Cutting 3

Version 1.20, May 2004

Optimal cutting program for rectangular sheets

The User's Guide

Cherkassy, 2004

Contents

1. Introduction

Cutting 3 is professional rectangular nesting software package. It can be used to get optimized cutting layouts in woodworking, furniture making, metal or glass cut, etc.

It is based on the unique advanced algorithm, specially created to reduce significantly the panel waste and costs due to the high material yield and reuse of offcuts.

The major criterion of the algorithm part of the program is minimization of offcuts. Cutting 3 is easy to use and has friendly and intuitive interface.

Cutting 3 is the development and synthesis of all the best that has been created in Cutting programs family: Cutting 1.x, Cutting 2, Cutting Lite, Cutting Glass.

Plenty of changes have been made in Cutting 3. They improved functional and algorithm part as well as the interface part of the program.

Using Cutting 3 you can:

- use unlimited quantity of panels and parts to cut;

- specify different textures or types of materials in one cut session;

- select different modes of calculation;

- create and use your own virtual storehouse of materials and remnants;

- move parts from one layout sheet to another;

- mark the offcuts;

- mark the band;

- easily identify different materials by use of visual textures;

- import details from AutoCad or other programs;

- export the projects and layout reports to other programs;

- move layouts sheets;

- save and restore the cutting results;

- automatically get total area of parts, offcuts, kerf length, waste, etc.;

- save data as project

and so on.

The program runs under Windows 98/ME/2000/NT/XP.

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1.1 License Agreement

State registration of the Ukraine PA No 4099 from 02.04.2001.

1. All copyrights belong to the author (Yury Shibaev).

2. For commercial usage the program must be purchased and registered by the author. For more information about registration, please write to support@cuttinghome.com.

3. The trial version of Cutting 3 is free. No private person or organization can get charge for the trial use of the program without author's permission.

4. CUTTING 3 IS PROVIDED AS IS WITHOUT ANY WARRANTY WHATSOEVER. YOU USE THIS SOFTWARE AT YOUR OWN RISK.

5. IN NO EVENT WILL AUTHOR BE LIABLE FOR ANY LOST REVENUE, PROFIT, OR DATA, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGES HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE.

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7. Any illegal usage of this software is equal to immediate canceling of this Agreement and may be pursued by Copyrights laws.

8. By opening the package, downloading the product, and using this software, you are consenting to be bound by this agreement.

9. If you not agree with this License agreement, immediately delete all Cutting 3 files form your disks and cancel using Cutting 3.

All implicit rights belong to the author.

1.2 Limitations of the trial version

The trial version has the following restrictions:

- It has 30 times of correct working. To see how many times remaining, refer to the form "About…"

- No more than 3 rows can be added to the table of panels; only 3 types of materials can be used.

- No more than 10 rows can be added to the table of parts, the quantity of each type of part is limited to 10.

- No more than 3 sheets of layout diagram can be printed.

To cease these restrictions, you have to purchase and register the program.

1.3 Registration of Cutting 3

To cease the restrictions of the trial version, you have to purchase and register the program.

To register means to install the one full-working version to one computer.

The registration process consists of the following steps:

1. After downloading the program, the file "registration.cr3" must be created at your computer. To create this file, click the button "Registration" of the form "About". The file will be created in the Cutting 3 location's catalog.

2. Send this file to support@cuttinghome.com.

3. After your order has been processed and paid, your license file "license.cv3" will be sent to you. Also you will get the downloading link and instructions.

4. You have to copy "license.cv3" file to the directory of Cutting 3, and replace the trial version (exe-file) by full-working exe-file, that has been downloaded.

After successful registration, the button "Registration" will be non-active and the information about the times remaining will not appear.

License file is different for different computers. Before creating "registration.cr3" file, make sure you have installed the trial version to the computer where you will be using Cutting 3 so you can receive the correct license file.

In case of changing hardware, please refer to author of Cutting 3 (support@cuttinghome.com) for re-registration. The re-registration is free.

1.4 Definitions

The main definitions of the program are:

*   Material - the common conception about sheets (panels) and parts. It is defined by the name, number and texture or color.

*   Panel, remnant, rest, preparation – initial material to cut.

*   Part, detail – the part of the rectangular panel of definite size and form. While cutting, parts are placed at panels and remnants.

*   Project – total data that include information about panels and parts, saved in file with extension ".spc".

*   Material type – name and texture of material.

*   Texture – the pattern of the material.

*   Layout, layout diagram – the result of calculation, presented by sheets with parts located.

*   Kerf length – total length of cut edging.

*   Rest, remnant, offcut – The unused area of panel without parts, marked by user.

*   Area of rest – the total area of panel without placed parts.

*   Waste – kerf width multiplied by kerf length, the area of unmarked offcuts.

*   Quantity of copies – the quantity of equal sheets with equal parts and locations.

*   Band, band edging, butt-end tape – the textured tape for covering the butt-ends of parts.

2. The main form of the program

Here is the main form of the program:
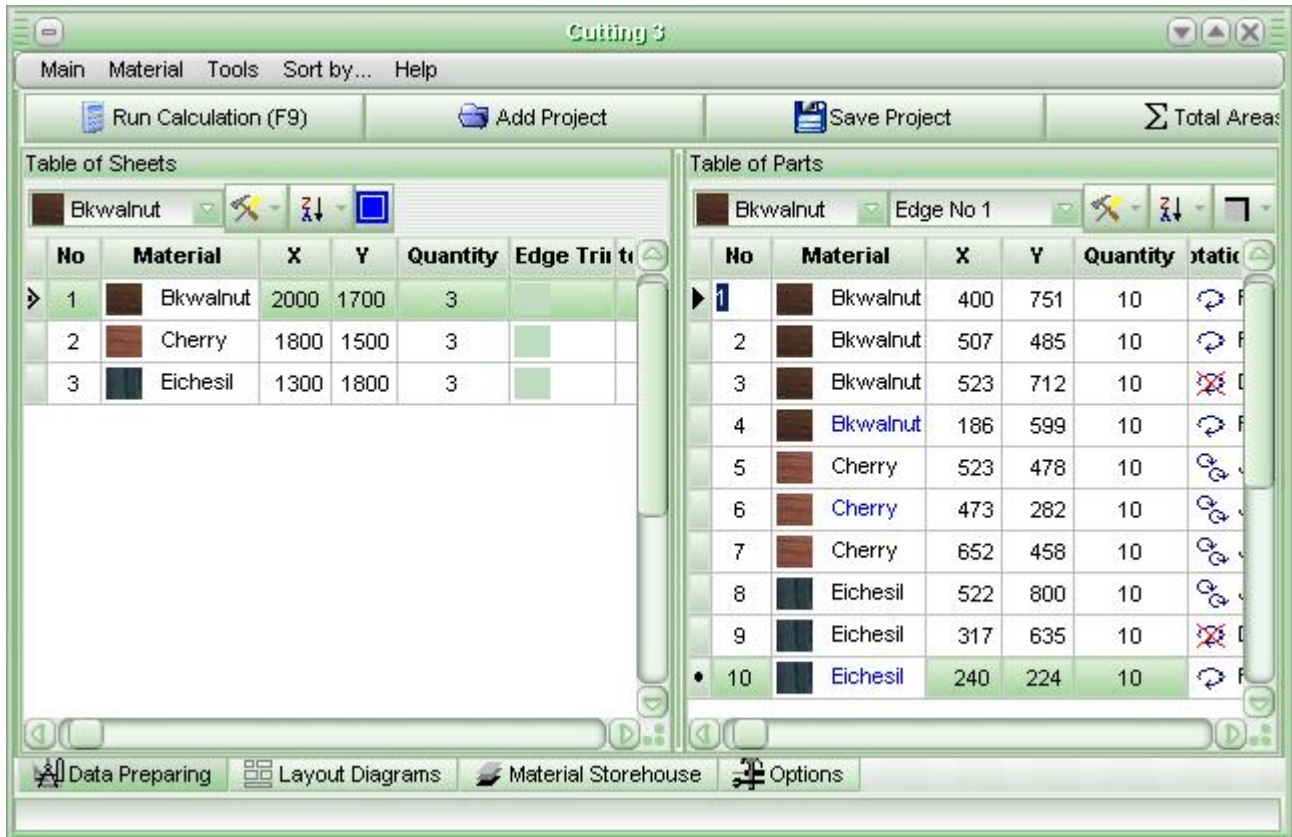
The main window of the program consists of 3 main parts:

