User guide

Software version **7.20**

Timber sawing optimization software

** Since 2005 **

Version: January 31, 2024 (19:53)

Before you begin

This instruction manual does not provide instruction in the basic operation of the personal computers, or the basic operation of Windows operating system; refer to the manuals supplied with the computer.

The screens of CutLog in this user guide may differ from the current version of CutLog because this software is constantly improving.

Contents

1 System requirements

For running CutLog your computer must meet some requirements. Basically, it is the same as for .NET 4.8, which is required for running.

Important

CutLog require 64-bit version of Windows operating system.

1. 1GHz Pentium processor or higher
2. 4GB RAM or more (recommended 5GB and more)
3. 200MB or more of available hard-disk space
4. A True Color (24 bit) or greater monitor with a minimum resolution of FullHD or higher is recommended.
5. Free USB port for Hardware key (in case of hardware key license)

Operating system Windows 10 (22H2) and Windows 11 is recommended. Microsoft .NET Framework 4.8. required

For Windows 10 support please refer to:
https://learn.microsoft.com/en-us/lifecycle/products/windows-10-home-and-pro

2 Before the installation

CutLog™ software is using Sentinel Hardware Key from Gemalto. This requires presence of hardware key in the USB port of a computer, where you should run CutLog™ and it will not be able to run in full mode without it.

Hardware key contains all necessary information about your license (validity, features purchased etc.) and no additional driver is necessary to install. Windows has native support for hardware key.

So after installation of CutLog, you can just plug hardware key into USB port and start CutLog.

3 Installation

Important

If you have full version and also the **hardware key** , don't insert it into the USB port of the computer. Hardware key can only be inserted after successfull installation of CutLog.

Program CutLog v7.20 can be installed from hard drive. Installation can be run from file `Setup_CutLog_7.x.y.exe` where:

X is subversion number

Y is build number

You don't have to install Microsoft .NET Framework 4.8 prior to this software. If you have not installed .NET 4.8, then CutLog will install it itself during installation process.

When you run exe installation file Windows UAC (user access control), asks for access of it to a hard drive.

CutLog installation file is digitally signed and it is proving of original installation file created by Tekl STUDIO s.r.o.

If you don't see Tekl STUDIO s.r.o. as a verified publisher, then the installation file has been altered! See Image [1]

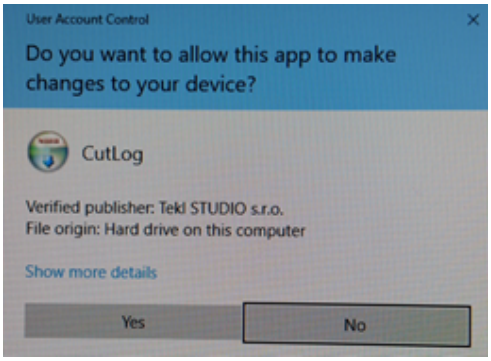


Figure 1: UAC windows warning

At first, the installation program will ask the user for the installation language. Select required language and press OK .

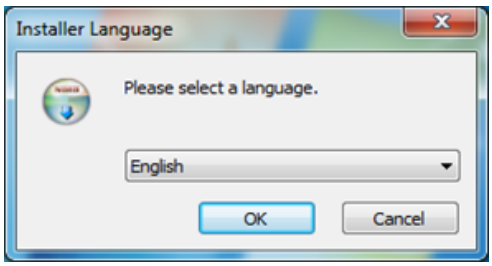


Figure 2: Language selection

Next figure is [3]. Press Next . (Version number may vary base on the version you are installing)

Figure 3: Welcome screen

For continuing installation, you have to read through END-USER LICENSE AGREEMENT for the CutLog program. You can continue with installation only after accepting it. (Fig.[4])

Figure 4: EULA agreement

You will be prompted for the installation directory. Installation program will preset the destination directory for you. It is recommended to leave it unchanged. Press Install to continue.

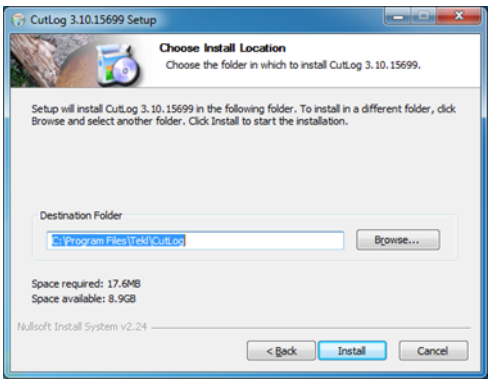


Figure 5: Folder for installation

Installation process. During this process are created: the program directory and startup menu with access to the CutLog program. Database will be set according to the language you have selected. Important! In this step is installation program checking for .NET Framework, which will be installed automatically in a case of absence.

Figure 6: Installation complete

For activation of CutLog to full version, please see page 7 - 'Registering and activation' for more detail.

3.1 Uninstallation

There are two possible ways to uninstall CutLog:

1. From Control Panel select add/remove programs. Then select CutLog and uninstall.
2. From Start menu/CutLog/Uninstall

Both choices run uninstallation process. You should allways follow the instructions.

4 Windows menu

After successful installation you can find CutLog menu under Windows start:

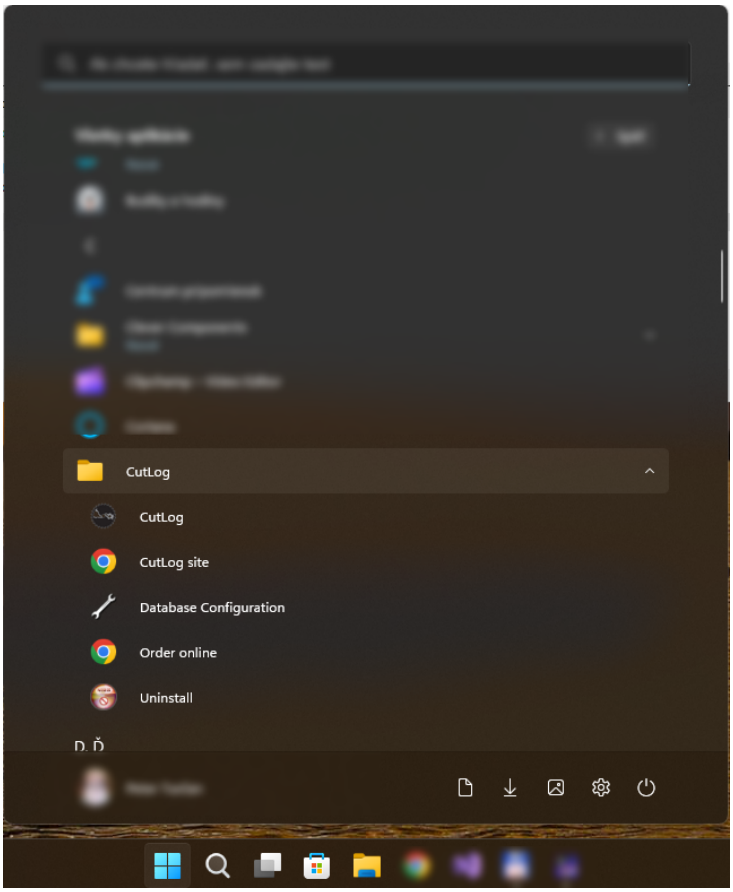


Figure 7: Windows 11 menu

You can see "`Database configuration`" utility, which makes backup of the CutLog database. You can also do some database management. See 5 Database management on page 14. for details.

"CutLog" for start CutLog optimization software.

5 Database management

CutLog stores data into internal database. It is highly recommended to do regular backup. You can do this either by manual utility described here or with automatic backup which is described at description of settings

5.1 Local database

Backup and restore utility can be run from Windows start described on previous page:

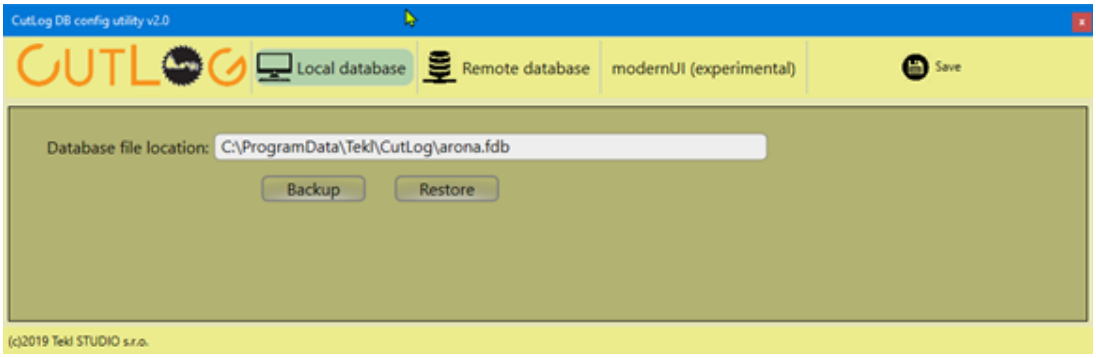


Figure 8: CutLog's database management tool

You can backup or restore database of CutLog. You can also see location of CutLog database file.

This section is not applicable to remote database, only to the local one.

5.2 Remote database

Important

For remote database you must have client-server version of CutLog

CutLog in **client-server** version can access to remote database, which can be located anywere on internet or local network. Docker hosting of database is also supported.

Access to remote database is defined in `Remote database` section.

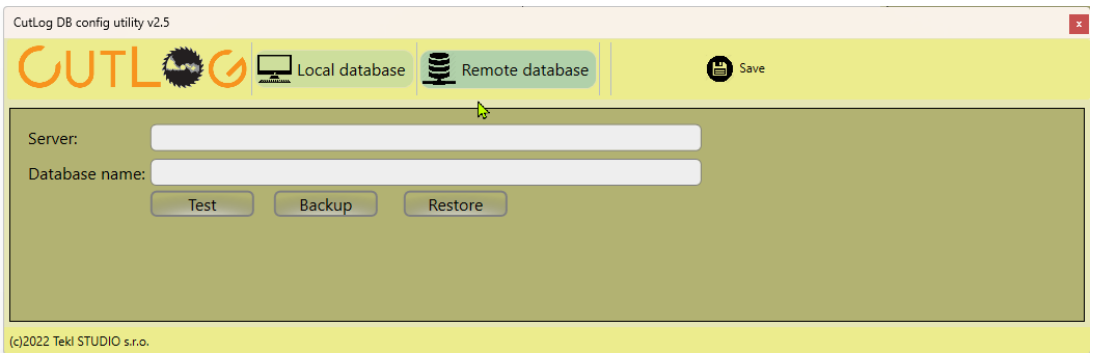


Figure 9: Remote database configuration

You have to define a Server address (either IP or DNS name) and a database name. With the Test button you can test access to the database. If everything is correct, then `Server` and `Database name` change color to green.

After successful configuration you have to store settings by Save button.

For Backup or Restore remote database you can use either Backup or Restore button. This will make backup to local file or restore network database from local file.

Configuration of the remote database is written in separate document.

6 Menu structure

Figure 10: CutLog main screen

After the startup of CutLog main, a window of application will be displayed. On the top of the window is the main menu, which is used for access for all CutLog functions.

There is also information about license owner, upgrades expiration or optional modules within CutLog.

1. Base data contain main settings and data of program

   Wood species (p. 20)

   Shrinkage allowance are defined for known wood species (p. 21)

   Coreboards definition of a core boards (p. 23)

   Products definition of products for all other optimization functions (p. 24)

   Length of timber timber length policy (for FlexiCut2) (p. 29)

   Diameters Definition of most used diameters of sawlog. You can choose them in optimization functions (p. 30)

   Length of sawlog definition list of sawlog length (p. 31)

   Monthly settings settings for the profit analyzer (p. 32)

   Sawing speed sawing speed used in various calculations (p. 33)

   Sawlog quality class define quality of sawlogs (p. 33)

   Sawlog price/heartwood diameter define price of sawlog base on quality, supplier and diameter (p. 33)

   Customers (p. 34)

   Suppliers (p. 34)

   Sorting lines (p. 35)

   Settings

      Application CutLog settings (p. 36)

2. Stock

Stock (p. 92)

3. Optimization timber sawing optimization functions

   FlexiCut2 (p. 58)
   Circular cut (p. 88)
   FlexiCut (p. 58)
   Quarter saw (p. 90)

4. Orders (p. 93)

5. Tools

   Calculator
      Shrinkage allowance
      Log volume

6. Modules optional modules for CutLog

7. Help

   User guide open user guide from web page
   Equipment menu wizard set menu visibility base on your technology
   Online activation activate the CutLog license online (p. 18)
   Import license key activate the CutLog license offline (p. 18)
   Request for license in case of electronic license you must use this form for license initialization
   Order online open online shop for ordering CutLog license
   Feedback / Feature request form for directly sending message to TEKL STUDIO Ltd. (p. 18)
   Check for update check for program update
   About display software and license information

7 Registering and activation

Info

If you purchased license (either hardware key or electronic), you must activate CutLog to use it in a full functionality.

It can be done by two ways, either offline or online.

7.1 Offline activation

This functionality is deprecated. Activation is done online only.

You receive a License Key (by email only) and a Sentinel Hardware Key (SHK) - for CutLog version 6.xx and older. For activation of the CutLog functionality you must import this key file into the program together with plugged SHK into USB port of computer.

Then use Help › Import license key from main menu and find appropriate file on your hard drive.

7.2 Online activation

This feature is used for activation of electronic license or for extending existing license either electronic or bind to hardware key. This is simpler procedure, but you must be connected to the internet on a computer with CutLog installed. Just select Help › Online activation (see Fig. 11).

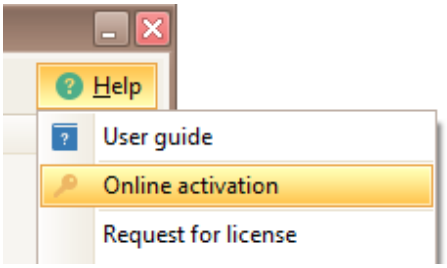


Figure 11: Online activation menu

After successfull activation, you will see the name of license on main window:

Important

In case of **an electronic license** , you have to restart CutLog after activation, to load the electronic license into software.

7.2.1 Request for license

In case of **electronic license**, user must firstly install CutLog to destination computer, where it will be regularly used, and then request for license. For this purpose is used Help › Request for license (fig. 13)

Figure 12: Main window

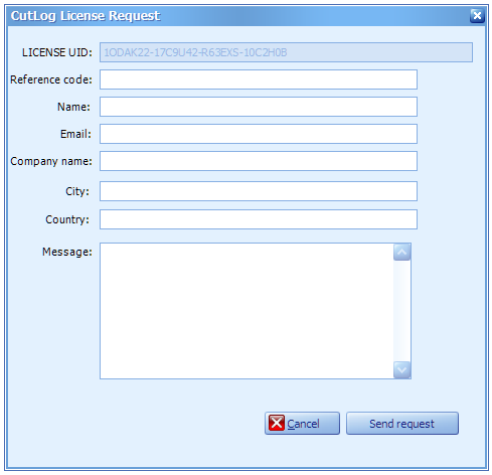


Figure 13: Request for license

After filling in the form press Send request button. After activation of license you will be notified by email. Then you can activate license on your side online. See 7.2 Online activation on page 18.

8 Base data

Before you use any optimizing function, you must correctly set appropriate data. CutLog is delivered with the predefined wood species, shrinkage allowances and products. However, maybe you want to set your own. You must set it before you use optimization itself. Those data should reflect your technology and possibilities.

Mostly it is not needed to set those values again after you set them up, except for products. Those are "live" data.

8.1 Wood species

Important

In whole CutLog software, in all functions you use there are basic definition - wood species. Everything is bind to wood species, from shrinkage allowance, to product definition or optimizations. First thing you need to define is set wood species you are processing. It is essential for all other settings. You can define as many species as you need.

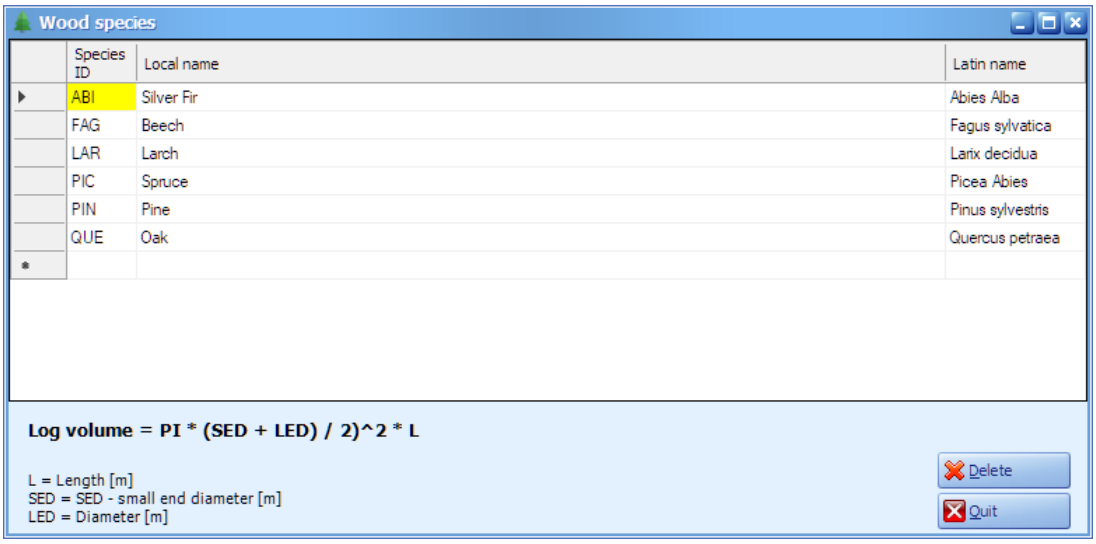


Figure 14: Wood species

In menu Base data > Wood species (Fig. 14) are defined wood species used in program. Only species defined here are known and can be used in other functions. Here you must enter all wood species which are you using (or plan to use) for calculations.

In this window can be modified only `Local name` and `Latin name`. It is not possible to change the ID, because of possible relations to other data and functions. You can add as many species as needed. Under Species list is shown formula used for calculation of sawlog volume. CutLog supports three formulas:

- Common formula
- A.Nielsen

- (Japanese Agricultural Standard)

For details, refer section 8.14.7 Log volume on page 40.

Info

You can define as many species as you need. CutLog is not limited to number of data in any ways

those calculations can be changed in settings (see page 40 - Log volume)

8.2 Shrinkage allowance

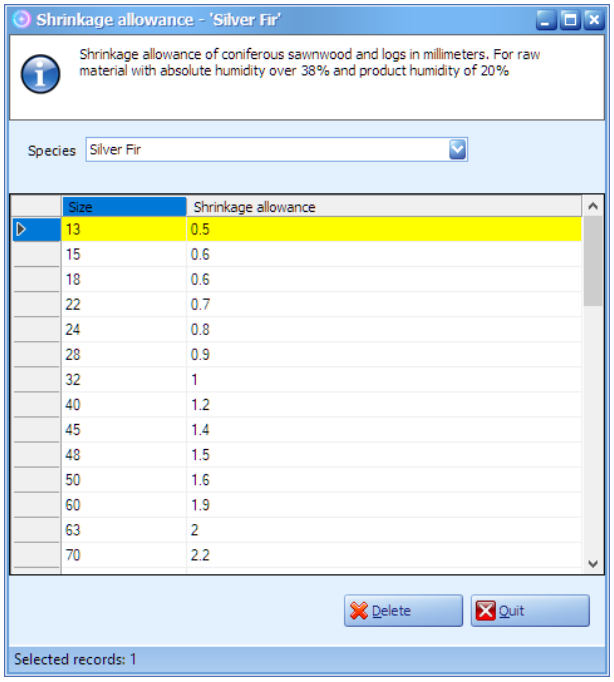


Figure 15: Shrinkage allowance

Humidity is one of the most important factor, which influence on many wood properties include size. Changing size base on humidity is called shrinkage. It should be considered during the optimizing process in form of different sizes for sawing and invoicing process.

Allowances are defined separately for each size of wood. For this purpose is used Base data > Shrinkage allowance (Fig. 15). However, it is not necessary to enter all allowances for all sizes of produced timber because if the specified size is not found here it is approximated from the others. However, it is recommended to enter as much data as you can here. It will increase the precision of calculation.

In this screen is possible to select multiple rows of data and copy them into another species. Select multiple rows you can either by Shift for range selection, or by Ctrl for select/deselect particular rows.

After selecting one or more rows you can press:

Ctrl + **C** , **Ctrl** + **Insert** Copy selected row/s to clipboards

Ctrl + **V** , Shift + Insert Insert selected row/s from clipboards to selected species. In case of existing row, it will be replaced

Delete Delete selected row/s

If you want to enter some allowances, you must define wood species itself for first (page 20). By using top combo-box you will select wood species and then you will define allowances for it. Note, that for specified species can be size defined only once with one allowance. As it is written on window you will define shrinkage allowance for nominal size. (*Humidity and allowances can be various depends on wood species.*)

Size defined in this function is not checked for size defined in normatives. Here can be defined as much allowances as necessary. (*Normatives feature is obsolete*)

8.3 Coreboards

In screen Base data > Coreboards (Fig. 17) is possible define coreboard sizes in case of selected option "**Remove core board**" in Flexicut2 (Fig. 16)(other optimization functions doesn't support this option)

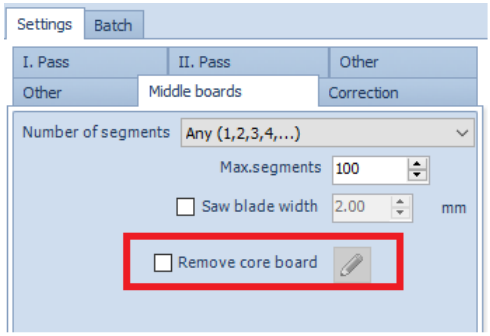


Figure 16: FlexiCut2 remove core board option

Screen looks simple (Fig. 17) It allows to define coreboard thickness base on sawlog diameter and width of coreboard (first two columns).

CutLog looks for thickness (and price, comment...) base on diameter and resulted width of boards from the last line.

For example for diameter 450mm it use thickness of core board 45mm, regardless of width. For sawlog diameter 300mm and coreboard width 200mm it uses thickness 40mm. For diameter 300mm and coreboard width 120mm it uses thickness 35mm. And from diameter 0 to 300mm it uses thickness of coreboard 30mm.

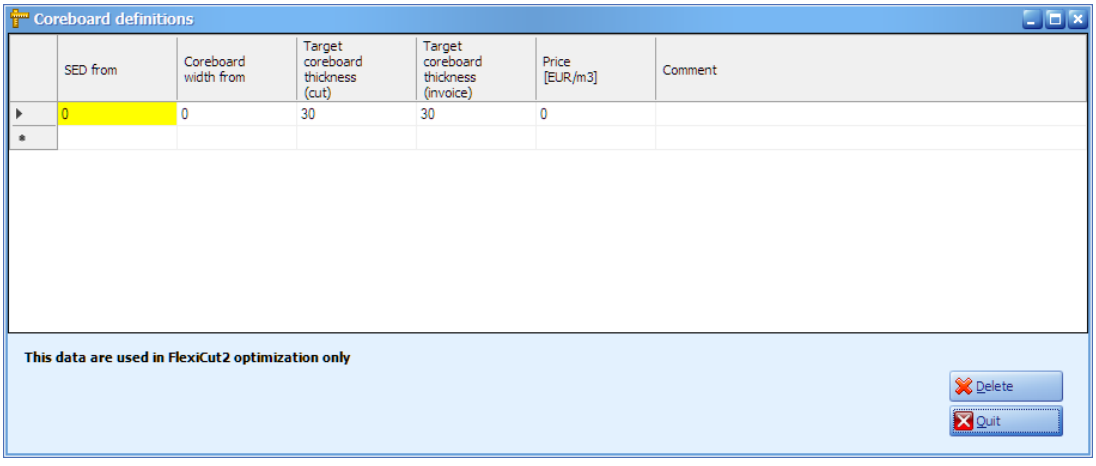


Figure 17: Core board window

8.4 Products

Important

This is core definition of products for all CutLog functions. Before any optimization you have to define your products using this screen. CutLog must know, which timber sizes it can use during optimization process

Values defined for each boards size depends on settings in screen Settings > Products (8.14.3 Products on p. 38). Mainly you can define either exact size of board as Thickness x Width or width can be defined as interval between some values.

On top of screen is possible to define price and optional comment for core board. In FlexiCut2 is possibility to remove core board. Its price can be defined separately.

