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BOBST DOC tech

Converting tools and production

AUTOPLATINE® SPO

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abc

BOBST GROUP

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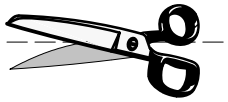

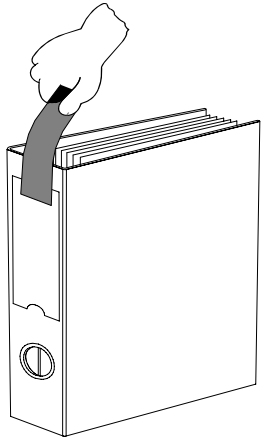

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Summary

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Preface

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General

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Safety

The instructions regarding the safety are described in a chapter printed on yellow paper. Before proceeding to any operation on or with the machine, operators, operator helpers, mechanics, electricians, persons responsible of the machine and its production or anyone else who comes into physical contact with the machine are imperatively asked to read this chapter.

Reserve

Some of the items shown in this manual are available as options. Only those items will be supplied which figure in the order confirmation of BOBST SA.

Reader's comments

Please submit any remarks or suggestions that might help us to improve this manual.

When applying to us, please do not omit to mention the manual number.

- Make a photocopy of each page concerned, noting your remarks or suggestions.
- Send these pages together to the address indicated below.

Additional orders

To purchase other copies of this document, contact the BOBST Technical Documentation at the address indicated, specifying the manual number.

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Dimensions

All dimensions of illustrations, diagrams and tables are given in millimetres (mm). A table for conversion of metric units (mm) into US units (inches) is provided at the end of the manual in chapter ”Various information”.

Abbreviations

os operator’s side

oos opposite operator’s side

Symbols

This manual uses symbols to make certain illustrations easier to understand.

Correct

Wrong

SP/SPO Standard

Machine running direction

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Safety and environment

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General safety instructions

Introduction

You should read and understand these instructions if you are an operator, set-up person, mechanic, maintenance person, a helper or assistant to any of these people, or anyone else who comes into physical contact with the machine and if you have administrative or supervisory responsibilities for the operation, maintenance, and use of the machine.

If there is anything about the instructions or about the machine that you do not understand, speak to your supervisor before you touch the machine.

YOUR FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE SERIOUS INJURIES TO YOU OR TO SOMEONE ELSE.

Manuals and directions for use

The manuals supplied by the manufacturer with the machine or after its delivery contain directions for use and must be made available to any person working with the machine or having any responsibility with regard to it.

Anyone who will be working with the machine must read and understand the directions before beginning work on the machine. The directions must be followed by all workers.

The manuals must be kept in a clean location and available to anybody dealing with the machine. Everybody dealing with the machine must be notified of all revisions.

To prevent injuries to people or damage to the machine, make sure that the whole machine receives regular maintenance as described in the manual.

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General rules for all users

To prevent injuries, you must:

- read and comply with the directions supplied with the machine. Make sure the machine is operated only by people who have been trained according to manufacturer's directions.
- not use the machine unless it is in good working condition and unless all safety guards and devices as well as all machine functions work properly.
- check whether safety devices are working properly.
- never void any safety device and never prevent or stop a safety device from doing what it is supposed to do.
- immediately report any trouble compromising safety at work to your supervisor and warn any person likely to work with the machine of the trouble.
- make sure before every start-up, that no one is inside the machine, that everybody is standing away from the machine, and that no one is touching the machine.
- never put your hands, feet or any other part of your body inside the machine or near moving parts while the machine is in operation.
- never climb onto the machine while the machine is in operation.
- make sure the work area around the machine and the machine itself are clean and neat. Grease, oil, and other slippery substances are dangerous and should be cleaned up immediately. Do not leave any tools or other objects on the floor, platform or in other working areas.
- make sure that the machine is serviced according to manufacturer's directions given in the maintenance manual.
- make sure that the worker is not putting himself in such a state (alcohol, narcotics, etc.) that he might put himself or other workers in danger.

Switch cabinets

Only a qualified person is authorized to intervene inside the switch cabinets.

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Warning

Depending on the machines, the safety instructions are in a chapter ”Safety and environment” of certain manuals, or in a separate ”Safety and environment” manual.

Chapter Safety and environment

Before carrying out work on the machine, it is essential to read the safety instructions given in the ”Machine controls”, ”Machine operation” and ”General maintenance” manuals before intervening in a machine and to adhere to them during intervention. The instructions can be found in chapter ”Safety and environment” of these manuals. Watch the validities if there are several machines of the same kind.

The chapter ”Safety and environment” of these manuals contains:

- a section ”General safety instructions”, which exists also in this manual.
- a section ”Personnel protection”.
- a section ”Safety instructions for operators and operator’s helpers”.
- a section ”Safety instructions for maintenance personnel”.
- a section ”Protection of the environment”.
- a section ”Noise levels”.

Manual Safety and environment

Before carrying out any intervention on the machine, make sure that you respect the safety instructions in the ”Safety and environment” manual of the machine in question.

If you have several ”Safety and environment” manuals for the same type of machine, watch the validities.

The ”Safety and environment” manual is composed of two chapters:

- A chapter ”Safety” including:
  - a section ”General safety instructions” (which exists also in this manual).
  - a section ”Personnel protection”.
  - a section ”Safety instructions for operators and operators’ helpers”.
  - a section ”Safety instructions for maintenance personnel”.
  - a section ”Noise levels”.
- A chapter ”Protection of the environment” describing the environmental policy of BOBST in accordance with the ISO norm 14001.

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General

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Introduction

Productivity

Three criteria are necessary for obtaining a good level of productivity with the AUTOPLATEN® SPO press:

High level of production

The production phase concerns the press operator, first and foremost.

His job is to achieve the maximum production rate with a minimum number of stops. If there are stops, he has to determine their causes and remedy them quickly.

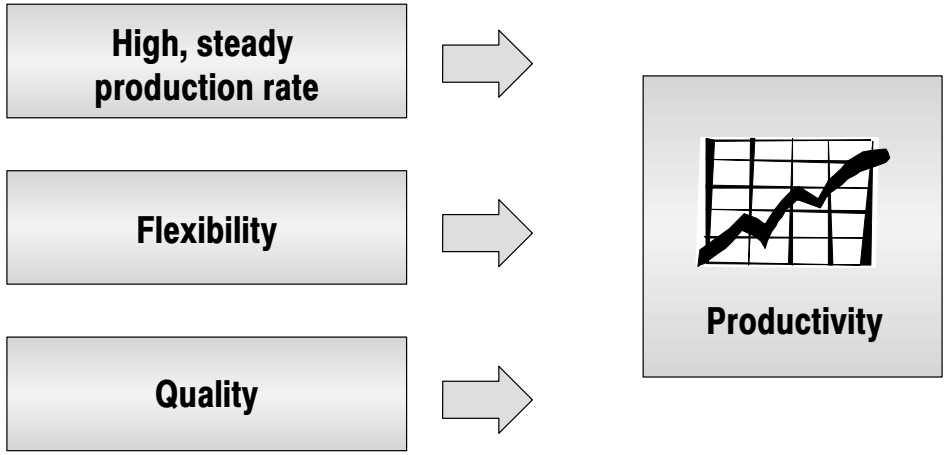
Good flexibility

Production flexibility is the ability to manufacture small batches easily. The best way of achieving this is to reduce the time needed to change jobs.

To guarantee a good flexibility and a high production rate, the job change phase must be as short as possible so that the machine downtime is kept to a minimum.

Assured quality

Total quality is obtained when quantities are observed, delivery times are met, the packaging is appropriate and the product conforms.



The quality of the converting tools and equipment is a determining factor in obtaining a high and constant rate of production, quick changeover between jobs and good quality conversion.

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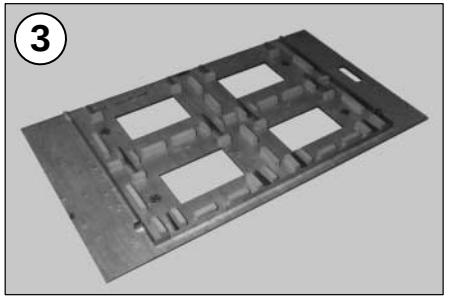
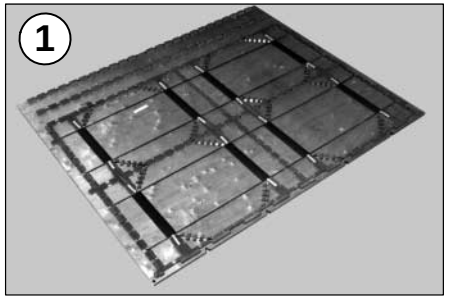
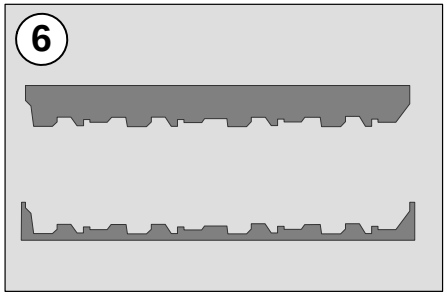
Description of the converting tools



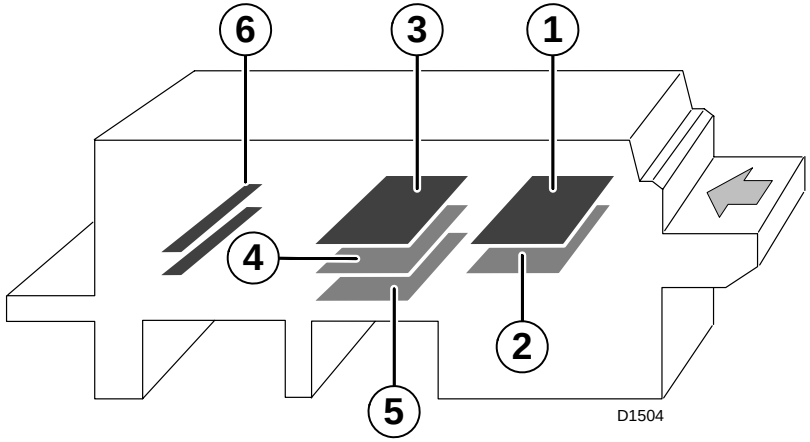
Upper stripping tool

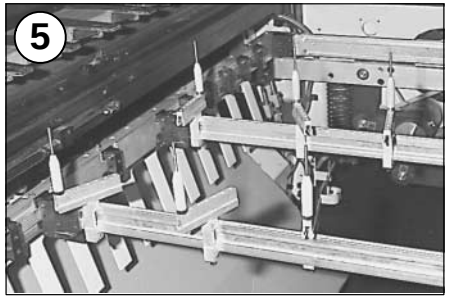


Cutting die

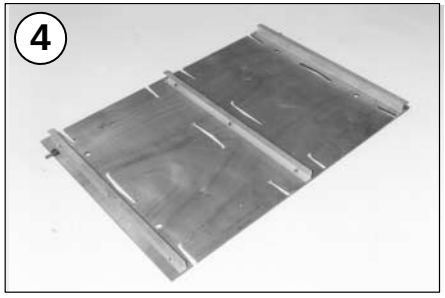


Front waste separator





Lower stripping pins



Central stripping board

Thin cutting plate

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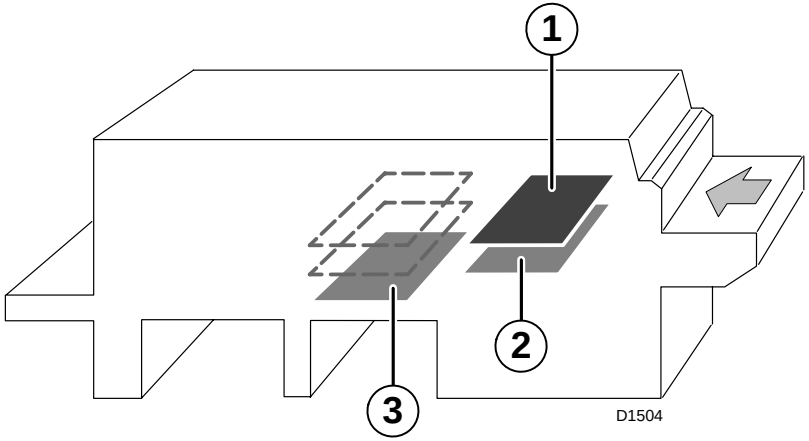
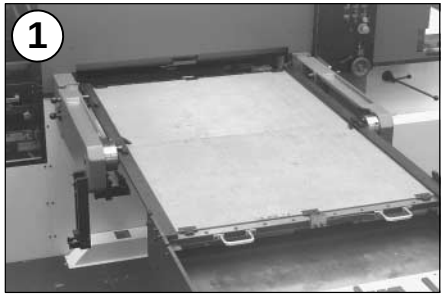
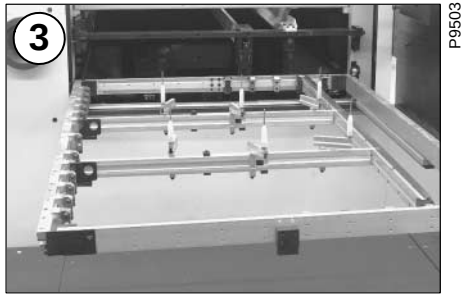
Description of the converting equipment





Chase for cutting die



pin holder frame

Supporting plate
(with or without adjustable centerings)

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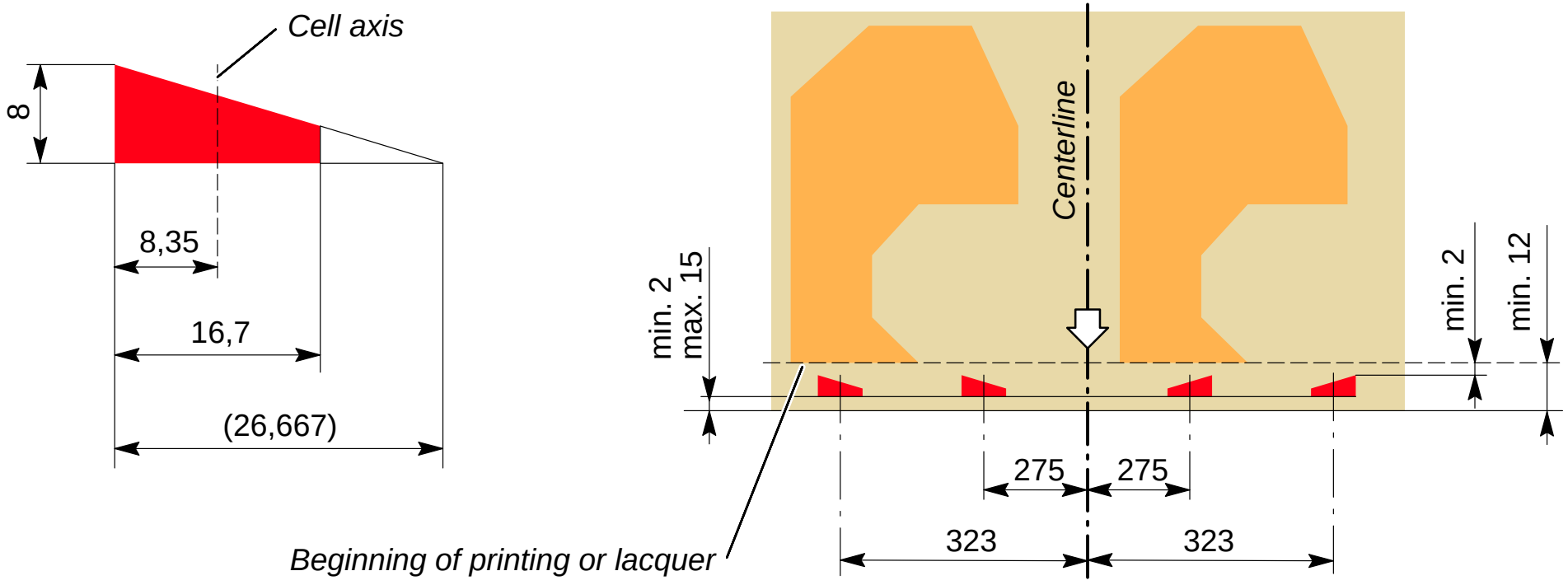
The Power Register marks

These marks must ideally be printed using the reference colour or with a well-contrasted colour.

There must always be four marks. Two marks for ”top print” scanning (dimension 275 mm) and two marks for ”bottom print” scanning (dimension 323 mm).

For the two 2 mm minimum dimensions, the ”printing-sheet front edge” register characteristics of the flexo printing line have to be taken into account in order to ensure these minimum dimensions.



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Technical data

		SPO 1575-EEG	SPO 1600	SPO 160-ER MATIC	SPO 160 A / matic / Power Register	SPO 160-S	SPO 160 VISION / Power Register	MASTERCUT 1.7
Corrugated board up to	mm	9	9	9	9	9	7	9
Solid board from	mm	1	1	1	0,75 / 1	0,75 / 1	0,75 / 1	0,75
Production speed up to	s/h	4500	6000	7500	6750 6500 Power Register	5500	4500	7500
Max. sheet size	mm	1575 x 1055	1600 x 1100	1600 x 1100	1600 x 1100	1600 x 1100	1600 x 1100	1700 x 1300
Min. sheet size	mm	600 x 400	600 x 520	600 x 520	600 x 520 ❶ 700 x 520 Power Register	600 x 400	600 x 400 700 x 400 Power Register	700 x 520
Cutting size (With front and rear waste)	mm	1575 x 1026	1600 x 1075	1600 x 1075	1600 x 1075	1600 x 1075	1600 x 1075	1700 x 1275
Height of cutting rules	mm	23,8 / 28,6	23,8 / 28,6	23,8 / 28,6	23,8 / 28,6	23,8 / 28,6	23,8	23,8
Gripper margin, adjustable	mm	15 ±3	15 ±3	15 ±3	15 $^{+3}$ $^{-6}$ ❷	15 $^{+3}$ $^{-6}$ ❸	15 $^{+3}$ $^{-4}$	15 $^{+3}$ $^{-4}$
Cutting force, adjustable up to	MN (t)	3,5 (350)	4 (400)	4 (400)	4 (400)	3,5 (350)	3 (300)	4,5 (450)

❶ *on request 600 x 400 mm*

❷ *0000/0020 = 15 ±3*

❸ *0000/0035 = 15 ±3*

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		SPO 2000	SPO 203 A / matic / Power Register	MASTERCUT 2.1
Corrugated board up to	mm	9	9	9
Solid board from	mm	1	0,75 / 1	0,75
Production speed up to	s/h	5000	5500 6250 Power Register	7000
Max. sheet size	mm	2032 x 1270	2032 x 1270	2100 x 1300
Min. sheet size	mm	600 x 520	600 x 520 ❶ 700 x 520 Power Register	700 x 520
Cutting size (With front and rear waste)	mm	2032 x 1245	2032 x 1245	2100 x 1275
Height of cutting rules	mm	23,8 / 28,6	23,8 / 28,6	23,8
Gripper margin, adjustable	mm	15 ±3	15 $^{+3}$ $^{-6}$ ❹	15 $^{+3}$ $^{-4}$
Cutting force, adjustable up to	MN (t)	5,5 (550)	5,5 (550)	4,5 (450)

❶ *on request 600 x 400 mm*

❹ *0000/0012 = 15 ±3*

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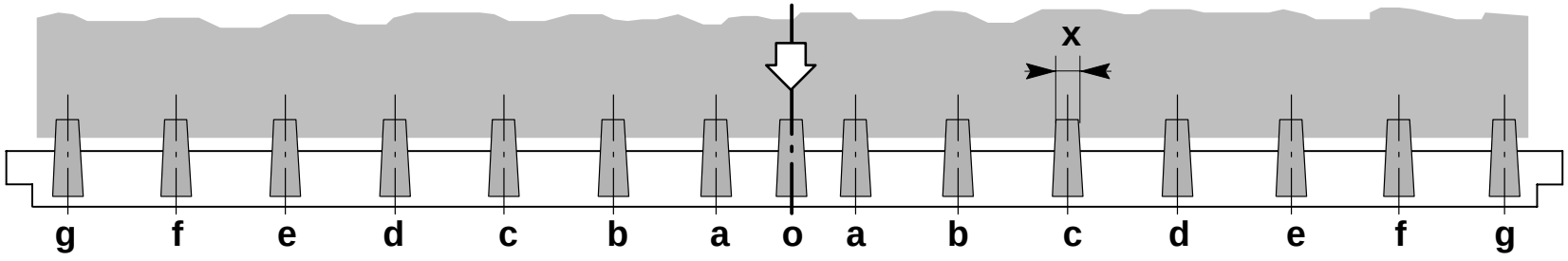
Gripper position

The standard position of the grippers with respect to the Centerline axis of the machine is shown in the table below by the letters **a - b - c - d - e - f - g.**

	o	a	b	c	d	e	f	g	x
SPO 1575-EEG		65	195	325	455	585	725		30
SPO 1600		65	195	325	455	585	715		30
SPO 160 A / matic		65	195	325	455	585	715		30
SPO 160 A / matic / Power Register		65	195		455	585	715		30
SPO 160-S		100		300	480	660			30
SPO 160 VISION ❶		100		300	480	660			40
SPO 160 VISION Power Register ❶		65	195		430	660			40
SPO 160-ER MATIC ❶		120		300	438	576	714		50
SPO 2000		65	195	340	485	630	775	920	30
SPO 203 A / matic		65	195	340	485	630	775	920	30
SPO 203 A / matic / Power Register		65	195		485	630	775	920	30
MASTERCUT **1.7 ❶**	0		223		420	590	760		31,4
MASTERCUT **2.1 ❶**	0		223		420	590	760	960	31,4

❶ *Grippers down*



General

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Job without front trim

Certain presses are designed to operate without front trim. With this method, it is imperative **never to place a cutting or creasing rule in the position of a gripper**. If this occurs, shift the imposition laterally inside the press to prevent damaging the grippers.

Another method is to remove the grippers and gripper counter-plates placed opposite a rule. This operation has to be carried out on each gripper bar of the press. Once the job is completed, do not forget to carry out the reverse operation (refitting the grippers).

Note

Operations on the grippers are time consuming and are not recommended for small runs.

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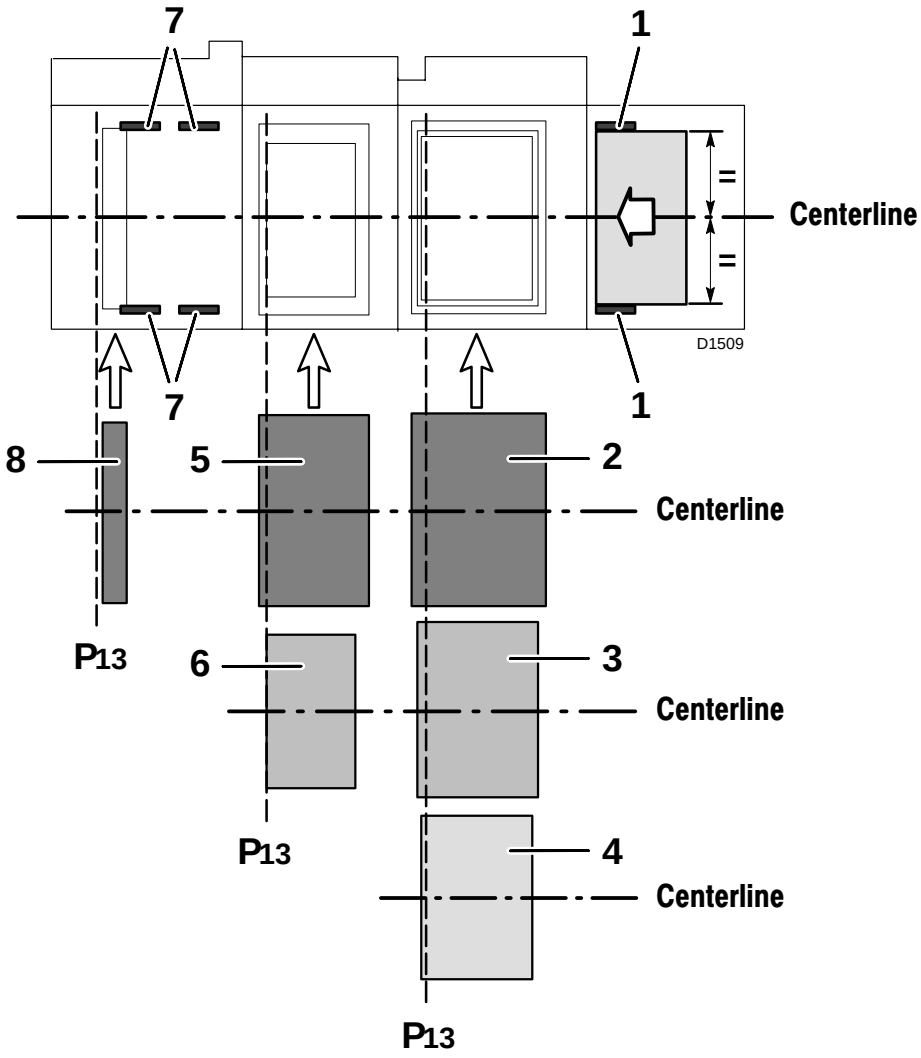
Centerline system

The Centerline system is used to reduce the time needed to put jobs into operation on AUTOPLATEN® presses. This register control device, aligned in the machine axis, offers the following advantages:

- The converting tools are prepared and set outside the machine.
- The preset equipment is positioned quickly and accurately.
- The defined settings are reused for repetitive jobs.
- The main machine sections are quickly preset to the new format.

1 Lateral guides
2 1 mm plate
3 Cutting die
4 Makeready sheet
5 Upper stripping tool
6 Central stripping board
7 Lateral joggers
8 Front waste separator



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Position of the converting tools

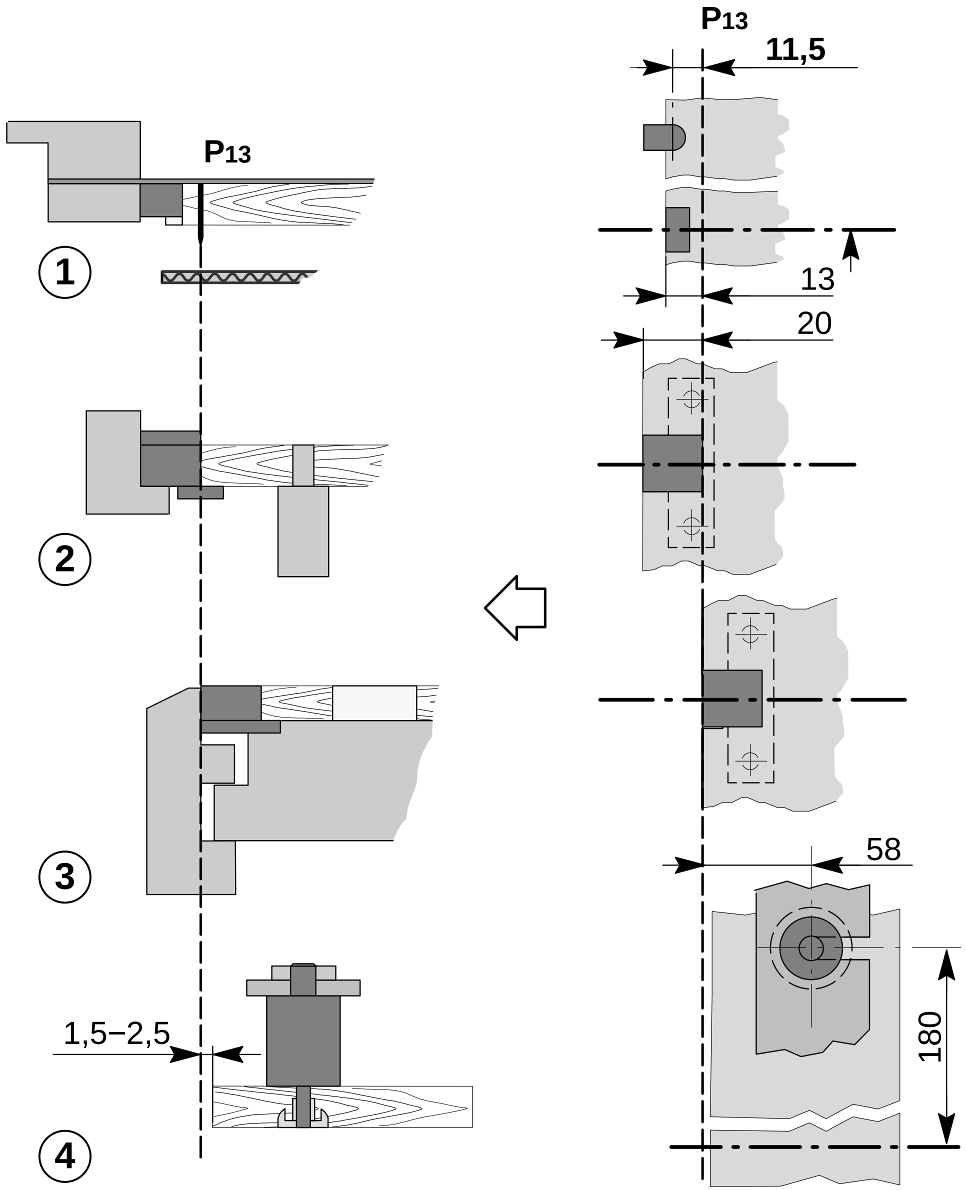
The converting tools positioning references for a press equipped with the Centerline II system are as follows:

1 Cutting die

2 Upper stripping tool

3 Central stripping board

4 Front waste separator



First rule — P13 – – – – – – – – –

Centerline —— · —— · —— · ——

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Converting tool standard

In order to ensure compatibility of converting tools between AUTOPLATEN® SP (compact) and SPO (corrugated) presses, BOBST has developed a new principle called the «**SP/ SPO Standard»**. It is based on the Centerline axis and the first rule.