- The main menu.
- Multi-page main tabbed form.
- Information panel.

The basic operations are shown at the main form (data input, viewing of layout diagrams, etc.).

You can switch over the windows by clicking the appropriate bookmark of the notepad.

At the bottom of the window you see the information panel, where the information, errors alert messages are displayed.
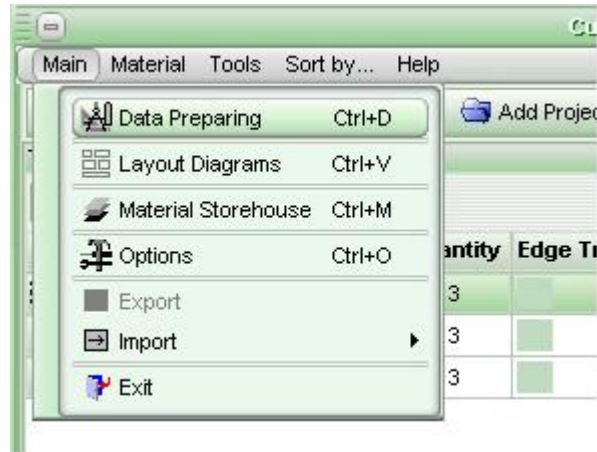
2.1 The Top Menu Bar of the program

The main menu allows choosing different functions of working with the program.

Some items of this menu can be inaccessible for some regimes of working (tab of the main form).

The top menu bar consists of the following buttons:

- Menu item "Main":
  - Data Preparing.

- Layout Diagrams.
- Material Storehouse.
- Options.
- Export.
- Import.
- Exit.

- Menu item "Material". Setting the material type for selected rows in the tables of sheets and parts.
- Menu item "Tools":
  - Select All. Selects all rows in the tables of sheets and parts (see also "row selection").
  - Clear Tables. Deletes all data about sheets and parts.
  - Delete Selected Rows. Deletes selected rows in the tables of sheets and parts.
- Menu item "Sort by…"
  - Material. Assorting by material in the tables of sheets and parts.
  - Length. Assorting by length in the tables of sheets and parts.
  - Height. Assorting by height (or width) in the tables of sheets and parts.
  - Quantity. Assorting by quantity in the tables of sheets and parts.
- Help.

2.2 The Tabbed Menu

Work with the program assumes the following main regimes:

- Data preparation.
- View and print layout diagrams.
- Work with Material Storehouse.
- Adjusting Options.

The tabbed menu is used to navigate the main regimes of the program. You can always see the tabbed menu at the main form of the program. Tabs are located at the bottom of the main form and have the same names that the main regimes, mentioned above, have.

To reach the desired regime immediately, click the mouse button on the corresponding tab.

Each tab is the form that contains components for working with selected regime.

3. Options

Clicking the main menu button "Main"-"Options" or the corresponding tab in the tabbed menu, you can see the form of options of the program. By adjusting options you can assign the main parameters and modes of the program.

This options form consists of two windows:

- Groups of options - at the left.

- Options of the selected group - at the right.

Change the options in groups to adjust all the necessary parameters you need.

After you have changed the options, press "Ok" to save the changes. If you press "Cancel", all changes are canceled and the form of options is closed.

All current options are saved for the subsequent starting of program. You don't have to adjust options each time you start Cutting 3.
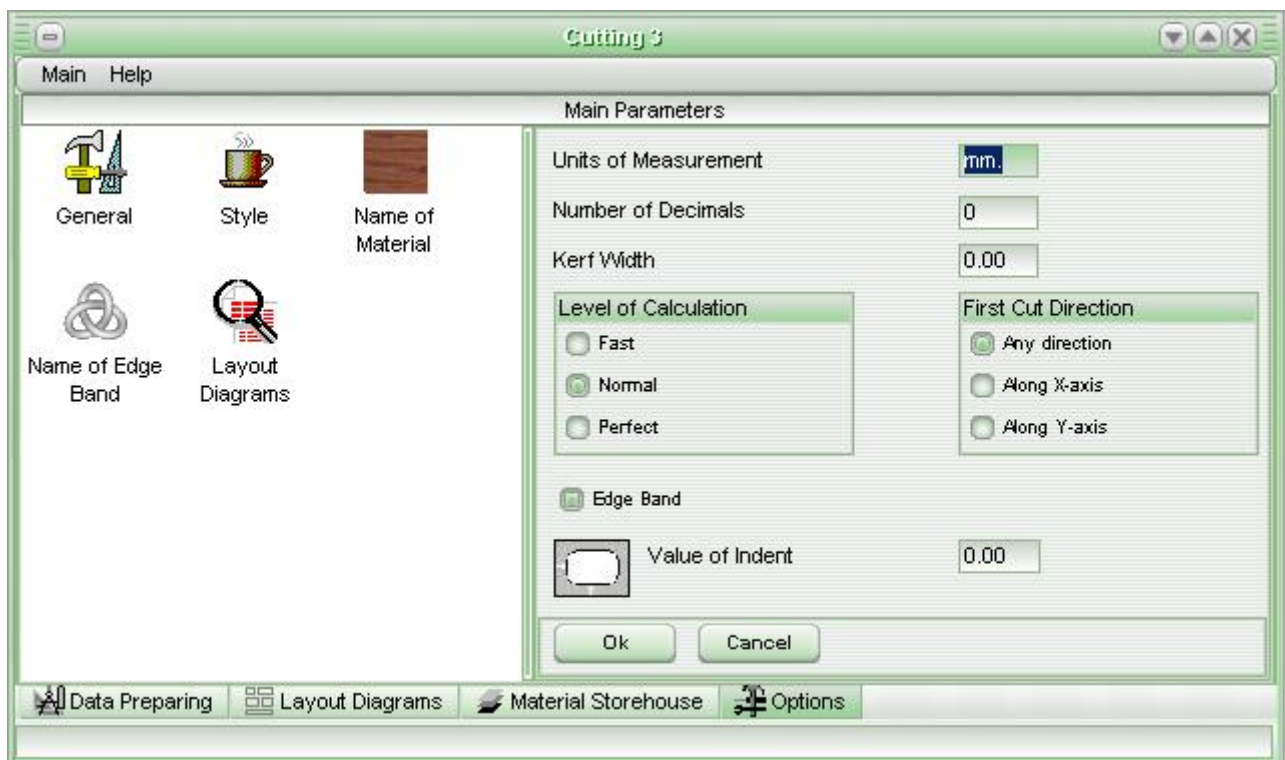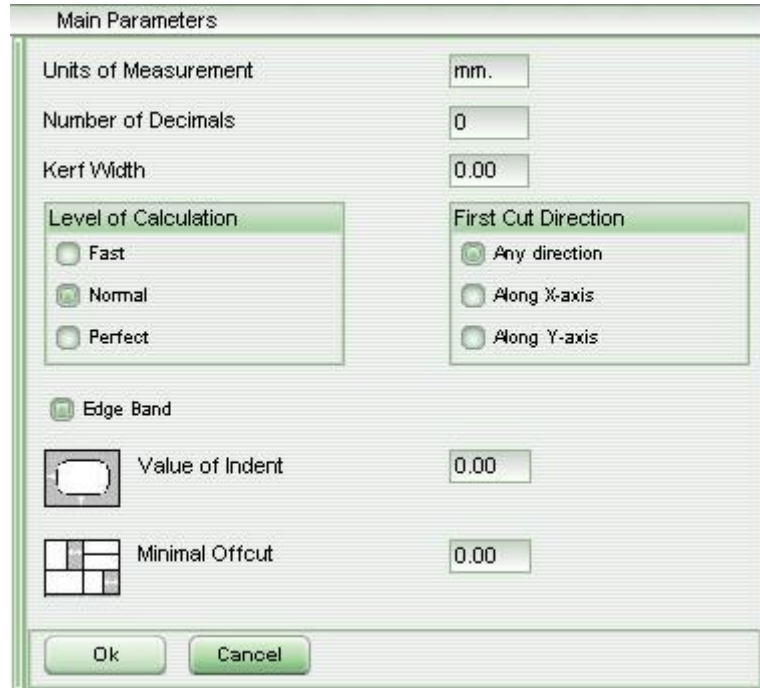

