is granted (see **Read**).

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Correct procedure for repairing the database

The different possibilities of checking and repairing in **Bydba** may lead to confusion when to use which function. Here a description of how to carry out a repairing in the correct order.

1. Make sure all **Bysoft** users leave **Bysoft**.

2. Run **Bydba** over Start\Program Files**Bysoft**6**Bydba** and login with your user name.

3. Select the **Version/Update** tab.

4. Click on the button **Update database** and wait for the program to display this prompt:
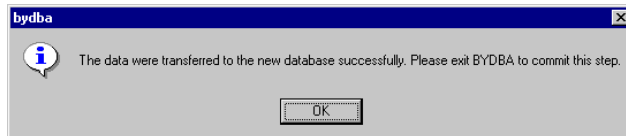
Click on the **OK** button.

5. Quit **Bydba** and try to run **Bysoft**. If the problem persists, run **Bydba** again.

6. Select the **Checking** tab.

7. Activate all control boxes, then click on the Start button. **Bydba** now checks all activated database sections for the activated points and displays the result.

8. Quit **Bydba** and try to run **Bysoft**. If the problem persists, run **Bydba** again.

9. Select the **Repair/Compress** tab.

10. Click on the **Repair database** button

11. Quit **Bydba** and try to run **Bysoft**. If the problem persists, contact the **Bysoft** Hotline.

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Glossary

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Glossary

B	**Button**	Graphic symbol on the screen with an assigned function. When you click on a button with the mouse pointer, the appropriate function is executed.
C	**Colours**	You find many colours in plan and graphic windows. Here a list of colours and their meaning.

plain white	drawing elements (**Bypart** only)
dotted white	selected objects, not yet confirmed
red	crosshairs and parts , which can be moved in a plan or graphic window
green	contour, technology not set
bright blue	contour, technology set
plain yellow	with part: initial/end cut; selected contours with import (**Bypart**)
dashed yellow	positioning ways
magenta	contour elements of enabled attributes of special view options (**Bypart**) engraved contours (**Byview**)
plain grey	disabled contour elements in special display (**Bypart**)
dashed grey	construction lines or elements drawn in construction layer (**Bypart**)
dashed brown	residual grid cuts (**Bywork**)
blue	remaining sheet (**Bywork**)
other colours	layer colours with import (**Bypart**), nested parts with 2-head-machine (**Bywork**, water jet only)

Command line	Message in the command window inviting you to input data or commands by means of the keyboard or the mouse
Command window, also Prompt	Part of screen where the software communicates with user; where user reads commands and types orders.
Confirmation sign	Functions which you can switch on (enable) or switch off (disable) receive a sign of confirmation to indicate that they are enabled (e.g. ⊠)
Contour	A series of linked drawing elements, displayed in green colour
Crosshairs	Mouse pointer in the shape of an orthogonal cross
Cursor	Mouse pointer in different shape (arrow, crosshairs, help in context etc.)
Cutting plan	Arrangement of parts on raw material. Also contains information on processing sequence.

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D **Dialog box** Window for input and selection of data and options

Default value The default value is always displayed in brackets and can be executed simply by pressing the **Enter** key. If you want to change the command, press another Hotkey.

e.g. Automatic or Manual (A/M) <A>

E **Enable** Switching on functions. A confirmation sign   indicates that the function has been enabled.

Export Giving out data in a format different from **BYSTRONIC**-specific data

F **Function** A sequence of commands which a program module executes (e.g. Drawing / Circle; Modify / Erase, etc.)

G **Graphic window** Area of screen where user creates and edits drawings or cutting plans.

I **Import** Reading of data from data format different from **BYSTRONIC**-specific data format

H **Hotkey** Capital letter which must be pressed on the keyboard if you have several command options displayed in the **>command window**.

e.g. dxf-import: **N**ormal, **L**ayer, line**T**ype, **C**olor, **B**lock

J **Job** Task in **Bywork**. Consists of one or more plans and is a combination of parts, material and machine data.

L **LCC** Laser Cutting Center; file type generated in the postprocessor that can be read by the machine's MMC

M **Material** Combination of material and thickness (without sheet dimension)

Mouse pointer General designation for the symbol on the screen which is moved by the mouse. Also called cursor. It can take on different shapes. (**>Crosshairs**, object selection box, arrow)

N **Nesting** Arranging the required parts on raw material. While arranging the parts, the optimal mutual position is considered according to certain pre-set criteria (minimal waste, optimal cutting time)

O **Object selection** One or more objects, which you select with an object selection box either one by one or several in one attempt and confirm with the **Enter** key.

	Object snap	Drawing aid, which draws the crosshairs with the object snap box to defined coordinates. These can be points of a grid or points of an object (end point, center, intersection etc.)
	OID	Means **O**bject **I**dentification **D**ata. OID is a unique number which the database assigns continually to every new record. You can use the OID for searching, but you cannot modify the OID.
	Option	Selection of commands or functions to be activated by clicking in a confirmation box.
	Ortho	Drawing aid, which allows the cursor to move only in horizontal and vertical direction.
P	**Pan**	Move a drawing graphically in relation to the screen. The construction data are not affected (contrary to command Move)
	Part	also construction part. It can be a flat, tubular, rectangular or polygonic part. Parts are programmed in **Bypart** and nested in **Bywork**. They can be processed with different technologies
	Plan	A job consists of different plans. A plan can be run several times in a job.
	Plan window	see Graphic window
	Point	Position defined through coordinates in a coordinate system
	Processing sequence	Machining sequence in production
	Prompt	see Command window
	Pulldown-menu	Menu containing several sub-menus. The sub-menus are displayed when you click on the appropriate pulldown-menu. Select the comands by moving the mouse over the command and click with the left mouse button. All entries of the menu bar are pulldown-menus. Some entries of the pulldown-menus may be pulldown-menus themselves. They are marked with arrows on the right.
R	**Raw material**	Combination of material, thickness and sheet dimension
S	**Selection**	see Object selection
	Snap	see Object snap

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