Manual

for

Bullmer Cutter

with

NextGen

topcut bullmer
cutting room technology

GA-CU-0809-01-EN.pdf
GA-Kapitel1-0809-01-en.doc
GA-CU-K2-0809-01-en.doc
GA-CU-K3-0809-01-en.doc
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GA-CU-K5-0809-01-en.doc
GA-CU-K6-0809-01-en.doc
GA-CU-K7-0809-01-en.doc

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Table of Contents

CHAPTER I

General notes

TABLE OF CONTENTS - CHAPTER I

1. General Notes

1.1 Observe notes in the instruction manual

Basic prerequisite for the proper use and the problem-free operation of this machine, is the knowledge of the instruction manual with the danger- and safety hints contained therein.

- This instruction manual contains the most important notes in order to operate the machine securely.
- This instruction manual, especially the safety notes,
  is to be observed by all persons, who operate the machine

  In addition, the rules and regulations for prevention of accidents, that are in force at the place of operation, are to be observed.

In the instruction manual, additional signs are used with the following meaning:

Marking of danger points

This symbol means a direct threatening danger for the life and the health of persons.

The failure to observe these notes can lead to heavy ,all the way to life threatening injuries to life and health.

Important information and notes

This symbol gives important hints for the proper contact with the machine. The failure to observe these hints can lead to faults at the machine or in the surroundings.

1.2 Obligations of the operator

The operator obligates himself to have only persons work on the machine, who:

- are familiar with the basic rules regarding work-safety and accident-prevention and who are trained regarding the handling and operating of the machine.
- have read the safety-chapter and the warning-hints in this instruction manual, understood them and have confirmed this with his/her/their signature.

The safety-conscious work of the personnel is checked in regular intervals by the security-representative of the operator

1.3 Obligations of the personnel

All persons, who are engaged with working at the machine, obligate themselves, before start:

- to observe the basic rules regarding work-safety and accident-prevention.
- to read the safety-chapter and the warning - and danger notes in this instruction manual and to confirm this by his/her/their signature.

They have to confirm through their signature that they have understood the safety chapter and the warning and danger notes.

1.4 Dangers when operating the machine

The machine is built in accordance to the stand of the technology and the safety-rules. Nevertheless, dangers can occur by its use for health and the life of the operators or third persons and/or damages can develop on the machine or on other objects or devices.

The machine is only to be used:

- for its intended use
- in safety-related perfect condition.

Disturbances of any type, which can impair the safety of the machine are to be corrected immediately !

1.5 Appropriate use

The machine is designed only to be used in accordance to the chapter "Use of the machine “Use deviating from or overreaching the intended purpose of the machine is inappropriate.
Topcut-bullmer GmbH cannot be held liable for damages occuring from such use.

Also included under the heading appropriate use are:

- the observance of all notes in the instructions
- the upholding of the inspection and maintenance work

1.6 Warranty and Liability

Our " general terms of sale and delivery “ are fundamentally valid.
These will be made available to the user upon closing of the contract at the latest.
Warranty and liability claims are not possible for personal injury or damage to property if the damage is due to one or more of the following reasons.:

- Inappropriate use of the machine
- Incorrect mounting, operating, controlling or maintenance of the machine
- Mounting or maintenance work being carried out by unauthorized personnel
- Operation of the machine with defective safety devices or safety devices which are not mounted properly or which do not function perfectly.
- Non observance of the notes in the instructions with regard to transport, storage, mounting, initial operation, operation, maintenance and preparation of the machine
- unauthorized structural changes made to the machine, as well as on the machines adjoining
- Installing or exchanging parts of the machine using non-original components
- Inadequate monitoring of machine parts which are subject to wear
- repairs carried out incorrectly
- disasters caused by foreign bodies or reasons of higher force.

1.7 Safety regulations

1.7.1 Organizational measures

- The required personal protection devices are to be made available by the operator
- All existing safety devices are to be checked regularly

1.7.2 Safety Devices

- Before every use of the machine, all safety devices must be installed correctly and must be functional
- Safety Devices may only be removed

  - after the machine has stopped
    AND
  - after being secured against being turned on again unintentionally

- When delivering part components, the safety devices are to be installed by the operator according to regulations
- After structural changes at the machine or or on adjoining devices, the safety devices must be installed to the changed machines or components and be checked by the responsible safety representative.

1.7.3 Informal safety measures

- The instructions for use are to be kept at the workplace of the machine at all times.

- In addition to the instructions for use, the generally valid safety rules as well as the local regulations for accident prevention and for environmental protection are to be available and observed at all times.
- All notes on safety and danger signs on the machine itself are to be kept in a legible condition.
- Only trained and assigned personnel can work on the machine.
- The responsibilities of the personnel are to be clearly determined for the mounting initial operation, operation, preparation, maintenance and repair of the machine.
- Personnel to be trained may only work on the machine under the supervision of an experienced and trained person.

1.7.4 Machine Controls

- Under no circumstances may program modifications be made on the software.
- Only appropriately trained personnel is allowed to operate the control

1.7.5 Safety Measures for normal use

- Only operate the machine when all safety devices are fully functional
- Before switching on the machine, it must be assured, that nobody can be injured by the starting of the machine.

- At least once per shift the machine is to be inspected for superficial signs of damage and for the correct functioning of the safety devices.

1.7.6 Dangers through electric energy

- Working at the electric supply is only allowed for specialists, under observance of the valid safety regulations according to DIN/VDE and EN.

- The electric equipment of the machine is to be checked regularly.
  Loose connections , damaged wires and cables and lines or other safety relevant damages are to be removed immediately.
- The electrical control cabinet and the clamping boxes are to be kept closed. Access is only allowed for authorized personnel with key or tool.
- On necessary work on parts that give out electrical voltage, the valid safety regulations are to be adhered to according to DIN/VDE and EN.

1.7.7 Dangers through pneumatic energy

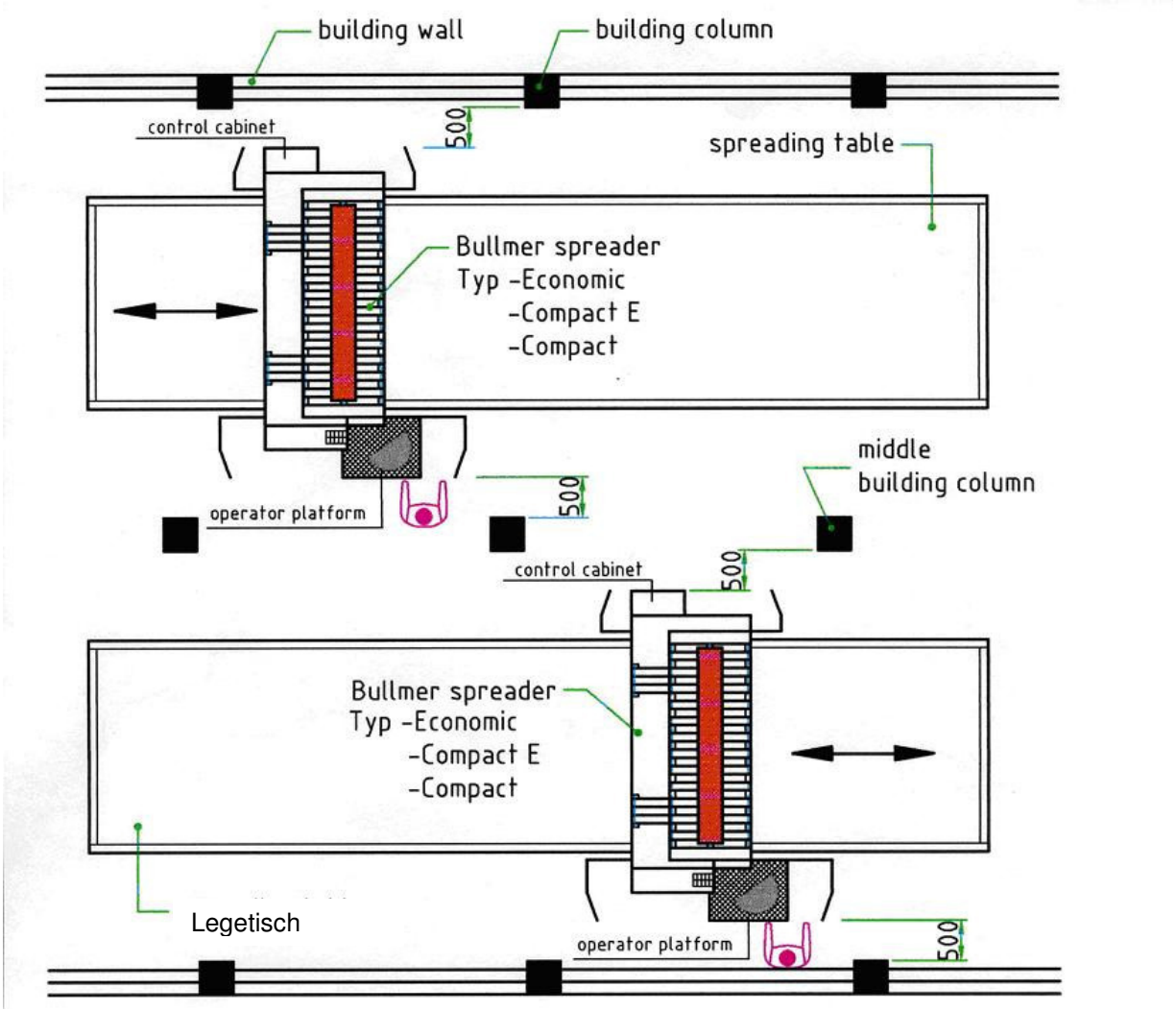
- Only personnel with specialized knowledge and experience in the field of pneumatic may work on the pneumatic appliances.
- Sections of the system and pressure pipes which are to be opened are to be rendered free of pressure before working on them.
- Pneumatic hoses are to be replaced at appropriate intervals , even if not showing any signs of safety relevant deficiencies.

1.7.8 Special points of danger

- A list of the dangers is included in the appendix.

1.7.9 Machine Installation - Safety distance

A. Spreader next to other parts of the building

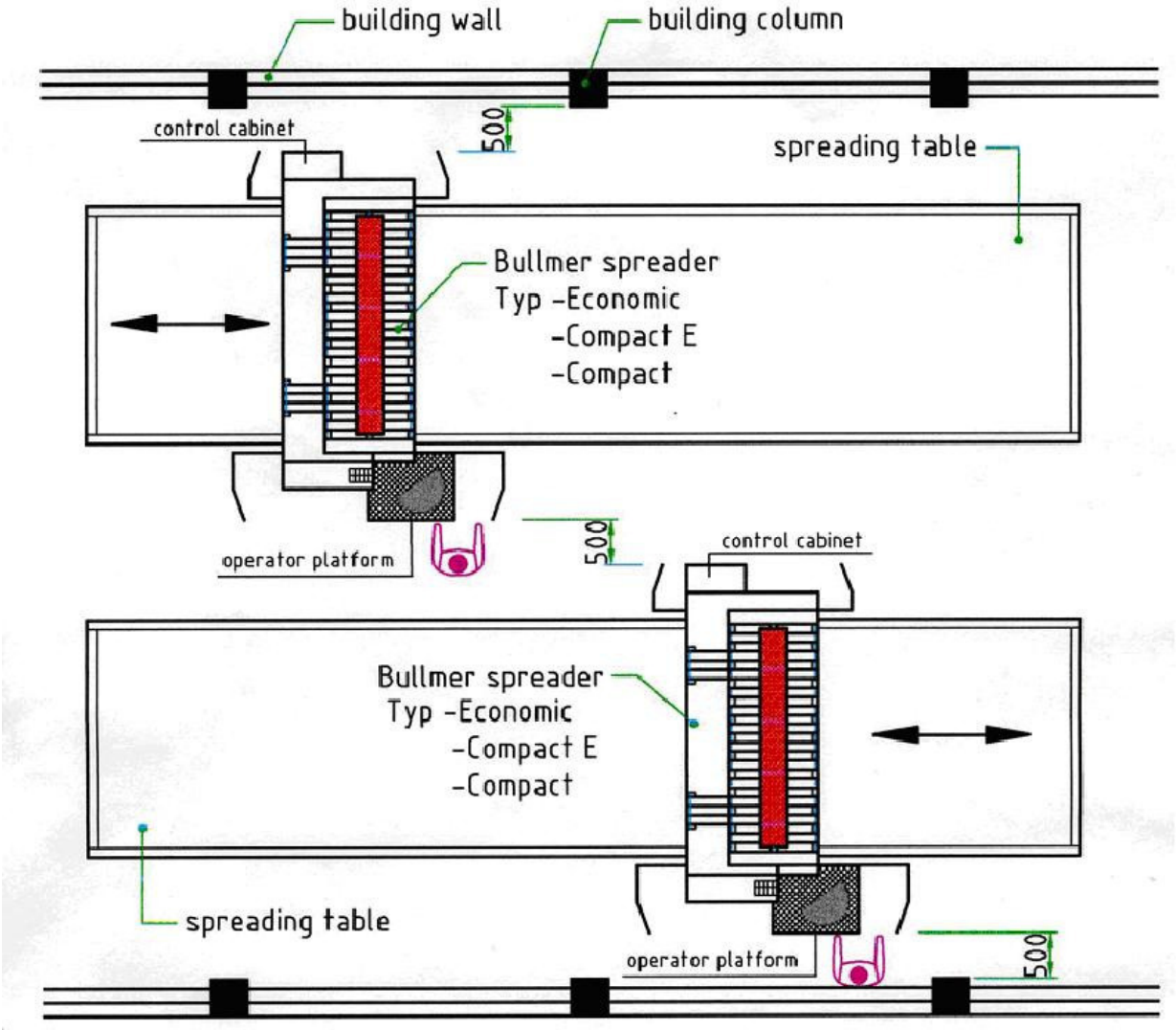


Motorised respectively driven spreading machines have to have a safety distance respectively a minimum distance opposite to another one or opposite of fixed building installations such as walls, columns, ducts, rails or similar of

500mm

This is valid for so called operator platforms, i.e. platforms which are connected with the machine and on which an operator is located and for parts of the machine which hang out of the machine square to it's drive way.
Beside this we recommend to mark the drive area of the spreader on the floor, for example with tape or with colour.

B. Spreader which pass together directly

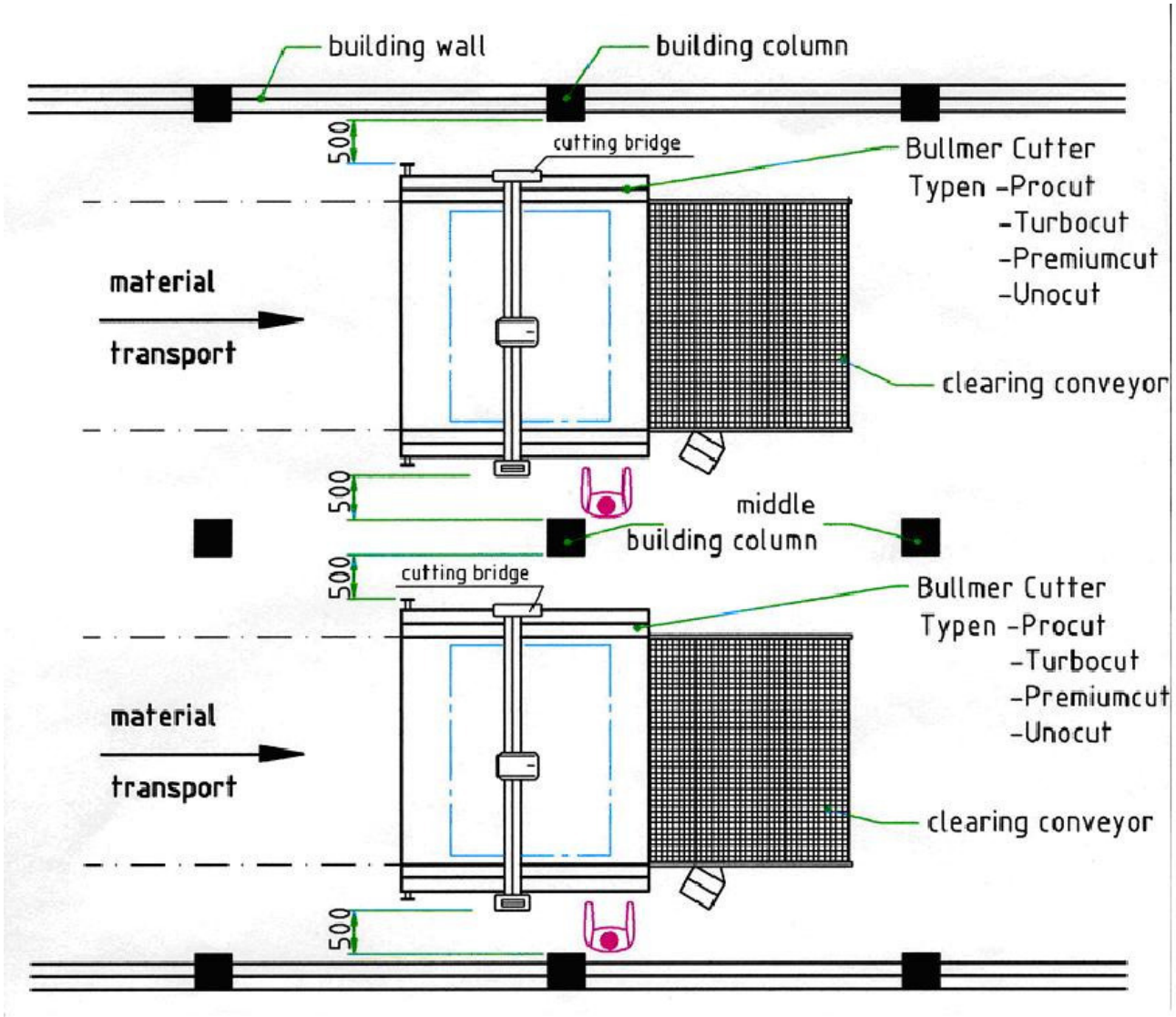


If movable spreading machines which usual move back and forth in operation direction on a spreading table are installed neighbouring so that the machines have to pass each other the safety distance respectively the minimum distance between the parts which hang out widest from both machines together has to be

500mm

For example: Operator platform of one machine and control cabinet of the other machine.

C. Cutter next to other parts of the building

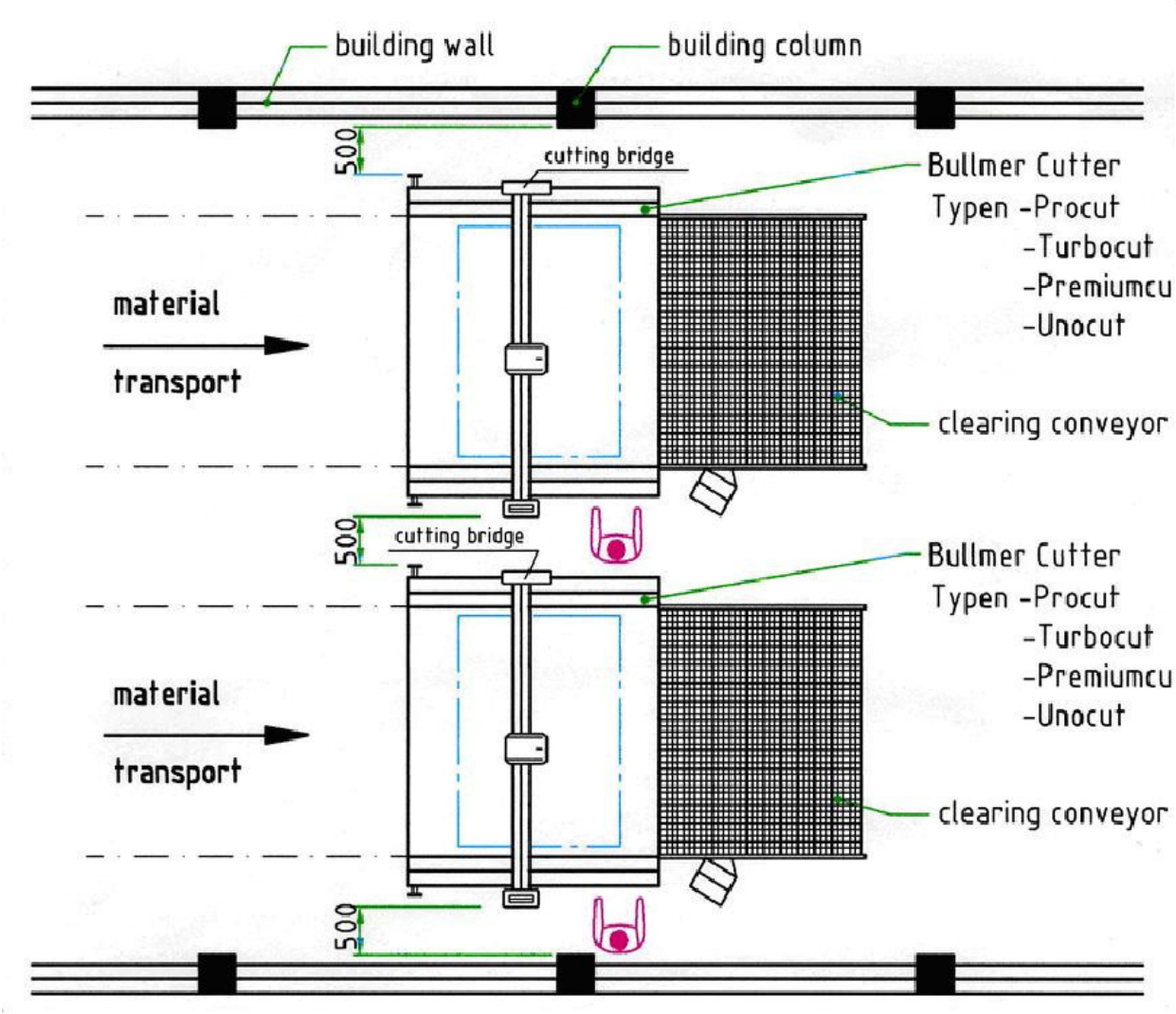


Cutter are either equipped with stationary tables or with conveyors to take over staks which has to be cut and after cutting to sort the cutted material ply. Such cutter are equipped with cutting bridges which move back and forth in operation direction above the cutter tables or cutter conveyors. It's possible that the cutting bridges tower above both tables and conveyors.

Because this cutter have to have with the outermost movable parts (cutting bridge) a safety distance respectively minimum distance at the narrowest place opposite to fixed building installations such as walls, columns, ducts, rails and similar of

500mm

C. Directly adjacent cutter



If cutter are installed directly neighbouring next to each other so that the cutting bridges of each cutter pass together the safety distance respectively minimum distance of the parts which are hang out widest of the cutting bridge has to be

500mm

If spreaders diagonally move towards or away from each other on rails, fixed stations need to be provided and the closest distance as above may only be

500 mm.

1.7.10 Storage - transportation - and operating conditions

STORAGE - AND TRANSPORTATION-CONDITIONS:

Temperature:	+5° to +40° Celsius
Relative humidity:	less than 80 percent (doesn't condense)

OPERATING CONDITIONS:

Temperature:	+5° to +35° Celsius
Relative humidity:	10 percent (doesn't condense) until 80 percent
Installation altitude:	less than 1000 m absolute altitude
Connection values:	400V 50Hz (3 Phase/N/PE) (Special values on inquiry)
Environment influences:	The voltage must be stable (max. tolerance +/- 5 %).

1.8 Maintenance and Servicing / Trouble shooting

- Required adjustment maintenance and inspection work is to be carried out regularly.

- The operating personnel is to be informed before maintenance and inspection is done.
- All components in front of or behind the machine and operating media such as compressed air and hydraulics are to be secured against unauthorized use.
- On all maintenance, inspection and repair work done, the machine is to be switched to voltage-free and the main switch is to be secured against being switched back on unintentionally.

    - **Turn off main switch and pull key if necessary**
    - **Place lock and warning sign to stop the machine being switched on again**

- Larger component groups are to be securely affixed to cranes or platforms when being replaced.
- Loosened screw connections are to be tested for strength
- After finishing the maintenance work, the function of the safety devices has to be checked

1.9 Structural changes at the machine

- Without authorization of the manufacturer, no conversions, re-build or changes may be made to the machine or parts of the machine.
- All conversion measures need a written authorization and confirmation of topcut-bullmer GmbH.
- All machine parts, that are not in perfect condition, are to be exchanged immediately, using original spare parts.
- Only original spare parts and wear and tear parts may be used.

At non-compliance to the above, all commitments, liabilities and guarantees are stricken by topcut-bullmer GmbH.

1.10 Disposals of cleaning fluids and lubricant-remains, waste disposal of spare and wear and tear parts and Lithium-Batteries.

- Used fabrics and materials are to be disposed of properly and according to the regulations.

  Especially

  - **when working on lubricating systems and facilities**
  - **when working with cleaning fluids and solvents**
  - **Discharged Lithium-Batteries may be given only to the old Batteries collection site and/or to the legal waste disposal sites.**
    With not completely discharged batteries, precaution must be made against short-circuits.

1.11 Noise of the machine

- The permanent sound pressure level emitted from the machine is under 70 dB(As)
- Dependent on the local conditions, a higher sound-pressure-level can arise, causing deafness. In this case, the service-personnel is to be safeguarded with according protection-facilities or precaution measures.

1.12 Copyrights

The copyright to these instructions remains with topcut-bullmer GmbH. These instructions are only for the operator of the machine and its personnel.

They contain regulations and instructions, which must not be

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Either in part or in whole.

Contraventions are criminal acts and are subject to legal consequences.

Stamp/Signature

Printed in Germany

The information in this handbook is published regardless of possible rights against third parties.

Merchandise-names are used without their free use being guaranteed.

We have prepared the software and the handbooks with great effort and care, nevertheless mistakes cannot be excluded completely.

For incorrect statements and their consequences we can not assume neither a legal responsibility nor any liability. For improvement-suggestions we are grateful.

We reserve the right for alterations, that aid the improvement of the computer program as well as the handbooks.

CHAPTER II

Introduction and summary

Table of Contents – Chapter II

1 Valid application

This machine is only to be used in a valid application, which is to cut contours from a single or multiple ply fabric lays, primarily textiles.
The number and height of the fabric lays depends upon the machine configuration and the type of the fabrics used, among other things.

The machine is exclusively limited to applications described in this instruction. Other use is invalid.

The company topcut-bullmer GmbH is not liable for consequential damages.

Valid applications includes the following

- Observance of all instructions from the operation manual
- Observance of all inspection and maintenance requirements

2 Introduction

NextGen is a program for the operation of a bullmer cutter. It enables this automatic cutting machine to be operated comfortably and simply in a wide range of applications and requirements.

In addition to the basic functions such as loading markers, starting and cutting, etc., NextGen also offers the possibility to set parameters in real time, to reallocate notches and cuts, to parameterize and to determine a desired set point after an interruption to recontinue cutting.

NextGen also allows the graphical control of the loaded data.

The NextGen system offers the user a succinct and easy-to-use working environment that also enables inexperienced computer users to learn what is required very quickly.

This handbook is designed to help you get accustomed to using the system and to serve as a troubleshooter when working with the machine in the future. The beginner should test the functions on the system itself, preferably while reading these instructions; this is made simple for the user because pictures of the corresponding screen in the handbook accompany all operating steps.

This introduction is followed by a description of the system. In the last chapter you will find a list of the functions that are of interest for servicing as well as pages with instructions on cutting.

We are always grateful to receive tips and ideas from you.

3 System description

3.1 Hardware - prerequisites

A computer control type CNC BSM 400 is necessary for the operation of NEXTGEN.

We assume that a VGA-card and a high-resolution color screen are available.

So that large files with a large number of points can be processed, at least 128 MB RAM and 1GH clock frequency must be available.

3.2 Software - prerequisites

As an operating system, Windows XP is required.

If markers are to be administered via the hard disk of the cutter control we recommend going over the hard disk regularly with a de-fragmentation program. This ensures high speed of data access.

3.3 Total view

Picture 1: XL PROCUT 7501

3.4 Cutter Control Panel

Picture 2: The Cutter Control Panel

Note:

According to machine-execution and optional equipment the individual operation elements and their order can vary. The use of the machine is only possible if the main switch and control is switched on and the machine is unlocked. The key functions are, with individual exceptions, only feasible in the manual operation mode.

Key	Function description
	Emergency stop: Hit this button in an emergency situation. It stops all movements of the machine.
	Control on: The machine can be used only with control switched on and "unlocked".
	Control off: With this button, the control is switched off
	Knife down With this button, the knife-drive is plunged as well as lifted (manual operation).

Lateral cut:
With this button, the lateral cut is operated (only in the automatic operation).

Vacuum On/Off:
With this button, the vacuum is switched on/off.

Manual operation On/Off:
With this button, the operating mode is switched Manual/Automatic. The button lights up for manual operation.

Knife drive On/Off:
With this button, the knife drive is switched on/off (only in manual operation).

Grinding On:
With this button the grinding process is switched on (Automatic operation of grinding discs, with grinding belts only in manual operation).

Enter:
With this button, the single edge points will be confirmed during the reference sequence.

Pause:
With this button the cutting is interrupted, pressing the button a second time resumes operations

Restart:
A stopped cutting process can be restarted with this button.
Reference sequence:
the reviewing of the edge points can be skipped; the cutter begins to cut immediately.

Presser foot down:
With this button the presser foot will be dropped as well as lifted (only with manual operation).

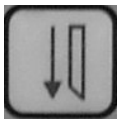
Abort:
With this button, the reference sequence is broken off, the cutter returns to the start-point.

Stop:
Stop during cutting – continue with restart or new marker.

Grinding discs On/Off:
With this button, the grinding discs are switched on at the grinding device, for example to clean the discs (only in manual operation).

Notch tool Up/Down:
With this button the notchtool can be lowered as well as lifted. (only with manual operation).

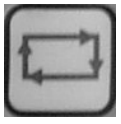
Rotary knife Up/Down:
With this button the rotary knife can be lowered as well as lifted (only with manual operation).



Chisel knife Up/Down:
With this button the chisel knife can be lowered as well as lifted (only with manual operation).

Advance conveyor:
With this button the conveyor can be moved forward.

Reverse conveyor:
With this button the conveyor can be reversed.



Automatic bitefeed:
With this button the automatic bitefeed can be started.

Cleaning of bristle conveyor:
To start a cleaning run press key „cleaning“ first (to start the conveyor feed) and then switch on vacuum. During cleaning run the vacuum is used in the way to suck out the bristle conveyor. **To avoid generating of vacuum during the cleaning run you absolutely have to pay attention that there is no cover foil on the table. Please pay also attention that cover foil is winded up in the way that it is not possible that it will be pulled on the table while cleaning run.**

Joystick :
With the joystick, the cutting head can be positioned in X - and Y-direction (press and hold the control-button in the joystick). When the control button is held on, the position lamp is lit

The position lamp (light-pointer) is switched on by pressing the button on the joystick, and helps to positioning the start-point. After releasing the button, the lamp goes out automatically after a short delay.

The light-pointer offers the possibility, in connection with the software (see chapter III, Software/Basis, reference sequence), to compare the total size of the loaded marker to be cut with the fabric lay. Additionally if a fabric lay is not lying straight, this can be corrected using the reference points checked with the light pointer. When these reference points are entered the marker is adjusted in the software to compensate for the lay not being straight on the cutting table.

CHAPTER III

Software / Basics

Table of Contents – Chapter III

The NextGen-System can be used either by the control panel (button field at the cutter bridge) together with the ASCII-keyboard, as well as only by the keyboard.
The operation by the control panel is limited by the most important functions. The handling of the system by keyboard is more comfortable.

1 Functional overview

This chapter will give you an overview about the functions of the bullmer control software.

Marker

- Handling of GERBER-ISO-Format
- Handling of DXF-Format with parameterised allocation of Layers and colours to tools and parts
- Rotation, zoom and reflection of all parts or choose parts
- Elimination of common lines
- Different strategies for automatic determination of the plunge position referenced on each part
- Automatic notch identification (V-notches, slits, stitches, drills, helpdrills, M19 slits) with the contour geometry
- Identification of doubled parts
- Optimising of the cutting sequence
- Handling of small parts at the beginning to get the vacuum
- Recording of markers

Jobqueue

- Edition of a jobqueue with functions insertion, scrolling and unloading of marker
- Interlink of marker
- Edition of marker specified parameter within the jobqueue
- Connection to roll storing system with automatic generation and implementation of a jobqueue
- Loading of existing jobqueues
- Back up of a jobqueue
- Barcode mode

Cutting

- Time optimized moving control with compliance of predetermined parameter such as speed, acceleration and jerk limit values
- Automatic speed and acceleration reduction dependent on curve radius to control with parameter
- Maximum cutting speed and low machine strain possible with smoothing of cutting contours through spline approximation

- Automatic compensation of the distance between knife edge and knife centre and extensive neutralisation of the knife radial force through adjustment of the tangential knife setting angle dependent on curve radius.
- Automatic lifting and plunge of the knife at angles with too big direction changing. Critical angle of direction changing, overcut and heelcut are adjustable with parameter.
- Automatic insertion of grinding cycles at the lifting points or if necessary cutting interruption for grinding cycles if the parameterised grinding distance is overstepped.
- Optimising of cutting sequence and notch sequence for minimising of empty drives.
- Multifaceted possibilities for re-defining and parameterise for notches.
- Cut out of drills as circles
- Prick out the notches with a notch drill
- Start of the marker with dry run, i.e. without sinking of tools
- Special handling of doubled parts

Additional functions for cutting process

- Adjusting of marker on the cutting table with comfortable correction of marker position
- Correction of marker position in every cutting window, only in the first cutting window or automatic takeover of starting point
- Multiple referencing: Adjustment of several markers on the cutting table
- Parallel referencing: Adjustment of markers on two or even more parallel laying fabric panels, for example in case of doubled fabric.
- Correction of marker with corner of marker, with rapport strips or with middle referencing
- Fabric grid referencing for accuracy check of the pattern
- Step ply referencing
- Automatic calculation of fabric demand and automatic bitefeed of fabric during the start of the cutting process.
- After a stop, - also after a blackout -, automatic continuing of the cutting process at the position were the stop happened or at any other position which you want to mark.
- Automatic identification of fabric end with automatic hive off of the parts which can not longer cut. These parts will be storage automatically as new markers.
- Warning message if knife is too wear
- Warning message for changing of grinding belts
- Automatic foil feeder
- Optional break after cutting the first part so that the operator has the possibility to control this part
- Special handling of fix parts for coarse cut and final editing cut
- Optional clear or copy the finished marker

Carry out dividing cut

- Manual dividing cut at any position
- Optional dividing cut at the end of every marker, also in marker sequences
- Preliminary end dividing cut so that it's possible to change fabric roll already before cutting end
- End dividing cut with maximum x-position
- Parameterised distance between end dividing cut and marker
- Edge dividing cut with parameterised distances
- Continuous dividing cut of inlying dividing cut bars
- Different speed for dividing cut, parameterised separate
- Continuous dividing cut at the end of cutting window
- Tool choice for dividing cut

Plotten

- Plot with Pen
- Plot with spraying device
- Optional plot of the whole marker, so also the cutting contour. With this the cutter becomes a „plotter"
- Plot of S-codes with a InkJet

Calculation of cutting window and bitefeed

- Calculation of cutting window with or without cutting break
- Intelligence cutting break, i.e. only big parts are divided
- Different bitefeed strategies
- Optional mark of a reference stitch for control of bitefeed
- Bitefeed axis as drag axis
- Automatic correction of bitefeed fields
- Fabric feed over terminal strip
- Switch off of bitefeed
- Clearance operation

Graphics

- Multifaceted graphic functions for visualisation of the marker, for example zoom, parts selection, point selection, notch display
- Display of s-code parts code
- Selection of parts with optional mark on the state „not cutting"
- Insertion of matching points
- Visualisation of cutting processes with online display of knife position and marking of finish cut parts
- Mark of any continuous point after breaking off

Re-cutting of defect parts

- Selection of faulty parts in the graphics even during cutting
- Comfortable nesting of these parts and generating of a new marker
- Automatic insertion of these marker in the jobqueue for trimming

Matching

- Matching over projector, camera or laser pointer
- Collision check during matching
- Different matching strategies: group rapport, single and global matching
- Bow and Skew: Manual adaptation of contours to the deformation of laying fabric with help of marker projection on the fabric
- Parallel carrying out of cutting and matching process with matching over projector
- Consideration of offset in case of strip material
- Global movement of matching offset
- Interactive generation of matching groups with storage possibility afterwards
- Insertion of new matching points

Clearing

- Display of parts which are in the clearing area in a special clearing graphic or projection of finished cut parts on the fabric
- Control of a clearing robot for serial production (automotive supply)

Parameter

- Adaptation to customer requests with multiple parameterise possibilities
- Comfortable parameter dialogue
- Special dialogue for parameterise of notches
- Changing of parameter which are often used with slider (for example cutting speed)
- Free choose of dimensions
- Special inch version
- Optional sorting of parameter
- Fading-out of not relevant parameter over different levels
- Password protection
- Automatic consistency check
- Different help texts for all parameter
- Loading of material dependent parameter sets
- Generate and storage of new parameter sets
- Tool dependent parameter

Data capture

- Recording of dimension, cutting time, break time, bitefeed time, marking time, total time and respective ways, number of parts, support points, plunges and sharpening cycles and number of cutting options of notches and drills
- Marker report
- Day and shift report
- Shift based endless report
- Monthly report
- Line report
- Optional report display at the surface, at a printer, at the log file or in a file
- Adaptation of statistic units at customer's option
- Print of statistics with marker graphics and marker journal
- Dialogue for log-in and log-off of the shift

Standard control functions

- Positioning of machine
- Referencing of machine
- Emergency stop without reference loss
- Switching of exits
- Unlock machine
- Break and continue
- Abort and continue
- Control of machine with button at separate console

Machine

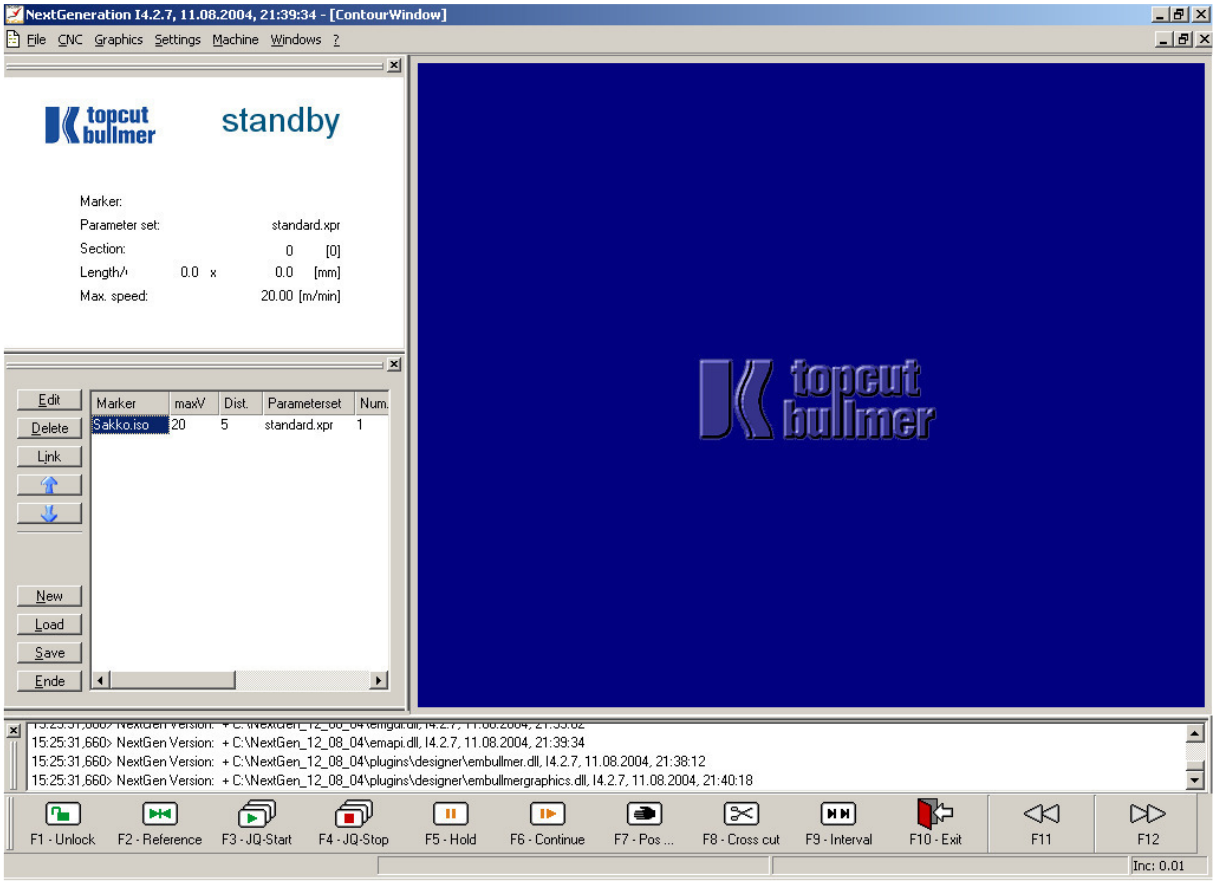
- Left/right execution of cutter with automatic mirroring of graphic
- Separation between drive and working area
- Activation of different vacuum sections according to size and position of marker
- Tools: Rotary knife, stitching knife, drag knife, notch chisel, drill tool, camera, pen or spraying device
- Activation of different drills with different diameters with automatic drill changing; optional one or two drills
- Different grinding strategies: Standard grinding, grinding while positioning, grinding while bitefeed
- Automatic knife width correction over wear-out-factor and measuring of grinding cycles
- Parameterise of oil injection
- Knife offset correction respectively knife intelligence
- Knife lifting frequency dependent on speed for the oscillating knife
- Cutter special execution with separate second c-axis and dichotomy of table in conveyor and cutting strip
- Cutter special execution with a z-axis for the mould
- Vacuum regulation
- Control of a joystick
- Oscillograph function as an adjustment help for the cutter start up

Others

- Operating system: Windows XP
- Windows surface which can be configured
- Network
- Detailed logging
- Barcode mode
- Optional language choose

2 Operator Interface / General

The operator interface is programmed in window technology in accordance with the modern standard. In principle, the operation takes place with the mouse. All functions can also be selected using the function-buttons <F1> to <F12>. In this way either functions are started (or the cutter is moved) or further menus are accessed.



Picture 1:Main menu page 1 functions.

2.1 Function area

All functions of the NextGen-System are available by the menu at the top of the window. Furthermore you can select the functions by the toolbar, which is placed at the bottom of the window.
This operation manual describes for each function and each parameter where it is placed and which is used to activate it.