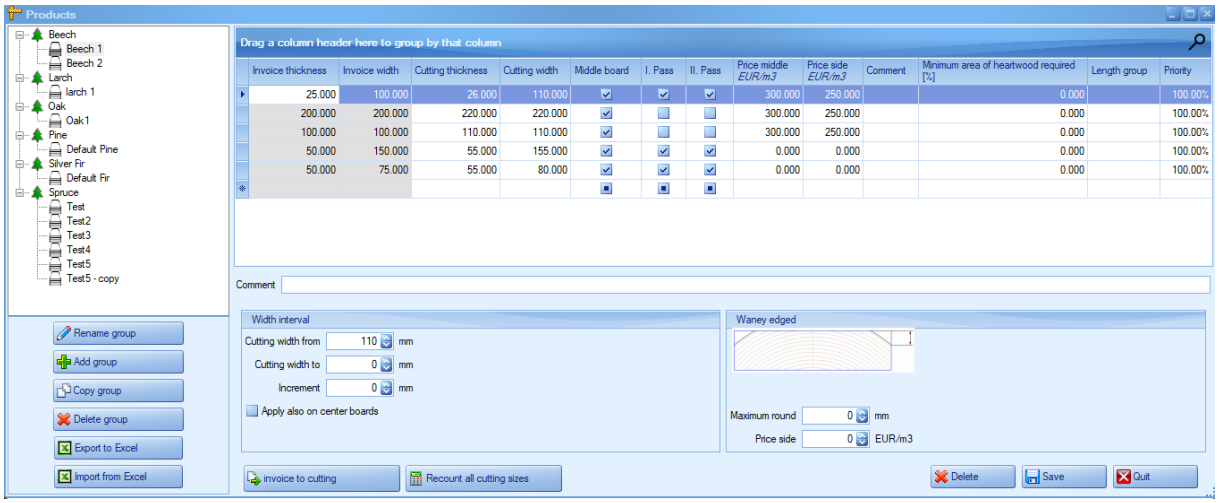


Figure 18: Products window

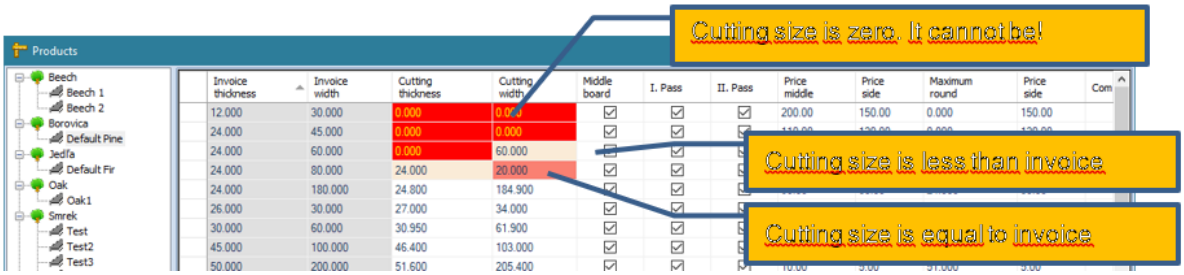


Figure 19: Products color highlight

In this function are defined dimensions for produced timber separately for each wood species. You can define any number of groups for grouping of dimensions. In optimization function then you have to choose particular group which will be used.

Insert key for inserting group for current species

Delete key for deleting group. Group will be deleted include all size combinations!

F2 key for renaming group

Data are edited directly in screen. After modifying is necessary to push Save button for storing the changes into database.

Units of measure are defined in FlexiCut configuration screen and are defined for 4 decimal places. Inch units are defined in decimal format.

For each combination of thickness/width should be defined these parameters:

invoice thickness/width is size which you have agreed with your customer. Volume on base of this dimensions will be invoiced. If user add new size in list, then Cutting size is counted as invoice size plus shrinkage allowance defined in „Shrinkage allowance“ function (see section 8.2 Shrinkage allowance on page 21).

Cutting thickness/width is size for calculation of optimization. It calculation base on positions of saw blades. Means, size of fresh sawn wood.

Allowed position of board (described in particular optimization functions description see page ...)

(a) **Middle board** – indicates, whether can be this size produced as middle board, if not, then it can't be in middle boards.

(b) **I. pass** – indicates, whether this size can be produced as side boards in first pass

(c) **II. pass** - indicates, whether this size can be produced as side boards in second pass

Price middle price of middle board (in prism - green color) per volume unit

Price side price of side board per volume unit

Maximum round see explanation below

Comment for any boards can be added comment.

Minimum area of heartwood required - If you enable "False heartwood diameter" in FlexiCut2 (12.8. False heartwood on page 82) then this is minimum area of false heartwood required in board

Length group - timber optional length group policy - see 8.5 Length of Timber on page 29

Priority - Timber priority see 8.4.3 Timber priority on page 28

For deleting of particular size press Delete button.

Cutting sizes are shown in different colors. Base on their comparison to cutting sizes. On the bottom side of frame, there are two buttons:

Invoice to cutting This function will copy all invoice IN SELECTED GROUP sizes to cutting sizes. It makes them equal

Recount all cutting sizes This will recount all cutting sizes IN SELECTED GROUP. It will set all width as addition invoice size and particular shrinkage allowance for this wood species. It is not necessary to define shrinkage allowance for every possible size defined here. If program did not find the exact size, it approximates it base on the others. If there is no allowances defined for species, it will not adding it.

Info

Remark: This product window can be directly run from optimization functions. In particular optimization function is button next to group selection. See Figure 20.

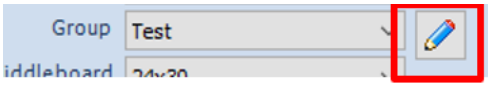


Figure 20: Access to Products window

8.4.1 Width intervals

In case, when you choose to define width interval in Settings Products (8.14.3 Products on p. 38) then width of board is defined in quite different way - see (Fig. 21).

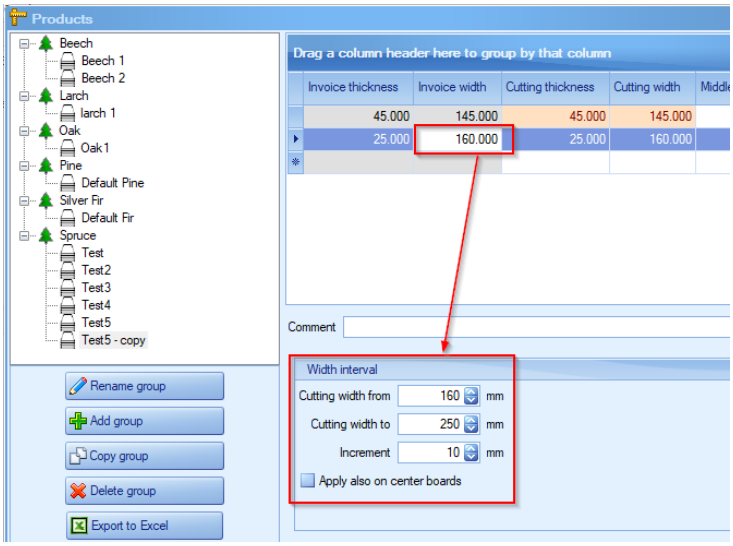


Figure 21: Products width interval definition

In this type of definition, you don't need to define all different width sizes for the same thickness. For example on image 21 are defined for thickness 25mm width from 160mm to 250mm with increment of 10mm, so CutLog will work with sizes: 25x160, 25x170, 25x180, 25x190 ... 25x150,25x160mm.

Then for example the results can be like in figure 22, where are for thickness of 25mm different board widths.

Important

- For interval is always width for sawing and invoicing the same
- By default, this interval is applied only to side boards (blue/green ones), but in case you need to apply it also for center (prism) boards, just check "Apply also on center boards" option.
- If you want to define exact size and not interval, then set "Cutting width to" to zero value.

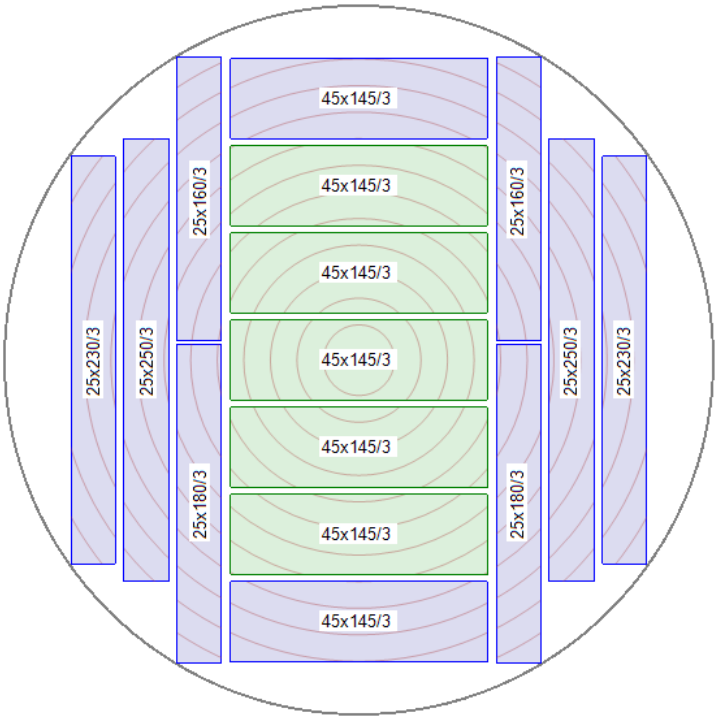


Figure 22: Width interval sample result

8.4.2 Waney edged boards

For define waney edged board is used field maximum round. For better explanation see the following figure 23.

T - sawing thickness

R – maximum rounding (R < T) (size of waney)

Figure 23: Waney edged board definition

8.4.3 Timber priority

Timber priority can change the result of optimization. **Default priority is 100%.**

During optimization is always calculated volume of board in resulted pattern and base of this volume is selected the best pattern as result. Volume of each board in patter is summarized together and compared between other possibilities.

In case you define some timber priority, then volume of board is multiplied by priority prior summarize all boards in pattern. So in case of 50% priority is volume multiplied by 0,5. so it is decreased by 50%.

For example one board 20x20 with 100% priority is better than one board 20x25 with 50% priority. Of course, when in result is one board 20x20 and two boards 20x25 with mentioned priority definition, then two boards have better volume after applying defined priority.

8.5 Length of Timber

In Base data > Length of timber (Fig. 24) you can define timber rounding policy.

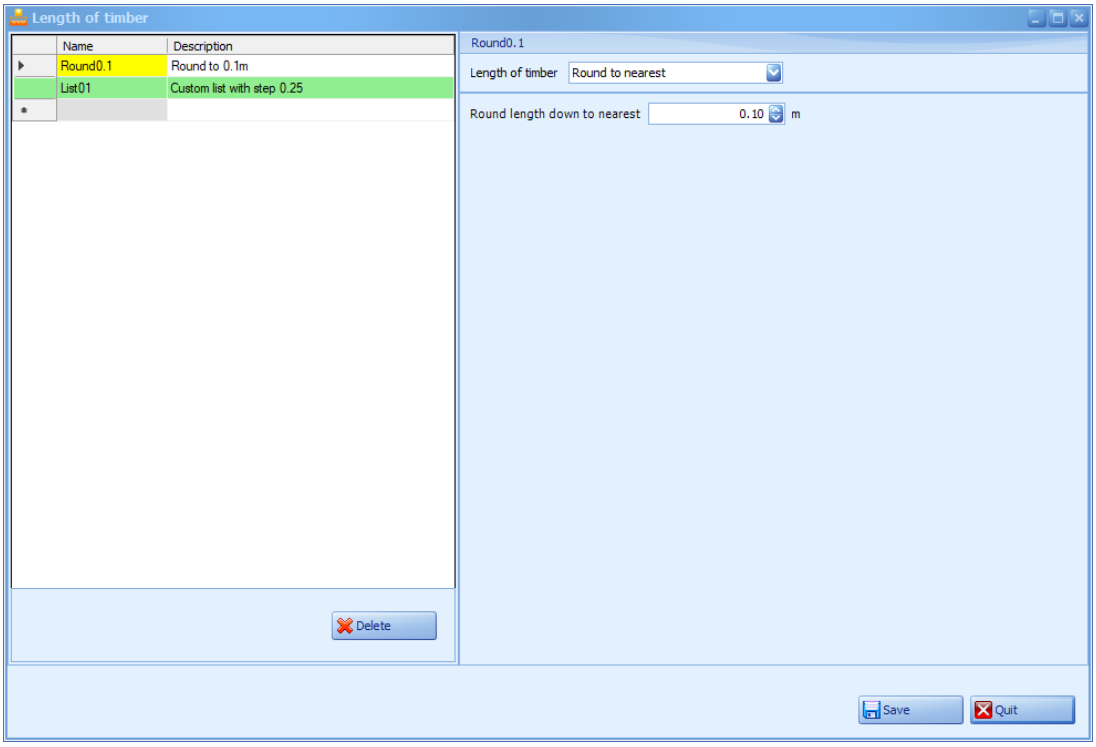


Figure 24: Length of timber

On left side, there is list of custom rounding policy. Length of center boards are default equal to length of sawlog, but side boards can be shorter. And length of these boards you can define in three ways:

1. Global rounding - from application settings menu
2. For each board
   - Rounding
   - List of allowed lengths

8.6 Diameters

This simple screen Base data > Diameters (Fig. 25):

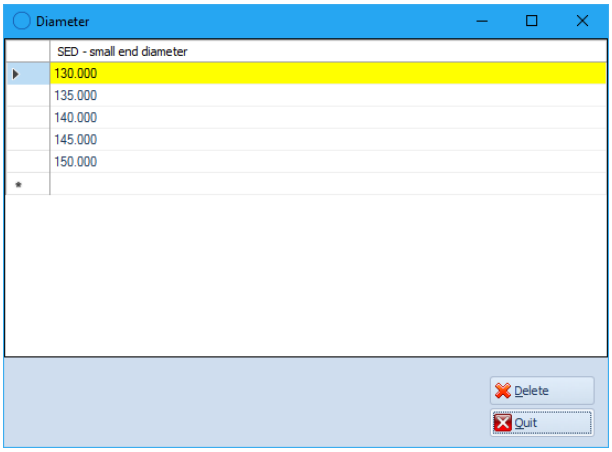


Figure 25: Diameters

Here you can define diameters, which can be used anywhere where diameter is necessary:

Figure 26: Diameters selection

Just press arrow down button to choose from list:

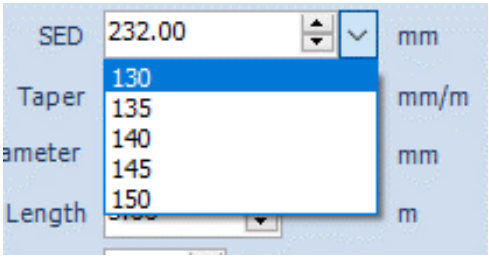


Figure 27: Diameters selection

If you have often used diameters,this screen is for defining them. You don't need to remember them and also entering them again and again into required input fields. You just select appropriate diameter from list.

8.7 Length of sawlog

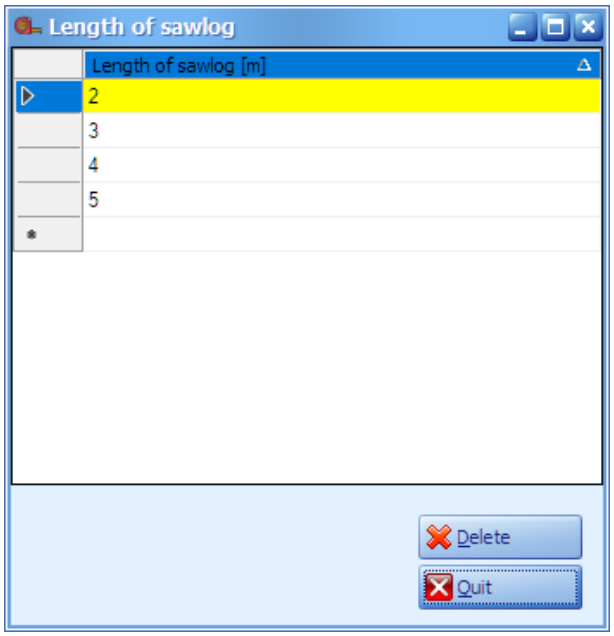


Figure 28: Length of sawlog

In screen Base data » Length of sawlog (Fig. 28)you can define your favorite sawlog lengths. Then you can select length in optimization functions:

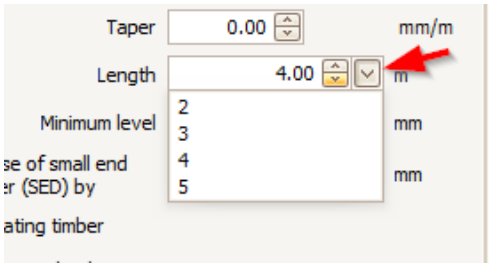


Figure 29: Choosing Length of sawlog

Just by pressing down arrow button next to length field you can select sawlog length from predefined set

8.8 Monthly settings

Screen Base data > Monthly settings (Fig. 30) is used for settings base data for **monthly** parameters used for profit calculation.

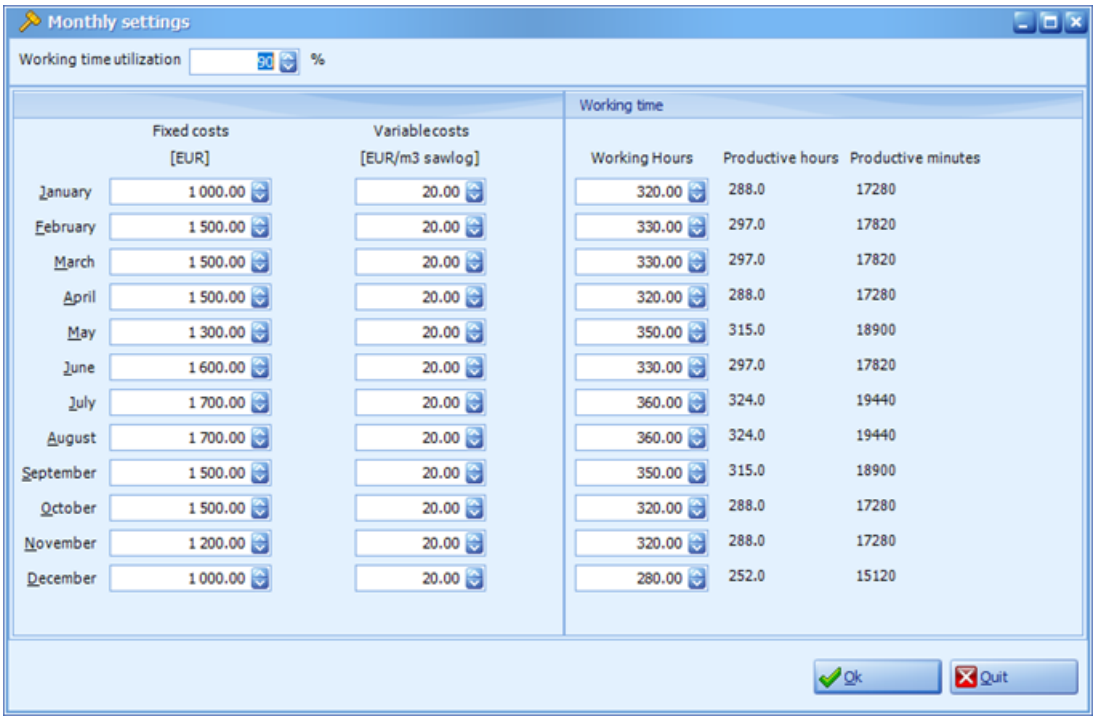


Figure 30: Monthly settings

Fixed costs Fixed costs in used currency.

Variable costs For one cubic volume of sawlog (usually for one m^3)

Working hours Net working hours in particular month. For example, 8 hours per day and 20 working days per month means 160 hours.

Working time utilization That is utilization of working time. Your technology does not work 100% of time, because of service interval, sawblade change etc.

8.9 Sawing speed

This is speed of sawing base on processed diameter. Usually, greater diameter means lower sawing speed.

It is not necessary to enter all processed diameters because CutLog makes approximation (linear) base on entered values.

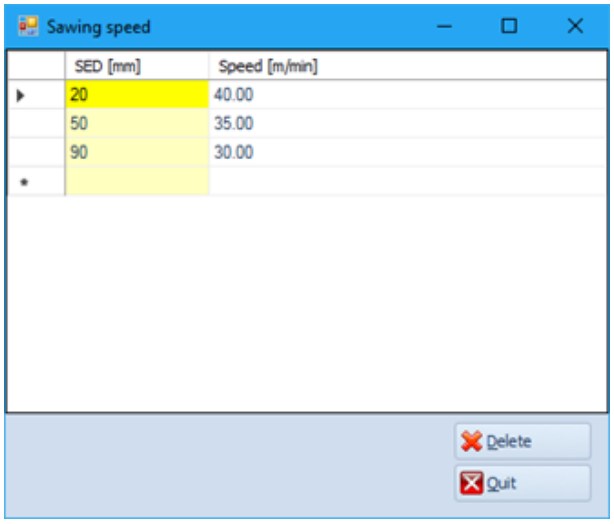


Figure 31: Sawing speed

8.10 Sawlog quality class

In this function is possible to maintain sawlog quality classes uses in various calculations.

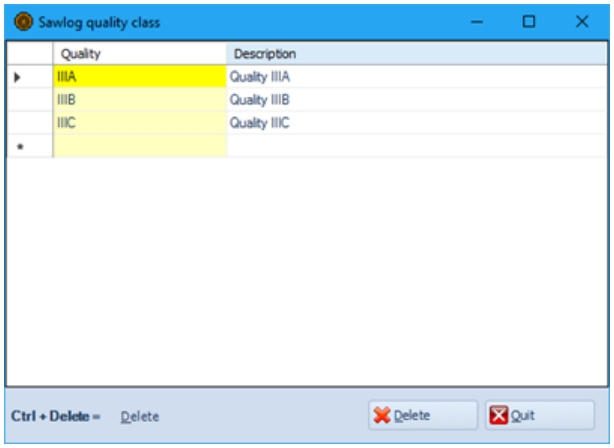


Figure 32: Sawlog wuality class

You have to enter Quality level and also description.

8.11 Sawlog price/heartwood price

In screen Base data > Sawlog price/heartwood diameter can be defined price of sawlog base on supplier, quality and species (Fig. 33).

First have to be defined suppliers (at least one), sawlog quality levels (at least one) and wood species.

Then on table below, just enter starting diameter and price for volume unit.

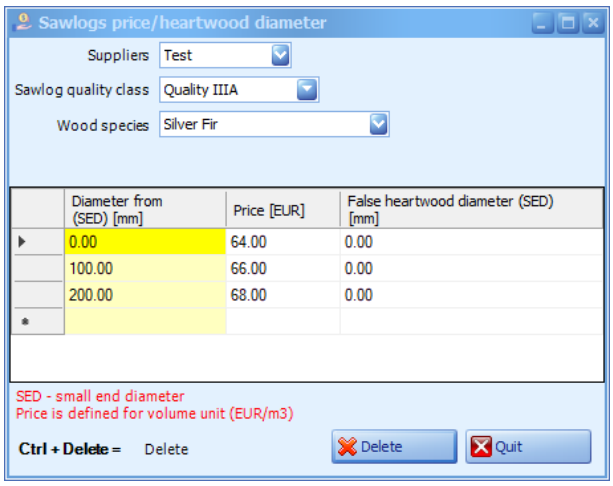


Figure 33: Sawlog price

Also for each diameter interval, you can define false heartwood diameter. It means, that all timbers out of false heartwood will be evaluated as side boards. See Fig. 34

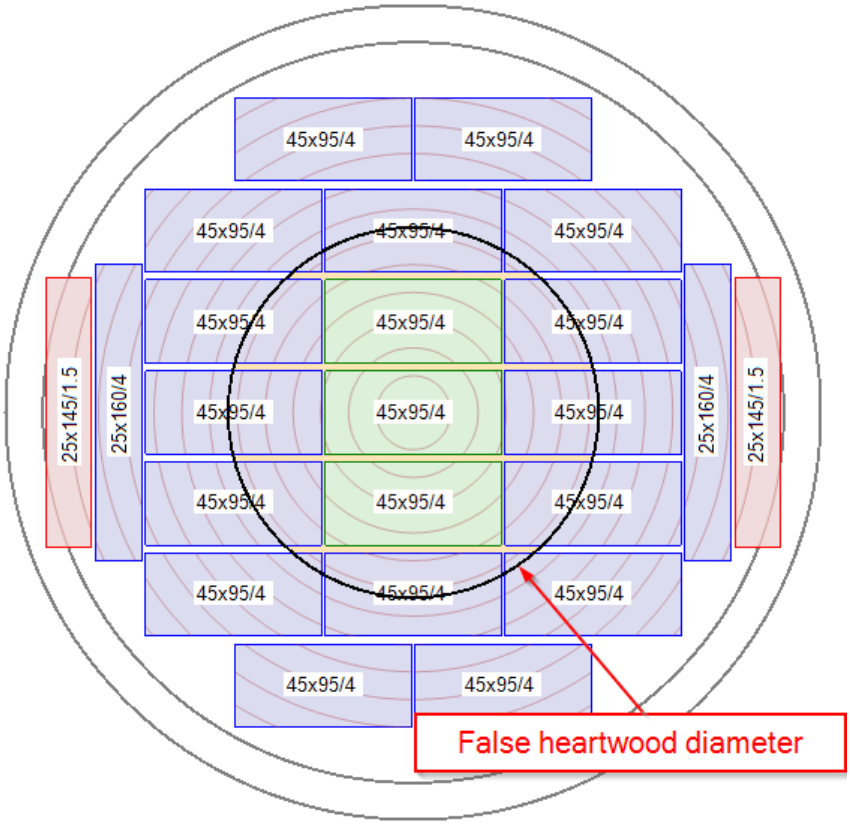


Figure 34: False heartwood diameter

8.12 Customers/Suppliers

In this two similar screens Base data > Customers and Base data > Suppliers you enter list of customer/supplier contacts used in various functions in CutLog. You can enter as many customers/suppliers as you need.