Existing converting tools can be modified to become compatible with the «**Standard»** or, as the case may be, be placed in specific converting equipment to ensure their compatibility.

= **SP/SPO Standard**

General		**SP**	**SPO**	
Gripper margin	mm	9 - 17	9 - 18	9 - 17
Cutting die				
Position of first rule	mm	13	13 ❶	13
Thickness of wooden panel	mm	18	15 (18)	15 or 18 ❷
Centerline notch	mm	15 x 8	pins	15 x 8
Diameter of fastening holes	mm	5,2	10 (6)	5.2 or 10
Matrix of fastening holes		SP	SPO	SP or SPO
Height of rules	mm	23,8	23,8 (28,6)	23,8

❶ *First rule at 20 mm on the old tools.*

❷ *According to board thickness.*

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Central stripping board		**SP**	**SPO**	**S**
Position of first rule	mm		0	
Thickness of wooden panel	mm		12	
Centerline notch	mm	15 x 8	22 x 20	❸
Height of quick-locking reinforcements	mm	25	50	35 ❹
Upper stripping tool				
Position of first rule	mm	20 ❺	20 ❺	20
Thickness of wooden panel	mm		15	
Centerline notch	mm	15 x 8	22 x 20	❸
Fastening and through holes	mm	Ø 7,5	70 x 20 ❻	
Total height of strippers	mm		50	

❸ *Compatibility ensured by different Centerline blocks.*
❹ *Optional, for ensuring compatibility..*
❺ *First rule at 0 mm on the old tools.*
❻ *SPO 203 A / matic / Power Register*

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Lower stripping tool		SP	SPO	S
Height of pins	mm		115	

Front waste separator				
Thickness of wooden panel	mm	12	15	15

Upper blank separating tool			SPO 160-ER MATIC	
Position of first rule	mm	20 ❺	20	
Thickness of wooden panel	mm	18	15	18
Centerline notch	mm	15 x 8	22 x 20	❸
Fastening and through holes	mm	Ø 7,5	70 x 20	
Total height of custom-made tool	mm		73	

❸ *Compatibility ensured by different Centerline blocks.*

❺ *First rule at 0 mm on the old tools.*

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Design and layout

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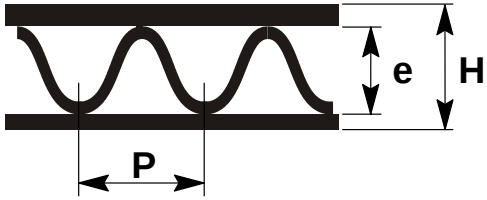
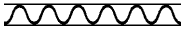
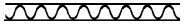
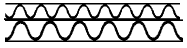
General

Characteristics of corrugated board



Flute profile		Type	e (mm)	H (mm)	P (mm)
Large flute		A	4,5	5	8,9
Small flute		B	2,3	2,8	6,5
Medium flute		C	3,5	4	8
Microflute		E	1,2	1,6	3,2
		F	0,75	1,2	2,4
		G/N	0,4	0,8	1,8
		O	0,3	0,7	1,1
Double wall		BC		6,5	
		BE		4,5	
		BF		3,8	
		EF		2,6	

Design and layout

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Layout

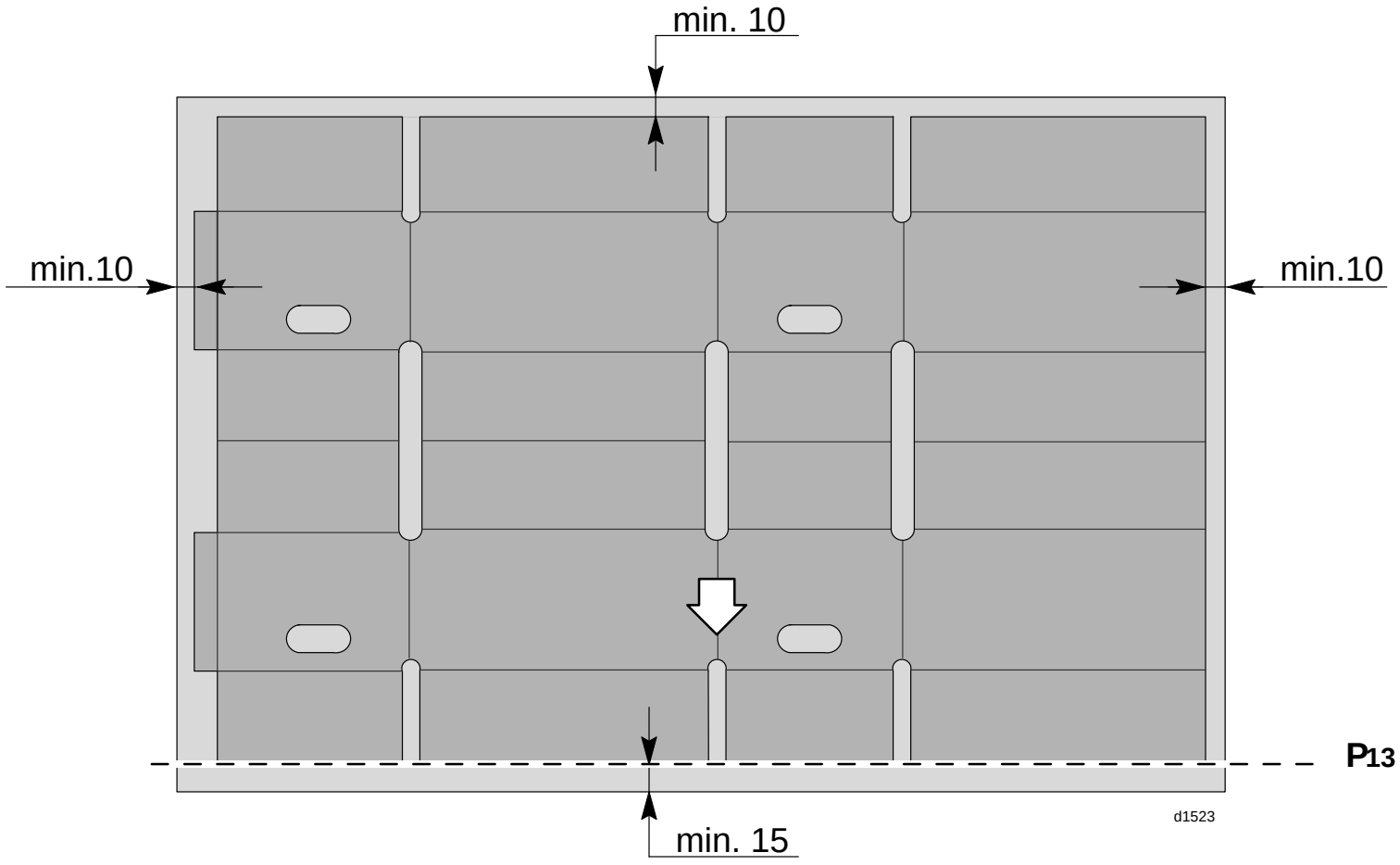
Front, lateral and rear waste

Front waste

The normal width of the front waste, from the sheet edge to the first rule is 15 mm.

Lateral and rear waste

Recommended minimum width: 10 mm.



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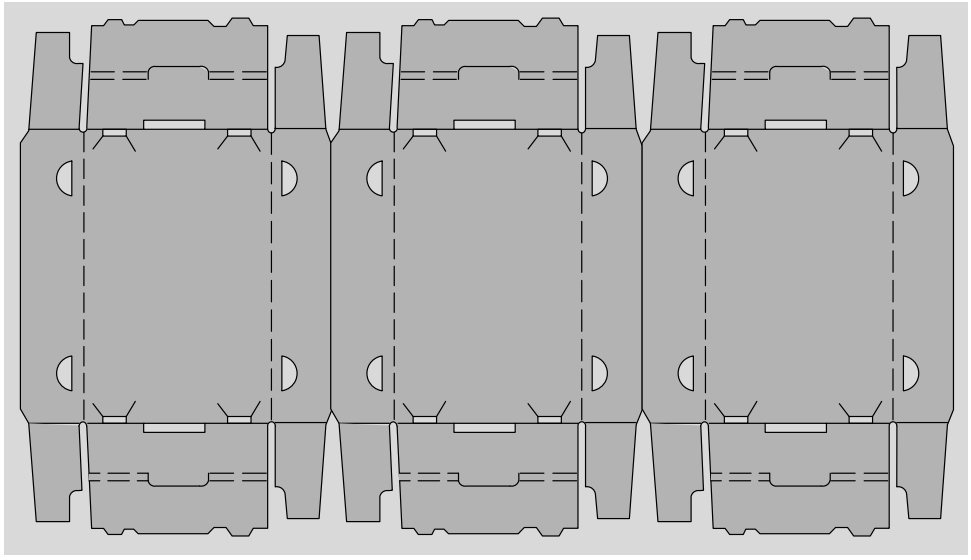
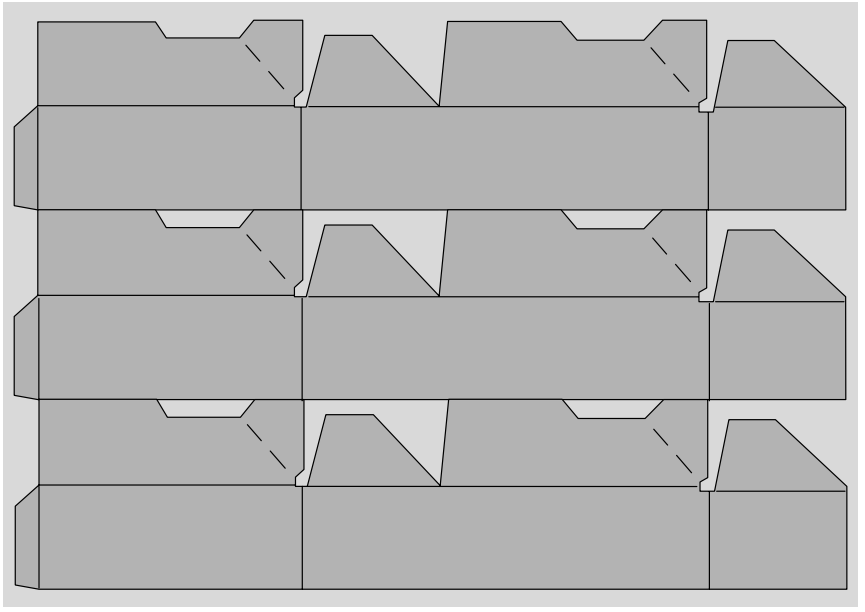
Three blanks per sheet

The three blanks are placed side by side.



D1527

The three blanks are placed one behind the other.



D1522

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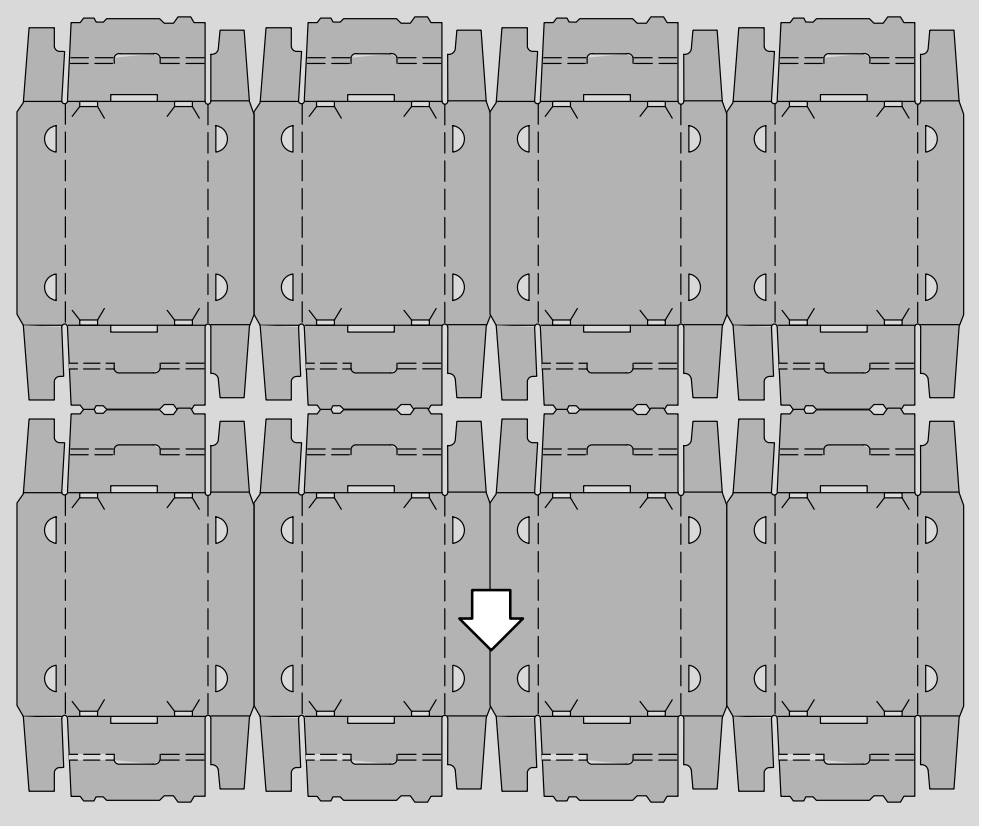
Multiple blank layout

When the blank is small, it is possible to rationalize the layout arrangement by placing a number of blanks on the sheet to make use of the largest possible cutting size.

The blanks should be laid out so as to allow for a maximum number of single cuts. In this way, a minimum number of nicks will ensure that the sheet stays in one piece until it is delivered.



D1528

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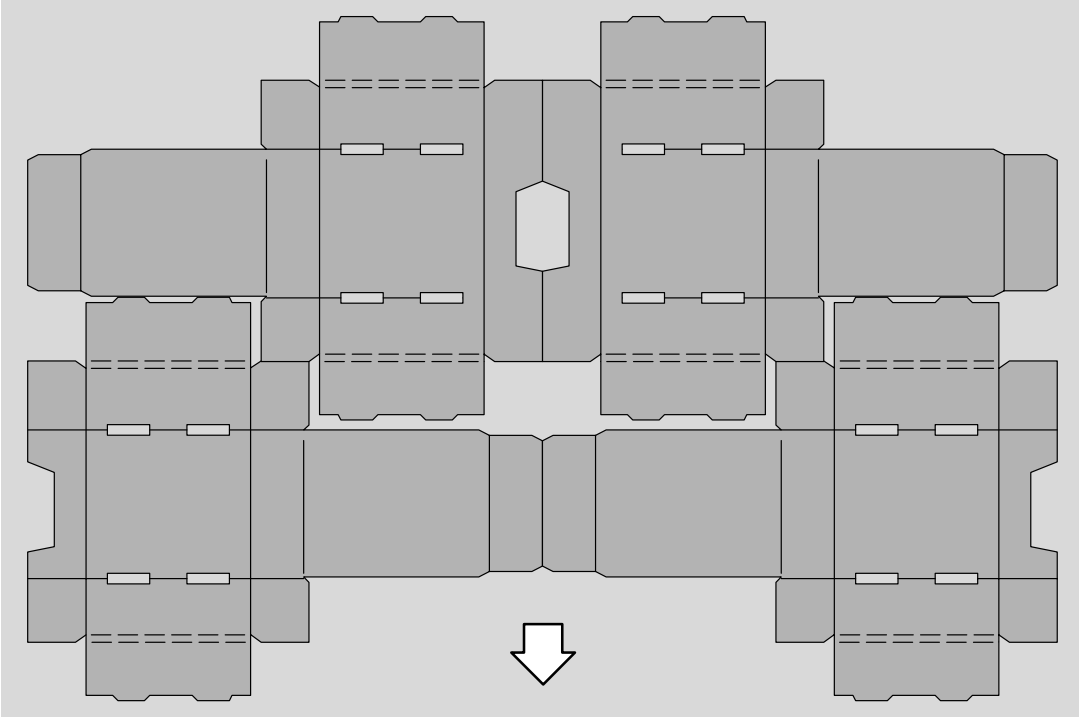
Overlapping blanks

The blanks should be overlapped as far as possible depending on their shapes so as to allow the maximum number of single cuts and reduce board waste. This also allows a sufficient number of nicks to be provided to ensure the rigidity and resistance of the sheet at high production speed.



D1529

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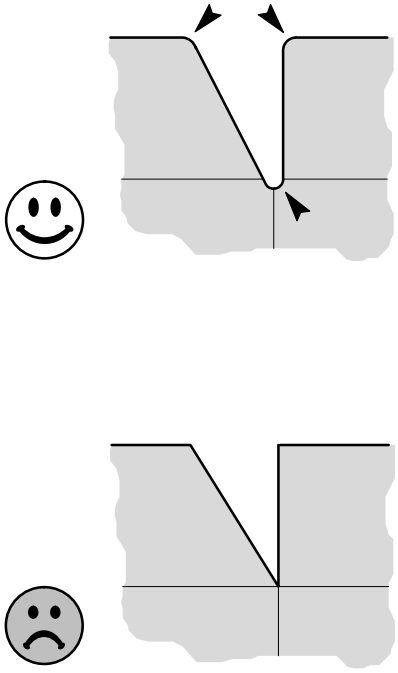
Rules for easier stripping

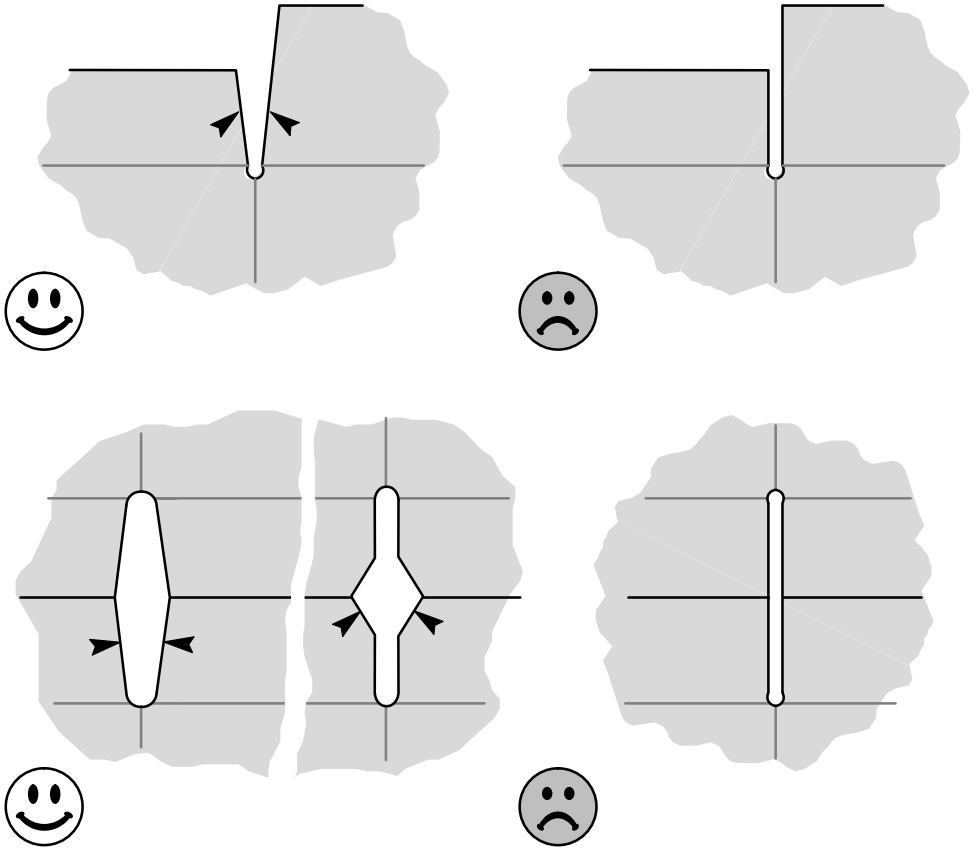
Sharp corners

Sharp corners should be replaced with rounded ones where possible. This makes it possible to avoid angular joins which often lead to unwanted nicks.



Small size waste

To facilitate stripping of small waste, the blank can be modified to obtain conically shaped waste; the waste width can also be increased over part of its length.



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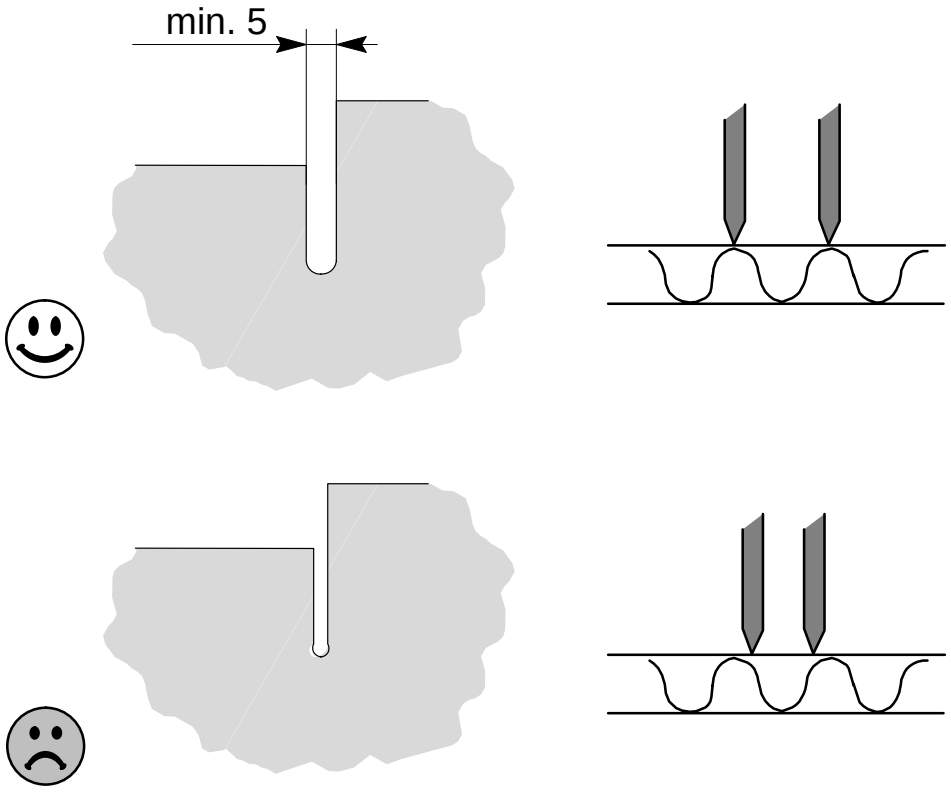
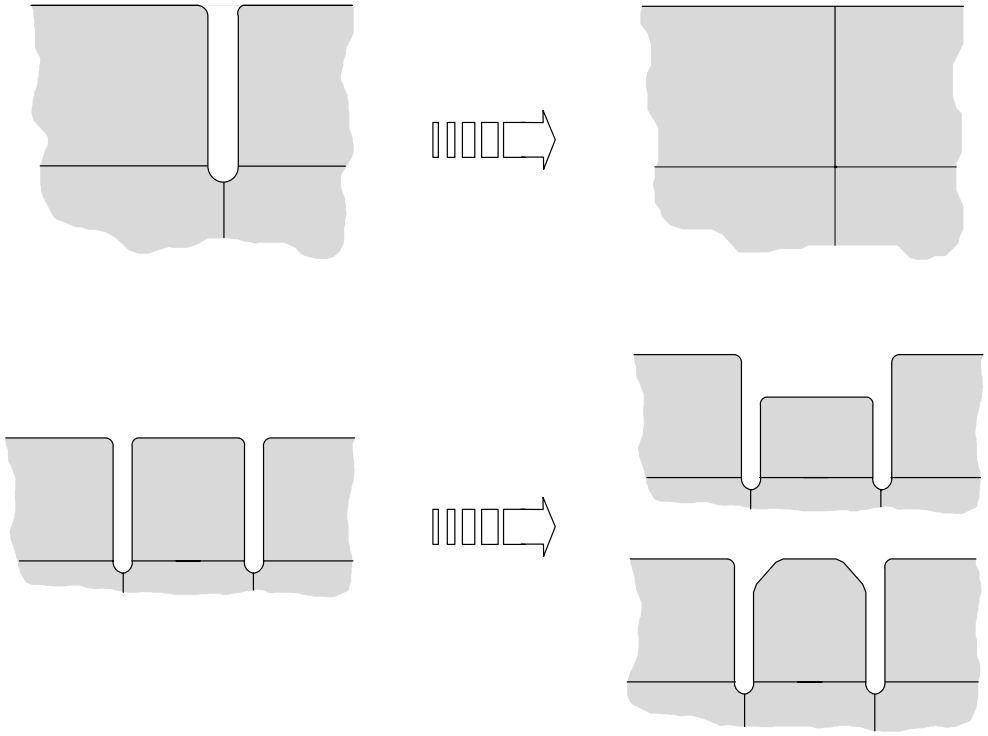
Narrow waste

Avoid narrow waste pieces wherever possible as they are difficult to strip. Their width should not be less than the flute pitch and at least **5 mm**.



If the blank shape so allows, it is advisable to replace narrow waste by a single cut.

For easier waste stripping, in some cases the shape of the blank can be modified so as to obtain a narrow piece of waste attached to a wider piece.



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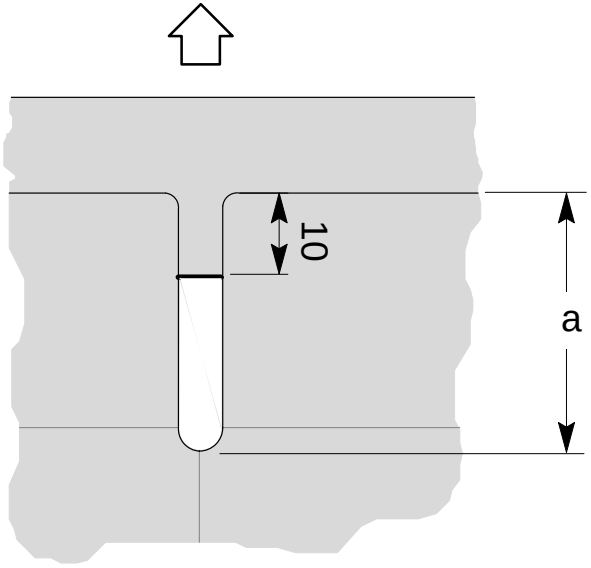
When a narrow piece of waste with a length **a** greater than 50 mm is attached to the front waste, an additional rule should be fitted approx. 10 mm from the first rule. This will make the job of the front waste separator easier as the shaded part of the waste will have been removed in the stripping station.