The menu bar

The menu bar is placed at the top of the NextGen-window. By these menus all functions can be reached.

If you want to activate a function, just select the corresponding menu and the function with the mouse. The function is whether executed directly or NEXTGEN opens another window and waits for another input.

Behind the most important functions in the menus, a shortcut is displayed (for example: „Parameter Strg+P“). These functions can always be reached by the shown shortcut.

The Toolbar

Additional there is a toolbar at the lower most position of the screen, where you can find all functions again. Users, who prefer working with keyboard, are able to select the displayed function keys instead of clicking the respective Icon with the mouse.

Because on one toolbar is not enough space for all necessary functions you can switch between different toolbars. If you click the Icons „<<“ and „>>“ or if you use the keys <F11> and <F12> you can change to the toolbar before or to the next one.

In the other toolbars the keys are occupied with other functions.

Beside this you can also change to the different toolbars if you click on one toolbar with the right mouse button. A list of all available toolbars appears.

2.2 The Contour Window

After starting NextGen, in the contour window only a background picture is displayed. As soon as a marker is loaded, this marker is displayed in the contour window. The menu *Graphics and the toolbars* „Graphics (part)“ und „Graphics (Point)“ offer different functions to check and to modify markers before cutting.

2.3 The Jobqueue Window

In the jobqueue-window all the markers, which were selected for the cutting process, are listed. Moreover for each cutfile there are the most important informations (parameter set, number of repetitions...) shown in that window. Furthermore the jobqueue window includes different buttons to modify or to save the actual jobqueue or to load a jobqueue which already exists.

2.4 The Status Window

In the status window at the left upper screen edge the most important information of the machine is shown continuously. In the uppermost line, the current machine condition is shown (i.e.: *machine active* or *machine locked*). Underneath it you find

statements about the loaded marker, names and dimensions, and the loaded parameter sentence.

2.5 The Message window:

NextGen offers an extensive message system. In principle the message is seen

either
In the lowermost window (message window)
or :
In a message box

You have the possibility to look at the last message anytime, to control the previous actions. The last message is shown constantly in the message window. To check the messages, which are longer ago, you can scroll the message list upward.

This list of the last message is also named LOGFILE. Into this Logfile, all message and service-actions are recorded with the time.

Message and actions that the system receives (i.e. function button confirmations) are marked with a left facing arrow. Input, coming from the control panel is additional marked with a 'T'. Messages, which are sent from the NextGen-system, get an arrow which points to the right side.

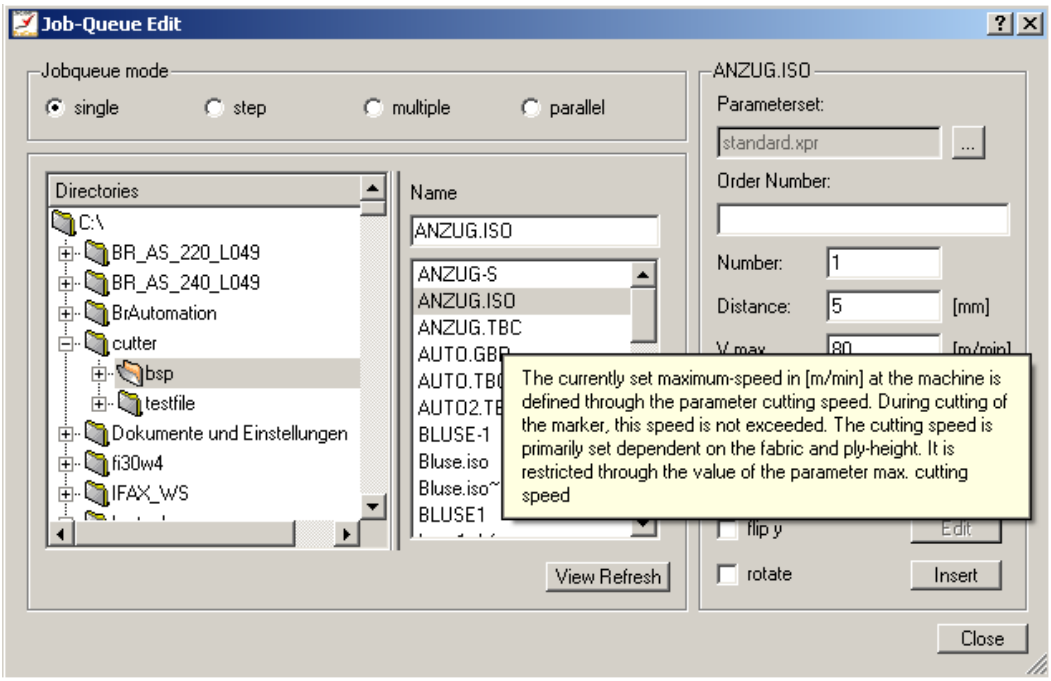
If you click with the right mouse button onto the message window, a context menu appears, which offers the functions „delete logfile" and „edit logfile". If the function "edit logfile" is selected, the message list is displayed in a text editor. Now you have the possibility to scroll through the whole list, to save the list with another name and to copy single messages out of the file.

2.6 The Help system

As soon as the cursor is placed on a function in the menu bar or in the toolbar, the status line (on the lowermost position of the screen) shows a short explanation of the selected function.

For all dialogue items such as buttons and input fields so called „tooltips" are displayed, if you move the cursor to the respective item. Tooltips are short descriptions which are shown in a yellow frame beside the cursor.

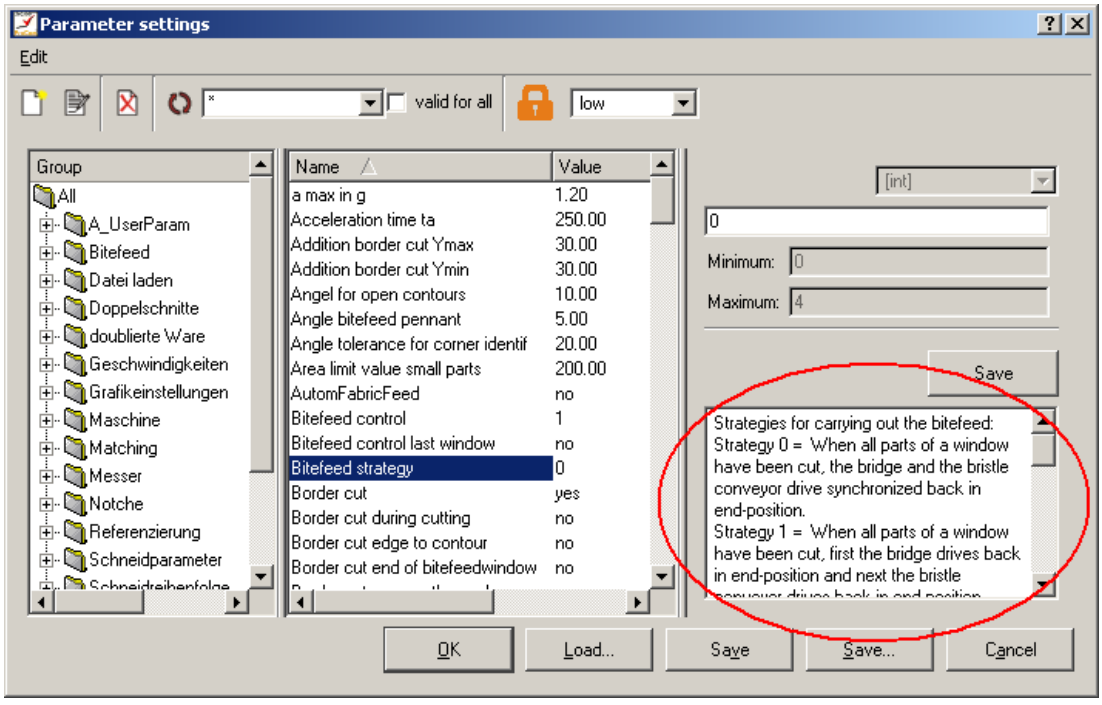
Inside of the different dialogue boxes you can get detailed information about any button or input field. Use the context help tool (the question mark) which is placed on the upper right corner of each dialogue box. After selecting the context help, the cursor is displayed as a question mark. Click on any item on the screen to get information about the selected item. A window with a description of the corresponding button or input field appears.



Picture 2: The Context Help

As soon as you click with the left mouse button to any place at the screen, the window closes again.

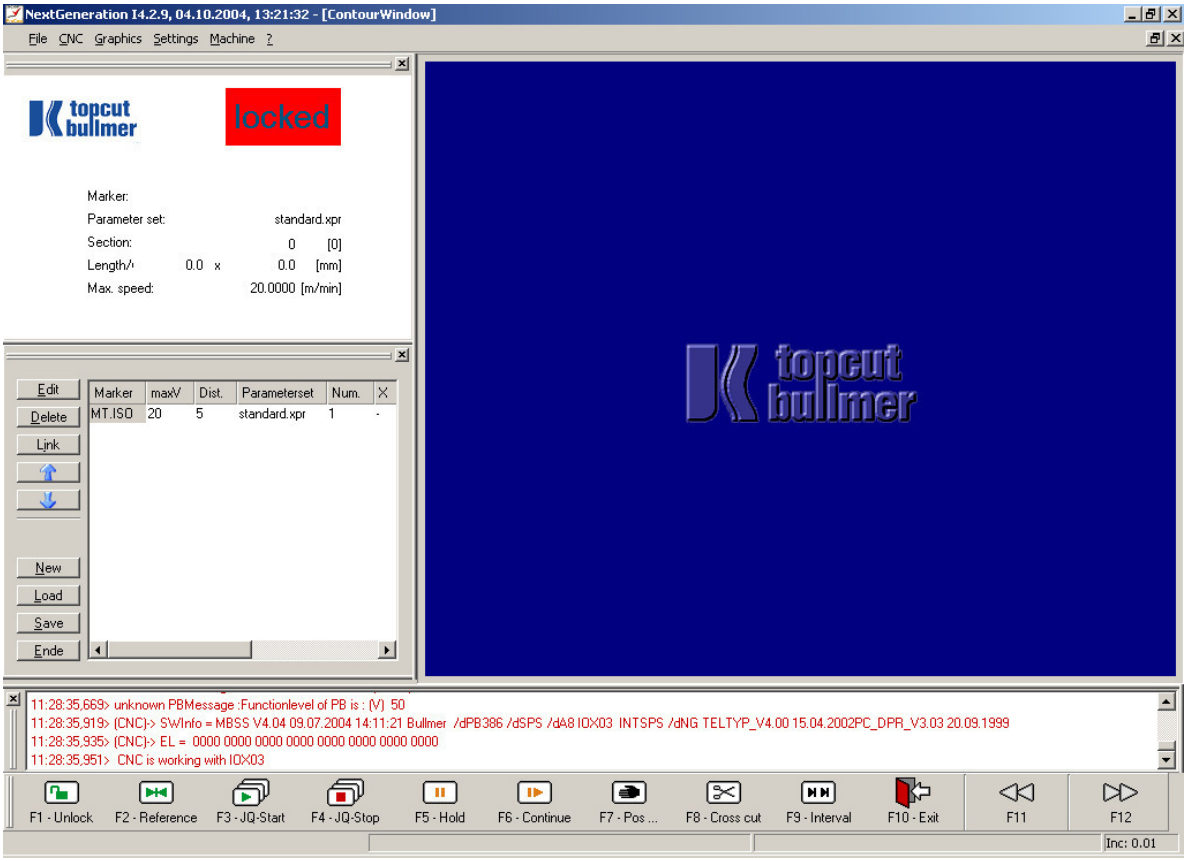
As a further support in the parameter dialogue box a description is automatically displayed if a parameter is selected.



Picture 3: The Parameter Explanation

3 Start of the software

After starting NEXTGEN by double clicking to the icon „NextGen“, the software displays the following picture:



Picture 4: The start-screen

Switch on cutter control
Switch on the cutter control panel.

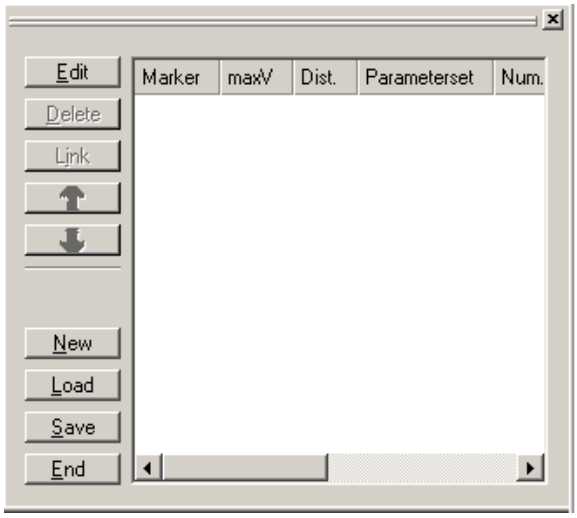
F1 – Unlock machine
As soon as the control panel is switched on, the machine can be unlocked.
Select the <F1>-key or click on the icon „F1-Unlock“ at the toolbar. The machine is put into the "ready" condition. In the status window (on the left upper side of the screen) the machine status „standby“ is displayed instead of the red indication „locked“.

F2 – Reference drive
In the notice line (lowermost window at the screen) the message “Attention, you must drive reference” appears. When the cutter software is restarted the machine must be re-initialized. To do this, the function „F2-Reference“ will be entered. If the function is confirmed with enter, the machine drives to the reference position (machine-zero-position).
As soon as this process is completed, the message "NC-data worked" appears. The machine is now ready for operation.

4 Start a marker

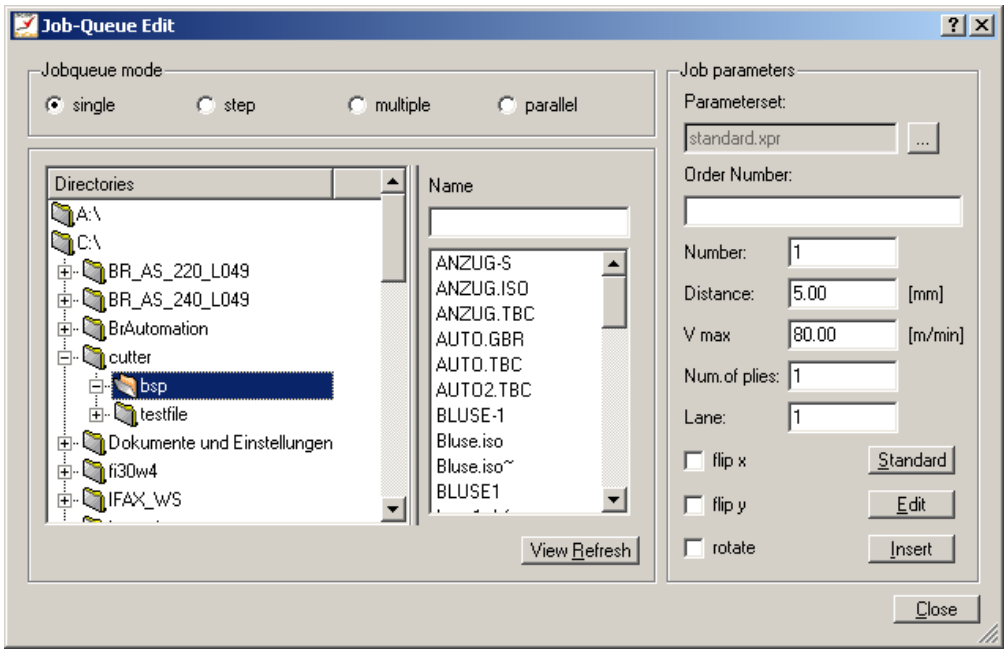
4.1 Marker

In order to load a new marker, markers have to be inserted into the jobqueue window.



Picture 5: The menu “load marker“

Click on the button “Edit” in the jobqueue window. The „Edit Jobqueue“ dialogue box appears:



Picture 6: The dialogue box "Edit Jobqueue“

Now you have to choose in the left window the list / file in which the wished marker is situated.

As soon as you mark a file in the file list in the window beside it a list of included files appears. Now you can choose the wished marker in the list (to mark) or enter the name of the marker in the input box above.

As soon as you type in the input box the file list beneath will be scrolled down, so that files/marker appears which are agree with the typed string. Because this it's also possible in case of long marker lists, to choose the marker after enter a few signs, instead of typing the whole name of marker.

After enter of each sign the first appropriate marker name will be entered in the input box automatically. If the entered name comes up with the searched marker you can finish the input. If the wished marker name will not appear you can enter further signs.

During input of signs in the input box only strings are displayed which are included as a marker names in the list. If the signs you input with keyboard not appear in the input box, it indicates that the corresponding marker not exists in this list.

Additional to the marker name you can input in the input box an order number and a number of plys. But this is only necessary if this information should appear in the statistics.

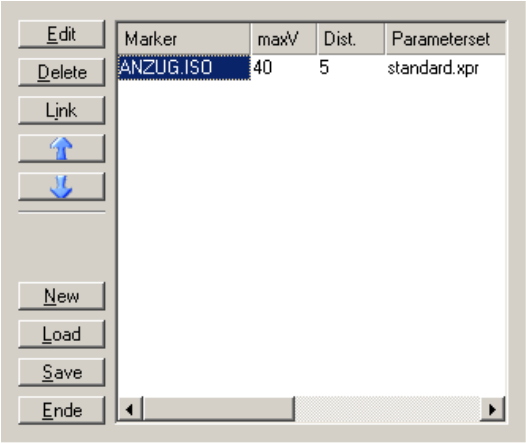
4.2 The Jobqueue – Parameter

Different parameters can be indicated:

- **Parameter set**
  For each marker in the marker list a predefined parameter-set can be selected. You can find detailed information about parameter sets in the chapter "Change of parameter settings". If a parameter-set is assigned to a marker, which is inserted into the jobqueue window, all parameter settings are automatically taken from that parameter list, when the respective marker is started.
- **Jobqueue mode**
  Above the register and marker list you can choose the jobqueue mode. In standard the mode is adjusted on "single". If several markers should cut together this marker are chained in a row. Instead of this it's possible to use several small markers parallel (jobqueue mode "parallel") or several small markers can be places single on the table (mode "multiple"). The detailed description for jobqueue mode you will find in chapter V of the user manual.
- **Number (of repetition)**
  The input field "Number" determines, how often this marker is to be cut in a row.
- **Distance**
  The parameter „Distance" defines the distance between the markers.
- **Vmax**
  For each marker, which is inserted into the jobqueue, a separate cutting speed can be defined. The parameter is only taken into account, if no parameter set is selected.

- **Flip/Rotate**
  Each marker can be flipped in x- or in y-direction or can be rotated by the three checkboxes „flip x“, „flip y“ and „rotate“.
- **Button „Standard“**
  You have to use the button „standard“ if you don’t want to assign a parameter set to the marker. You have to input then „standard.xpr“ in the input box „parameter set“. No parameter adjustments are loaded with the marker but it will be cut with the actual parameter sets.

If all adjustments of the „jobqueue process“ dialogue are done you can enter the marker in the jobqueue window. For this use key “enter”.



Picture 7: Inserted marker

The marker appears with the selected parameters in the jobqueue window. In this manner you can enter any marker in the jobqueue window. You can finish the “jobqueue process” with button “close” as soon as have completed the wished list.

In the job queue window can be worked on the current job queues, as the sequence is changed or cutfiles from the list are deleted:

The selected (marked in blue colour) cutfile is deleted out of the jobqueue.

The marked cutfile is linked to the previous one and is loaded together with that one.

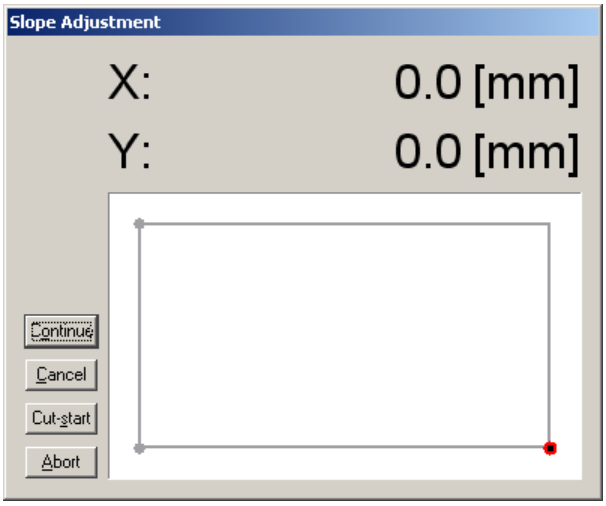
The marked cutfile is shifted upward in the list.

The selected marker is shifted downward in the cutfile list.

4.3 Positioning of the marker (Reference sequence)

If the desired markers in the right sequence are defined in the jobqueue window, the jobqueue can be started. Click on the icon „F3-JQ-Start“ in the toolbar or choose the function key F3 or the short key <Strg> + <J>.

The window for the „Slope adjustment“ appears:



Picture 8: Dialogue box for the slope adjustment

No further operation is necessary on the keyboard before starting to cut now. The position of the marker must merely be set on the cutting table. The edges of the marker are aligned to it with help of the joystick and the light-pointer (at the cutter control panel).

Switch on the vacuum. (Button at the cutter control panel)

Note:

Positioning of the cutting head on the cutter table is defined over a two-dimensional coordinate system. The position on the length of the table is the x-axis; the y-axis defines the position on the width. The origin of machine, which is automatically approached by the cutter when referencing, is the origin of the cross axis/zero position. The current head-position is shown in the window in relation to the zero position. If the cutting head is at zero position, therefore ‘0' will be shown as the machine position in each case for the x - and the y-axis. If you move cutter in conveyor direction the y position will be bigger. The actual machine position is shown in the window “Slope Adjustment” permanently.

First, the start-point of the marker must be fixed:

The light-pointer shines automatically in the moment you press in manual operation the button on the joystick. Move the light-pointer to the position where the ***start-reference-edge*** of the marker should be on the fabric lay. Should be for example the lower left edge of the marker the starting edge, you have to positioning the light-

pointer exactly where the lower left edge of the marker should be to start the cutting-process.
The corner of the marker which should be the start-reference-corner is adjustable over the parameter "Start-reference-point " (see chapter V, parameters for the user).

After the light-pointer is positioned on the start-point, this must be confirmed with the button <Enter>. NextGen checks whether the marker fits within the available area chosen by you on the cutter bed. If this is not the case, an area infringement is reported and the start is rejected. If the start-conditions are met, NextGen reports the start of the marker and begins with the marker referencing.

Now the cutting head positions on the edges, which are marked within the ***reference sequence***, before beginning the actual cutting process. If a marker edge is reached the system waits for you to confirm that the referenced position is correct. Now you check the position and correct it with help of the joystick. If you do not want to correct the position, simply confirm it.

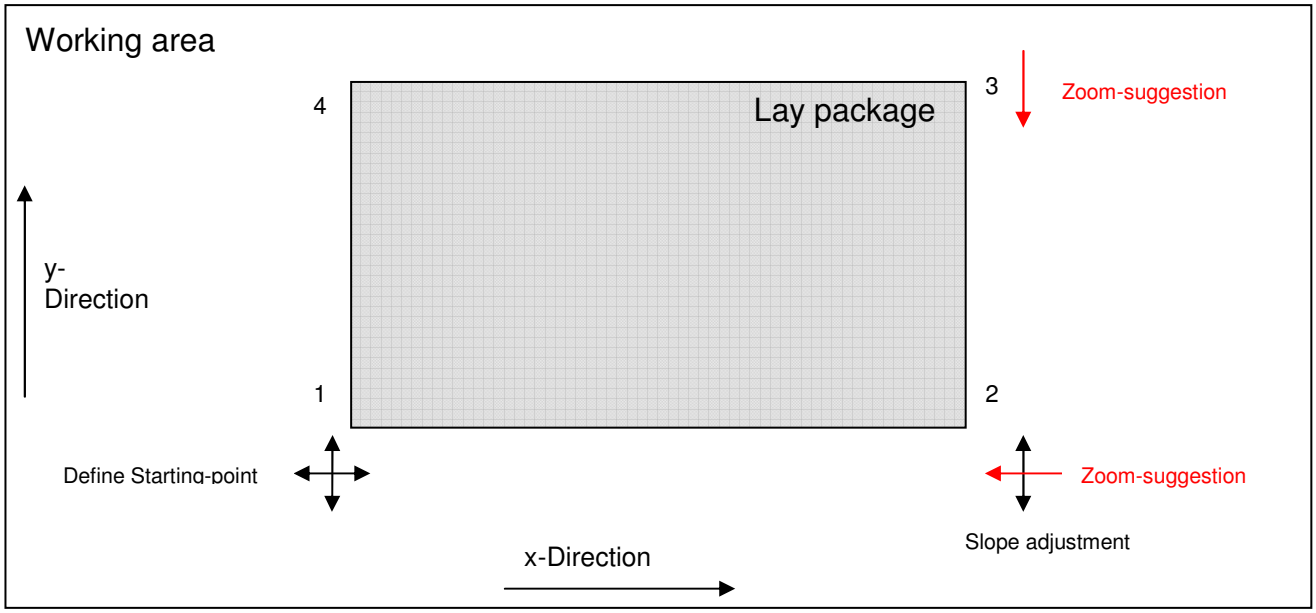
You determine the reference points and the sequence of the referencing by the parameter ***Reference-Sequence*** (see chapter V, parameters for the user).

Through this reference-sequence you have the possibility to compensate for a skewed fabric lay and to compare the dimensions of the fabric lay with those of the corresponding marker.

Note:

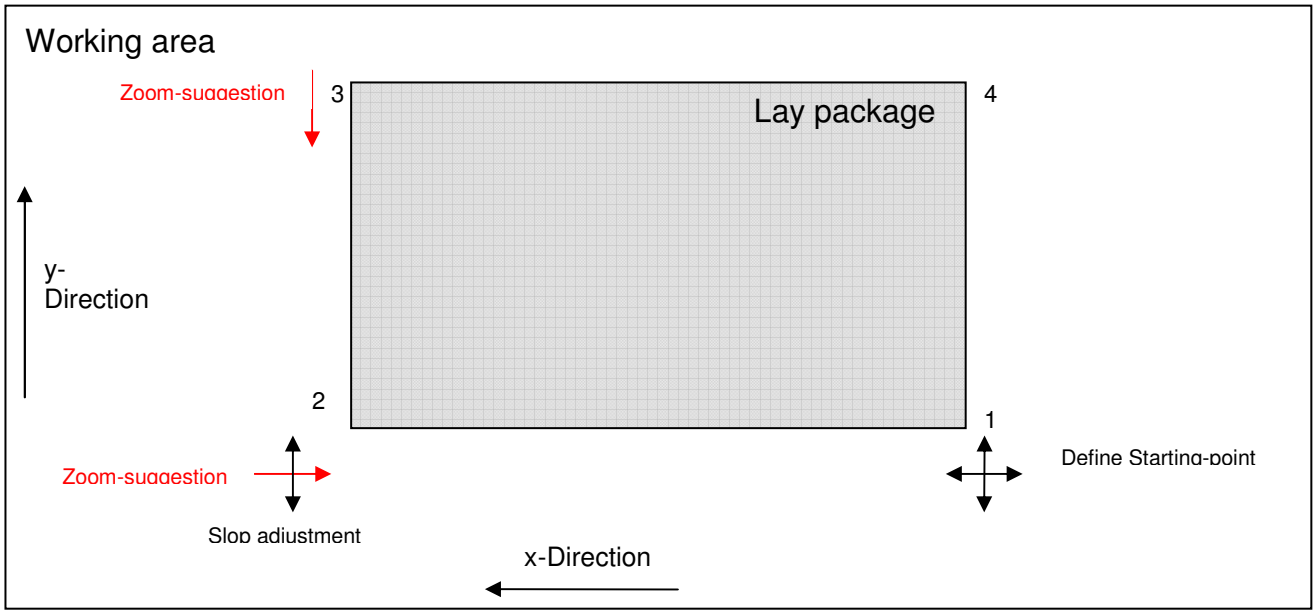
With the referencing, the process can be broken off with the button <ABORT> at anytime (at the operation terminal). In this case, the machine returns to the start-point.

Reference–Sequence for left-orientated execution:



Picture 9: Fix the position of the marker on the fabric lay

Reference–Sequence for right-orientated execution:



Pciture 10: Fix position of marker on lay package

Slope adjustment:

If the fabric lay is not straight (skewed) on the table, the loaded marker can be turned to compensate. To do this, you proceed as follows:
If the start-point of the marker is fixed at the edge of the fabric lay and the fabric lay lies parallel to the x-axis, point 2 (first point of referencing sequence) is also at the edge of the fabric lay since the bridge proceeds only in x-direction. Determine now if the light-pointer is exactly on the edge or within the fabric lay or outside the fabric lay. If it is not exactly on the edge the fabric lay lies skewed on the table. As soon as you now correct the light-pointer-position in the y-direction at the material-edge, the marker is turned around the start-point so that it gets the same skewed position as the fabric lay.

Size-control:

If you determine at point 3 that the fabric is not sufficiently wide for the corresponding marker (the light-pointer is outside the fabric lay); this point cannot simply be corrected in the negative y-direction. Since the position of the marker was already defined on the table with 2 points, correcting another point would tell it that the marker had to become negatively zoomed (reduced or shrunk).
To enable the marker to be placed full-size on the fabric lay, the positioning of the marker must be restarted. Press the button <ABORT>, so that the cutting-head proceeds to the start-point of the fabric lay. Test whether the start-point of the marker can be moved in negative y-direction without pushing the marker outside the fabric lay. Continue the reference sequence again.
If you have to correct point 3 by moving in the negative y-direction on the edge of the fabric lay, the marker will be zoomed (shrunk) and pieces will be cut smaller than full size. Confirm this corrected point and a message appears at the screen that the marker is zoomed through confirming the calculated factor.

Zoom suggestion:

If the reference sequence at point 2 is determined and the light-pointer has driven in the x-direction outside the fabric lay (meaning that the fabric lay is too short for the marker), or lies at point 3 in Y-direction outside the fabric lay (fabric lay is too narrow) a zoom-suggestion can be ordered by correcting the position.
If you determine at point 2, for example, that the light-pointer is outside the fabric lay, you can move it with the joystick (into negative x-direction) on the fabric lay. As soon as this point is confirmed, NextGen calculates a factor, with which the marker must be reduced proportionally in the x-direction, so that it fits on the fabric lay. In order to avoid a marker being zoomed inadvertently, the zoom-suggestion must be confirmed additionally at the keyboard.

Note therefore, that within the reference sequence point 2 can only be corrected in y-direction and point 3 can no longer be corrected at all, if the marker should be cut full-size.

Note:

The zoom (reduce) of the marker is feasible only within certain limits. These limits can be fixed during the commissioning operation. It still must be noted that a zoom-factor can only be calculated in the x-direction if a marker is not cut with the bitefeed procedure but fits completely into the working area.

5 The cutting process

You can stop the cutting process with the function „F5-Hold“. Because the machine is still in the current cutting process and consequently in the "active " condition, no further execution of machine functions is possible.

With pressing function „F6 - Continue“ the cutting process will continue to the position on which it stopped.

If you choose instead of the function „break“ the function „F4-Stop“ (or the button <STOP> at the control panel), the cutting process is broken off so that the machine is in the "standby" condition again. Then there is the possibility to use other machine functions (for example manual operation of switches to move the cutting head).

With the icon „F3 - JQ Start“ you can continue the interrupted cutting process, if there are not loaded new markers in the meantime. The cutter starts at the first point of the part where the cutting-process was broken off.

Cutting with bitefeed operation:

If the marker is longer than the working area of the cutter, it will be cut with bitefeed operation. If you fix the start-point of the marker, NextGen compares the table dimensions with the dimensions of the marker and calculates independently which parts are in the working area and can be cut immediately. After cutting of this cutting window a bitefeed of the bristle conveyor will happen automatically so that you can start with the next cutting window directly.

With markers in the bitefeed, the cutting process is as follows:

- Cutting of the first cutting window
- A so called bitefeed plunge is carried out at the end of the cutting window (Reference-plunge, to control the length of the transport). The vacuum will be drop automatically at the end of a cutting window because the bristle conveyor can be carried out only with lowered vacuum.

- Conveyor, bristle conveyor and clearing conveyor are moved synchronized ahead and the material is transported in direction of the clearing conveyor so that the area of the second cutting window is on the working area. The cutting head is positioned on the bitefeed plunge.

- You have to confirm now the position of the bitefeed plunge with the <Enter>-key at the operation terminal, another reference sequence can be carried out (checkpoints of the second cutting window). Afterwards the next cutting window will cut.

- This process will be repeated until all cutting windows of the marker are cut.

After the cutting process is complete the next marker of the marker list will be loaded if there is a further marker in the jobqueue window included. The window “slope adjustment“ appears again, so that you can continue directly with positioning of the next marker on the ply package.

6 Finishing program

F10 - Exit
You can finish the program with selecting the icon “F10 – Exit” or click the closer (the cross on the right-hand side above in the main window) of the NextGen window or instead of that press key <F10>. If a cutting process is active you first have to break it off before try to leave NextGen. The program is finished after the confirmation.

WinXP can also be finished with (Start -> finishing -> Shut down windows). You can now turn off the control with the main-switch at the control box of the cutter-control.

CHAPTER IV

Further Functions

Table of Contents – Chapter IV

1 Stop cutting / Continue cutting

1.1 General

Usually (if the operator has not selected another function) the marker, i.e. the cutting process is shown in the monitor while cutting. To interrupt the cutting procedure you now have two possibilities:

1.) Break off the cutting procedure at the machine terminal.
Simply press the **STOP** key at the machine terminal.

2.) Interrupt with the mouse or the keyboard of the cutter computer.
On the first toolbar you can find the function *F4 – JQ Stop*. If you press the key <F4> or if you klick with the mouse on the corresponidng icon, the cutting procedure will stop.

After breaking off a cutting procedure you can continue again directly. Press the function key <F3> *JQ Start* or klick with the mouse on the icon. (This key corresponds to the <RESTART> key on the machine terminal.)

A message window will report you at which point of the marker cutting will continue. All you have to do is confirm this with the <ENTER>key or by klicking the button “OK” in the message box.

1.2 Continue after Emergency stop

If a cutting-process is stopped through an emergency stop, the machine must be unlocked again and be initialized before you can continue. Dependent on at which action the cutting process was interrupted (cutting or bitefeed), continuation of the machine must be executed in different ways.

1.2.1 Emergency-stop during cutting

- control on
- unlock the machine (Icon *F1 - Unlock*)
- switch on vacuum
- Icon *<F2> - Reference*
- Icon <F3> *JQ Start* or RESTART at the operation terminal

If "continue cutting" is not possible:

- Change into the toolbar “Graphics (part)”
- Step with the icon “*F7 – next part*” to the part, where it should be continued
- Change into the toolbar “Graphics (point)”

- Select the function "*F10 – Set cont. point"* to define the continuation point
- Change back into the default toolbar "CNC"
- Icon <F3> *JQ Start* or <RESTART> at the operation terminal

1.2.2 Emergency stop between two bitefeed-windows

Since no cutting is in this cutting window, the cutting process will be continued like follows:

- control on
- Unlock the machine (Icon *F1 – Unlock*)
- Switch on vacuum
- Icon *<F2> - Reference*
- Icon <F3> *JQ Start* or <RESTART> at the operation terminal
- Drive with the light-point to the start-point and confirm with <ENTER>

1.2.3 Emergency stop during the bitefeed

- control on
- Unlock the machine (Icon *F1 – Unlock*)
- Switch on vacuum
- Icon *<F2> - Reference*
- Icon *<F7> Pos...*
- In the line Z-position the value is registered, with which the conveyor still must transport. If you confirm with the button "Start", the bitefeed will be carried out.
- Close the dialog box with the button "Close"
- Icon <F3> *JQ Start* or <RESTART> at the operation terminal
- Drive with the light-point to the start-point and confirm with <ENTER>

1.2.4 Emergency stop after power failure

- Switch on the machine and start the program as usual
- Control on
- Unlock the machine (input <J>)
- Switch on vacuum
- Icon *<F2> - Reference*
- Icon <F3> *JQ Start* or <RESTART> at the operation terminal
- Confirm the message box with the button "OK".

2 Change the parameter-Settings

2.1 General

All adjustments regarding speeds, cutting modes and other handlings of the machine but also regarding to the machine configuration (table measures, amplifier adjustments and tool positions) are storaged in a parameter file.

With different dialogues which are detailed discribed as follows you can get the access to these files.

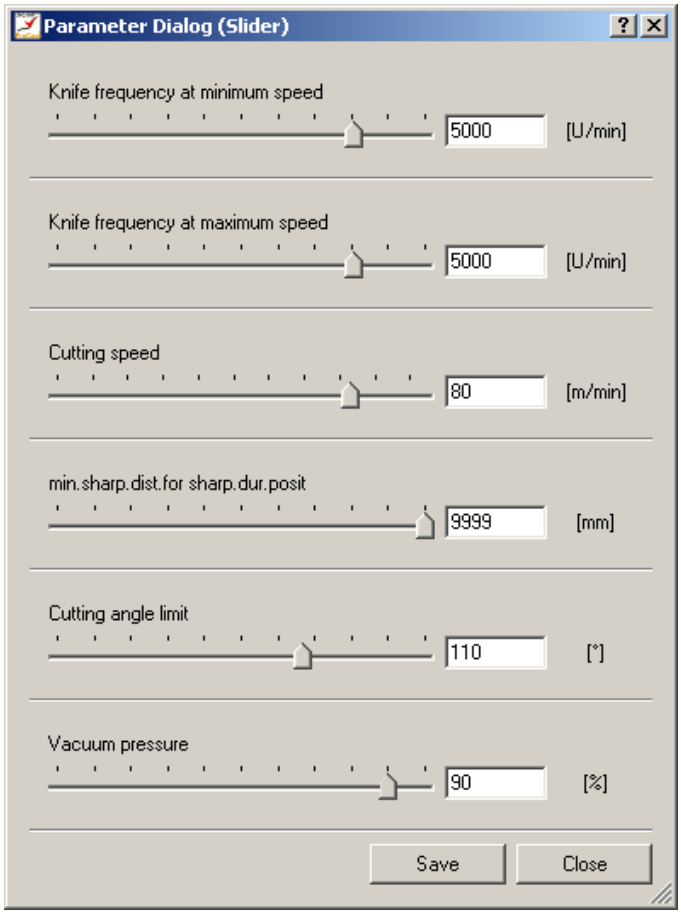
All the functions for the modification of the parameter settings are placed on the second toolbar (Toolbar „Settings“). You can find the same functions additionally above in the menue bar in the menue „Settings“.

At the toolbar „Adjustments“ you find the functions

- to display all parameter values in a list and to have to possibility to change it (with the icon *F1-Parameter*),
- to load complete parameter lists (*F2-P.loading*)
- or to storage it (*F3-P.save*),
- to change the most important parameter in a separate dialogue with a slide control (*F4-slide*)
- or to do in a further dialogue all notch adjustments (*F5-Notch*).

2.2 The slider dialog box

The dialog box “Parameter Dialog (Slider)” is displayed, when the Icon *F4 – Slider* is clicked. In the slider dialog box, the most important parameters are listed. The values of the parameters are shown as number and as slider. Which parameter are listed as slider you can change at any time and it is possible to adapt it to the requirements of customer during starting up or training.



Picture 1: Dialog box slider

In the dialog box there are two possibilities to change a parameter value:

- Click onto a slider and drag it with pressed mouse button to another position in the scale. In the corresponding input field of the parameter, the value changes similar to the actual position of the slider.
- Klick into the input field of the parameter and enter the wanted parameter value. As soon as you quit the input field, the slider moves to the changed parameter value.

With the button “Close”, the dialog box is closed. The change of parameter is active until leaving NextGen. If you restart the parameter includes the old value.

If the parameter modification is saved with the “Save”-button, before the dialog is closed, the new parameter setting is saved into the parameter file “parameter.xpr”. so that the change is also still effective after the restart of NextGen.

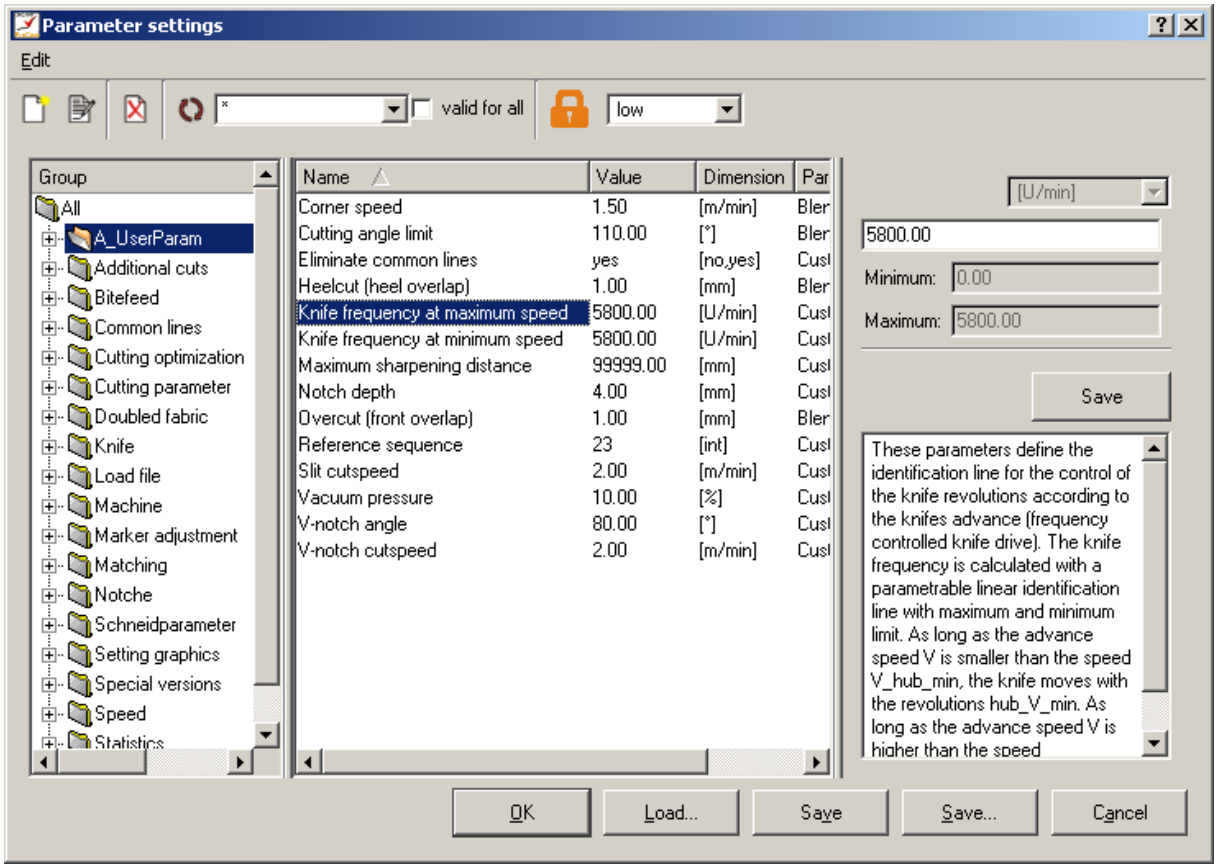
2.3 The Dialog „Dial“

The dialog box „Dial“ only shows the actual value of parameters. So, it is useful to choose parameters for the dial-dialog-box, which are calculated by the software and which values change over the cutting process. As displayed parameters are useful for example the effective cutting speed or the actual knife revolution (in case of revolution regulation).