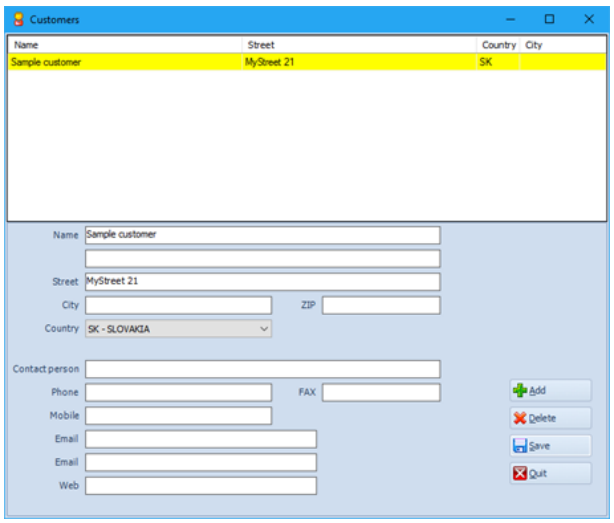


Figure 35: Customers

8.13 Sorting lines

Important

Sorting lines is optional module purchased separately from base license for CutLog software.

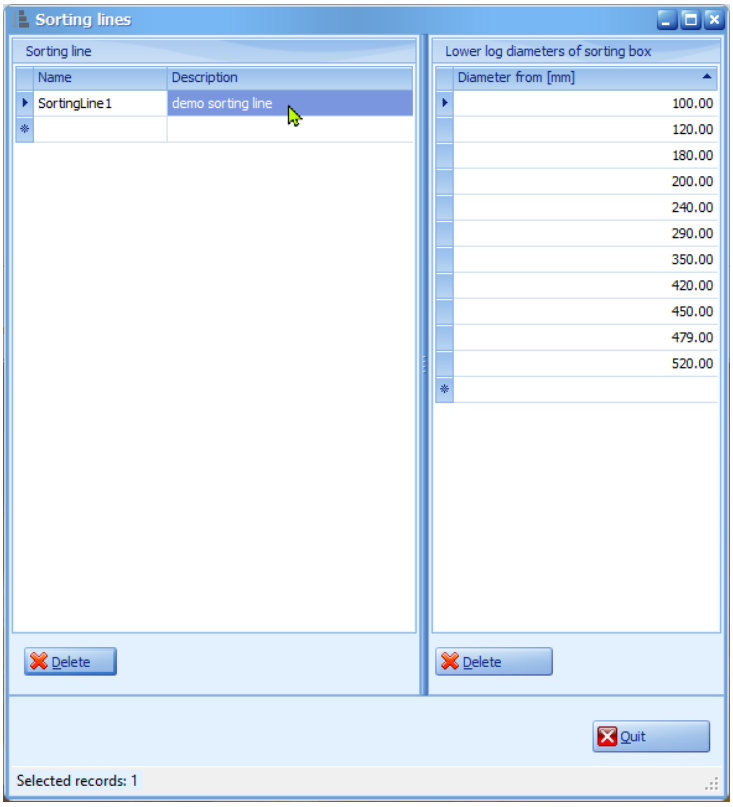


Figure 36: Sorting lines

This screen defines sorting line, which can be present on facility. Each sorting line consist of more sorting boxes, where are stored saw logs of defined diameter interval. Base

on your needs you can define as many sorting boxes as it is necessary and for analysis also you can define many sorting lines.

It is usefull in case, you need to change sorting logic and you want to play with 'fictional' sorting lines and analyse, if particular line is suitable or not.

Each sorting box is defined as lower diameter of sawlog. so for example, if you already have sorting boxes with these intervals:

- box 1: diameter 100 - 119mm
- box 2: diameter 120 - 179mm
- box 3: diameter 180 - 199mm
- box 4: diameter 200 - 239mm
- etc...

Then you can define boxes as in image 36. above. You don't need to define upper limit, because it is defined by the next sorting box diameter. So it is far enough to define lower diameter in each sorting box.

You can select and copy/paste rows between different sorting lines. So you don't need to rewrite them manually from one to another.

8.14 Settings

Main application settings are defined in Base data » Settings » application. This screen can be started also with hotkey CTRL + L)

This screen has several subsections. Each of them can be selected on left side of screen.

After changing of some option, you have to store those changes by OK button.

8.14.1 Application

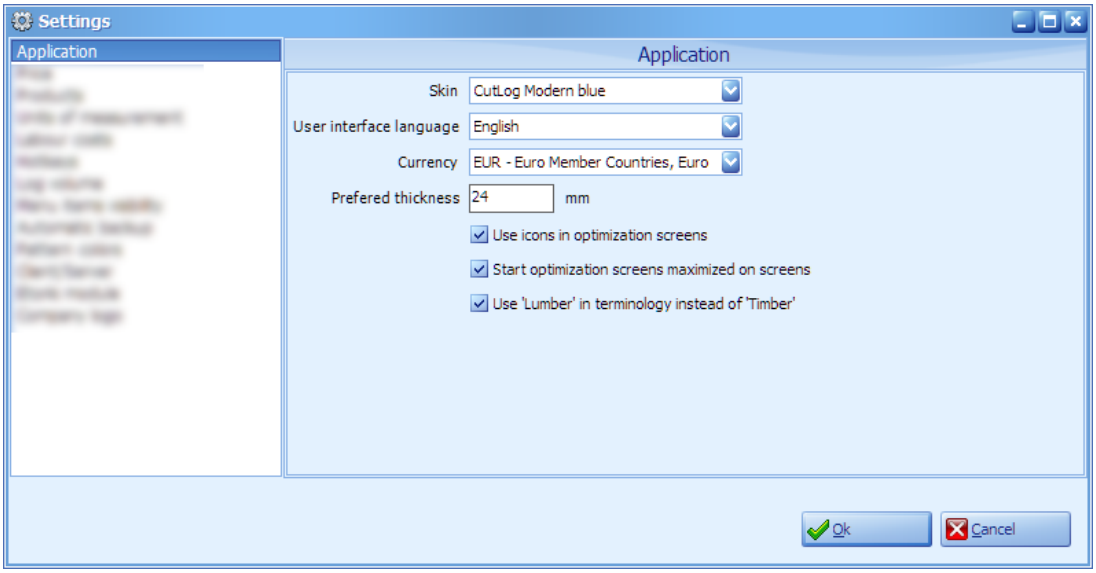


Figure 37: Application

Skin design of CutLog. You can change design look of CutLog application, based on your preferences.

User interface language Language of user interface. Settings will be applied immediately.

Currency abbreviation of local currency. Here user can select from any world currencies (See ISO 4217).

Use icons in optimization screens If you will check, then in optimization functions you will see icons (Fig. 38), instead of text (Fig. 39)

Start optimization screens maximized If checked, then all optimization screens will be opened maximized on start, in stead of windows somewhere on screen. This is suitable for smaller displays.

Use 'Lumber' in terminology instead of 'Timber' In some countries is processed wood into boards called 'Lumber' and in some countries it is 'Timber'. This switch causes using first or second, based on your preferences. This will affect whole CutLog and it is used only in case of English user interface language.

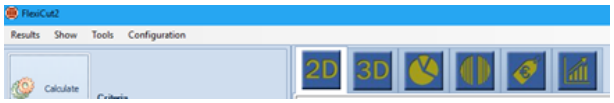


Figure 38: Enable "use icons..."

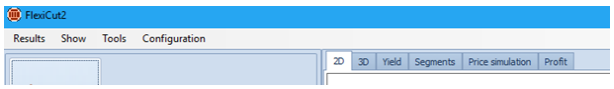


Figure 39: Disable "use icons..."

8.14.2 Price

Here is defined price for chips and sawdust with appropriate coefficient for volume.

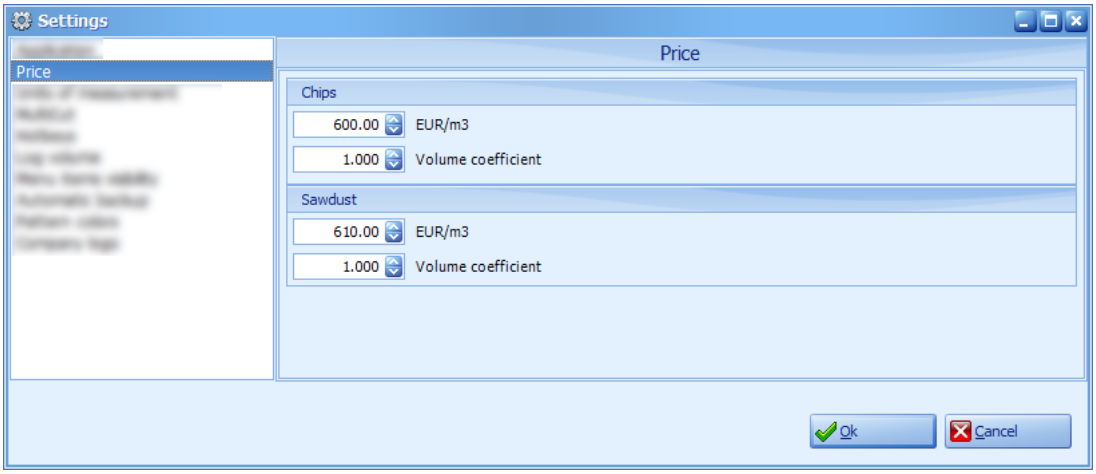


Figure 40: Price

Here is defined price for chips and sawdust with appropriate coefficient for volume.

If you produce $1m^3$ of chips It is volume of raw wood. In real you can count of chips volume include of empty space = air. So after calculation is always "raw" volume multiplied by this coefficient. So you can calculate price of chips/sawdust as you need.

8.14.3 Products

In some cases is not enough to define board size in exact dimensions.

Sometimes you need to define boards width in some interval. For example you produce this board sizes (thickness x width):

- 25 x 50
- 25 x 75
- 25 x 100
- 25 x 125
- 25 x 150

In this case you can either define each size separately, or define one board in product window and set interval of width from 50mm to 150mm with step 25mm

for enabling this feature, you have to check option in settings (Fig. 41) Then in products screen you will see new options to define this interval. For more information see Products screen (8.4 Products on p. 24).

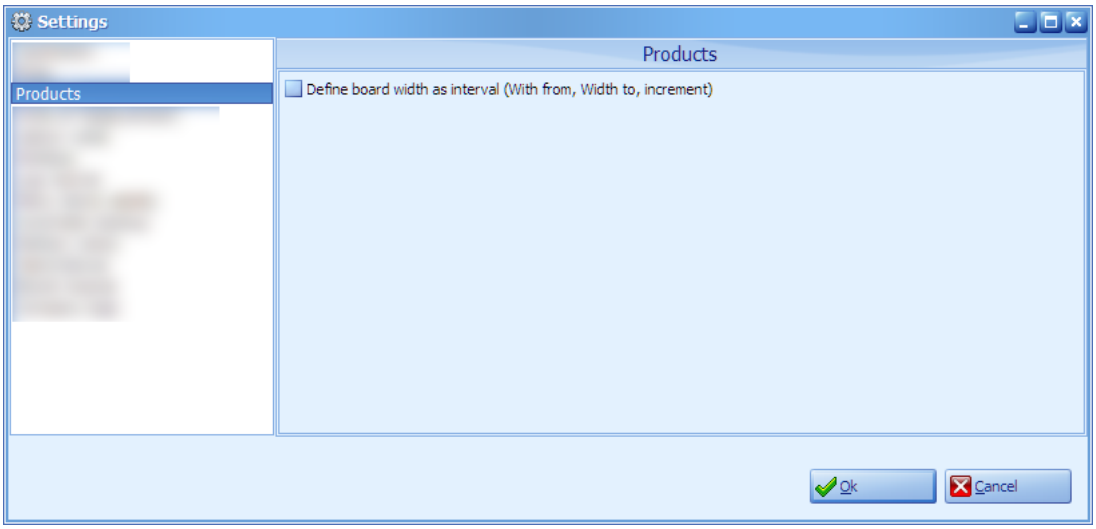


Figure 41: Products

8.14.4 Units of measurement

In this function (Fig. 42) are defined measure units and conversion between them. Units are used in optimization functions. Basically, there are metrics and English units used. However, user can define any possible unit.

Here is configuration of metrics units: one thousand millimeters are equal to one cubic meter.

For FlexiCut / FlexiCut2 there is settings for timber length criteria:

Round length down to nearest rounding side boards down to nearest divisor of given number. Default value is 0.25m so counted lengths will be: 1.5, 1.75, 2.00, 2.25 etc.

Timber length from minimum length of timber.

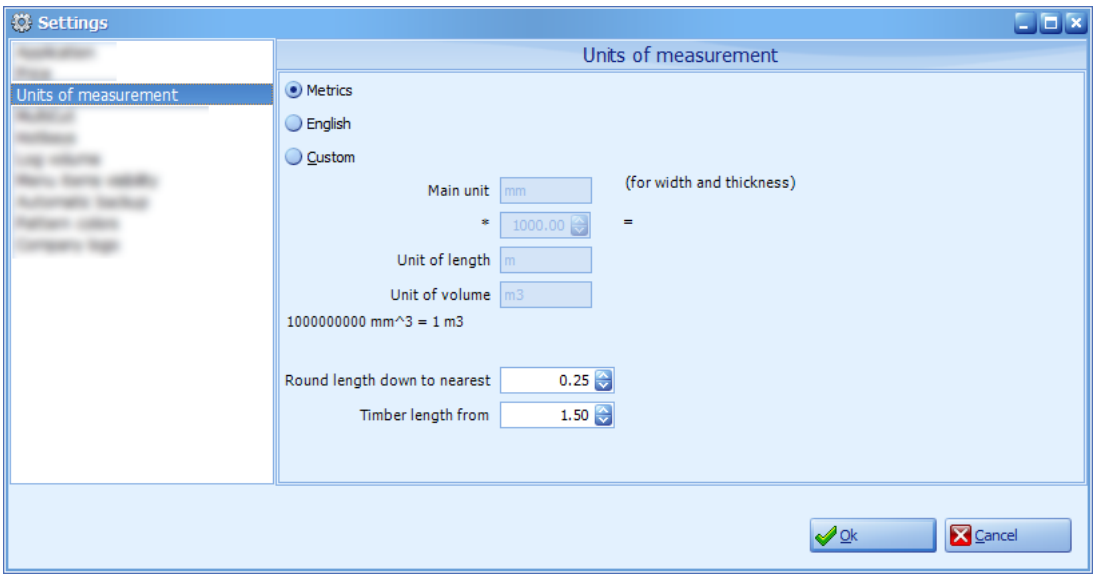


Figure 42: Units of measurement

8.14.5 Labour costs

In this function are defined values for cost formula. For more detailed explanation see optimizing function explanation.

Figure 43: Labour costs

8.14.6 Hotkeys

In Hotkeys tab (Fig. 44) you can define your hotkeys for quick access to various functions of CutLog. Those are active from within main menu.

In addition, you can define hotkeys for selecting particular fields in optimization functions. It reduce your work with mouse and you can use only keyboard for entering those data.

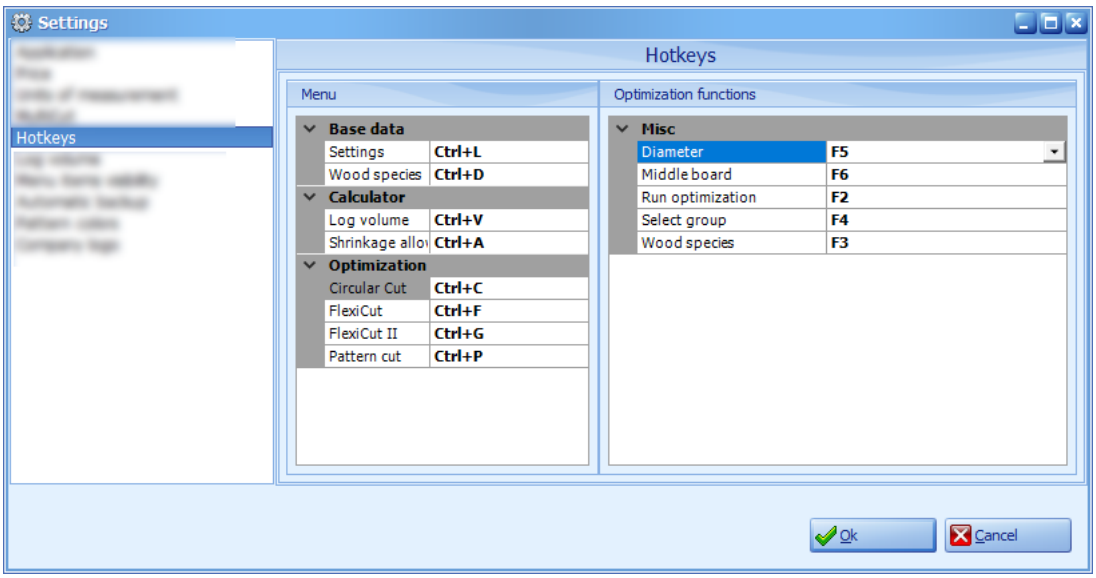


Figure 44: Hotkeys

8.14.7 Log volume

In this screen you can define formula for calculating volume of sawlog:

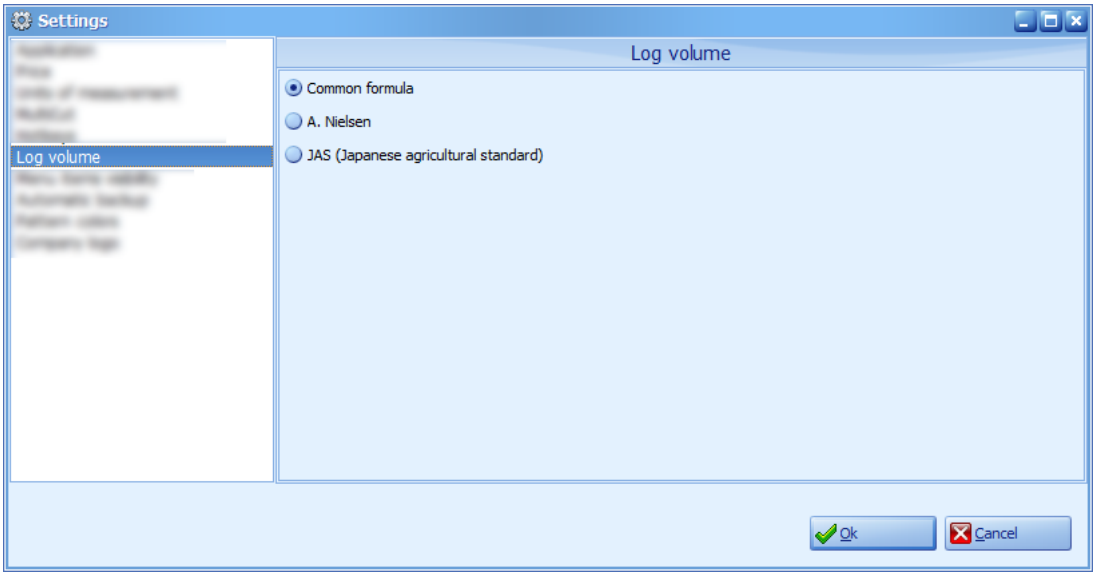


Figure 45: Log volume

Common formula:

$$V = \pi r^2 L \quad [m^3]$$

where:

π = 3.14

r = sawlog diameter in the middle of its length

L = length of sawlog in meters

A.Nielsen:

$$V = (D^2L(A + BL) + CL^2) \quad [m^3]$$

where:

A,B,C = defined separately for each species

D = small end diameter

L = length of sawlog in meters

When you select A.Nielsen calculation, then in species screen will be A,B,C values which has to be defined:

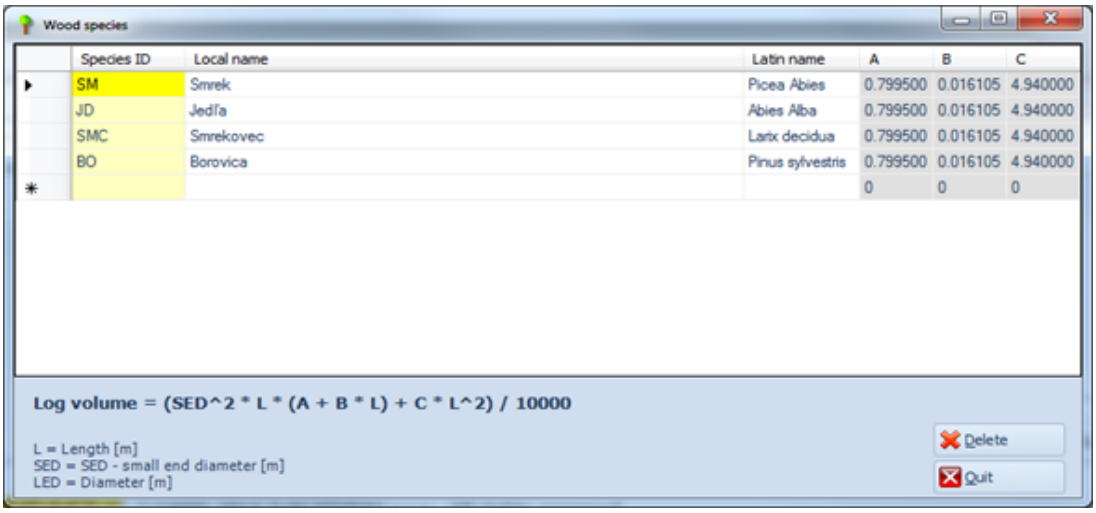


Figure 46: Species window with A.Nielsen

JAS (Japanese Agricultural Standard):

Volume for logs shorter than 6m:

$$V = D^2L\left(\frac{1}{10000}\right) \quad [m^3] \tag{1}$$

Logs equal or longer than 6m

$$V = \left(D + \frac{L-4}{2}\right)^2 L\left(\frac{1}{10000}\right) \quad [m^3] \tag{2}$$

where:

D = small end diameter in cm rounded down to even number

L = length of sawlog in meters

8.14.8 Menu items visibility

In real production there can be menus or functions, which you do not need. For this purpose, you can hide functions from CutLog menu (Fig. 47).

If some menu is checked in this screen, it means, that it is visible and available to user. And if it is not checked then user will not see it in menu.

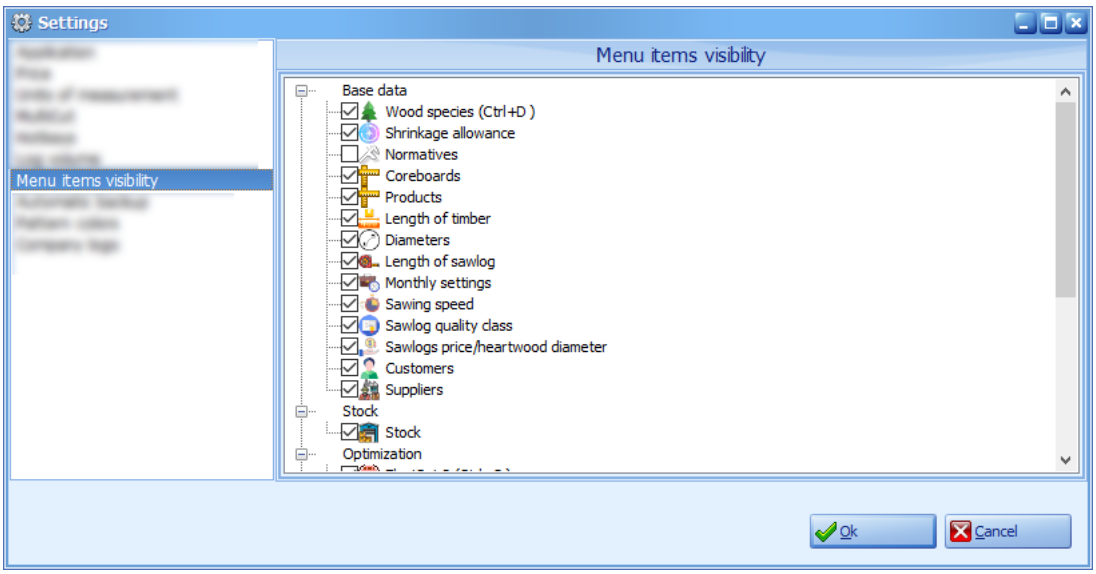


Figure 47: Menu visibility

8.14.9 Automatic backup

Info

This functionality works with local and also remote database.

You can set CutLog to create automatic backup of database each day.