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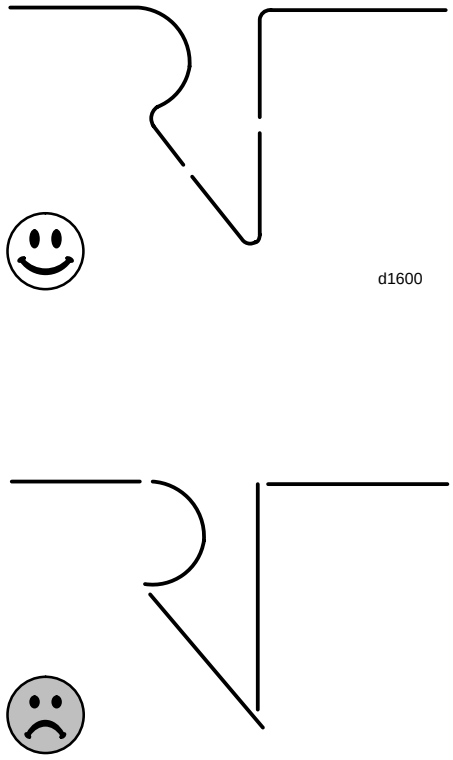
Rules for easier rule joining

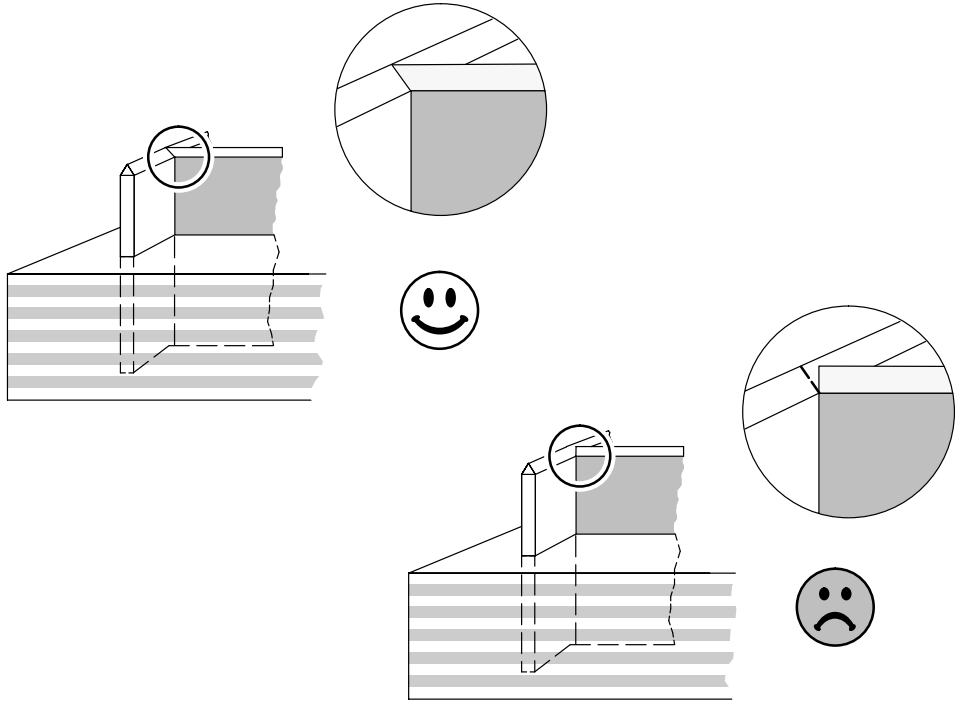
Rules concerning joins

Whenever possible, join the rules on a straight line.



Right-angled joins

To join two rules at a right angle, a joined mitre has to be made on one of the two rules. This mitre will allow the rules to be adjusted so that the cutting edges fit each other perfectly. The shape of the mitre should correspond to the profile of the rule.



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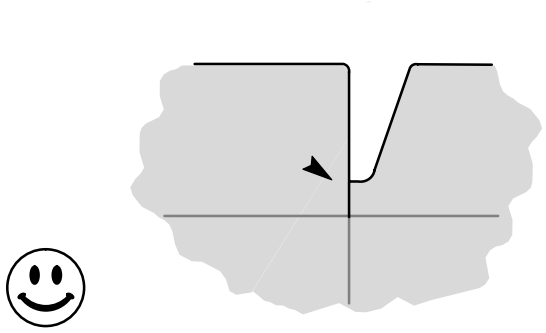
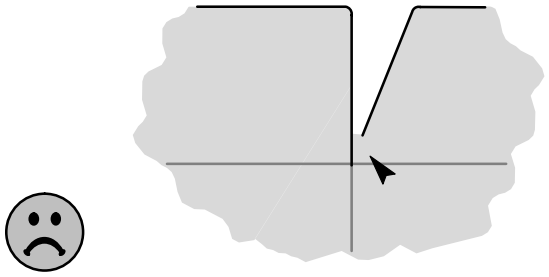
Joining a slanting rule to a straight one

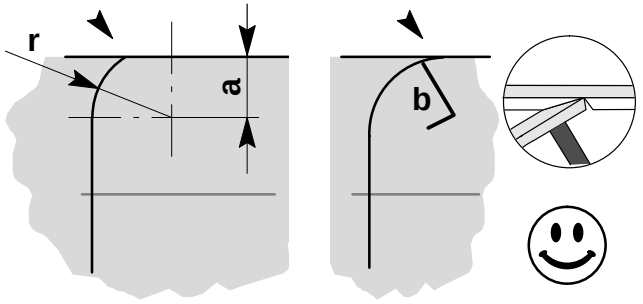
Round off the end of the slanting rule in order to obtain a right-angled join. Compared to a slanted join, a right-angled join is easier to adjust and also more rigid.



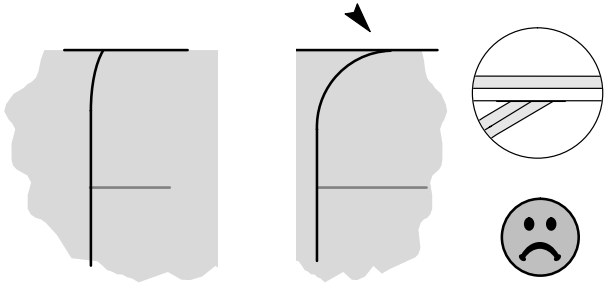


Joining a rounded angle to a straight line

The tangent connection of a radius on a straight cutting rule is practically impossible to achieve. We recommend centering the circle of radius **r** at a distance **a** smaller than the value of **r**. The value **a** should correspond to approx. **0.8 r**. A creasing rule **b** can be positioned in support of the cutting rule to avoid leaving a natural nick.



Example: ***r*** *= 10 mm* ***a*** *= 0,8 x 10 =* ***8 mm***



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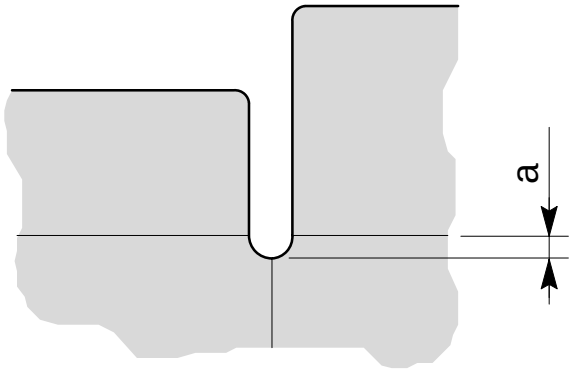
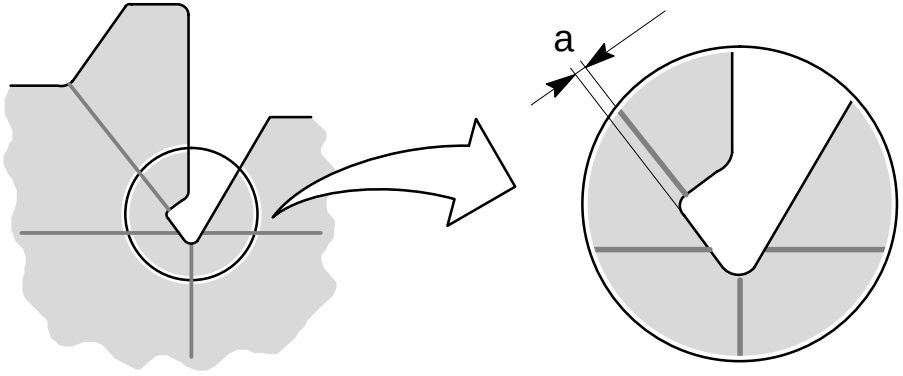
Rules to facilitate folding / gluing

Clearing the slots

Folding and gluing is made easier when the slots are well cleared and when they project slightly beyond the creasing lines. Distance **a** corresponds to approx. 1.5 mm. When working with E-flute, reduce this distance to 0.5 mm. Following this rule prevents the corners being torn during folding, as well as a bad squaring of the box.





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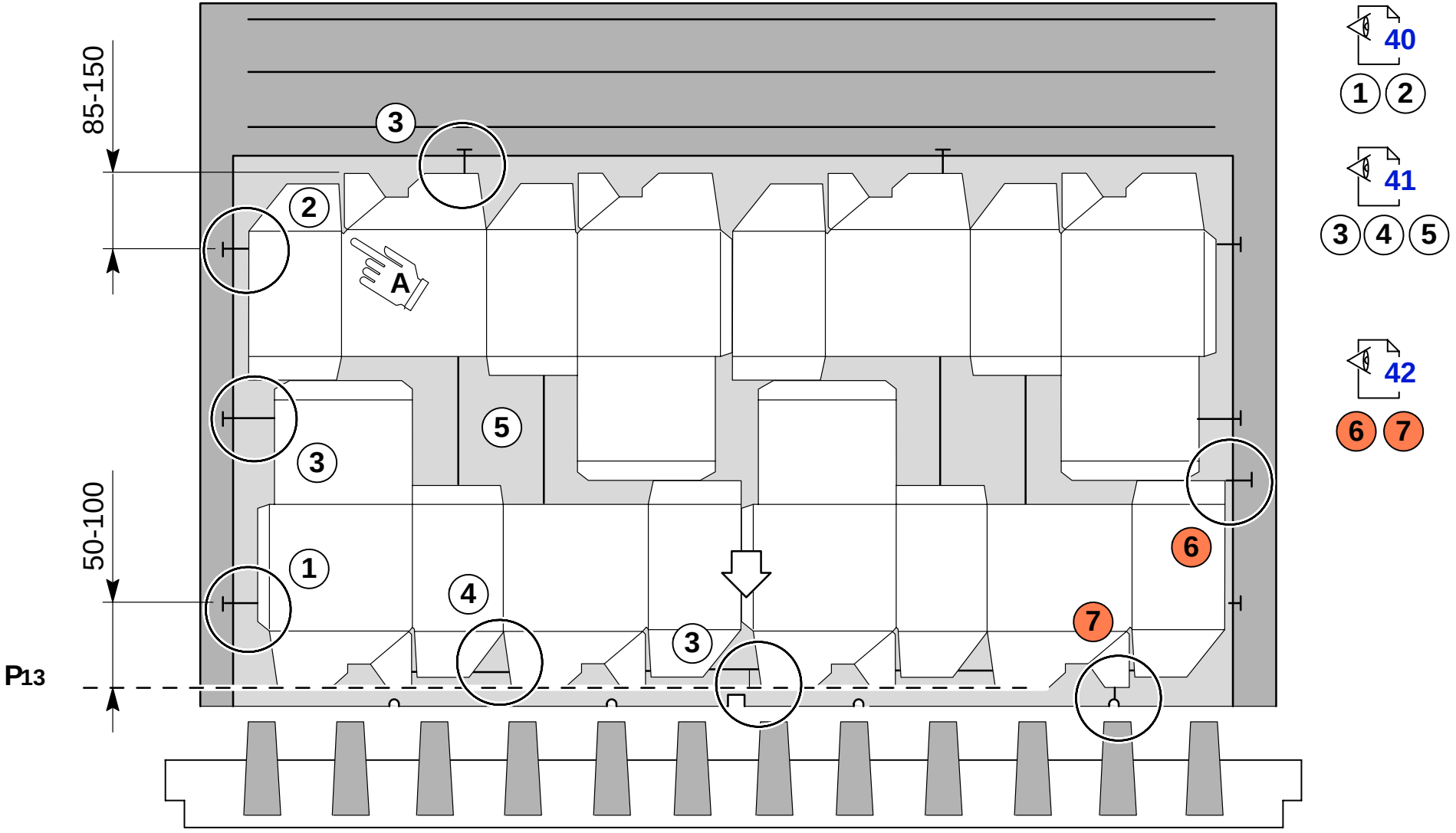
Waste separator

Position of the waste separating rules



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1 Separate the lateral waste from the front waste.

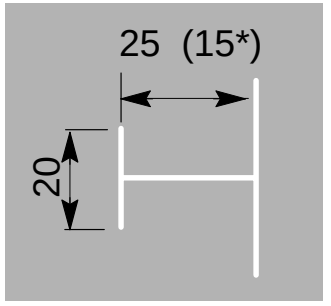
Place a separating rule, os and oos, between **50** and **100 mm** from the first rule $\mathbf{P_{13}}$.

2 Separate the lateral waste from the rear waste.

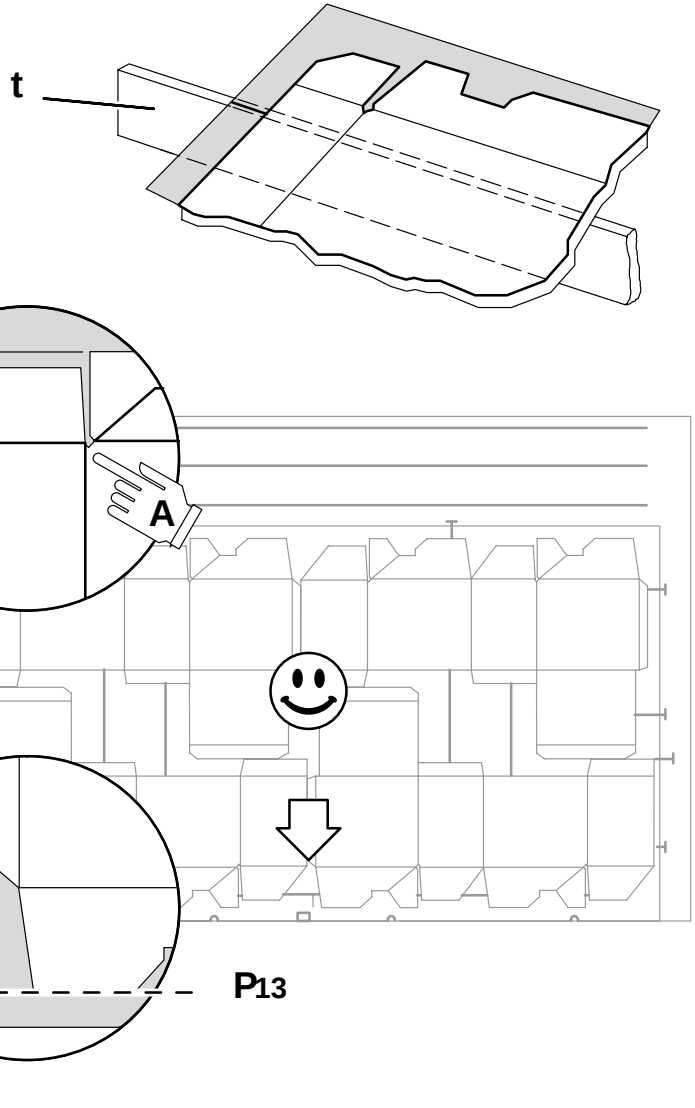
Place a rule, os and oos, between **85** and **150 mm** from the last rule.

The separating rule has to be placed in front of the last waste **A**. Therefore, it cannot remain hooked onto the crossbar **t** of the carrier frame. If this waste is longer than 150 mm, it has to be separated.

The opening in the cutting die should always be "**T**-shaped" so that one version or the other of the breaking-up rules can be used.



* Values for the max. size



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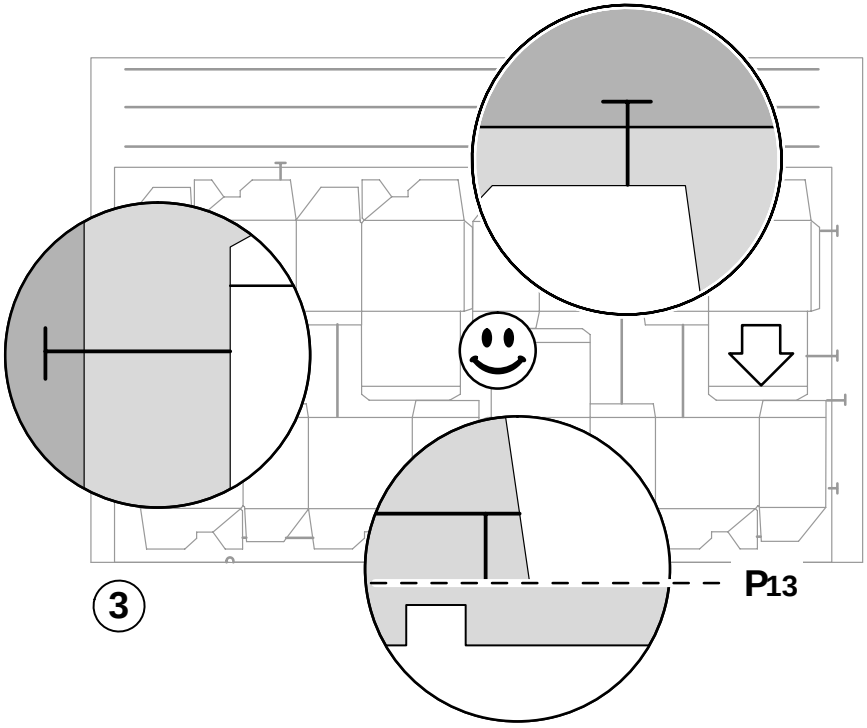
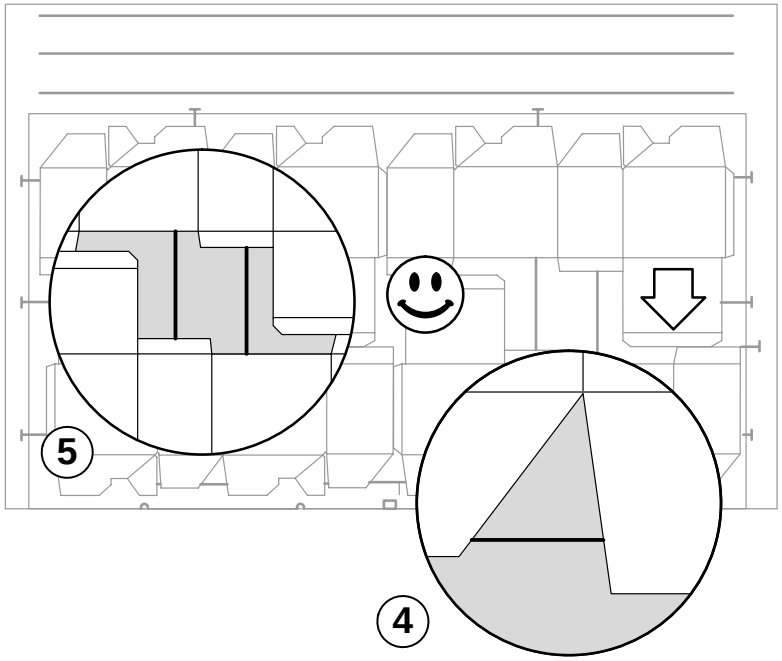
3 In order to facilitate the removal from the machine, the front, rear and lateral wastes can be divided up. In this case, provide for cutting rules or perforating rules.

Note: For sizes bigger than 1000 mm in the running direction, a support bar for the converting tools of the stripping station can be used. In this case, provide for cutting rules in order to fraction the lateral wastes at the level of the support bar.



4 Enables to obtain the front waste as narrow as possible to facilitate its separation.

5 Often it is necessary to divide the big-size inner wastes. This is a way to facilitate their removal from the machine and the sheet transport on the central board (see ”Supporting irons” in the chapter ”Central stripping board”).



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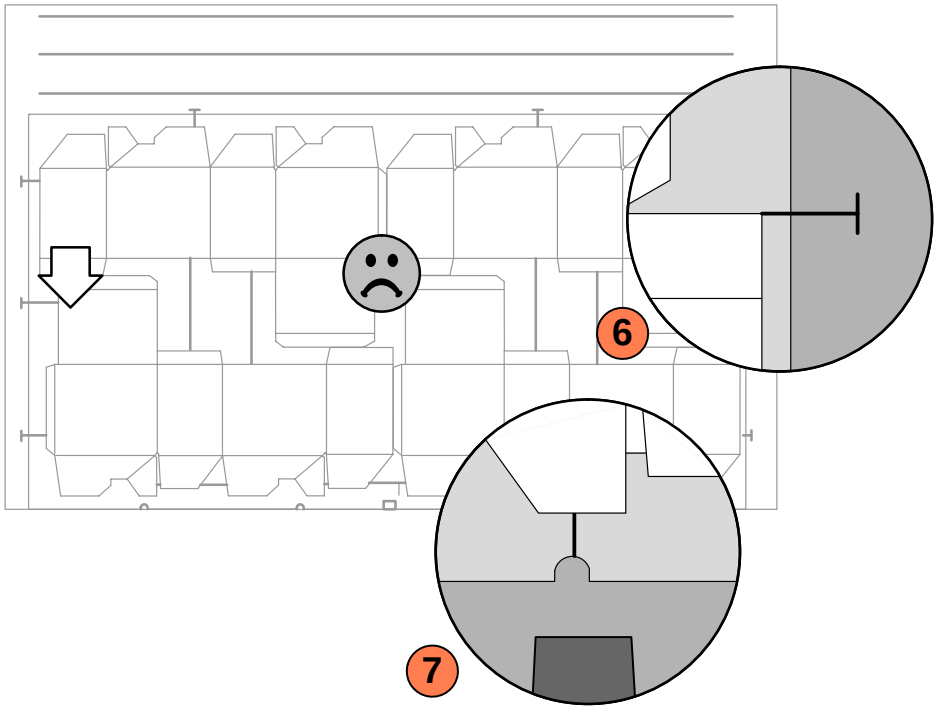
6 Do not place the separating rules in the extension of a cutting rule.

7 Do not place the separating rules opposite the centering notches or opposite the grippers.



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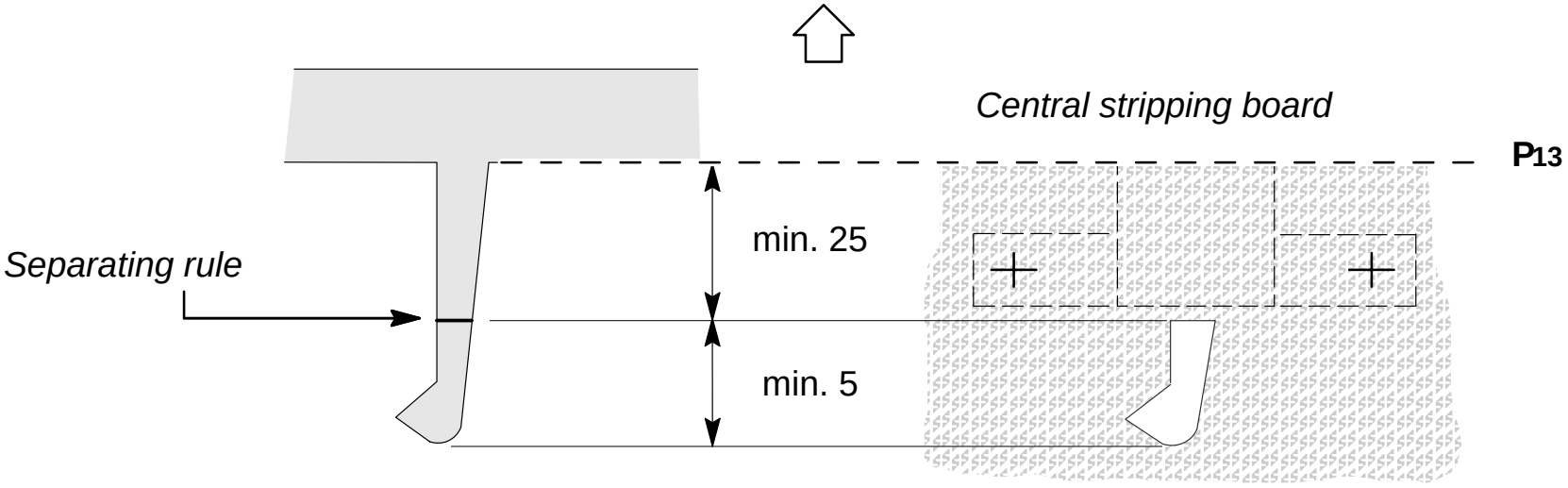
Stripping a waste in the Centerline zone

When using the Centerline block on the central stripping board, place a separating rule on the cutting die at least **25 mm** behind the first rule $\mathbf{P_{13}}$



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Cutting die

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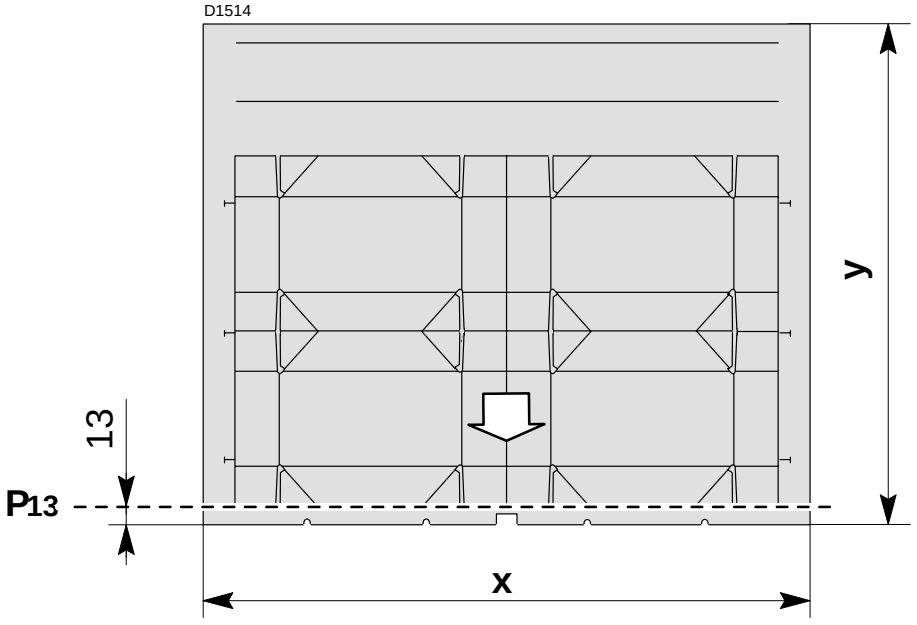
Dimensions of the wooden board

Length **y** of the board is a fixed dimension that depends on the press used. This principle allows compensatory rules to be fitted to obtain an even cutting pressure.