2.4 The general parameter dialog

The general parameter dialog is opened by clicking the icon *F1 – Parameter*. Furthermore the dialog box can be displayed with the shortkey <Strg> + <P> at any time. You can also find the function („Parameter...“) in the menue „Settings“. With the parameter dialog box all the parameters of the NEXTGEN-System can be managed. The parameter, which are listed in the „slider“ dialog can be modified in that dialog too.

2.4.1 Modification of single parameters



Picture 2: Menue Parameter Settings

- In the left window of the parameter dialog box, you can find the different parameter groups. In these parameter groups are all parameter according to the application field sorted out.
- In the middle window the parameter, its actual values and the respective units of measure are displayed. If you open the parameter dialog all parameters are listed. When a parameter group is selected in the left window, only the parameter appears in the parameter list, which is included in that parameter group.
- When a parameter is marked in the parameter list, all the informations about the selected parameter are displayed in the right area of the parameter dialog box. In detail the adjusted value, the unit of measure, the value area (minimum and maximum permitted value) and a discribtion to the parameter are displayed.

You can change a parameter value if you enter a new value into the input box. There are only values accepted which are listed within the mentioned limits.
In standard all parameters are displayed in the parameter list. To relieve the search of a parameter and to display only some of all parameters you have two possibilities:

- Select a parameter group in the left window. Only the parameters are displayed, which belong to that parameter group. In the parameter group „A_UserParam“ you can find all the parameters which are often modified by the user. Select the group „A_UserParam“ to get all parameter listed which have to adjust dependent on material and ply height. All other groups include the parameter to each special matter.
- The input field for the parameter filter is situated above the window. It is possible to enter a filter text there for circumscribing of the displayed parameter. These filter text can be provided with wildcards. A star (*) stands for any numbers of signs and a question mark stands for exactly one sign. These filter always affects on all parameters.

The button „save“ saves the actual parameter adjustmenst in the file „parameter.xpr“, which are loaded automatically with every restart of NextGen. The button „save…“ opens a dialog in which it is possible to storage the parameter adjustments under a new file name. With the button “load” you can load a parameter file. The adjustments of the parameter are withdrawed from these file.
With the buttons „OK“ and „Abort“ you can leave the dialog.

2.4.2 Input of password

For certain parameters and functions you need a passwort so that unauthorized personnel are not able to change machine parameters or start certain functions.

The parameters which are only changed in case of starting up or maintenance are protected with a password. You can only modify them after changing of the password level.

The password level can be changed by the listbox on top of the dialog box. By default the password level is set to „low“.
If a higher password level is selected, an input field appears, where you have to enter the respective password.

2.4.3 Save and load parameter sets

NextGen offers the possibility to store a complete parameter list under a freely selectable name and therefore to install an extensive parameter-library. This means that the user has not to input individually all parameters before cutting but simply to load a pre-defined parameter-sentence for the material to be cut and the required ply-height.

Save parameter set

There are several possibilities to save a parameter set:

1. Mark a parameter group in the general parameter dialog. Stay with the mouse pointer on the group and press the right mouse key.
   A context menue (a window, where several functions are listed) appears. Select the function „Save...“. Only that parameters are saved, which are included in this parameter group.

2. The actual setting of all parameters is saved, when you select the button „save...“ in the parameter dialog box. A name and a directory can be chosen too.

3. At the toolbar „Settings“ the actual setting of all parameters can be saved by the function *F3 - P. save*. Enter a name for the actual parameter list into the input field „Filename“ and make sure that the file is saved into the subdirectory „params“.

NOTE :

All parameters which have to change dependent on material and ply height are included in the parameter group „A_UserParam“. Because this it’s adivsable not to store the complete parameter list in the parameter set but only the parameter from „A_UserParam“.

Load parameter set

A stored parameter-set can be used again and again through loading to another cut file, which has to be cut. The loading of a parameter-set can happen in different ways:

1. In the jobqueue dialog box you can assign a parameter set to each marker. As soon as the marker is started, the belonging parameter set is loaded.
2. If the function *F2-P.load* is selected, NextGen opens a dialog box, where you can load a parameter set out of a filelist.
3. The button „Load...“ in the parameter dialog box opens the same dialog box to load any parameter set.

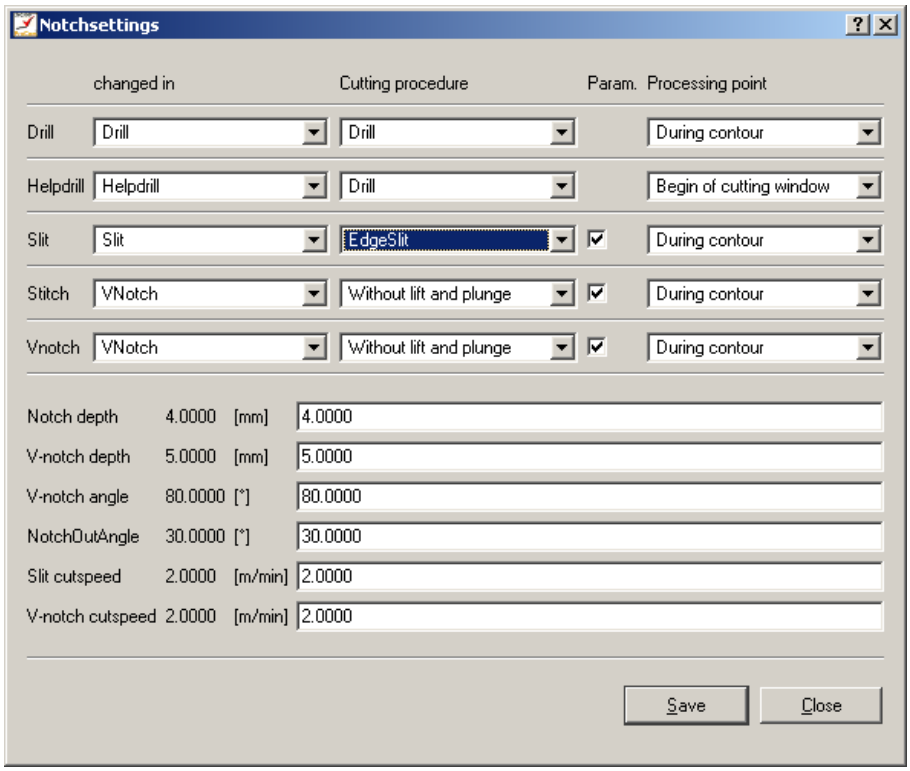
2.5 Cutting procedure for NOTCHES

NextGen offers extensive options for changing the cutting procedures for NOTCHES - even independently of the CAD-settings.

2.5.1 Notch change

Open the dialog box „Notch Settings“ with the Icon F5 – Notches on the second toolbar.

The following window appears:

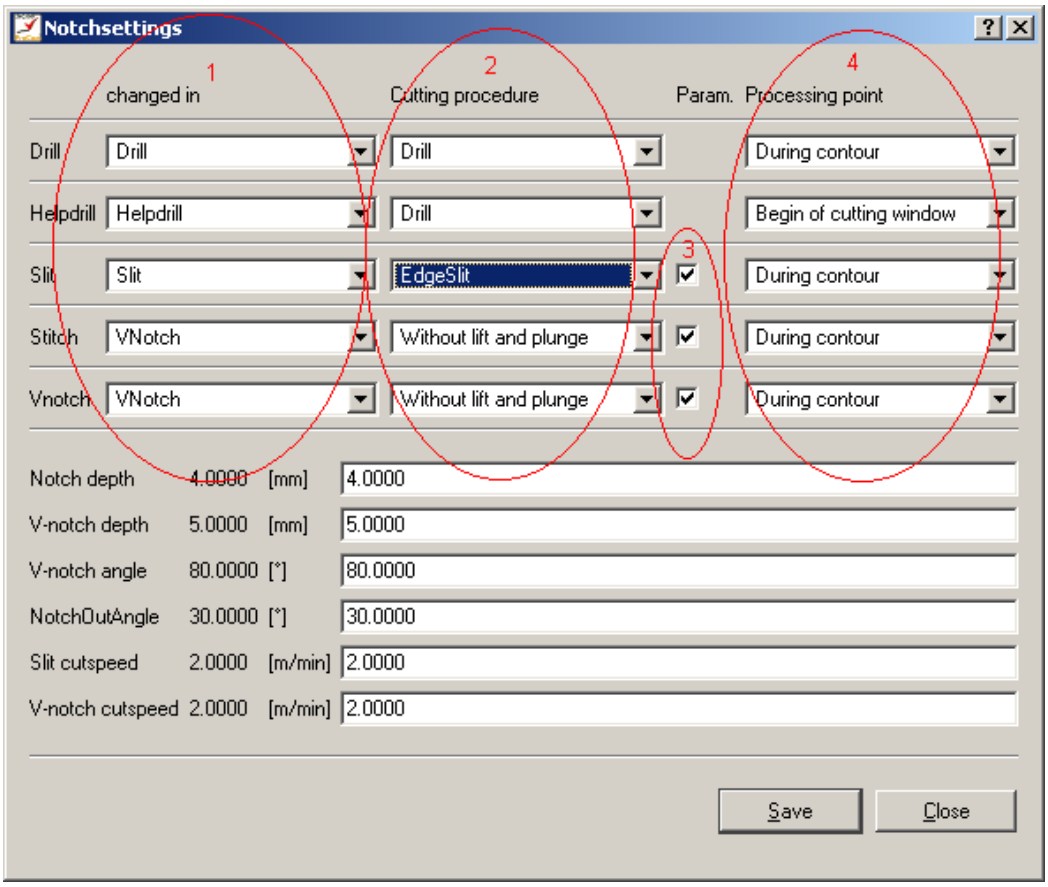


Picture 3: Menu notch settings

Now you have the possibility, to change the attributes of the CAD generated punches and drill holes. It depends on which notch type (drill, I-punch or V-punch) differently to the statements of the CAD should be cut, the corresponding line of the dialog must be entered. Individually the following elements can be altered in their attributes:

- drill holes in the first line (*Drill*).
- drill holes for the second drill device (*Helpdrill*)
- I-notches which are named *Slit*
- punched I-notches in the line *Stitches*
- *V-notches* in the fifth line

You can do the following:



Picture 4: Fix cutting procedure

(1) You can set in the list box „changed in“, wheather a notch should be ignored or be cut as a drill, as a helpdrill, as a slit, as a stitch or as a V-notch. You can only chose „Drill“, „Helpdrill“ „ignore“ in the submenu for the drill and the helpdrill because it’s not able to convert a drill hole in a notch.

(2) Cutting procedure:
For Drill and Helpdrill:
Drill = The drilling is carried out by the drill marking device.
Circle = Instead of a drilling a circle is cut with the knife and the diameter of the circle is set by the parameter „Diameter Drill/Circle“.

For Slit and Stitch:
Edgeslit = The I-notch is done without lift and plunge
Arcslit = The I-notch is cut with one lift and plunge (at the top of the notch).
Stitchslit = The notch will be cut with lifting two times.
Notchtool = The notch is done with a separate notch tool.

For V-Notches:
Without Lift and plunge = The notch is cut without lift and plunge.
2x with Overcut = The notch will be cut with two times lifting of the knife.
3x with Overcut = The notch will be cut with three times lifting.

Notchtool = The notch is done with a separate notchtool.
3x without Overcut = The notch will be cut with three times lifting. An overcut at the top of the notch will not happen.

(3) parametrized?
The checkbox is not active if you keep the original notch type. If you switch off the parameterizing every notch will be cut with the dimensions which are setted in the CAD system. As soon as the parametrizing is switched on (option „parametrized choosed“) the dimensions of the notch will be setted through parameter „V-notch depth/ V-notch angle” (for V-notches) or “notch depth” (for I-notches).

(4) Processing point
Begin of cutting window = All notches of the respective notch type are cut at the beginning of the cutting window.
Before contour = The notches of that notch type are cut before the according part.
During contour = The notches are cut with the contour.
After contour = The notches are cut directly after cutting the according piece.
End of cutting window = If all parts of a cutting window are cut, the notches are done.

While you finish the dialog with „close“ the changes are effective as long as an other parameter set is loaded or unitl restart of NextGen. If you press the button “storage” before the changed values will be storaged in the Default parameter set.

NOTE:

Also the parametering of the notches will be stored with the parameter-sentences.

2.5.2 Notch parameter

Below the line for changeing notch name further parameter which are coherent with the adjustment of the notches are listed. It is among other things possible in this list to put in the depth of the I-slits, (parameter ***slit depth***), and the depth and the opening-angle of the notch (parameter ***notch depth*** and ***notch angle***), to put in.

Notch depth

All notches, which are cut at the cutter as I-Notch and which should be parameterised, (slit depth do not take over from the CAD-System), are executed in the depth, which are stated in the parameter ***Notch depth***.

V-notch depth
V-notch angle

If a slit or stitch is changed in a V-notch and this V-notch is parametered, the parameter ***V-notch depth*** is taken into consideration at the calculation of the V-notch depth and the parameter ***V-notch angle*** at the calculation of the V-notch angle.

Notch recognition
Under some circumstances, it can occur that a notch, (V-Notch or cut), is not recognized as that. This can be on the one hand because the contour is opened at the notch position or (specifically with V-notches) that the contour-course clearly deviates from the norm.
If therefore notches are not cut in the inputted measured, you should check whether these is recognized. You can determine this in the chart of the cutter-software. Notches, which are recognized as that, are represented in the chart in another colour than the cutting-contour.

Note:

The attitudes of the parameters ***notch depth, V-notch depth*** and ***V-notch angle*** only have effect, if with the definition of the corresponding notches the checkbox “parametrized” is switched on. If the marker contains notches with different depths and should also be cut in this way, in the line of the respective notch type the option “parametrized” must be switched off, so that the parameter of ***slit depth*** as well as ***notch depth*** is deactivated and therefore the notches will be cut with different depth.

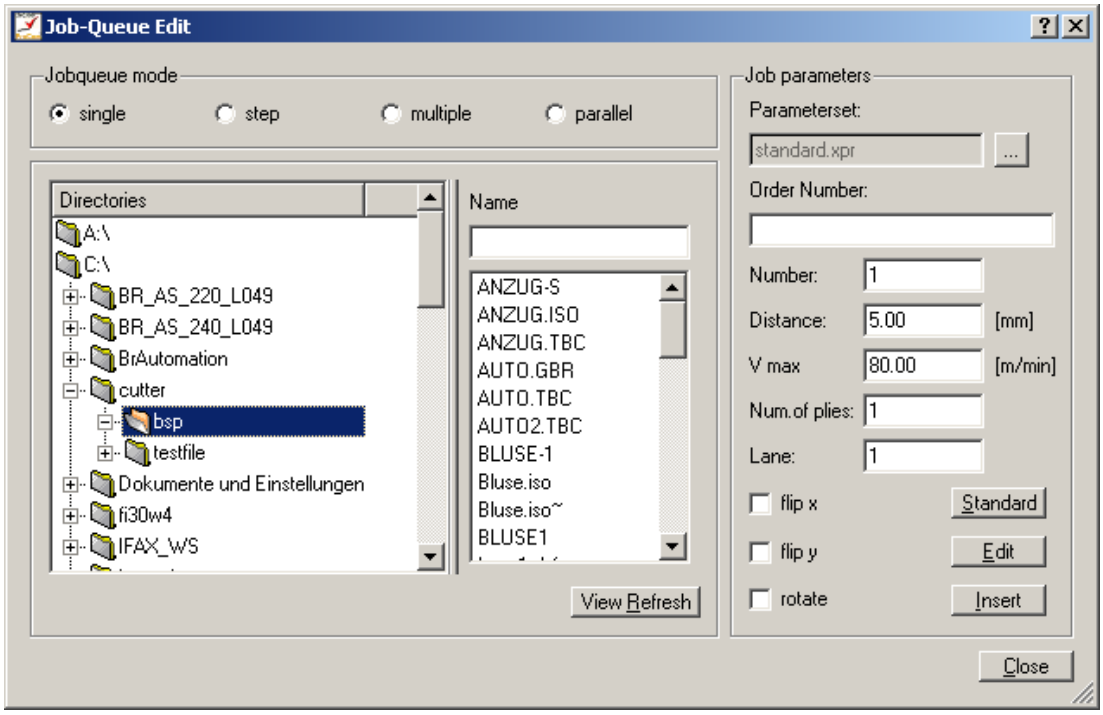
The parameters which you can adjust besides in the dialog „notch settings“ are discribed in chapter V – „user parameter“.

3 Generate and processing a jobqueue

3.1 General

NextGen offers the function to display several markers (jobs) in a jobqueue and consecutively to join as marker-chains, if necessary. A separate parameter-sentence can be assigned to each of these jobs. This list of markers is worked off automatically in the jobqueue operation.

First you must generate (define) the jobqueue, i.e. the names of the markers, that should be cut one after the other in the jobqueue, must be written down into a list. Therefore you have to select the button “Edit” in the jobqueue window.



Picture 5: The Jobqueue Edit Dialog

Choose the list in the left window in which the wished marker is situated. The contents of these file appears in the marker list on the right-hand side. Choose the marker in which you either enter the name of the marker into the input box or which you choose from the list below it.

Further you can declare the following parameters per inserted marker:

Parameter	Description
Number	Determines, how often this marker is to be cut in a row.
v max	Cutting velocity, if no parameter sentence is loaded.
Distance	Determines the distance between two markers (Distance to the marker before).
Parameter set	For each marker a parameter set can be loaded
Lane	Determines on which lane the marker has to be cut (only for parallel mode)
Order Number	It is possible to enter the number of the order (This information appears in the protocol)
Number of plies	It is possible to enter the number of plies (This information appears in the protocol)
flip x, flip y rotate	Additionally to the parameters „Flip“ and „Rotate“, each marker in the jobqueue settings can be flipped and rotated separatly.

NOTE:

The standard-parameter-set is made in the way that it only contains the parameters, for which there is actually a basic attitude. Parameters, which are put in dependent on material and ply height, are consequently not contained. If the standard-parameter-set is used in the jobqueue, all retain those parameters, which are not contained, the prior attitude.

One of the markers in the jobqueue is always marked in blue (or grey, if the window isn't active). The blue beam in the jobqueue window marks the position, at which the next marker is inserted into the jobqueue.
To insert a marker at the end of a jobqueue, the last marker has to be marked, before the next marker is inserted.
The marker, which are already loaded are yellow marked.

Interlink the jobqueue

A jobqueue is interlinked while all following markers are attached to the first. For this you move the blue selection-beam in the jobqueue window with help of the cursor-buttons (or with the mouse) on the second marker in the list and press the <space key>. The marker is indented and is marked with a symbol. This way several markers can be attached to the first and will be consequently together loaded and worked off.

If a currently entered, blue deposited marker is already chained at the in front-going marker and you operate here <space key>, so the connection is solved. The symbol to the labelling of the concatenation vanishes and the sectional image is represented left-justified in the ad again.

You can not mark the first cutfile which stands in the jobqueue for interlink. If a cutfile is inserted into a jobqueue, it is not interlinked in standard. When a marker is removed from the jobqueue, it is checked automatically, whether the following marker was interlinked at the deleted marker. This connection to the following marker will be solved. The symbol to the labelling of interlink vanishes and the marker is represented left-justified in the display again. If the deleted marker was the first of a marker interlink consisting from several markers, the following marker will be automatically the first of this chain.

With the cut of a jobqueue all markers in a marker interlink will be loaded and interlinked to an overall picture. The repetition factors and distances defined in the jobqueue are taken into account. This total-marker is now processed so as it is about a single-marker. The referencing to correct a possible inclined position as well as the subsequent division in the bitefeed window works on the overall picture. Bitefeed after each singles-picture are avoided.

If markers are not interlinked, while starting of a jobqueue only one marker will be loaded and worked off in each case and then the following marker will be loaded. A jobqueue can also exist from composite markers as well as single jobs.

Jobqueue-Mode:
With the radio button „Jobqueue-Mode“ it is possible to determine, how you handle a complete jobqueue:

- single:
  The markers are arranged one after the other, considered as one marker and loaded together, referenced and cut.
- steps:
  The interlinked general view is carried out like a single marker. However it is possible in spite of that to displace the single marker under consideration of all step ply limits. Between the single markers matching points are inserted automatically which are approached with the light pointer and which are able to correct with the joystick according to the step ply limits.
- multiple:
  Different markers are combined, loaded, optional referenced one after the other on machine table and afterwards cut.
- parallel:
  If you choose the parallel mode it is possible to carry out markers on parallel laying fabrics, also over different cutting windows.

The jobqueue mode is always related to a whole jobqueue and thus it is not possible to change it per marker.

Note:

If a marker is declared for example with repetition quantity 2, the two markers are automatically interlinked. To be able to carry out them separately, the same marker must therefore be written down twice in the jobqueue without interlinking it with the delete key.

You can supplement continiously the existing jobqueue by adding further markers at the end of a jobqueue. It is not possible to add a marker to an interlink which is already loaded.

3.2 Store and load a Jobqueue

In order to produce a jobqueue in the way, that it can be used several times, the button “Save” in the jobqueue window must be selected. A dialog appears, where a name for the jobqueue must be defined. Enter the new jobqueue name and confirm it with the button „Save“.

With the button „Load“ an already produced jobqueue can be loaded again at any time. As soon as you have chosen and loaded a jobqueue, the affiliated markers are shown in the jobqueue window.

By using the button „New“, all the markers, which are listed in the jobqueue window, are deleted again.

If the function *F3–JQ Start* is executed, the first marker of the list and all the ones which are linked to the first one, are loaded.
In the jobqueue window the markers are marked in yellow color.

4 Barcode mode (Option)

Instead of entering of the marker and parameter sentence name by keyboard or the selection from the list, the input is also possible with help of a Barcode reader.

If the parameter ***Barcode-Mode*** is switched on, the normal cutting-course changes as follows:

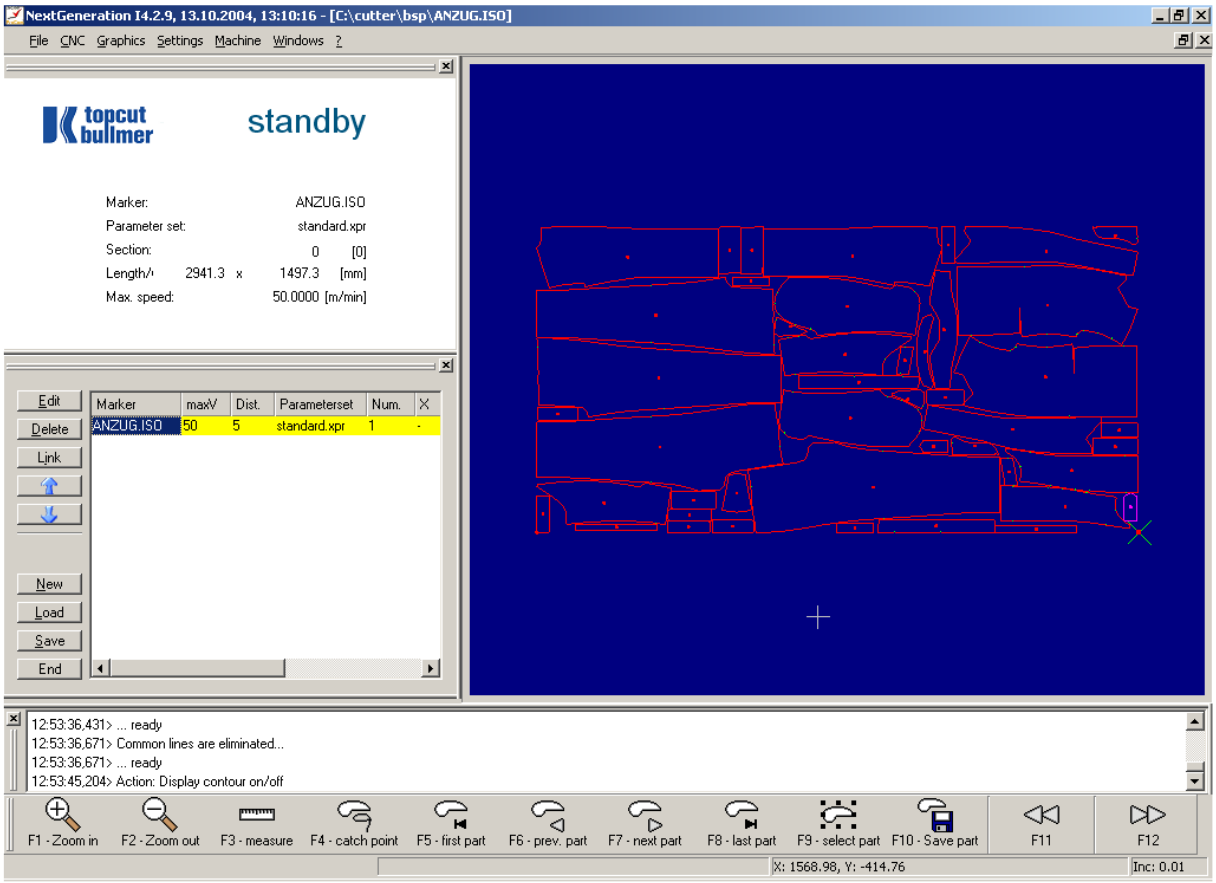
- With selecting the button “Edit”, the “Jobqueue Edit” dialog is opened as usual.
- In the belower area of the dialog you can already see, that NextGen is working in the barcode mode. The input field for the marker name is deactivated.
- The user holds the barcode reader over the barcode of the corresponding marker name.
- The marker is added at the end of the jobqueue without key-activity and is shown in the jobqueue window. The jobqueue name can be controlled again.
- A parameter-set can still be read additionally over barcode now. The name of the parameter-set is marked through a particular sign. The input of the parameter-sentence is optional. If a parameter-sentence is inputted, so the name of the parameter-set appears in the jobqueue window behind the finally inserted marker. If no parameter-set is inputted, so the values of the standard-parameter-sentence are adopted automatically.
- With the “Close”-button the input-window can be left then, if all chosen markers are registered in the jobqueue. The marker as well as the jobqueue will now be loaded like usual by the Icon “F3 - Start Jobqueue”. The further course takes place like usual.

As soon as the „Jobqueue operating“ dialog is opened and activated it is possible to add during cutting further markers with barcode into the jobqueue list.

If the software should be used in the conventional way, so the function barcode must be switched off.

5 The graphic functions

5.1 Introduction



Picture 6: The Graphics

The graphic offers you numerous functions to help you view the loaded functions in detail. If a marker is loaded, NextGen automatically displays the graphic in the contour window. All functions of the graphic are available either in the menu “Graphics” or in the three graphic toolbars.

At the display of the graphic the first part to be cut is marked red. This part is called the “current part”.

Now you can carry out the following operations in the graphic :

Zoom
You can display the chosen extent part of the picture while pulling up a frame in the graphic with the left mouse key. If you use the right mouse key you can activate the final view again (display of the first cutting window).

Catching point
Additional to the mouse pointer is displayed a cross wire in the graphic. If you click with the mouse into the graphic the cross wire will be displaced to this position. If you click double the cross wire will position to the nearest support point. The part (and the

support point) which is nearest to the cursor will be catched, marked violet and with this changed to the “actual” part.

You can move the cross wire instead with the mouse also with the cursor keys (←; ↑; →; ↓). On the right-hand side of the status line (belower area of monitor) is a value of movement indicated. In standard this value is 0.01. That means that the cross wire will move with every key pressing by these value in the corresponding direction.
It is possible to change the step distance of the movement in the menu with function graphic -> „Set Value”.

In the status line at the lowermost position of the NextGen-window the step length for the movement and the actual selected set point information is shown.

Part number Point number: type x y Velocity Notch type

The Part number	is the number of the current, violet colored part.
Die Point number	is the current base-point.

Type options	"-" for line element	and
	"P" for positioning	is possible.

The x- and y- coordinates follow. Velocity is a percent value. It will show you, what percentage of the maximum permitted velocity may be reached.
The contour window is required for the illustration of the marker or individual design sections. The individual parts of the marker are represented in dark red. The current part (this is the first part when starting the graphic) is represented in violet. Notches, which are recognized as such, are represented in the chart green. Pen contours are represented grey.

The graphic, which is represented during the cutting-process, shows the advance of the cutting process online. The actual cut piece is shown in yellow; the pieces which are already cut are displayed in red. By different shades of red the affiliation of a part to the cutting window is visible.

5.2 The Toolbar Graphic (part)

Function F1 – Zoom in
With the function *F1 – Zoom in* the marker is enlarged. At zooming, the excerpt is chosen about the cursor.

Function F2 – Zoom out
Minimizing the section step by step

Function F3 - Measure
With this function, distances, parts etc. can be measured in the marker. The starting point of the measuring is the position of the cursor, if the function ***Measure*** is selected. As long as the function is activated, the actual distance between start position and actual curosr position route is shown in the lower screen-line. The actual distance is always displaed as a “rubber thread” (violet line).
When the cursor is moved by mouse or trackball, the actual length of the violet line is always displayed in the lowermost status line. The function will be deactivated through operating again the button ***F3 - Measure***.

Function F4 - Catch
That part, which is closest to the reticle, is "caught" and consequently becomes the current part (violet).

Function F5 – First part
The first part of the marker becomes the current part (displayed violet).

Function F6 – previous part
Change to the previous part. The current part of the marker is represented in violet. All other parts are shown in dark red. If you start the graphic the first part is automatically the current part, which will be cut first. With the help of the functions “Previous part” and “Next part”, you can jump from one part to the next. The last current part appears again in red and the new current part in violet. When changing to another part the starting point of the part becomes the current point.

Function F7 – next part
Cange to the next part

Function F8 – last part
Change to the last part of the marker.

Function F9 – Select part
When parts to be cut will be marked with the function <F5> select, so these are not cut in the subsequent cutting process, provided the marker is not loaded new after marking. Marked parts can still be stored with the function “save parts” as separated marker

Function F10 – Save part
The parts, which are marked with the function <F9> *Select part*, can be saved as a separat marker with the function *<F10> - Save part*. (see also chapter „Save single parts“)

5.3 The Toolbar Graphic (Point)

Because the functions „enlarge“, „reduce“ and „measure mode“ are often needed you can get them also in the second graphic toolbar.

Function F4 – Catch point
The part, which is closest to the reticle, is "caught".
Move the cursor near to a contour or a set point which you wish to select with the help of the cursor keys. Select the function “Catch point”. The cursor now jumps to the nearest set point. This point automatically becomes the new current point and the part to which it belongs becomes the current part which is coloured violet then.

Function F6 – previous point
The cursor is positioned to the previous set point.
Within the graphic there are at all times one current set point and on current part (pink colour). When jumping on a part (Function “First part; “Previous part”, “Next part” and “Last part”), the first set point is the current at the same time. Through selecting the functions “previous point” and “Next point” you can now step from a support point to the next. The data of the current set point is displayed at the bottom line of the screen.
With jumping from set point to set point you cannot escape from the current part. Use additionally the function part forwards/backwards.

Function F7 – next point
The cursor is positioned to the next set point.

Function F8 – Next speciality
Each time, the function “Next speciality” is selected, the cursor steps to the next notch of the current part. This happens until the cursor is

positioned at the last notch of the part. In the lowermost line of the software each time the type of notch is shown.

Function F9 – Get continuation point
If a cutting process was broken off before, it can be shown with this function, with which part the cutting process was interrupted. The cursor will be put on the corresponding part.

Function F10 – Set continuation point
The continuation-point is defined with this function. Only positioning points are accepted, which means puncture-points as continuation-point. If a defined point is accepted as continuation-point, the news appears in the notice line: "continuation-point taken on". Can a base as continuation point not be accepted, the error note "not puncture-point" will be shown. This function can only be executed, if the cutting process will be interrupted, however not yet be finished.

5.4 The Toolbar Graphic (General)

At this toolbar the functions Zoom in / Zoom out and Measure are again included.

Function F4 - center
The displayed area is moved in that way, that the cursor is placed in the middle of the picture.

Function F5 – show points
It's possible to display with the function „contour points" addtitonal to the display of the cutting contours, the single support points on the cutting contour.

Function F6 – Show contour
If a marker is loaded and shown in the graphics, NextGen shows only the first cutting window of the marker. Sometimes it is necessary to see the whole marker, even if it is several cutting windows long. Therefore the function ***Show contour*** is used.

5.5 Zoom

General display :

The part contours of the first cutting window are drawed in the standard display. If contours are standing out of the frame, it could happen that you can not see them at the monitor.
To display the whole picture, also i fit is clearly longer, you have to use the function „display contour“.

Zooming of a part:

In the general picture the details are usually not visible. Therefore NextGen offers you the option of viewing the parts in an enlarged form. Use the left mouse key, keep the key pressed, while you open a frame around a part. If the frame is dispalyed in the wanted size, release the mouse key. The current part is shown filling the entire screen.

If you now use the functions part forwards and part backwards, the entire screen will be deleted so that the new current part can be shown in the size of the screen. You can also jump from part to part in the zoomed picture.

Doubling or halving the scale:

It is possible that even the part zoom does not offer you enough detail. If, for example, you wish to view a notch more exactly a larger scale is necessary.

By selecting the functions “Zoom in” and “Zoom out” you can double or halve the current scale. The centre of the new picture is always the current cursor position.
If you wish to move the position of your section, move the cursor to another position, and use the “zoom in” and “zoom out” function.

5.6 Determining the continuation point:

The graphic is also useful for determining a new continuation point after interrupting a cutting procedure.

Move the cursor to another set point with the help of the function “previous point/next point” and “previous part/next part”. This set point must be a positioning point. If you think you have found a suitable continuation point, select the function “Set continuation point”. If the set point you have selected is a suitable continuation point it will be accepted by NextGen, otherwise an error message will be elicited.

You can repeat the procedure described above as often as you wish. It is also possible at any time to return to the original continuation point by selecting “Get continuation point”.

If subsequently carrying out the function <F3> *Start JQ,* the continuation point determined within the graphic will be used.

5.7 Save single parts

To re-cut a faulty part for example, or, to cut only one section of a marker, single parts can be taken from an existing marker and can be stored as new marker under another name. In single you proceed as follows:

- The marker, from which are taken parts, must be loaded but not completely worked.
- Then change to the tool bar “Graphics (part)”.
- Through selecting the functions *F7–next part* or *F6 – previous part* you are able to switch from part to part. (The in each case actual part is represented violet). The wanted part can also be clicked directly with the left mouse key.
- As soon as the wanted part or one of the required parts is represented violet, it can be marked. Therefore the function *F9 - Select* is used. The part is represented in another color.
- When all parts, which are required for the marker, were marked in this way, the function *F10 – Save parts* can be called up, to save the new marker.
- A dialogue is shown, in which you can fix, where and under which name the new marker should be stored. In the first line you have to choose a name for the new marker. (Use a new name in order not to head the original-marker!). By default the file is saved with the name “parts.”
- Below the input field, the option “deselected parts” must be marked, if the parts should be stored, which were marked. Should all other parts be stored instead, except them which were marked, “selected parts” must be selected. If you choose “part number” it is only possible to storage one part, namely the part with the number which is entered behind. Through confirming of the dialogue with the “OK”-button, the marker is stored.

- You can now load the markers which are produced in this way and cut as usual.

6 Shift menu and protocols

6.1 General

Each completely worked off marker is grasped automatically in the statistics. Different protocol-files are set aside in a table, which is defined singularly. This contains statements of the cut markers. Furthermore can through the value of the parameter ***print mode*** (see chapter VI, machine parameter) be fixed, which protocol should be printed out on a connected printer.

Menue: Machine-> Function: Statistics
In the software, the protocol can be viewed over the function *Statistics*. Following protocols are shown among each other with what the screen-excerpt must be scrolled, in order to make all information visibly.

1. Marker protocol
   The marker of the last cut marker is shown if a marker was not loaded already again.
2. Daily protocol or protocol of the current shift
3. Monthly protocol
4. Line-protocol
   All markers which are already cut in the actual shift will be shown. If no shift enter will happen, all markers of the respective day are displayed.
5. List of the interruption-times

All the informations of the statistics dialog can be marked, copied into the clipboard and inserted into other programms.
The statistics can be left again with the button “Close”.

6.2 Shift menu

You can access the shift menu by selecting the funktion *Shiftmenue* in the menue *Machine*.

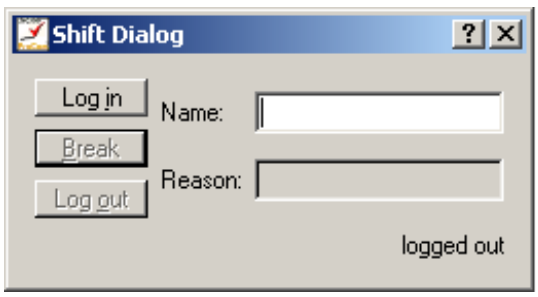
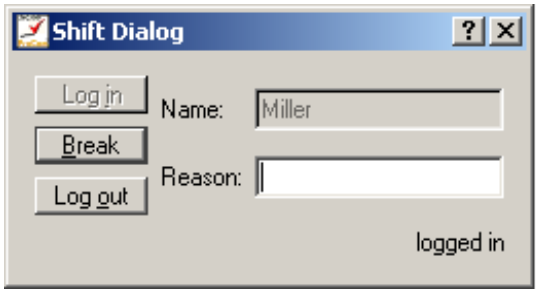


Abbildung 7: The shift dialog box

Should be made a separate protocol for every shift at multiple-shift-operation, the operator must announce at shift menu before start of work.

Shift start

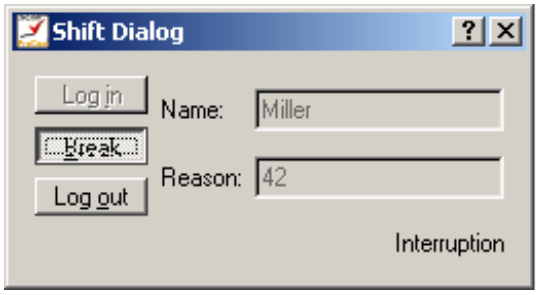
The operator can announce with entry of the name. After that, press button “login”. If a printer is installed directly at the cutter, corresponding news is passed out at the printer. Furthermore, a new line protocol and accumulated shift protocol will be opened. In the line protocol which is cut during that shift, the entered name is shown in a separate row.



Picture 8: Shift start

Interruption begin / Interruption end

If an interruption occurs during the shift, the operator can also fix these by entering a reason for the break (two digits) and selecting the “break”-button after that. The corresponding message is also passed out on the connected printer. Still, the interruptions are also presented in the line-protocol and in the separate interruption protocol. If the break is finished, you have to press the button “Break” to finish the interruption time.



Picture 9: Break

Shift end

Before shift end the operator give notice of leaving with the function *logout*. All markers, which are cut between registration and cancelling are considered in the protocols of the respective shift.

Inputs in the shift-menu will also be printed out, if aprovided printer is connected.

An accumulated shift-protocol and a line-protocol (statements per marker a line) will be made for each operator who announces before shift start and cancel after shift end. You can file them in every register, which can be fixed before. Furthermore a file in which all interruption times a registered is created.

6.3 Marker protocol

After each cutting-process, a protocol is generated for the cut marker.
Here are all relevant information shown respecting the marker and the cutting-process. The marker-protocol is not set-aside in a file but it is only being presented under the function *statistics* and in the logfile. In the statistic menu the protocol is only included until a new marker is loaded.

```
-------------------------------- marker report -----------------------------
 Name           : SAKKO-0M. (x:1.00/y:1.00)
 Measures       : 1575.3,1357.9mm          #Sectors      : 1
 Load moment    : 24.9.2004  11:37:10      Stoptime      : 24.9.2004  11:40:15
 Cuttingtime    :     2.63 min             Add.time      :     0.18 min
 Bitefeed time  :     0.25 min             Total time    :     3.07 min

 contur length  :    27.84 m               Pos-Way       :     8.82 m
 Average speed  :    10.57 m/min           max.Speed     :    90.00 m/min
 Draw way       :     0.00 m               Drawing time  :     0.00 min
 #Parts         :       22 (0)             #Set-points   :      956 (2)
 #Lift & Plunge:       27                  #Sharp. cycls :        4

 #Stitch        :        0                 changed in    :      3.0 >Slit
 #Slit          :       19                 changed in    :      3.0 >Slit
 #Vnotch        :       10                 changed in    :      5.0 >VNotch
 #Drill         :        8                 changed in    :      1.0 >Drill
 #Helpdrill     :        0                 changed in    :      0.0 >ignored
```

6.4 Line protocol

Each cut marker is presented in a line with all essential information in a so-called line-protocol. The sums of the respective columns are presented in the last line. This will be new produced for every day, as well as for each shift. The line-protocol is set aside in the table, which was defined for the operation-data-recording, and is marked with the date of the current day.