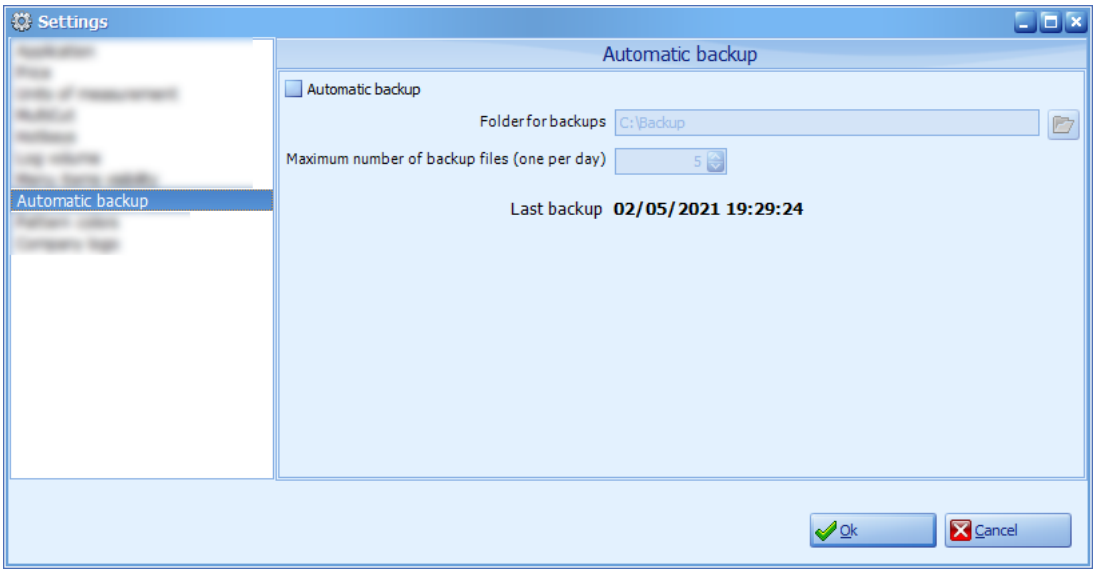


Figure 48: Backup settings

If you check `automatic backup` you have to define destination folder. Always when you run CutLog it create backup of database to selected folder. By defining `Number of backups` you can limit number of last-backups. For example if you set '1' you can find only last backup of database created prior

CutLog LAST start. It is important, because there is not first backup in particular day, but last one.

8.14.10 Colors

In this section, you can customize some of colors in CutLog.

Those are either colors of boards in production planning module[1], or various part of displayed pattern. With "Reset colors" button you reset all colors to default values

Figure 49: Pattern colors

8.14.11 Client/Server

Important

This option is valid only for client-server version of CutLog software.

In case of client/server license, when CutLog accessing to common database from various clients is possible to have dedicated settings for all clients. So all users can have own settings in CutLog. For this you have to check "personalized settings" in this section.

[1] sold separately as optional module

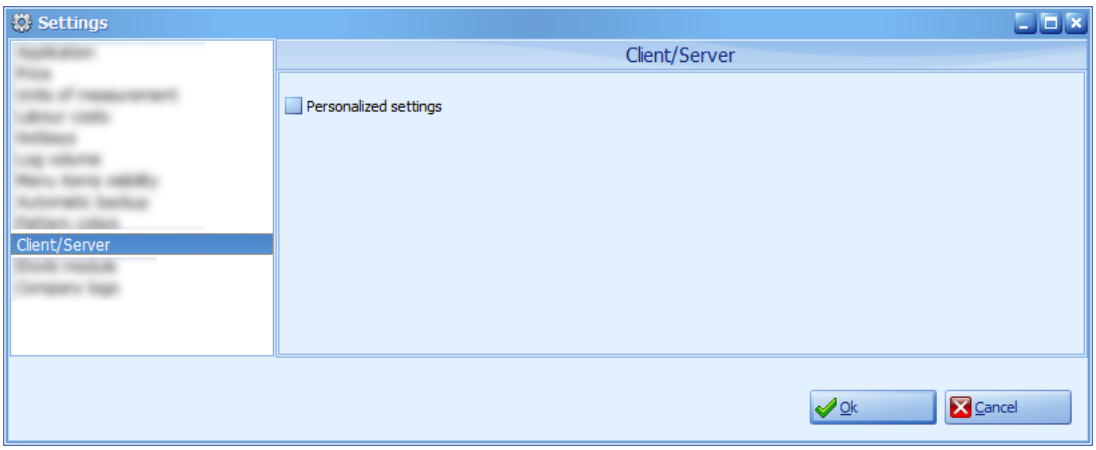


Figure 50: Client/Server

8.14.12 Company logo

It this section (Fig. 51) you can define custom company logo. It will be printed on reports or visible in various screens.

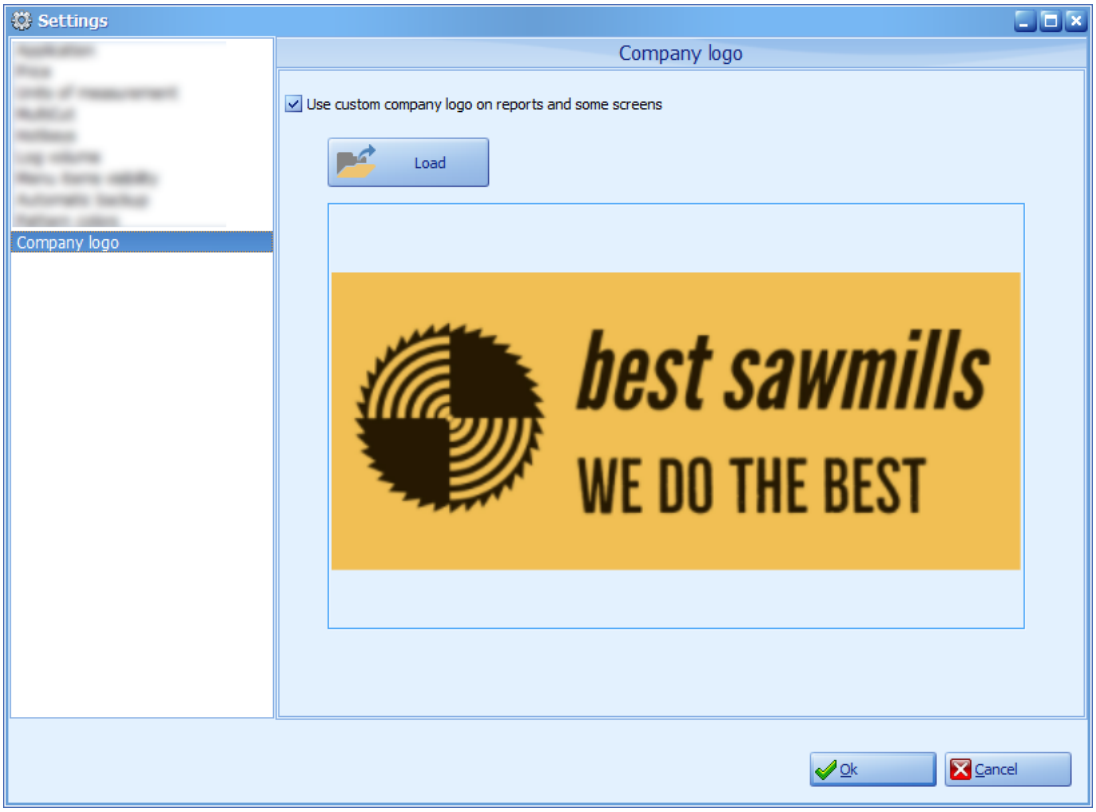


Figure 51: Define company logo

Various image formats are supported: `jpg`, `png`, `bmp`. Logo is proportionally resized base on needs.

9 Terminology and presentation

9.1 First and second pass

In some optimization is used the term first/second pass. It is based on a sash gang saw where the sawlog has to be turned by 90 degrees after first pass through the saw:

FIRST PASS – vertical boards (blue and red)
SECOND PASS - horizontal boards (blue and red)

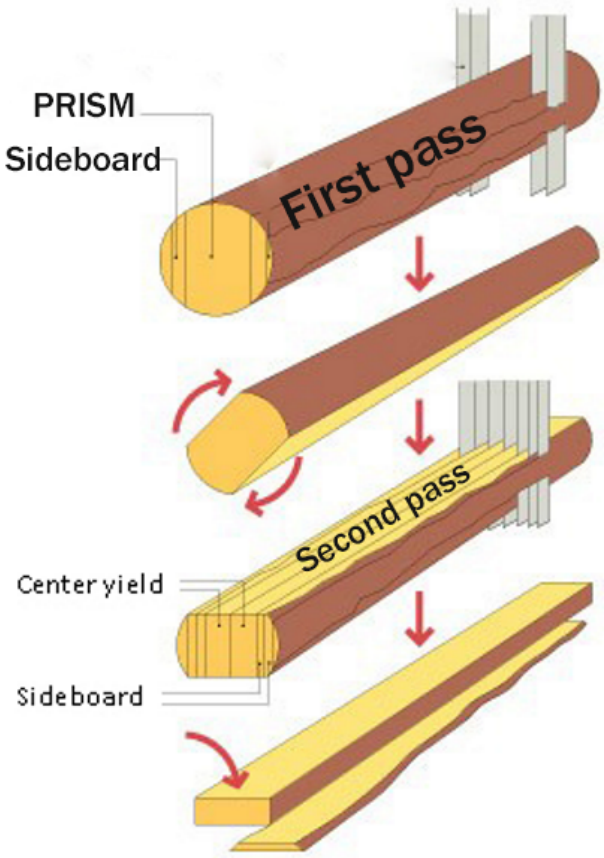


Figure 52: First and second pass

9.1.1 Segments

Segment is one horizontal/vertical part of sawlog, which is produced by main saw with one pass. For example on figure 53. You can see four segments in first pass (two on the left and right side of prism). Then in second pass there are 5 segments in the middle (green boards) and 6 segments (blue) above and below middle boards.

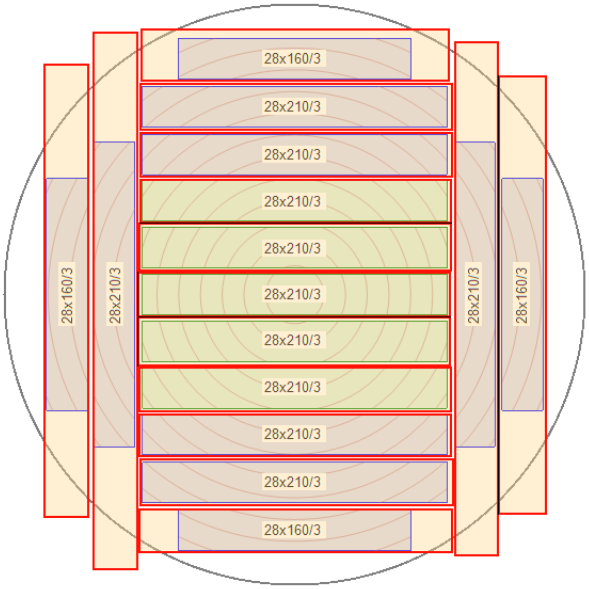


Figure 53: Segments

Each segment can be further processed by rip saw. See figure 54., where is first segment in first pass processed by rip saw to further two boards.

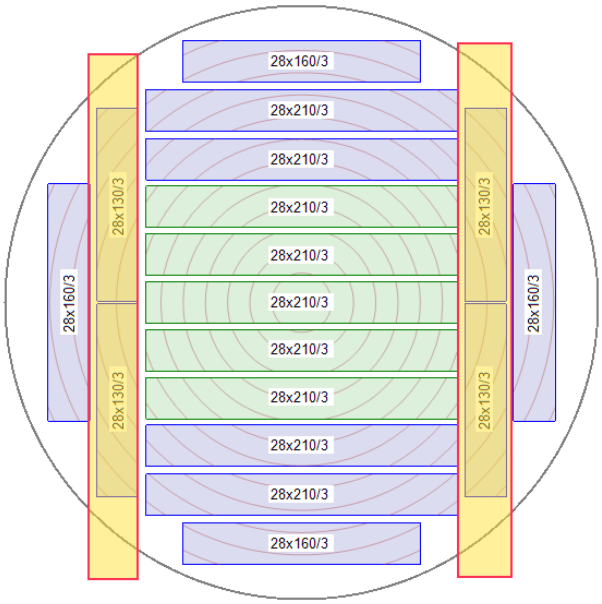


Figure 54: Segments process

9.2 Pattern and board colors

In the middle of the screen is a visible graphics presentation of the optimized scheme. The boards are hatched in a different colors (see fig. 55 Description of resulted image on page 47):

Green – primary product. Timber from center cant. Length is equal to log length. (MIDDLE BOARD)

Blue – side boards. Length of them is equal to length of log (before the middle zone of log)

Red – side board and different hatch. These timbers are shorter than log (behind the middle zone of log). Other items are explained on the following picture.

Colors of particular boards are just for user visualization. User see immediately type of board, especially if it's length is lower than length of sawlog.

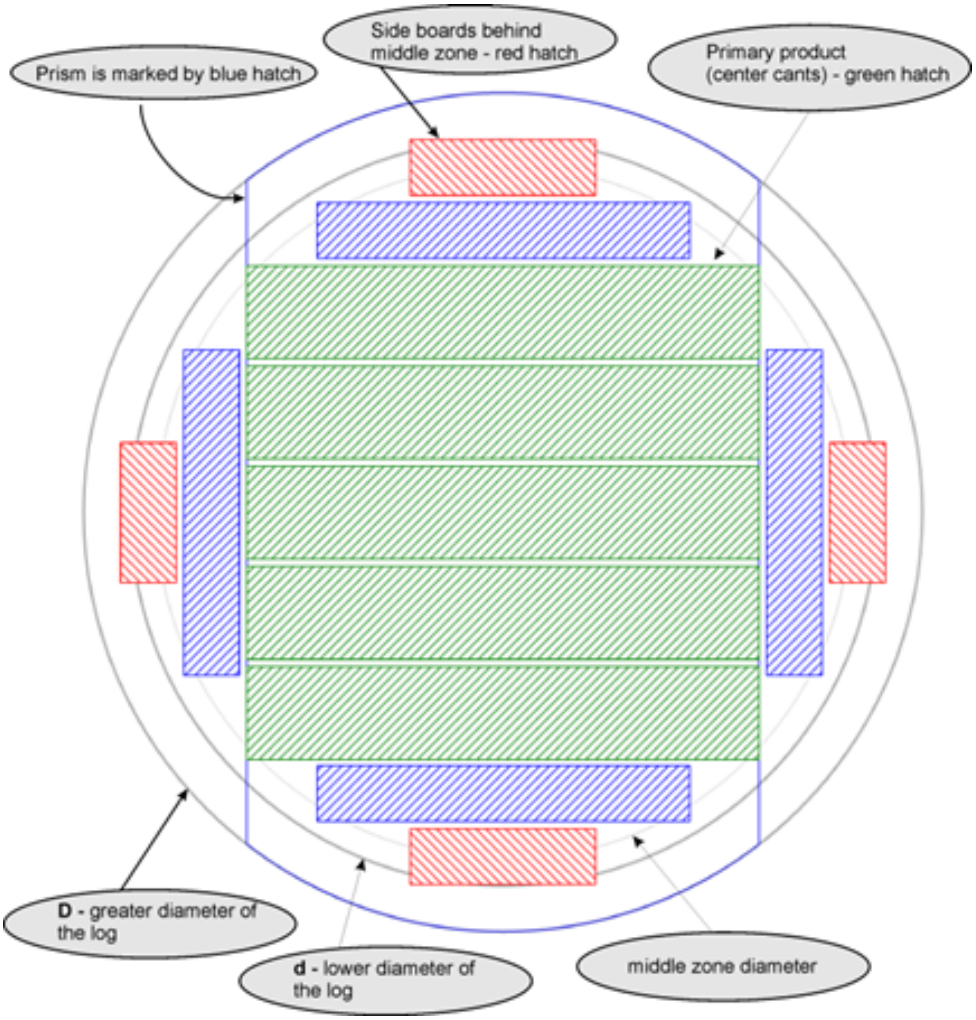


Figure 55: Description of resulted image

Info

If you press the right mouse button, you can save the image to disk or windows clipboard

10 Common functionality

Info

These features are common in optimization functions (mainly FlexiCut2, CircularCut, RadialCut and FlexiCut), so it is not necessary to duplicate text and you can find description on following pages.

10.1 Price simulation

This functionality allows you to make price analysis base on input material.

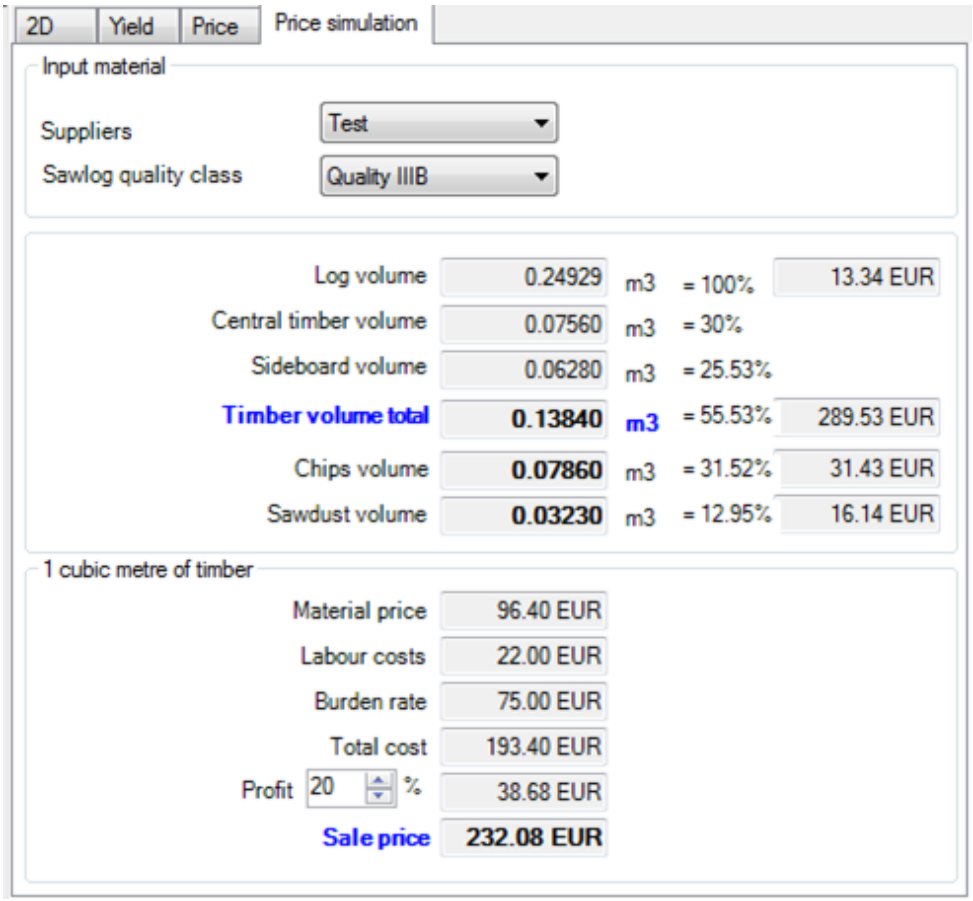


Figure 56: Price simulation

First of all, you select supplier and sawlog quality class. Base on this combination and diameter of log is calculated price of input log. Let's show, how values are calculated (see fig. 56):

1. Log volume = 0,24929 m^3=> price of one log is 13,34 Eur
2. Central/Side timber board volume – depends on optimization results.
3. Timber volume total – depends on optimization results

4. Timber price (= 289,53 Eur in this case) is calculated base on data entered into "Products size and price function"

5. Chips/Sawdust volume and price are calculated base on pattern and price entered for particular product.

One cubic meter of timber Required logs:

$$\frac{1}{0.13840} = 7.225 \quad [m^3] \tag{3}$$

pcs of logs. (0.1384m^{3}is volume of timber produced from one log)

Price of required logs (= Material price):

$$7.225 * 13,34 = 96.4 Eur \tag{4}$$

To this price is added the cost of a labor, burden rate (= total costs) and profit. You get sale price.

In this case you get 238.08 Eur as sale price. Base on price set in screen ("Products") you get 289,54 Eur. It is approximately 49% profit (Fig. 57)

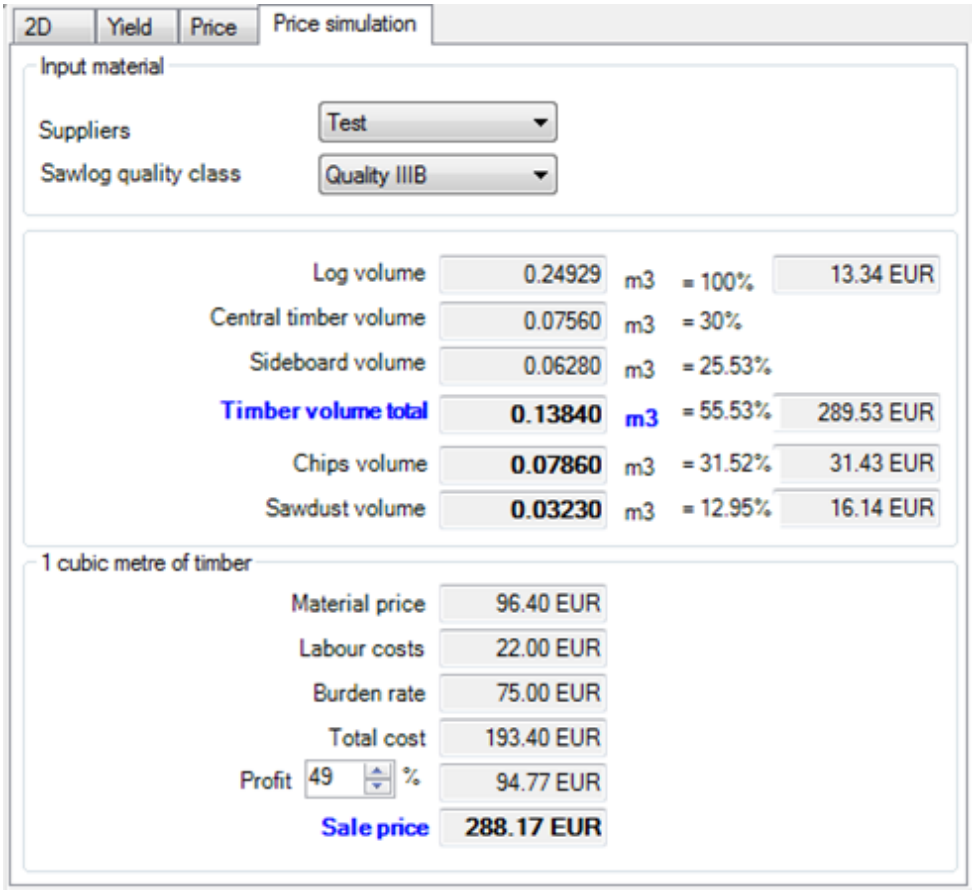


Figure 57: Price simulation profit

10.2 Profit

This feature (fig. 58) is used for analyzing of the profit based on the month, technology used and input material.

Figure 58: Profit

First of all, you need to correctly set monthly parameters (8.8 Monthly settings on p. 32) and sawing speeds (8.9 Sawing speed on p. 33).

Then after optimization has been made, you can see your profit from production.

In profit calculation is sawing process simplified in meaning that it is meant as "single-pass".

It means sawlog on one side of the saw and timber on the other one. So, you set the month, Supplier and sawlog quality. Rest is calculated based on other input factors.

Monthly sawing volume – volume of processed sawlogs during month. It is calculated based on working hours, sawing speed and log volume. Other results are calculated based on this volume.

10.3 Curvature

For explanation how the CutLog takes curvature into the account, look at the following picture.

Sawlog is painted in brown color. The curvature of a sawlog affects the diameter into which optimization will be counted. From the picture is obvious, that optimization will be counted into the new yellow diameter. New diameter depends on the curvature entered by the user and on the entered length of timber (sawlog).

Figure 59: Curvature

For example: Diameter: 300mm Curvature: 1Length: 4m This means, that the axis of the log is „shift“ by 40mm in the middle of length:

$$Length * Curvature = 4m * 1\% = 4000 * 0.01 = 40mm \tag{5}$$

As a result, optimization will not be counted for 300mm diameter, but for 300-40 = 260mm diameter.

10.4 Magic chart

MagicChart is a new feature in CutLog software. It gives user an ability to compare various input parameters and it is affecting to optimization result. For example, base on product range for two customers can be compared timber yield for range of a small end diameters (fig. 60).