As a rule, width **x** of the board corresponds to the cutting width plus a margin of **40 mm** on either side. Width **x** must not exceed the maximum margin admissible for the press.



		y	x max.	x min.
SPO 1575-EEG	mm	1043	1580	680
SPO 1600		1103	1620	
SPO 160-ER MATIC				
SPO 160 A / matic / Power Register				
SPO 160-S				
SPO 160 VISION / Power Register				
SPO 2000		1273	2060	
SPO 203 A / matic / Power Register				
MASTERCUT **1.7**		1303	1720	
MASTERCUT **2.1**			2120	

Cutting die

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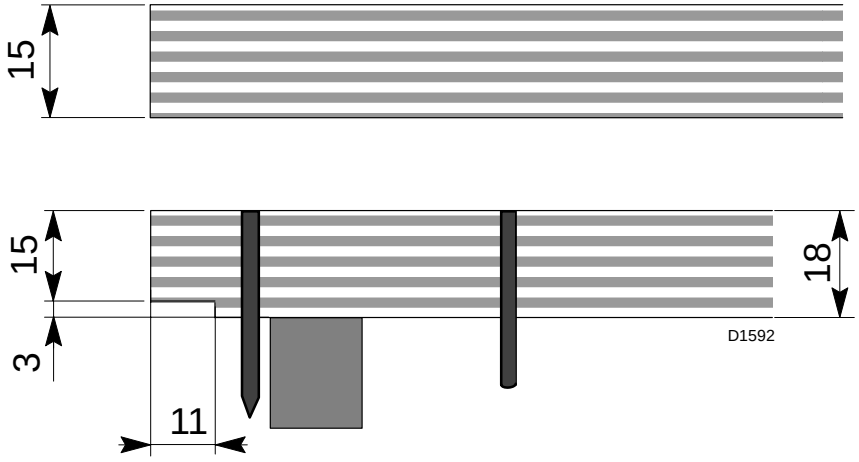
Characteristics of the wooden board

The board must consist of **9 to 11** layers of plywood. The board thickness should generally be **15 mm**.

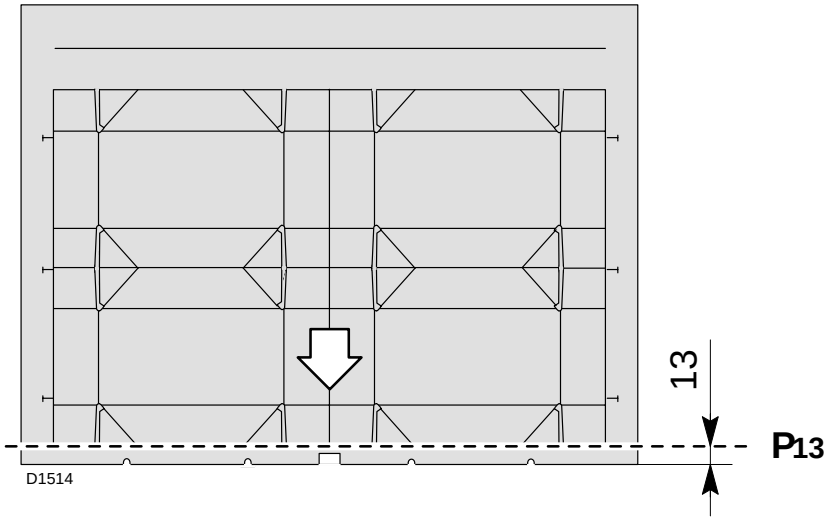
For certain jobs (E-flute corrugated, high-precision), use a **18 mm** thick wooden board, consisting of **11 to 13** layers of plywood. Reduce the front of the board to cut a recess for the grippers.

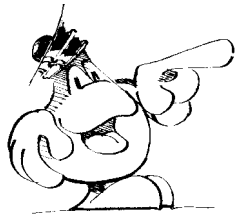
Note: The use of a board with varnished surfaces facilitates the gluing of auto-adhesive rubbers.



Position of the first rule

The theoretical position of the first rule is **13 mm** from the front edge of the cutting die.





Old cutting dies with first rule at 20 mm may be used as they are or be adapted to «Standard SP/SPO».

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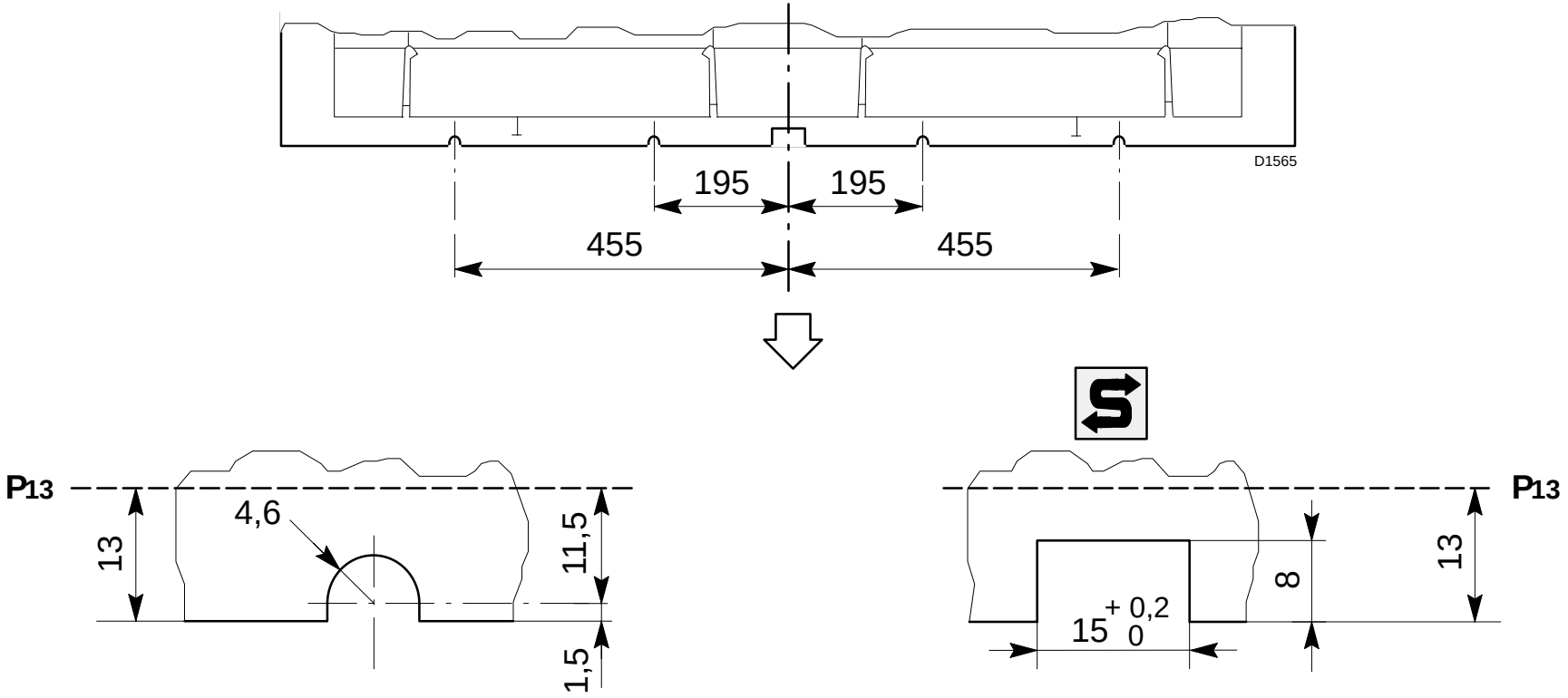
Centering notches and Centerline notches

The centering notches are used for centering the die within the chase using the pins on the bottom plate.

The Centerline notch centers the die within the chase using the adaptation gib of the ”SP chase”.



Cutting die

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Fastening holes

Lay out five to ten through-holes over the surface of the wooden board. The hole diameter depends on the type of chase used:

Fig. 1. Chase with drilled bottom plate: the hole diameter is **6 mm**.

Fig. 2. Chase with tapped bottom plate (new method): the hole diameter is **10 mm**.

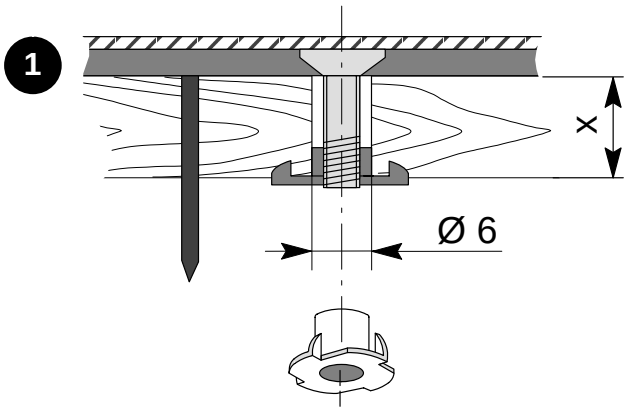
T-nuts are driven into these holes. They are used to screw the cutting die to the chase.

Note

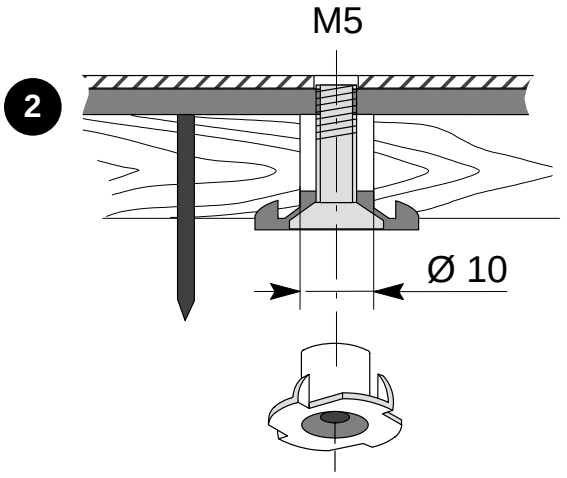
The length of the fastening screws depends on the thickness of the wooden board. For a chase with a threaded bottom plate (Fig. 2), **the screws must not, under any circumstances, project from the protection plate.**

Make sure that the holes chosen do not coincide with the rules or the rubber!

M5 x 20 (x = 15 mm)
M5 x 25 (x = 18 mm)



BOBST 1005-0099
(batch of 100 pieces)



BOBST 1005-0100
(batch of 100 pieces)

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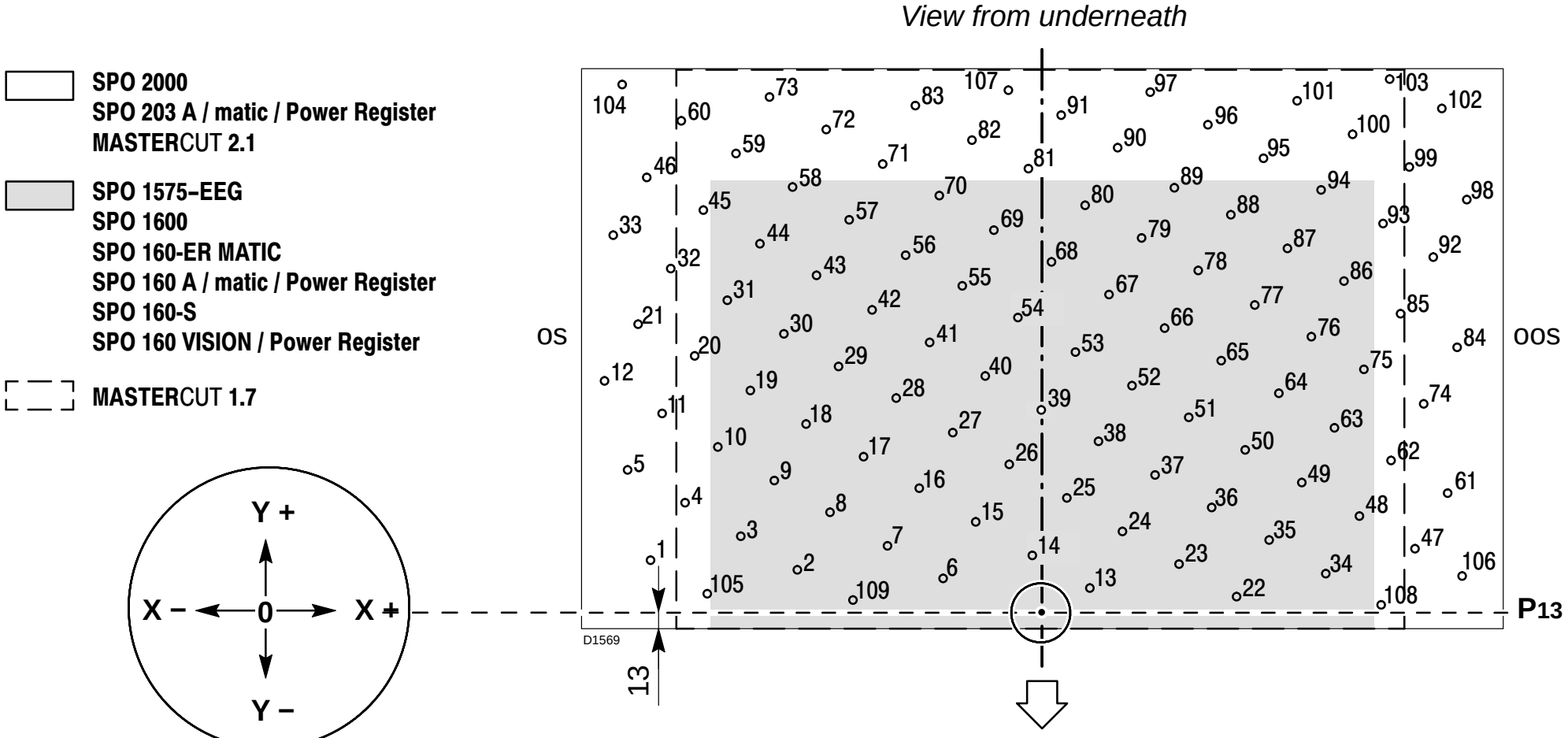
Position of the cutting die holes

The drawing below indicates the position of the holes that can be drilled to fasten the cutting die to the chase (viewed from the side of the die rules).

Remember: **the first rule is situated 13 mm from the front edge of the board**.



Cutting die

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Nº	X (mm)	Y (mm)	Nº	X (mm)	Y (mm)	Nº	X (mm)	Y (mm)	Nº	X (mm)	Y (mm)	Nº	X (mm)	Y (mm)
1	-894,6	127,9	25	54,9	272,5	49	594,6	307,3	73	-629,4	1187,2	97	245,1	1201,9
2	-559,8	107,8	26	-75,0	347,5	50	464,7	382,3	74	874,5	492,1	98	969,6	956,8
3	-689,7	182,8	27	-204,9	422,5	51	334,8	457,3	75	744,6	567,1	99	839,7	1031,8
4	-819,6	257,8	28	-334,8	497,5	52	204,9	532,3	76	614,7	642,1	100	709,8	1106,8
5	-949,5	332,8	29	-464,7	572,5	53	75,0	607,3	77	484,8	717,1	101	579,9	1181,8
6	-225,0	87,7	30	-594,6	647,5	54	-54,9	682,3	78	354,9	792,1	102	914,7	1161,7
7	-354,9	162,7	31	-724,5	722,5	55	-184,8	757,3	79	225,0	867,1	103	784,8	1236,7
8	-484,8	237,7	32	-854,4	797,5	56	-314,7	832,3	80	95,1	942,1	104	-964,2	1207,3
9	-614,7	312,7	33	-984,3	872,5	57	-444,6	907,3	81	-34,8	1017,1	105	-764,7	52,9
10	-744,6	387,7	34	649,5	102,4	58	-574,5	982,3	82	-164,7	1092,1	106	984,3	82,3
11	-874,5	462,7	35	519,6	177,4	59	-704,4	1057,3	83	-294,6	1167,1	107	-89,7	1222
12	-1004,4	537,7	36	389,7	252,4	60	-834,3	1132,3	84	949,5	622,0	108	779,4	27,4
13	109,8	67,6	37	259,8	327,4	61	929,4	287,2	85	819,6	697,0	109	-429,9	32,8
14	-20,1	142,6	38	129,9	402,4	62	799,5	362,2	86	689,7	772,0			
15	-150,0	217,6	39	0,0	477,4	63	669,6	437,2	87	559,8	847,0			
16	-279,9	292,6	40	-129,9	552,4	64	539,7	512,2	88	429,9	922,0			
17	-409,8	367,6	41	-259,8	627,4	65	409,8	587,2	89	300,0	997,0			
18	-539,7	442,6	42	-389,7	702,4	66	279,9	662,2	90	170,1	1072,0			
19	-669,6	517,6	43	-519,6	777,4	67	150,0	737,2	91	40,2	1147,0			
20	-799,5	592,6	44	-649,5	852,4	68	20,1	812,2	92	894,6	826,9			
21	-924,4	667,6	45	-779,4	927,4	69	-109,8	887,2	93	764,7	901,9			
22	444,6	47,5	46	-909,3	1002,4	70	-239,7	962,2	94	634,8	976,9			
23	314,7	122,5	47	854,4	157,3	71	-369,6	1037,2	95	504,9	1051,9			
24	184,8	197,5	48	724,5	232,3	72	-499,5	1112,2	96	375,0	1126,9			

Cutting die

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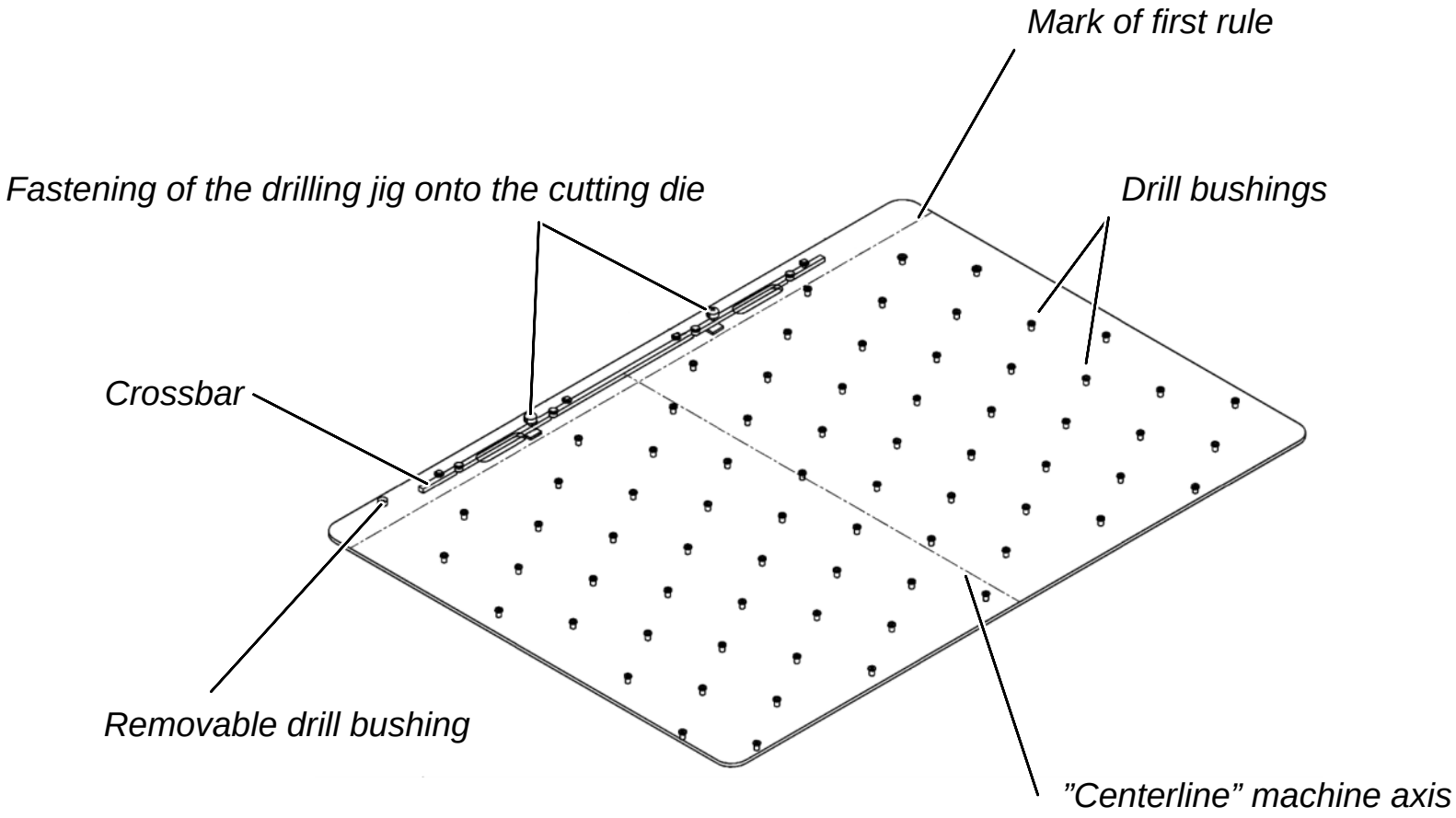
Drilling jig for SPO 160 VISION / Power Register, SPO 160-S, SPO 160 A/matic/Power Register and SPO 1600 (option)

Drilling jig equipped with drill bushings enabling to drill the holes and the fastening notches of the cutting die according to the Centerline system.



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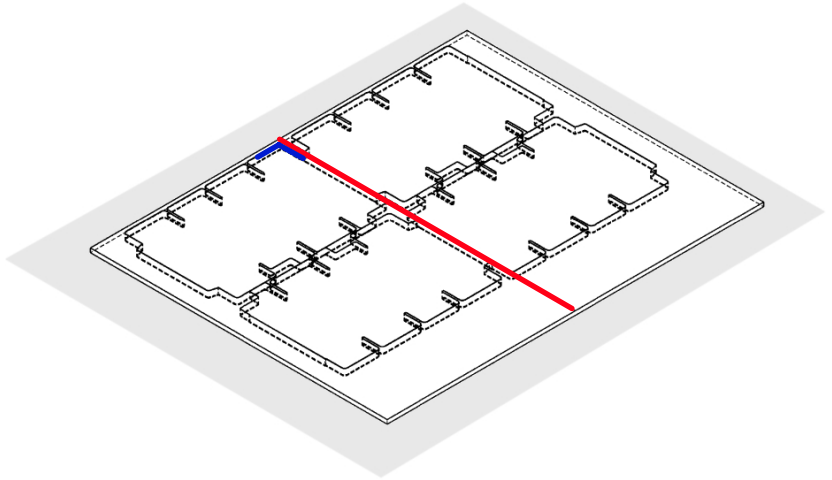
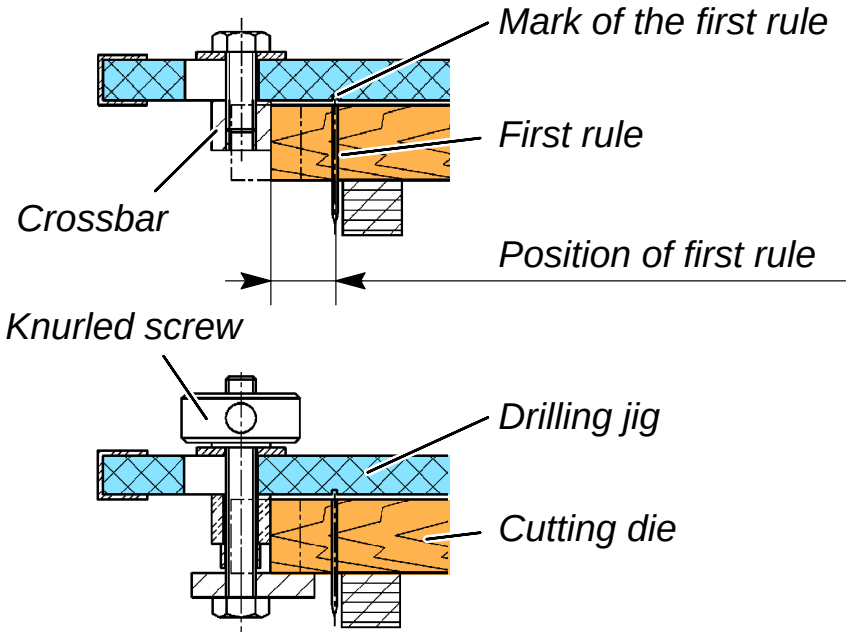
Drilling jig for SPO 160 VISION / Power Register, SPO 160-S, SPO 160 A/matic/Power Register and SPO 1600 (option) (cont'd)

Drilling of fastening holes

1. Put the cutting die on a cardboard sheet with lines below.
2. On the cutting die, draw the central axis perpendicularly to the first line.
3. Measure the position of the first rule with regard to the front edge of the cutting die (13 mm Bobst standard, 20 mm former cutting die).
4. Position the crossbar on the drilling jig on the mark of the first line according to the distance measured before.
5. Place the drilling jig on the cutting die by pressing the crossbar against the front edge of the cutting die.
6. Center the drilling jig laterally with regard to the Center-line axis marked out on the cutting die.
7. Fasten the drilling jig with knurled head screws on the cutting die.





Cutting die

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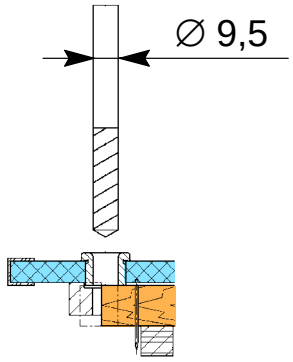
Drilling jig for SPO 160 VISION / Power Register, SPO 160-S, SPO 1600 A/matic/Power Register and SPO 1600 (option) (cont'd)

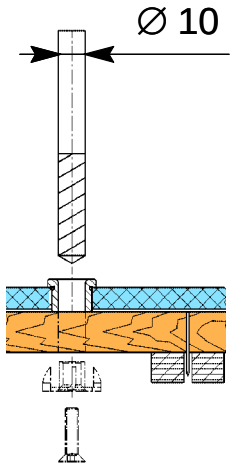
8. Drill 4 holes for the centering notches (Ø 9,5 mm).
9. Mark 5 to 10 drill bushings spread over the drilling jig.
   - Make sure that the holes do not fall on the lines or the rubbers.
10. For a chase with threaded bottom plate:
    - Drill the cutting die through the marked drill bushings (Ø 10 mm).
11. For a chase with drilled bottom plate:
    - Drill the cutting die through the removable drill bushing and the marked drill bushings (Ø 6 mm).

Drive the corresponding T-nuts in these holes.

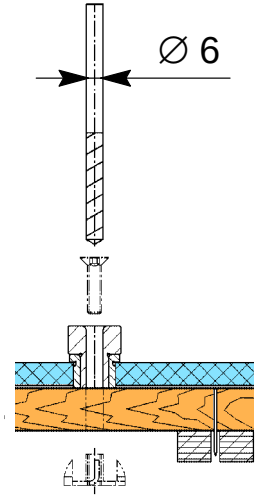
12. Loosen the knurled head screws and remove the drilling jig from the cutting die.
13. Open the 4 centering notches in U-shape.



Drill bushing for notches



Drill bushing for threaded bottom plate



Removable drill bushing for drilled bottom plate

Cutting die

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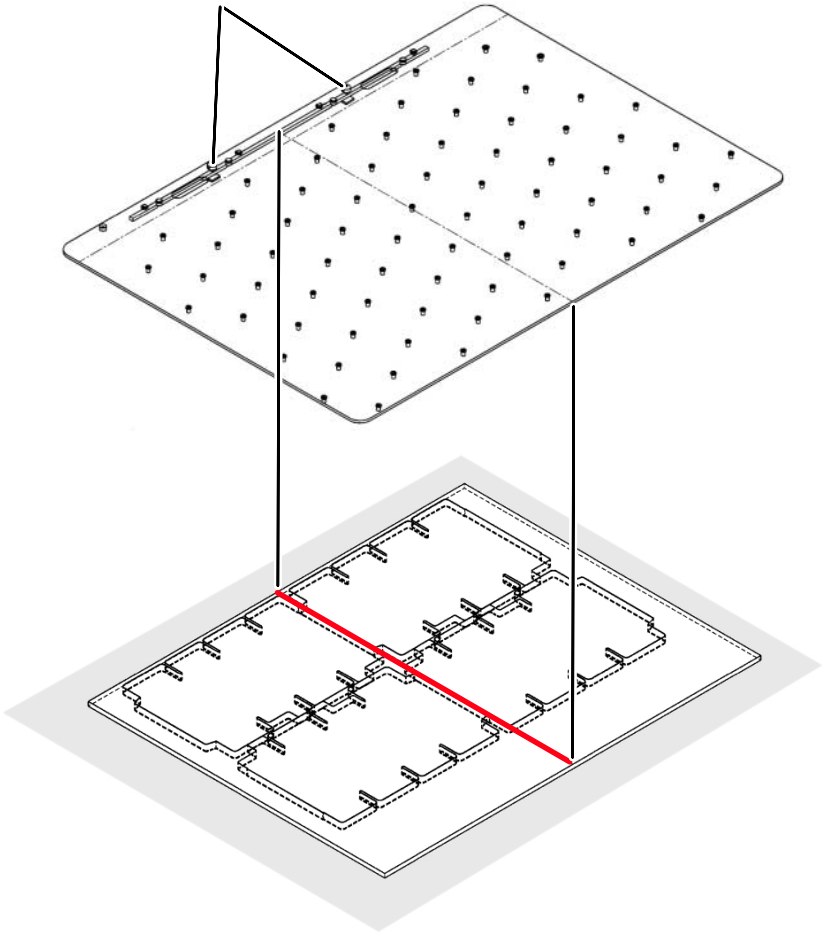
Drilling jig for SPO 160 VISION / Power Register, SPO 160-S, SPO 160 A/matic/Power Register and SPO 1600 (option) (cont'd)

Additional fastening holes

1. Position the drilling jig as for the drilling of the fastening holes, but without tightening the knurled head screws.
2. Place 2 to 4 M5 screws in the drill bushings which correspond to the already positioned T-nuts.
3. Tighten the knurled head screws.
4. Drill the additional holes to their corresponding diameter.