In single the name of such a file consists as follows:

%ttmmjj%.z0	where	tt	= Date of the actual day (two numbers)
		mm	= Actual month (two numbers)
		jj	= Actual year (two numbers)

In this way the first line-protocol is named of the 24.Januars 2004 %240104% .z0s. As soon as another user registers to the shift, a new file, in which all further markers are written down, is generated. The line-protocol of the second shift is marked then with %240104% .z1.

```
---------------------------- daily markerprotokoll -------------------------------
 Marker    Cutting  length   Oder Cutting Bitefd Break  Start    Stop   Plys Order
              way       x    time   time   time  time   time     time         Nr.
              [m]     [m]  [min]  [min]  [min] [min]
-----------------------------------------------------------------------------------
HOSE-D.ISO   10.57   1.22   19.13   1.02   0.23 17.88  9:18:34  9:37:42   1  1234
HOSE1.ISO    14.57   1.19    1.95   1.08   0.25  0.62  9:38: 6  9:40: 2   1  4711
BLUSE.ISO    16.59   1.36    2.50   1.83   0.23  0.43  9:40:24  9:42:54  10  5000
HOSE1.ISO    14.57   1.19    1.93   1.07   0.22  0.65  9:45:30  9:47:25   5  5111
HEMD.ISO     22.63   1.39    5.65   2.20   0.23  3.22  9:47:31  9:53:10   4  2354
+++++++++    78,93   6.35   31.16   7.20   1.16 22.80
```

6.5 Day or shift protocol

The day or shift protocol contents all essential details of the cutting performance of the corresponding day / shift.

```
--------------------------------- Day report -----------------------------
Program start : 21.9.2004  8:2:47       Time          : 21.9.2004  12:2:31
Total time    :    89.88 min            Bitefeed time :     4.17 min
Cutting time  :    35.08 min            Add.time:     :50.63 min
Contour length:   371.11 m              Pos-Way       :   133.29 m
Average speed :  10.5780 m/min          Length X[mm]  : 28203.14 mm
Draw Way      :     0.00 m              Drawing time  :     0.00 min
#Markers      :       19
#Lift & Plunge:      395
#Sharp. Cycls :       78

#Stitch       :      124
#Slit         :      338
#Vnotch       :      193
#Drill        :        0
#Helpdrill    :        0
```

If the operator at the cutter starts or ends a shift-interruption, a list of the interruptions is also presented in the shift protocol.

6.6 Month protocol

An overview of the cut marker of total month is set aside in the so-called month protocol. This is also set-aside in the file of the operation data recording. The file-name contains the details of month and year. The file is marked in single as follows:

mm_jjjj.bde whereas mm = corresponding month (two numbers)
jjjj = corresponding year (four numbers)

In this way the month-protocol of the August 2004 is therefore set aside under the name 08_2004.BDE for example. The month-protocol contains the same information like the day protocol, however in each case as sum over the complete month:

```
------------------------------ Monthly report --------------------------------
Program start : 9.8.2004  18:0:35       Stop time     : 31.8.2004  21:40:11
Total time    :  2956.72 min            Bitefeed time :   304.45 min
Cutting time  :  1519.67 min            Add. time     :  1132.60 min
Contour length: 13200.23 m              Pos-Way       :  3582.24 m
Average speed :   8.6863 m/min          Length X[mm]  :  1012662.46 mm
Draw Way      :     0.00 m              Drawing time  :     0.00 min
#Markers      :      459
#Lift & plunge:    19725
#Sharp. Cycls :     3046

#Stitch       :        0
#Slit         :        0
#Vnotch       :     9268
#Drill        :       28
#Helpdrill    :        0
```

6.7 Protocol of the interruption times

As soon as the operator starts or finishes a shift interruption at the cutter, interruption-reason, interruption-start - and end moment will be stored in a separated protocol.

If at the end of a shift a shift-protocol is generated, all stored shift interruptions are passed out additionally within the shift-protocol. Also with the output on the printer and the writing into the logfile, all shift interruptions are passed out.
As a reason of the interruption, only an input of numbers is possible, so it must be agreed internally within the company, which value for a certain interruption-reason is fixed and has to be used.

```
Interruption Mr.Miller.
 Start       End     Duration[min]  Reason .
  9:16:27    9:22:32      6.05        23
 10:52:38   11:02:43     10.05        10
 11:50:49   11:58:53      8.04        5
```

6.8 Components of the protocol

Cutting length	The ways which the knife has to cover in circuit are calculated during loading of program. If the marker will change for example through removeing of double cuts, deviate distances could happen. These distances will not be collected new.
Drawing length	The way which the graphic pointer covers in droped condition are calculated during loading of program.
Contour length	Cut length + drawing length
Pos way	Length of the positioning ways. The distance of the positioning ways will be calculated during loading of program. If you change the cutting order or the work out order it could happen that the positioning distances are deviate. These will not collected new.
Order time	Time between loading of the picture and the end of the last bitefeed. Zeit zwischen dem Laden des Bildes und dem Ende des letzten Vorschubes. Meets SB total time.
Cutting time	Time for the whole cutting process with the knife. Time is measured from the first positioning on the first knife contour point until the moment from which the bitefeed was requested (respectively until changeing to the pen).
Drawing time	Time for the whole drawing process with the pen. Measured ist he time from the first positioning on the first pen contour point until the moment from which the bitefeed is requested (respectively until changeing to the knife).
Contour time	Cutting time + drawing time
Bitefeed time	Time in whiche the feeding conveyor is moved. The times for positioning of the bridge before and after bitefeed are not added.
Additional time	Order time (cut time+drawing time+bitefeed time)
Average Speed	Contour way (cutting time and drawing time). The positioning ways are not taken in consideration! Contour way = cutting way + drawing way
Max. Speed.	Value of the parameter „max. speed". If you change the value of the parameter during cutting, the actual parameter value is shown.

Interruptions of cuttings and bitefeeds with „break“ are added tot the additional times.

7 Interval mode

When the cutter is working in bitefeed mode, both the bristle conveyor and the clearing conveyor are fed automatically after cutting a section.

To give the operator the possibility of interrupting this process (this is useful if the clearing conveyor cannot be cleaned quickly enough), the switch option **CONTINUOUS MODE** / **INTERVAL MODE** is available.

To switch from CONTINUOUS MODE (setting when starting the cutter software) to INTERVAL MODE, simply the function F9 – Interval has to be pressed. In the status window of NextGen you will see the message INTERVAL MODE instead of CONTINUOUS MODE.

Now the cutter stops its process after cutting a section and waits for selecting function *F9 - Interval* once again. The mode of operation switches back from INTERVAL to CONTINUOUS MODE and the process will continue.

If you wish to stop again at the end of the section being processed, just select *F9 – Interval* again to return to interval mode.

8 Recutting of parts with interactive nesting (option):

If at the single-ply cut the situation occurs that during the cutting process, i.e. through lacks in the material, faulty parts established, you can sort aside these parts and cut it again later.

NextGen offers a comfortable possibility to select and prepare these faulty parts in the graphic for the cutting again. The parts can be interlaced interactively and be cut as separated marker to any time afterwards.

The course of the cutting again is for the operator as follows:

- 1. mark faulty parts in the graphic
- 2. interlace interactively parts
- 3. parts will be stored automatically
- 4. cutting again of parts

8.1 Mark faulty parts in the graphic

If a faulty part is already recognized in the marker during the cut, it can already be marked in the graphics, through simply clicking on the relevant part with the mouse. When a fault is discovered with the clearing, during the cutter already cuts the next cutting-window, it can be changed into the total view and then zoomed into the previous cutting window. You can also mark the effected part then. Marked parts are represented in another color. After finishing the cutting-process, you go ahead like follows:

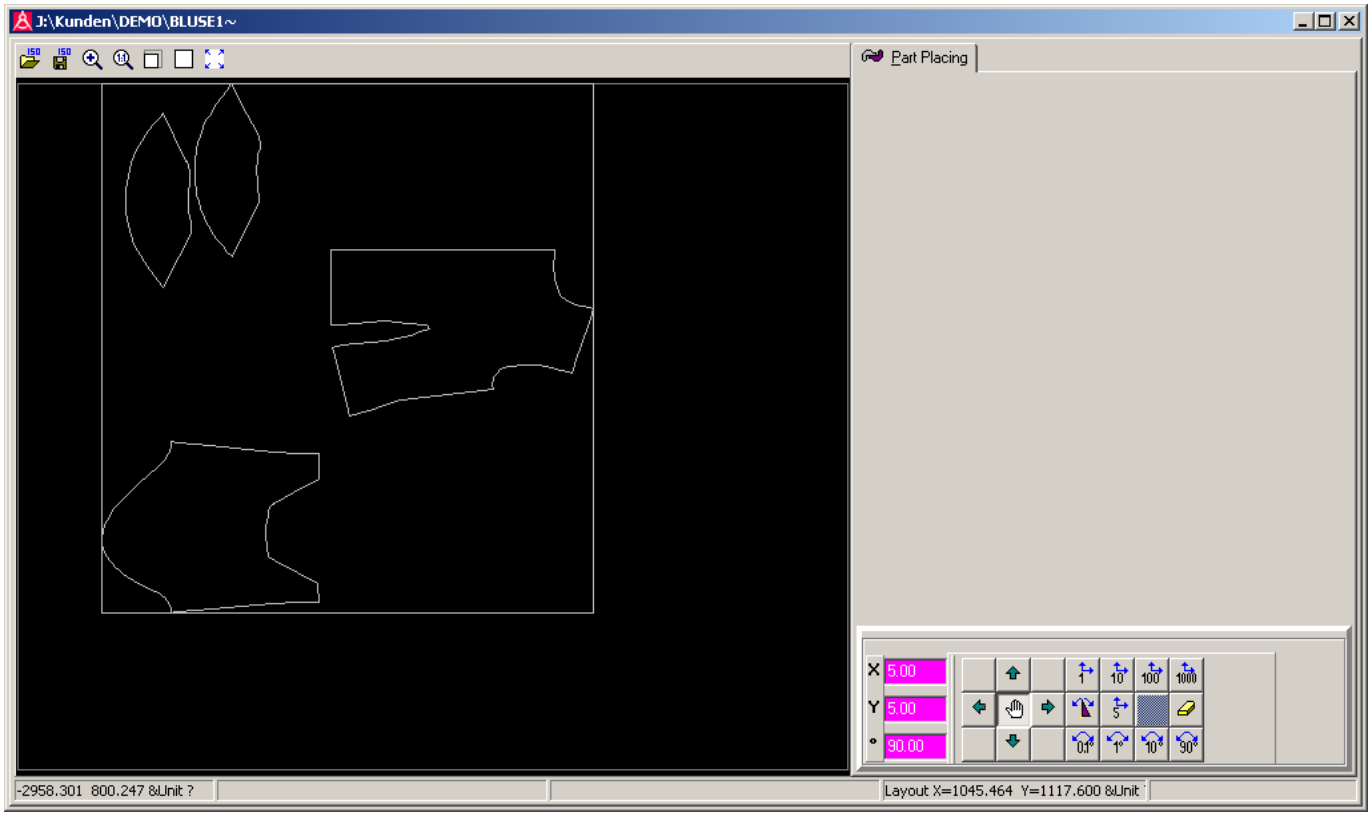
Choose the function *CAD* in the menue “Graphics”. The current marker (as well as the linked jobqueue), in which you have recognized the faulty parts, is represented graphically as a result. You are in the graphic-mode "Recut".

The parts, which were marked during cutting are already represented in a different colour. With help of the mouse further parts can be selected for recutting now.
If you click a second time on a part the color of the part changes again and it is deselected again.

Picture 10: Mark faulty parts

8.2 Interactive nesting of parts

If all parts are selected, - i.e. displayed in white color -, which should subsequently cut, you can switch off the rest of the parts with icon „delete not selected parts“. Now changes the graphic-representation: Only the parts which are just marked are drawn. Herewith the parts get back their original situation, which is programmed in the original ISO-File. Possible spins, which could have originated through the crooked-situation-correction or the matching, are made automatically declining. The parts are not interlaced.



Picture 11: Renesting of the parts

Click the first part with the left mouse-button now. It is selected and is marked color-like.


You can only move the part in the wished direction with the icons for movement step by Stepp (arrow icons). It's possible to select and move several parts together.

You can set the width of the step per icon for movement with the icons „1", „10", „100" and „1000".

So the selcted parts are moved in choosed direction with the four bottons with arrow display.

Movement with the mouse:
Instead of the movement by the arrow icons, you can move the parts directly with the mouse. As long as the „Shift" key is pressed, the part get lost. It now „hangs" at the cursor and follows each movement of the mouse.

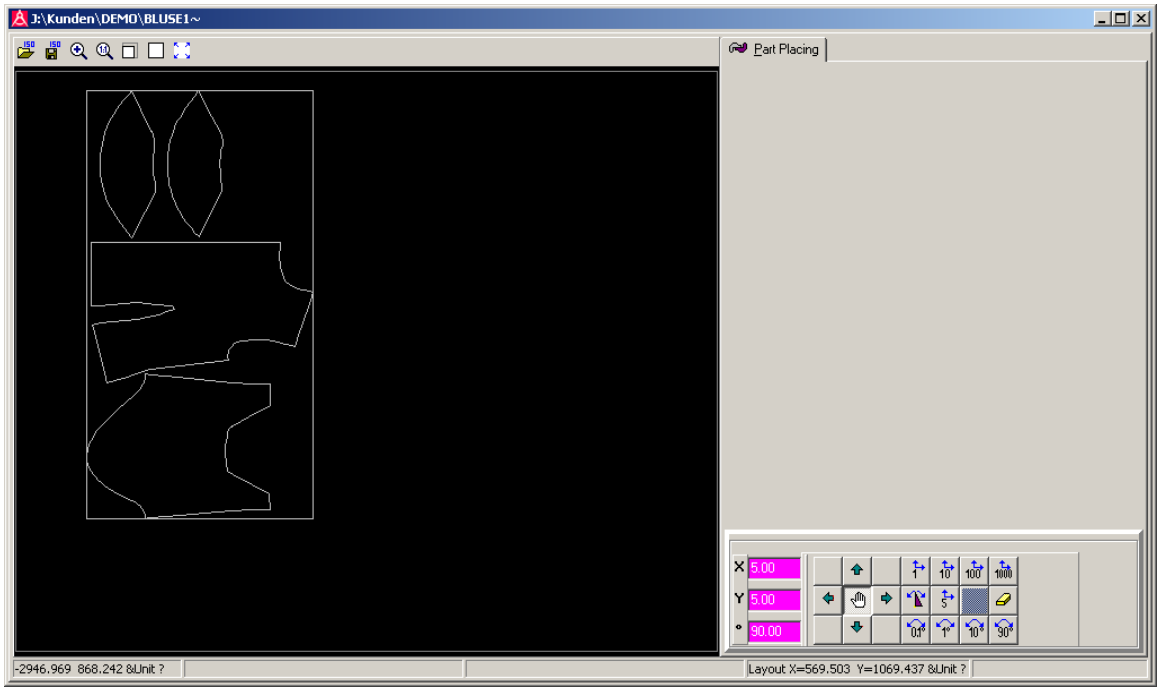
Move that part into the chosen position. As soon as you release the “Shift”-button, the part lies fix again.

To turn a part you have to press the „turn“-button: Now it’s possible to turn the part with the mousewheel also at the same time with the shifting in the angle which was adjusted before.

The step width für the turning movement is adjusted in standart 90°. You can change these step width with the icons „0.1°“;“1°“;“10°“ and „90°“.

You can also edit the step width for vertical, horizontal and turning movement directly with the pink colored entering fields.

As a result the so nested picture is displayed in the graphic.
Select step by step every part and move it at the chosen position until you get an interlaced picture.



Picture 12: New nested marker

8.3 Storage of parts

As soon as the operator has finished nesting, he chooses "Save ISO".
Afterwards the nesting graphic will close.
The name of the marker is made from the original marker in which the sign ‚~‘ will be added to the original marker name.

8.4 Cut again parts

The new marker which has occurred through nesting of the parts to be cut again, can now be processed further like a quite normal marker.
If you would like to cut the faulty parts directly, because you still have sufficiently material on the role or on the cutting table, so you load the marker, as well as write down the marker name into the jobqueue.
If you would like to cut again all faulty parts later, so you can of course process the marker to any later time.

9 Automatic separation of parts at fabric end detection (option)

If a light-barrier is installed at the cutting table to the fabric-end-recognition, so NextGen offers the possibility to recognize automatically the end of the fabric during the bitefeed. Now NextGen tests whether all parts of the marker can be cut on the rest-material. If this is not the case, so all not processed parts will be separated automatically and stored as separate marker. These parts can be cut on a new ply or on a remnant.

If you would not like to enforce the automatic separating of the parts with fabric-end-recognition, so you put the value of the parameter "***With fabric-end-detection"*** on <NO>.
If you would like to execute the automatic separation of the parts, so you put the value of the parameter on <Yes>. In this case, the singles - or step-ply-mode must be entered as reference-mode.

Is a fabric end realized it first will be proofed if it is possible to cut the last feeded marker still from the rest of fabric. If not, these parts, which are fit no longer on the rest-material, will be stored automatically in a separate file as individual marker. This marker will get the same name as the original-marker, with which the first sign of the extension is replaced through the sign ‚#'.
Now, the remaining parts are cut. The subsequent bitefeed is only executed up to the fabric-end.

If all parts still fit on the rest of fabric the marker will end correct and as usual the next marker is loaded from the jobqueue. Now the check has to happen if this new loaded marker fits on the rest of fabric. Here is also the case took in consideration that the new marker could lay on a second separate fabric ply. If it fits on the rest of fabric it will be processed as usual. If it doesn't fit on the rest of fabric the above described process will be carried out and the jobqueue mode will be finished.
Now the user has the possibility to insert the new obtained marker into the jobqueue and to cut.

Carry out interlinked marker

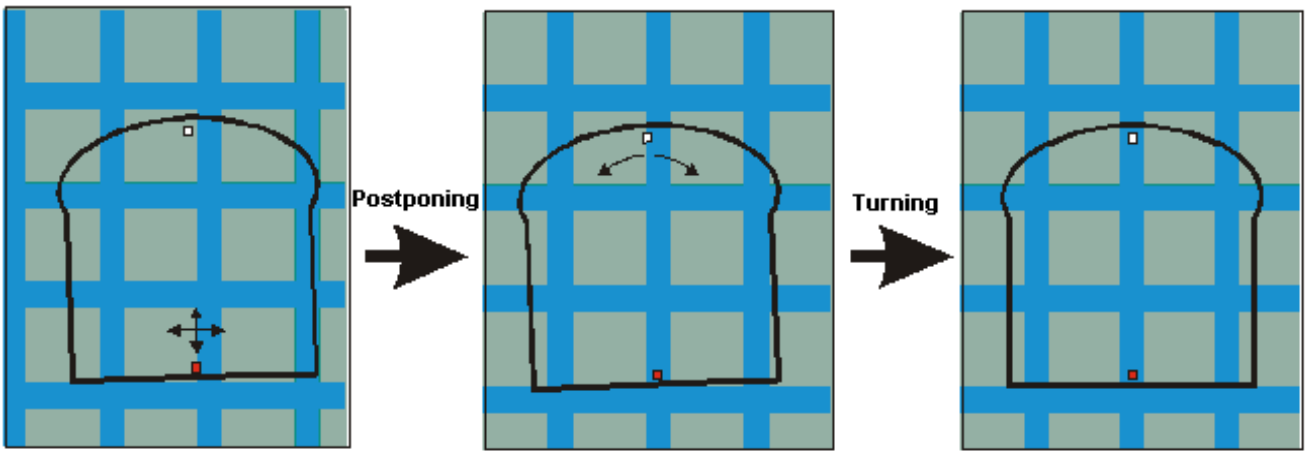
If the operation marker chains in the jobqueue is processed, so the above procedure must be executed for every situated individual marker in chain. On this occasion also the case must be taken into account that several separate ply packages could be on the cutting table. As soon as a single marker no longer fits one the rest material, so the described procedures will be enforced and the jobqueue operation will be finished. The operator now has the possibility to insert the again won marker as starting picture into the marker-chain and to start the jobqueue operation again.

10 Matching (option)

10.1 Overview

Matching is the procedure, parts at the cutter - with help of repeat adjust points (so-called matching points) -, under consideration of a pattern-report, to shift, turn and to distort perhaps even according to the repeat.
Matching points are usually already produced at the CAD-System, however can be inserted also after the store of the marker in the graphic of the cutter. Normally, the adaptation points are at a position of the part to be cut, which should lay on a certain position of the pattern-repeat (on a repeat-strip for example). In which the position of the matching points is checked then for the patterned material and is corrected if necessary, the parts were adapted on the pattern-repeat.

The first matching point of a part is used for pushing the part. In that this point is therefore also corrected, the part will be shifted about the corresponding value. Further matching points of a part function as turning-points. When these are moved, the affiliated part is turned about the rotation point (as turning-center). With this procedure, parts therefore can be turned into a report-strip, if this proceeds diagonally.



Picture 13: Shifting and turning of a matching part

Matching mode [1,2,3,4]

Through the parameter ***Matching mode*** can be fixed, on which way the repeat adaptation should be executed. The following variations are possible:

Single matching:

If the parameter is set on <1>, so every part, which possesses a matching point, will be fit individually on the pattern. The in each case first matching point will be used to push the part, all further to turn a part around the first matching point.

Global matching:

If the parameter is set on <2>, the total marker will matched globally. In this way the total marker can be postponed on the basis of any matching points.

Group matching:

If the value is set on <3>, parts can be summarized to any groups in the matching menu. All parts of a group are moved together with the subsequent matching. On this occasion also a turn of the groups is possible. Only the first matching point of the entire group is treated as moving point then, enables therefore a shifting of the group. All further matching points of the group are only used as turning points then.
If parts are not summarized explicitly to groups, every part is considered as own group, by which results again a "single matching".

Repeat matching:

If the value is set on <4>, so the repeat matching is switched on. In this mode, through moving of the first part all following parts are moved about the same offset.
If the first part has reached the chosen position, this is set aside. At moving the next part, all following parts will be moved again. The parts which are already measured remain down however.
With the turning of one part, the following parts are not also turned.

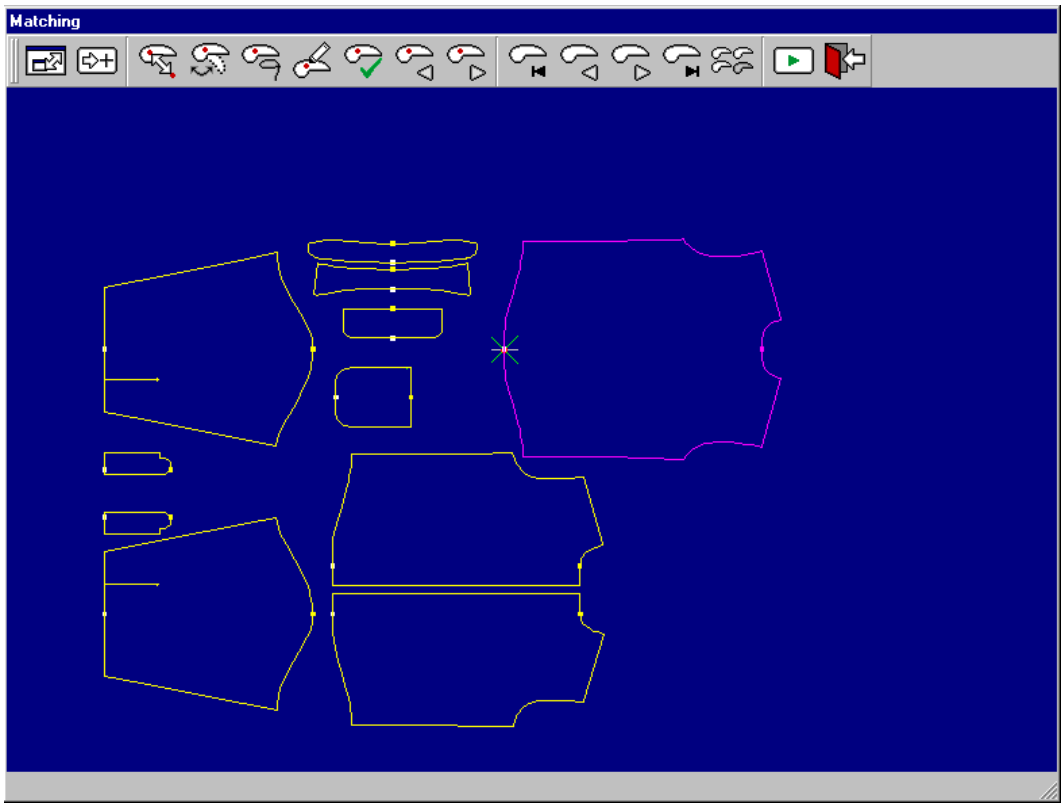
x-Offset Stripe fabric [mm] (Custom262)
y-Offset Stripe fabric [mm] (Custom263)

Matching points for adjusting of cut parts on a patterned material, are usually inserted at the CAD there, where a repeat-stripe should figure in the cut part.
If a matching point for adjusting of the part at the cutter should be moved on the middle of a wider repeat-stripe, it is often difficult for the user, exactly to determine the middle of the stripe. Instead of this one of the both parameters - ***x-Offset stripe fabric*** resp. ***y-Offset stripe fabric*** can be used. If a value is written down unequally "0" in one of these parameters, not the matching point itself will be approached, but a moved position of the cut file about the amount of the parameter.

Should therefore the matching point be in the middle of a strip - the width of the strip can be measured and the half of this value can be written down into the parameter. Then at the matching the moved point about the offset will be approached and shifted on the edge of the stripe, so that the actual matching point will be precisely in the middle of the stripe.

10.2 Matching with light pointer

The light-pointer-matching can only be executed if matching points are contained in the marker. Still, the parameter ***Matching active*** must be set on the value <Yes> in order to activate the matching.
As usual the referencing sequence is executed when starting a marker. A global turn of the parts on the pattern-report consequently already takes place over the incline position-correction. After finishing the reference sequence the cutting head with light-pointer positions automatically on the first matching point of the marker.
On the screen, the marker is visible, with which the corresponding part is represented pink-colored in the chart. Shall now the position of the matching points (and with it the part to be cut) be corrected on the ply package, the light-pointer and consequently the matching point must be moved with help of the joystick on the chosen position.
With the key <ENTER> at the operator terminal the new position is confirmed. Dependent on the attitude of the parameter ***Matching mode***, a part, a group of parts or the total marker will be moved about the corrected value.
With every correcting of a matching point an automatic collision-check is executed. If the part to be cut would collide through shifting or turning with another part, the movement is rejected.
If a part to be cut contains several matching points, the first matching point of a part will be represented in the color white, on the other hand all further points of the part are represented in the color of the part to be cut. The white matching point functions as "shifting point". When the light pointer with the joystick will be moved, the affiliated part to be cut is moved about the same value into the same direction. All further matching points of the part can only used for the turn of the part, with which the "shifting point" is the center of the rotation, so that its position is not changed.



Picture 14: The matching menu

At the matching menu the following functions are possible:

Maximization of matching window
As usual in the Windows programs it's possible to move the matching window with the upper beam and it's possible to change the size with the right below corner. This way it's possible to place the window so that the user has access to some elements of the main window of NextGen also during matching.
If now for a short time an enlarged display of the matching window is needed you can switch with the fuction „Maximization of matching window" to the full window mode. The matching window is displayed then as a filled monitor. You can switch back from the full window mode with the same icon to the previous display.

F2 catch M:
If this function is required, the light-pointer approaches the matching point that lays next the cursor. The affiliated part will be caught and turns consequently into the current part.

Switch Single/Repeat:
If the parameter Matching mode is set on *rapport matching (4)*, all following parts are moved with the same value during moving of a marker with help of matching points.
Under circumstances, it is however necessary, to take out a part from the repeat matching for a short time for continuing the repeat matching afterwards. When the function ***Switch single/repeat*** is entered, the repeat matching can be turned off short-term in order to move a part individually.

Previous Matching point:
With this function, you can step from matching point to matching point in the cutting sequence backwards. Hereby the light-pointer also drives on the corresponding matching point.

Next Matching point:
With this function, you can step from matching point to matching point in the cutting sequence forwards. Hereby the light-pointer drives on the corresponding matching point.

First part:
With this function, the light pointer you can move to the first matching part of the cutting window.

Last part:
With this function, the light pointer you can move to the last matching part of the cutting window.

Previous part:
With this function you can quilt backwards in the cutting order from matching part to matching part. The light pointer moves with this also to a matching point of the part.

Next part:
With this function you can step forward in the cutting order from matching part to matching part. The light pointer moves with this also to the first matching point of the part.

Confirm Matching position:
If the chosen position of the current matching point is approached with the light-pointer. You can confirm this position with the function ***Confirm Matching position*** (or with the <Enter>-key at the operator terminal). The corresponding part will be moved or turned accordingly.

Switch between matching-turning- and matching-postponing-point:
Within the group - and repeat matching, parts and part-groups can as well as turned parts also be shifted. NextGen offers the possibility to be able to fix flexibly for each matching point, whether it should be a turning or a shifting point.
In the group-/repeat matching, each group possesses exactly one shifting point; the remaining points are turning points. The shifting point is accentuated color-like. With a turning, the group is turned with help of the turning points around the shifting points. If you would like to move that part alone, so the shifting point must be chosen, and this be moved on the chosen position.
If a turning point should now be defined as shifting point, so you have to enter it first ("catch M" or "point forwards"/"point backwards"). With the Icon **Switch between matching-turning- and matching-shifting-point** is changed the original shifting point into a turning point. The entered turning point turns into the shifting point.

NOTE :

It is not possible to define a shifting point as a turning point as you would eliminate the only shifting point of the group through it. However it must always exist exactly one shifting point per group.

Matching point offset-movement:
With the construction of markers, the matching points are defined usually respecting a known repeat. NextGen offers the possibility, to use the same marker for different fabrics with different repeats many times. With help of the here described function the possibility is given, all in the marker existing matching points to shift about and at the machine defined x - and y offset.

If a matching point is entered, the machine moves automatically on the position of the original matching point. Through selecting the function ***Matching point offset-***

movement appears the hint "Matching-Offset in the uppermost screen-line. With help of the joysticks on the cutting table or with the cursor on the screen you can now drive to the position that the matching point should be.
After pressing the key <Enter>, the software tests automatically for all matching points whether these still lay after the offset-movement within the surrounding rectangle of the affiliated parts.

If the offset is not correct, an error message is passed out. If the offset is correct, all matching points will be postponed about the pre-determined x - and y - offset. The postponement of the matching points is executed also into the graphic so that all matching points have now got a new coordinate.

This function can be repeated whenever, until the matching points have reached the optimal situation for the repeat. Afterwards, the matching can be continued in the usual way.

<Alt-F4> Set matching point:
As well as in the graphic "view marker in graphics" exist a possibility to define new matching points in the matching graphic. Through operating the function ***Set matching point*** is set a matching point that belongs to the current (in pink color) part, at the current cursor-position.

Calculate and cut:
If all parts were adjusted on the pattern, you can start the cutting with the function ***Calculate and cut***.

Interrupt Matching:
With the function ***Interrupt Matching,*** you can quit the matching menue without starting the cutting process.

CHAPTER V

Parameter for the user

Table of Contents – Chapter V

You will reach the parameter list with the function „parameter“ in the menu „adjustments“ or with the icon F1-Parameter in the second toolbar at the lower monitor frame. The following parameters are displayed mostly also with the „Security Level“ <low>. Information about changing and storage of parameters you will find in part 3, chapter “changing and parameter adjustments” in the manual.

Miscellaneous parameters are required only for certain machine-implementations and optional equipment. Therefore, the parameter-list is adjusted to the machine in each case. It is therefore possible that you don't find some parameters of the list presented below in the parameter-menu of your cutter-software.

The NextGen names which are written down in the brackets behind the parameter name are displayed in the parameter list of NextGen in the last column. This parameter name is irrelevant for the user. Because the NextGen name is not translated you can clear identify a parameter also in a foreign language version.

To find a parameter in the parameter list you can use the parameter filter. Enter any part of the parameter name as a filter text. All parameter will appear which includes these word segments. Furthermore all parameters are sorted in different thematic groups. If you choose in the list on the left side of the dialog a group only the parameters in the parameter list will appear which belong to this group. In the following description is described at every parameter in which parameter group you will find it.

To each parameter, limits are fixed, which can not be over - or under-strode. It is therefore not possible to input values, which lay outside of the pre-determined borders. Instead of this the error message "value outside the borders" is shown.

For each parameter an explanation exists, which is displayed on the lower right side of the parameter dialog box.

1 Cutting parameter

1.1 General cutting parameter

Cutting speed [m/min] (TimeMaxV)
Parameter group: Speed

The currently set maximum-speed in [m/min] at the machine is defined through the parameter ***cutting speed***. During cutting of the marker, this speed is not exceeded. The cutting speed is primarily set dependent on the fabric and ply-height. It is restricted through the value of the parameter max. cutting speed (see chapter VI, machine-parameters)

Cutting angle limit [degree] (BlendPhiCurveChordTol2)
Parameter group: Speed -> Corners and curves

At a corner with a change of direction-angle smaller than the parameter ***cutting angle limit*** the corner is cut with the knife turned in the fabric. At corners with

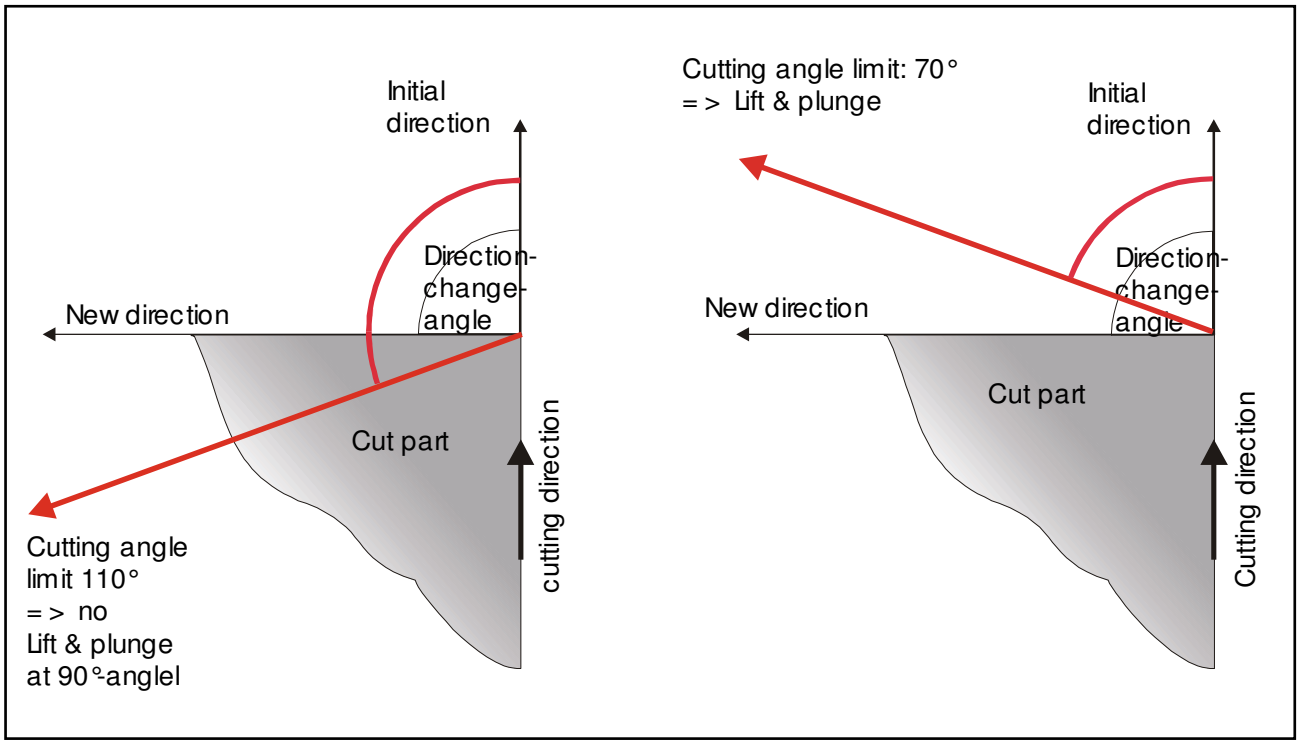
direction-change-angles bigger than the cutting-angle limit, a lift and plunge is enforced, i.e. the knife is lifted out, turned and again stuck in.
With the cut of high plies or hard materials, corners should be cut with lifting out, (lift and plunge), since with the alternative - the turn of the knife in the fabric ply - the danger of a knife-break exists.

Note:

With cutting machines, that are equipped with straight-knives, it is usually sufficient to change between the values 70° and 110° for the parameter cutting angle limit. Consequently the right angles (90° -edges) in the marker, which occur the most frequently, are cut without lifting out (cutting angle limit = 110°) or with lifting out the knife (cutting angle limit = 70°).

Cutting angle limit 110°: All edges in the marker with a direction changing angle bigger than 110° is cut with lifting out the knife. A right angle, 90° => direction changing angle also 90°), is cut then without lifting out the knife.

Cutting angle limit 70°: All edges with a direction changing angle bigger than 70° is cut with lifting out. Edges with a right angle are cut then with lifting out the knife.



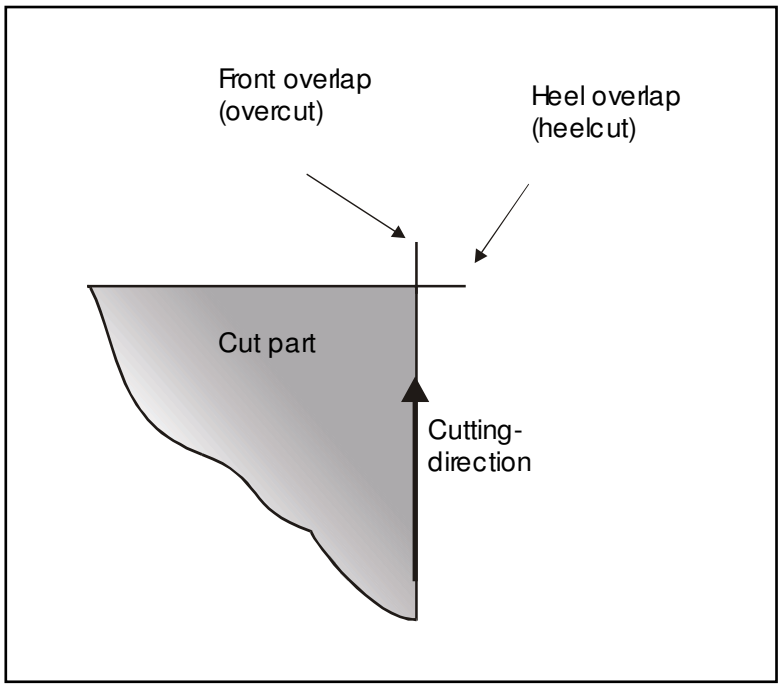
Picture 1: The parameter Cutting angle limit

If it is cut with a round-knife, the ***cutting angle limit*** should be set much smaller, (for example 30°) since the danger of a knife-break is essentially higher with this cutting-tool.

Front overlap (overcut) [mm] (BlendOvercut)
Heel overlap (heelcut) [mm] (BlendHeelcut)

Parameter group: Cutting parameter

If an edge with ‚Lift and Plunge' will be cut, the parameter defines the front overlap (overcut) the distance which the knife drives over the contour before the lift. The parameter "Heel Overlap" (heelcut) defines the distance which the back of the knife stands over the contour at the plunge. A cut-overlap in each case of 1-3 millimetres is necessary, to separate the marker clearly from the waste.



Picture 2: front and heel overlap

knife-frequency at min. speed (Custom100)
knife-frequency at max. speed (Custom101)

Parameter group: Knife -> Knife frequency

These parameters define the identification line for the control of the knife revolutions according to the knife's advance (frequency controlled knife drive).
If the parameters ***knife-frequency at min. speed*** and ***knife-frequency at max. speed*** are set on different values, so the knife-frequency is varied dependent on the respective feeding speed.

Dependent on the feeding speed, a certain frequency is necessary, to cut the material clean and with a smooth cut-edge. On the other hand with higher frequency the increase in the friction and heat-development through the vertical movement of the knife, can lead to welding of the cutting edge with synthetic materials.

Through choosing different values of the two parameters with the cut of synthetic materials (smaller value for ***knife-frequency at min. speed***) the friction and heat-

development at corners, curves and punch is reduced by lower frequency. For the higher cutting speed at straights, and also for the reduced speed at corners and curves, in each case a matching frequency must be found; this must be sufficiently high, in order to get a clean cutting edge, but also preferably low in order to reduce welding through friction.

Vacuum pressure [%] (option) (Custom135)
Parameter group: Cutting parameter

On machines with adjustable vacuum, through this parameter the vacuum-pressure is selected as a % of the adjusted maximum.
A vacuum-loss through open contours during the cutting-process is evened out by increasing performance of the vacuum-pump on this occasion so that the vacuum-pressure remains constant during the complete cutting-process.

1.2 Tool-referring cutting parameters

Tool selection [1=stitch, 2=circ, 3=chisl, 4=pen] (Custom111)
Parameter group: Tool

With machines, that are equipped with two cutting tools, the change of the cutting tool takes place over the parameter selection***: Tool selection.***

According to active tool, different values are required for the parameter knife-width, knife-backs, front and heel cutting overlap, speed and cutting angle limit. Dependent on it, which tool is activated, is considered the proportionate parameter (see chapter VI machine-parameters). The original parameters are considered only with use of a straight knife (***Tool selection*** on 1).

Repeate knife select.at cut.start [Y/N] (Custom112)
Parameter group: Tool

If the cutter is equipped with two cutting-tools, the user can always fix over the parameter ***Repeate knife select.at cut.start*** that the cutting tool can be fixed before each cutting start.
If the user has fixed over parameters to be asked before each cutting start about the knife-type, so a dialogue-window, in which the knife-type can be selected, opens to begin the start-course. The registered value will adopt into the parameter ***Tool selection***. If you don't ask before each cutting start about the knife-type, so the already registered value of the parameter is adopted.

Program interupt after draw [Y/N] (Custom57)
Parameter group: Tool

This parameter defines whether the program is stopped after marking, or if the cutting process follows automatically after marking. If the parameter is set on <Yes> first the marking contours are marked. As soon as the marking process is finished,

the control-software waits for an operator-input. In the message window, the invitation appears to input a <C> for Cutstart; the cutting process is started by operating this button.

Drawing speed PEN [m/min] (Custom329)
Cutting-angle limit.PEN [degree] (Custom332)
Toolback PEN [mm] (Custom317)
Toolwidth PEN [mm] (Custom318)
Heelcut PEN [mm] (Custom319)
Overcut PEN [mm] (Custom320)
Parameter group: Tool -> Pen

max.cutting speed ROTARY-BLADE [m/min] (Custom330)
Cutting-angle limit.ROTARY KNIFE [degree] (Custom333)
Toolback ROTARY-BLADE [mm] (Custom325)
Toolwidth ROTARY-BLADE [mm] (Custom326)
Heelcut ROTARY-BLADE [mm] (Custom327)
Overcut ROTARY-BLADE [mm] (Custom328)
Parameter group: Tool -> Rotary blade

max.cutting speed CHISELBLADE [m/min] (Custom331)
Cutting-angle limit.CHISELBLADE [degree] (Custom334)
Toolback CHISELBLADE [mm] (Custom321)
Toolwidth CHISELBLADE [mm] (Custom322)
Heelcut CHISELBLADE [mm] (Custom323)
Overcut CHISELBLADE [mm] (Custom324)
Parameter group: Tool -> Chiselblade

For cutters, which work with two cutting tools, or which are equipped additionally to the cutting tool with a pen (for drawing the step lines), according to active tool, different values will be required for the parameters knife-width, knife-backs, overcut, heelcut, speed and cutting angle limit.
Dependent on which tool is activated through the parameter ***Tool selection***, the corresponding parameter is considered. The original parameters are only taken into account with use of a straight-knife.