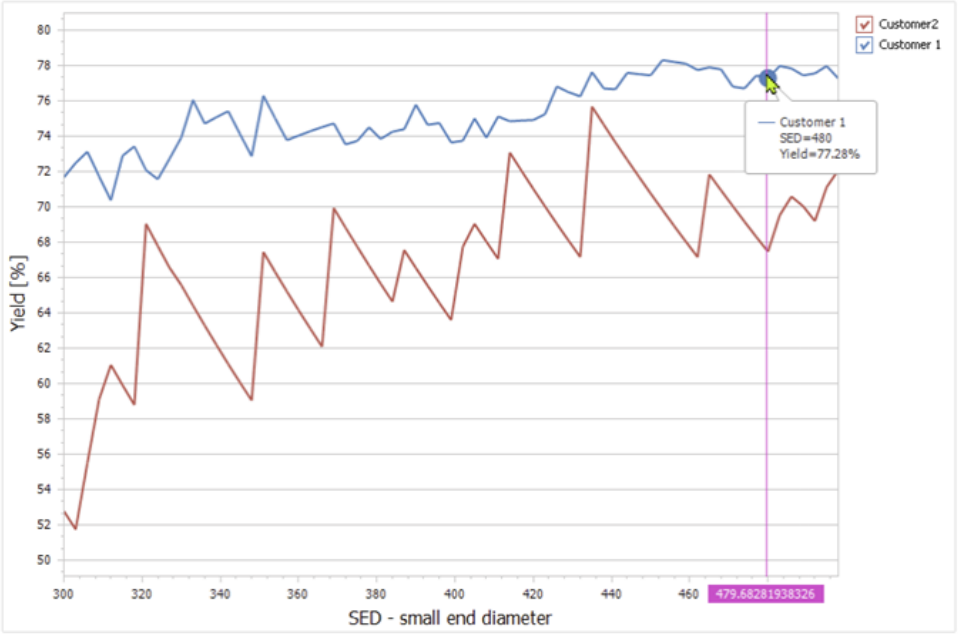


Figure 60: Magic chart

As you can see on the Figure 60, it is possible to compare production for two customers. For customer 1 is quantitative yield of timber better for all log diameters. User is able to see exact yield on diameter and compare more values. It is also possible to zoom chart with a mouse wheel and move it with the mouse.

Each chart within MagicChart can be counted based on different input values for optimization:

- different sawblade thickness
- different production
- different sawlog length
- completely different technology

So in case of investment into the new technology or upgrading the current one, you can compare benefits of it very quickly.

It is very easy and fast to create chart. In the following example each Customer has different products, it means different timbers for optimization.

Basically, into MagicChart you can add result by two ways (see fig. 61).

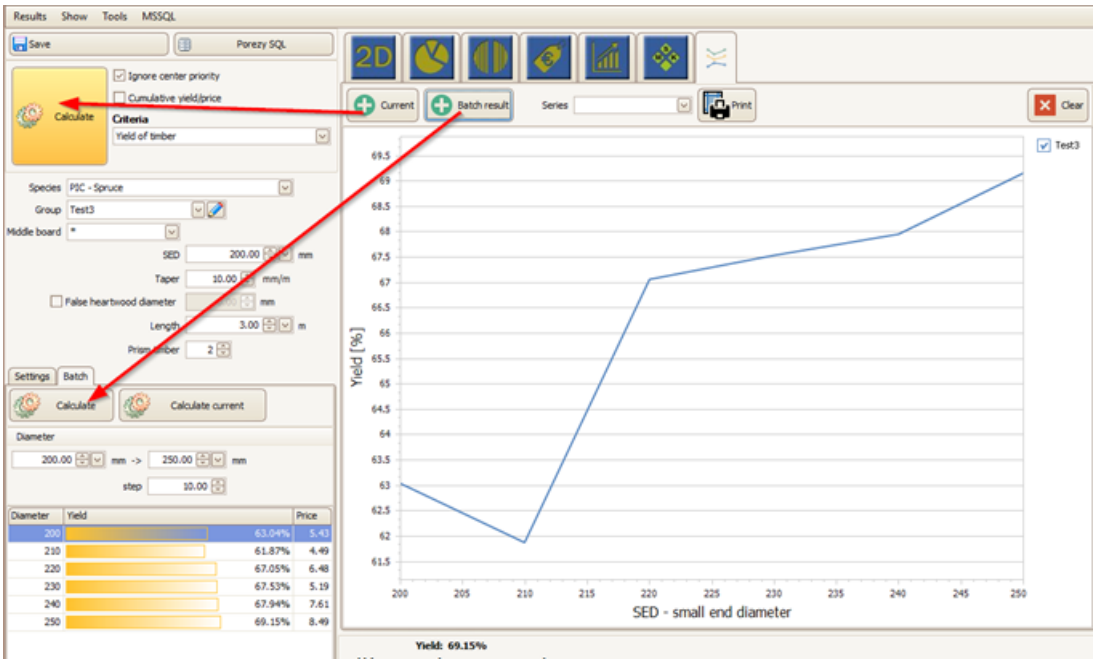


Figure 61: Magic chart add data

If you want to add just current result, use Curent button, this add only active result to chart. Batch result add all results precalculated in batch calculation in FlexiCut2. By default is name of the set the same as the name of a product group, but you also can define your own.

The chart can be zoomed, moved and analyzed by mouse. You can also print ito with a Print button.

The chart is not cleared during the optimizations. You can add the results to it as many times as you need. In case you need to clear it, use Clear button on the right.

10.5 Stock evaluation

From CutLog version 6.40, we have implemented possibility to apply optimized pattern to stock amount of selected wood species and diameter.

Info

This feature is integrated into the FlexiCut2, CircularCut and Quarter sawn optimizations

It helps to better analyze the results based on current input material you have and based on this you can better evaluate prices and prepare price offers for customers, or just predicate income based on production.

This feature needs several prerequisites and then has several features needed to explain in detail.

10.5.1 Definition of the stock quantities

Menu Stock - see page 92. In this screen, you have to define stock amount based on small end diameter of sawlog.

This preset has to be done, before any stock calculation

10.5.2 Apply stock calculation to pattern

Now in optimization functions that support stock integration (FlexiCut2, Circular Cut, Quarter sawn) can be enabled this feature in menu Show > Stock evaluation or key press CTRL + T ’.

There are two new data blocks (screens are from FlexiCut2 optimization screen, but are the same in two others) - fig. 62.

In the third result list, you can see result of sawing when you apply calculated pattern on whole stock amount.

As you can see, the entered diameter is 360mm, and base on screen above is stock amount = 315m^3. You can see, how much of particular products you get. Of course everything depends on board sizes, kerf sizes etc. so how you set CutLog technological parameters prior calculation.

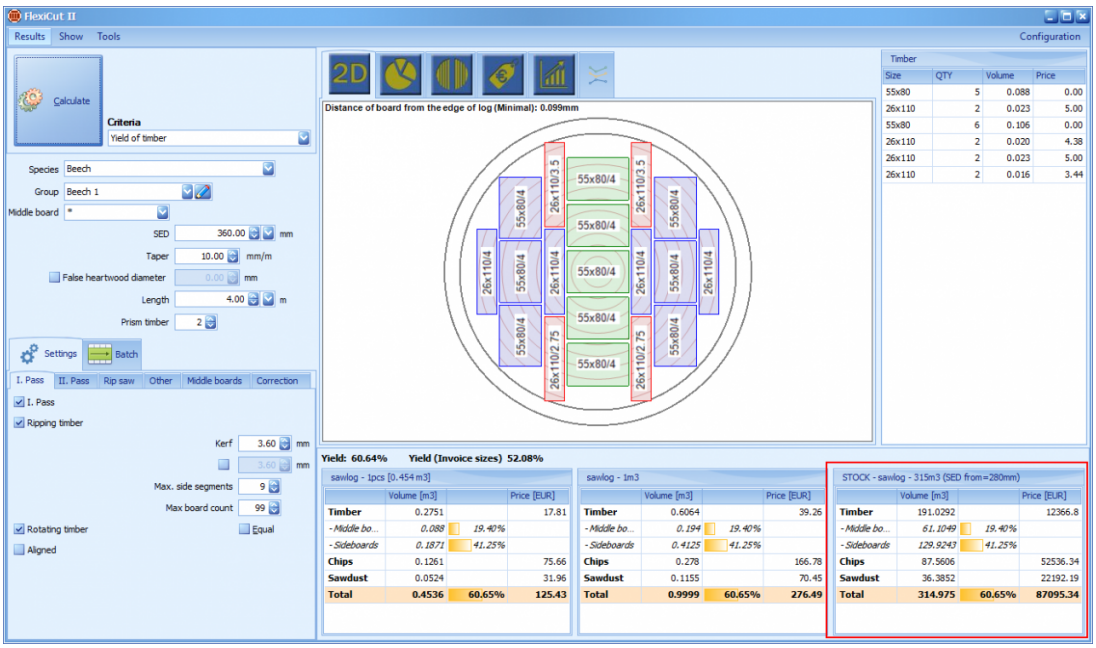


Figure 62: First data block for stock evaluation

Next Image (for price analysis - fig. 63) calculates an income and sale price for the produced timber, based on the input price for labor, material and your profit. This is applied to amount on stock.

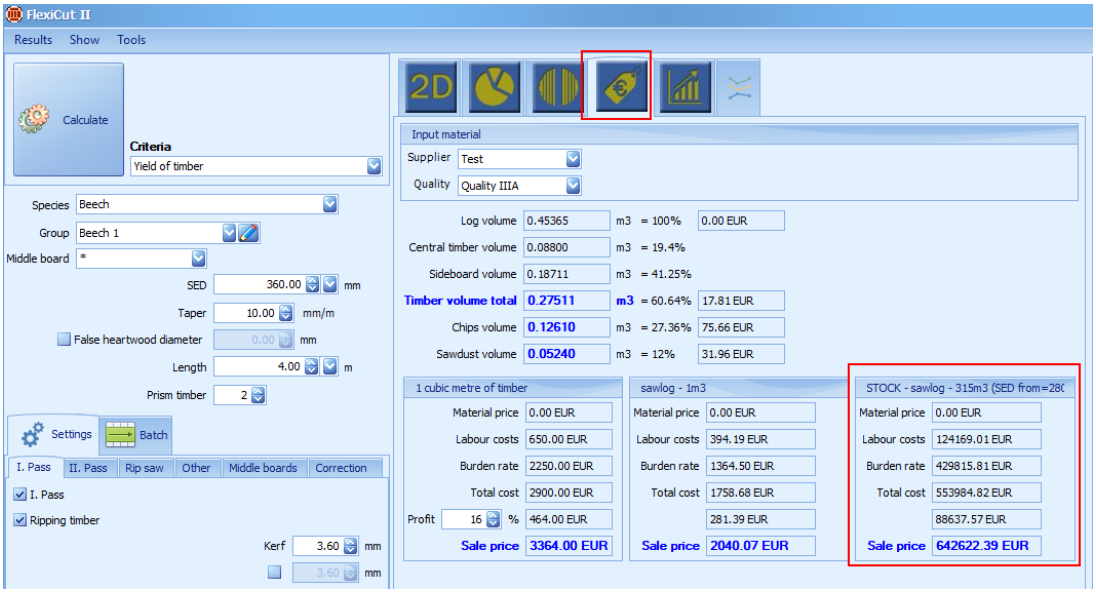


Figure 63: Price analysis for stock evaluation

10.5.3 Excel export

In all mentioned functions, when you export result to excel, via menu Results > Excel there are new columns. One for calculation to 1m^{3}and stock volume (fig. 64).

Invoice thickness [mm]	Invoice width [mm]	Length [m]	Volume [m3]	QTY	Total [m3]	Price of timber	Sale price	Volume from 1 m3 of logs	Volume from 315 m3 of logs
50	75	4	0,015	5	0,075	0	0	0,165327	52,07805
25	100	4	0,01	2	0,02	250	5	0,044087	13,88748
50	75	4	0,015	6	0,09	0	0	0,198393	62,49367
25	100	3,5	0,00875	2	0,0175	250	4,375	0,038576	12,15155
25	100	4	0,01	2	0,02	250	5	0,044087	13,88748
25	100	2,75	0,006875	2	0,01375	250	3,4375	0,03031	9,547643

Figure 64: Excel export with stock evaluation

10.6 Highlight selected boards

Info

This feature is not available in old FlexiCut

In some cases, when there are more different boards, it is hard to find particular boards in pattern.

Then highlighting can be helpful. In optimization screen you can select particular board in list of resulted timber, and then selected board is also highlighted in pattern - see Fig. 65.

Color of highlighted boards can be changed in settings (see page 43 - Colors).

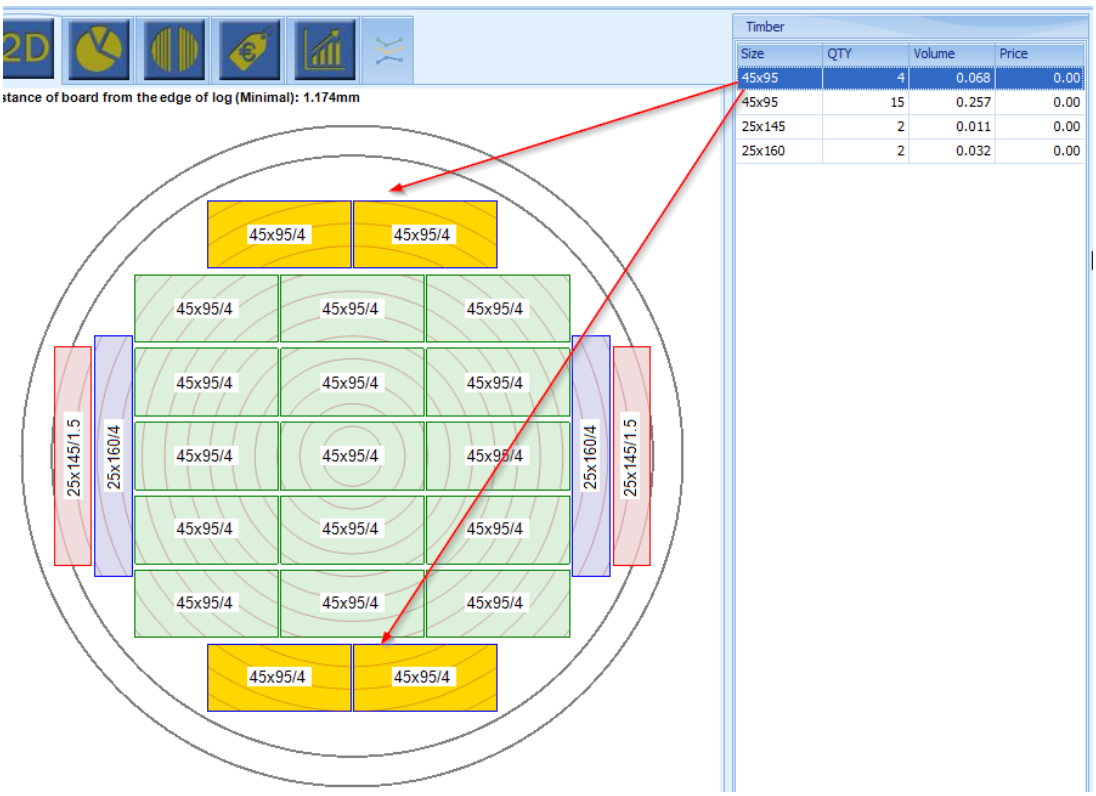


Figure 65: Highlight selected boards

10.7 Sorting line

Important

Sorting lines is optional module purchased separately from base license for CutLog software.

Info

This feature is integrated into the FlexiCut2, CircularCut and Quarter sawn optimizations

Prior to using Sorting lines module in optimization functions you have to define at least one sorting line - see page 35 - Sorting lines.

Sorting lines can be defined also in **Sorting optimization** module, purchased separately.

In supported optimization functions you can fing menu Sorting line (Fig. 66).

Under this menu you can find all sorting lines you have defdined in Base data > Sorting lines menu.

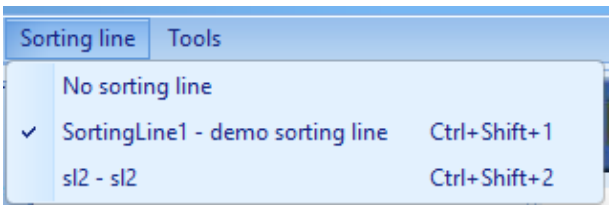


Figure 66: Sorting lines menu

First menu position is always No sorting line, which disables this functionality in particular optimization. It is followed by defined sorting lines, together with keyboard shortcuts bind to them. For example ctrl + shift + 1 for "SortingLine1" in this example figure.

When you select some sorting line from menu, you enable integration of it into optimization screen. See sample figure 67. Where you can see sorting visible boxes. Sorting box number depends on diameter and it is shown on various places on screen.

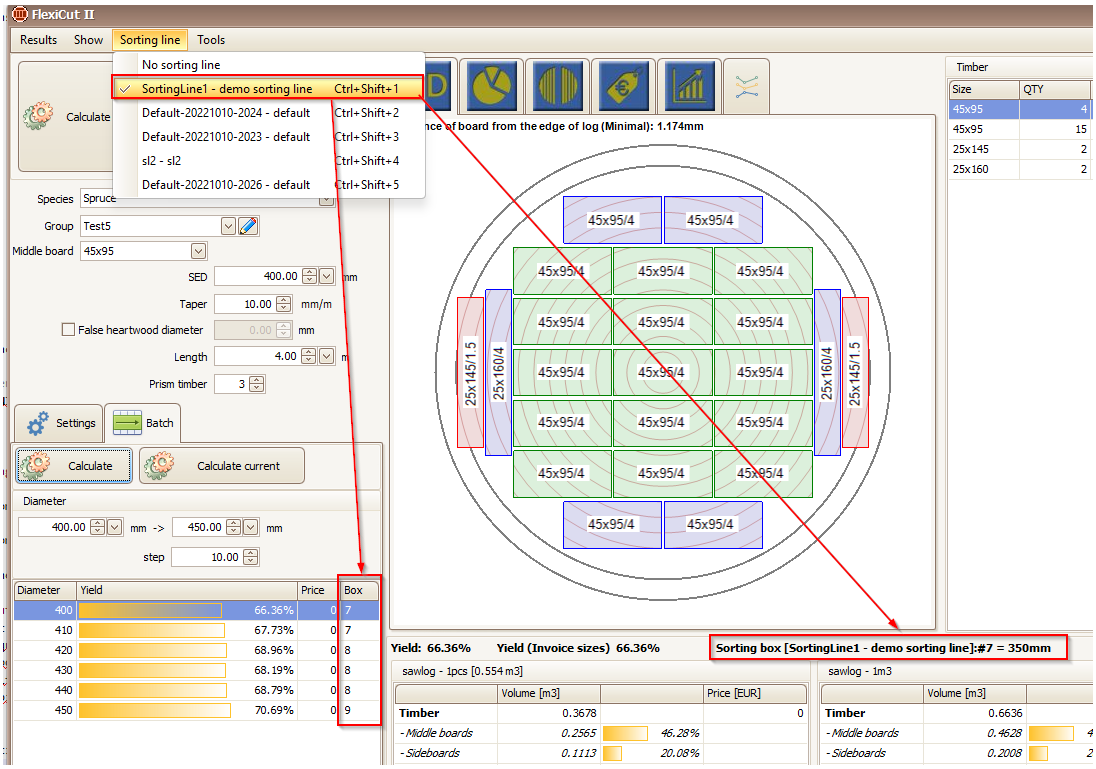


Figure 67: FlexiCut2 with sorting boxes

11 FlexiCut optimization

Info

Older version of the FlexiCut2 optimization. For more possibilities, please refer to FlexiCut2 optimization on page 68.

Algorithm of this function is completely different from the previous pattern cut optimization. It is not calculated in real-time. As necessary input into function must be defined list of produced timber sizes. It means that the function needs all the combinations of width and thickness, which can be produced for particular wood species.

Important

Optimization algorithm in FlexiCut (and FlexiCut2) **works in three steps**.

1. center timber – green. Make optimization of center timber base on the entered criteria.
2. Into the rest area it is optimized side timber with length equal to the length of log - blue color.
3. And the rest is filled with the shorted timber (red color).

This is important to take in account this process to understand whole optimization logic.

In case of waney edged boards is particular steps count with it.
Function calculates all possible (defined) combinations of thickness and width and put them into particular diameter. From all of them it takes the one with either the maximum yield or the maximum price of timber, depends on the „`Criteria`“ switch.
On the top of the screen, there are several buttons:

Print – print of optimization results

Excel – export all results into Microsoft Excel

Print setup – setup of printer

Zoom – if pressed, then sawing scheme will be drawn in scale, when maximal chosen diameter will fit into drawing area and others are smaller. If this button is not checked, then all diameters will be drawn in the same size.

Show sizes – show sizes of timbers on screen

Tree rings – show tree rings, instead of hatch pattern

Invoice size – show invoice size instead of cutting size

Load screen – load screen settings

Save screen – save screen settings

Here is the function with sample the optimization results:

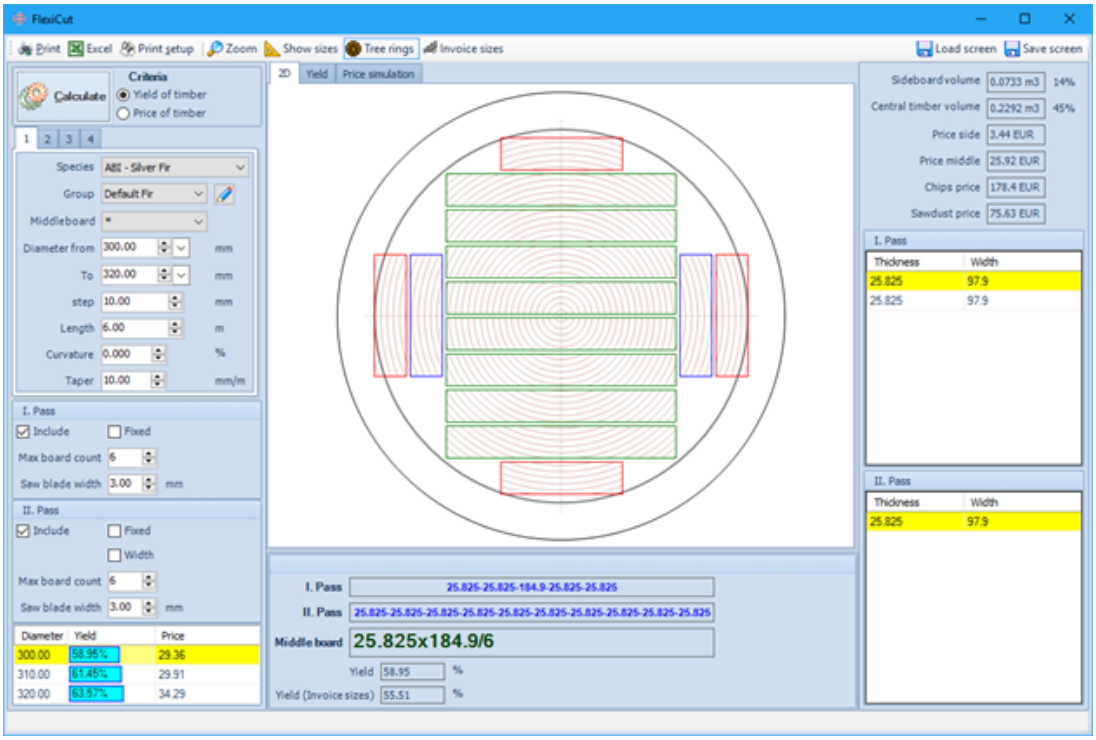


Figure 68: FlexiCut optimization

Info

by pressing mouse right-click on the scheme you can export to MS Excel or print only current schema, the same in MultiCut

Function counts optimum saw solution between interval of diameters with particular step. Also length should be defined for correct counting of price and volume. Screen is similar to „pattern cut“ function with a different left panel for entering values.

Figure 69: Calculation

Calculate button starts the main calculation.

Criteria – based on settings here will be calculated optimum sawing solution. If the **Yield** is chosen, then optimum solution is the one with maximum quantitative yield of timber. If the **Price** is chosen, then optimum sawing solution is the one with maximum value of produced timber.

Below are 4 tabs, marked as 1-4 (see fig 70.), where is possible to set parameters, which affects the optimization algorithm.

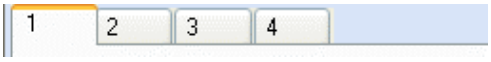


Figure 70: Tabs

11.1 Tabs - input parameters

11.1.1 Tab 1

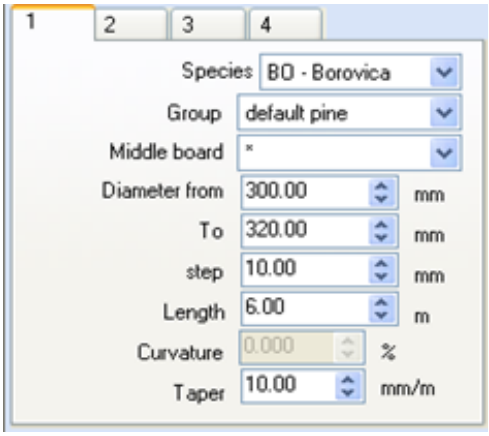


Figure 71: Tab 1

Here are defined wood species (and group of board sizes) and start/end diameter to count with a specific step. **Middle board** – If there is preferred

board in the prism, then it should be set here. For any appropriate board set asterisk '*' User can specify **length** of sawlog and Curvature (when no waney edged timber is selected). Base on the Curvature is diameter for the optimization lower than that, entered by the user: The **Tapper** can be also entered, although it is visible on the scheme, it is not taken into the account at this time. If the **waney edged** is checked (Fig. 72), then in results will be also waney edged boards, otherwise only edged boards are counted. If this option is selected then no curvature can be entered. By checking „Fixed“ you can explicitly set the size of the waney. So either no waney or only one size of waney will be set.