Knurled head screws



Cutting die

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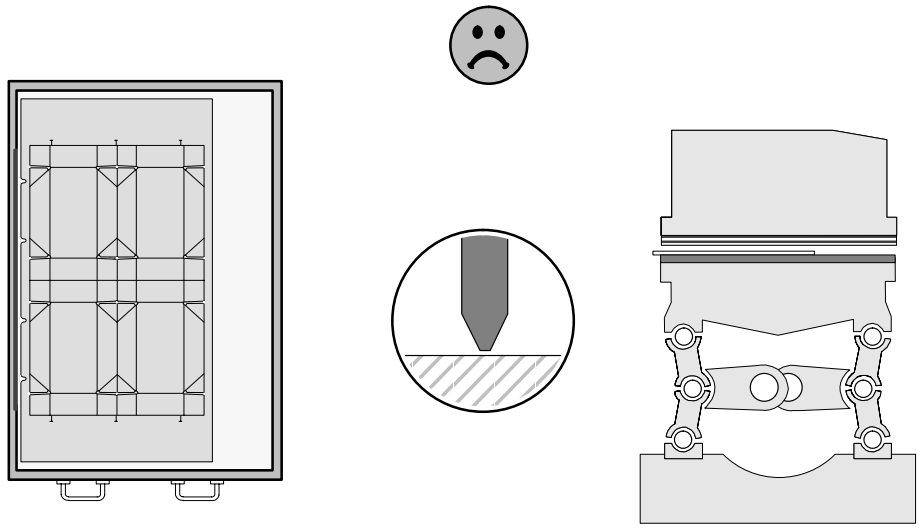
Compensation to balance out the load

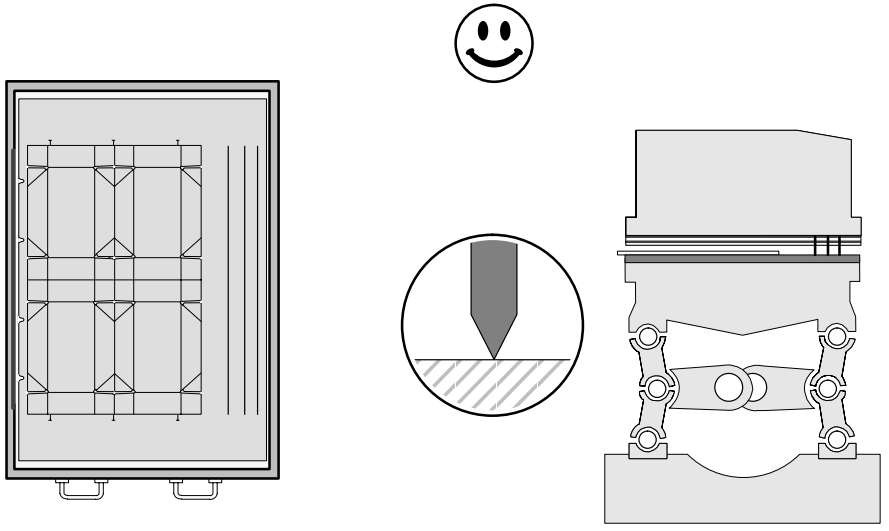
Importance of load balance of the platen press

When the load is unbalanced, the rules at the back of the die are subject to a greater load and tend to wear more quickly. ***If so, the time spent on the makeready will be greater and the rules will have to be replaced more frequently. The quality of the converted product will suffer.***



Rule to apply

If the length of the blank in running direction is less than the machine size, compensating rules are recommended. They must be fitted directly on the cutting die using rubber of the same quality as the one used for the cutting rules. The compensating rules must be replaced each time there is a complete change of cutting rules.



Cutting die

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Formula

1 Cutting zone

2 Compensating zone

c Maximum diecutting length of the machine

a Total length of cutting rules in the cutting zone

b Length of the compensating zone

d Width of the cutting and compensating zones

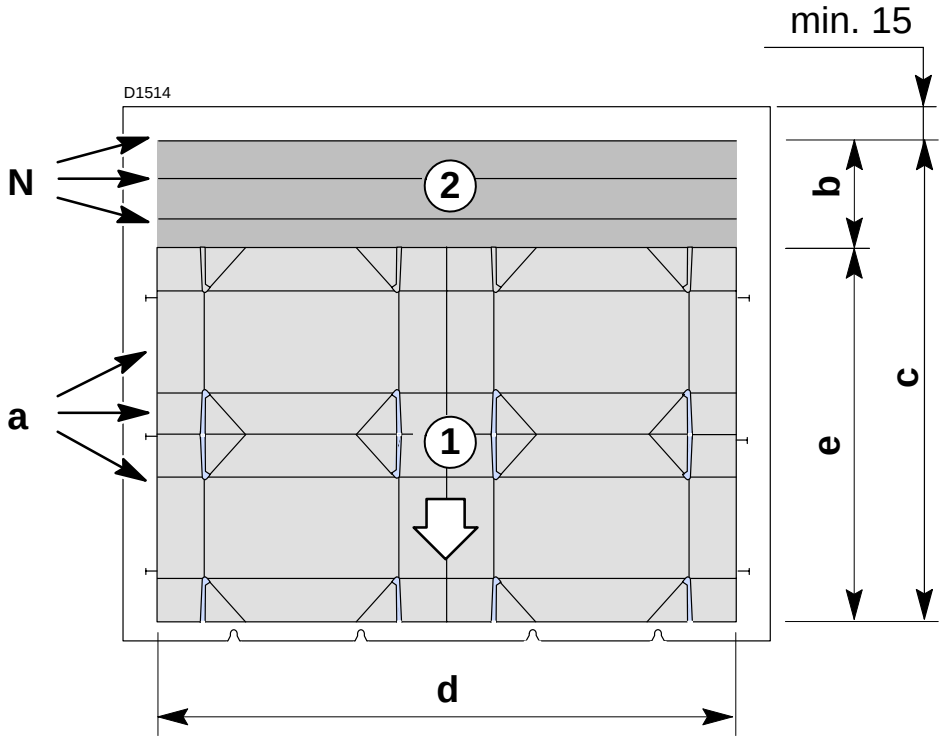
e Length of the cutting zone

N Number of cutting rules of length **d**, to be arranged regularly over the die in zone **b**.

Note: Correct the result to the nearest value.

If **N** = 3.4; round down to 3

If **N** = 3.6; round up to 4



$$N = \frac{a \times b}{e \times d}$$

Example of calculation:

$$N = \frac{a \times b}{e \times d} = \frac{10995 \times 166}{554 \times 880} = 3{,}8$$

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Cutting rules

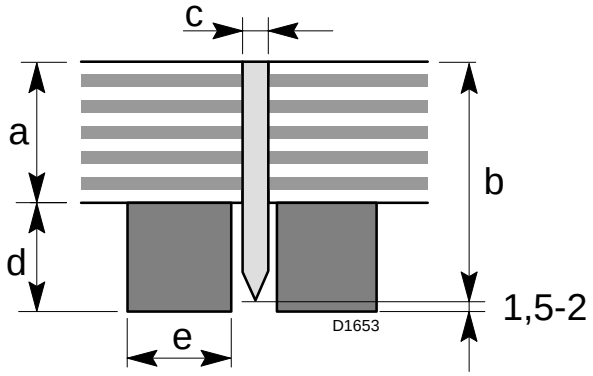
Certain dimensions relating to the wooden board, cutting rules and rubber depend on the thickness and type of the cardboard to be cut. The table below indicates these dimensions for three types of job.

Note

There are two types of upper chases: the standard model for cutting rules with a height of **23.8 mm** and one for double wall board for cutting rules with a height of **28.6 mm**.

Never mount a 28.6 mm rule on a standard chase, otherwise severe damage might ensue.

The data indicated in the table below correspond to a wooden board with a thickness of **15 mm**. When using a different wooden board thickness, adapt the height **d** of the rubbers until they project beyond the rules by **1.5 to 2 mm**.



		a	b	c (pt) 1 pt = 0,35 mm	d	e
A-B-C-flute	mm	15	23,8	3 pts.	11	12-15
E-flute		15 -18		2-3 pts.		
F-G-N-flute		18		2 pts.	8	8-10
Double wall thickness 6 mm or more		15	28,6	3-4 pts. *	15	12-15
		** faceted cutting rule*				

Cutting die

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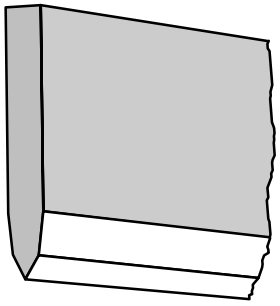
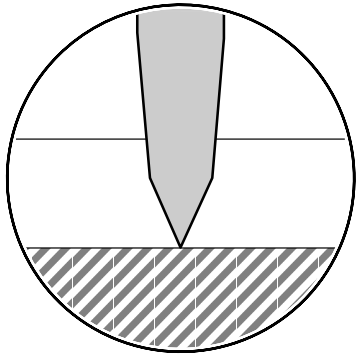
Faceted cutting rules

To facilitate cutting thick sheets (double wall) and reduce the cutting force, we recommend the use of faceted cutting rules.

For more information, please consult the companies specialized in the manufacturing of converting tools.



D1599



Cutting die

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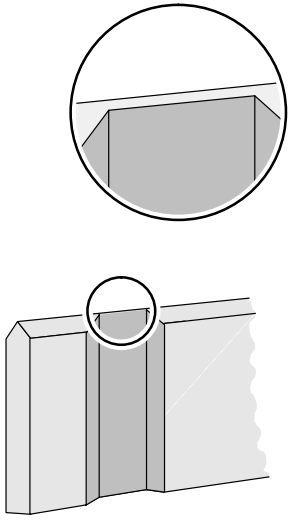
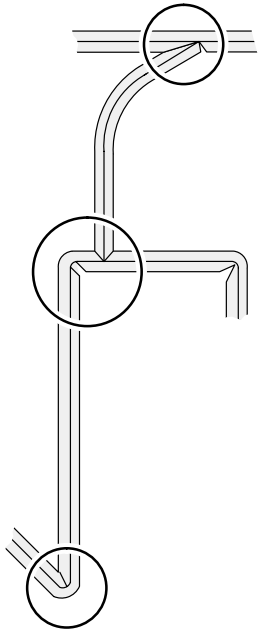
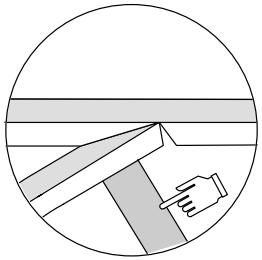
Complex rule shapes (E-F-G-N-O-flute)

To join this type of rule, choose a method using removal of material. This approach offers many advantages:

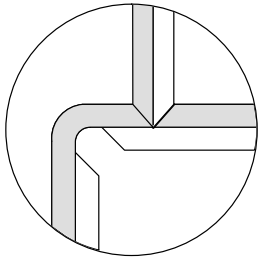
- Accurate adjustment of joins
- High bending angle
- Constant height of rule after bending
- Reduction in time required for fitting

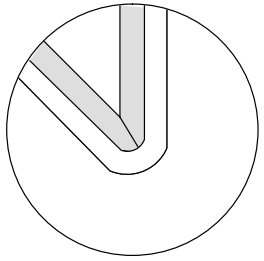






Supporting rule





Cutting die

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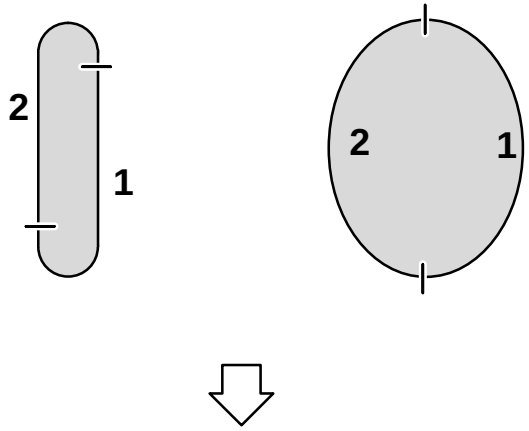
Complex rule shapes (E-F-G-N-O-flute)

This type of shape is manufactured in one or two parts.



There is a whole range of hollow punches available on the market to insert in the shape. Some types are equipped with a spring ejector.

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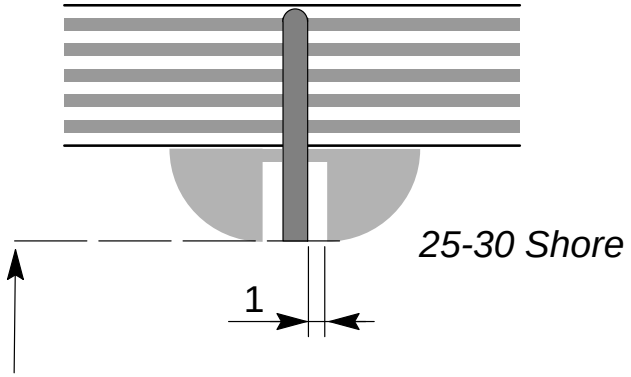
Creasing rules

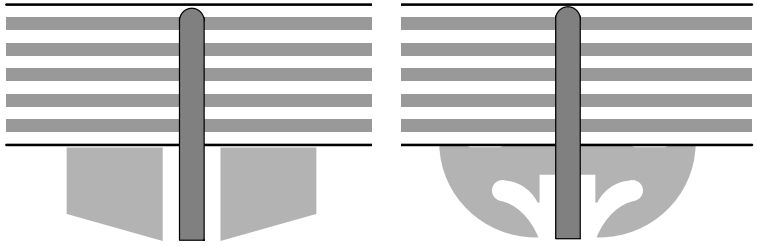
Creasing without counterpart

Generally, the active part of the creasing rules has a rounded top. However, we noted that folds through 180° need better defined creases. To this aim, it is recommended to fit creasing rules upside down.

To avoid bursting of the cardboard, rubber strips are glued on both sides of the rule. The type and the hardness of the rubber depend on the quality of the worked material.



Rules and rubbering at equal height



70 Shore

Cutting die

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Thickness of the rules without creasing counterpart

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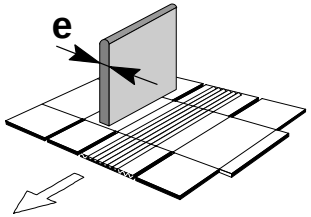
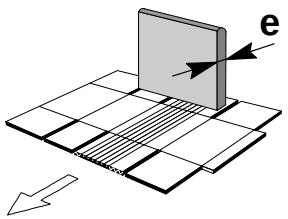
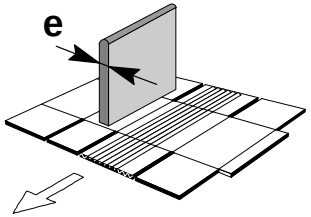
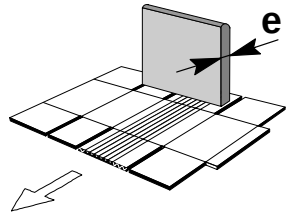
<tr><td></td><td> 

A-B-C-E-F-G-N-O</td><td> 

A-B-C-E-F-G-N-O</td><td> 
</td><td> 
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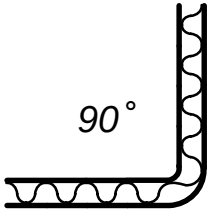
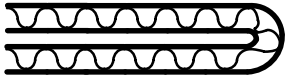
<tr><td> 
</td><td colspan="2">e = 3 pts</td><td rowspan="2">e = 6-8 pts</td></tr>
<tr><td> 
</td><td>e = 6-8 pts</td><td>e = 3 pts</td></tr>
</table>

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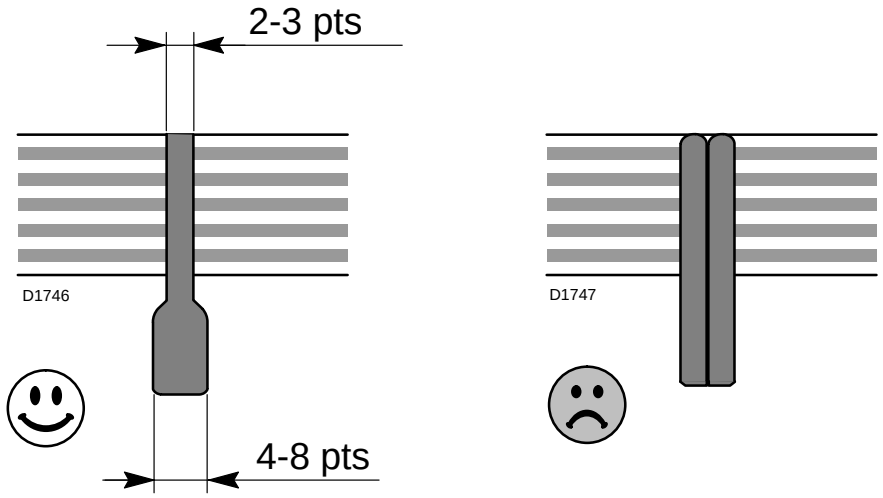
Wide creasing

In order to obtain a certain width of the creases, it is possible to use creasing rules whose creasing section is wider than the body of the rule.

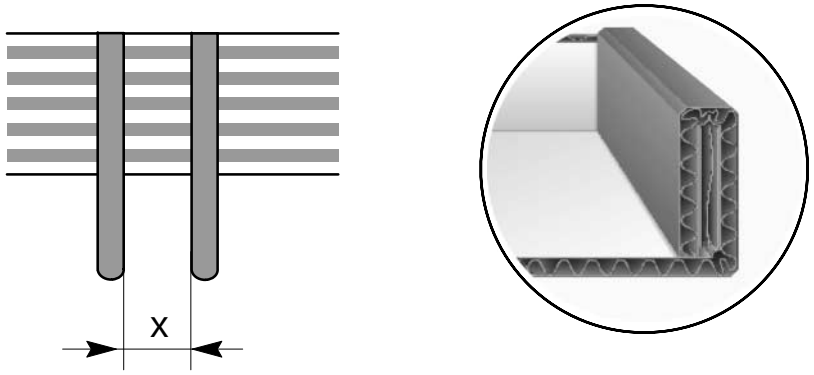
Do not use two creasing rules mounted side by side.



Double creasing

Double creasing is provided for facilitating the folding at 180 degrees.

Distance **x**, separating the two rules, has to correspond to about 2 or 3 times the thickness of the cardboard (verify this method before adopting it).



Cutting die

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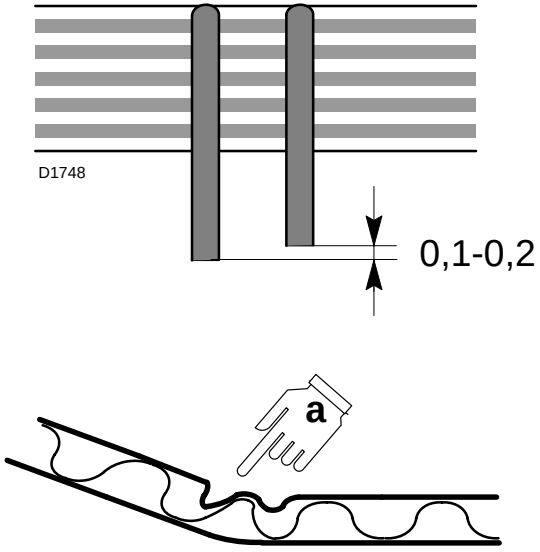
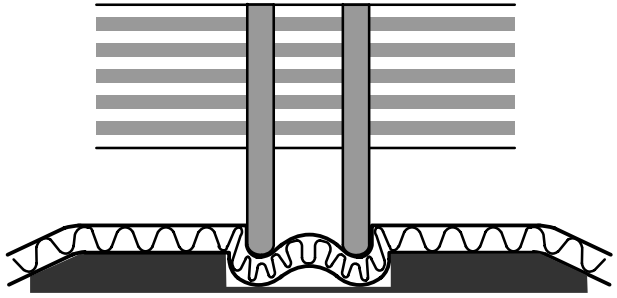
Double creasing without creasing counterpart

Without counterpart, double creasing is achieved thanks to two creasing rules mounted parallel in opposite direction. The outer rule should be **0.1 to 0.2 mm** higher than the inner rule.

Thus, the beginning of the folding will be done on the outer crease **a**, i.e. on the most distinct one.



Double creasing with counterpart



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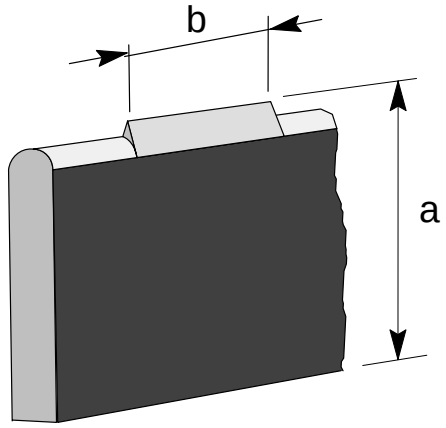
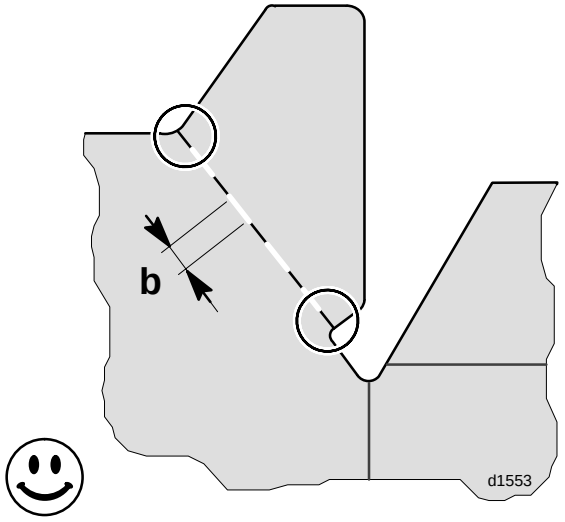
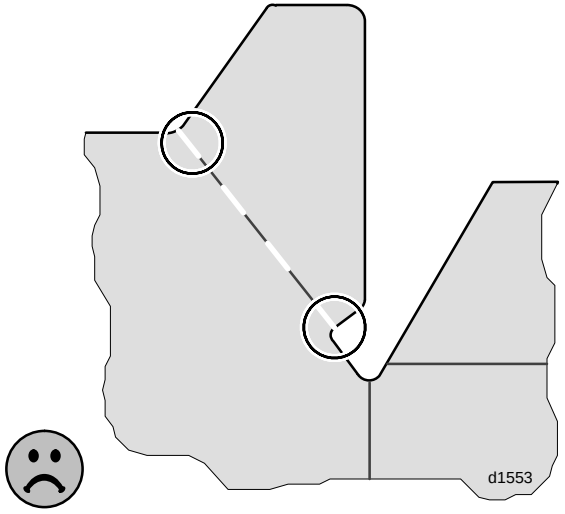
Alternated perforated creases

To facilitate folding through the flutes and 180 degree folding of glue flaps, creases should be made using creasing/perforating rules. Height **a** of the perforating part should be equal to the height of the cutting rules. Length **b** of the grooves can vary according to needs.

Take care not to perforate the crease at its ends to avoid tearing during folding.







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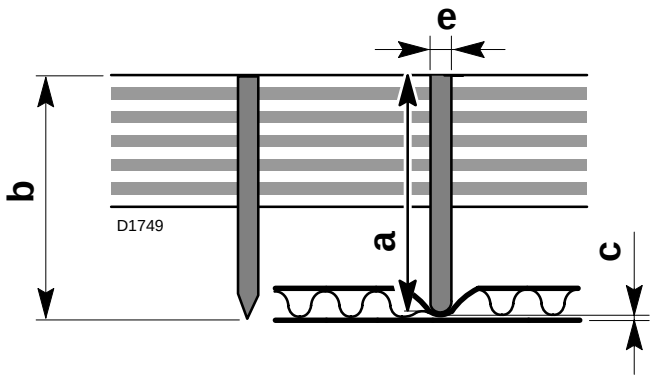
Height of the rules without creasing counterpart

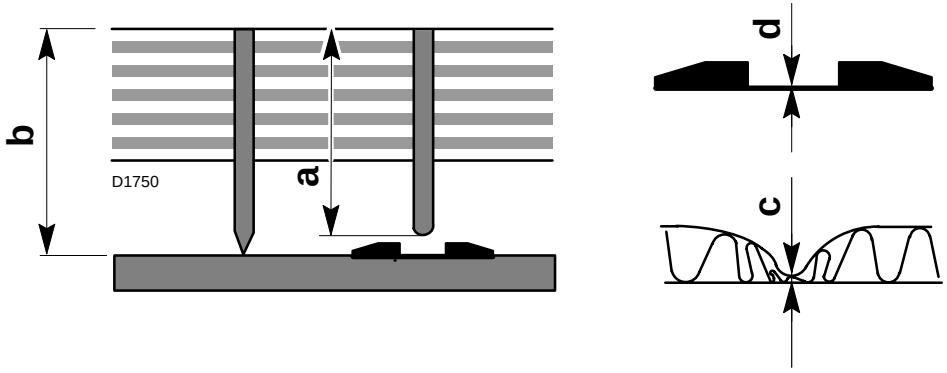
a height of the creasing rules
b height of the cutting rules
c thickness of the crushed board
e See table ”Thickness of the rules without creasing counterpart”



*** a = b – c**

Height of the rules with creasing counterpart

a height of the creasing rules
b height of the cutting rules
c thickness of the crushed board
d thickness of the counterpart base



*** a = b – (c+d)**

***** When using thin cutting plates of 1 mm thickness, reduce height **a** of creasing rule by 0.1 mm.
In cross direction of the flutes, the height of the creasing rule can be increased by 0.1 to 0.2 mm

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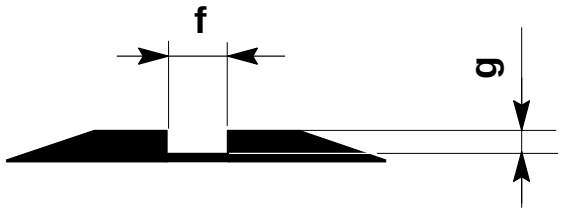
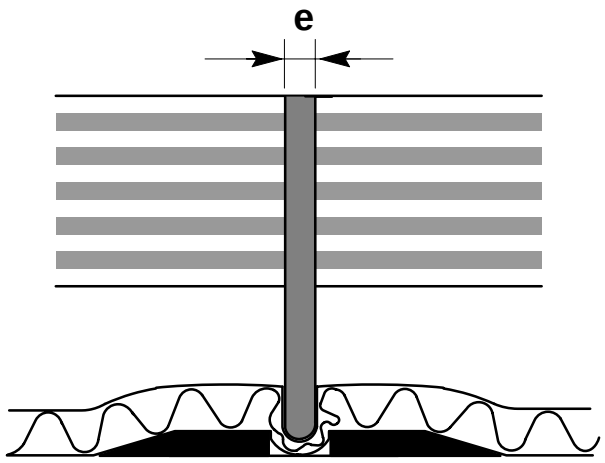
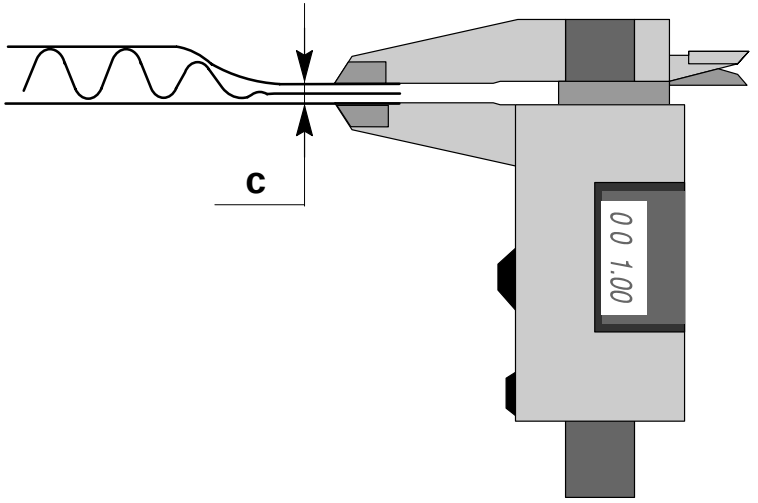
Counterpart sizes





g = c

f = (2xc) + e



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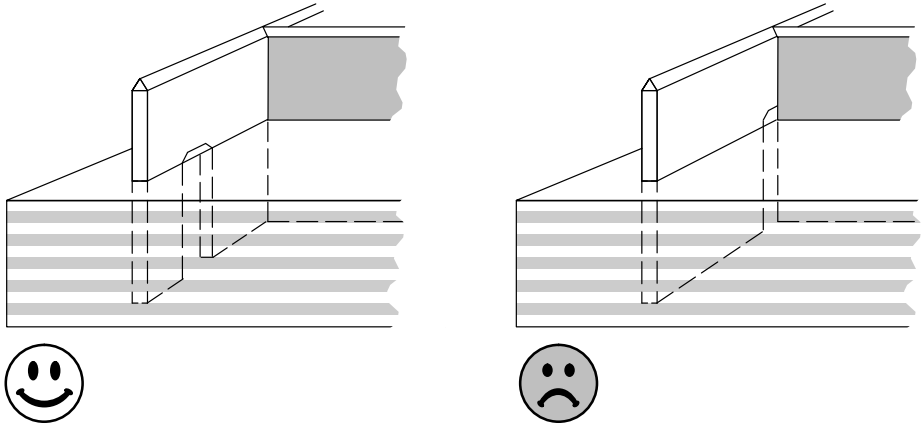
Bridges

For straight cuts, leave a bridge approximately every **100 to 150 mm**. If possible, avoid placing bridges in curved sections. If, however, they are necessary, place them every **80 to 100 mm**.