You can adjust 5 groups of options:

- General.

- Style.

- Name of Material.

- Name of Edge Band.

- Parameters of Viewing Layout Diagrams.

3.1 General Options

The main options of the program are assigned in this group.

Here you can adjust:

- **Units of measurement** of the linear dimensions of sheets, parts, offcuts, etc. It can be any text you type: "mm", "cm", "inch", etc.

- **Number of Decimals** for round-up dimensions in layouts diagrams. It must be the integer 0, 1 or 2. For example, if "1" is assigned, all linear and quadratic dimensions will be rounded up to 1 sign after point. <u>Separator of fraction is "dot".</u>

- **Kerf Width**. The value of kerf width of the cutting part of the machine is assigned.

- **Level of Calculation**. You can set up deferent levels of calculation:

  - Fast. It is elementary, very rapid calculation. Usually all parts of the same type and dimension are located next to each other.

  - Normal. The best ratio of speed and quality of calculation.

  - Perfect. The time of calculation may essentially increase, but the layouts results are perfect.

The speed of the calculation depends on the number of parts and sheets. For example, you can add 1000 sheets of one type and dimensions to cut, but you know that only 1 or 2 sheets would be enough for all parts of this type of material. The program will calculate more time because the each sheet needs a certain amount of time to be cut. Hence, the user must add the reasonable quantity of sheets to cut.

- **First Cut Directions**. In this entry, you may specify one of the following options:

  - Any direction.

- Along X-axis.

- Along Y-axis.

Select Any Direction, if it does not matter for you along which side of sheet of material the first cut will be done. Select Along X-axis, if you want the machine to do the first cut along "X" side at all sheets. Select Along Y-axis, if you want the machine to do the first cut along "Y" side at all sheets. The subsequent cuts may be done along "X"-side as well as "Y"-side.

This parameter is used if the ability of cutting machine is limited by length or width of the sheet.

• **Edge Band**. Click on "Edge Band" if you want to use banding tape for furniture parts. The information about edge band will be shown in the Parts Table. If the indicator is blank, Edge Band is not used in working and the information about bands is not shown in the Parts Table.

• **Value of Indent**. This parameter usually is used for figured glass cutting. The Value of Indent increases the dimensions of the rectangular that surrounds the detail, by double value of indent along "X" and "Y" sides.

For example, suppose the dimensions of the defined part are 100 x 200 mm and the value of indent is 5 mm. Then, the real part to be cut will have dimensions 110 x 210 mm.

If the Value of Indent is "0" then the column "Use Indent" in the Table of Parts is not shown.

• **Minimal Offcut**. This parameter is used frequently for glass cutting. It assigns the minimal vertical and horizontal distance between two cut lines or between cut line and edge of the sheet.

For example, if the value of this parameter is assigned as 5 mm, the program will place parts in order to leave the size of offcut not less than 5 mm. If you don't want to use this option, set "0".

3.2 Style

The interface options of the program are adjusted in this group.
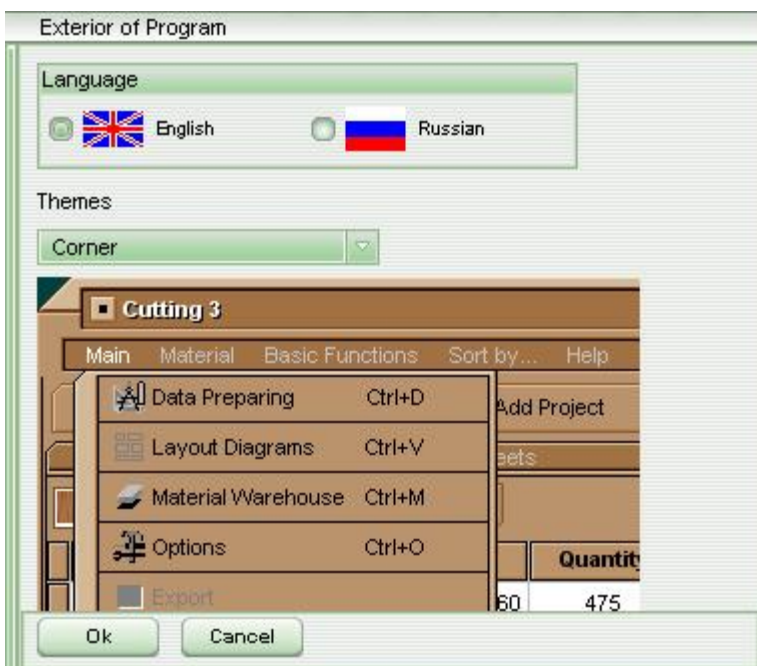
This group consists of 2 elements:

• Language. Here you can choose either English or Russian language of interface.

• Themes. In the pull-down menu you can specify the theme (or "skin") of the program.