11.1.2 Tab 2

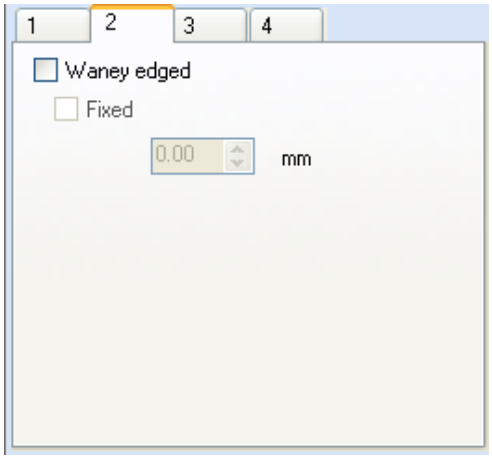


Figure 72: Tab 2

By checking "**the Waney edged**", program will be counting timber which can contains waneys. If the size of the waney must be exact size then "Fixed" checkbox should be checked and size have to be set.

This checkbox, however doesn't mean, that the side timber will be always with waneys. Everything depends on the exact results.

11.1.3 Tab 3

Limit maximum number of side boards: This feature will make time of calculation much longer!

This is setting of limitation to the maximum number of the different timbers (thickness x width) in the side area of sawlog. Look at the figure 74.

Here in the sample picture are three different side boards: 12x30, 24x80, 24x45

Now set limitation to "2" (fig. 75)

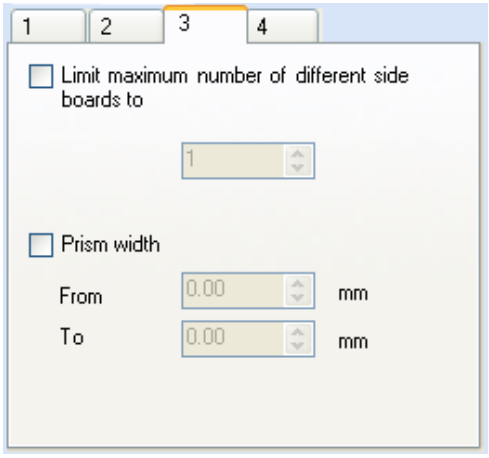


Figure 73: Tab 3

And see the results on the figure 76.
Now there are only two different sideboards: 24x80, 24x45.

Of course everything depends on the sizes, which can be used for the optimization.

Setting the limitation of prism width

On the figure 73, there is option for limiting of prism width. You limit size of 'a' value (fig. 77).

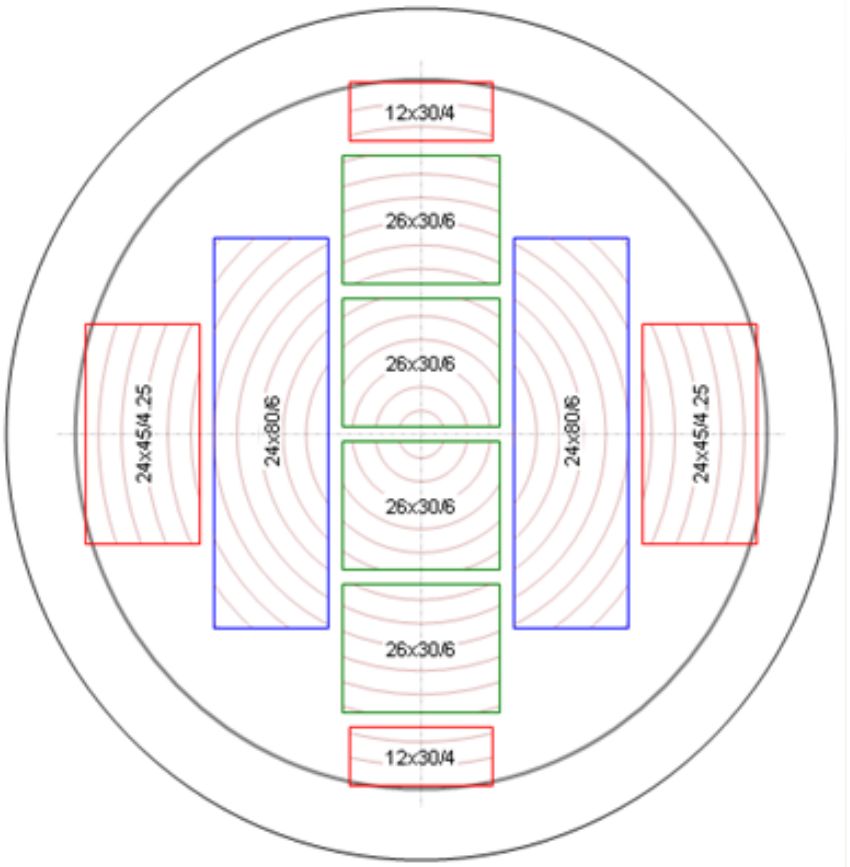


Figure 74: No limited side boards

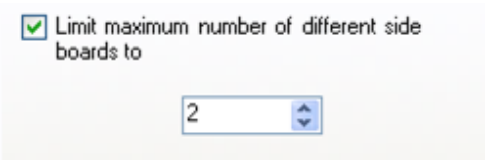


Figure 75: Limiting side boards

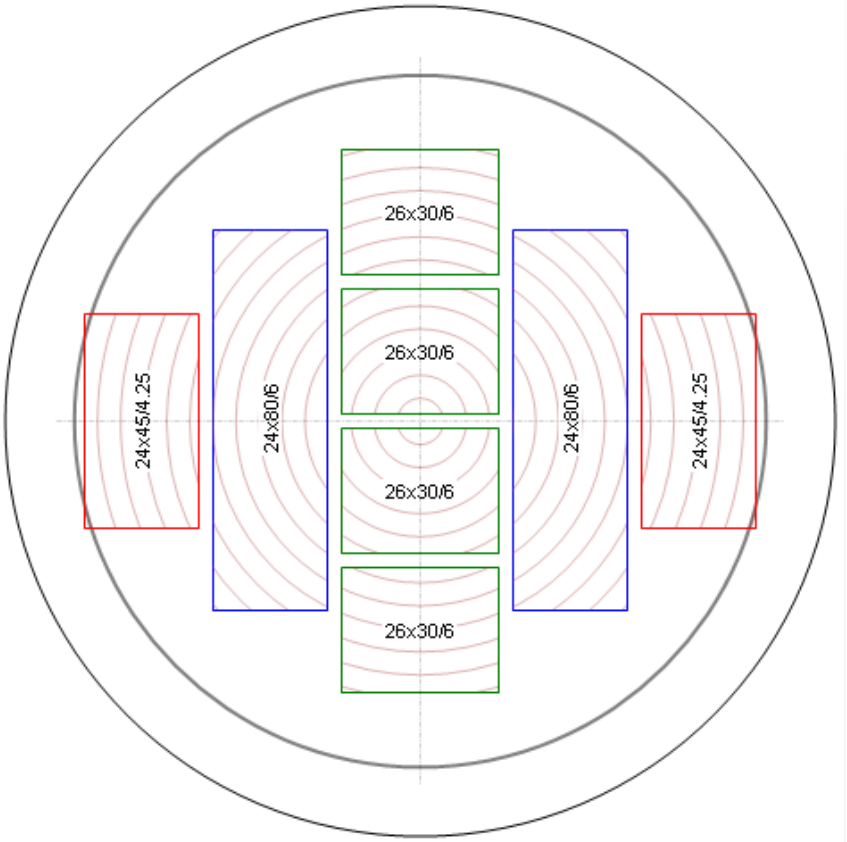


Figure 76: Limited side boards

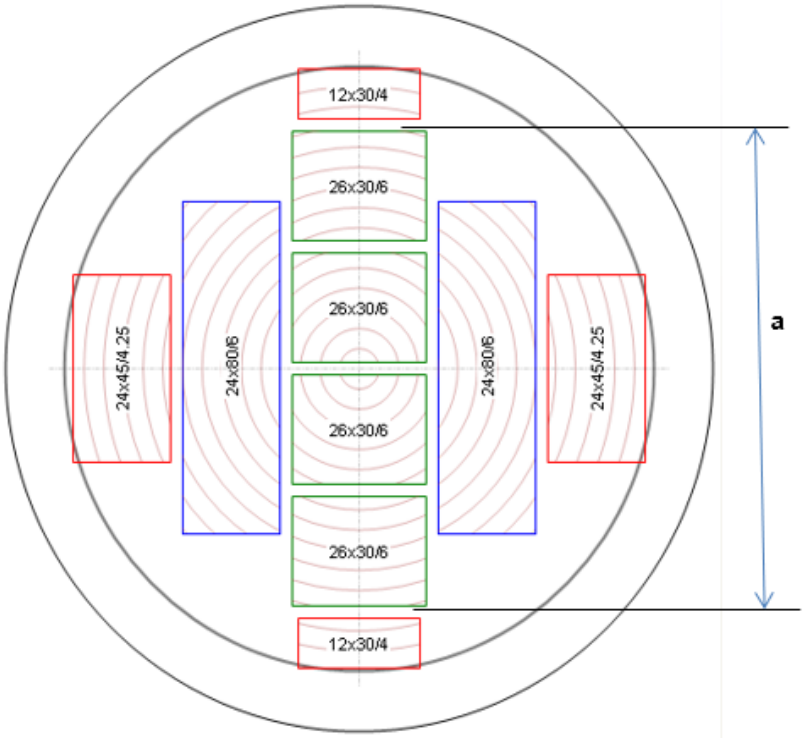


Figure 77: Width of prism

11.1.4 Tab 4

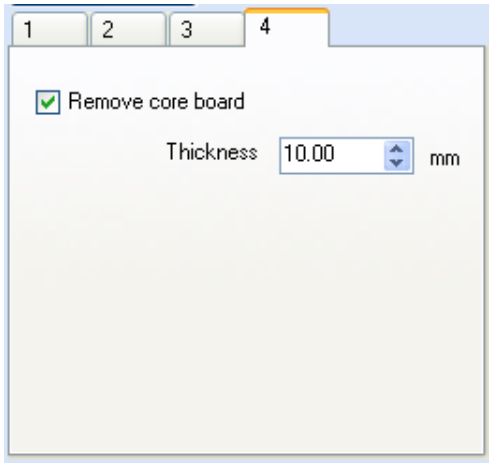


Figure 78: Tab 4

This is for removing of the core board from center of the log. You define thickness of it. The width is set based on other boards.

11.2 Modification of optimization for first and second pass

Boards from the particular pass can be included or excluded from the saw.

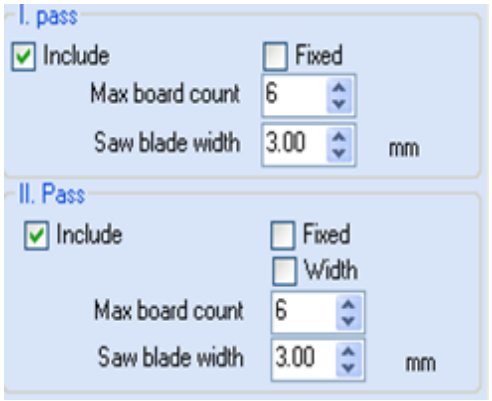


Figure 79: First and second pass

Max board count defines the maximum number of boards produced from specified side

Fixed – if checked, then all boards from first or second pass have the same size (thickness/width)

Saw blade width – width of a saw blade for the first or the second pass.

Width checkbox mean, that if there will be some side boards in second pass, they must have the width the same as the center timber.

11.3 Mouse-over information

If you roll over the picture, program will show you base information about the selected timber (see fig. 80 for the details)

1. Timber is grayed, so you know, what by the timber is meant.
2. In the upper left corner there are basic information about this timber.
3. The last "Distance of board from edge of log" is meant the distance "a" - it is always distance of the corner closest to the edge of log (small end diameter).
4. 4. For shorter timbers than length of log it is the same logic. Length is always calculated in plane, which is perpendicular to log axis (not log surface!) via the calculated corner.

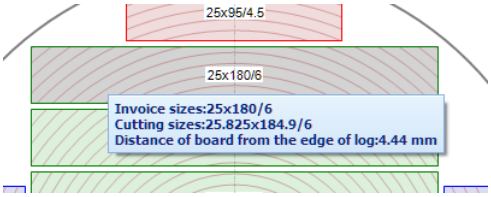


Figure 80: Mouse over information

11.4 Price simulation

For this functionality see 10.1 Price simulation on page 48.

11.5 Profit

For this functionality see 10.2 Profit on page 50.

11.6 Curvature

For this functionality see 10.3 Curvature on page 50.

11.7 Waney edged – remarks

- For the waney edged boards is exact volume counted.
- Both sides (top and bottom) have to be at least touched by the saw.
- Price, volume and yield of waney edged boards are counted together with side boards

Volume for Price is counted in this way in case:

$$Volume\_saw = width\_saw * thickness\_saw * length - waney\_Volume \tag{6}$$

$$Volume\_shrinkage = \frac{width\_invoce * thickness\_invoice * length}{width\_saw * thickness\_saw * length} \tag{7}$$

$$Volume\_invoice = Volume\_saw * Volume\_shrinkage \tag{8}$$

In case, that there is no waney, then the volume for invoice sizes:

$$Volume\_invoice = width\_invoce * thickness\_invoice * length \tag{9}$$

12 FlexiCut2 optimization

The FlexiCut2 is the natural evolution and great improvement of the FlexiCut optimization.

Info

If a waney edged boards are enabled, then all the volume, prices etc. are counted together with the waney. It means, that volume of timber is counted including the air

Important

Optimization algorithm in FlexiCut (and FlexiCut2) **works in three steps**.

1. center timber – green. Make optimization of center timber base on the entered criteria.
2. Into the rest area it is optimized side timber with length equal to the length of log - blue color.
3. And the rest is filled with the shorted timber (red color).

This is important to take in account this process to understand whole optimization logic.

The screen of FlexiCut2 is similar to the FlexiCut:

Info

Some settings have the same meaning as in FlexiCut, so you can refer to FlexiCut part of this user guide.

In addition to optimize for the maximum yield and the maximum price of timber it is possible to optimization on the maximum yield or price of radial timber. In process of optimization is radial board meant, that maximum angle of year rings is +30 degrees with shorter board side or 70-90 degrees with longer board side.

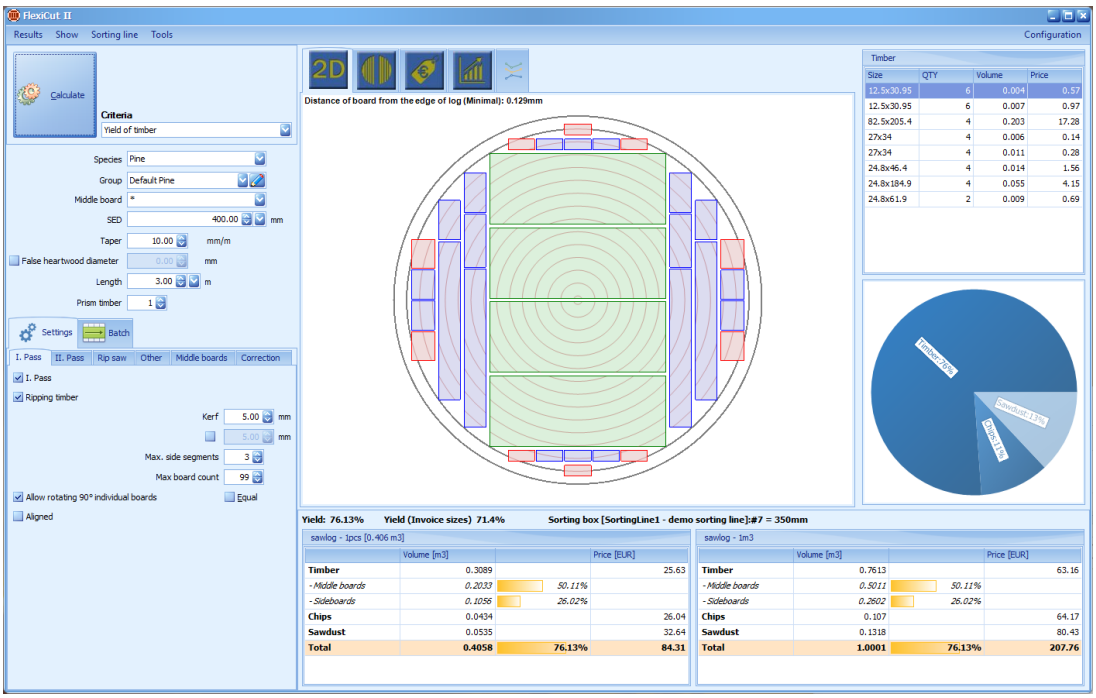


Figure 81: FlexiCut2 optimization

12.1 Optimization criteria

You can define the criteria of optimization, base on yield or price of timber either for the radial or any kind of timber (Fig. 82).

The first tells the CutLog, that it tries to optimize for any/even/odd number of the middle boards segments. The second one tells, that you don't mind yield of the center timber. You just need the maximum yield of timber regardless of length and kind.

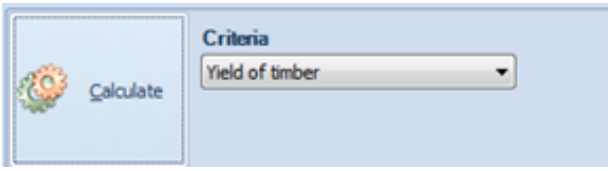


Figure 82: Optimization criteria

Maximum number of the center boards, which can be positioned side by side. In previous screen it is set by 10. If we set it to 3 then results can looks similar to the one on the figure 84.

With three red lines on figure 84 are marked meanings, what means "prism timber limitation". There are three blocks of the center timber (green) side by side. It is the maximum number. Those number of boards can be lower.

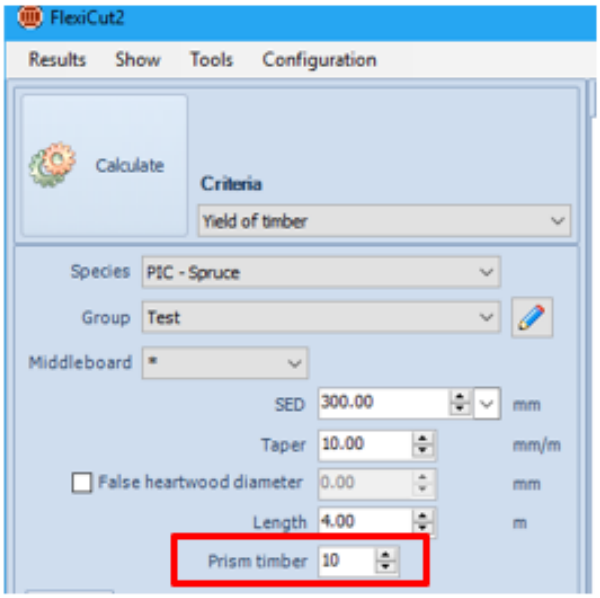


Figure 83: Optimization criteria

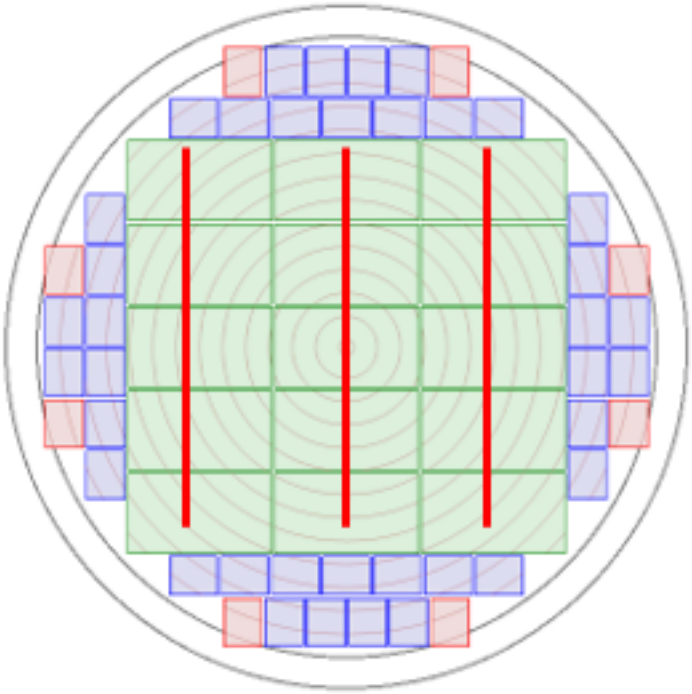


Figure 84: Timber limiting

12.2 First pass settings

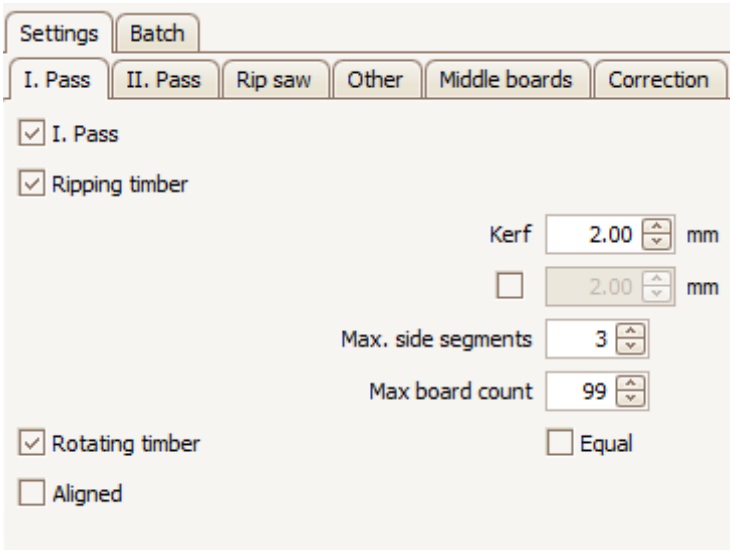


Figure 85: First pass settings

I. Pass indicates, that if the timber from first pass should be included in the calculation or not.

Ripping timber - if this is not checked, then the results looks similar to the FlexiCut results. In case it was checked, then secondary processing of timber is allowed, so boards can be put side by side. By this will be better yield and the utilization of wood.

Kerf - width of the kerf (saw blade - vertical saws) for first pass

The second check box below the kerf indicates, if the first saw from the log center will have different thickness. It can be made by a different machine. Then the rest of the boards can be sawn on the machine with a thinner saw blade.

Max segments - the limit number of segments on one side in first pass

Max board count limit maximum number of boards in one segment

Rotating timber due to increasing yield can CutLog rotate timbers by 90 degrees. However in some cases the results are technologically not possible. This can prevent rotation of the timber.

Equal if all boards in one segment have to be the same size, you can check this option.

Aligned - It has an affect on ripping timber. In case, that all sideboards are processed in different ways. For explanation see the table 1 on the page 72.

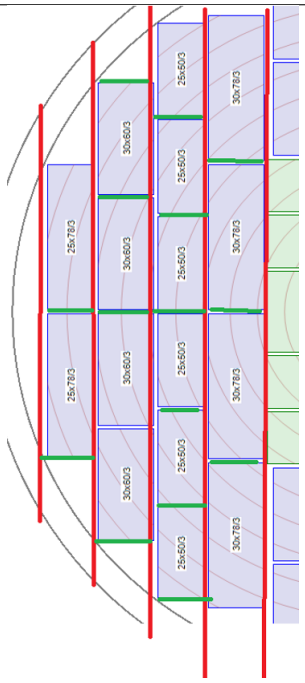
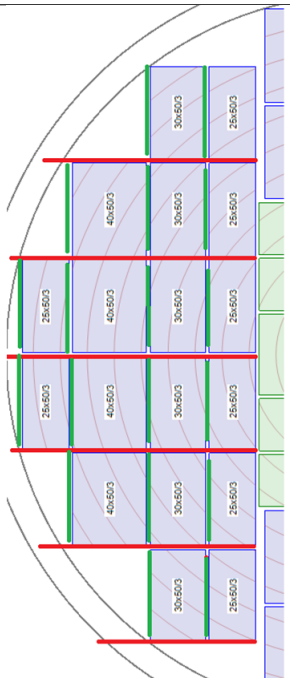
With no “Aligned” checked	With “Aligned” checked
	
The first is side part sawn by red lines, then by gred ones	The first is side part sawn by red lines, then by gred ones

Table 1: Aligned option

12.3 Second pass settings

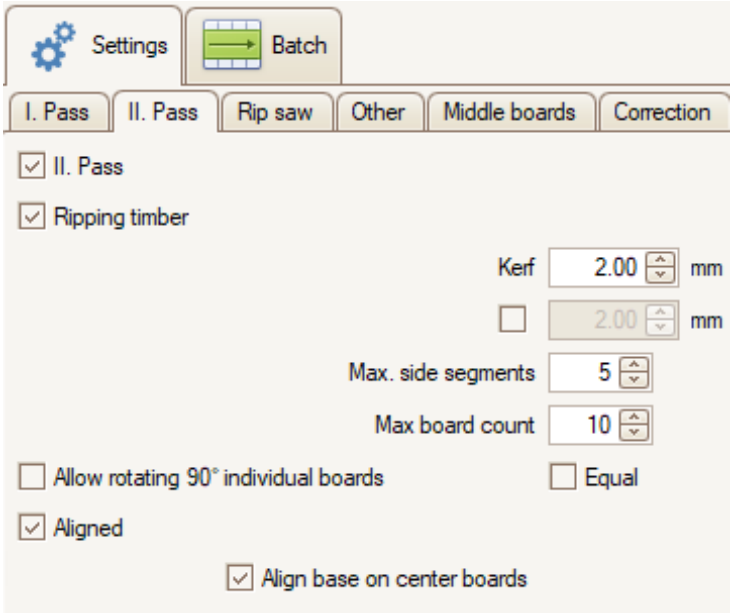


Figure 86: Second pass settings

II. Pass indicates, that if the timber from second pass should be included in the calculation or not.

Ripping timber - if this is not checked, then the results looks similar to the FlexiCut results. In case it was checked, then secondary processing of timber is allowed, so boards can be put side by side. By this will be better yield and the utilization of wood.