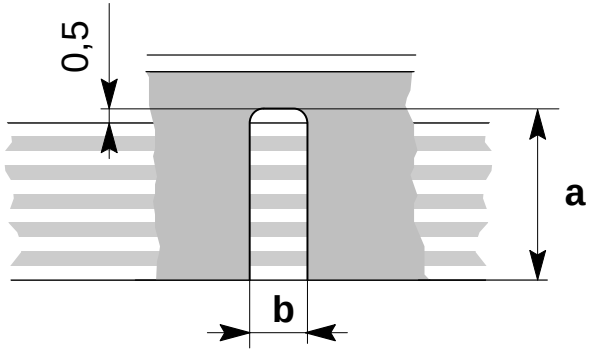
Do not make bridges where rules intersect, as this diminishes the strength of the joins.



Dimension of notches

Height **a** of the notches should be **0.5 mm** higher than the thickness of the wooden board in order to take account of the thickness variations in the wood. This allows you to see the position of the bridges when you make the notches for the nicks.

Length **b** of the bridges is generally **5 mm** to **8 mm**.



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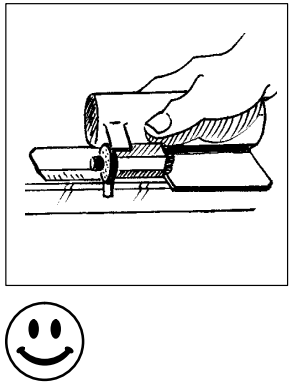
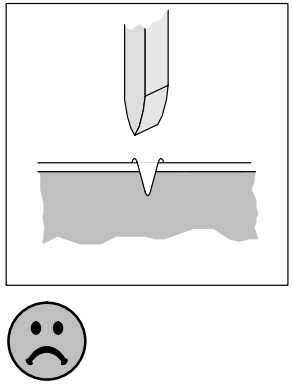
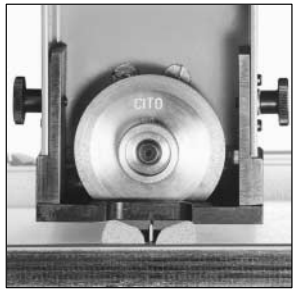
Nicks

The die-maker must make the notches for the nicks **before placing the rubber**. Use a **grinder** to make these notches.

In case you add nicks, remove rubbers on both side of the rule and use a grinder to move rubbers aside.

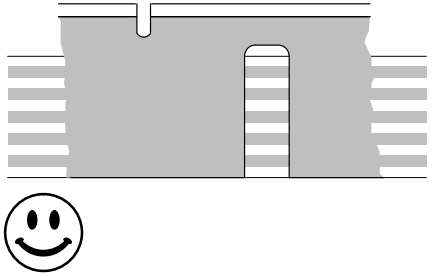


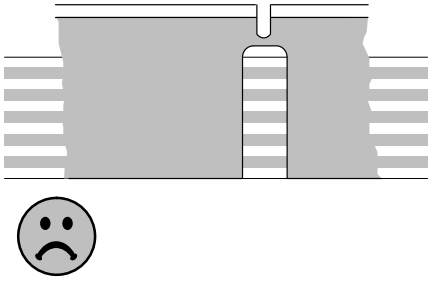




Position of notches for nicks

Do not make any nick notches over a bridge, to prevent any cutting weakness at that point.





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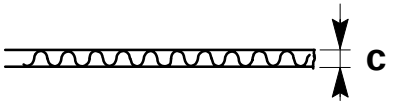
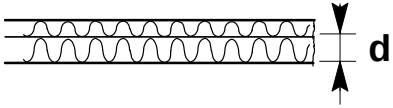
Dimensions of notches for nicks

These values apply when the flute direction of the sheet is parallel to the running direction of the machine.

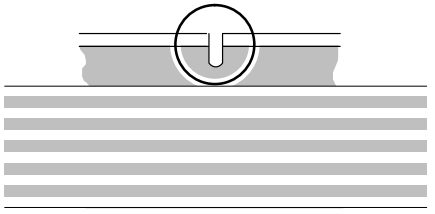
When the notches are perpendicular to the travel direction, **reduce the size or the number of nicks by half** (The nicks are more resistent since the cardboard fibres are always perpendicular to the fibres).

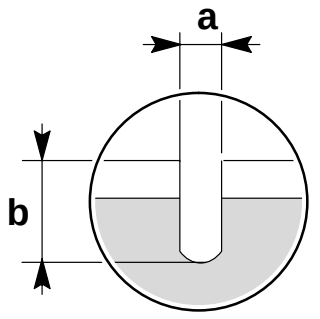
Board	a (mm)	b (mm)
E-flute	0,6 - 1,5	**c** + 0,5
A, B und C-flute	2 - 2,5	**c** + 0,5
Double wall	2 - 3	**d** + 0,5





Do not forget that it is easier to add nicks than to remove them.





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Number of nicks

The number, position and size of the nicks depends on the type of box made. However, the following rules must be respected:

Connection of the blanks to the front waste

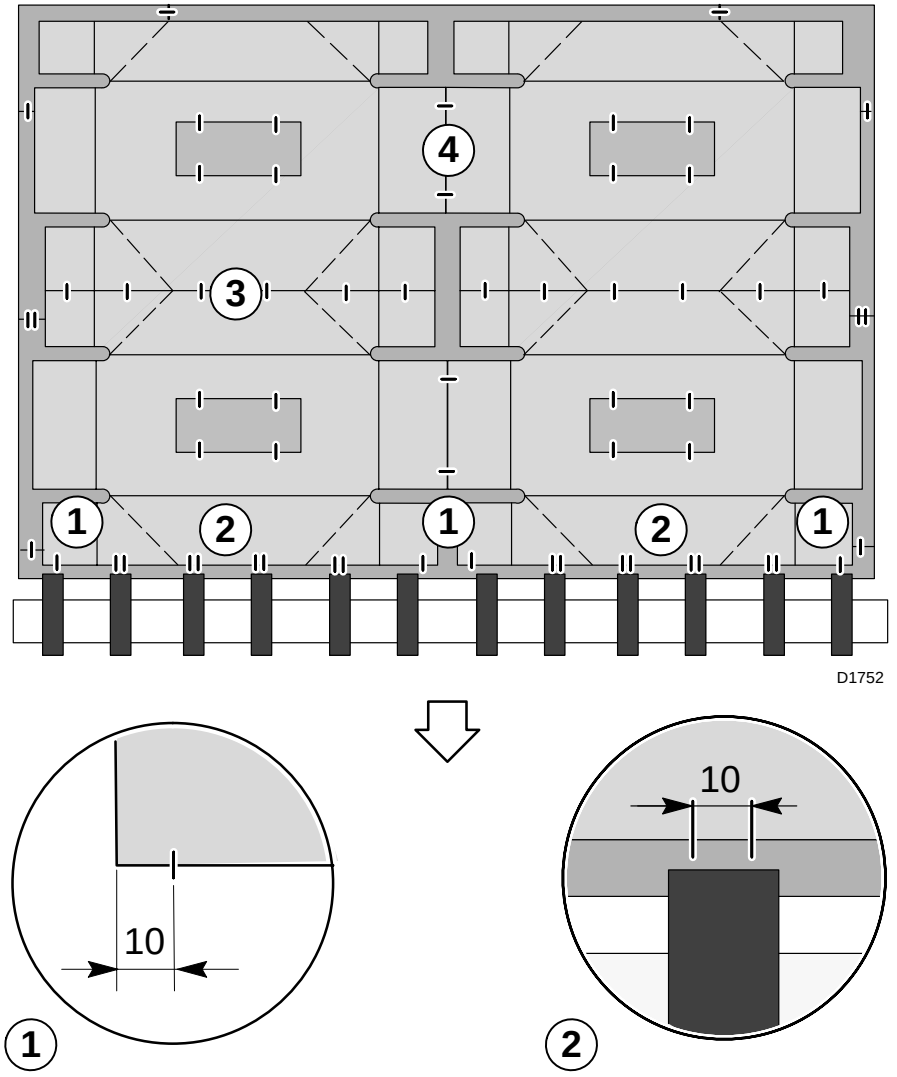
1 Start by making a nick on the flaps, at **10 mm** from the edge (These nicks will not necessarily fall opposite the grippers). This manner will enable a better sheet transport.

2 If possible, make two nicks opposite each gripper. Leave a distance of approx. **10 mm** between the two nicks.

Connection between blanks

3 Make several nicks between the blanks in sheet travel direction. Line them up with those linking the blanks to the front waste.

4 Make several nicks between the blanks in crosswise direction.



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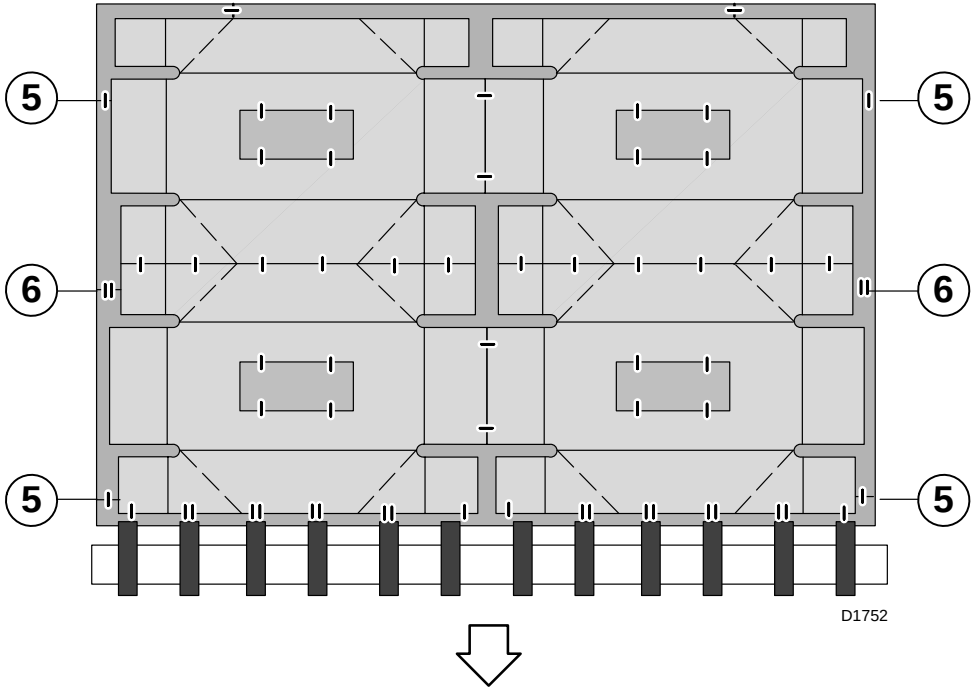
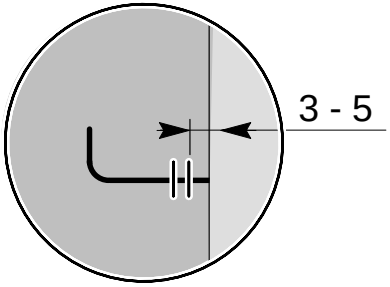
Connection of outside waste

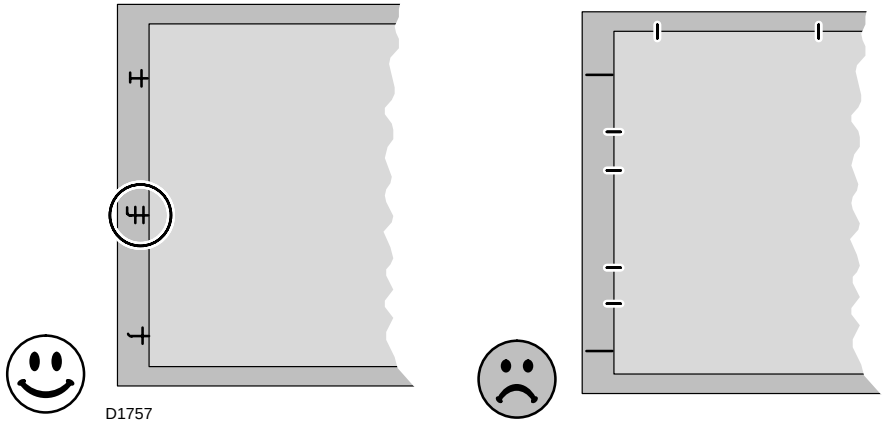
5 Make a nick in each of the rules separating lateral waste from front and rear waste.

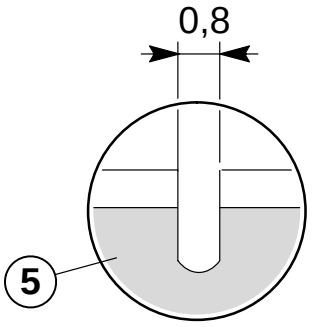
6 If the outside waste has been broken up, make two nicks in each of the breaking up rules.

Do not make nicks connecting the blanks to rear and lateral waste.









Cutting die

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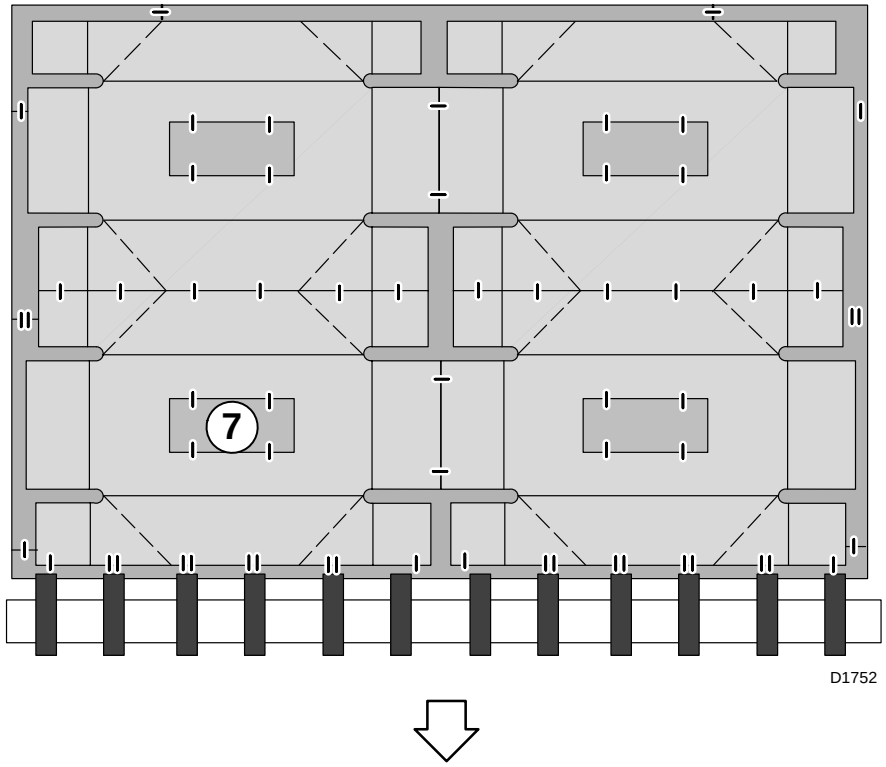
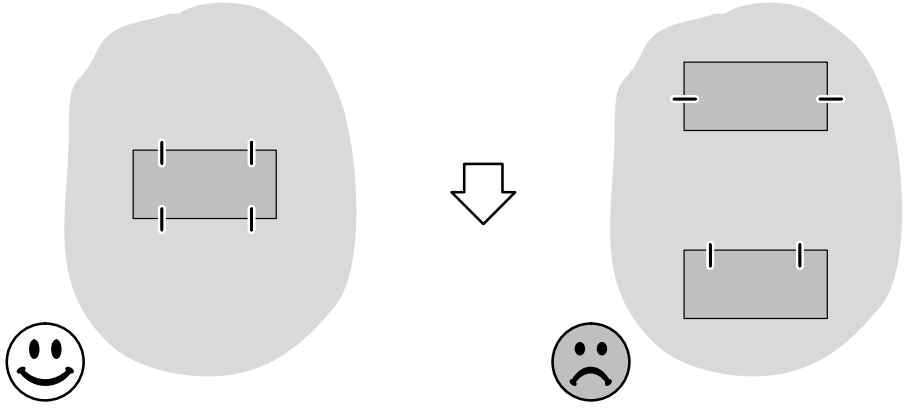
Keeping inside waste attached

7 Never make nicks on only one side of the waste. Always make two opposite each other to avoid leaving a hinge.

If possible, the nicks keeping the inside waste attached should be placed in sheet travel direction.





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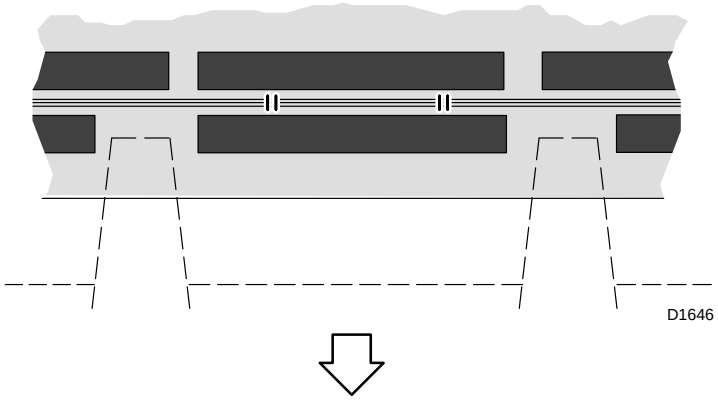
Front waste

Nicks can also be placed between the grippers. Rubber can then be placed on either side of the rule to improve the resistance of the nick.



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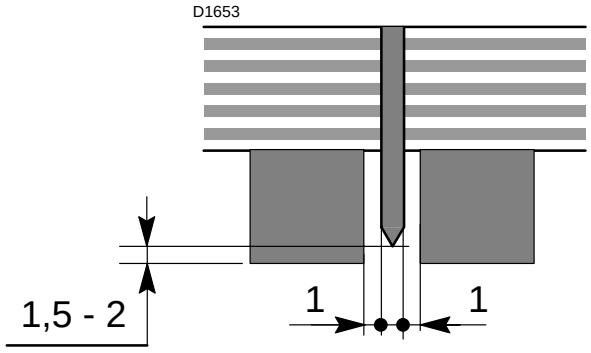
Rubbers

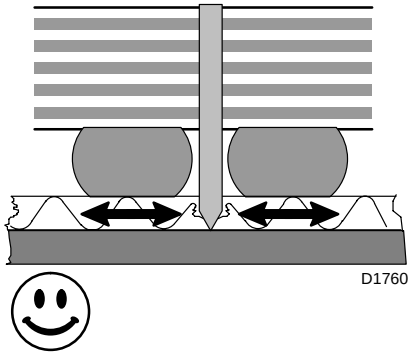
Generally, **the rubber height should exceed that of the cutting rules by about 1.5 to 2 mm**. Rubber hardness depends on its position and of the worked cardboard. Use rubber which returns quickly to its initial shape once it is decompressed.

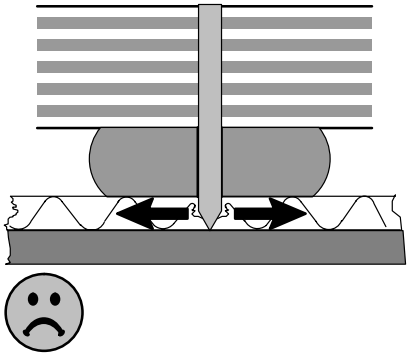
Be sure to leave a minimum clearance of **1 mm between rubber lining and cutting rules.**

If rubber lining touches cutting rules, it cannot be squeezed properly, resulting in breaking nicks. Moreover, the rubbing of the rubber lining against the rule will slow it down as it returns to its initial shape.

The use of self-adhesive rubber enables to remove it more easily in case that additional nicks are added.







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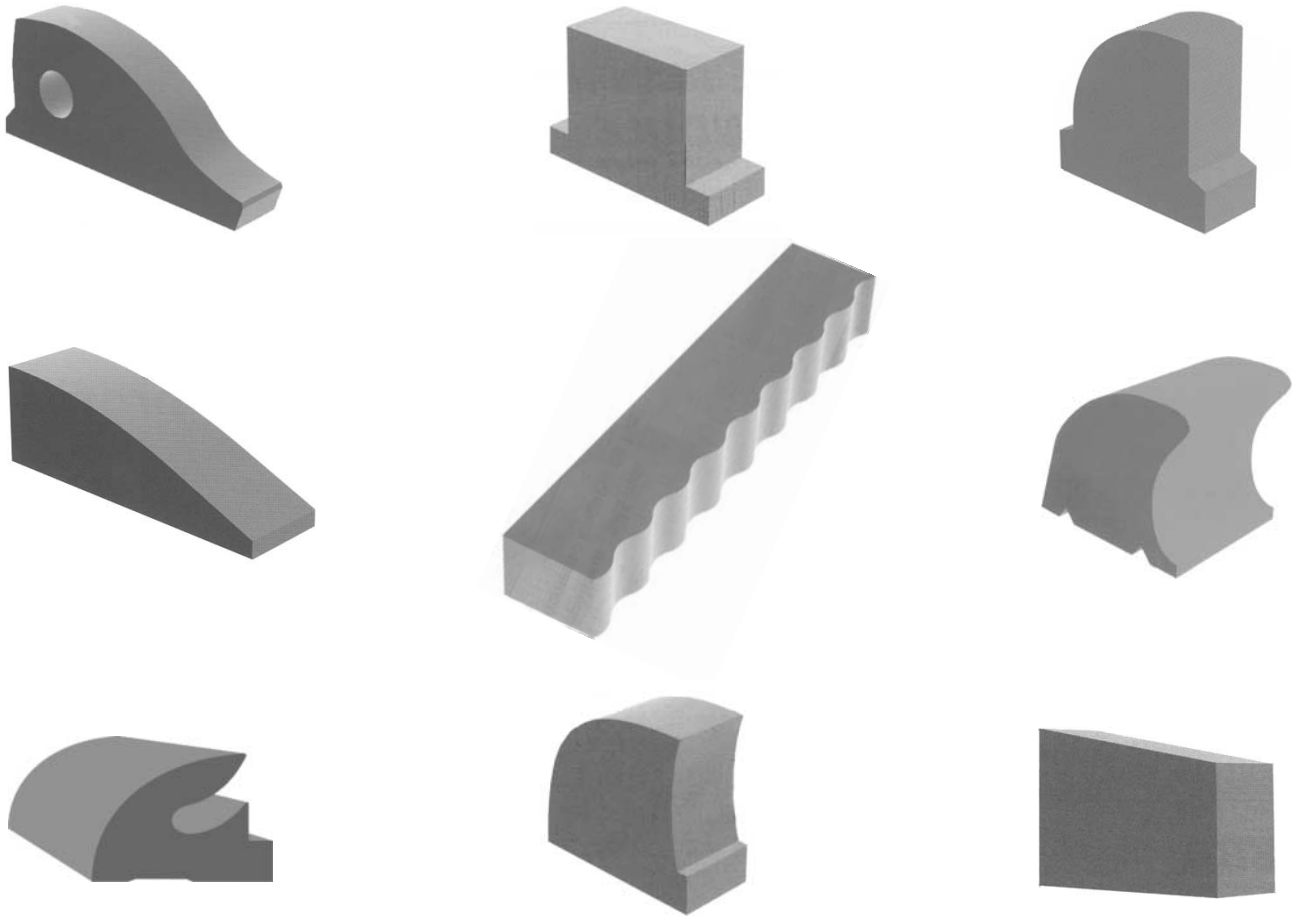
Special profiles

There are different profiles and rubber hardnesses whose use is specific for certain jobs.