2 Knife

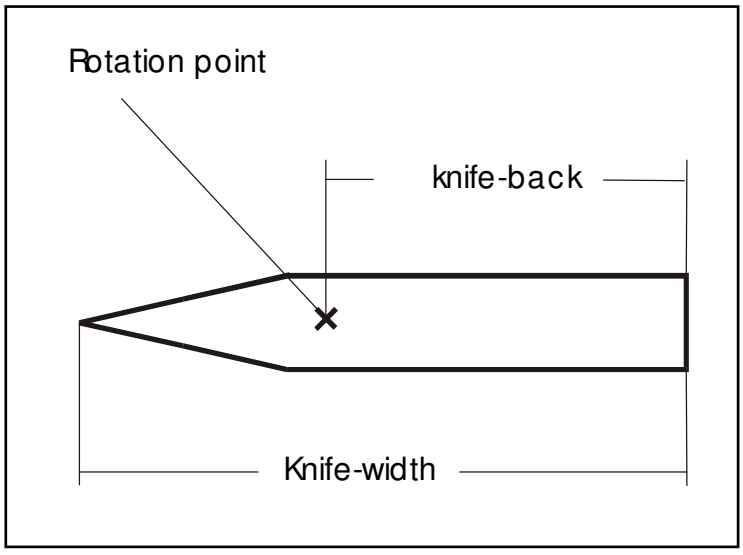
Knife back [mm] (ToolBackLength)
Knife width [mm] (ToolLength)
Parameter group: Tool -> Stichknife

Knife width:
The knife width indicates the distance between the knifepoint and the knife-back in [mm].

Knife back:
The knife-back parameter indicates the distance between the rotation point of the knife and the knife-back in [mm].

For the calculation of the knife-movement during a cutting process, the control-software requires the current measures of the knife constantly.

The knife-width is reduced by each grinding cycle. The knife-width is updated automatically with correct attitude of the parameter ***knife-wear-out-factor***.
After a knife-change, the value of the parameter knife width must be set manually on the width of a new knife again.



Picture 3: The knife values

Knife-wear-out factor [mm/100 grinding cycle] (Custom125)
Parameter group: Tool -> Knife

The theoretic knife-width is reduced by the set parameter value at each sharpening cycle. Therefore, the parameter knife-width will be reduced about the set parameter ***knife-wear-out-factor*** (in mm/100 grinding cycle).

The value of the parameter is calculated an empirical way.

As long as the knife-wear-out-factor is not yet adjusted at your machine, the knife-width should be measured again regularly and be compared with the value of the parameter ***knife-width***. Align the parameter-value as measured if necessary.
Determine if the value of the parameter is continuously smaller than the measured width of the knife, the value of the parameter ***knife-wear-out-factor*** must be reduced additionally. This value must be increased if the actual knife-width is regularly smaller than the value of the parameter ***knife-width***.

min.allowable knife-width [mm] (Custom123)
Parameter group: Tool -> Knife

NextGen controls automatically the wear of the knife. The user is asked for a knife-change, as soon as a pre-determined knife width is under-strode through the parameters.

Change into the parameter dialog box and select the parameter ***min.allowable knife-width***. Put in a meaningful value and confirm through <ENTER>. The supervision of the knife-width should be turned off, so the value of the parameter is put on zero.

During the cutting NextGen controls automatically the actual knife width. As soon as the current knife-width under-strides the value of the a.m. parameter, the operator will be asked to control the knife and to change, if necessary.

If at the moment a marker is worked off, this message appears within the message line, a new marker will however be started - so a question-window opens, in which the operator is asked, whether the cutting process actually wants to start, although the minimal knife-width is under-strode. This question-window must be answered before with the treatment of the next marker is begun.

minimal grinding distance [mm] (Custom120)
maximal grinding distance [mm] (Custom121)
Parameter group: Cutting parameters

As soon as a distance which is bigger than the ***minimal grinding distance***, has been cut, without a grinding cycle have taken place, the knife is sharpened automatically at the next lifting place. The next lifting place can be a corner, a notch or an end of a part.

As soon as a distance, that is bigger than the ***maximum grinding distance***, has been cut without grinding, so a cutting interruption is forced so that the knife can be sharpened automatically.

Note:

It is not desirable to force a grinding cycle in the middle of a piece so the difference between minimum and maximum grinding distance should be preferably chosen to be large so that the software has the scope to find a lifting place to grind at.

At cutting-media, which will be not ground (for example round-knife or oscillating high frequency-knife) the values of both parameters should be put to “0” in order to eliminate the grinding demand.

Sharpening one side [J/N] (Custom119)
Parameter group: Knife -> Sharpening

If the parameter “Sharpening one side” set on <Yes>, the following process is activated:
If - after expiry of the parametrized sharpening distance - the sharpening process is requested, the knife is turned into the first sharpening position. After this side of the knife is sharpened the machine continues cutting.
For the next sharpening process, the knife is turned into the other sharpening position and only that side is sharpened.

No. grinding cycles before change belts [ ](Custom124)
Parameter group: Knife -> Sharpening

NextGen controls when the operator has to exchange the grinding belts.

To do this, the software counts all grinding cycles and stores automatically the reached number. As soon as the number oversteps the value of the parameter ***number grinding cycles before change grinding belts***, you are asked to change the grinding belts.

If actually a marker is worked off, so this news appears merely within the message line so that you must not interrupt the current cutting process.

When you select the function „*Starte Jobqueue“* however, although the grinding belts had to be changed, so a window opens where you are asked whether you want actually to start the cutting-process although the number of grinding cycles is overstepped. If you select the “Yes” button, you can start the next cutting process. Select the “No” button to finish the process.

If the supervision of the grinding belts change should be turned off, the value of the parameter should be put to zero.

If you carried out a grinding belt change you have to report this to NextGent. Choose the function „administration“ *>quit grinding belt change.* A window will open and you will asked to confirm the grinding belt change with activating the „OK“ button.

3 Notches

3.1 Notch changes

As already described in chapter IV of the operators manual (see point 3, cutting-procedure for notches), the possibility exists, to alter the attitudes of that at the CAD generated notches and drills. The notch alteration of the notch attitudes contained already in the marker-data, doesn't take place in the parameter list, but in the separate menu *notch settings*. Ever choosing a notch type (Drill, I-Notches or V-Notches) which should be cut, the corresponding line must be chosen differently to the statements of the CAD. In each case following decisions can be transacted in the submenu for the notch type:

Dependent on which notch type (drill whole, I-slit or V-slit) deviating to the data of CAD should be cut, you have to enter the change in the corresponding line of the dialog. In single you can do the following adjustments:

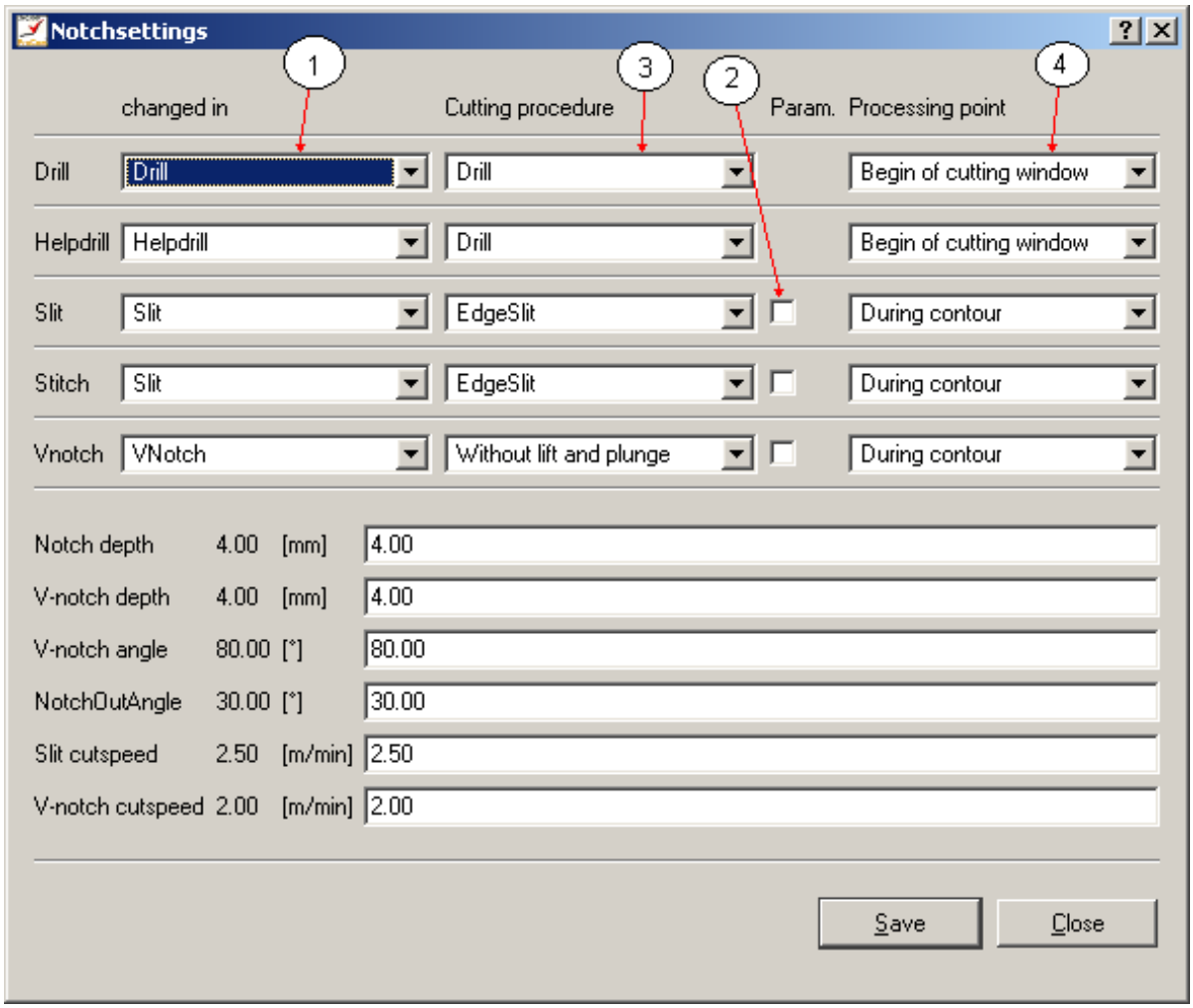


Abbildung 4: Notch settings

(1) In the list box „changed in“ the user can define, if a notch has to be ignored, or made as a drill, a help drill, a slit, a slit or as a v-notch. In the submenus for the drill and the help drill only „drill“, „help drill“ or „ignore“ can be selected, because it is not possible, to change a drill into a notch.

(2) Parameterized?
The checkbox is just activated, if the original notch type is maintained. If the option „parameterized“ is switched off, each notch is cut in the length (and width) like defined on the CAD-system. If the option „parameterized“ is switched on, the length and width of the notch is defined by the NextGen parameters ***notch depth*** (for I-notches), ***v-notch depth*** and ***v-notch angle*** (for v-notches).

(3) Cutting procedure:
For drill and help drill:
Drill = The drill works with the drilling device
Circle = Instead of the drill, a circle is cut with the knife. The diameter of the circle is defined by the parameter „Diameter drill/circle“.

For slit and stitch:
Edgeslit = The I-notch will be cut without lift and plunge
Arcslit = The I-notch will be cut with one lift and plunge (in the knife top).
Stitchslit = The notch will be cut with two lifts.
Notchtool = The notch is worked with a special notchtool.

For VNotches:
Without lift and plunge = The notch will be cut without lift and plunge.
2x with Overcut = The notch will be cut with two lifts.
3x with Overcut = The notch will be cut with three lifts.
Notchtool = The notch is worked with a special notchtool.
3x without Overcut = The notch will be cut with three lifts and without an overcut in the notch.

(4) Processing point
Begin of cutting window = all of the notches of the respective notch type are cut at the beginning of the cutting window.
Before contour = the notches of the respective type are cut before the belonging cut part.
During contour = The notches are cut with the contour.
After contour = The notches are done directly after cutting the belonging contour.
End of cutting window = After all the parts of a cutting window are cut, the notches of the respective notch type are done.

On example of slits the different possibilities of changing the notch name are listed in the following chart. Analogy to this the changing of names happens for V-notches and stitches.

Alteration	parameterized	Cutting procedure	result
ignored	No entry possible	No entry possible	Notches will not be cut
Drill	No entry possible	No entry possible	Drill at the top of the notch
Helpdrill	No entry possible	No entry possible	Drill (2. boring device) at the top of the notch
Slit	N	Edgeslit = without lift Arcslit = one lift Stitchslit = two lifts notch tool = using the notch tool	I-notch with notch depth after statement in the CAD
	Y	Edgeslit = without lift Arcslit = one lift Stitchslit = two lifts notch tool = using the notch tool	I-notch with notch depth according to the value of the parameter notch depth
Stitch	No entry possible	No entry possible	Stitched I-notch with notch depth according to the value of the parameter notch depth
Vnotch	No entry possible	without lift one lift three lifts notch tool	V-notch with the fixed measure through the parameters notch depth and notch angle

Note:

If notches - above all I-notches - should be plunged, it recommends itself for reasons of the time-savings to plunge these before. If the notches will be plunged with the contour, the knife must be lifted out at each notch twice. Furthermore, the cutting speed must be reduced with the following cut of the main-contour at each notch. If the notches will be executed before the cut of the main-contour however, only one plunge and lifting of the knife per notch takes place.

The user parameters, which can be set additionally in the notch dialog box, are described in the following chapter:

3.2 Notch parameter

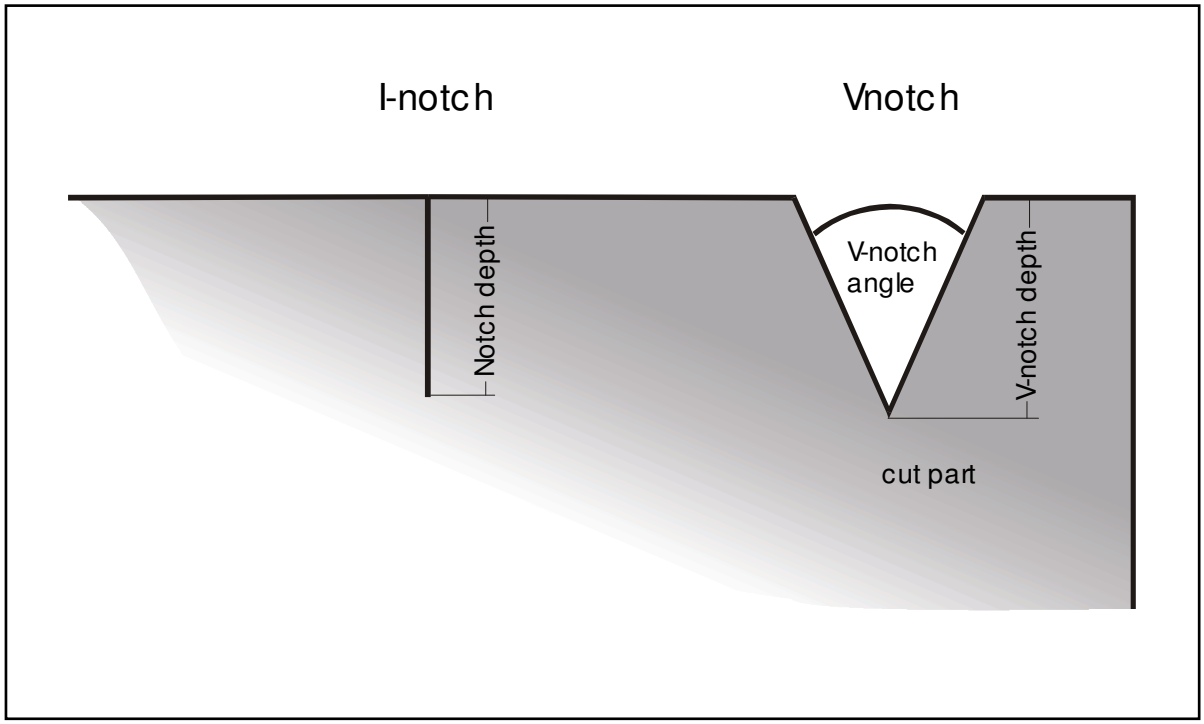
Notch depth [mm]

With “notch depth” you can fix the depth of the I-notches.
The input value is taken into account with stitches and slits, if in the notch settings dialog box the checkbox “parameterized” of slit or stitch is checked. If V-notches also became amendments in the notch dialog box in slits or stitches, these are also cut with the input notch depth.

V-notch depth [mm]
V-notch angle [degree]

If slits or stitches become changed in V-notches, these are cut in the dimensions which are stated in the parameters notch depth and notch angle.

If a slit/stitch into a notch becomes changed (i.e. into a V-notch), so the calculation is taken into account of the depth of the notch of the parameter ***V-notch depth*** and with calculation the angle of the notch of the parameter ***V-notch angle***.



Picture 5: Notch parameter

Diameter Drill/Helpdrill [mm] (Custom27)
Parameter group: Notches -> Notch settings

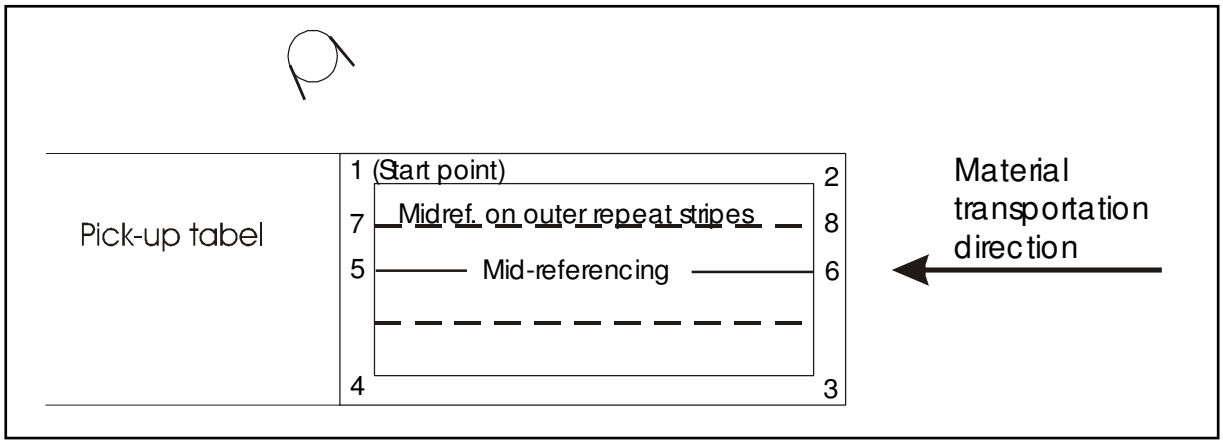
If the cutting procedure for the drill or the helpdrill is set to „circle“ (when the drill has to be done with the knife as a circle), the value of the parameter ***Diameter Drill/Helpdrill*** defines the diameter of this circle.

4 Referencing

Start reference point (Custom31)
End reference point (Custom32)
Reference sequence (Custom33)
Parameter group: Marker adjustment

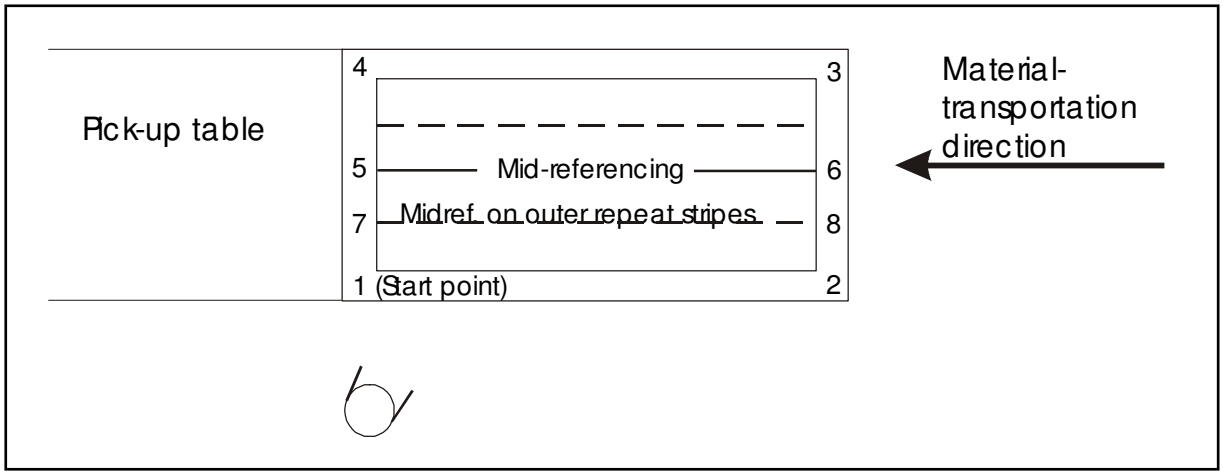
Before cutting of a marker is started, certain edges of the marker are automatically driven to. This way, the marker is placed on the ply-package. Which positions are approached on this occasion in order to check the situation of the marker for the ply-package as well as to correct it, is put in with the above mentioned parameters.

Numbering of the edges with STANDARD-VERSION (right version):



Picture 6: Standard version

Numbering of the edges with LEFT VERSION:



Picture 7: Left version

The parameter ***start reference point*** defines the edge of the marker which must absolutely be checked first. Therefore only inputs between 1 and 8 are allowed. Usually, as start point the value <1> is chosen. The start-reference-point must be driven up manually (with light-pointer by means of joystick) from the user. By defining the start-point, the position of the marker on the ply-package is fixed. With the subsequent ***reference sequence***, a turn or zoom of the marker is only possible.

Those edges, which are approached after deciding the ***start-reference-point***, are defined in the parameter reference sequence. After achievement of an edge, you are asked to confirm the situation or perhaps to correct, by using ***reference sequence*** the values <2 and 3>. Consequently, a possible twist of the ply-package can first be taken into account (through correcting of point 2 in Y-direction). As a result you can check whether the fabric width is sufficient for the marker.
If point 2 is corrected in X-direction or point 3 in Y-direction, the definition of this edge point can only be kept if the marker is changed in its measurements. Through moving of the respective point into the corresponding direction and subsequent confirming of this position, a zoom-factor is calculated by NextGen. As soon as this is confirmed at the keyboard (not at the operator terminal), the marker is reduced or increased by the desired amount (see also chapters IV, “Positioning of the marker on the ply-package”).

The parameter ***end reference point*** defines the edge of the marker, which is driven up to when the cutting process is over. If the value “0” is entered here, no edge will be driven up to.

With Bitefeed Cutters you can define additionally with this parameter whether a last bitefeed is executed at the end of the marker:
If the parameter ***end reference point*** is put down on <1>, another bitefeed takes place with a bitefeed-cutter after finishing the marker. If as end reference point <2> is entered, so no further bitefeed is executed after finishing the marker. This parameter can be used to help clearing off/feeding in the next lay. Furthermore the bridge is automatically driven to the x-position, which is defined in the parameter ***xParkPosEndreference2***.

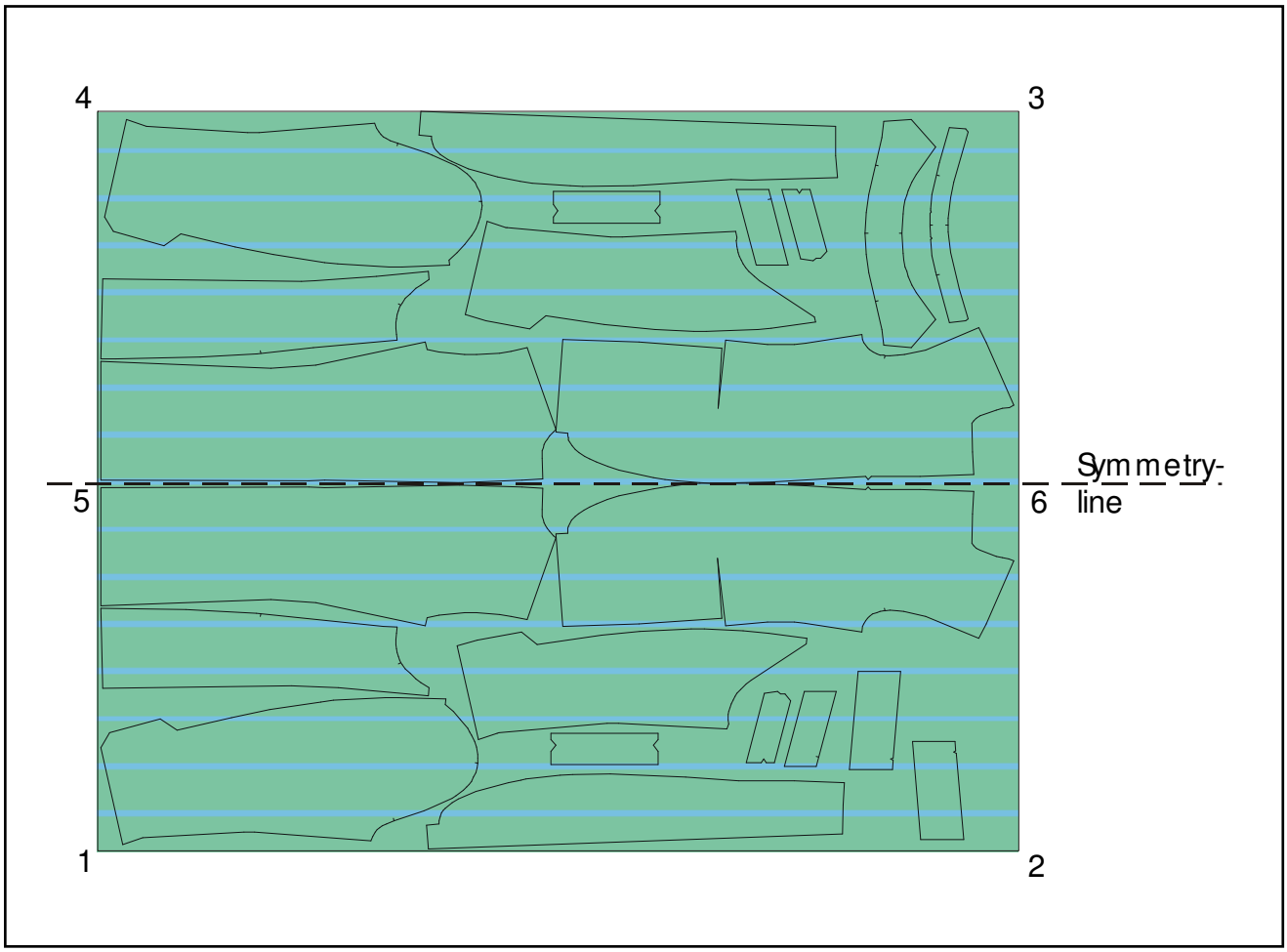
Mid-referencing:

A mid-referencing by two reference points on the middle line is applied for correction of marker position in case of pattern aligned markers; only valid if the fabric features a centre line. Already during the preparation of the marker on the CAD-System, all parts are interlaced symmetrically from the middle. The marker is therefore centered. Adjust the mid-referencing by setting parameter ***'Start reference point'*** on value 5 and by starting the ***'Reference sequence'*** with value 6. Afterwards, further edges can be entered into the reference sequence.

Then the start reference point must be positioned on the middle line of the fabric. NextGen tests whether the picture fits with its measures in the situation chosen by you on the machine bed. If this is not the case, so a section pass over is reported and the start was rejected. The cross light lamp positions automatically to the other end of the cutting window on the middle line if this point is confirmed. In case of a twisted presentation of the lay, this point can be corrected with the joystick and

positioned exactly on the middle line. If further edges of the picture are stated within the reference sequence these are driven to after it.

The mid-referencing is primarily used, if the alignment of the parts can be restricted so that the most important parts (for example front - and back-parts) are on the center repeat. In this case, the marker becomes arranged so that these parts are put about a symmetry-line, which is exactly in the middle of the marker. This parameter can also be used for hand spread lays if there is not a good edge.



Picture 8: Mid-referencing

Mid-referencing on outer repeat stripes:

Furthermore the possibility of the mid-referencing exists on outer repeat-strips. This procedure can be used if repeat fabric has no recognized repeat directly on a centre line but the middle is defined indirectly as middle between two outer repeat strips. The mid-referencing is put in, in that the parameter ***start-reference-point*** gets the value <7>, and the ***reference sequence*** becomes start with the point <8>.
In order to be able to enforce the mid-referencing, the left edge of a freely selectable repeat stripe is to be fixed as start-reference-point and to confirm. At the screen, the operator is now asked to fix the corresponding repeat stripe beyond the fabric middle. NextGen calculates also after the second point was confirmed, the centre between

the two points, and moves the marker so that the marker-middle lies exactly on the calculated centre. Now you can check whether the picture fits with the measures in the ply chosen by the operator on the cutting table. If this is not the case, so a section infringement is reported and the start is rejected.

Alternatively position the reticle-lamp automatically on the reference-point lying right about the marker-length on the first chosen repeat-stripe. Now the light-cross must be positioned exactly on the strip again in order to execute the angle-correction. If even wide edges of the picture are stated within the reference sequence, these are approached.

With the button <RESTART> at the operator terminal you can finish the reference sequence prematurely. Then the cutter immediately begins with the cutting process.

xParkPosEndreference2 [Yes/No] (Custom46)
Parameter group: Marker adjustment

The bridge moves at the end of the last cutting window to this parking position if no bitefeed in the last cutting window happens, i.e. if the parameter is set on the „end reference point“ on „2“. This is valid only if the value of the parameter is useful, i.e. if it is situated within the positioning area.

Reference strategy [0,1,2] (Custom34)
Parameter group: Marker adjustment

NextGen offers three different strategies, after which the crooked-situation-correction - by means of ***reference sequence*** - can be executed. These strategies are selectable simple by parameters.

Put in as value of the parameter **reference strategy** the desired strategy and confirm your selection with help of the <ENTER>-key. The three reference-strategies result in the following:

Strategy 0:

No marker position correction is carried out. Only the start-reference-point of the marker is referenced. If a jobqueue is active, only the start reference point of the first marker is referenced. The following markers are worked automatically.

Strategy 1:

For non-bitefeed cutter: A marker position correction of each marker is carried out. For bitefeed cutter: In case of a bitefeed cutter: A marker position correction only of the first window of a marker is carried out. If a jobqueue is worked, only the first window of each marker is referenced.

Strategy 2:

For non-bitefeed cutter: A marker position correction of each marker is carried out.
For bitefeed cutter: A marker position correction of each cutting window is carried out.

Reference mode [1,2,3,4] (Custom37)
Parameter group: Marker adjustment

Single (1), Step(2), Multiple(3), Parallel (4).
If you work with an interlinked jobqueue so referencing can be fixed with the parameter: Singles (1), step (2), multiple (3), parallel (4) as the individual marker of the marker chain should be arranged. The parameter reference mode can also be modified with the radio button “Jobqueue-mode” in the upper left corner of the “Jobqueue Edit” dialog box.

Single:

Shall the markers be interlinked, viewed as one marker, and loaded together, referenced and be cut, so an interlinked jobqueue must be formed, and as value of the parameter ***Reference mode*** be entered 1.

Step:

Input (2) to activate this mode. This mode requires the chain up of markers by the function 'Marker of jobqueue' where the markers were linked with the space-key to one total marker. This total marker is now treated as one marker.

Nevertheless the possibility is given to move only a single marker (within this total marker) but under respect of all limits of the step lay. After the reference sequence, NextGen shows the graphics again. Now, matching points are automatically added between the single markers. The cross light lamp drives up to those points. They can be corrected with the joystick under respect of the limits of the step lay.

Take care, that the global matching is not activated (set parameter on 1 or 3) when using this function! The parameter ***Matching (single/global/group/repeat)*** should not be set on 2.

Multiple:

Particularly for folded fabric: Input (3) to work markers parallel in y-direction, or to chain-up markers and to position within the machine's working area. This mode requires also the chain up of markers by the function 'Marker of jobqueue' where the markers were linked with the space-key to one total marker. Take care, that only as many markers are chained up as are fitting in the machine's working area at once.

If the cutting of the jobqueue is started, all markers included in the jobqueue are loaded one by one. The defined repetitions are respected. The position of the markers to each other is not set already.

The referencing sequence of the first marker is as usual. After confirming the last edge-point, drive the cutting head manually (with help of the joystick) to the start-point of the second marker and confirm the standard referencing sequence for the second marker. This procedure is repeated until all markers are referenced. Press once-more <Enter> to start the total cutting process.

parallel:

If the parallel-business is choosed, it is possible to process markers lying on parallel material tracks, also over several cutting windows. The functions in jobqueue mode will carried out as usual.

Each marker that is inserted into the jobqueue must be assigned the number of the track on which it should be cut. Values are allowed as number of the track between one and the value of the parameter "***number parallel-tracks***" (see chapter VI, “machine parameter”). The number of the track is shown in the jobqueue window afterwards. Note that all markers of a chain must lay on the same track.

First the markers of the first track are loaded. Markers are loaded for the track 1 automatically as far as they fit on the entire length of the working area. These are all referenced one after the other. Afterwards the light-pointers drive automatically to the possible start-point of the first marker of the second track. The markers of the following tracks are referenced analogously to Track 1. Should referencing of the markers of a track finished, though there would still be place for further markers, you have to use key <Tab>, so that it’s possible to begin the referencing of the markers of the next track. Not referenced markers are taken over automatically into the next cutting window.

If all markers are referenced the cutting process will begin. If there should be a reference plunge carried out it will be done per track at the end of the last picture. NextGen checks after finishing the bitefeed independently for each track whether markers can be reloaded. If this is the case the jobqueue will be searched to corresponding markers and these are reloaded according to space required.

The parallel mode continues as long as the jobqueue is empty.

Manual reference [J/N] (Custom35)

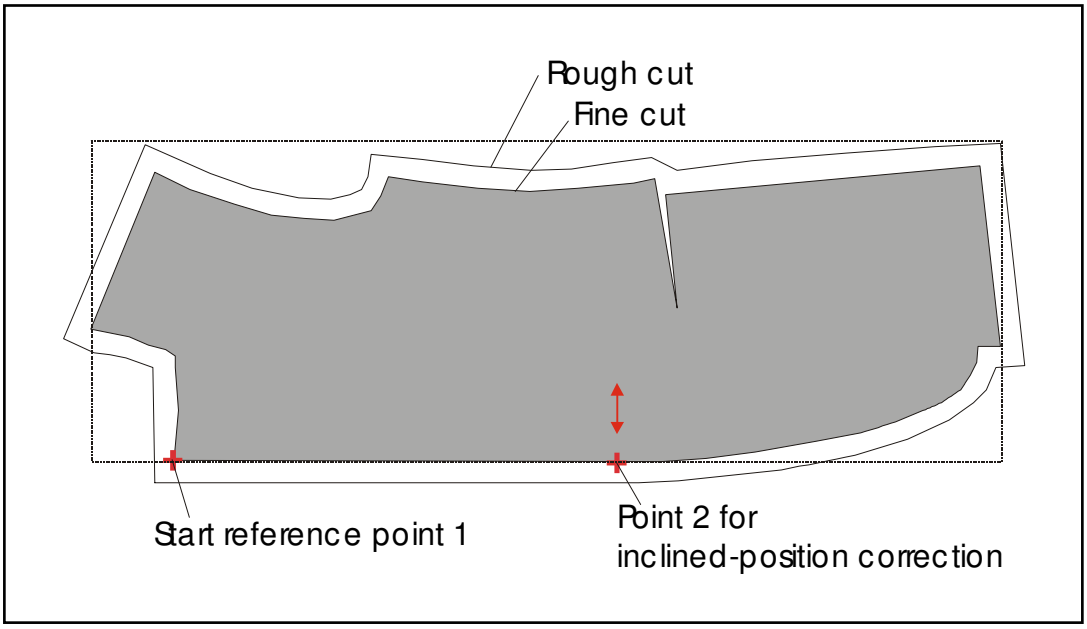
Parameter group: Marker adjustment

NextGen offers the possibility during referencing the second reference-point (which is used for the angle-correction primarily) to put down so that it doesn't lay on the marker framework but at a position within the marker and is used merely for the definition of the spin.

If the parameter "***manual reference***" is adjusted on <N>, the ***reference-sequence*** is carried out in the way that after confirming the start-point point 2 is approached (if in parameter **reference sequence** the 2 is indicated as the first value). This can be corrected in the y-direction if an angle-correction should be made.
If you now switch on the parameter "manual reference", the angle-correction is executed as follows:

Start the cutting with the function “Jobqueue start”. After loading the marker and a suitable parameter-set, the marker adjustment starts automatically. You are asked to fix the initial-reference-point. Move the light-pointer like usual on the desired start-point of the ply-package. Confirm with <ENTER>. You have now defined the subsequent situation of the marker.

The machine stops on the entered position. Put now in position the light-pointer with help of the joystick on the second reference-point, to fix the crooked situation of the marker as desired. This new light-pointer-position can lay within the marker. In order to get sufficient precision of the desired turn angle, you should keep an eye on it however so that this second reference-point shows an adequately big distance in x-direction of the initially-reference-point. The sloping position of the marker is calculated after confirmation of the second reference-point.



Picture 9: Manual reference

Over the initially-reference-point, you therefore fix where the marker has to lay on the ply-package. A theoretical line, that defines the crooked situation of the marker, is constructed between the initially-reference-point and the second reference point then. The size of the picture remains unchanged.

Note:

The parameter ***manual reference*** is used primarily then if the ply-package, from which a marker should be cut, is not rectangular. This is for example the case if the corresponding part in fine cut should be cut from a rough cut (see picture 9). The accustomed angle correction over the edge points is not possible then. This problem can be solved over the manual reference, if a straight edge partially exists.

y-Startpos for marker-adjustment [mm] (Custom36)

Parameter group: Marker adjustment

With the referencing of the marker-situation on the machine-table the cut file is moved in y-direction so that exactly through the parameter ***y-Startpos for marker-adjustment*** pre-determined ISO-coordinate lies on the light-pointer-position. In this case a starting point must define the edge 1. If the value of the parameter is as

big/small as the value lies outside the surrounding rectangle, the cut file is positioned, that the left low corner lies of the surrounding rectangle on the light -pointer-position.

Correct. compl. marker 1st window [Y/N] (Custom30)

Parameter group: Marker adjustment

When a marker is cut in several cutting windows, the following cutting windows will be cut automatically without sloping position-correction. This is necessary because otherwise the marker could push out slowly from the working area and an area-infringement would appear.

If the parameter is adjusted on ***Correct. compl. marker 1st window*** at the reference-strategy "0" and "1", the in the first cutting window referenced sloping position will be taken over automatically in the subsequent cutting windows. When a marker chain will be processed, the sloping position is valid for all markers of the chain. When the reference strategy is on "2" - during the sloping position correction a new sloping position of the marker in the following cutting windows can be referenced.

5 Zooming/Turning/Mirroring

You have to note for the following six parameters that the value is considerable which is adjusted when loading a marker. The parameters must be used in the way that the parameters are first put on the wished value and the marker is loaded in after it.

Zoom factor total (ContourFactor)
Parameter group: Cutting parameter -> Zoom - Flip

This factor zooms the complete marker exact to the angle, means zoom in X AND Y direction. The value which is set at loading of the marker is decisive.

Standard-attitude is the value <1>. The marker is loaded full-size then with enlargement, a factor emerges bigger 1, with reduction a factor smaller 1. All zoom-factors are put back automatically after working off the marker on the factor 1 (original size) again.

The factors - in x - and y-direction - about which the marker actually became zoomed and which yields itself from the parameters zoom-factor, ***x-zoom factor*** and ***y-zoom factor*** and from the zooming with the reference sequence, is shown in the marker-protocol behind the marker measures

x-zoom factor (Custom273)
y-zoom factor (Custom274)
Parameter group: Cutting parameter -> Zoom - Flip

With this factor the marker can be zoomed in X OR Y-direction, during loading of the program (for ***X- and Y-zoom*** see parameter 'zoom factor').The value which is set during loading of the marker is decisive.

The zoom factor is calculated as follows:

$$\text{ZOOM FACTOR} = \frac{\text{Reference value (original size)} + \text{Enlargement}}{\text{Reference value (original size)}}$$

as well as:

$$\text{ZOOM FACTOR} = \frac{\text{Reference value (original size)} - \text{Reduction}}{\text{Reference value (original size)}}$$

That means that in case of enlargement the factor is > 1, and in case of reduction the factor is < 1. The parameter for the zoom factor is input without showing plus or minus.

The zoom factor is automatically reset to 1 when the marker has been worked.
The values of the X and Y zoom factors are shown behind the name of the marker.

Flip x (over y) [Y/N] (Custom276)
Flip y (over x) [Y/N] (Custom277)
Parameter group: Cutting parameter -> Zoom - Flip

For the mirroring of the marker in x- or y-direction the following parameters ***flip x*** or ***flip y*** will be put on <YES>. A <NO> is put in if there is no mirroring.