Kerf - width of the kerf (saw blade - vertical saws) for second pass

The second check box below the kerf indicates, if the first saw from the log center will have different thickness. It can be made by a different machine. Then the rest of the boards can be sawn on the machine with a thinner saw blade.

Max segments - the limit number of segments on one side in second pass

Max board count limit maximum number of boards in one segment

Rotating timber due to increasing yield can CutLog rotate timbers by 90 degrees. However in some cases the results are technologically not possible. This can prevent rotation of the timber.

Equal if all boards in one segment have to be the same size, you can check this option.

Aligned - It has an affect on ripping timber. In case, that all sideboards are processed in different ways. For explanation see the table 1 on the page 72.

Align base on center boards - is additional possibility to align side boards. It takes into the account also center boards. For example see figure 87

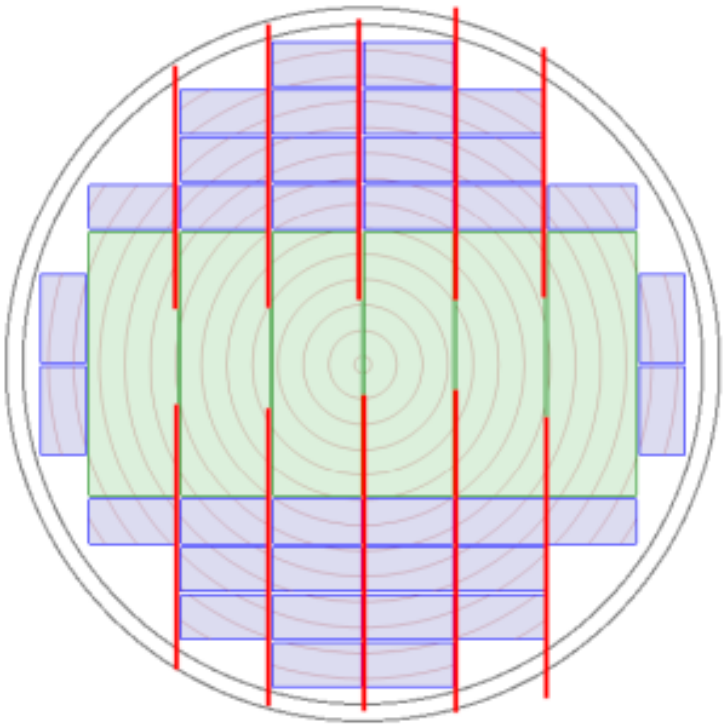


Figure 87: Side boards aligned with center boards

12.4 Rip saw settings

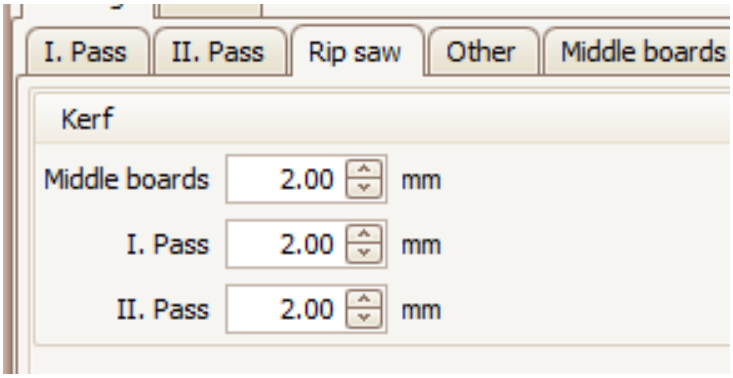


Figure 88: Rip saw settings

For meaning of **Kerf**. This is thickness of saw blade for various part of sawing process.

Middle boards define the thickness for edger in the center boards (red lines) - Fig. 89 on page 75

I.Pass boards define the thickness for edger in side boards of the first pass (red lines) - Fig. 90 on page 75

II.Pass boards define the thickness for edger in side boards of the second pass (red lines) - Fig. 91 on page 76

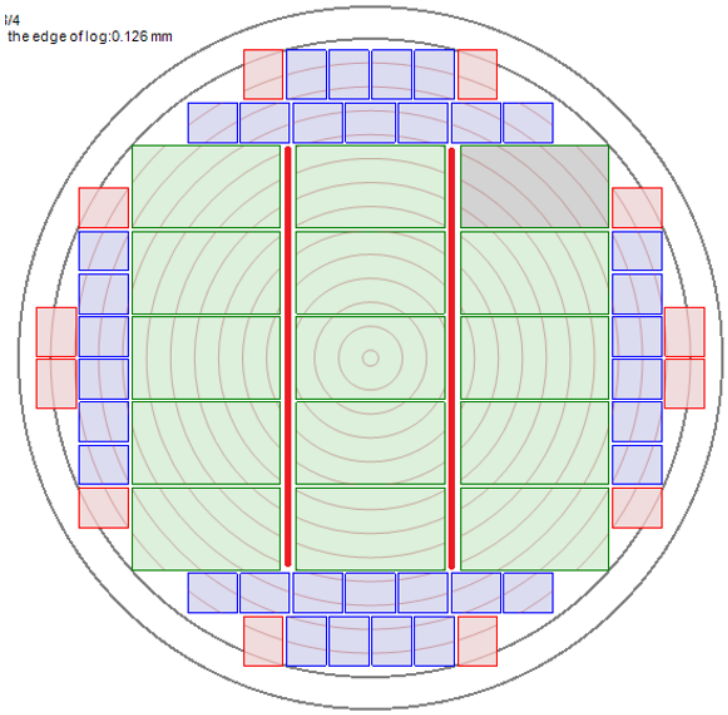


Figure 89: Rip saw middle

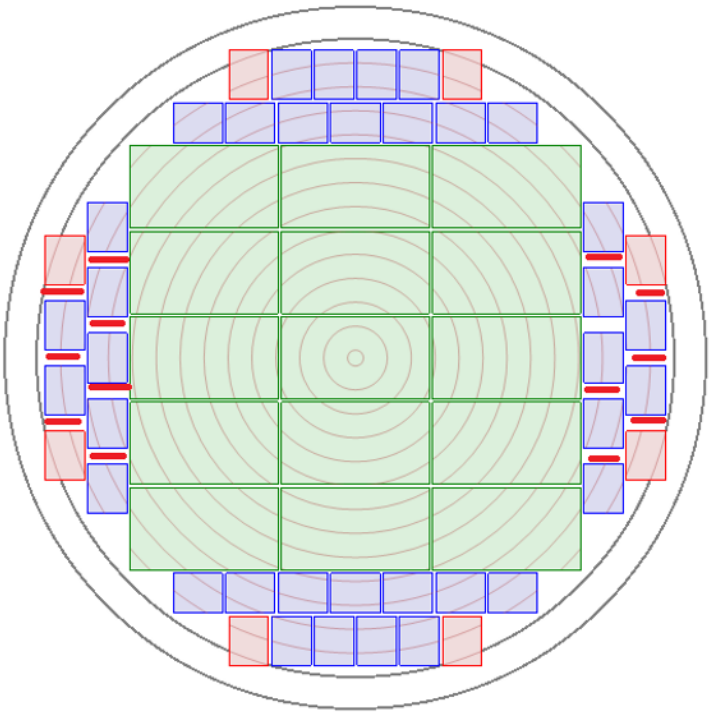


Figure 90: Rip saw first pass

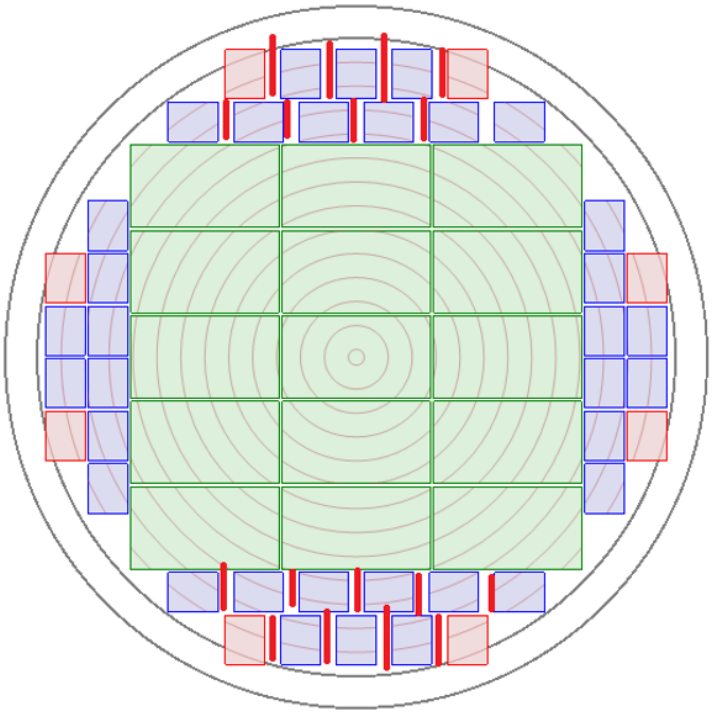


Figure 91: Rip saw second pass

12.5 Other settings

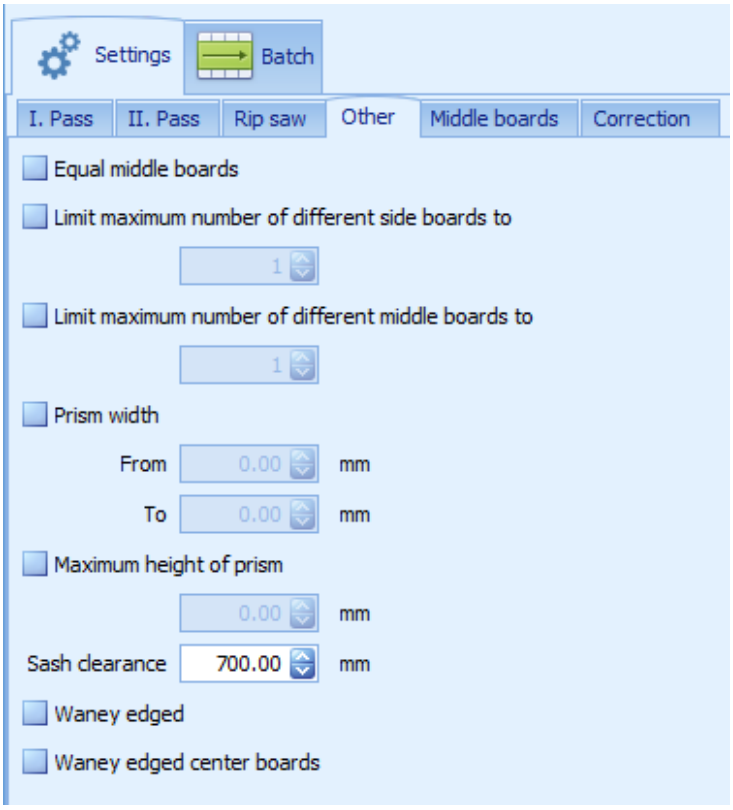


Figure 92: Other settings

Equal middle boards - all middle boards in log (green color) must be the same size.

Limit maximum number of different side boards to - this defines maximum number of different boards. If you wish to limit the number of products in the side area of the log.

Limit maximum number of different middle boards to [2] - this defines maximum number of different boards. If you wish to limit the number of products in the center area of the log. For example on figure 93. on page 78. you can see limit set to '2'. There are two boards - 100x100 and 25x100. In case of limitation number of middle boards to '1' you can see on next figure 94. only one size 50x150.

Sash clearance – the clearance of sawing machine. It is the maximum distance of outer surface of the boards.

Prism width - set limitation for prism width

Maximum prism height – set limitation of prism height

Waney edged – enable waney edge optimization. Otherwise, only boards without waneys are in results (if defined in Products screen - see page 24)

[2] CutLog 7.01 and newer

Waney edged center boards – enable center boards with the waneys (if defined in Products screen - see page 24)

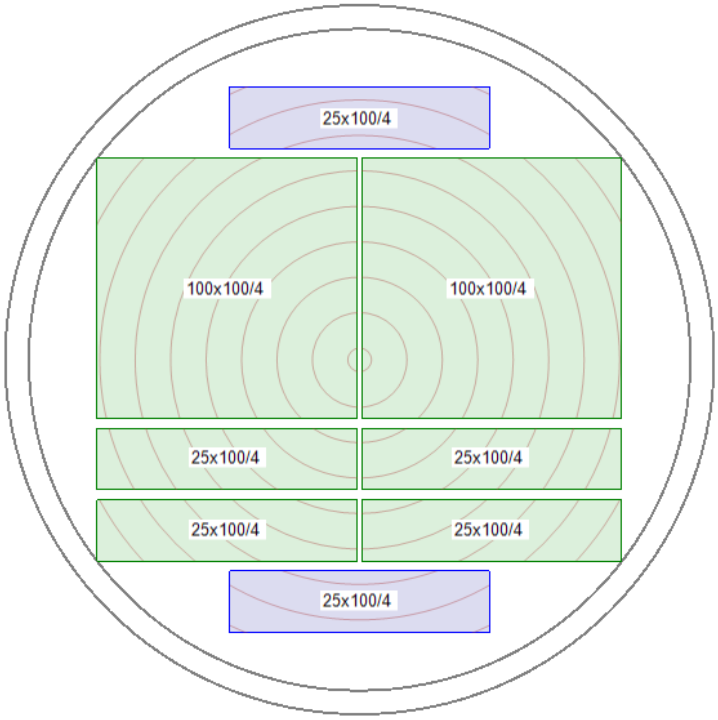


Figure 93: Results for limit of middle boards to 2

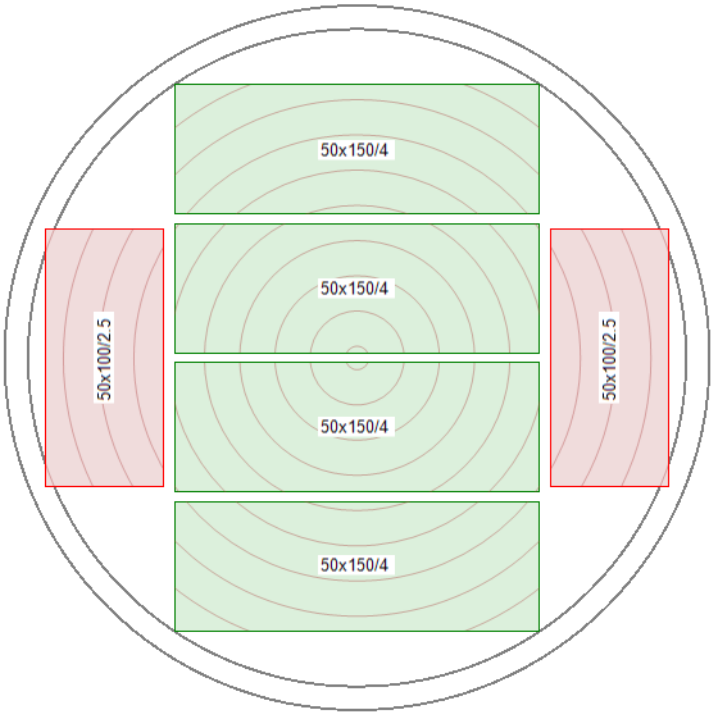


Figure 94: Results for limit of middle boards to 1

12.6 Correction

In this section can be set modifications of diameter log used for calculation of timber inside of pattern.

Either **curvature** can be set (see 10.3 Curvature on page 50), or SED can be directly decreased by some value.

It means, that if you set diameter to 100mm and decreasing to 20mm then calculation of the timber will be made in virtual sawlog with SED=80mm. But all other calculations, like the yield, prices of sawdust, chips, etc. will be taken for sawlog with SED=100mm. This is used only for limiting of area, where can timber occurs.

Timber in length of sawlog only - if checked, then timber will be in if checked, then timber will be in length of sawlog itself. No shorter boards will be produced. Of course yield will be lower in case of this option. length of sawlog itself. No shorter boards will be produced. Of course, yield will be lower in case of this option.

Minimum level – is minimum distance from bottom, where timber can occur. It is suitable for circular saws because of fixing the log from the bottom side of it. It has no affect on optimization, but boards below this value are displayed by gray color.

Maximum timber length – stands for the maximum length of timber regardless the length of sawlog. So maximum length of particular board

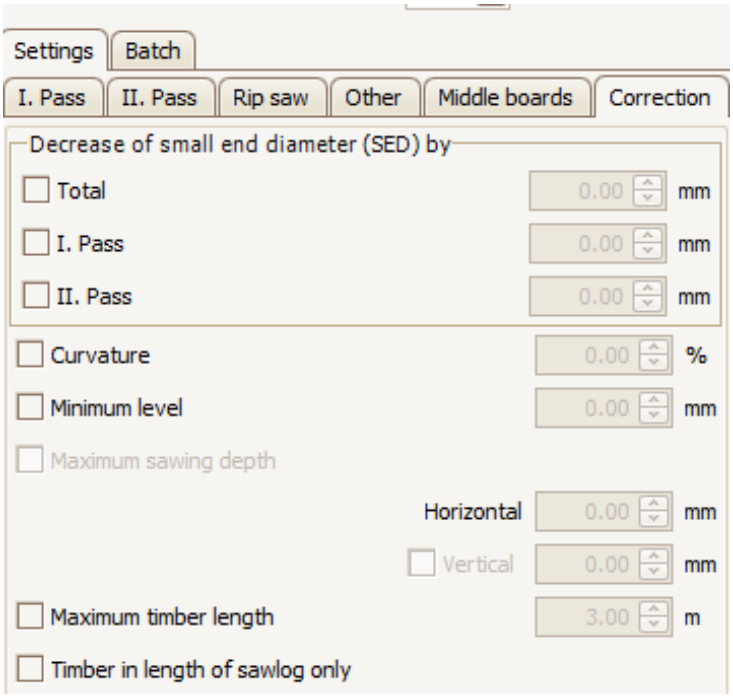


Figure 95: correction

is lower value from the sawlog length or "the maximum timber length"

Maximum sawing depth – is for the maximum sawing depth on circular saws. See figure 96 for explanation.

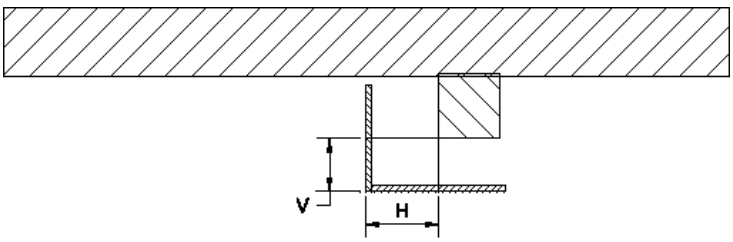


Figure 96: Sawing depth (**V**-vertical, **H**-Horizontal)

12.7 Middle boards

Number of segments - Defines, if the middle boar segments are in odd, even or any numbering. There can be limitation due to sawing blades.

Max. segments - In addition, you can define the maximum number of the middle board segments.

Kerf size is defined for center boards. If you don't define thickness of a saw blade here, then it will be taken from settings of the second pass.

Remove core boards - This option allows define the thickness of the middle board, which will be placed into middle of prism so that it passes the core.

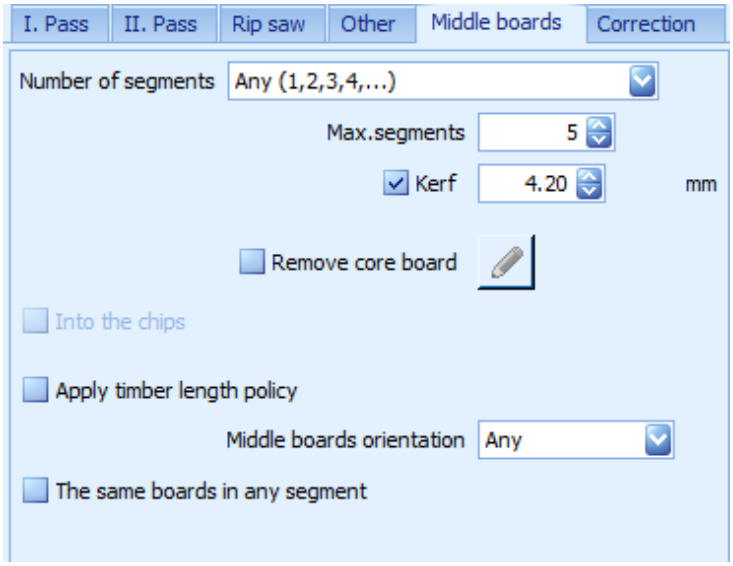


Figure 97: Middle boards

Into the chips In case you select "Remove core boards" then this boards can be optionally processed into the chips. Then no volume from those boards will be calculated and instead of this all boards will be calculated as chips.

Apply timber length policy - for middle boards can be optionally enabled/disabled timber length policy defined in see 8.4 Products on page 24. If this option is not checked, the6n default length policy is applied (8.14.4 Units of measurement on page 38).

The same boards in any segment can be used in case of limitation of processing the prism. In this case, all boards in prism (middle board) will have the same size, so they can be for example procesed at once with band-saw.

The boards used for this purpose are generated by the program additionally. When there is bigger number of the different boards defined in the products, there is a risk that the optimization will take longer than normal. If you select “Remove core board”, you have to define invoice and sawing thickness of the board in “Coreboards” definition window in base data menu.

The results can be as on figure 98.

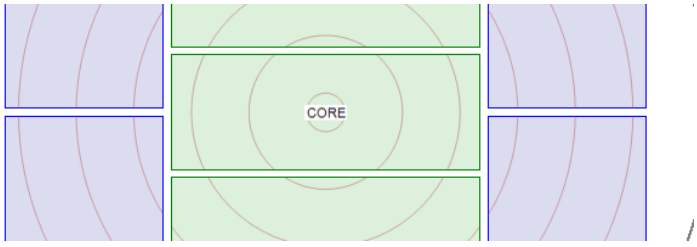


Figure 98: Remove core

In case, you check '**Into the chips**' (fig. 99)

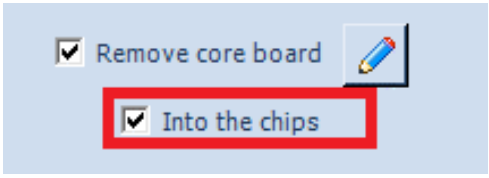


Figure 99: Core into the chips

Then core board will be taken out of pattern, and it's volume will be counted as chips (fig. 100)

Figure 100: Core in chips

12.8 False heartwood

There is possibility to take in account also false heartwood (Fig. 101).

Figure 101: False heartwood

If you enable option for a false heartwood diameter (fig. 102), then for the timbers in this area can the CutLog count price as middle boards and others are counted as side boards. You can separate those quality of timbers.

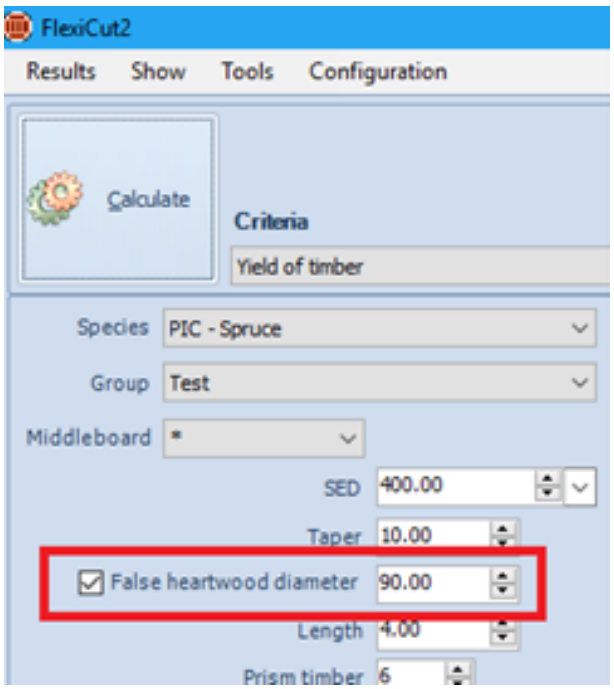


Figure 102: False heartwood option

You define diameter of false heartwood. Results will be, for example, as on the figure 103.

Green timber is in defined heartwood diameter. CutLog count with different price of mentioned timber.