Cutting die

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Arrangement

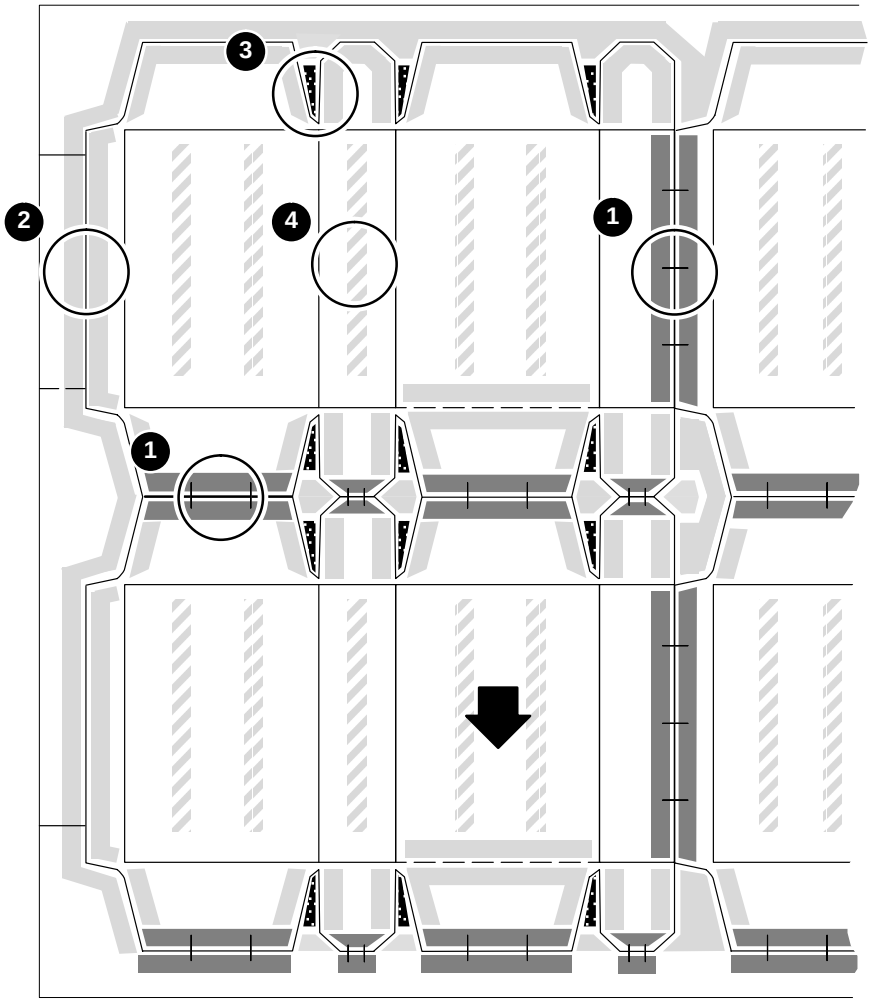
As shown in the illustration, we recommend rubbers of different profile and hardness according to their position and depending on the function of the worked cardboard:

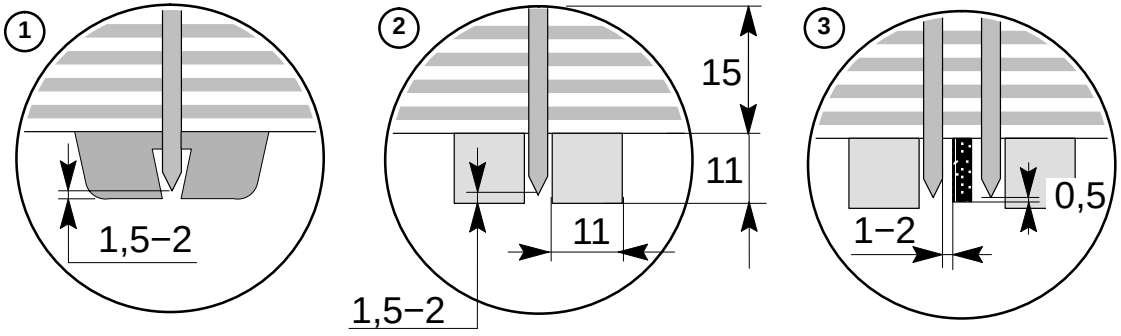
1 Solid profiled rubber of more then **30 Shore** near nicks.

2 Foam rubber of **20** to **25 Shore** at other cutting rules.

3 Solid rubber of **35** to **40 Shore** in slots.

4 In some cases, it may be necessary to place strips of **25 Shore** foam rubber inside the blanks to improve stability and cutting precision.





Cutting die

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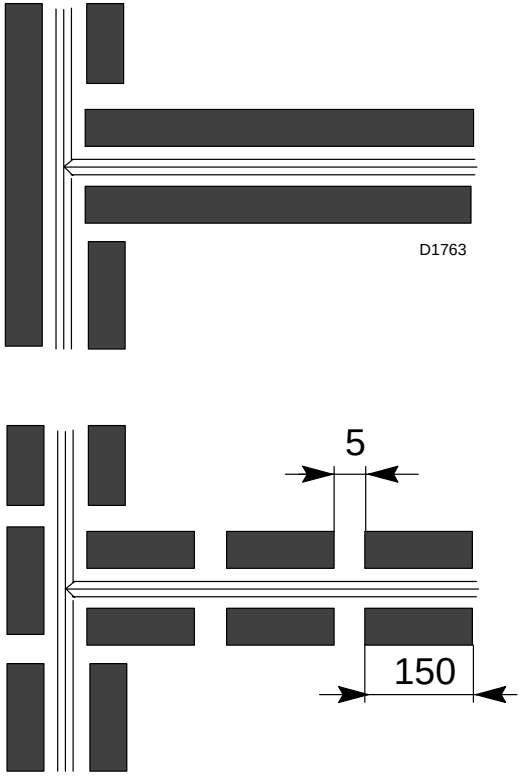
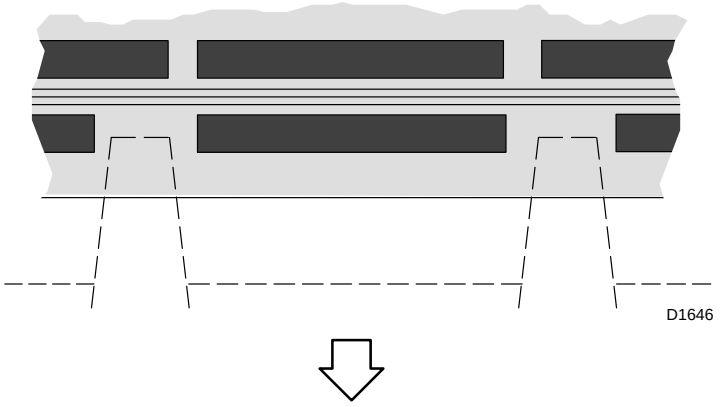
Glue **continuous lines** of rubber on either side of the cutting rules. It is also possible to glue rubber strips **approx. 150 mm** in length opposite one another, leaving a gap of **approx. 5 mm** between each strip.



IMPORTANT

Never place any rubber lines in gripper areas in front of the first rule!



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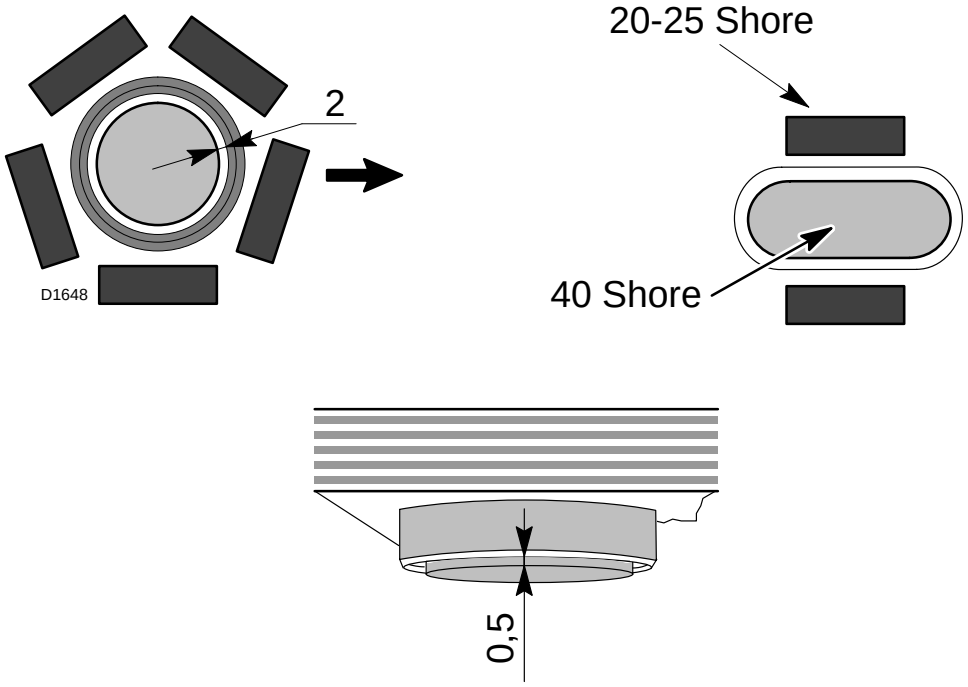
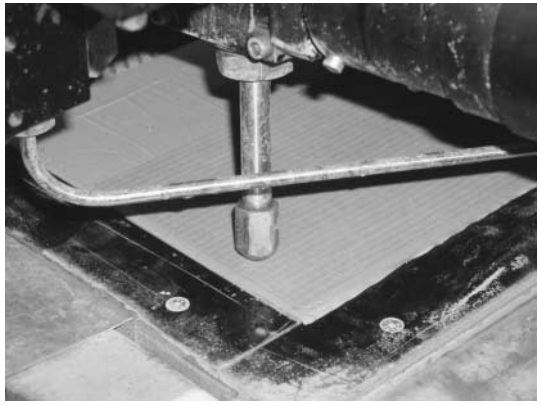
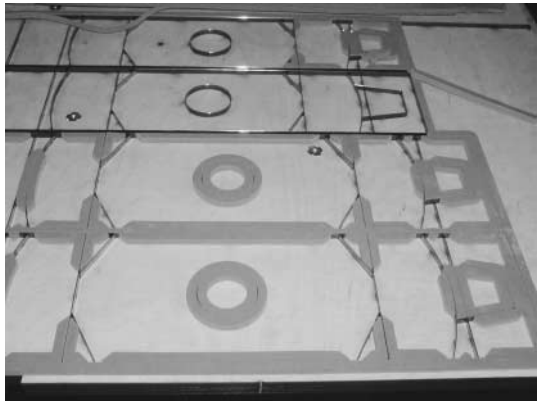
Rubber for diecutting round and small apertures

For diecutting **up to 40 mm in diameter and small apertures**, place inside the cutting rule a round piece of rubber or a piece shaped exactly like the aperture, with a hardness of approx. **40 Shore**. Leave a 2 mm space between the cutting rule and the rubber. **Rubber should exceed cutting rules by about 0.5 mm**.



Diecutting with a pressurized water jet guarantees higher quality and higher precision than traditional diecutting.





Cutting die

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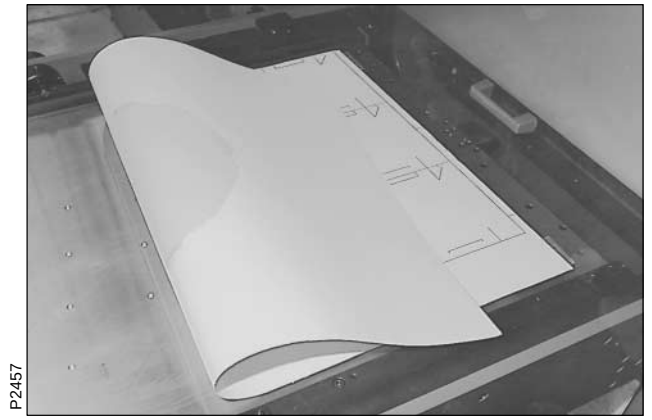
Makeready sheet

A makeready sheet is a sheet of paper bearing the layout of the cutting die. It is specific to one job and one machine and must be used systematically with its corresponding cutting die. To do so, it is recommended to identify the machine on the makeready sheet.

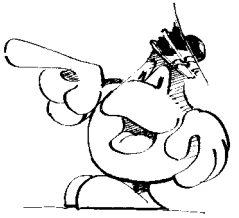
The makeready consists in pasting strips of paper on to the sheet in the places where weaknesses of cut are apparent in order to obtain uniform cutting quality without a significant increase in cutting force.

- Reduced wear of cutting rules
- Accuracy and evenness of cutting

A new makeready sheet must be made whenever any cutting rules or the converting equipment (cutting plate, thin plate, supporting plate, chase bottom plate, etc...) are replaced.


P2457

IMPORTANT
One makeready sheet per job and machine!



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Dimensions

The dimensions of the makeready sheet must correspond to the dimensions of the wooden board of the cutting die, including the compensating rules.

Note: Fig. 1 and 2. In order to facilitate the register of the makeready sheet on the chase, it is recommended to continue the line of the 1st rule and the Centerline axis until the sheet edge.

Thickness

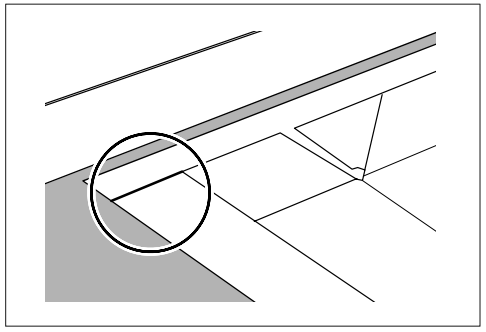
Use a **0.1 mm** thick paper (max. 0.15 mm) with a tolerance that does not exceed **± 0.01 mm**.

Quality

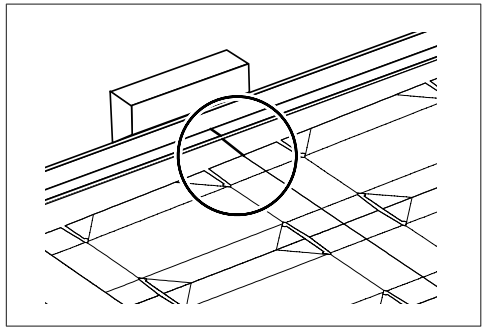
The paper used for the makeready sheet should have the following properties: **incompressibility, resistance to humidity, dimensional stability and evenness of thickness**. We strongly recommend the special papers for offset printers (calibrated papers) and plasticized papers.

Imprint

If a converting tool is not designed with CAD, the outline of the cutting die can be reproduced on the makeready sheet using carbon paper directly on the machine (See chapter “Starting up a job”).



1



2

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Upper stripping tools

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Dimensions of the wooden board

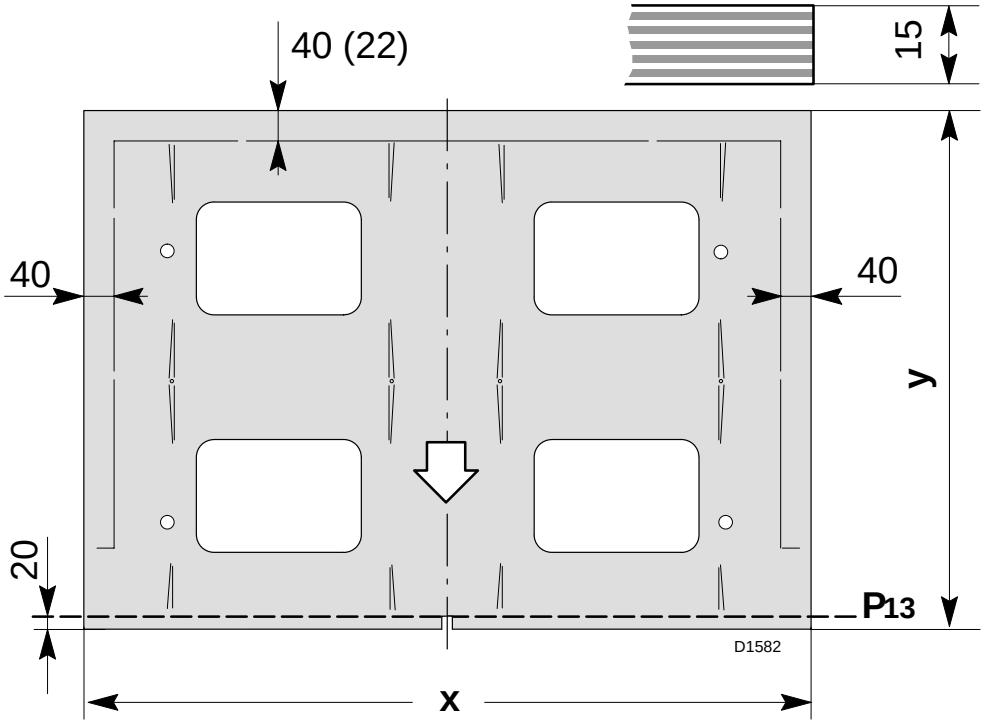
The board dimensions depend on the cutting die.

The front edge of the board must be 20 mm from the position of the first cutting rule. Length **y** and width **x** of the board should exceed the position of the last side and rear cutting rule by **40 mm**. Use plywood **15 mm** thick.

Notes

When using a maximum size **y**, reduce the rear distance of the board to **22 mm**.

In order to pre-position the clamping device and thus to facilitate the fitting of the tool, it is recommendable to engrave distance **y** on the front side of the board.



	mm	x max	y max.	y min.
SPO 1575-EEG		1605	1065	545
SPO 1600		1630	1117	
SPO 160-ER MATIC				
SPO 160 A / matic / Power Register				
SPO 160-S				
SPO 160 VISION / Power Register				
SPO 2000		2062	1287	
SPO 203 A / matic / Power Register				640
MASTERCUT **1.7**		1730	1315	545
MASTERCUT **2.1**		2130		

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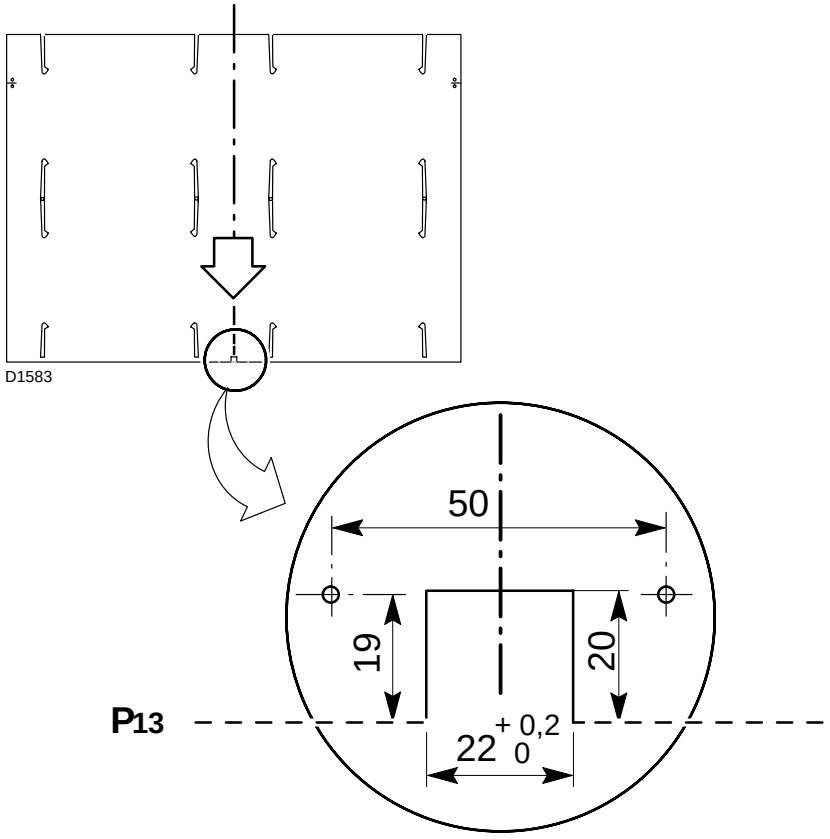
Centerline II

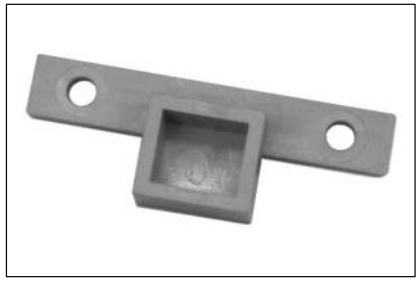
Notch for centering stop

Add a **20 x 22 mm** notch for engaging the Centerline II centering stop.

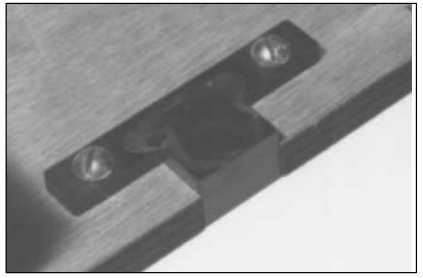


Centering stop

Place the centering stop in the Centerline notch with the shoulder on the reinforcement side and fasten it by means of wood screws.



BOBST 502-QV
(batch of 20 pieces)



P353

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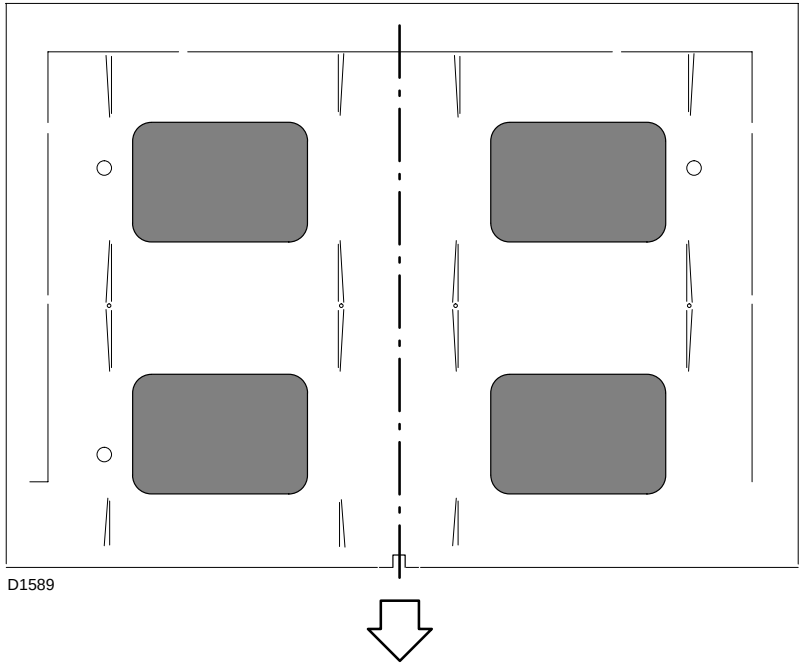
Anti-vacuum apertures

It is important to provide large apertures in the wooden panel in order to avoid the sheets being sucked up during waste stripping. However, be careful not to weaken the resistance of the stripping die with excessive apertures.



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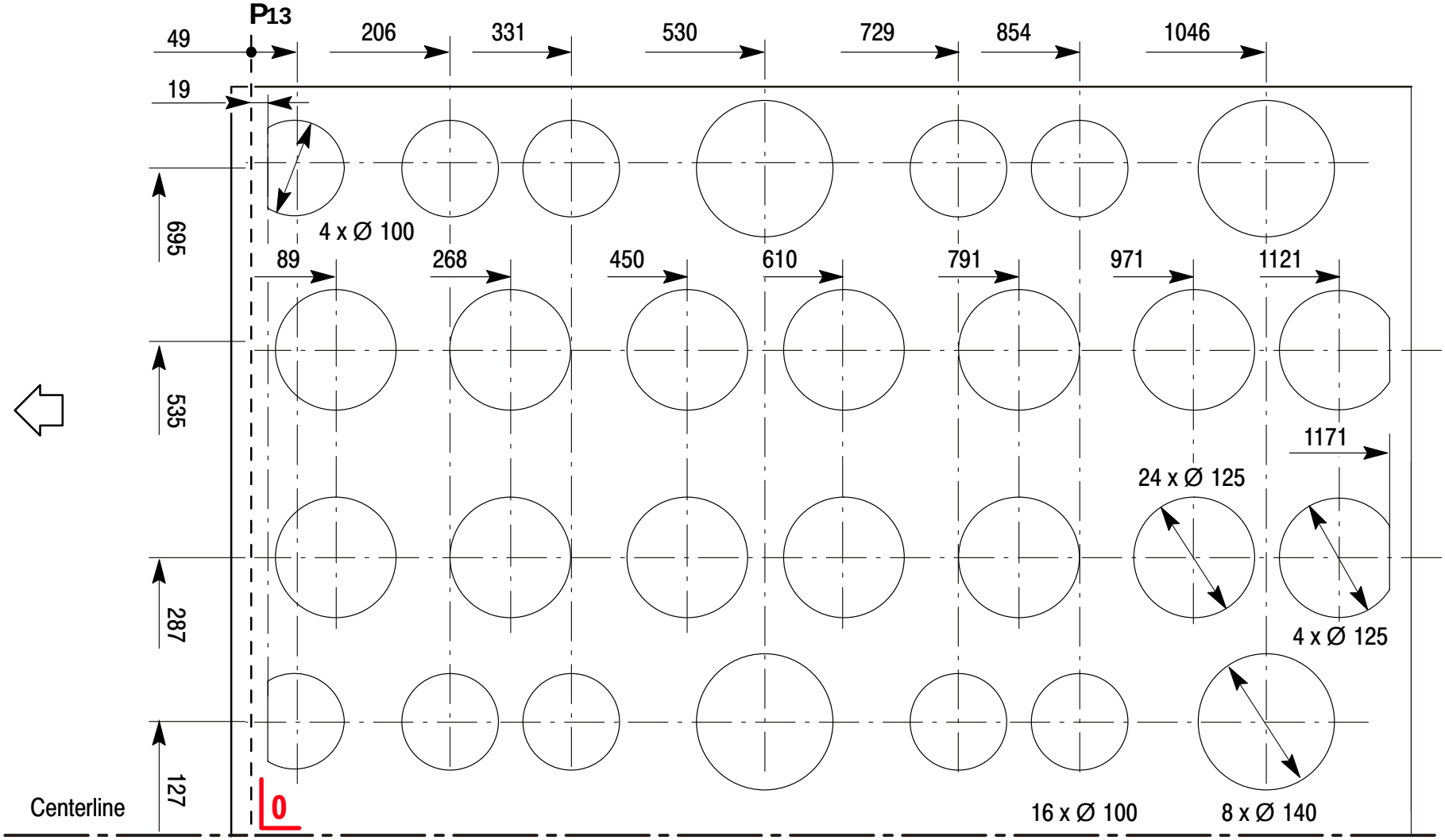
Positions of the SPO 160-S anti-vacuum apertures

The plan indicates the position of the apertures which are possible to be made, os and oos, in order to correspond with those of the bottom plate of the upper frame.



Upper stripping tools

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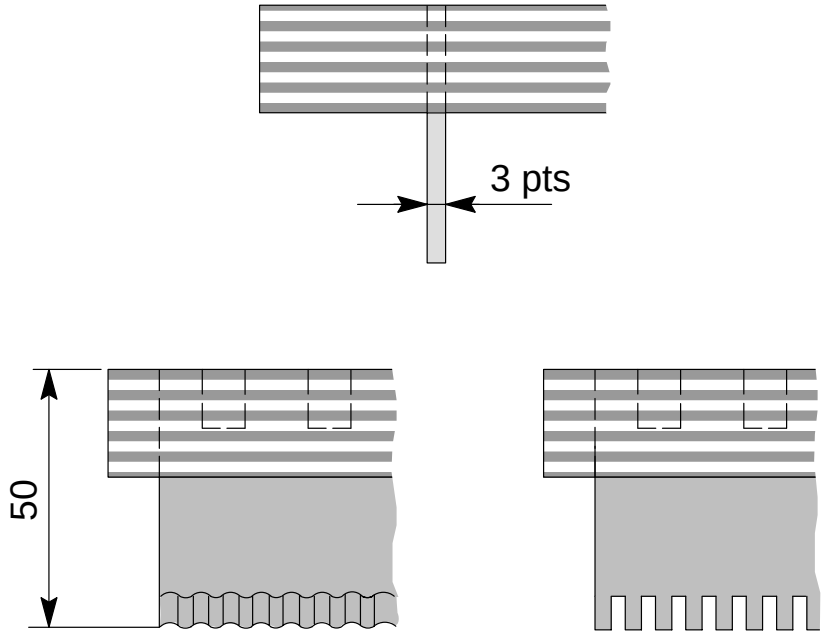
Types of strippers

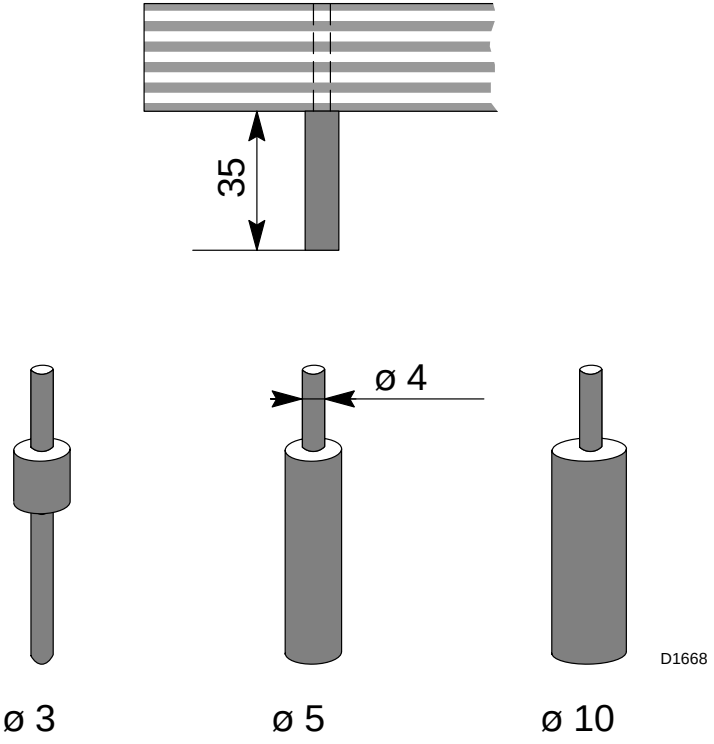
Stripping rules

The stripping rules are simple profiles of drawn steel with a thickness of **3 points** (= approx. 1 mm) and a height of **50 mm**. For certain types of waste, it is possible to use different profiles in order to increase the contact surface with the waste.