Below the pull-down menu the example of themes are shown.
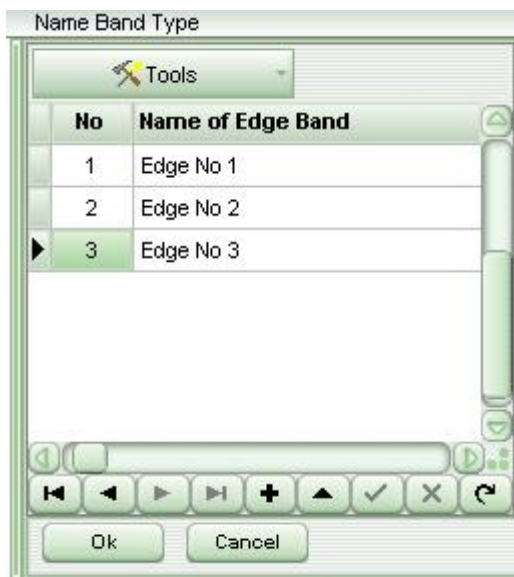
3.3 Name of Material

This group consists of one table with 25 types of material.

You cannot add or delete the type of material, but you can change its name.

To change the name of material, print new name in the cell.

After changes are saved, new types of material will appear in the pull-down lists at the Main Form and at the Material Storehouse.

3.4 Name of Edge Band

This group consists of one table with the names of edge band tape.

In the table you can define the names of edge band tape.

At the top of the window there is the button "Tools" with pull-down list.

This list has two items:

- Clear Table. All names of band tape will be deleted.
- Delete Selected Rows.

3.5 Parameters of Viewing Layout Diagrams

This group of parameters is used to transform actual dimensions (linear or quadratic) into customary, handy view. These coefficients are used only for layout displaying and do not influence parameters of optimization.

For example, suppose, all dimensions are defined in mm (2000x3000 mm). Then the area of the sheet is 6000000 sq. mm. By means of these adjusting factors, this area can be displayed in handy view 6 sq. m.

Here you can also adjust the number of signs after decimal point and names of the units of measurement to be displayed.

4. Preparing Data for Calculation

To arrange parts on the material, the data for materials and parts has to be added. Cutting 3 does not calculate the quantity of material sheets that are needed to allocate all the parts you have added. You have to add sufficient number of sheets to be cut by yourself.

The parts of a certain material type are arranged on the sheets of the same material type. In other words, if you specified material type for the parts as "Navy", they will be allocated on the sheets of material type specified as "Navy".

To start working with data, click the tab "Data Preparing" of the tabbed menu or use the button of the Top Menu Bar: "Main" → "Data Preparing".

The following window appears:
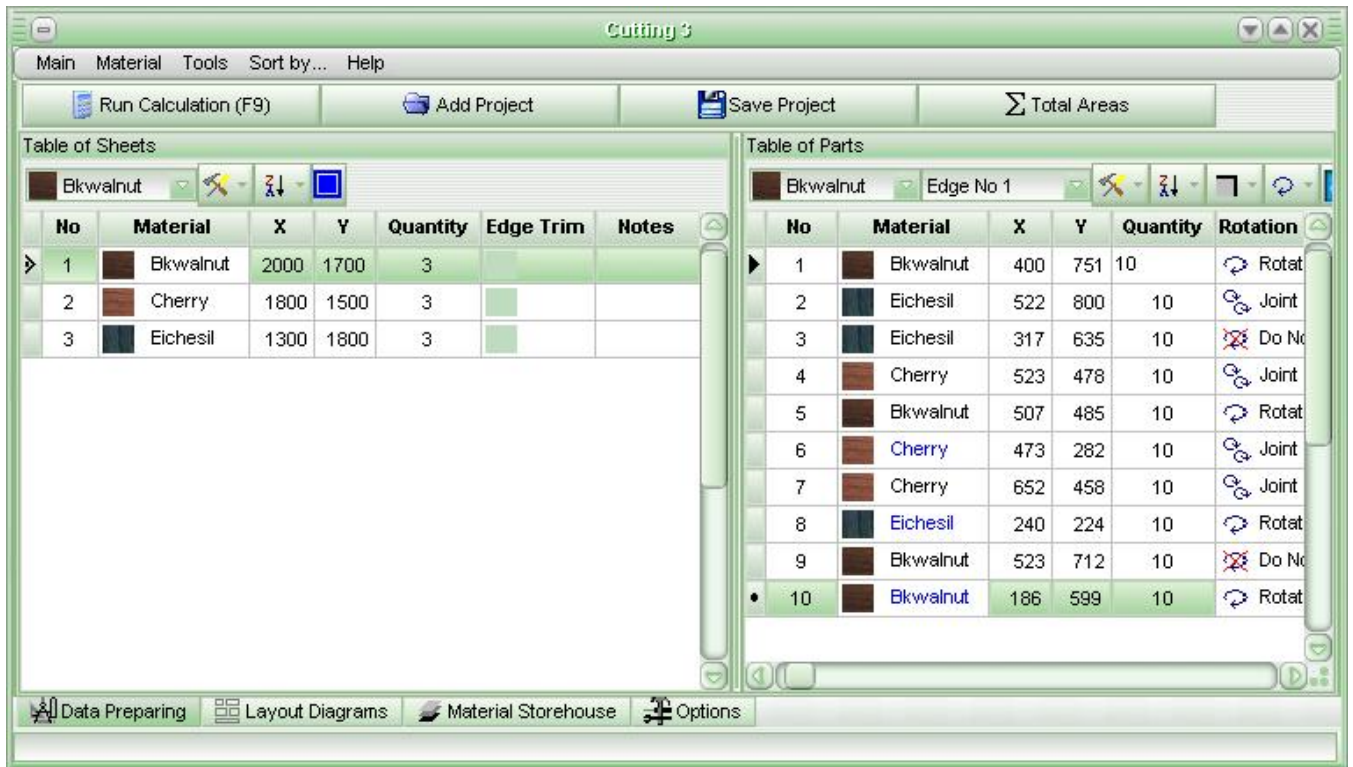
There are buttons at the top of this window:

- Run Calculation. The program starts calculations with current sheets and parts.

- Add Project. By clicking this button the dialog window appears. There you can select the project that has been saved previously. Project is the file with ".spc" extension. After you have chosen the project, all data from it will be added to the end of tables of sheets and parts.

- Save Project. By pushing this button, the dialog window appears. There you can save current data from tables of sheets and parts into a project (file with ".spc" extension). The project files allow avoiding unnecessary repeated imputing similar data to tables of sheets and parts.

- Total Areas. By pushing this button, the window with total area reports appears. The user can evaluate whether the number of sheets is sufficient for parts to be cut. If it is insufficient, the program will inform you by the message in the Information Panel.

Material	Total Area of Sheets	Total Area of Parts
Bkwalnut	10.2	10.301
Cherry	8.1	6.82
Eichesil	7.02	6.727

At the left part of the main window there is the Table of Sheets. See "Sheet Data".

At the right part of the main window there is the Table of Parts. See "Part Data".

Attention! The data for the materials and parts entered in the tables are saved when you exit the program and restored when you run the program next time.

4.1 Selecting Rows

All actions with rows of the tables (for example, delete, change rotation) take place when one or some rows are selected. In all the tables at the left there is a marker "•>", which shows the selected (active) row.

You can move along the rows, using arrow buttons or mouse click. All the time, you have at least one selected (active) row.

To select more than one row, you can press "Ctrl" and click the mouse button on the rows you wish to select. Or you can press "Shift" and use arrow buttons.

Selected rows are lighted by color and "•" sign. Use the same means to deselect rows.