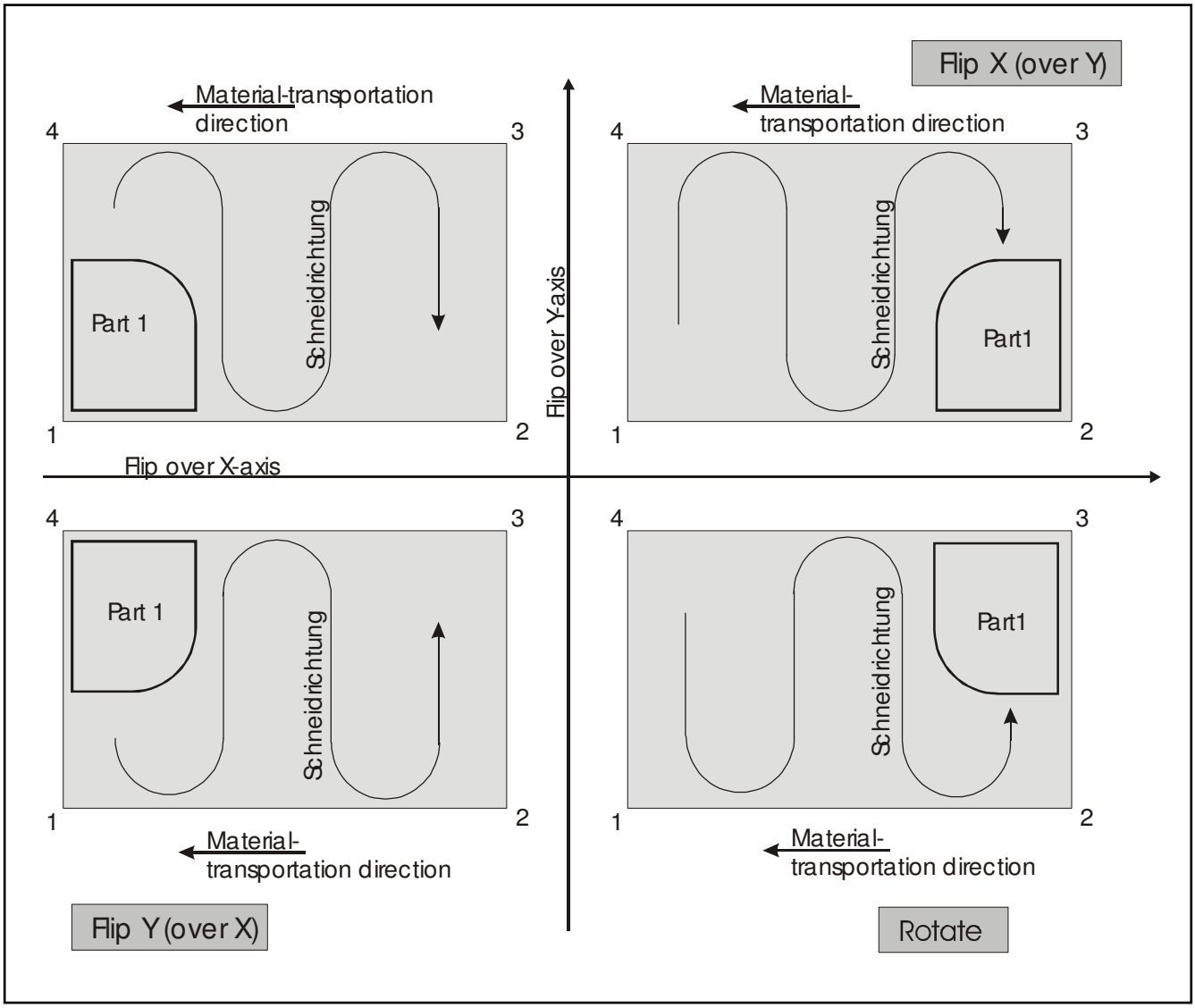
CAUTION, you don't get the original-parts through the mirroring of a marker with asymmetrical parts but its mirrored counterpart!

Rotate [Y/N] (Custom275)
Parameter group: Cutting parameter -> Zoom - Flip

The turn of a marker 180° is necessary conceivably if materials have to be worked up which have a pile (for example corduroy, velvet or similar) or if patterned fabric has a so-called head-pattern. If the ply-package is not in the intended line-direction, the marker will turn in the software by 180°. This is much easier than turning the ply-package!

Enter Y (Yes) at the parameter ***Rotate*** in order to turn the marker by 180°. This function corresponds to a mirroring in X and Y direction by 180° each. Enter N (No) if the marker should not be turned.

In case of turning or y-mirroring of a marker the cutting order is automatically turned this way that the cutting direction runs always towards the material running direction. The reverse of the cutting order is necessary for stitch-knife cutter because there is installed only one additional plastic covering foil at one side of the bridge, which is used to uncover the already cut contours to minimize through this the vacuum loss.



Picture 10: Mirroring and turning of a marker

6 Cutting sequence

Area limit value small parts [cm^2] (Custom80)
Parameter group: Cutting parameter -> Small parts

Subsequently, several parameters, which refer only to the cut of the small parts, are described. The selection over it, which parts treated as small parts, take place over the parameter ***Area limit value small parts [cm^2]***.

All parts with a smaller area than set by the parameter ***Area limit value small parts***, are considered (defined) as small parts.

Small parts first [Y/N] (Custom87)
Parameter group: Cutting parameter -> Small parts

When the value of the parameter ***small parts first*** is set on 'Y', first the small parts and then the remaining parts should be cut. The parameter ***Area limit value small parts [cm²]*** define the small parts. These small parts are distinguished from the others by a different colour in graphics.

V-reduction small parts [%](Custom82)
Parameter group: Cutting parameter -> Small parts

NextGen offers the possibility, to cut small parts with percentage reduced speed. These small parts will be cut with the input percent value of the cutting speed in the parameter ***V-reduction small parts***.

Length limit value reduct.speed [mm] (Custom81)
Parameter group: Cutting parameter -> Small parts

If a small part fixed through the parameter ***area limit value small parts [cm^2]*** includes straight lines longer than ***length limit value for reduced speed***, these distances will be cut with a cutting speed of 100 %, independent from the value of the parameter ***V-reduction small parts [%].***

Note:

As soon as the parameter small parts first V-reduction is activated, the small parts are accentuated in the graphic by colour.

optimized cutting sequence [Y/N] (Custom83)
Width of meander [mm] (Custom84)
Parameter group: Cutting parameter -> Small parts

If the parameter ***Optimized cutting sequence*** gets the value <Y>, so an optimized cutting sequence is calculated before cutting begins. This optimization takes place so that all parts of one marker are worked off in the form of meander.
The width of this meander becomes fixed through the parameter ***Width of meander [mm]***. The start points of the parts remain with this procedure as set through the CAD with this procedure.

Selection mode for start.points..[0..4] (Custom85)
Parameter group: Cutting parameter -> Cutting optimization

Strategy 0:

The start-points are adopted as from the CAD program. No amendments take place.

Strategy 1:

If the start point of the part lies on a notch it becomes moved to the next point

Strategy 2:

The start point is moved on the next corner with the edge amendment close to 90°.

Strategy 3:

The start point of the part becomes shifted on that corner which shows the biggest angle amendment (Piping).

Strategy 4:

The start point of the part is not shifted. The knife plunges in the original-start-point and circles around the part, until the corner with the biggest angle alteration is found. Here the knife is removed and positioned back to the start-point. Now the part is cut in the contrary direction.

Angle tolerance for corner identif. [ø] (Custom86)
Parameter group: Cutting parameter -> Cutting optimization

The parameter value ***Angle tolerance for corner identif. [degree]*** fixes in which tolerance-window the edge amendment of the corners can lay: e.g.: strategy 2 (90° edge) Angle-tolerance =20° all corners 70°-110° is recognized as corner.

Special cut sequence of part1 [Yes/No] (Custom89)
Parameter group: Cutting parameter -> cutting sequence

Some users want to check the cut quality of the first part of each marker. The parameter ***Special cut sequence of part1*** is used, to simplify this check.

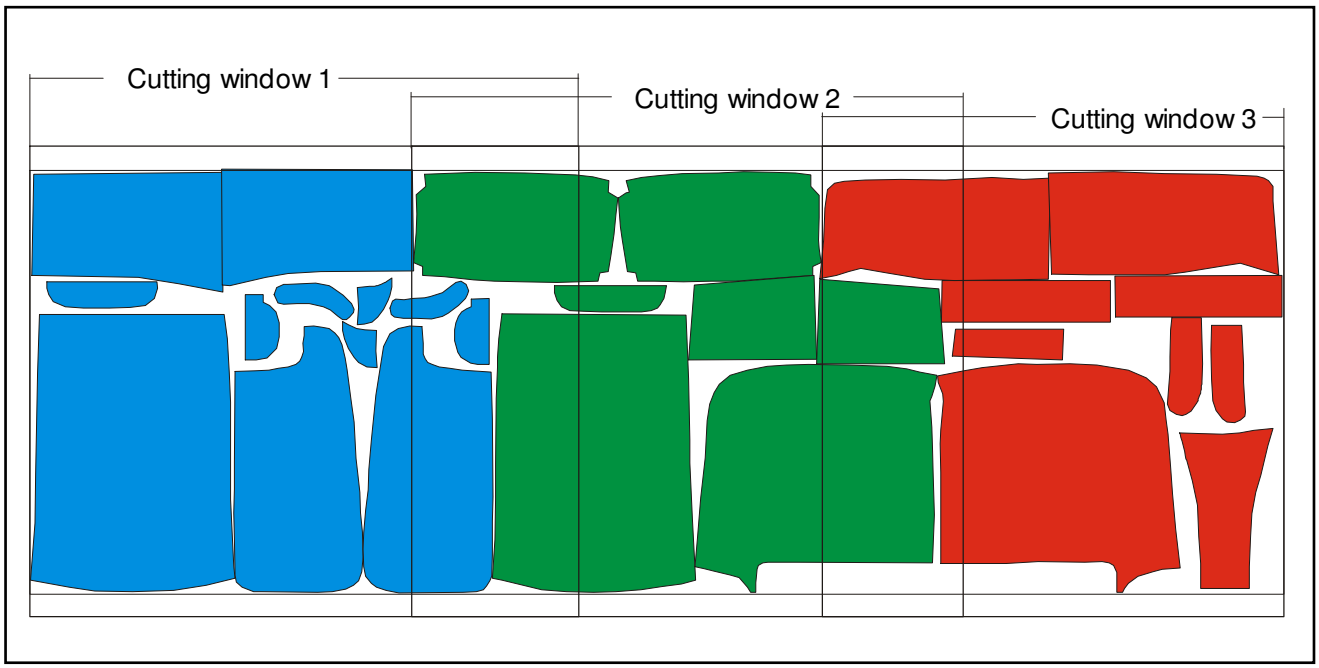
If this parameter value is set on <Yes> and the first part to be cut is not on the operator's side, the cutting sequence is changed: the part next to the start reference point is cut first, pause is activated then. If this parameter is set on <No>, the original cutting sequence is kept.

7 Bitefeed-Parameter

On a cutter with bitefeed, the marker becomes apportioned automatically for the cutting process into several cutting windows, if it is longer than the cutting area. After all parts that lay in a window are cut, the bristle-conveyor transports the cut parts onto the clearing table and simultaneously the new fabric onto the cutting table. Afterwards the parts of the next cutting window are cut.

Note:

Calculating of the cutting windows will happen automatically, dependent on the position of the start-point in the first cutting window. As soon as the start-point of the marker is confirmed, NextGen subdivides the marker into the necessary number of cutting windows. It is therefore not necessary to declare a table-length with the data-editing of the CAD-System.



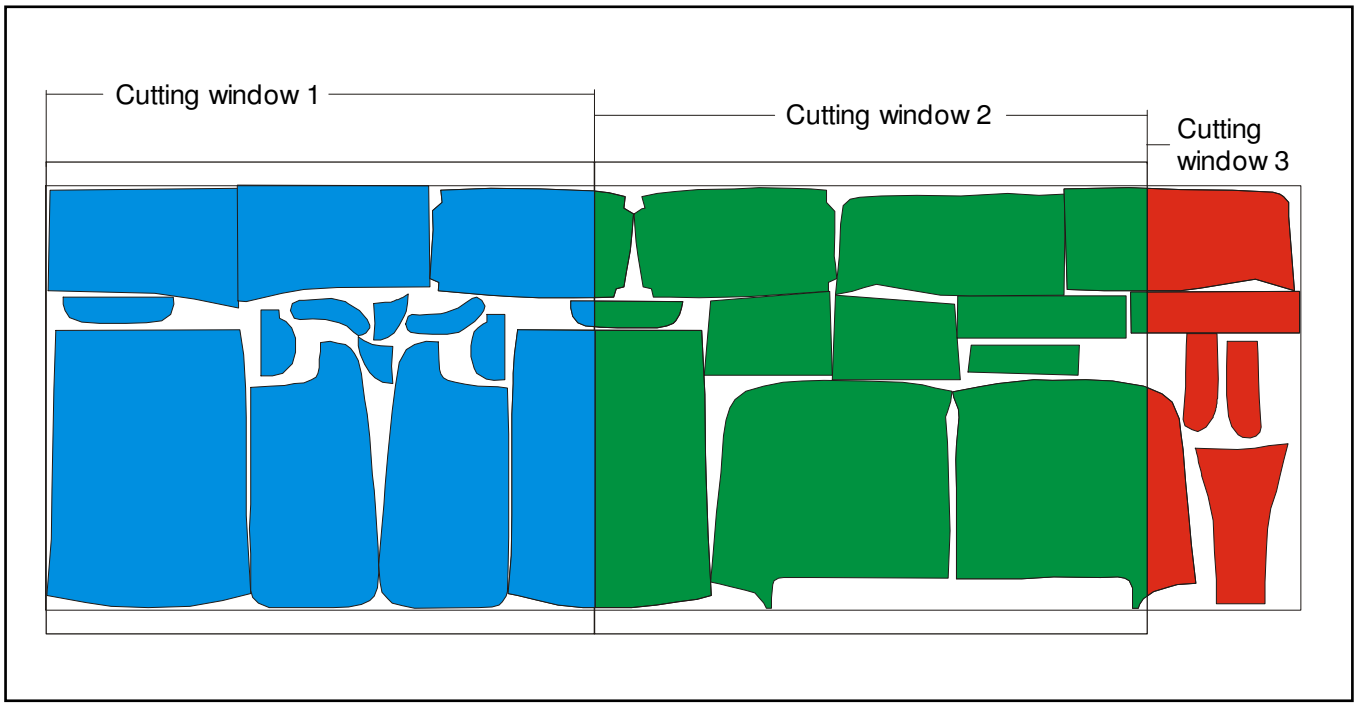
Picture 11: Bitefeed-window without cutting interruption

With cutting interruption [Y/N] (Custom50)

Parameter group: Bitefeed -> Application

If the parameter ***with cutting interruption*** is set on 'N', the cutting windows are calculated in this way for markers which are cut in bitefeed mode, that parts which are at the end of a cutting window are cut completely before bitefeed will carried out.

If this parameter is set on 'Y', the bitefeed windows are calculated to maximise use of the table. So it is possible in this case that the contour cutting of a part is started in window 1 and then the rest is cut in window 2.



Picture 12: Bitefeed-window with cutting interruption

Split only big parts for bitefeed[Y/N] (Custom51)
Parameter group: Bitefeed -> Application

When additionally to the parameter ***with cutting interruption*** the parameter ***Split only big parts for bitefeed*** is set on <Y>, the cutting window calculation takes place as the following procedure:

All parts of the marker, which x-length is bigger than the length of the maximum cutting-window are determined. A division is executed in cutting windows after it, so that all remaining parts will not be cut. Therefore only the big parts will cut with the cut of the marker.

Partial, more frequent and shorter bitefeeds appear in comparison to the previous procedure. Only the " big " parts are now cut with the subsequent cut of the marker. All remaining parts will bypass "in a piece".

Bitefeed Strategy [0..4] (Custom53)
Parameter group: Bitefeed -> Application

NextGen offers four different strategies, after which the transport of the fabric is executed with the bitefeed. These strategies are selectable simply over parameters.

Strategy 0:

When all parts of a window have been cut, the bridge and the bristle conveyor will drive synchronized back in end-position.

Strategy 1:

When all parts of a window have been cut, first the bridge drives back to end position and next the bristle conveyor drives back to end position (clearing off of material).

Strategy 2:

When all parts of a window have been cut, first the bristle conveyor drives in end position (clearing off of material), next the bridge drives back in end position.

Strategy 3:

After all parts of a window are cut, the bridge will position on the start point of the first part of the following cutting window. Afterwards, the bridge and the bristle bed drive synchronously back to the calculated final position. After the bitefeed is completed, it begins directly with the cut of the part without a referencing taking place.

Bitefeed control [0,1,2] (Custom54)

Parameter group: Bitefeed -> Application

On a cutter with bitefeed, the marker is apportioned automatically into several cutting windows for the cutting process. After all parts which lay in a window, were cut, the cutter extends a reference plunge, which is used for the bitefeed control of the following cutting window, if required. The reference plunge is a plunged cross, which is on minimal y-position and maximum x-position of the cutting window.

After execution of the cross plunge, the bristle conveyor transports the cut parts on the clearing table and simultaneously the new fabric on the cutting table. Now position automatically the reticule lamp of the cutter on the position of the reference plunge. If the fabric has postponed itself through the transportation, so that the reticule lamp will not stand precisely above the reference plunge, so you correct the position of the lamp with help of the joystick. The parts of the next cutting window are cut after implementation of the correction of the sloping position.

Enter the value ‚1' for the parameter ***bitefeed control***, if you want to get the reference stitch as a cross. If the reference stitch has to be done as a stitch in y-direction, select the value ‚2'. Enter the value ‚0', if you like to work without any bitefeed control.

Bitefeed control last window [Y/N] (Custom56)

Parameter group: Bitefeed -> Application

With the parameter ***Bitefeed control last window [Y/N]*** you can define whether the reference stitch should be effected separately in the last cutting window or not.

y-Offset reference cut [mm] (Custom55)

Parameter group: Bitefeed -> Application

The reference plunge for the control of the bitefeed is put down at the low edge at the minimal y-position of the marker i.e. normally so that no part is damaged. When markers are cut however which contains open folded parts, so it is possible that the

reference plunge is placed in such a part, which lies in the crease. In order to avoid this problem, the reference plunge can be postponed in y-direction about the amount which is registered in the parameter ***Y-offset reference cut***. If the parameter gets a negative value, the reference-plunge is postponed about this amount in millimeters from the ply package.

After finishing the bitefeed, the moved reference-plunge is approached automatically.

Note:

Nevertheless in order to be able to use the reference plunge for the control of the bitefeed, underlay paper should be used which is wider than the ply package, so that the reference plunge is visible in the paper.

Max.length last window [Y/N] (Custom52)

Parameter group: Bitefeed -> Application

In order to have enough time for the material-roll-change, the parameter ***Max.length last window*** can be put on <Yes>. Now, the calculation of the cutting windows is changed in the way, that in the last window a max. length will be reached.

Bitefeed and x-axis synchronized ? [Y/N] (Custom59)

Parameter group: Bitefeed -> Application

The bitefeed with synchronous movement of the x-axis can executed in the "drag-operation", with which the bitefeed-axis the dragged and the x-axis the towed axis is.

8 Border cut

Border cut [Y/N] (Custom205)
Parameter group: Additional cuts -> Border cut

In order to cut through the lateral waste-strip of the ply-package, border cuts of the edge of the cutting table as well as the ply-package can be cut in regular periods up to the next-possible part in Y-direction. If only the parameter ***border cut*** is entered, these are executed after the complete cutting-window has been worked off.

Border cut during cut [Y/N] (Custom206)
Parameter group: Additional cuts -> Border cut

If with the parameter ***border cut*** the parameters ***border cut during cut*** is chosen, the border cuts will be carried out during the cutting process. As soon as a part is ready cut, the system checks automatically, if a border cut ends at this part. If such a border cut exists, it will be carried out straight away.

Note:

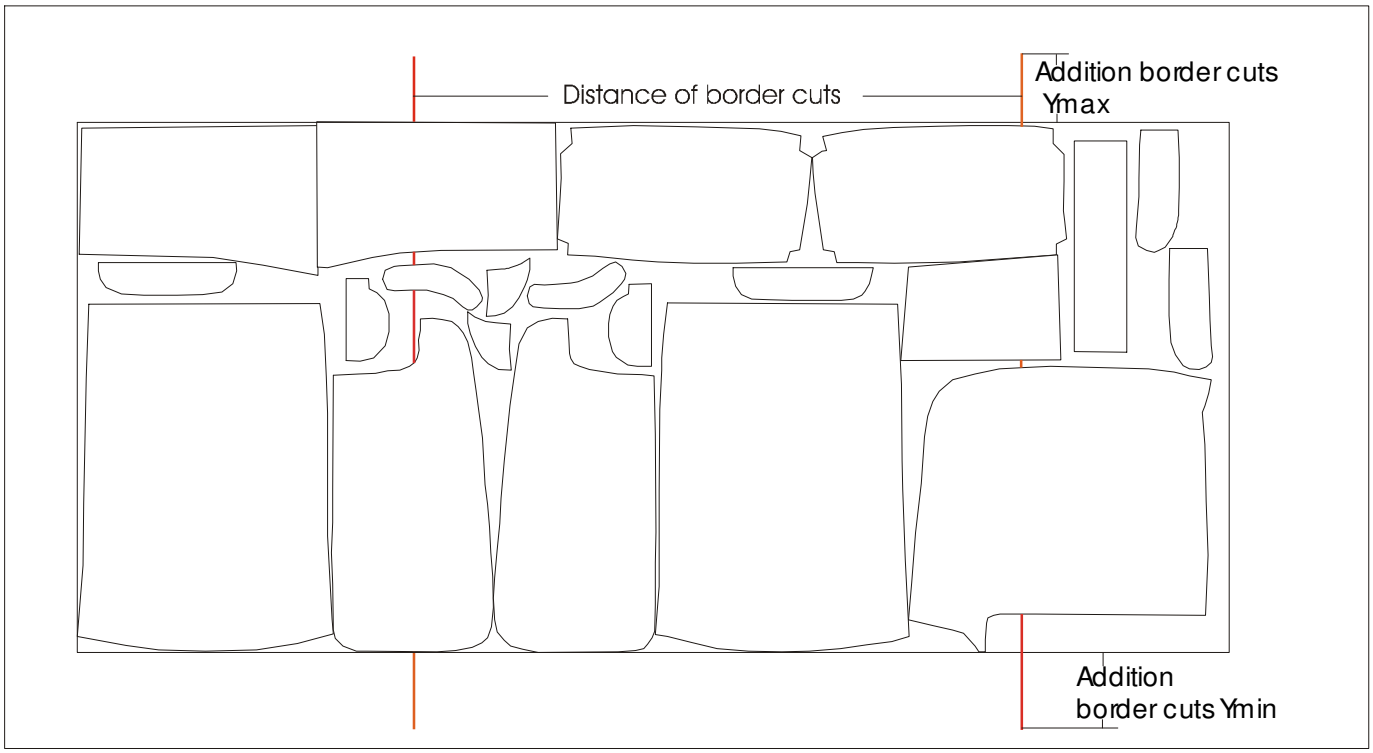
With stitch-knife-cutters with additional cover blind, the border cuts should immediately be cut in the connection with the parts in every case. (If the border cuts are only cut after finishing the cutting-window, the cutting-bridge moves to the cut of the border cut back to the marker-start so that again all open contours, which are normally covered by the cover foil, are uncovered. Consequently, at least for a short time, there is a clear vacuum-loss which impairs the cutting quality.

Distance of the border cuts [mm] (Custom210)
Parameter group: Additional cuts -> Border cut

Provided border cuts are switched on, these become executed in the fixed distance through the parameter ***distance of the border cuts [mm]***. It divides the waste-edge-strips into pieces that are not longer than the parameter pre-determined distance.

Addition border cut ymin [mm] (Custom207)
Addition border cut ymax [mm] (Custom208)
Parameter group: Additional cuts -> Border cut

Border cuts can be restricted in length. To this purpose can be fixed with the parameters ***addition border cut Ymin*** and ***addition border cut Ymax*** how far the border cut should proceed outside over the marker edges in order to separate completely the waste-strip. These additions become added on the respective Ymin - and Ymax-value of the marker. The resultant coordinates are restricted on the current table measures. In order therefore to prolong the border cuts up to the table border, the additions must be chosen sufficiently large.



Picture 13: Border cuts across marker

Border cuts across marker [Y/N] (Custom212)
Parameter group: Additional cuts -> Border cut

Should the border cut also be carried out between the parts, so that the waste-skeleton will be completely cut through, the parameter ***Border cuts across marker*** must be put down on <Y>. The border cut will then be carried out across the whole marker.

Min.length cuts betw. parts [mm] (Custom213)
Parameter group: Additional cuts -> Border cut

When the distance between two cut parts is smaller at the position where the border cut should be carried out, than the parameter ***Min. length cuts betw. parts***, the order cut will not be carried out between these parts. Border cut strips which are shorter than this length will not be cut through.

Heel-/Overcut border cut [mm] (Custom211)
Parameter group: Additional cuts -> Border cut

The parameter ***Heel-/Overcut border cut*** fixes, about which amount the border cut at the part the contour shall overlap in order to guarantee that the waste strips can be cut through cleanly.

Border cut fabric edge -> contour [Y/N] (Custom209)
Parameter group: Additional cuts -> Border cut

If the border-separation-cut takes place inside from outside, the danger exists that the presser bowls lands beside the lay package and with high plies at the step pushes the lay. If the value of the parameter ***border cut fabric -> contour*** is set on <Y>, the cut of the first strip will be effected from outside onto the part, otherwise with N, from inside to outside.

lateral cut end of bitefeed window [Y/N] (Custom199)
Parameter group: Additional cuts -> Border cut

Usually, the non-stop border cut is enforced so that it is carried out in even parameterised distances, (parameter distance border separation cut) over the total marker.

The parameter ***lateral cut end of bitefeed window*** is set on the value <Y>, becomes executed so - independently from the value of the parameter ***distance of the border-cut*** - per cutting-windows exactly a non-stop separation cut. The position of this non-stop separation-cut is identical with the x-position of the reference plunge that marks the window end. On this occasion it is insignificant whether the reference plunge is actually executed. No non-stop separation cut is carried out in the last cutting window. Instead, a border cut is cut at the marker end.

Outer edge lateral cut: 1=Straight 2=Round 3=Stich [1,2,3] (Custom214)
Inside edge lateral cut: 1=Straight 2=Round 3=Stich [1,2,3] (Custom215)

Parameter group: Additional cuts -> Border cut

You can use on the assyst/bullmer cutter a reciprocating floating knife. The dip in depth of the knife is put in mechanically in dependence of the fabric depth. If the part now leaves the fabric package during the cutting process, so the knife drops more deeply into the cutting table underlay, which will be damaged.

During the cut of the contours, the knife doesn't leave the fabric ply. If lateral cuts are cut however, so the plate leaves the fabric ply and changes to the underlay.

Therefore NextGen offers the possibility that the rotary-knife can be entered for the cut of the lateral cut. Only the two outer cuts should be made with the rotary knife, the inside cuts are made with the reciprocating knife however.

If edge lateral cuts are cut, so also these proceed over the edge of the fabric package in order to guarantee a certain cutting through of the waste. Therefore these edge lateral cuts must be cut with the round knife. With help of the parameter ***Outer edge lateral cut:1=Straight 2=Round 3=Stitch*** you can fix the tool for this edge lateral cut.

If non-stop edge lateral cut are cut, so the same conditions are applied to these as for " normal " edge lateral cuts. Therefore the first and the last lateral cut strap the outer are cut with the round knife. With help of the parameter ***Outer edge lateral***

cut: 1=Straight 2=Round 3=Stitch can be fixed the tool for these outer cuts of the non-stop edge lateral cut.

The inner lateral cut strap should however be carried out with the stitch knife as until now. Therefore, the tool can here be adjusted separately with help of the parameter ***Inner edge lateral cut:1=Straight 2=Round 3=Stitch***.

If the tools for the outer and for the inner edge lateral cut strap are parameterized differently, NextGen enforces a tool-switch during the processing of a non-stop lateral cut automatically. All tool-specific parameters (tool offsets, cutting speed, tool width, tool backs, heelcuts, overcuts, cutting angle limit) become switched automatically with the switch between the tools.

9 Lateral cuts

Lateral cut [Y/N] (Custom190)
Parameter group: Additional cuts -> Lateral cut

When a border cut at the end of a marker is desired, the parameter ***lateral cut*** must put down on <Yes>. The separation cut is carried out over the total working width in y-direction and consequently severs the ply package as well as the individual fabric ply after the marker.

dx for lateral cut [mm] (Custom195)
Parameter group: Additional cuts -> Lateral cut

If the lateral cut should take place with distance to the last cut parts, the distance can be fixed over the parameter ***DX for lateral cut***.

Lateral cut before cutting [Y/N] (Custom191)
Parameter group: Additional cuts -> Lateral cut

The time of the transaction of the lateral cut can be fixed with the parameter ***lateral cut before cutting***. If this parameter is put on <Yes>, the cut of the last cutting window of a marker, first the lateral cut will be cut. After that the remaining parts of the marker will be carried out. Through that you have the possibility to change the material bale (with cutters with round-knives and without foil) during the cut of the last window.

In order to execute the lateral cut at the end, the value of the parameter must be set on <No>. The marker becomes then loaded like used referenced and started. If the last cutting window of a marker is now transported on the cutting table, so the remaining parts of the marker are first carried out. At the end the lateral cut is cut.

Lateral cut at max-X [Y/N] (Custom192)
Parameter group: Additional cuts -> Lateral cut

If the parameter ***lateral cut at max-X*** is put on <Yes>, the material for the last cutting window will only transported so far, that all cut parts and the lateral cut can be carried out. The lateral cut at the ply end is therefore always carried out at the same position.

In case of cutters with cradle and automatic fabric roll change only a short section of the fabric must be rolled back during the cut of the last bitefeed window.

Max. X for lateral cut [mm] (Custom193)
Parameter group: Additional cuts -> Lateral cut

With the parameter ***max_X for lateral cut***, the maximum allowable x-position for the lateral can be fixed. The bitefeed before the last cutting window only advances so that the last cutting window fits completely on the working area, so that the lateral cut can be carried out as big as possible at x-position which is near the cradle.

Max. length last window [Y/N] (Custom52)
Parameter group: Additional cuts -> Lateral cut

In order to have enough time for the material-roll-change, the parameter ***Max.length last window*** can be put on <Y>. Now, the calculation of the bitefeed window is effected, that in the last window a max. length will be reached.

Lateral cut at Xmin [Y/N] (Custom196)
Parameter group: Additional cuts -> Lateral cut

At cutters with two tables the material is alternately supplied from both sides. Therefore, the lateral cut at the marker end with the one half of table must take place with Xmax, as with other cutters; -however with the cut on the other half of table, the lateral cut must be carried out with Xmin. If therefore at cutters with two tables a lateral cut at the ply end is desired, the parameter ***lateral cut at Xmin*** must be adapted at the respective material feed direction.

Lateral cut in chains [Y/N] (Custom197)
Parameter group: Additional cuts -> Lateral cut

Different single markers can be interlinked and an overall picture can be summarized. If now should carried out a lateral cut behind every single marker of the chain the value of the parameters must be put down on <Yes>. If a lateral cut is to carry out only at the end of the total marker the parameter must be set on <No>.

Speed lateral cut [m/min] (Custom194)
Parameter group: Additional cuts -> Lateral cut

In marker chains, inter-lateral cuts are put down between the individual markers in order to separate this marker from each other and to cut through the waste. These inter-lateral cut can be cut with high speed, since the waste must not be cut through completely.

Speed final lateral cut [m/min] (Custom198)
Parameter group: Additional cuts -> Lateral cut

At the end of markers as well as the marker chain an end lateral cut has to carry out. If you set it in advance the fabric bale can already rewind the remaining material while the last cutting window is cut. These end lateral cut must be cut with low speed to guarantee that the waste will be cut through completely in order to guarantee a smooth bale-change.

End lateral cut:1=Straight 2=Round 3=Stich [1,2,3] (Custom200)
Parameter group: Additional cuts -> Lateral cut

On the Bullmer cutter you can use a reciprocating knife. The dip in depth of the knife is put in mechanically dependent on the fabric depth. If the part now leaves the fabric-package during the cutting process, so the knife drops more deeply into the cutting table underlay, which will be damaged.

During the cut of the contours, the knife doesn't leave the fabric ply. If lateral cuts are cut however, so the plate leaves the fabric ply and changes to the underlay.

Therefore NextGen offers the possibility that the rotary-knife can be entered for the cut of the lateral cut.

The end lateral cut, the lateral cut in chains, as well as the manual lateral cut over bracket, as well as keys always proceed from the minimal up to the maximum Y-position of the cutting area. With this it is guaranteed that the fabric will be cut through completely. The possibility must exist, to cut this lateral cut with the round-knife. With help of the parameter end lateral cut :1=Straight 2=Round 3=Stitch the tool can be fixed for this lateral cut.

If the cut of the lateral cut is finished, NextGen will switch back automatically to the tool chosen before. All tool-specific parameters (tool-offsets, cutting speed, tool-width, tool-backs, heelcuts, overcuts, cutting angle limit) become switched automatically with the switch between the tools.

10 Double cut elimination

Eliminate common lines [Y/N] (Custom145)
Parameter group: Common lines

NextGen offers the function to fade double cuts through the parameter pretended minimum length. At loading in a marker, double cuts are recognized and are eliminated automatically. Double lines will therefore only be cut one single time. The cutting sequence pre-determined through the CAD-System is not changed by fading the double cuts. Notches and cuts of the faded straights are fixed automatically to the other straights. Choose the parameter ***Eliminate common lines***. If you would like to fade double cuts put a <Yes> in here.

Two parameters are at your disposal, over which you can control the fading of the common lines:

min. length for common lines [mm] (Custom146)
Parameter group: Common lines

Only double cuts featuring a certain length are eliminated. The length is set by this parameter ***min. length for double cuts.***

max. distance for common lines [mm] (Custom147)
Parameter group: Common lines

This parameter ***max. distance for double cuts*** defines, which maximum separation two parallel straight lines might have in order to be defined as double cuts. If only double cuts which are exactly one on each other should be eliminated, this parameter must be set on value 0.0.

11 Others

Delete marker [1/2/3] (Custom150)

NextGen offers the possibility to delete the marker from the hard disk automatically as soon as it is completely finished.
Change into the parameter-menu and choose the parameter ***delete marker [1/2/3]***. The values 1, 2 or 3 have the following meaning:

1: Each marker is automatically deleted after the cutting process. Valid as well in jobqueue mode: Each marker in the jobqueue is deleted after cutting. Therefore one marker cannot exist several times in one jobqueue. If the marker is on a floppy disc or on a server, it is deleted there.

2: Only the next marker is not deleted after the cutting process. Then the parameter is automatically reset on value 1, so that the following markers will be deleted.

3: No marker will be deleted after cutting.

Copy marker [Y/N] (Custom151)

NextGen offers the possibility, copying of marker on diskette or to automate over network on the hard disk of the control-calculator.

Select <Yes> for the parameter ***copy marker [Y/N]*** and confirm with pressing the <ENTER>-key. All markers, that are not on C: (for example on A: for floppy or on F: for server) are copied before the store into a special subdirectory. If there is already in the subdirectory a marker with the same name, so this is headed.

Carry for the parameter a <N> for "NO" and confirm with pressing the <ENTER>-key. Markers will not be copied automatically on the hard disk.

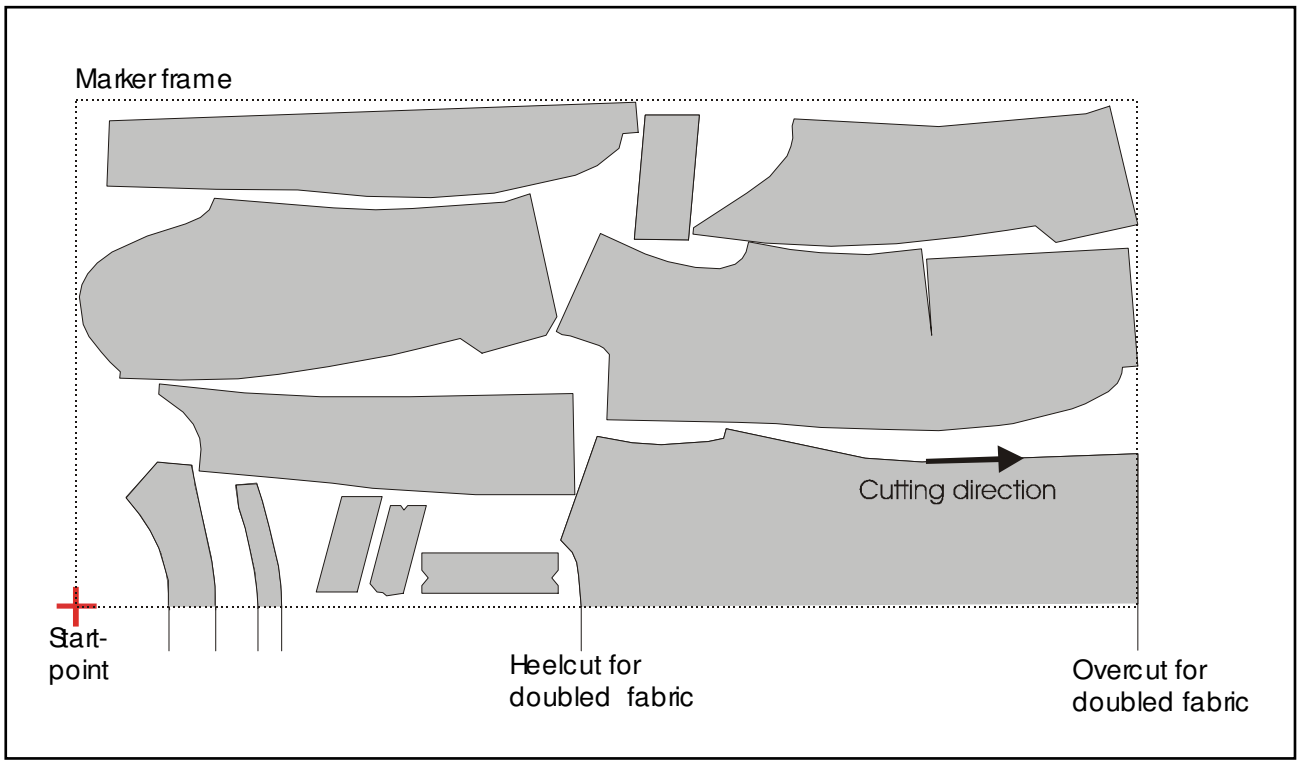
Feed length SPS-key [mm] (Custom64)
Parameter group:Bitefeed -> Application

If a button is installed at the keyboard of the conveyor-control to supply the fabrics from the conveyor belt into the cutting area in order to execute a bitefeed, can be fixed with the parameter ***Feed length SPS-key*** the length of the bitefeed. Usually this will be declared as the value of this parameter the distance between the light-barrier at the end of the conveyor belt and the desired ply-start on the cutting table. Through single operating of this key (under vacuum and in the automatic operation), the fabric ply will be bitefeed so far then that it can begin directly with the cut.

Heelcut folded fabric [mm] (Custom156)
Overcut folded fabric [mm] (Custom157)
Angle for open contour lines [ø] (Custom158)
Parameter group: Doubled fabric

If parts lie in the marker in the fold, these can be cut with a separate overcut and heelcut.

With the reference sequence, this over-width must be taken into account. Folded parts are recognized as such if cut-starts as well as cut-ends lead away from the marker-framework approximately vertically as well as finish there. The parameter ***Angle for open contour-lines*** fixes, in which angle the parts must impact on the contour in order to be recognized accordingly.



Picture 14: Heel- and overcut for folded fabric

12 Special versions

12.1 Automatic fabric feed

For a single ply-cutter with the device for automatic fabric feed, NextGen offers the possibility to accept the function for the fabric feed into the start-course.

Dial the function "free input of parameters" and write down suitable values for the following parameters:

- **automatic fabric feed [Y/N] (Custom184)**
  Parameter group: Special versions

  Here you have to set a <Y> for yes, if the automatic fabric feed should be made. Otherwise set a <N> for no.

- **Offset for the fabric feed [mm] (Custom185)**
  Parameter group: Special versions

  The distance, that the bridge covered in direction of the machine-zero-point, to feed the fabric, results from the length of the loaded marker plus this parameter-value.

- **Speed fabric feed [m/min] (Custom186)**
  Parameter group: Special versions

  With this parameter you can fix the speed with which the bridge moves in direction of the machine-zero-point, to feed the fabric.

At the bracket, you now dial like usual the function Cutting/Production. After the store of the marker and a suitable parameter-sentence, a window opens, in which you are asked, to start the automatic move of the fabric.

Now go to the machine-bridge. Move the bridge at the end of the machine-table and fix the fabric at the feeding device. Operate the key "FABRIC FEED" afterwards. The bridge moves as a result on the possible start-point of the marker and stops there. The distance, that the bridge covers, becomes fixed through the length of the marker plus the value of the parameter ***Offset for the fabric feed***.

Afterwards the crooked-situation-correction begins like usual.

12.2 Reading of marker and parameter sentence over barcode

Barcode-Mode [Y/N] (Custom177)
Parameter group: Special versions

If the input of marker - and parameter-sentence names should take place with help of a barcode-pistol, you have to switch on the parameter ***barcode mode***. If this parameter is set on <Yes>, the cutting procedure looks as follows:

- The „Barcode mode“ is displayed in the jobqueue window. The user does not have to open the „Edit jobqueue“-dialog.
- If the barcode pistol is now held over the barcode of the corresponding marker name, this is joined automatically without key-activity at the end of the jobqueue. The marker-name can be co controlled by the operator.
- After reading the marker, an affiliated parameter-sentence can be loaded in the same way. The parameter-sentence is marked through a special sign. The input of the parameter-sentence is optional. If a parameter-sentence is loaded, its name appears in the jobqueue window behind the marker. If no parameter-sentence is loaded, the values of the standard-parameter-sentence are adopted automatically.
- This process must be repeated until all markers are input. The cutting-operation will start with the function *Start jobqueue*.

12.3 Fabric end detection

With fabric end detection [Y/N] (Custom180)
Parameter group: Special versions

A light-barrier is installed at the cutter to the material-end-recognition, so, NextGen offers the possibility, to recognize automatically the end of the material during the conveyor advance. When a material-end is recognized during the conveyor advance, the operator will be reminded of it with a notice window after finishing the conveyor advance. The actual material-end becomes now marked with help of the joystick.

NextGen will test then, whether all parts of the marker on the rest-material can be cut. If this is not the case, all parts no longer be processed are separated automatically and stored as a separate marker. These parts can cut on a new ply or on a fabric remnant. In order to be able to execute the automatic separating of the parts, you have to set the parameter ***With fabric end detection*** on <Yes>. In this case you have to choose as reference-mode the single - or step ply-mode.

Non-jobqueue-operation:

Before the start of the next cutting window, those parts which no longer fit on the remaining material are secured in a separate file as an autonomous marker. This marker will get the name of the original marker with the sign "#" joined at the end. The subsequent bitefeed will now be executed up to the material-end.

Jobqueue-operation:

As soon as a single marker fits no longer on the remaining material, the remaining parts are also stored in a separated file and the jobqueue operation is finished. Now the operator has the possibility, to insert the new created marker as the first marker into the marker-chain and to start the jobqueue operation again.

CHAPTER VI

Machine parameters

Table of Contents – Chapter VI

The parameters which are presented here are all privileged and can be altered only after input of the corresponding password. Machine parameters should be modified only after consultation with Bullmer.

1 Velocity / Acceleration

amax in g [g] (TimeMaxA)
Parameter group: Speed

The parameter ***a_max*** signifies the maximum acceleration in g (1g = 9,81m/s^2), allowed in case of changes in speed.