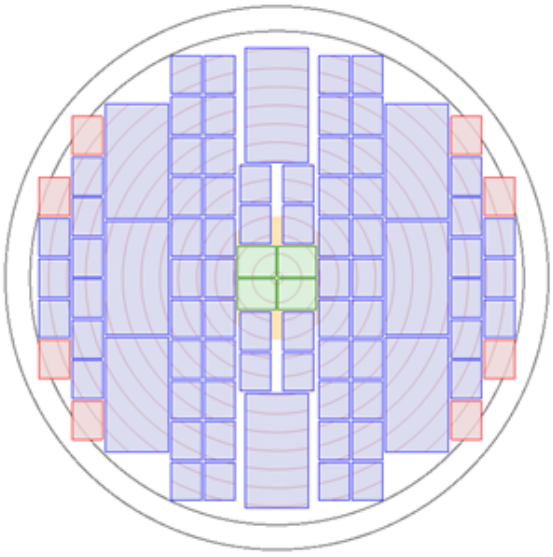


Figure 103: False heartwood sample

12.8.1 Minimum heartwood

If you define "Minimum area of heartwood required" in Products (8.4 Products on page 24) then this value is taken into the calculation and board will

be in result only in case, that it contains minimum required volume of heartwood.

For example on figure 104. you can see board 45x145, which has "Minimum area of heartwood required" set to 50%. So In case of define some false heartwood diameter (in our case it is 250mm - inner circle) there is result, where are accomplished required condition on mentioned figure.

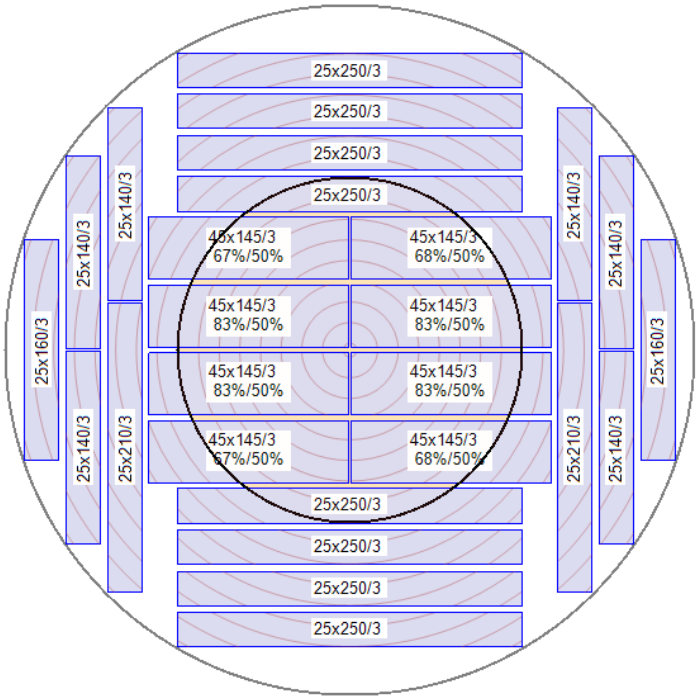


Figure 104: Minimum false heartwood

12.9 Batch

Using this feature (fig. 105), you can count optimization for the set of diameters. You just define the start and end diameter and the step. Then just push Calculate button and the CutLog will calculate diameters in batch.

After calculation you see list of diameters with results (fig. 106): the yield and price. You can move within list and the rest of screen is refreshed based on appropriate diameter. In addition, you can change any settings for a specific diameter and by pressing the Calculate current you recalculate diameter. By this way you can have completely different settings for any diameter in list.

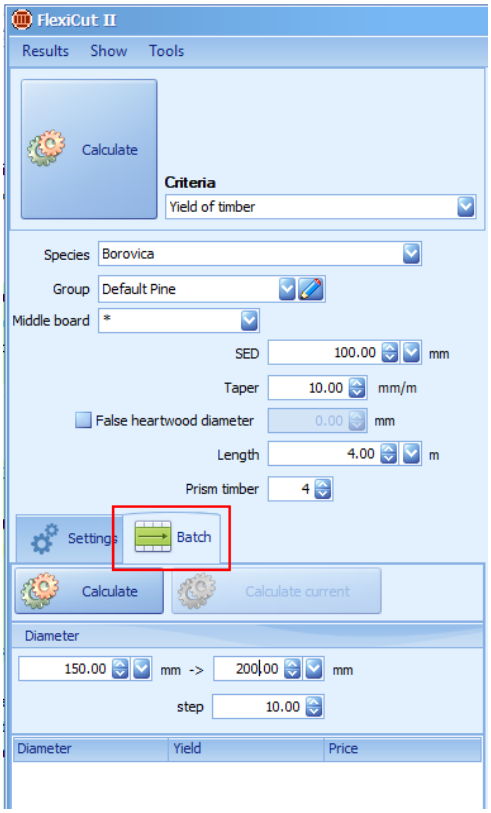


Figure 105: Batch calculation

Figure 106: Batch result

12.10 Segments

User can define either the thickness of each segment, based on boards or particular board size which can occurs either in the first or the second pass in some segment. Additionally, it can limit number of boards in one segment to only one kind of the board (thickness x width). Ypi can also select particular board which is defined in product window and marked for SIDE (I/II)

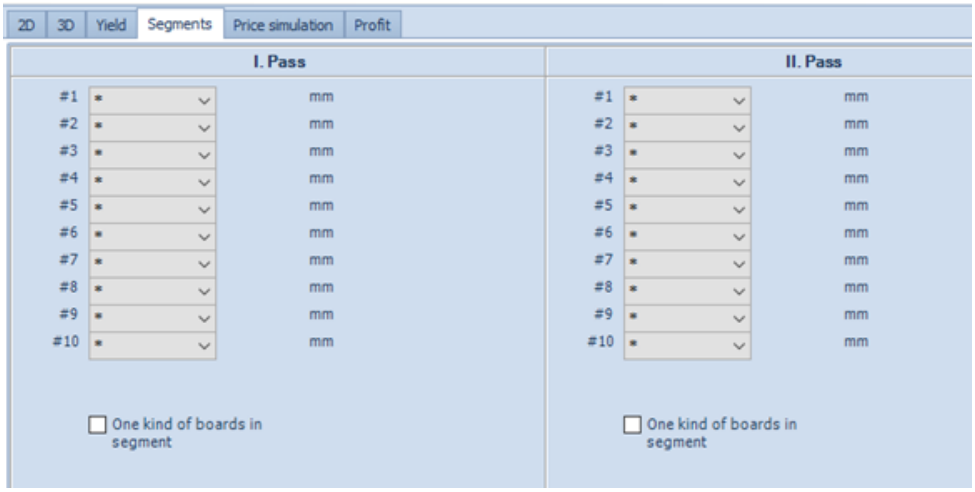


Figure 107: Segments

12.11 Price simulation

For this functionality, see 10.1 Price simulation on page 48.

12.12 Profit

For this functionality, see 10.2 Profit on page 50.

12.13 Batch export

From within the FlexiCut2 optimization you can run batch export via the menu Tools > Batch (fig. 108).

This is special feature, when optimization core is called for several sawlog parameters and the results are exported into MS Excel.

(Sorting optimization tab is visible only when you have purchased license for sorting optimization).

Here you will define an interval of board size-diameter-curvature-taper. Other parameters like **the wood species**, **group**, **length** etc. are taken from main optimization screen. Values entered here are saved for later use automatically.

The diameters or curvatures values can be entered also directly.

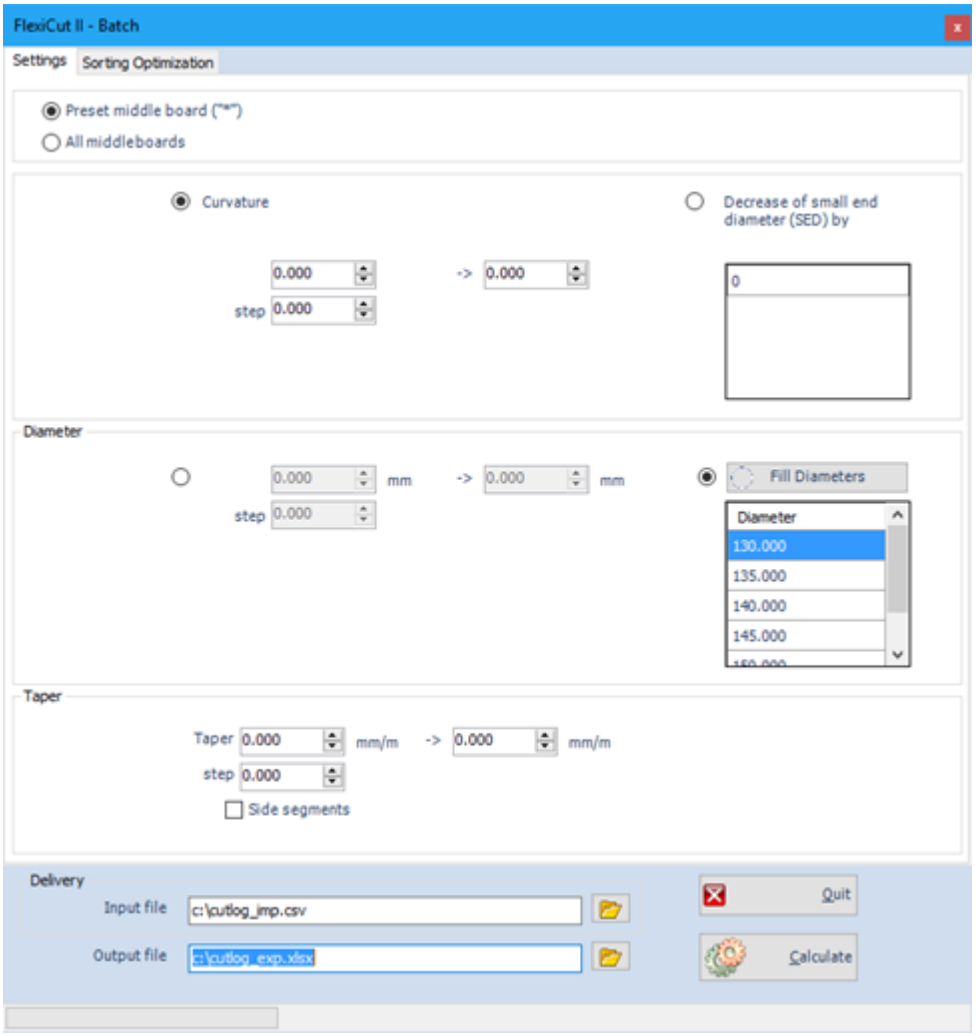


Figure 108: Batch export

13 Circular cut

A Circular Cut (fig. 109) is optimization with different view than the previous ones. This optimization divides log on levels. It is suitable for horizontal band-saws or portable saws. In each level, there are boards with the same thickness.

In addition it takes into the account space for the bottom fixation of a log (minimum level). User can seen size of levels base on which he can saw position. User can set minimum level to zero, then all area of the log will be used for optimization.

Important: This optimization counts with timbers marked as „the Middle board“ and putting them into the sawlog area. Price of timber is counted as it was in middle timber.

All other options and possibilities are the same as in the previous functions (FlexiCut/ MultiCut).

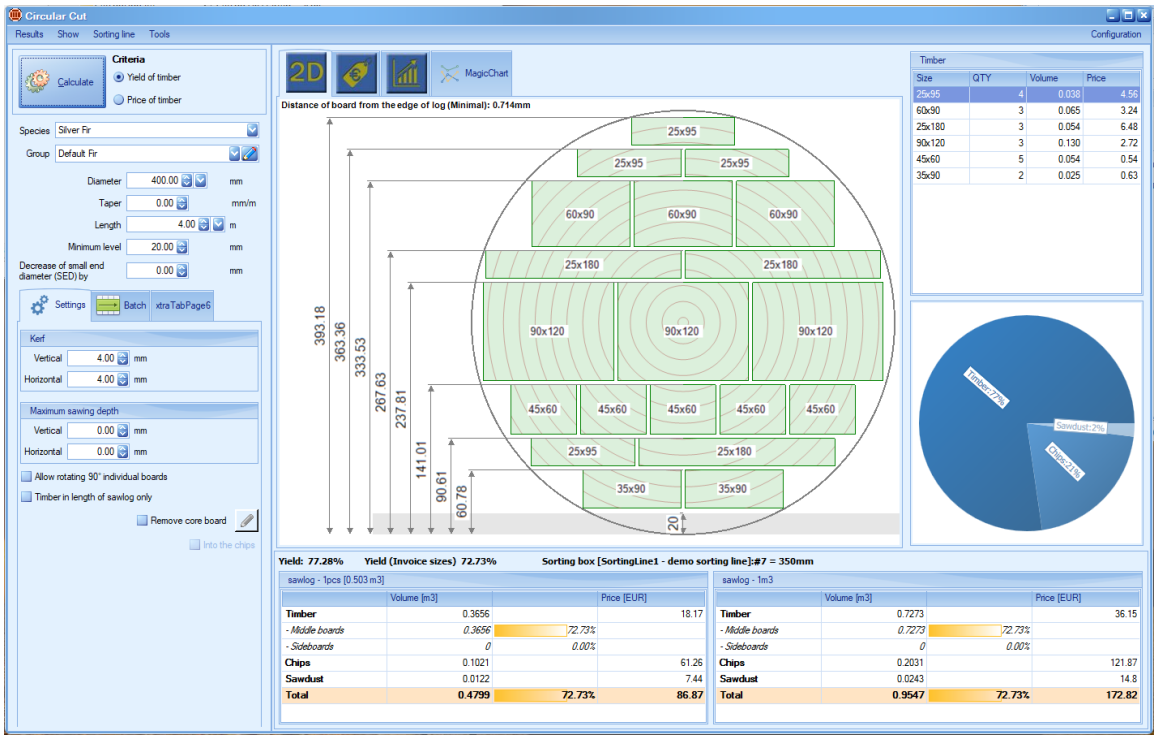


Figure 109: Circular cut optimization

Most parameters are already known from the previous optimizations.

Rotating timber – if checked, in result can be board either on horizontal or vertical orientation. If it was not checked then only vertical position is allowed.

For **sawing depth**, please see page 80 or figure 96. "Sawing depth (**V**-vertical, **H**-Horizontal)" on page 80 .

Remove core board - see page 80: *Remove core boards* feature in FlexiCut2

13.1 Price simulation

For this functionality see 10.1 Price simulation on page 48.

14 Quarter sawn

This optimization is used for calculating of a radial timber board produced by a quarter sawn. There are two types of quartersawn: traditional (fig. 110) and modern(fig. 111).

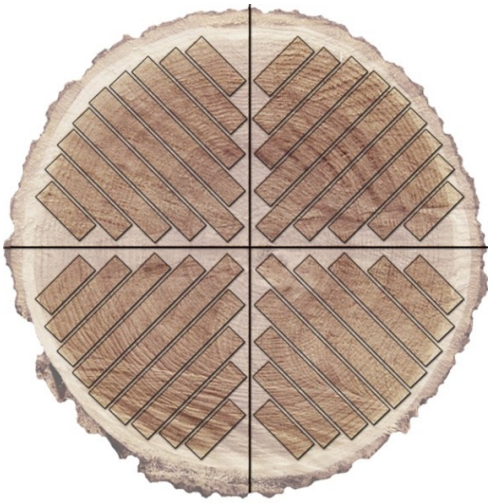


Figure 110: Traditional quarter sawn

Figure 111: Modern quarter sawn

CutLog supports both.

In main screen you define the type of sawing. Also it is necessary to define other data, like diameter, saw blade width etc. The rest of the screen is similar to the other optimizations.

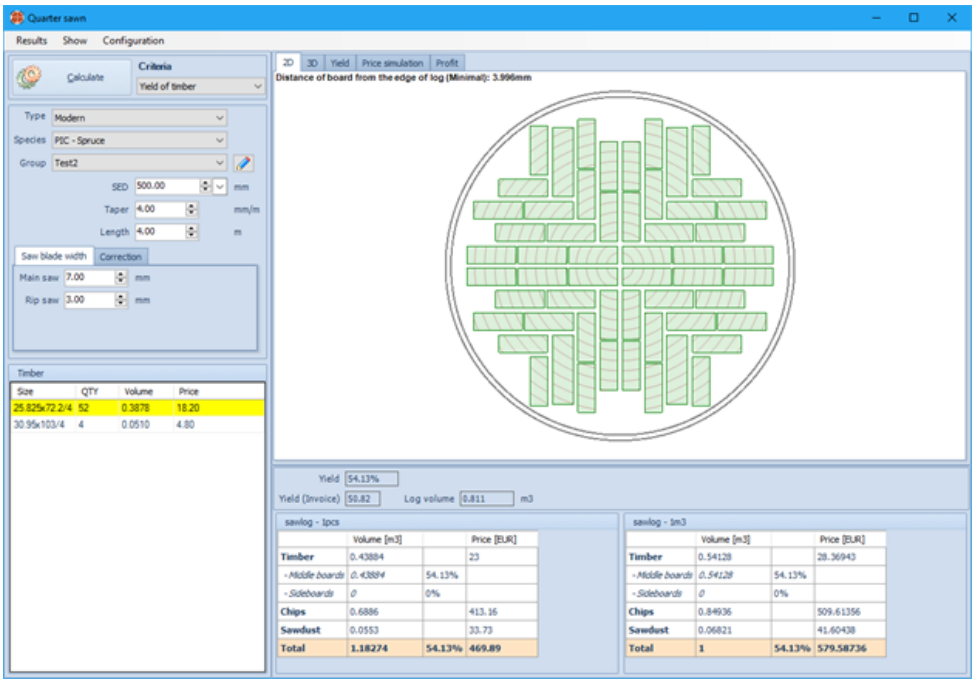


Figure 112: Quarter sawn optimization

15 Stock

The Menu Stock is used by the optional module for production planning and for stock evaluation (page 53) in optimization functions.

Function is rather simple (fig. 113).

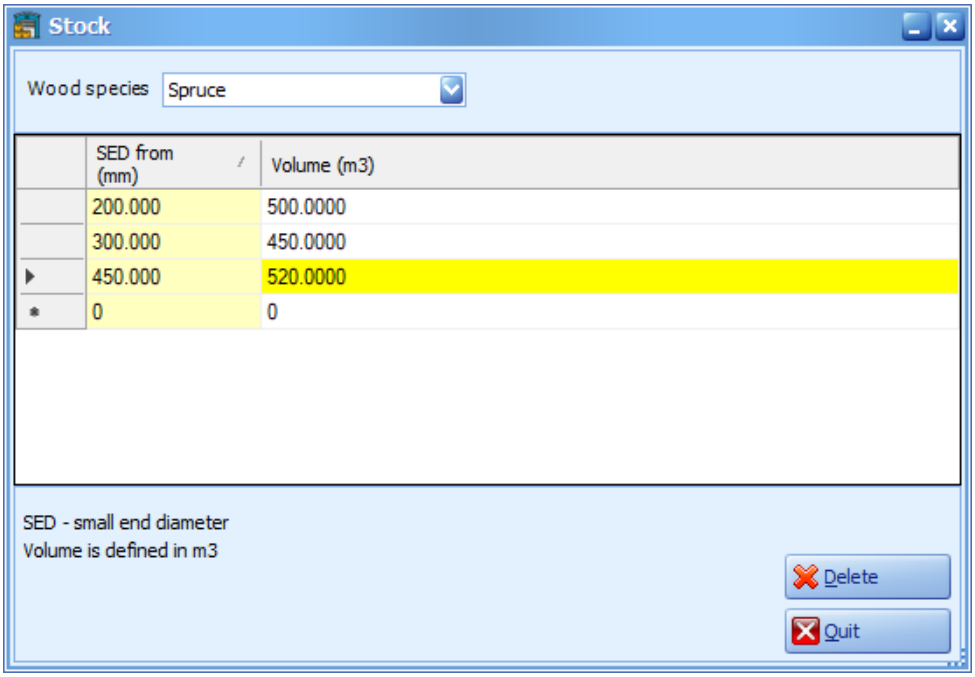


Figure 113: Stock definition

Based on the wood species (selected on top combo box), you enter diameter and volume on stock. The algorithms search for the volume of a specified diameter by looking in this table. In case that specified diameter is not defined here, then the nearest lower is taken. It means, that for 250mm is the volume 500m^3. In case, that by using production planning you are preparing a year plan, here you can define year delivery of the sawlogs.

16 Orders

This is another function used by a production planning. The design is simple, see fig. 114.

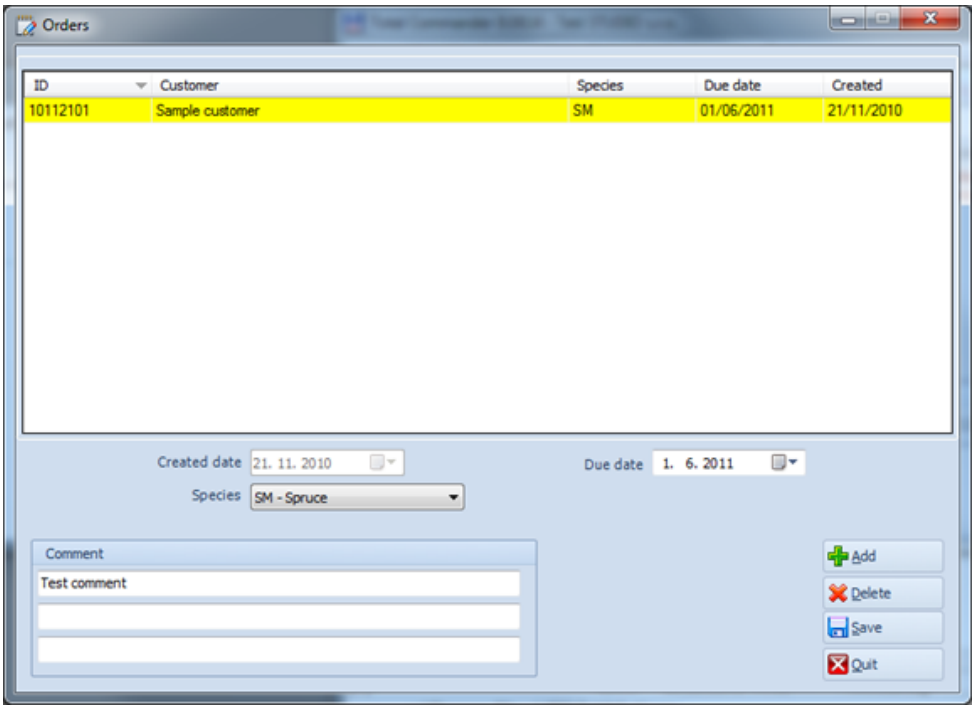


Figure 114: Orders

You can enter new order by pressing Add button (fig. 115).

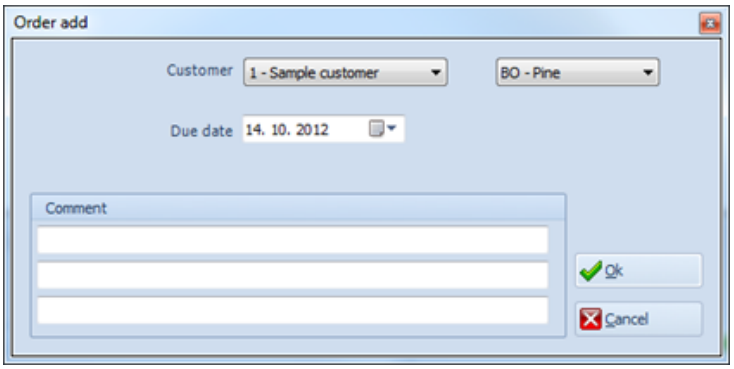


Figure 115: Add order

Details of order can be viewed/edited by double-clicking on the order line (fig. 116).

In order detail, you can also add a whole product group to order by Add group.

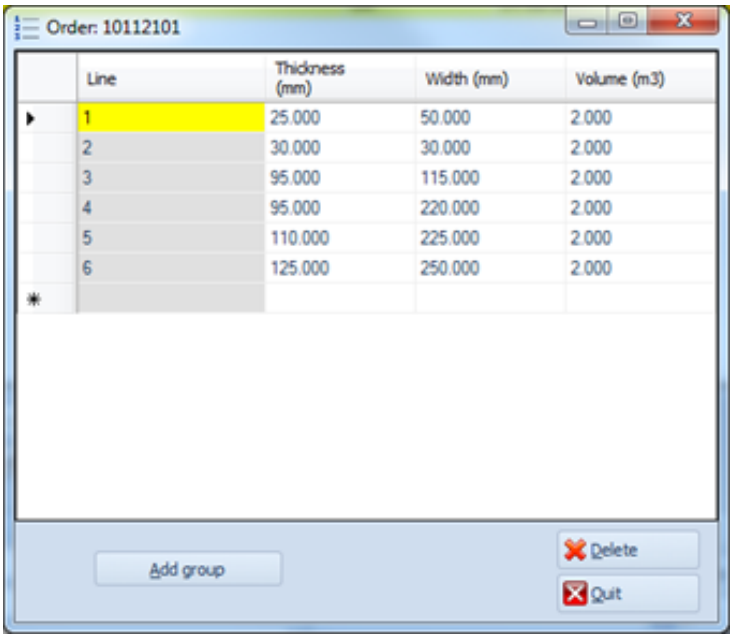


Figure 116: Order detail

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18 Support and contact

For any questions and requests you can use the following contacts:

WWW https://www.cutlog.com

email info@cutlog.com

Or from within the application, you can use embedded function, choose Help » Feedback/Feature request and fill the form. Your request will be immediately sent through the internet.

If you have any questions about the CutLog or have any ideas, which can improve the quality of the CutLog, do not hesitate to contact us or contact your local reseller.