4.2 Sheet Data

In order to get layout diagrams for the sheets to be cut you have to add dimensions, quantity and texture of the sheets into the Table of Sheets. Dimensions are added along "X" and "Y" sides correspondingly and have the real type.
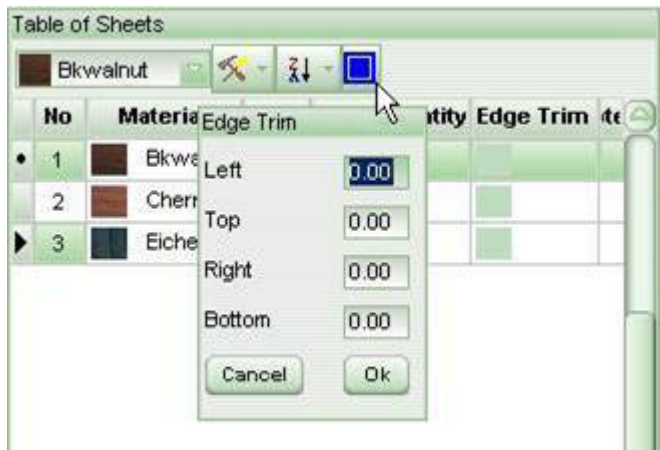
Above the table of sheets there is the panel of buttons, which consists of:

- Pull-down list of names of materials.

To choose material, click the button of mouse on the name of material you want to pick out. If you have some rows selected, the material will be changed in all these selected rows. The program remembers the last chosen material and inserts it when you input new data to the table until next change.

- Tools button with the pull-down list of the following buttons:
  - Select all. All rows of the table are selected.
  - Clear table. All rows are deleted from the table.
  - Delete selected rows.
  - Move to Storehouse. The information form selected rows are moved from the table to the storehouse. Selected rows are deleted form the table of sheets.
  - Remove Cut out Material. Deletes the rows, which contain already cut material in a current session.
  - Copy to Clipboard. Selected rows are copied to the clipboard.
  - Add from Clipboard. Data from clipboard are added to the end of the table of sheets.
- Button Sort by... with the pull-down menu, which contains the following items:
  - Material. Sorting by material type.
  - Length. Sorting by the sheet length.
  - Height. Sorting by height (width) of sheet.

- Quantity. Sorting by quantity of sheets.

- Button Edge Trim. Click this button to define the dimensions of material to be cut out of the edge.

This option is very useful when the initial material sheets have some edge defects. When you set up the dimensions in this option, the actual size of the sheet to be cut will be reduced.

You can also adjust this option for one particular row, using the field "Edge Trim" on the right side of the row.

4.3 Part Data

In order to get layout diagrams you have to add dimensions, quantity and texture of the parts into the Table of Parts. Dimensions are added along "X" and "Y" sides correspondingly (dimensions are added in real type).

Above the table there is the panel of buttons, which consists of:

- Pull-down list of the names of materials.

To choose material, click the button of mouse on the name of material you want to pick out. If you have some rows selected, the material will be changed in all these selected rows. The program remembers the last chosen material and inserts it when you input new data to the table until next change.

- Pull-down list with the types of edge band.

By picking out a type of edge band from this list, you can specify the type of band that will be used for later part banding. The band can be located at the top, bottom, left or right of the part. You can not use the edge band for AutoCAD details. This option will be applied to all selected rows.

- Tools button with pull-down list of the following buttons:
    - Select all. All rows of the table are selected.
    - Clear table. All rows are deleted from the table.
    - Delete selected rows.
    - Copy to Clipboard. Selected rows are copied to the clipboard.
    - Add from Clipboard. Data from clipboard are added to the end of the table of parts.

- Button Sort by... with pull-down menu, which contains the following items:
    - Material. Sorting by the material type.
    - Length. Sorting by the part length.

- Height. Sorting by height (width) of the part.
- Quantity. Sorting by the quantity of parts.
- Rotation. Sorting by the sign of rotation (rotate, do not rotate, and joint rotation).

- Button Edge band Arrangement with pull-down menu, which contains the following items:
  - Left. Marks the left side of the part by the selected edge band type.
  - Top. Marks the top of the part by the selected edge band type.
  - Right. Marks the right side of the part by the selected edge band type.
  - Bottom. Marks the bottom of the part by the selected edge band type.

Use can use this feature only if some rows with edge band have been selected. This button is active only when the edge band type has been specified for this particular row of the table.

- Button Rotation with pull-down list, which contains the following items:
  - Do not rotate. The part must not be rotated toward the texture of the sheet.
  - Rotate. The part can be rotated toward the texture of the sheet.
  - Joint rotation. The part's location (will be rotated or not) will be the same as one of the parts with the same material type and the rotation sign.

This sign can be specified in the cell of the table ("Rotation"):

0 - do not rotate;

1 - rotate;

2 - joint rotation.

- Button AutoCAD Parts with pull-down list, which contains the following items:
  - Add AutoCAD Part. The dialog window appears, when you can choose AutoCAD file (.dxf ex tension). After you have chosen the file, the visual representation of the detail is shown. Here you can load the detail to the end of the table or cancel. The file name is added to the corresponding field "Notes".
  - Show AutoCAD Part. The form that shows the visual representation of AutoCAD part for selected row appears.

The material type of AutoCAD parts is highlighted by blue color. You cannot change the dimensions or choose the edge band for AutoCAD part. The dimensions of the described rectangular over Auto-CAD part are calculated automatically. You can use the field "Use indent" in the table. Click this field if you want the indent to be used for this detail. See also "General Options".

4.3.1 AutoCAD Parts

You can import parts from AutoCAD to the table of parts. (See also "Part Data")

For layout optimization the AutoCAD part is described by the rectangular (pseudo curvilinear cut).

AutoCAD part always is inserts to the end of the table of parts; its material is marked by blue color. You cannot change the dimensions or choose the edge band for AutoCAD part.

The dimensions of the described rectangular over AutoCAD part are calculated automatically.

The part must be created in AutoCAD program and meet the following requirements:
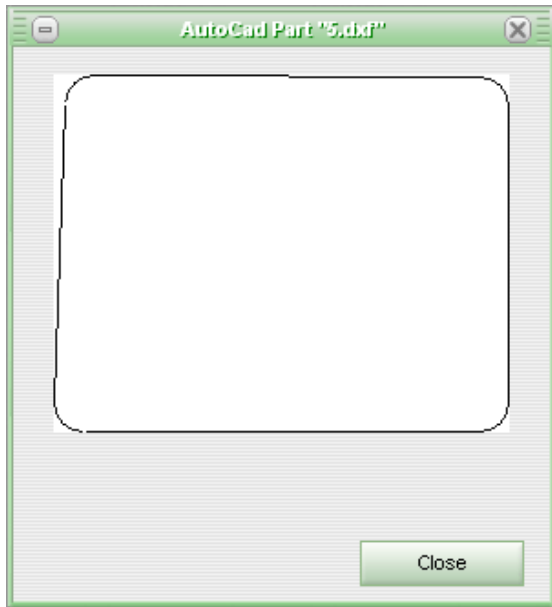
- it must be a self-contained and rectilinear;

- must have metric dimensions (mm);

- must be the only one per picture;

- must contain only segments of straight line and arcs of a circle;

- must be smoothed over (see "change poliline" in AutoCAD program) ;

- must be saved to file with one of the following formats:
    - "AutoCAD 2000 DXF (*.dxf)";
    - "AutoCAD R14/LT98/LT97 DXF (*.dxf)".