Acceleration time ta [ms] (TimeMaxTa)
Parameter group: Speed

The parameter ***ta*** fixes the duration in milliseconds, for the linear increasing acceleration from 0 to maximum.

Min. course speed [m/min] (TimeMaxV)
Parameter group: Speed

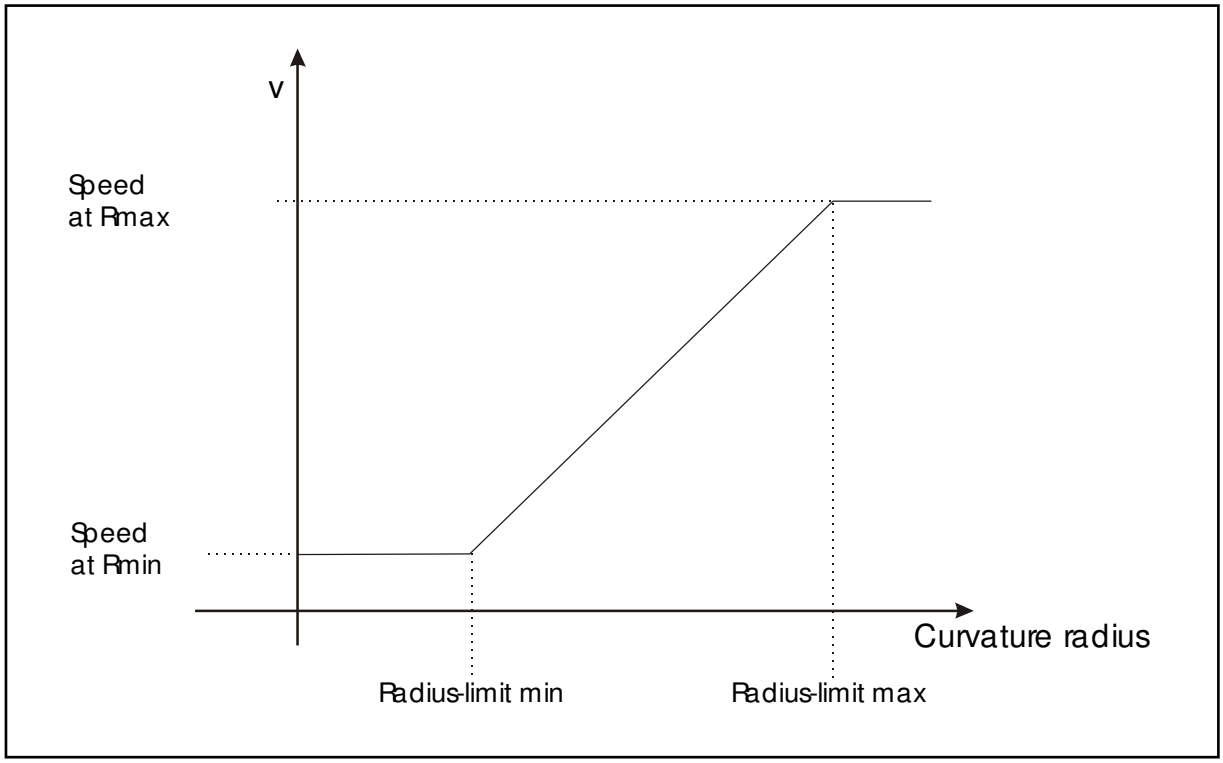
The speed does not fall below this value, restricted through the parameter ***min. course speed***, even when cutting sharp contour edges. The value selection is critical; it has a strong influence on the cutting time.

Radius-limit at max. speed [mm] (TimeMaxR)
Radius-limit at min. speed [mm] (TimeMinR)
Speed-limit at max. radius [m/min] (TimeMaxVMaxR)
Speed-limit at min. radius [m/min] (TimeMaxVMinR)
Parameter group: Speed

Characteristics for the allowed course speed at curved sections. The allowed speed at free form and arc sections depends on the curvature radius. The smaller the curvature radius is, the slower the speed. The minimum allowed speed is set by the parameter "***min. course speed***".

A diagram shows the interdependence of allowed speed and curvature radius. In this diagram, the point with the values ***'radius-limit at min. speed'*** and ***'speed-limit for min. radius'*** (curvature radius in [mm] and according speed in [m/min]) defines the end point of the straight line for the field of small curvature-radius, a second straight line starts for the following curvature-radius field. This second line ends at the point with the values ***'radius-limit at max. speed'*** and ***'speed limit for max. radius'*** (curvature radius in [mm] and the according speed in [m/min]).

For a radius which is bigger than "***radius-limit for max. speed***" the allowed speed is always equal to the "***speed-limit for max. radius***".



Picture 1: Speed dependent on the curvature radius

Edge cutting speed [m/min] (BlendMaxVAtCorner)
Parameter group: Speed

This parameter fixes the speed with which edges are cut. You should not change the set value.

Minimum relative amax-Sinking [ ] (TimeMinRelAcc)
Parameter group: Speed

At this position a value is expected between 0 and 1. The acceleration for arcs is only allowed up to this limit value. This value is indicated as a percentage of the maximum acceleration (e.g. 0,2 = 20% of amax).

max. speed / V max [m/min] (TimeMaxVForPositioning)
Parameter group: Speed

The parameter ***Vmax*** defines the maximum speed at which the machine is allowed to drive.
The parameter value ***max. cutting speed*** can be not bigger than the value pre-determined through the parameter ***max. speed***. Moving from part to part within a cutting-process is at the speed defined in max. speed. This speed is never exceeded during cutting of a marker.
Take care: It is not allowed to set the OVERRIDE on a higher value than parameter vmax.

ta while positioning [msec] (TimeMaxTAForPositioning)
Parameter group: Speed

The parameter "***ta while positioning***" fixes the time, in milliseconds, in which the positioning acceleration drives linearly from 0 to maximum-acceleration (a_max) increase.

Exponent for V(R) [ ] (TimeExpVR)
Parameter group: Speed

This parameter influences the curve dependant speed reduction. The parameter value 0.5 results the characteristic of a root function.

In order to intensify the speed reduction at smaller radius, set the value between 0.5 and 1.0, in this process 1.0 corresponds to a linear correlation between V and R.

In order to avoid a reduction of the medium speed that is too strong by this parameter, the parameter ***Radius-limit at max. speed*** should probably be reduced.

genAccTab_dsVmax_x [Inkr] (AccTab1DsVMax)
genAccTab_dsVmax_y [Inkr] (AccTab2DsVMax)
genAccTab_dsVmax_c [Inkr] (AccTab3DsVMax)
genAccTab_dsVmax_z [Inkr] (AccTab4DsVMax)
genAccTab_tamax_x [Tic] (AccTab1TAMax)
genAccTab_tamax_y [Tic] (AccTab2TAMax)
genAccTab_tamax_c [Tic] (AccTab3TAMax)
genAccTab_tamax_z [Tic] (AccTab4TAMax)
genAccTab_s_amax_x [Inkr] (AccTab1SAMax)
genAccTab_s_amax_y [Inkr] (AccTab2SAMax)
genAccTab_s_amax_c [Inkr] (AccTab3SAMax)
genAccTab_s_amax_z [Inkr] (AccTab4SAMax)
Parameter group: Machine -> Amplifier settings

The point to point positioning takes place on the basis of tables and for the corresponding axis depends on the above parameters. Note that with these download parameters a parameter alteration will only be effective after renewed download and restarting of the program.
These parameter values have been set at the initial installation and should not be changed.
These tables will only be used with the reference sequence and with the positioning between drills.

dsVmax:

Way alteration in increment with maximum-speed

tamax:

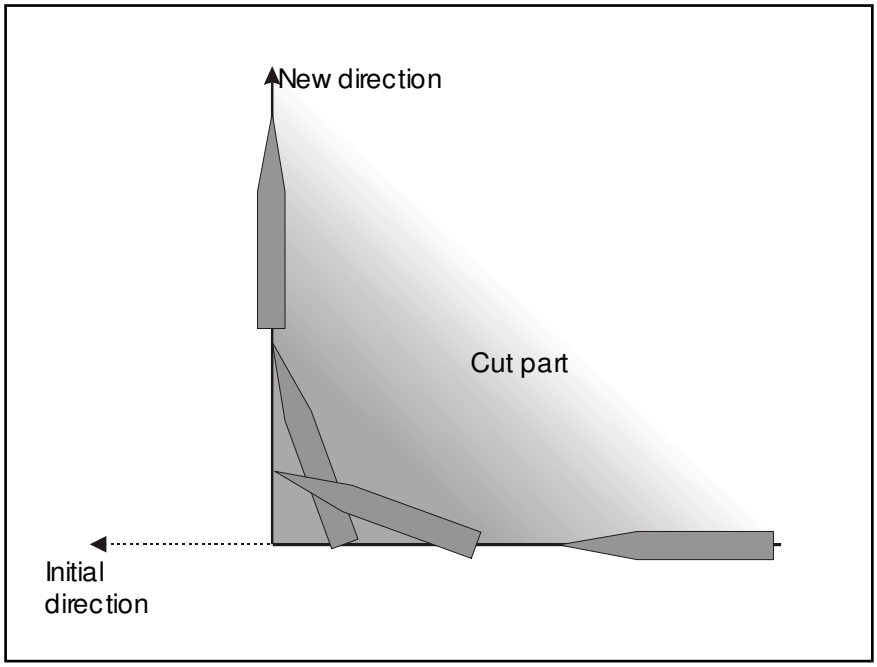
Time in Tic for the acceleration increase of zero on maximum

s_amax:
Way alteration in increment up to the achievement of the maximum-acceleration

2 Cutting procedure for edges and curves

Round-off angle [degree] (BlendPhiCurveChordTol1)
Parameter group: Speed -> corners and curves

The parameter of round-off angles defines the allowable edge-angles for the round-off (an edge-angle is the direction change angle on a contour-edge). Contour edges with a value smaller than the set ***round-off angle*** and bigger than the value of the parameter ***grad_LineGr*** are cut without lift and plunge of the knife, meaning the knife turns on the same position staying in the fabric. Bigger direction changes involve a knife turn according the special edge-strategy. The set value should be kept!



Picture 2: The edge-strategy

Chordtolerance [mm] (BlendChordTol1)
Parameter group: Speed -> corners and curves

For edge-angles (change of direction-angle) which are smaller than the value of the parameter ***round-off angle*** and bigger than the value of the parameter ***grad_LineGr***, the edge is smoothed by round-off. The value of the parameter ***chordtolerance*** in [mm] sets the maximum allowed deviation of the rounded contour from the contour edge's set point. The round-off radius is calculated accordingly.

grad_LineGr [grad] (BlendPhiDriftLine)
Parameter group: Speed -> corners and curves

At contour edges with a change in direction, which are smaller than the set ***degr_LineGr*** and bigger than "***degr_tolerance***", the knife is turned in the new direction on a short slope (determined by the parameter "***d_sinew***"). This parameter avoids numerical problems with non-logical big round-off radius.

d_sinew [mm] (Custom340)
Parameter group: Speed -> corners and curves

This value in [mm] determines the length of the slope at contour edges with changes in direction below "***degr_LineGr***".

degr_tolerance [grad] (BlendPhiTol)
Parameter group: Speed -> corners and curves

If contour edges have a bigger change in direction than "***degr_LineGr***" and are smaller than "round-off reserve" in [degr], a rounding arc is inserted and the knife is turned continuously in the new direction.

Cutting procedure of a contour edge

Direction change angle	Cutting procedure
Dth > Cutting limit angle	Lift and plunge
Cutting limit angle > Dth > Round-off angle	Edge strategy
Round-off angle > Dth > Degr_LineGr	Smooth edges through round-off
Degr_LineGr > Dth > Degr_Tolerance	Smooth edges through sinew
Degr_Tolerance > Dth	Drive round edges without smoothing

Dth = Direction change angle

Round-off reserve [mm] (Custom339)
Parameter group: Speed -> corners and curves

This value in [mm] determines at contour edges the distance reserve for contour edges with rounding arc. This reserve is advanced for the rounding of the next respective edge.

3 Bitefeed parameter

3.1 General

xminBitefeedReserve / left bitefeed distance [mm] (Custom61)
xmaxBitefeedReserve / right bitefeed distance [mm] (Custom62)
Parameter group: Bitefeed -> Setting

The left and right bitefeed distance simply defines the security area. The size of bitefeed windows does not correspond with the size of the cutting length. The maximum of one bitefeed window is:
(x_max Table – x_min Table) – (left bitefeed distance + right bitefeed distance).

If there is a deviation in the distance of bitefeed (transport of conveyor belt), the cutter can still cut the whole cutting window as calculated by setting the starting point of the marker.

The tool offsets also have to be subtracted from the table measurements (x_max table – x_min table) to get the maximum cutting window. Please take care that the parameters left and right bitefeed distance is bigger than the x-tool-offsets otherwise there is no tolerance at bitefeed .

P3 Left security distance. Parts in cutting section 2,3,4... might only be cut starting from this limit.

P4 Right security distance. Parts in cutting section 1,2,3... might only be cut starting from this limit.

Delay bitefeed ready [m/s] (CustomSPS1)
Parameter group: Bitefeed -> Settings

The waiting period before the bitefeed, while the vacuum is reduced and before the transportation can take place, is fixed by the parameter ***delay bitefeed ready***. This parameter is determined by whether the machine is equipped with vacuum regulation or not.

Bitefeed at drag operation [Y/N] (CustomSPS2)
Parameter group: Bitefeed -> Settings

If you cut highly compressed fabrics, such as foam, these can lift during bitefeed advance, which can cause the material to be caught on the cutting bridge if it is not moving. This option makes the conveyor instruct the cutting bridge to move in exactly the same way so that the risk is avoided.

Delay resealer down [ms] (CustomSPS3)
Parameter group: Bitefeed -> Settings

The time which you wait after bitefeed until the vacuum is set up ready to put down the resealer will be set in the parameter „Delay resealer down“. This parameter is required for materials which can be strong compressed.

Bitefeed and x-axis synchroniced [Yes/No] (Custom59)
Parameter group: Bitefeed -> Application

You can carry out the bitefeed with synchronous movement of the x-axis in „drag mode“. The bitefeed axis is the drag one and the x-axis is the axis which is dragged.

dx-positioning at BFstrat=4 [mm] (Custom58)
Parameter group: Bitefeed -> Settings

When fabrics are cut in bitefeed process which is uncompressed higher than the maximum cutting height, it is necessary that there is sufficient vacuum with the bitefeed in order to reduce the height of the fabric so that it fits under the cutting bridge and the cover foil.
When the parameter ***bitefeed strategy*** (see chapters 5 - user parameters) is used and strategy 4 is chosen, the bridge is moved after the cut of a cutting window with the value of the parameter ***dx-positioning at Bfstrat=4*** in a positive x-direction so that all cutting contours are covered through the additional cover blind and the vacuum is stabilized.

Ax4 Feed clamp rail [0,1] (Ax4ACtrl)
Parameter group: Bitefeed -> Settings

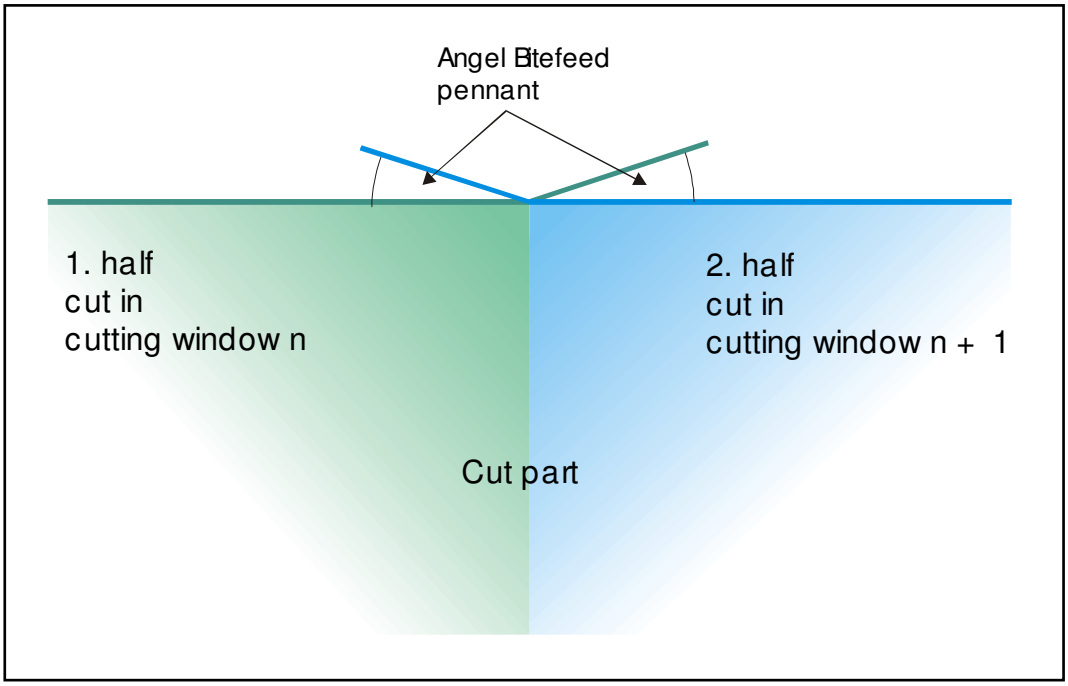
In case of single ply cutter you carry out the bitefeed while you stick the belt at the punches which are fixed at the bridge and which are pulled forward.
If the parameter value feed clamp rail is set on 0 the feed will carry out over the bitefeed axis. If the value is set on 1 the feed will carry out with help of a clamp rail.

dxErrClamp [mm] (Custom68)
Parameter group: Bitefeed -> Settings

At the bitefeed with clamprail always a constant bitefeed error occurs, because of the elasticity of the belt. The deviation can be compensated by the value of the parameter ***dxErrClamp***.

Angle bitefeed pennant [degr] (Custom63)
Parameter group: Bitefeed -> Application

If you start the bitefeed cutter with the option “***with cutting interruption”*** (see chapters V - user parameters), contours that lie at the end of a bitefeed window are only cut partially and the rest of the contour is cut in the next cutting window. Small “pennants" are automatically inserted at these positions so that all fibres are cut. The parameter “***angle bitefeed pennant”*** sets the angle (in degrees), at which these pennants connect to the contour.

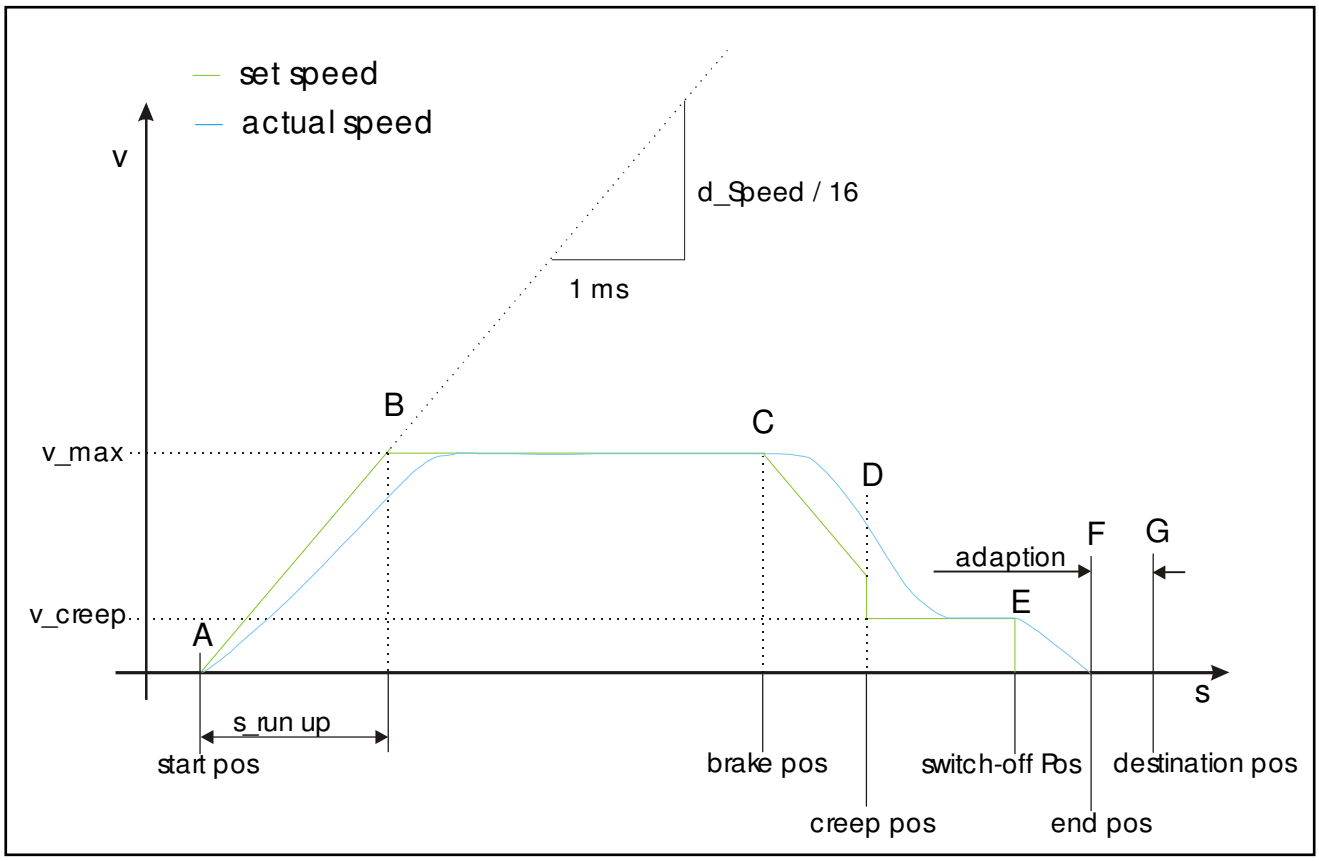


Picture 3: Angle bitefeed pennant

Speed X at bitefeed [m/min] (Custom60)
Parameter group: Bitefeed -> Settings

This parameter sets the conveyor speed (drive speed of the X-axis) at bitefeed. The input is in metres per minute. However, the parameter is effective only if the value of the parameter is 1, 2 or 3 in ***bitefeed strategy*** and the parameter ***with drag operation*** is set on <N> (see chapters V - user parameters).

3.2 Parameter for the bristle conveyor transport at the bitefeed



Picture 4: Bitefeed Algorithm

s Pre-switch-off [incr] (Custom242)
s Creep [incr] (Custom243)
d Speed [Incr/Tic] (Custom244)
V Creep (Custom245)
t Slowdown [Tic] (Custom246)
max. brake route bitefeed [mm] (Custom247)
Parameter group: Bitefeed -> Settings

At beginning of a bitefeed (see A) the start position and finish position are calculated. The acceleration ramp is increased each milli-second by 1/16 of the value of the parameter ***d Speed***. The maximum speed is reached with 2047 (= 10V). After achievement of the maximum-speed (see B) the high speed route is measured. The deceleration ramp is reduced in the braking procedure (from C). Since the measured high-speed-route doesn't precisely correspond to the required finish position, a small jump can occur on ***v Creep*** (see D). At the creep position, v creep is switched on every time. After the finish position is reached, a short waiting time, ***t Slowdown,*** elapses so that the axis can come to a final stop.

At A: Switch-off pos = End pos – s_Pre-switch-off – adapted braking route
Creep pos = Switch-off pos – s_Creep
At B Brake pos = Creep pos – s_Run up
s_Run up = Actual pos – Start pos
At F: adapted braking route = (Destination pos – End pos)

For safety, if the adapted braking route is bigger than s_brake route_max (***max brake route bitefeed***) the adapted route is ignored and it returns to the normal value.

4 Axis- and Amplifier adjustment

X-Zoom [Incr/mm] (Ax1Res)
Y-Zoom [Incr/mm] (Ax2Res)
C-period [Incr/360°] (Ax3Res)
C0degr [Incr] (Ax4Res)
zZoom [Incr/mm] (Ax5Res)
Parameter group: Machine -> Resolution

As follows the conversion factors for rotation axis.

Zoom X-axis	conversion factor [mm]->[incr] for the x-axis
Zoom Y-axis	conversion factor [mm]->[incr] for the y-axis
C-Period	conversion factor of 360[ø] in [incr] for the ROTATION axis
C0degr	zero position in [incr] for the ROTATION axis
zZoom	conversion factor [mm]->[incr] for the z-axis

k_control_x_(5).[ ] (Ax1KCtrl)
k_control_y (5).[ ] (Ax2KCtrl)
k_control_c (10).[ ] (Ax3KCtrl)
k_control_z (2).[ ] (Ax4KCtrl)
k_control_A5 [ ] (Ax5KCtrl)
k_control_A6 [ ] (Ax6KCtrl)
k_control_A8 [ ] (Ax8KCtrl)
Parameter group: Machine -> Controler settings

In order to compensate for unsymmetries of the servo amplifier, the proportional amplifier factor for positive (k_control_p_) and negative (k_control_n_) movement direction is calculated with separate equations.

x-axis:	k_control_p_x
y-axis:	k_control_p_y
c-axis:	k_control_p_c
z- axis:	k_control_p_z

ZeroDeviation-Tol [Inkr] (EndDeviationTol)
Parameter group: Machine -> Resolution

Tolerance for the determination of rule divergence; this is the incremental time, within which the rule-deviation must be reduced. If the deviation is greater than this increment, the machine will stop and display a time out error message.

ZeroDeviation-Tol C-axis [Inkr] (Custom117)
Parameter group: Machine -> Resolutions

This is the tolerance for definition of the general deviation of the c-axis. This general deviation defines the allowed tolerance value in the c-axis.

Filtre – par. 1 [ ] (Ax1FilterTime)
Filtre – par. 2 [ ] (Ax2FilterTime)
Parameter group: Machine -> Controler settings

This parameter scales the contour error compensation of the X and Y-axis. (Value must be calculated by experiment. Parameter 1 and parameter 2 should be identical).

max. Incr.Change [ ] (Custom287)
Parameter group: Speed -> Corners and curves

The maximum rate of change in the C axis*, w*hen exceeded a time extension takes place, so that that C-axis does not turn too quickly.

max allowed course change/Tic [Incr] (Custom290)
Parameter group: Speed -> Corners and curves

The maximum rate of course change of an axis*;* if exceeded the machine stops and displays the message “interpolation error”. The course change is per Tic, a Tic is a unit of time within the CNC programme.

Second C-axis existing (Custom 116)

If a cutter is equipped with a second c-axis, a special version of the software is used. Furthermore the parameter Second c-axis existing has to be set on <Yes>.

5 Definition of the working area

min_X-table (Custom335)
max_X-table (Custom336)
min_Y-table (Custom337)
max_Y-table (Custom338)
min_C-table (Ax3MinPos)
max_C-table (Ax3MaxPos)
Parameter group : Machine -> Working area

These values determine the maximum allowed driving area of the machine. During positioning or cutting of a marker this driving area cannot be exceeded. This is checked automatically by NextGen.

SW_Limit switch_xmin [mm] (Ax1MinSwLimit)
SW_Limit switch_ymin [mm] (Ax2MinSwLimit)
SW_Limit switch_cmin [degr] (Ax3MinSwLimit)
SW_Limit switch_zmin [mm] (Ax4MinSwLimit)
SW_Limit switch_min_A8 [mm] (Ax8MinSwLimit)
SW_Limit switch_xmax [mm] (Ax1ManSwLimit)
SW_Limit switch_ymax [mm] (Ax2ManSwLimit)
SW_Limit switch_cmax [degr] (Ax3ManSwLimit)
SW_Limit switch_zmax [mm] (Ax4ManSwLimit)
SW_Limit switch_max_A8 [mm] (Ax8ManSwLimit)
Parameter group : Machine -> Working area

Apart from the hardware limit switches, it is also possible to set minimum and maximum positions for each axis, functioning like software limit switches and resulting in a stop of the movement as soon as the valid area is exceeded. The positions of the software limit switches are located only a bit out of the allowed table positions so that slight overswings don't interrupt the movement. Still the positions of the software limit switches should be chosen so that these are approx. 5 millimetres within the hardware limit switches. The moving area of the machine can be defined with help of these parameters. This is normally bigger than the cutting area.

6 Tool specific parameter

x-Offset drill [mm] (Custom304)
y-Offset drill [mm] (Custom305)
x-Offset helpdrill [mm] (Custom306)
y-Offset helpdrill [mm] (Custom307)
x-Offset Notch tool [mm] (Custom310)
y-Offset Notch tool [mm] (Custom311)
Parameter group: Tool -> Drill-Notch

x-Offset Knife [mm] (Custom300)
y-Offset Knife [mm] (Custom301)
Parameter group: Tool -> Stitch knife

x-Offset pen [mm] (Custom302)
y-Offset pen [mm] (Custom303)
Parameter group: Tool -> Pen

x-Offset Chisel blade [mm] (Custom313)
y-Offset Chisel blade [mm] (Custom314)
Parameter group: Tool -> Chisel blade

x-Offset Rotary blade [mm] (Custom315)
y-Offset Rotary blade [mm] (Custom316)
Parameter group: Tool -> Rotary blade

The different tools (pen, drill, knife, helpdrill, camera, notch tool) are installed offset in X- and Y-direction to the position set by the NC program. The parameter indicates the offset for each tool with regard to the set position (of the NC program).
A test file is available for every tool; this should be used in order to adjust the offset.

x-offset rotat.point notch tool [mm] (Custom312)
Parameter group: Tool -> Drill-Notch

With single ply cutters with rotary knife, it is not possible to do the notches with this knife, so there is a special tool for notches.

Cutting procedure 3 means “doing the notch with this special tool”. If you want to cut an I-Notch, you have to change the notch-parameters into Slit (3). To cut a V-Notch with the notch tool, you need another notch tool (with a V shape), or the cutter must make two slits (=> change into V-notch (5))

As with the parameter “knife-back”, the cutter-software has to know the rotation-point of the notch tool by parameter ***x-offset rotat.point notch tool.***

Notch tool/knife identical direct [Y/N] (Custom110)

Parameter group: Tool -> Drill-Notch

The notch chisel can be used either as an alternative to or in connection with the ultrasonic or round knife. It must taken into account that

a: ultrasound knives and notch chisel turns in opposite directions
(Parameters NOTCH TOOL/KNIFE IDENTIC DIRECT on no)

b: round knives and notch chisel turns in the same direction
(Parameters NOTCH TOOL/KNIFE IDENTIC DIRECT on yes)

Position duration DOWN [Tics] (Custom114)

Parameter group: Tool

Compulsory waiting period for the machine between the signal ***'knife down'*** = stop, and the release to continue movement.

Position duration UP [Tics] (Custom115)

Parameter group: Tool

Compulsory waiting period for the machine between the signal ***'knife up'*** (= stop) and the release to continue movement.

7 Operation data recording and logfile

StatisPrintMode (Custom152)
Parameter group: Statistics

The cutter can be equipped with software to record the main features of operation. This parameter is used to choose how the real time data capture is printed.

Print mode 0: No report is printed.

Print mode 1: After the whole marker is cut the marker report is printed

Print mode 2: After the whole marker is cut both the marker report and the day report are printed.

Print mode 3: Automatic print of the month report.

Print mode 4: Automatic print of the line report.

Print mode 5: Automatic print of the marker report.

Print mode 6: Saves each marker report as a file.

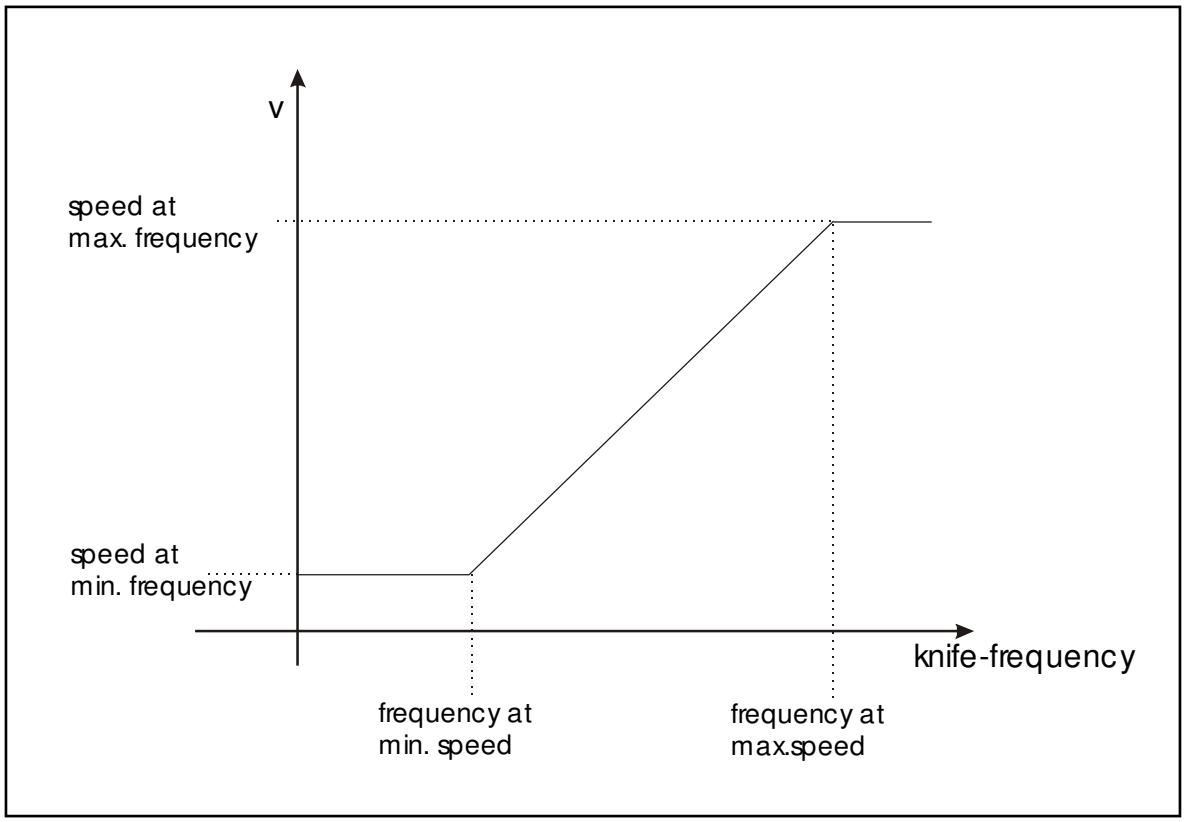
p_TimeTrigger [ ] (Custom283)
Parameter group: Statistics

Trigger for the timing of the operation report. The timing for the cut of a marker begins as follows:

0: Timing begins at the start of the order
1: Timing begins at the start of cutting

8 Knife frequency control

This parameter determines the speed dependent frequency control. The knife-frequency varies directly with the knife speed with maximum and minimum values. Speeds, and thus knife frequency, depend upon the length of the line being cut. Adjustment of knife frequency can avoid problems with fusing (melting) of synthetic fabrics, for example.



Picture 5: The speed dependent knife frequency

hub_V_min : knife revolutions for min. speed (Custom100)
Parameter group: Knife -> Knife frequency

Knife revolutions at ***speed for min. knife frequency***

hub_V_max : knife revolutions for max. speed (Custom101)
Parameter group: Knife -> Knife frequency

Knife revolutions at ***speed for max. knife frequency***

V_hub_min : speed for min. knife revolutions (Custom102)
Parameter group: Knife -> Knife frequency

The knife revolution is fixed on the value of the parameter ***knife revolutions for min. speed***, if a cutting speed is driven which is smaller than the value of the parameter ***speed for min. knife revolutions***.

V_hub_max : speed for max. knife revolutions (Custom103)
Parameter group: Knife -> Knife frequency

The knife revolution is fixed on the value of the parameter ***speed for max. knife revolutions***, if a cutting speed is driven bigger than the value of the parameter ***speed for max. knife frequency***.

As long as the advance speed V is smaller than the speed V_hub_min, the knife moves with the revolutions hub_V_min.

When the machine drives with a speed bigger than the value of the parameter "***speed for min. knife revolutions"*** and smaller than the value of the parameter "***speed for max. knife revolutions"***, the knife frequency is calculated on the basis of the linear code line and reaches a bigger value than the value of the parameter ***knife frequency for min speed*** and smaller than the value of the parameter ***knife frequency for maximum speed***.

As long as the advance speed V is higher than the speed V_hub_max, the knife moves with the revolutions hub_V_max.

Knife revolutions for positioning (Custom105)
Parameter group: Knife -> Knife frequency

When positioning with the knife in lifted position, the knife frequency is constantly on the value of the parameter ***Knife revolutions for positioning.***

Knife revolutions for sharpening (Custom106)
Parameter group: Knife -> Knife frequency

When sharpening the knife frequency is constantly on this value of the parameter ***Knife revolutions for sharpening***.

Conversion revolut.->incr [Incr/rpm] (Custom 104)
Parameter group: Knife -> Knife frequency

This parameter converts the value from the unit [rpm] of the revolutions to the value in numbers [0...2047] requested for the analog output.

9 Sharpening

9.1 General

Sharpening position left [degr] (Custom126)
Sharpening position right [degr] (Custom127)
Parameter group: Knife -> Sharpening

On a cutter with sharpening stones the knife must be turned into the sharpening position. Enter here the position in [degr] which the knife should have when the left or the right side of the knife should be sharpened.

Number of the sharpening cycles [ ] (Custom122)
Parameter group: Knife -> Sharpening

Through the parameter ***Number of the sharpening cycles*** you can fix how many times the knife is sharpened per sharpening procedure. The standard procedure is with the value set at 1. If you think a value greater than 1 is required, a reduction of the sharpening distances so that the knife is sharpened more frequently (see chapters V - user parameters) is normally a better solution than a multiple sharpening of the knife.

Sharpening time (CustomSps4)
Parameter group: Knife -> Sharpening

This is the time which is taken for knife sharpening.

9.2 Sharpening during positioning

Sharpening during positioning [Y/N] (Custom128)
min.grind.dist.for grind.dur.posit [mm] (Custom129)
min.pos.dist. for grind.dur.posit [mm] (Custom130)
Parameter group: Knife -> Sharpening

If the value of the parameter "***Sharpening during positioning***" is set on <Y>, the knife is sharpened while the machine is moving between pieces (positioning). This can reduce the time lost through sharpening.

Always if the cutter should carry a positioning the following decision process will run:

If the cutting distance that has been cut since the last sharpening is bigger than the value of the parameter " ***min. sharpening distance***" and if the positioning distance is bigger than the value of the parameter "***min.pos.dist. for grind.dur.posit*** " a sharpening cycle will be carried out during the positioning between parts.

Max. acceleration C sharpening [Tic] (Custom131)

Parameter group: Knife -> Sharpening

Max. acceleration for the C-axis at sharpening during positioning.

Max. speed C sharpening [Tic] (Custom132)

Parameter group: Knife -> Sharpening

Max. speed for the C-axis at sharpening during positioning.

Sharpening during bitefeed (Custom133)

Parameter group: Knife -> Sharpening

If the value of the parameter ***Sharpening during bitefeed*** set on <Yes>, the sharpening is done during bitefeed.

10 Notch parameter

Identification Vnotchangle [degr] (Custom17)
Identification Vnotchdepth [mm] (Custom18)
Parameter group: Notches -> Notch recognition

The values of the parameters ***p_identific_Vnotchangle*** and ***p_identific_ Vnotchdepth*** and its minimum and maximum values support the identification of V-notches and cuts. You should not change the parameters.

NotchOutAngle [degr] (Custom19)
Dialog box: Notchsettings

If a V-notch is cut without any lift of the knife, the knife turns out of the V-notch so that at least the angle set by this parameter is driven. To cut out of the notch cleanly, the knife turns at the exit of a notch.

Drill-time marker 1 [msec] (CustomSps6)
Drill-time marker 2 [msec] (CustomSps7)
Parameter group: Tool -> Drill-Notch

These parameters set the length of the drilling time.
The input is in milliseconds. Lengthening the drill time can help improve the visibility of the hole on certain fabrics.

Vnotch cutspeed [m/min] (Custom21)
Slit cutspeed [m/min] (Custom20)
Dialog box: Notchsettings

These parameters set, with which speed the corresponding notch will be cut. You should not change set values.

11 Oil injection cutting head

Revolutions before oil injection [rpm/min] (Custom113)
Dissolution counter canal 5 [] (Ax5Res)
Parameter group: Tool

After a parameterable number of revolutions of the knife, from the parameter ***Revolutions before oil injection,*** an injection of oil will be made into the knife-drive. The number of revolutions of the knife drive is counted by the encoders and communicated through a free counter channel of the CNC. The dissolution of the knife lifting frequency axis should be adjusted in the *Baldor* amplifier in increments of 512 .

12 Adjustments Joystick

Joystick drive before reference [J/N] (Custom354)
Parameter group: Machine -> Joystick

Yes: You can move the cutting head before the axes are referenced.
No: You can only move the cutting head after the axes are referenced.

Speed Joystick x-axis [m/min] (Ax1JoystickMaxV)
Speed Joystick y-axis [m/min] (Ax2JoystickMaxV)
Speed Joystick c-axis [m/min] (Ax3JoystickMaxV)
Speed Joystick X2-axis [m/min] (Ax4JoystickMaxV)
Parameter group: Machine -> Joystick

This is the maximum speed for driving with the joystick.

Max. set value joystick neg.. x-axis [ ] (Custom348)
Zero position joystick x-axis [ ] (Custom349)
Max. set value joystick pos. x-axis [ ] (Custom350)
Max. set value joystick neg. y-axis [ ] (Custom351)
Zero position joystick y-axis [ ] (Custom352)
Max. set value joystick Pos. Y-axis [ ] (Custom353)
Parameter group: Machine -> Joystick

This is the parameter to adjust a controlled joystick.
The values are set with the test program MTEST.
Max.pos : value 2048
Max.pos : value -2048
Zero position: value 0

13 Loading of marker data

Read Q-commands [Y/N] (Custom223)

Parameter group: Load file

A Q-command is contained in many markers. This is a reference point between the marker data and the x-axis which allows the marker data to be offset (e.g. a stripe) the absolute coordinates of a marker are normally not considered with the reference sequence.

A marker is placed on the table by the reference sequence so that the minimal y-values of the marker are placed at the start point. If a Q-command is passed out additionally to the marker data, this can be taken into account at the loading of the data. As soon as this point, outside the actual marker data, lies on a y-position reading of this point has an effect on the marker measures and on the position of the actual marker data. A Q-command is usually on the zero point of the y-axis. If the cut parts themselves don't lie there the result, through consideration of the Q-command, is a postponement of the marker data in positive y-direction.

If this is not desired, the Q-command can be ignored by setting read Q-commands to <N>

Format:1(ISO),2(DXF),3(both)....(1,2,3) (Custom220)

Parameter group: Load file

The DXF format is a data exchange format that is supported from many CAD-programs, i.e. AutoCad. The NextGen control software offers the function to read markers in the DXF format and to process them.
However on this occasion you have to take into account, that no exact definition of DXF exists and the DXF format is not a standardized format. Therefore, reading of DXF files works only under certain restrictions in the control software.
The NextGen software offers the function, to read and process markers, in the DXF format. Through alteration of the parameter ***FORMAT: 1(ISO), 2(DXF), 3(BOTH)*** you can choose which data format can be read into the control-software.

1: Only markers are loaded in the ISO format.
2: Only markers are loaded in the DXF format.
3: Markers in either the ISO or the DXF format can be loaded

The differentiation of the two formats takes place with help of the extension. When a marker has the extension “DXF", it will be interpreted as DXF format. All other markers are loaded in the ISO format. The tool parametering for reading the DXF data is deposited in the file "DXF.INI ".

Elements are read from DXF format generated by the AutoCad Releases R11, R12, R13, R14 and AutoCad 2000.

Standard_marker_distance [mm] (Custom176)
Parameter group: Load file

The parameter ***Standard_marker_distance*** defines the distance between two markers to be cut one after another in one jobqueue. The value of the parameter is entered automatically as the default value in the jobqueue parameters, however it can be altered for each individual marker.

xy-tolerance [mm] (TimeMinLineLength)
Parameter group: Load file

If you load ISO files, points are filtered out which have a smaller distance to the point before than set by this parameter ***xy-tolerance [mm]***.

max.quantity parts [ ] (Custom154)
Parameter group: Load file

You can adjust the quantity of the max. loadable parts with this parameter. You should only choose this parameter as big as necessary for granting an optimal use of storage. If you choose the parameter too small, not all parts can be loaded. If you choose the parameter too big and the marker consists of many pieces, then perhaps storage is not sufficient and the error message "list full" appears. In this case increasing the RAM on the computer should be considered; contact your local Bullmer office.

No of Set points [ ] (Custom155)
Parameter group: Load file

The parameter ***Set points*** will fix how many points can be loaded when storing a marker. The storage place for the set points list in the RAM will be initialized with the start of the software. If the value of the parameter is chosen too small, bigger markers might not be loaded completely. With a value for the parameter that is too large the initialization of the set points needs too much storage space.

No of Bufferpoints [ ] (Custom341)
Parameter group: Load file

This parameter sets the number of points of NC cut data which are processed in an internal buffer so that the cutter can access them without stopping. This is unimportant now because computers have large memory available.

x-Testposition at simulation [mm] (Custom285)
y-Testposition at simulation [mm] (Custom286)
Parameter group: Load file

The start-position at the reference sequence normally results from the position of the cutting head. On PC versions of the cutter software the cutting head doesn't exist. In order to be able to simulate a cutting process on the PC you have to choose a valid start position; to do this the parameters "***X-testposition at simulation***" and " ***Y-testposition at simulation*** " are used.

14 Graphic

x-correction [mm] (ContourOffsetX)
y-correction [mm] (ContourOffsetY)
Parameter group: Setting graphics

With loading of the cutting program the presentation in the graphics is moved in X- or Y-direction by the correction factor. The value, which is set at the loading of the program, is decisive. These values are only used to move the marker in the visible sector of the graphics.

ViewRotY (ViewRotY)
Parameter group: Setting graphics

Cutter with right-hand side design (operation side in material running direction right), With help of these factors, the graphic representation can be mirrored in x - or in y-direction. (To do that the corresponding value must be set on 180 degrees.)

15 Reference drive

AX1 Reference position x [mm] (Ax1RefPos)
Ax2 Reference position y [mm] (Ax2RefPos)
Ax3 Reference position c [Grad] (Ax3RefPos)
Ax7 Reference position x2 [mm] (Ax7RefPos)
Ax8 Reference position A8 [mm] (Ax8RefPos)
Parameter group: Machine -> Reference drive

For driving reference: Parameters are for choosing a distance between the reference switches and the reference position (zero position) of the machine.
When driving reference the cutter moves to the reference position. This parameter is used, for example, to set the zero position of the knife (c-axis) parallel to the x axis

Ax1 Free Pos x [mm] (Ax1FreePos)
Ax2 Free Pos y [mm] (Ax2FreePos)
Ax3 Free Pos c [grad] (Ax3FreePos)
Ax8 Free Pos A8 [grad] (Ax8FreePos)
Parameter group: Machine -> Reference drive

After finding the reference point, the machine can drive to a defined position. You can set this position by the parameters “free-drive-position”. Normally we use these parameters only for the leather cutter connected with nesting system, where the cutter always starts the cutting procedure on the same position.

Ax1 referencing speed x [m/min] (Ax1RefV)
Ax2 referencing speed y [m/min] (Ax2RefV)
Ax3 referencing speed c [rp/min] (Ax3RefV)
Ax8 referencing speed A8 [rp/min] (Ax8RefV)
Parameter group: Machine -> Reference drive

Drive speed setting of each axis to the reference point.

Units : X and Y axis -> [m/min]
C axis -> [rp/min]

Ax1 free drive speed X [m/min] (Ax1FreeV)
Ax2 free drive speed Y [m/min] (Ax2FreeV)
Ax3 free drive speed C [m/min] (Ax3FreeV)
Ax8 free drive speed A8 [m/min] (Ax8FreeV)
Parameter group: Machine -> Reference drive

Free drive speed setting on each axis for the drive from the reference point to the free drive position.

Units : X and Y axis -> [m/min]
C axis -> [rp/min]

Ax1 reference strategy X [ ] (Ax1RefStrat)
Ax2 reference strategy Y [ ] (Ax2RefStrat)
Ax3 reference strategy C [ ] (Ax3RefStrat)
Ax8 reference strategy A8 [ ] (Ax8RefStrat)
Parameter group: Machine -> Reference drive

Strategy which is valid for the referencing of each axis.
Set following values for the axis strategy:

X axis : 3
Y axis : 3
C axis : 5

Strategy 3:
With the reference strategy 3 the axis will be referenced by means of reference switches and limit switches. With this the emergency supervision of the limit switch is deactivated at the start of the reference drive, then the axis is moved with the parameterized "relatively high" positioning speed in the direction of the reference switch. With recognization of the reference switch signal, the axis is braked to the parameterized "low" ***reference-speed*** and is moved further until the limit switch is activated.
There, the reference-position is registered and the axis is braked. Afterwards, the movement direction is reversed and the parameterized ***free drive position*** with the parameterized ***free drive speed*** is approached. The emergency supervision of the limit switch is reactivated at the end and the reference drive is completed.

Strategy 5:
With the reference strategy 5 the axis will be referenced by means of a reference switch and zero impulse. There will be moved with the parameterized reference speed in the direction of the reference switch with the start of the reference drive, with which the evaluation of the zero impulse of the corresponding axis is activated. As soon as the reference switch is operated, the reference position is taken on ***at the first following zero impulse***.

After recognized reference position, the axis will be braked, the direction of the movement will be inverted and the parameterized ***free drive position*** with the parameterized ***free drive speed*** will be approached and the reference drive is completed.

If the axis is already on the limit switch at the start of the reference drive, then the axis is free driven as before with the parameterized reference speed from the limit switch. The described course is automatically started afterwards.

16 Parallel operation

Numbers of parallel marker [1..5] (Custom172)
min.loading capac. parallel mode [mm] (Custom173)
Distance between parallel widths [mm] (Custom174)
Width of parallel widths [mm] (Custom175)
Parameter group: Cutting parameters -> Parallel mode

If the parameter „***Reference mode***“ is set on value 4 (parallel) it is possible to process markers on parallel laying fabric plies even over more cutting windows.

Each marker, which is inserted into the jobqueue, must be given the number of the track on which it should be cut. Values are allowed as the number of the track up to the value of the parameter "***Numbers of parallel marker***".

The number of the track is shown in the jobqueue window afterwards. Note that all markers of a chain must lie on the same track. First, the markers of the first track are loaded.

Automatically as many markers for track 1 are loaded as fit on the entire length of the working area. All will be referenced one after the other. Afterwards, the light pointer drives automatically to the possible start point of the first marker on the second track. The markers of the following tracks become referenced in the same way as track 1.

If the referencing of the markers of a track is finished, although there is still space for further markers, the <Tab> button allows referencing of the markers of the next track to begin. Non-referenced markers will be taken on automatically into the next cutting window.

If all markers are referenced the cutting process begins. If a reference mark should be carried out this is carried out per track, at the end of last window. NextGen checks each track independently, after finishing the bitefeed, whether markers can be reloaded. If this is the case, the jobqueue is searched for corresponding markers and these are reloaded according to required space. The parallel operation will be continue until the jobqueue is empty.

How many tracks should be processed side by side must be set with the parameter "***Numbers of parallel marker***". The minimal length of the material track that must be free is fixed the "***min.loading capac. parallel mode***", so that the next marker will be reloaded automatically.

17 Fabric repeat referencing

x-measure fabric repeat [mm] (Custom260)
y-measure fabric repeat [mm] (Custom261)

The fabric repeat referencing enables you to check the coordinates of a fabric pattern before cutting the material. Normally, the pattern repeat is not distorted in the x-direction. In the y-direction the repeat lines of the fabric pattern can deviate by varying amounts.

For example, it is demanded that only fabrics with a deviation of not more than 2% within a cut part can be cut and a typical part measured: 600 mm * 400 mm, then this means with a fabric pattern that exists from points from 3 to 4 mm diameters in the repeat distance from 10 to 12 mm, that the deviations must lie in the area + - 1 mm.

In order to determine the percentage value of the deviation in each case with the ***fabric repeat referencing***, you can proceed as follows:

1) Laser pointer of the machine positioning by hand on the middle of a screen point and afterwards entering the function *<fabric repeat referencing>* at the keyboard.

2) The menu appears *<fabric repeat referencing>* with the two input fields for the x - and the y-measure of the part. Then, if the values there are still valid, confirm with the <Return>-key; otherwise, valid values must first be entered.

3) The laser pointer is moved automatically by the x-measure into positive x-direction and the machine is switched into manual operation.

4) Now you have to position the laser pointer by hand on the middle of the next repeat and confirm the conclusion of this action.

5) The machine is moved automatically vertically to the basic line defined by the y-measure in the positive y-direction and is switched back again into the manual operation.

6) Now position the laser pointer on the middle of the next repeat and confirm.

7) NextGen calculates automatically from the three reference points the fabric repeat error and shows you this value.

18 Special versions (Option)

18.1 Vacuum control (Option)

Vacuum value [%](Custom135)
Parameter group: Machine -> Vacuum

This is the vacuum value as a % of the max. set vacuum during cutting. (see chapter V – user parameter)

Vacuum value for uncontr. interval [V] (Custom142)
Parameter group: Machine -> Vacuum

At cutters with adjustable vacuum, the SPS must receive a digital transfer signal during the bitefeed in order to avoid an increase in the vacuum frequency regulation. Parameters for the adjustment of the P-controller of the vacuum control, these parameters are set at the initial commissioning and are not altered afterwards.

Point for vacuum correction value [V] (Custom136)
Parameter group: Machine -> Vacuum

Maximum start voltage for full vacuum for the frequency converter

Identification line vacuum x1 [mbar] (Custom137)
Parameter group: Machine -> Vacuum

This is the minimum vacuum (with 0 control of the frequency converter for the vacuum-pump).

Identification line vacuum x2 [mbar] (Custom138)
Parameter group: Machine -> Vacuum

This is the maximum vacuum (with full control of the frequency converter for the vacuum pump).

Identification line vacuum y1 [V] (Custom139)
Parameter group: Machine -> Vacuum

Minimum exit voltage of the pressure sensor with 0 vacuum

Identification line vacuum y2 [V] (Custom140)
Parameter group: Machine -> Vacuum

This is the maximum exit voltage of the pressure sensor with full vacuum.

Tolerance vacuum [mbar] (Custom141)
Parameter group: Machine -> Vacuum

Max. tolerance from the set vacuum value. If the value falls below, the cutter control sends an error message or stops the cutting process by activating the 'pause' function.

18.2 Vacuum zones

Width of vacuum sections [mm] (Custom143)
Parameter group: Machine -> Vacuum

Some cutters are subdivided in different vacuum zones (same width each). The different zones can be switched on and off separately. The value of the parameter ***Width of vacuum sections*** defines the width of the sections.

18.3 Special version with clearing robot

Special version with robot [Y/N] (Custom181)
Number bitefeeds until dead zone [ ] (Custom182)
Parameter group: Special versions -> Robot

Special version: Cutters with a robot that clears the cut parts.
For the clearing of the cut parts with help of a robot, a special bitefeed operation is used. The cutter has no clearing bristle, instead of it the conveyor belt will be subdivided into a cutting zone and a dead zone, with robot clearing within the dead zone. The drive area of the bridge is restricted to the cutting zone. Then one cuts in continuous operation, always the same marker. The calculation of the cutting windows and advancing of the markers takes place so that, in each case, one part of the marker will be cut and then advanced into the dead zone. The parameter "***Special version with robot***" must set on <Y> in order to activate the robot operation.

The parameter set up of the table takes place as follows:

Left bitefeed reserve = beginning reference point - min_xTable

Right bitefeed reserve = table length - left reserve – cutting window width

Over a digital connection the cutter gets a decontrol signal of the robot. As soon as the first part reaches the dead zone, the robot can clear these parts. The first part reaches the dead zone, as soon as the first ***Number bitefeeds until dead zone*** acc. parameter is enforced. Now, the cutter software sends a signal to the robot so that the clearing can begin.

18.4 Automatic fabric feeding

Automatic fabric feeding [J/N] (Custom42)
Reserve for feeding [mm] (Custom41)
Y beginning reference point [mm] (Custom43)
Parameter group: Special versions -> Automatic feeding

In case of single ply cutting the fabric can provide from the cradle. If a marker is finished a roll change will happen. In this case it is necessary that the dividing cut is carried out always at exactly the same position at the end of the bristles. For the fabric lays still on the table the cradle can not rewind it anymore.

Therefore the control software provides the function that at start of a marker respectively a marker chain the bitefeed will be calculated and carried out automatically on dependence of the cutting window size.

Open the parameter dialogue and set for the following parameters the right values:

`Autom. Bitefeed [J/N]:`
In this case you have to set <J> for yes if the automatic bitefeed should be carried out. Otherwise you have to set <N> for no.

`Reserve for Bitefeed [mm]:`
The way which the bristle conveyor covers to feed the fabric, results from the length of the loaded marker plus these parameter value.

`Y Beginning reference position [mm]:`
After finishing the automatic bitefeed the reticule light is set in X on the automatic calculated beginning reference position and set in Y on the position which is given through the parameter.

Semi automatic process
If you choose a marker referencing with parameter the semi automatic process will happen. In this case the operator has to confirm the bitefeed.
After loading the marker and a suitable parameter set you have to start with the „***Jobqueue Start***“ as usual. Now a window will open on which you are asked to confirm the automatic fabric feeding.
After confirmation, the bristle conveyor will push the fabric automatically with the calculated distance on the table. At the same time the light pointer will position on the calculated beginning reference position. Then the correction of marker position will start as usual.

Automatic process
If you don’t choose the marker referencing the automatic process will happen. In this case the complete cutting process will run without interfere of the operator.
The processing of the jobqueue will start as usual. The marker and the parameter set will load automatically. Afterwards the bristle conveyor will push automatically the fabric with the calculated distance on the table. At the same time the light pointer will set on the calculated beginning reference position and the cutting process will start.

18.5 Automatic bitefeed with expansion device

Automatic fabric feed [J/N] (Custom184)
Offset for fabric feed [mm] (Custom185)
Speed of fabric feed [m/min] (Custom186)
Parameter group: Special versions

For the single ply cutter with fabric loading device NextGen offers the possibility to integrate the function for the fabric feed with the cutting.

When the parameter "***Automatic fabric feeding*** " is set on “Y” for yes, the automatic fabric feed is activated.

Fabric is fed with the distance of the conveyor advance plus the value set in the parameter "***Offset for fabric feeding***". The speed of the conveyor advance is fixed with the parameter "***speed for fabric feeding***".

18.6 Fabric end detection

With fabric end detection [Y/N] (Custom180) (Option)
Parameter group: Special versions

Used when cutting single ply. If a light barrier (magic eye) is installed at the fabric feed to the cutter, NextGen automatically recognizes if the material runs out (end recognition) during the bitefeed. If the bitefeed is finished the user must mark the position of the fabric end on the cutting table. Then NextGen tests whether all parts of the marker can be cut on the remaining fabric, if this is possible cutting continues. If this is not the case all parts that do not fit become separated automatically and stored as separate marker. These parts can be cut on a new ply or on a fabric remnant.

If you do not want to activate the semi automatic separating of the parts at the material ends, put the parameter automatic material end-recognition to <N> for no. If you would like to activate it put the parameter on <Y> for yes. In this case, the single or step layer mode must be selected as reference mode.

If the signal which is fixed at the fabric roll suspension recognize the end of the fabric during the bitefeed respectively a „break“ will carry out during bitefeed, the automatic process will stop after bitefeed is done and you will be asked „Cutting section will start now, carry out fabric end, fabric end dedection (J/N)?“.

The check will happen for every bitefeed section as soon as the end of fabric respectively the bitefeed break is recognized. The check will also happen if the marke can cut in a section and no dividing is necessary. This cutting section will be treated then as the last cutting section.

After completion of the bitefeed, you can look whether the fabric end still lies around the cutting window or if it is much longer than the cutting window. Look at the useable fabric end - for example, the last part of fabric may be damaged and the useable end may be have some distance before the actual fabric end.

Continue cutting, no fabric end marking necessary
There is plenty of fabric so cutting continues. You therefore set <No>.

If the process is however one of the cutting windows before the last cutting window and the fabric end will tower above the cutting window, cutting continuous and the checking process of fabric end will be shift into the next cutting window which is the last cutting window but it can also be a previous cutting window. In this case NextGen will realize that the above question has to question once more.

Fabric end marking necessary

If there could be insufficient fabric the cutting finishes if the operator answers with input of <Yes>. Now the following course of action occurs:

- The laser pointer of the cutter moves automatically to the end position.
- NextGen switches automatically into joystick operation.
- You move the laser pointer to the fabric end.
- Press the "confirm" key or use the key <ENTER> on the keyboard.
- NextGen displays the position on the marker on screen. All cut parts that are affected by this joystick position, as well as all parts that are in the marker but outside the fabric are marked. Leave the graphic by <Tab>.

The cutter software automatically finds which parts can no longer be cut, separates these and stores them in a separate marker. Afterwards, automatic cutting is continued for the parts that fit within the fabric.

18.7 Cutter with spray device

Cutter with spray device [Y/N] (Custom183)
Parameter group: Special versions

As an alternative to the crayon, a spray device can be used for spraying a line, for quilting lines or seams, for example. If a resealing foil is used after drawing and the liquid is not yet dry, the liquid smears on the covering foil.

If value of the parameter ***Cutter with spray device*** is entered as <Y>, the following sequence will be carried out:

- Cutting
- Lifting the foil unwinding blind
- Drawing of the quilting/seam
- Bitefeed with foil unwinding blind lifted

18.8 Cutter with ink-jet printer head

Print direction (0=wie progr., 1=hor, 2=vert) [0,1,2] (Custom291)
Parameter group: Special versions

The ink-jet printer which will fit at the cutting head to print the text can only print either horizontal or vertical. Because this the printing direction will set with parameter „***Print direction***“.
0: The printing string will be printed as programmed
1: Printing exclusive horizontal
2: Printing exclusive vertical

18.9 Knife neutralization

Count off L/P to Offset-correction [ ] (Custom107)
Delay for offset-correction [ms] (Custom108)
Delay until offset-correction [ms] (Custom109)
Parameter group: Knife -> Knife intelligence

Some cutters are equipped with knife neutralization to help avoid bending of the blade under high side loads. On cutters with knife neutralization an offset equalize of the knife (C-axis) takes place before each new segment during the cutting of a marker. The counting of segments begins afresh with each start of a marker. The offset correction will be enforced after every reference drive. The respective offset correction values are recorded in the logfile for control, /FILEMESSER if you start NextGen with the program switch /FILEMESSER.

Since the statistical offset failure is only measurable and rectifiable in oscillating condition, the cutter must be wait a parameterable time before and after the offset correction.

Scale of knife intelligence [V] (Custom95)
Offset knife intelligence [V] (Custom96)
max. value knife intelligence [V] (Custom97)
min. value knife intelligence [V] (Custom98)
+- value insensitive zone [V] (Custom99)
Parameter group knives -> knife intelligence

If the knife intelligence is controlled over CNC 5 download parameter will send to the MBSS. A sensor signal will measure the crooked position of the knife. A value of ***Offset knife intelligence*** means that there is no crooked position***.*** You can scale the signal with parameter ***scaling knife intelligence***. If the value of the parameter is set on zero no internal knife neutralization will happen. The sensor signal will be limited according to the parameter ***min./max. value knife intelligence***. If the sensor input value is ***+-value insensitive zone***, knife neutralization will not happen.

- If the cutter has no knife intelligence you have to set the parameter ***number of stitches offset correction (Custom107)*** on ZERO.

- If the cutter has an external knife intelligence the parameter ***number of stitches offset correction (Custom107)*** is > ZERO and at the same time the parameter ***Scaling knife intelligence (Custom95)*** has to set on = ZERO.
- If the cutter has an internal knife intelligence the parameter ***of stitches offset correction (Custom107)*** > ZERO and at the same time the parameter ***Scaling knife intelligence (Custom95)*** has to set on = ZERO.

18.10 Feeding from both sides

Rotary cutter with two tables [Y/N] (Custom 178)
Parameter group: Special versions

If a cutter has two cutting tables the fabric to be cut can be supplied from both sides. Dependent on which side the material is supplied from, other parameters might need to be changed.
If the value of the parameter is set on <J> the check box “material left” will appear above in the jobqueue work dialogue. The operator has to enter before loading from which side the material will feed.

Before loading of the marker is carried out, NextGen automatically loads a parameter sentence (MLINKS.XPR or MRECHTS.XPR) for the left as well as for the right half of the table. Within this parameter sentence the start reference edge can be defined; for example, if the user of the cutter wants a different start reference edge for each half of the table. On this occasion, because of adaptation at line direction, the parameters stated automatically in the parameter sentences through NextGen are spun - reversal of the cutting sequence, separation cut with Xmin, start reference point.

18.11 Cutting orders over fabric roll storing system

Jobqueue of Storage system [Y/N] (Custom153)
Parameter group: Special versions

If the unrolling device is fed with fabric rolls from an automated fabric roll storing system, the cutting orders for the fabric rolls can be made with the fabric roll storing system. The cutting jobs are deposited in a file and will be read from NextGen.
When the parameter ***Jobqueue of storage system*** is set on <N>, NextGen works in the usual way. When the parameter is set on <Y>, reading of the cutting jobs will take place over a file which was made available from the fabric roll storing system.

If the processing of a jobqueue generated by the fabric roll storing system is broken off, the rest of the jobqueue, which is not yet worked, will be secured with the function ***Quit and save jobqueue***.

As soon as the function is chosen, the current marker will be cut ready. Afterwards, the markers already cut will be deleted from the jobqueue. You can store the jobqueue under any name.

CHAPTER VII

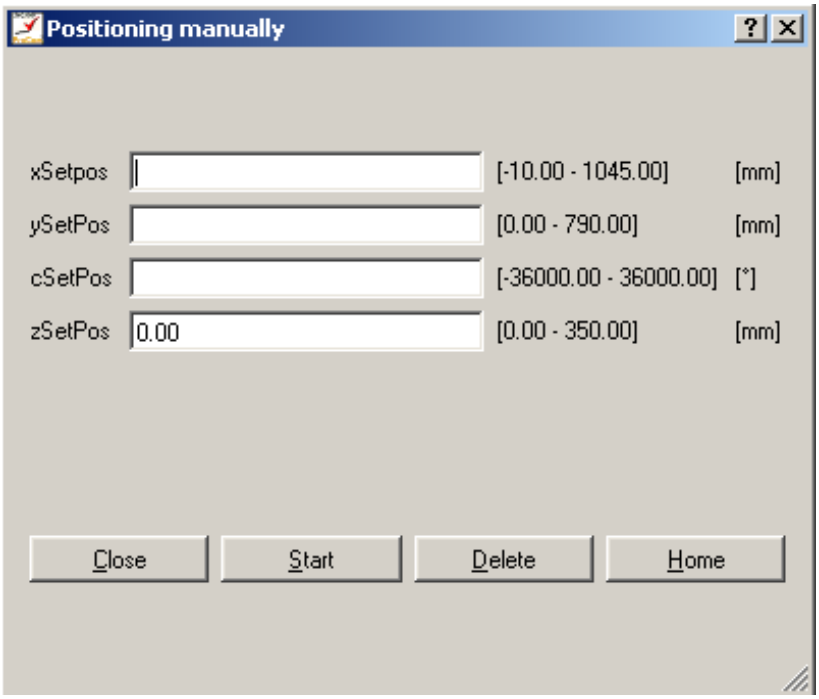
Maintenance and technical Data

Table of Contents – Chapter VII

1 Service functions

1.1 Positioning machine

If the function *CNC -> Manual positioning* is chosen, a window is opened, in which you can input values for the axes **X** (movement of the bridge on the table), **Y** (movement of the cutting head on the bridge), **C** (rotation of the knife) and **Z** (bristle conveyor). By selecting the “Start” button the machine is positioned.



Picture 1: Menu "Machine positioning"

To do this the machine must be in the AUTOMATIC MODE.

X- AND Y-AXIS:

With help of this function, the machine can be positioned at an absolute coordinate with reference to the machine origin. Put in the desired position value and confirm with the “Start” button. Positioning takes place provided the value is within the allowable borders.

C-AXIS:

To position the C-Axis, you input the desired angle, in degrees, and confirm with the “Start” button. The C-Axis then turns to the desired position.

Z-AXIS:

If a value in millimeters is entered in this input field and this is confirmed, the bristle conveyor moves by the entered amount. The positioning of the Z-axis can only take place with the vacuum switched on.

1.2 Display condition of digital IO

Using the function *Windows -> Digital inputs* the following window is opened:

Picture 2: Display digital in-/output

You can see on the colour of the displayed LED if the corresponding entrance is 1 or 0.

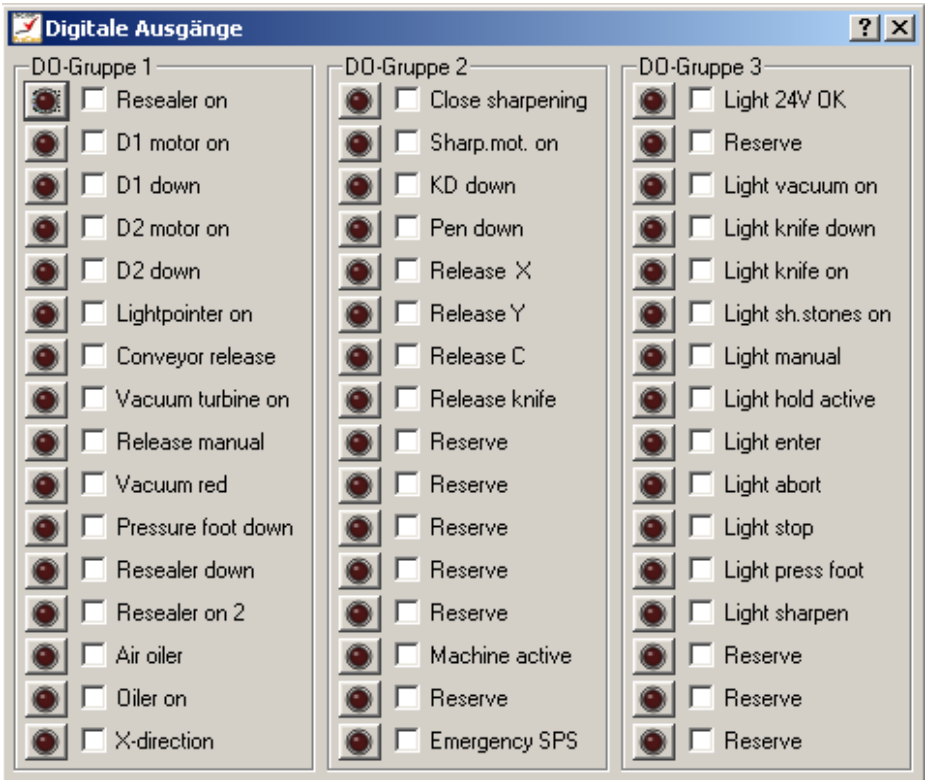
1.3 Switch digital outputs

NextGen offers the possibility, to manually switch the DO's (digital outputs).

ATTENTION :

These switch-functions are used for service purposes – if used incorrectly they can lead to damage!!!

If the function *Windows -> Digital Outputs* is chosen the following window opens:



Picture 3: The menu switch outputs

In the list of the digital outputs a checkbox is placed beside the displayed LEDs. Only when the checkbox is selected, the corresponding output can be switched by clicking onto the displayed LED.

The outputs can only be selected, when the password is entered before.

IMPORTANT NOTE:

If you manipulate one of the exits through choosing the check box (mark) you have to pay attention absolutely that you switch off the check box before you leave the window.
The mark then will delete and the exit can take on the condition which is given from the program. Make sure that before you leave the window all marks are removed.

If this will not happen a perfect PLC function can not guaranteed.

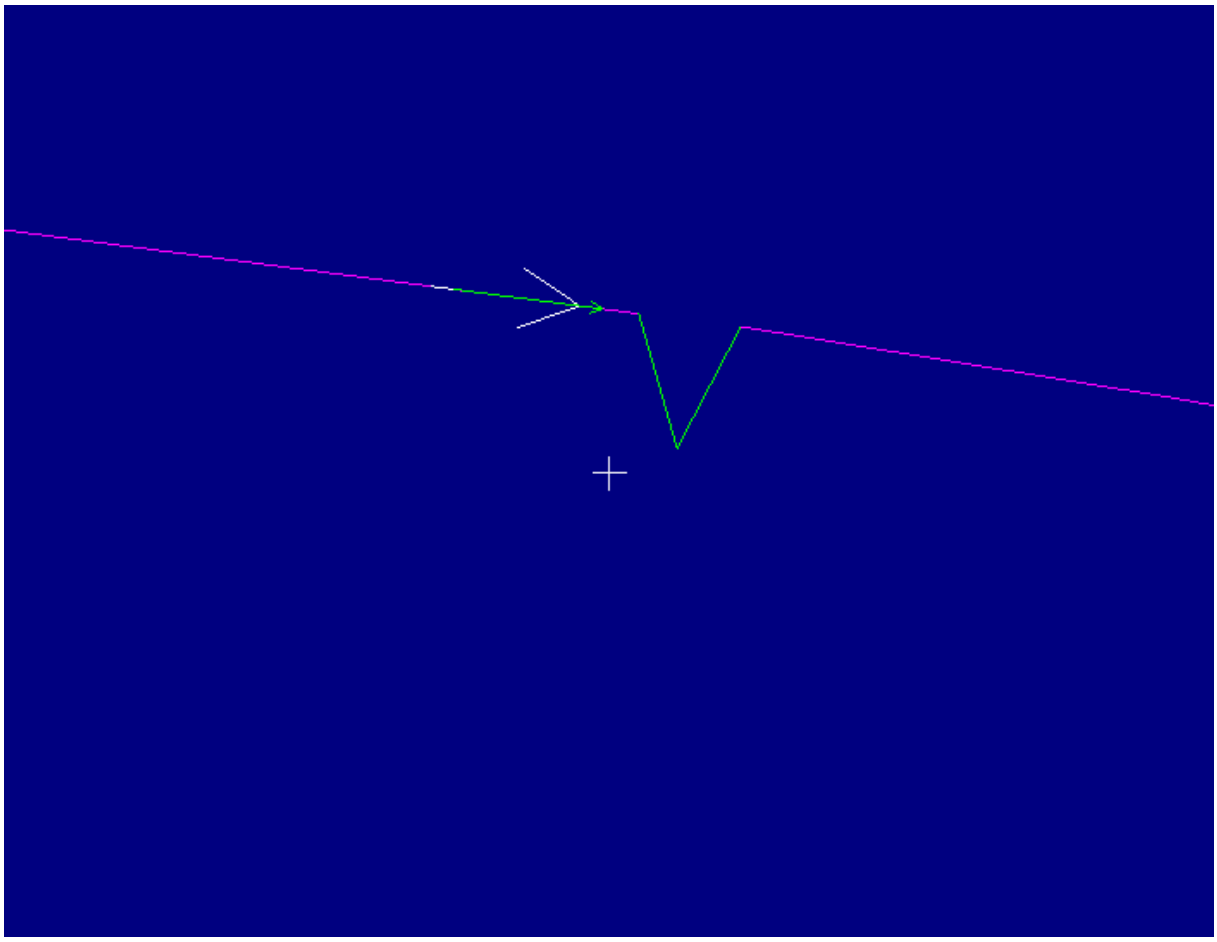
1.4 Keys for machine functions

Important machine functions can be switched with key combinations. The following functions are available:

Shortkey	Function
Strg + F1	Drill (M43)
Strg + F2	Helpdrill (M44)
Strg + F3	Switch over from automatic operation into manual operation (amplifier no longer in control)
Strg + F4	Thread out at the cradle
Strg + F5	Sharpening
Alt + F1	Digital I/Os Group 1
Alt + F2	Digital I/Os Group 2
Alt + F3	Digital I/Os Group 3

1.5 Reconstruction

With the function *Graphics -> run measuring list* you can reconstruct the cutting course after a cutting process. The position of the knife is represented on the cutting contour.



Picture 4: The reconstruction

It is shown the debit and the actual position of the knife. Furthermore, the x -, y - and c-position of the knife is shown and the deviation to the actual position.

The reconstruction is started with the function *Graphics -> Run measuring list*. The function *Graphics -> Next point* halts the knife. *Graphics -> Next point* shows the next, and *Graphics -> Prev. point* the preceding, knife position.

1.6 Markers for adjustment purposes

In a separated table, you find some markers, which were produced for test - and adjustment purposes. If the table statement is not altered with the installation, these are in following table:

C:\NEXTGEN\TESTFILE

The test files are used for testing and adjustment of machine parameters and should be cut, with foil and under vacuum, on paper.

The list of the markers is:

Marker name	Application-purpose
QUAD200.ISO	The square with 200 millimeters of edge length can be used for checking of the tool offsets (x - and y-distance to the light pointer) for the knife. Before the cut the start point, which is approached with the light pointer, must be marked on the foil. Since the marker consists of only one square, the start point of the marker corresponds with the corresponding edge of the square (left low edge of the square with left execution, right low corner of the cutter with right execution). You can check after the cut, whether the edge of the square (the cut contour) is exactly on the marked light pointer position. If this is not the case, the values of the parameters "x-Offset knife" and "y-Offset knife" must be corrected accordingly.
QUAD400.ISO	The square with a edge length of 400 millimeters, is used, to check the accuracy of the x - and y-axis. The edge length of the square - cut from the paper – must be precisely 400 millimeters. If deviations in length or width occur, the corresponding parameter (dissolution x-axis or dissolution y-axis) must be corrected.
QUAD.ISO	Checking of the parameters dissolution x-axis or dissolution y-axis (sees QUAD400.ISO). This test file can also be used in order to check whether the bridge is standing diagonally on the machine table. If the bridge is not standing straight, the parts do not meet each other in x - and in y-direction in a 90° angle (parallelogram). This becomes clear if the cut square is folded diagonally.
KREUZ43.ISO	Checking of the bore offsets for the drill (M43). At right attitude of the tool offset (parameter "x-offset drill and "y-offset drill"), the boring must be precisely on the intersection of the cutting-lines..
KREUZ44.ISO	Checking of the bore offset for the help drill (M44), if a second drill marking device is existing. At right attitude of the tool offset (parameter "x-Offset Helpdrill" and "y-Offset Helpdrill") the boring must be precisely on the intersection of the cutting-lines.
NOTCH.ISO	Adjustment of the tool offset for the notch (Only for machines with separate notch tool). The pinches must be exactly in the middle of each edge of the square and must show all the pre-determined pinch depth. With deviations, the parameters "x-offset notch" "y-offset notch" and "pivot notch" must be changed.
QUADPEN.ISO	Checking of the tool offset for the pen (Only for machines with crayon). The x - and y-offset for the Pen is adjusted if the cutting-

	contour disagrees with the drawn contour (Parameter "x-Offset Pen" and "y-Offset Pen").
MPOINT.ISO	For adjustment of the tool offset for the camera. After the marker was cut, it must be started at the same start point. In the camera representation, the matching point must be represented on the cut edge in each case. With deviations, the parameters x-offset camera and y-offset camera must be modified.
CTEST.ISO	For adjustment of the C-axis. Two circles and two rectangles will be cut once clockwise and cut once counterclockwise. If the two circles are not equally big, this points out that the pinch is not in the mechanical pivot of the knife drive (knife guiding).
MT.ISO	Control of the knife position, knife opposition. The marker consists of four punctures, opposite in pairs. A puncture with a C-position of 0 degrees, opposite a position of 180 degrees. A puncture with the position 90 degrees opposite a puncture with 270 degrees. The opposing punctures should be in a line. If these are moved at the side, these points out that the pinch is not in the mechanical pivot of the knife drive (=> adjustment of the knife guidance).
QUAD16.ISO	16 meters long marker, existing from squares with in each case 1m edge length. Is used to test the bitefeed.
RAUTE.ISO	Test picture for checking the axis equalization (without use of v-list). When the amplifiers of the X- and the Y-axis are not equalized to each other (one axis reacts more slowly than the other), the edges of the rhombus show an arched course. If an edge is bent inside, the neighboring edges are bent outside and the opposite inside. If the rhombus is folded at two opposite corners, two edges lie in each case one on top of the other. An arched course of the edges becomes visible if the top edge does not agree with the edge underneath. Check by aligning the edge with a straight ruler.
DIAG.ISO	Marker for v-list (addition-function for the amplifier equalize). Diagonal is required only for the amplifier equalization with v-list.
DIAG100.ISO	Marker for amplifier equalization with v-list. Diagonal, is required only for the amplifier equalization with v-list.

2 List of dangers

No.	Type of danger	Solution principle	Acc. To standard
1	Danger through moving of the cutting bridge	Note in the operation manual Note at the machine Protective bow (EMERGENCY STOP)	EN 292 VBG
2	Danger through cutting on the cutting knife	Note in the operation manual Note at the machine	EN 292 VBG
3	Danger through crushing on the low holder or on moving parts	Note in the operation manual Note at the machine	EN 292 VBG
4	Danger through working on the machine at not switched off machine and against unintentional switching on of the protected machine	Note in the operation manual Note at the machine	EN 292 VBG
5	Danger of crushing on the conveyor, on transfer or moving of the machine (Mover-Cutter)	Note in the operation manual Note at the machine	EN 292 VBG

3 EG-Konformitätserklärung / EC Conformity Declaration

im Sinne der EG-Richtlinie Maschinen 89/392/EWG
in accordance with the EC-Machine Directive 89/392/CEE

CE

Wir erklären hiermit, daß die Bauart der Maschine

We hereby declare that the type of the Cutting Machine complies with the following regulations:

Fabrikat:	**topcut-bullmer Cutter**
Typenbezeichnung:	**Procut/Turbocut / Premiumcut / Unocut**

folgenden Normen und Bestimmungen entspricht:

Complies with the following applicable regulations:

-EG- Richtlinie Maschinen 89/392/EWG zuletzt geändert 93/68/EWG
EC- Machine 89/392/CEE, last amended by 93/68 EEC
-EG Niederspannungsrichtlinie 73/23/EWG zuletzt geändert 93/68/EWG
EC- Low-voltage Directive 73/23 CEE, last amended by 93/68 EEC
-Elektromagnetische Verträglichkeitsrichtlinie (EMVR) 89/336 EWG zuletzt geändert 93/68/EWG
Electromagnetic Compatibility Act (EMVG) 89/336 EEC, last amended by 93/68 EEC

Folgende harmonisierte Normen sind angewandt:

Applied congruent standards:

DIN EN 292-1, Sicherheit von Maschinen, Geräten und Anlagen, Grundsätze.. DIN EN 292-1, Safety of machinery, principle for risk
DIN EN 292-2 Sicherheit von Maschinen, Technische Leitsätze und Spezifikation DIN EN 292-2 Safety of machinery, basic concepts, general principles
DIN EN 60204-1 Elektrische Ausrüstung für Industriemaschinen DIN EN 60204-1 Electrical equipment of machine
DIN EN 50081-1 Elektromagn. Verträglichkeit. Fachgrundnorm Störaussendung DIN EN 50081-1 Electromagnetic compatibility- Residential, light industry
DIN EN 50082-1 Elektromagn. Verträglichkeit. Fachgrundnorm Störfestigkeit DIN EN 50082-1 Electromagnetic compatibility- Immunity, light industry

Folgende nationale Normen, Richtlinien und Spezifikationen sind angewandt :

Applied German standards:

UVV VBG71 Unfallverhütungsvorschriften

_____ _____

Ort, Datum / Place, Date Unterschrift / Signature Titel Unterzeichner / titel of signature

4 Technical Data

Working widths		1600 mm; 1800 mm; 2000 mm; Special widths on request
Working lengths		acc. to execution
Max. cutting height		acc. to execution 1 ply up to 75 mm (under vacuum) acc. to material
Working height		approx. 860 mm
Max. positioning speed		acc. to execution up to 100 m/min.
Max. cutting speed		acc. to execution up to 100 m/min.
Material support system		acc. to execution Bristle segments resp. air permeable cutting underlay
Max. acceleration		acc. to execution Up to 1,5 g (= 9,81 m/s^2)
Data format		ISO; Gerber-Standard-Data format
Data transmission	Offline	- 3 1/2" disk - Hard disk
	Online	- network (Ethernet or similar)
Connection values		400 V / 50 Hz Special voltages on request
Energy consumption	Vacuum device	acc. to execution
	Cutter	acc. to execution approx. 4,0 kW
Compressed air consumption when cutting		200 l/min at 6 bar
Influence from surroundings		The voltage in the lines to the control cupboard must be stable (max. tolerance +/- 5 %). The environment (rel. humidity and temperature) should be adapted to suit the material being processed (air conditioning).

Diese Gebrauchsanweisung wurde nach bestem Wissen und Gewissen verfasst und geprüft.
Topcut-bullmer haftet jedoch nicht für eventuelle Irrtümer und behält sich das Recht zu technischen Änderungen ohne Ankündigung vor.

These instructions have been written and checked to the best of our knowledge and belief. However, topcut-bullmer will not be liable for errors and reserves the right for changes at any time without notice