4.4 Data Import

There are two ways to import initial data to the program:

1. From text file.

The structure of the text file must be the following:

[Material]

L H MaterialNum Quantity Priority EdgeLeft EdgeTop EdgeRight EdgeBottom Note

L H MaterialNum Quantity Priority EdgeLeft EdgeTop EdgeRight EdgeBottom Note

. . . .

. . . .

[Detail]

L H MaterialNum Quantity Rotation Note

L H MaterialNum Quantity Rotation Note

. . . .

. . . .

Where:

L - length of the sheet/part.

W - width (height) of the sheet/part.

MaterialNum - the number of material in the correspondence with the number in the table of sheets.

Quantity - quantity of sheets/parts.

Priority - reserve.

EdgeLeft – left side edge trim.

EdgeTop - topside edge trim.

EdgeRight - right side edge trim.

EdgeBottom – bottom side edge trim.

Note - any comments.

Rotation - the sign of rotation of the part. (0 - do not rotate, 1 - rotate, 2 - joint rotation).

Example.

[Material]

2000 2000.3 1 10 0 2 2 2 2 12345

1000 1500 2 50 1 0 5 0 0 abdc

700.23 500.4 3 70 0 0 0 0 0 zzzzz

[Detail]

100 200 3 10 1 xxxyyy

300.3 200.24 1 20 0 tttt

345 234 1 2 2

120.3 250.1 24 13 2 123456

Attention! The structure of the text file can be changed in the next versions of Cutting 3.

2. From the Cutting 2 project.

To import data from Cutting 2 file, click "Main" → "Import" → "From Project Cutting 2"

In the appeared dialog window you can choose the name of Cutting 2 project. These files have ".cut2" extension.

Attention! The information about number of sheets and edge band are not saved. You have to input it manually to the tables of sheets and parts.

Note. All data are added to the end of the tables while importing.

5. Material Storehouse

The newly entered materials and unused offcuts can be stored in the virtual Material Storehouse.

To view the material storehouse click tab button on the notepad of the Main window or select "Material Storehouse" in the Main pull-down menu.
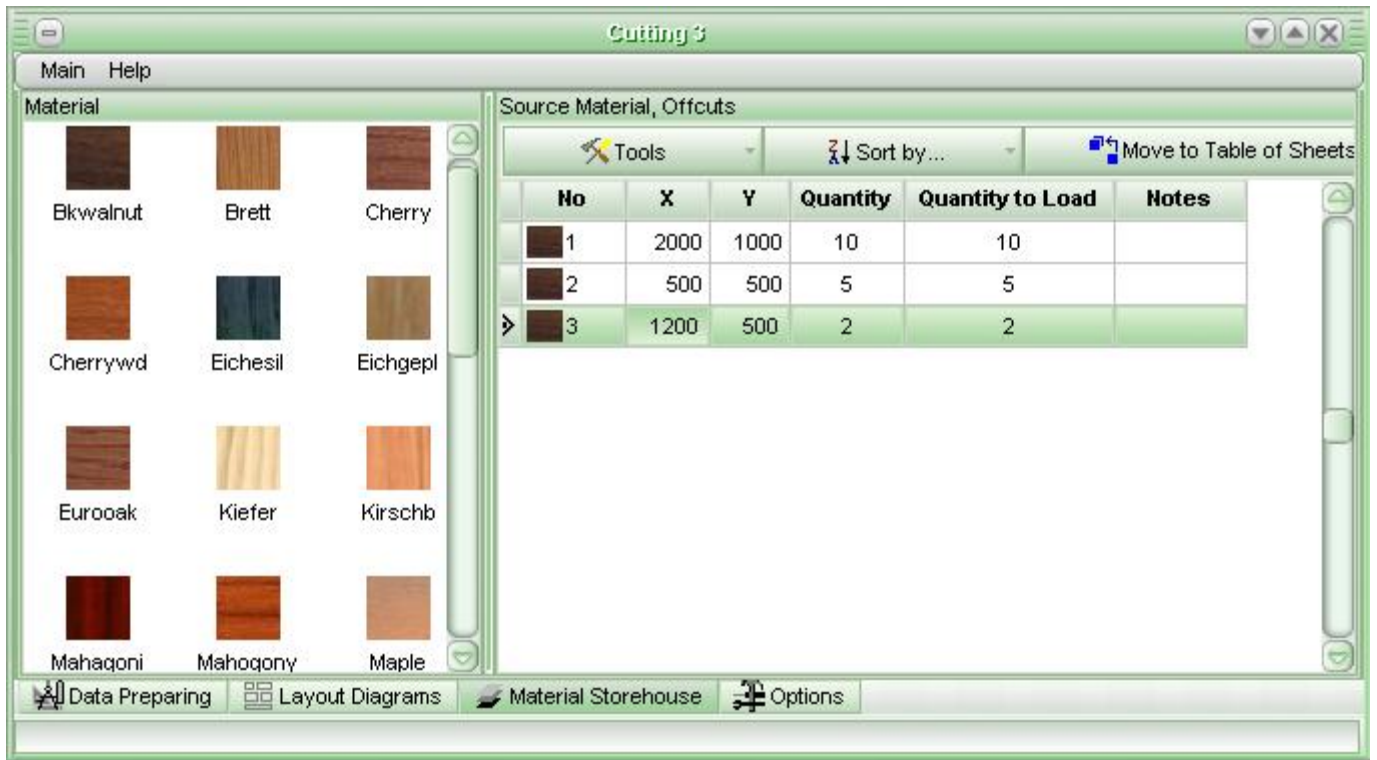
There are material types (patterns and names) in the left part of the window. The storehouse is supplied by 25 textures and names of material. If you don't like the name of the material, you can change it in the table of sheets. The name of this material will be changed automatically in the Material Storehouse.

Sheet dimensions and quantity are displayed in the right part of the Material Storehouse window. You can use the field "Notes" to keep some information about technological number of sheet or offcut.

To change material type, click selected material type with your left mouse button. Sheets dimensions and quantity of this selected material are displayed in the right part of the Material Storehouse window.

You may use two methods to input information to the Material Storehouse:

- Manually enter data (dimensions, quantity and description).

- Select offcuts on the layout diagram and move them into the Material Storehouse.

To operate the Material Storehouse, use the panel of button above the table:

- Tools button with the pull-down list that contains the following items:

    - Select All. All rows of the table are selected.

    - Clear Storehouse from This Material. All sheets and offcuts of selected material type are removed from the Material Storehouse.

    - Delete Selected Rows.

    - Copy to Clipboard. All selected rows are copied to clipboard.

    - Add from Clipboard. Data rows from clipboard are added to the end of the table.

- Sort by… button with pull-down list with the following items:

    - Length. Sorting by the length of sheets.

    - Height. Sorting by the height (width) of sheets.

- Quantity. Sorting by the quantity of sheets.

- Move to Table of Sheets. All selected rows of material will be moved to the table of sheets to cut out. Do not forget to specify the necessary quantity of sheets you want to move, using the field "Quantity to Load".

6. Layout Diagrams

After the calculation is over, the window of **Layout Diagrams** appears. You can also click the tab "Layout Diagrams" of the notepad in the main window or use "Main" → "Diagram Layouts".
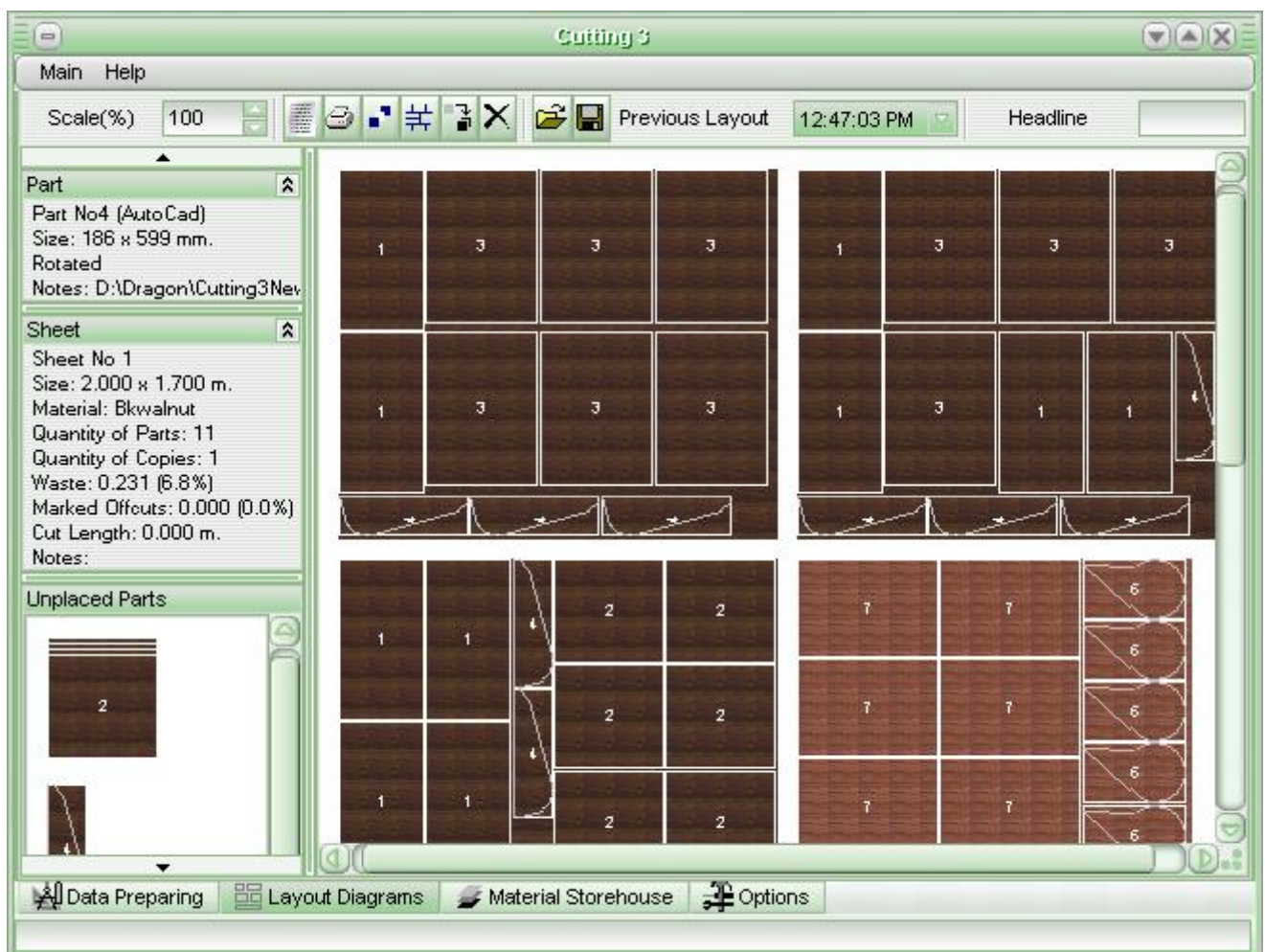
The layout window consists of 5 parts.

1. At the top of the window there is the panel of control components. They include:

- **Buttons:**

   - Scale. Select the most convenient for you scale to view the diagrams. Scales vary from 25% to 1000% with interval of 25%.

   - Report. Click this button to view the report window with total information about layout.

   - Print. Click this button to preview of diagrams and print.

   - Allocation of Parts. Here is the total report about cut and allocated parts.

Material	No in Table	Size	Quantity	Placed	Notes
Bkwalnut	1	400 x 751	10	10	
Bkwalnut	2	507 x 485	10	6	
Bkwalnut	3	523 x 712	10	10	
Bkwalnut	4	186 x 599	10	9	D:\Dragon\Cutting3N...
Cherry	5	523 x 478	10	10	
Cherry	6	473 x 282	10	10	D:\Dragon\Cutting3N...
Cherry	7	652 x 458	10	10	
Eichesil	8	522 x 800	10	8	
Eichesil	9	317 x 635	10	8	
Eichesil	10	240 x 224	10	10	D:\Dragon\Cutting3N...

- Show/Hide Cut Lines.

- Store Offcuts. Marked offcuts will be saved to Material Storehouse.

- Unmark All Offcuts. All marked offcuts are unselected.

- Open Layout. Opens previously saved layout diagrams from a file with ".s13" extension.

- Save Layout. Saves current layout into a file with ".s13" extension.

- Previous Layout **with pull-down list. To restore a previous layout, choose its date/time.**

- Headline**. Here you can type some text to name the layout diagram. This text will be displayed while printing the diagrams.**

There are 3 components at the left of the Layout Diagrams window:

2. **Part information window**. There is information about the part, above which the mouse pointer is placed over.

3. **Sheet information**. There is information about the sheet, above which the mouse pointer is placed over.

4. **Unplaced Parts information window**. There are the parts that have not been located on the sheets, because of insufficient place. Here you can rotate parts by clicking the mouse button on the part.

5. **The layout diagrams** are displayed at the center of the window. There are sketchy displayed sheets with allocated parts.

6.1 Marking the Offcuts

All offcuts can be marked and used for subsequent cutting. Marking the offcuts is the selecting of the offcut on the layout diagram and moving it to the Material Storehouse.

To mark the offcut, click the mouse button on the free-from-parts place of the sheet. The offcut will be selected by blue color. To deselect the offcut, use the same means.

While marking the offcuts, please, follow the next instructions:

1. The offcut selection varies on the location of mouse pointer.

Generally, place the mouse pointer close to the edge of the part or already marked offcut. Different offcuts can be marked with different place of mouse pointer on the sheet.

2. The marked offcuts behave the same as parts located on the sheet (reserve place on the sheet).

3. While marking the offcut, the user is responsible for the propriety of using it on manufacturing.

Clicking the button "Store offcuts" will save all marked offcuts. This will move all the marked offcuts to the Material Storehouse and deselect them on the layout sheets. All stores offcuts can be used in subsequent cutting.

Attention! When you mark the offcuts on the sheets that have more than 1 copy, the offcuts will be selected on all copies of these sheets. The same is with deselecting offcuts.

6.2 Parts moving

The layout diagrams can be changed, if you want to correct manually the location of some parts. These parts can be moved to another place of sheet, or another sheet.

User is responsible for the correctness of the layout when changing the layout manually.

You can move:

1. Parts form the sheet to the panel of Unplaced Parts.

2. Parts from the panel of Unplaced Parts to the sheets.

To move the part, press left mouse button on the parts you want to move, and drag it to a new place. While dragging the part is scratchy displayed in less scale with the number in the middle.

If you see a white rectangular on the scratch model of the moving part, you can place it here. If you see crossed circle on the scratch model of the moving part, you cannot place it here.

When you are about to move the part, please, keep in mind, that:

1. Moving from the layout sheet to the panel of Unplaced Parts.

    1.1. Part should be replaced on the free space on the panel of Unplaced Parts.

    1.2. If the part is moved from the sheet that has more than 1 copy, then all copies of this part will be moved, accordingly the number of copies of the sheet. For example, if the part is moved from the sheet, that has 7 copies, and then 7 parts will be moved to the panel of Unplaced Parts. The quantity of part to be moved is displayed at the right upper corner of the part's scratch model.

2. Moving from the panel of Unplaced Parts to layout sheet.

    2.1. The part can be placed only on the sheet that has number of copies no more than 1. If the number of copies is more than 1, the part cannot be placed on this sheet. Therefore, you can move only one part at one time.

    2.2. The material of the part to be moved and the material of the sheet, where you want to place this part, must be the same. You cannot move the part of "Maple" material to the "Cheery" material sheet.

    2.3. Before the moving the part can be rotated. Rotating is allowed only at the panel of Unplaced Parts and if the part has rotation sign "1" ("rotate"). To rotate the part, click right mouse button on the part.

2.4. After moving the part, it automatically placed at the left upper corner of the free space. (See 6.1 Marking the Offcuts).

After the parts have been moved, the length of cut lines, offcut area and wastes are automatically re-calculated.

6.3 Summary Report

The Summary Report looks like this:

Here you can see summary information about layout.

Here are also the lengths of cut lines, total area of sheets and parts, offcuts, wastes, etc.

6.4 Layout Printing
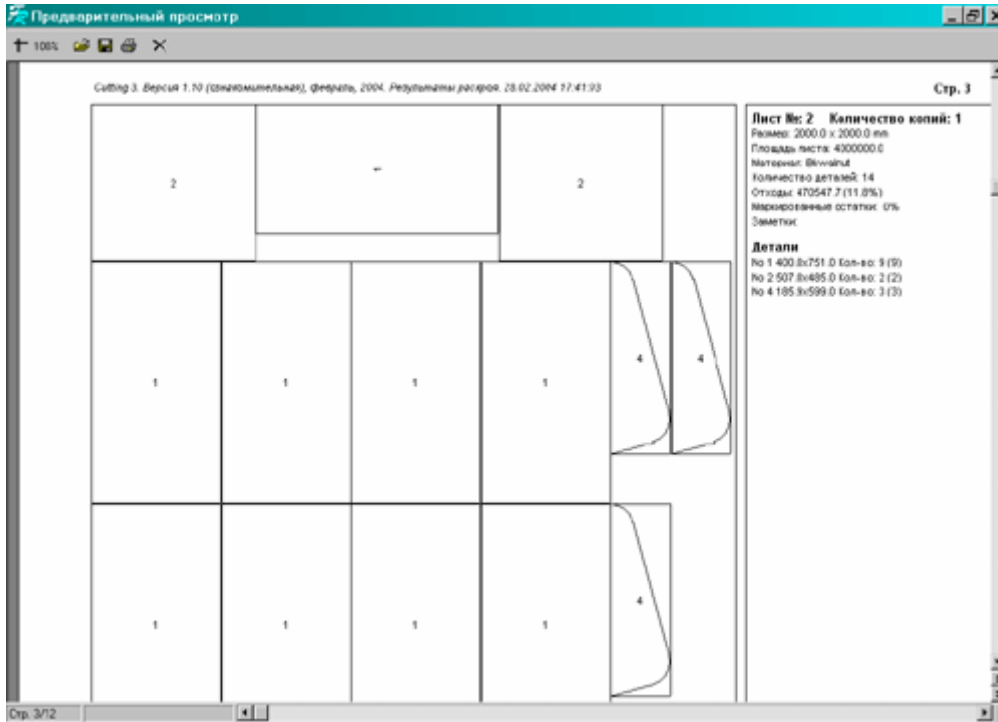
7. Clipboard

Using the clipboard you can export data from the tables of sheets, parts and storehouse to other programs that use Windows clipboard (for example, Excel, Word, etc). This feature can be used to prepare data for calculation in other programs. Also you can use it to copy and paste equal rows of the tables.

Click "Tools" and "Copy to Clipboard" in the pull-down list to copy data from the tables of sheets, parts and storehouse to clipboard.

Attention. Only selected rows can be copied to clipboard.

All data must be separated by the standard symbol of tabulation.

All rows must be separated by the standard symbol of "Next string" and "¶".

Here is the structure of data clipboard for the table of sheets:

• the number of material in correspondence with the number of material in the table of Name of Material in Options;

• sheet dimensions along X;

• sheet dimensions along Y;

• left edge trim;

• top edge trim;

• right edge trim;

• bottom edge trim;

• the quantity of sheets;

• notes.

Example from Excel:

0	2000	1700	0	8	0	0	5	List 1
2	1800	1500	0	0	0	0	10	List 2
20	1300	1800	5	0	5	0	3	
4	1000	1200.25	5	8	5	0	8	New List

Next is the structure of data clipboard for the Material Storehouse:

- the number of material in correspondence with the number in the table of Name of Material;

- sheet dimensions along X;

- sheet dimensions along Y;

- the quantity of sheets;

- the quantity to load;

- notes.

Example from Excel.

0	2000	1000	10	10	N1
0	500	500	5	5	
0	1200	500	2	2	List 20

Next is the structure of data clipboard for the table of parts:

- the number of material in correspondence with the number in the table of Name of Material;

- part dimensions along X;

- part dimensions along Y;

- the quantity of parts;

- rotation (0 – do not rotate, 1- rotate, 2 – joint rotation);

- the name of edge band. If it doesn't have – leave the blank row;

- the sign of edge band at the left side of the part. Might be "true" or "false". Always type "false" if the edge band is not used;

- the sign of edge band at the top of the part. Might be "true" or "false". Always type "false" if the edge band is not used;

- the sign of edge band at the right side of the part. Might be "true" or "false". Always type "false" if the edge band is not used;.

- the sign of edge band at the bottom of the part. Might be "true" or "false". Always type "false" if the edge band is not used;

- indent. Might be "true" if you want to use the indent or "false" if you do not. Always type "false" if the indent is not used. See "Options" for more information about Indent;

- notes;

- sign of AutoCAD part. "D"- it is not the AutoCAD part, "A" – it is the AutoCAD part.

Example from Excel.

0	507	485	10	1		False	False	False	False	False		D
2	472.9	282.5	10	2		False	False	False	False	False	10.dxf	A
2	652	458	10	2	Edge 1	False	True	False	True	False	Door	D
4	240.5	224.3	10	1		False	False	False	False	False	3.dxf	A
0	523	712	10	0		False	False	False	False	False		D