Stripping pins

There are 2 main systems for using stripping pins: Insertion in holes cut by laser, pressing in the wood. It is essential for these cylindrical pins to have a shoulder to prevent them being pressed in the wooden board.



Upper stripping tools

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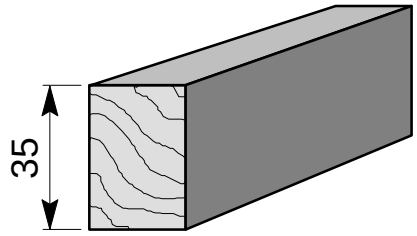
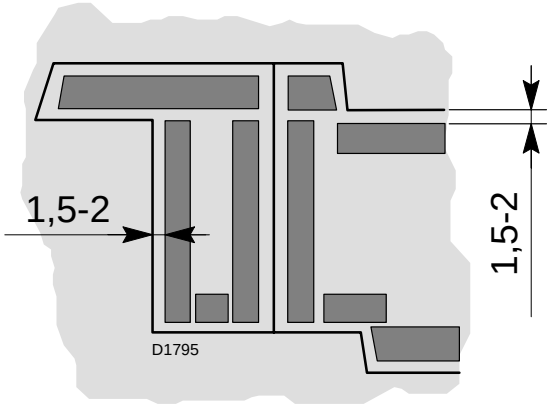
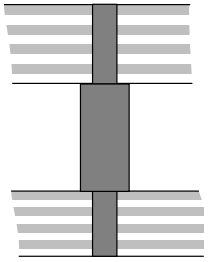
Blocks of wood

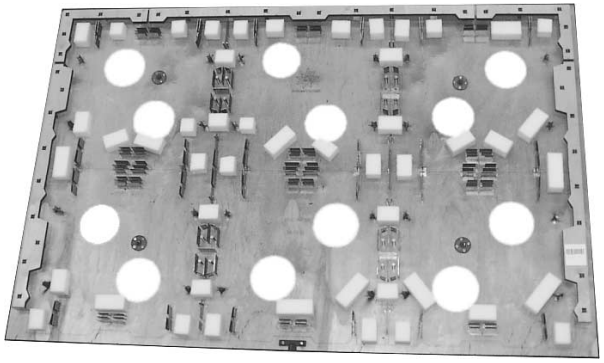
Use wood with a height of **35 mm**. Screw (or nail) **and** glue the wooden blocks onto the board.

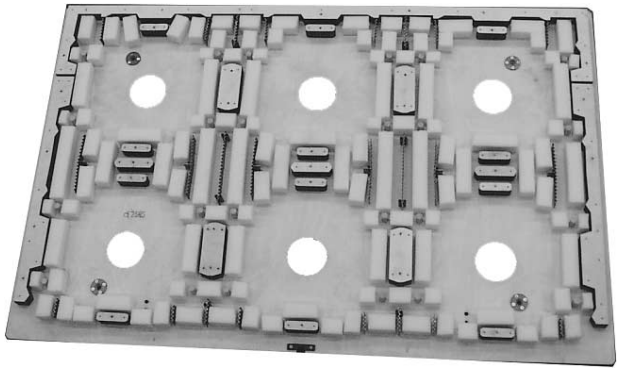




Another solution which is used more and more, consists in recovering the wooden wastes when manufacturing the central board and to fit them on the upper tool using pre-manufactured distance pieces.







Upper stripping tools

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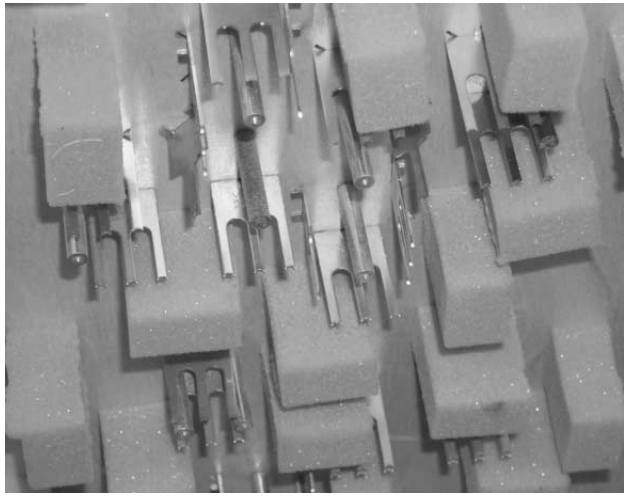
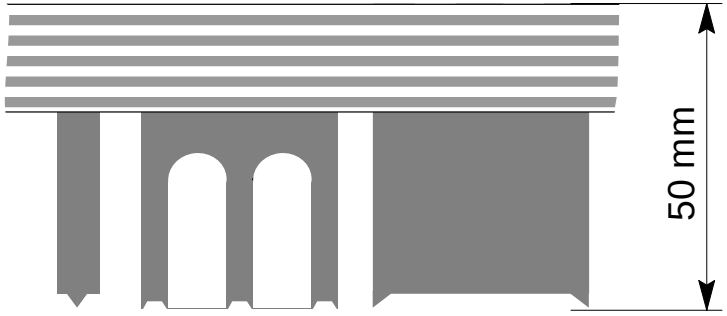
Pointed strippers

This system is also known as **dynamic stripping**. The inner waste is forced by pointed strippers mounted on the upper stripping tool through the central stripping board whose openings in some places are smaller than the waste to be stripped.

This type of stripper goes for waste with a maximum size of 50 x 50 mm. If it is bigger, use conventional stripping.

For more information, please consult the companies specialized in the manufacturing of converting tools.





Upper stripping tools

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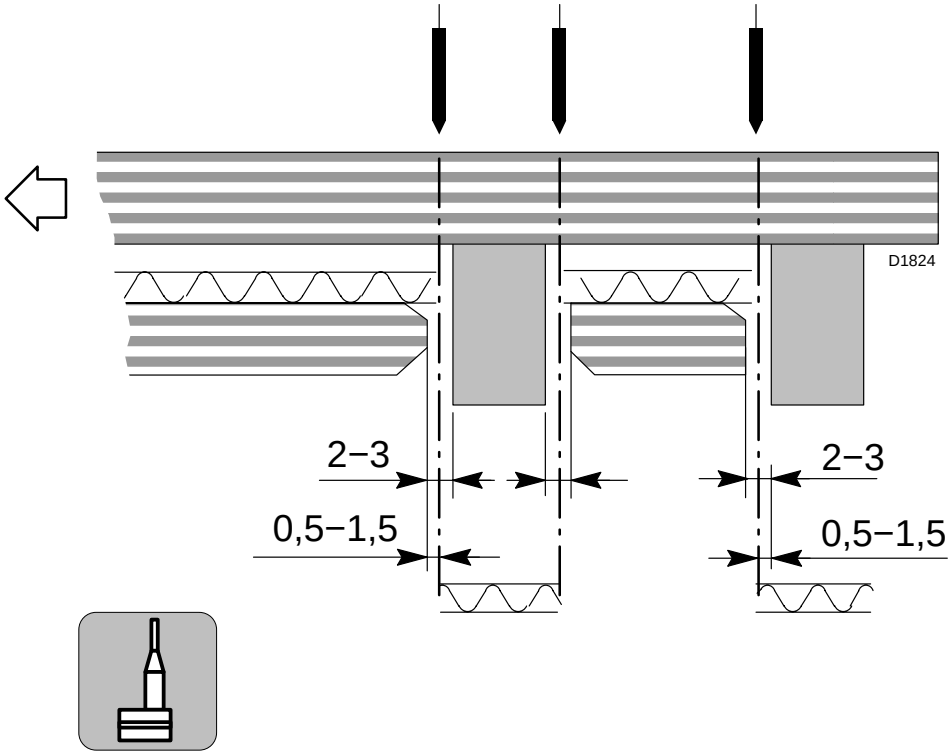
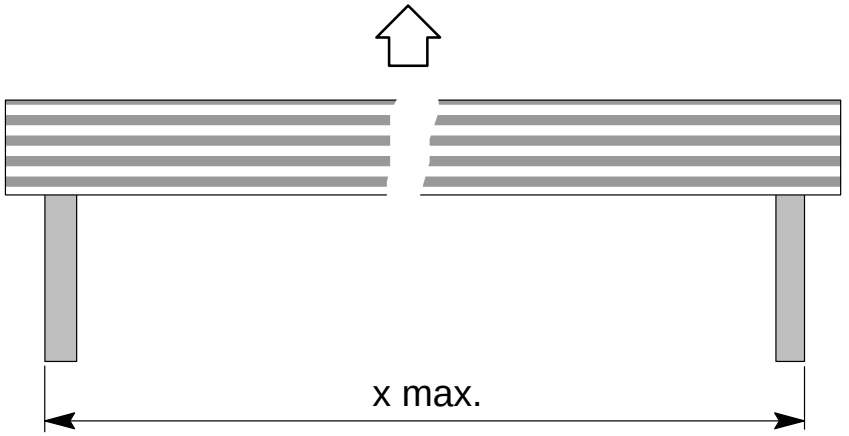
Position of strippers

Conventional stripping

The distance between the upper tools and the apertures which are made into the central board has to be **2 to 3 mm** (0.5 to 1.5 mm with respect to the center of the cutting rule). This distance also goes for the circumference of the board.





		x max.
SPO 160-ER MATIC	mm	1614
SPO 160 A / matic / Power Register		
SPO 160-S		
SPO 160 VISION / Power Register		
SPO 203 A / matic / Power Register		2040
MASTERCUT **1.7**		1714
MASTERCUT **2.1**		2114

Upper stripping tools

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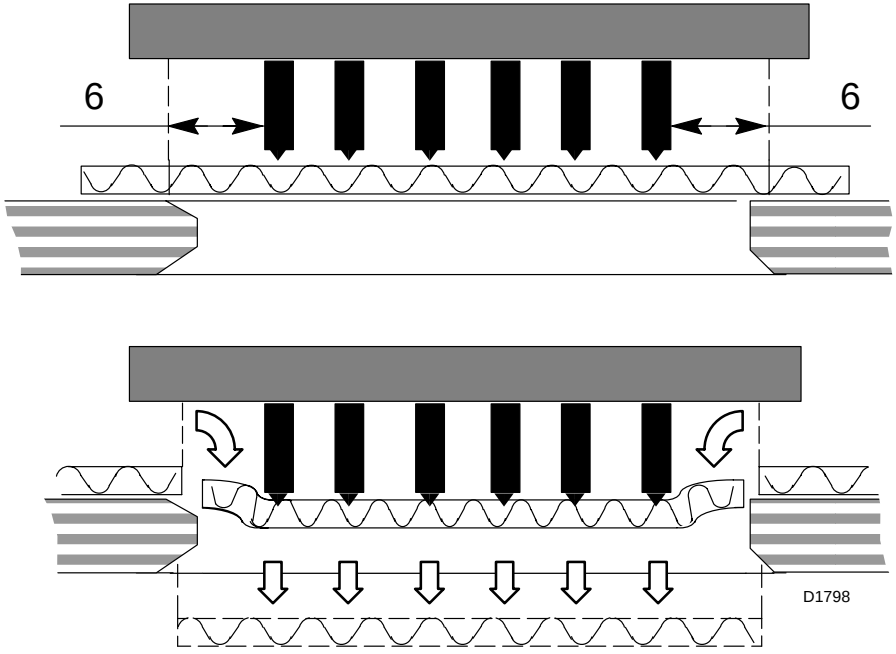
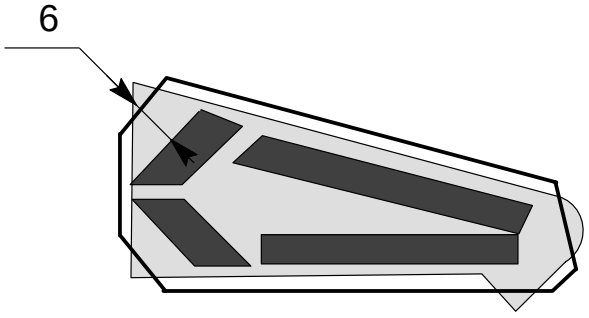
Dynamic stripping

If the aperture in the central stripping board is smaller than the waste to be pushed through, leave **approx. 6 mm additional space between waste edge and stripper.** This will enable the waste to be bent and stripped correctly.





Upper stripping tools

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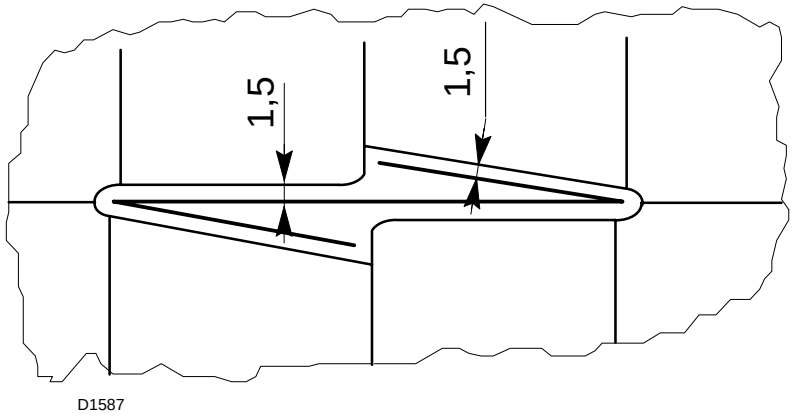
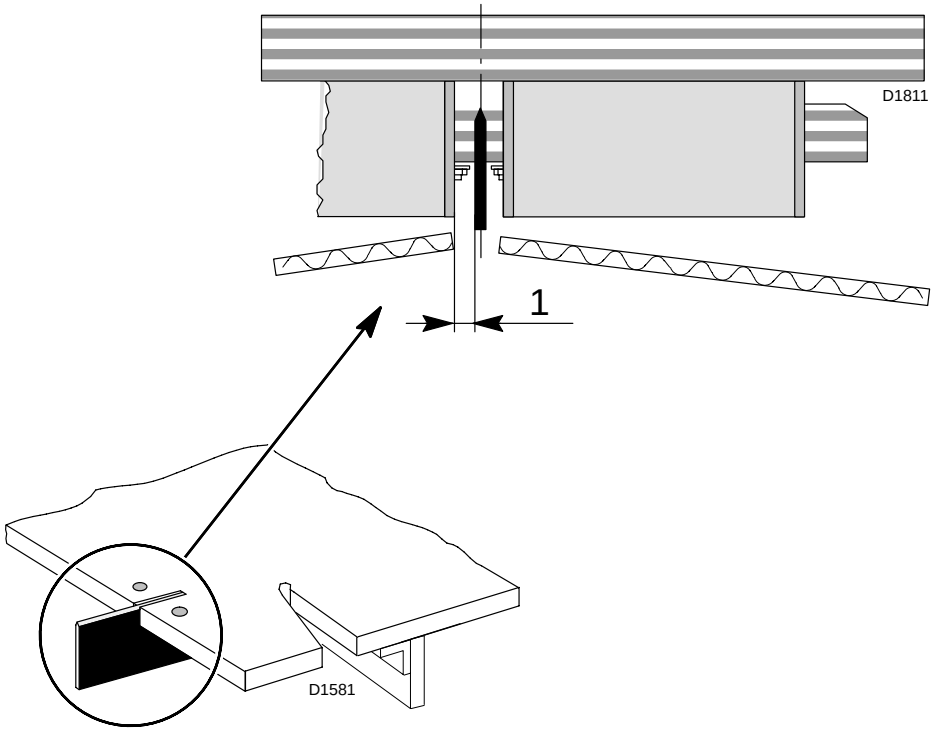
Position of stripping rules

Stripping rules must follow the waste outline at a distance of **1.5 mm**.



Leave **1 mm** distance between end of stripping rule and edge of rule cutting lateral waste.



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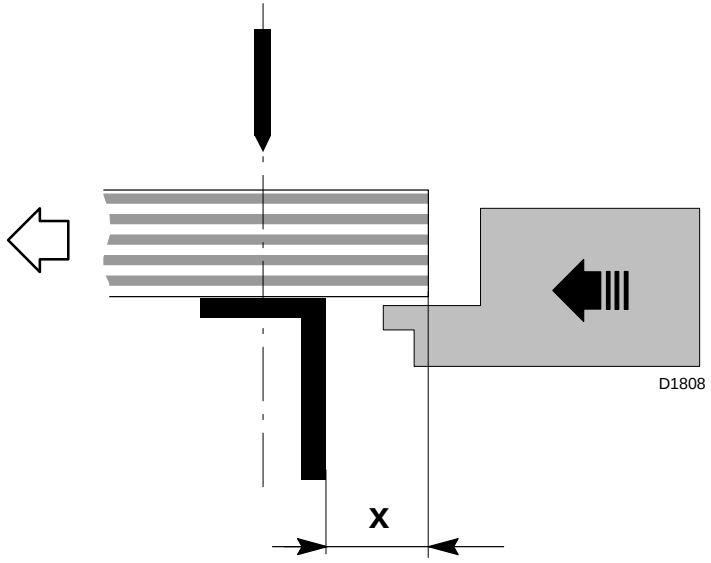
Rear strippers

Leave a clear area **x** between the last stripper and the rear edge of the wooden panel to ensure a correct tightening of the Centerline system.



		x
SPO 1575-EEG	mm	15
SPO 1600		
SPO 160 A / matic / Power Register		
SPO 160-S		
SPO 160 VISION / Power Register		
SPO 160-ER MATIC		12 *
SPO 2000		15
SPO 203 A / matic / Power Register		
MASTERCUT **1.7**		
MASTERCUT **2.1**		

** 15 mm if the tools are used on other machines*

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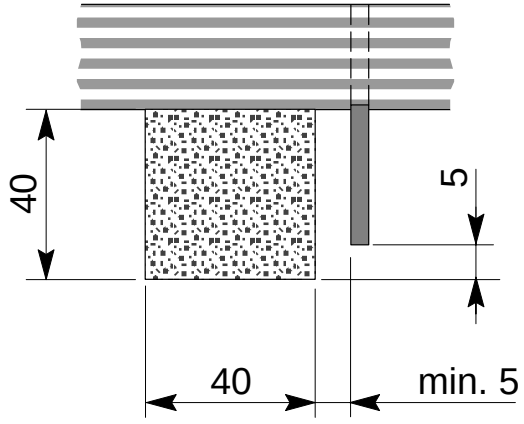
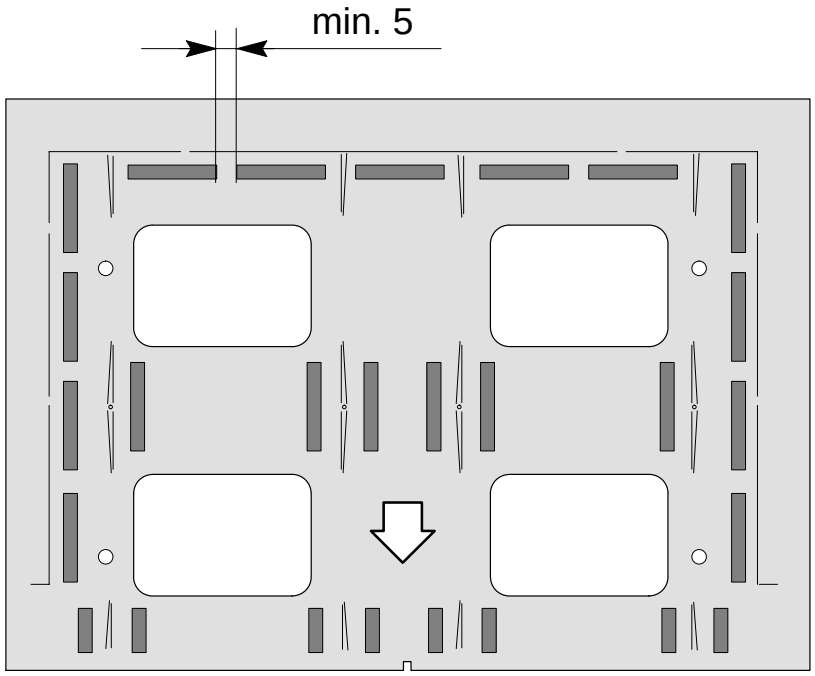
Stripping foam

Use polyester foam with a density of **30 to 40 kg/m^3**, elastic enough to return to its initial shape after crushing (BOBST 502 175 102). The section of each piece of foam is **40 x 40 mm**.

The height of the foam pieces must exceed the strippers by **5 mm**. Maintain a minimum distance of **5 mm** between the pieces of foam and the strippers.





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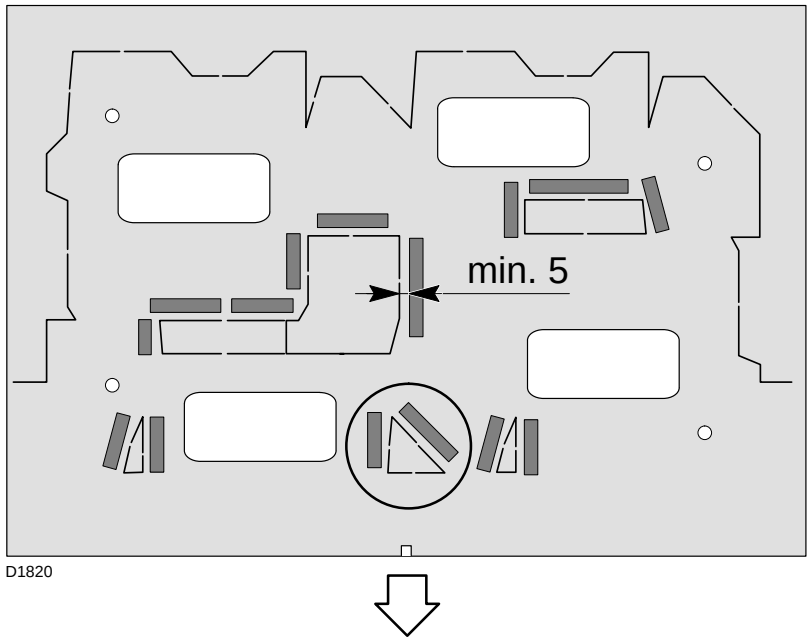
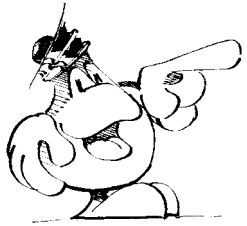
Position

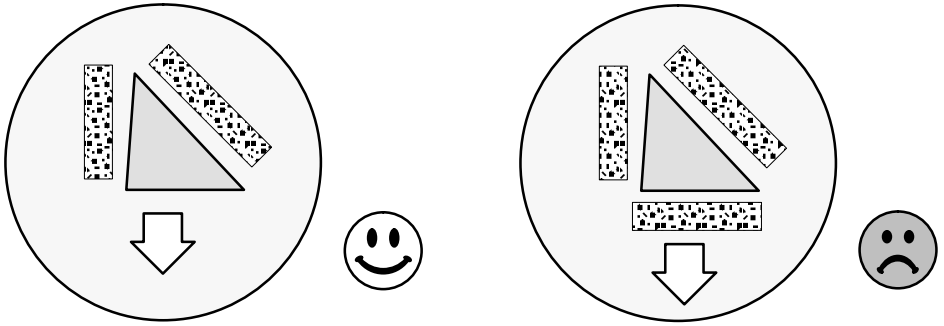
Place the pieces of foam at the side of and behind the inside waste strippers, at least **5 mm** from the outside of the waste.

Avoid placing too many pieces of foam (too much support on the central board).



Never place pieces of foam in front of the strippers!





Upper stripping tools

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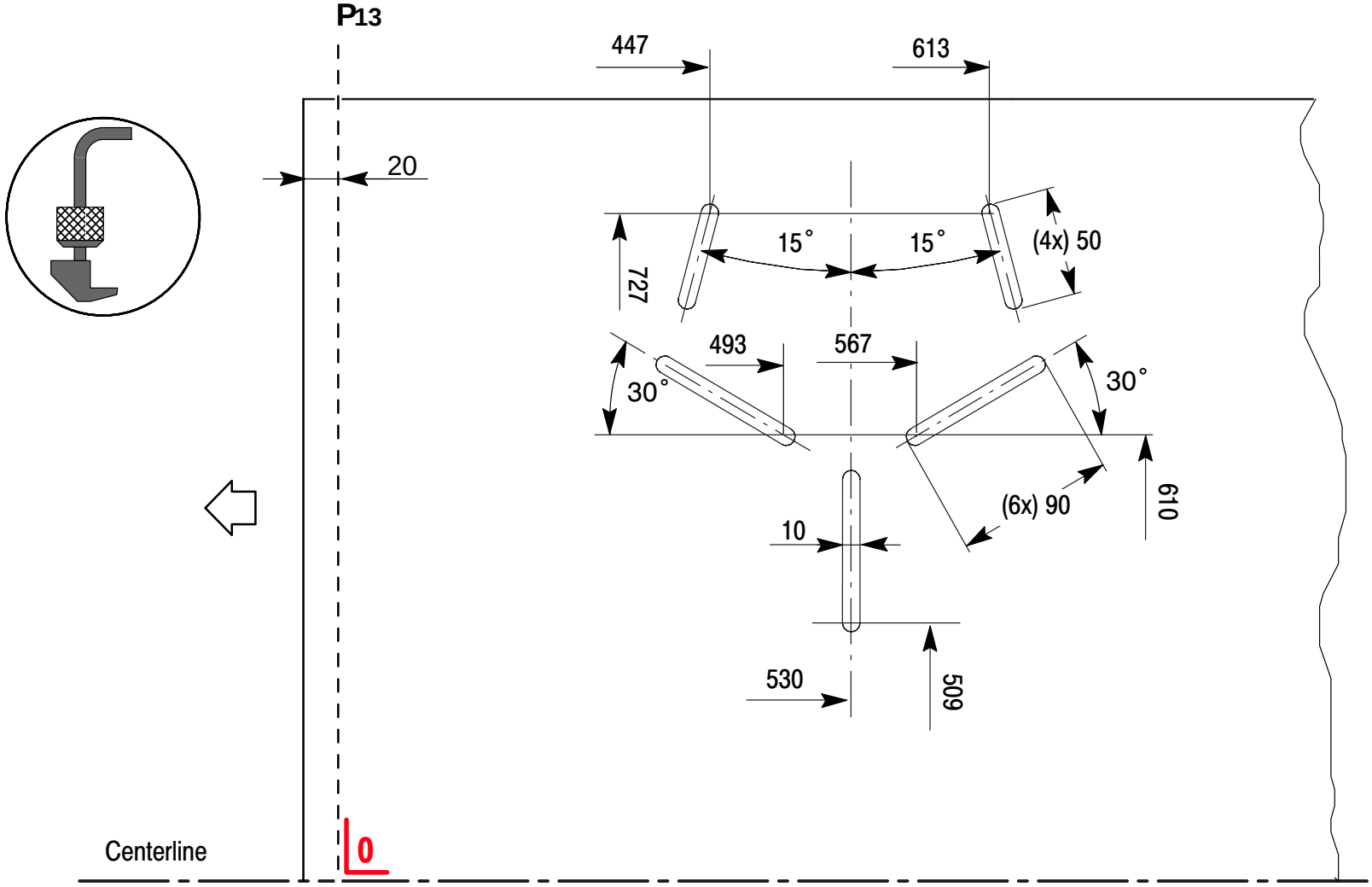
Position of the suspension notches for fastening hooks, SPO 160 A / matic / Power Register

The plan indicates the position of the notches which are possible to be made, os and oos, in order to correspond to those with the bottom plate of the upper frame.



Upper stripping tools

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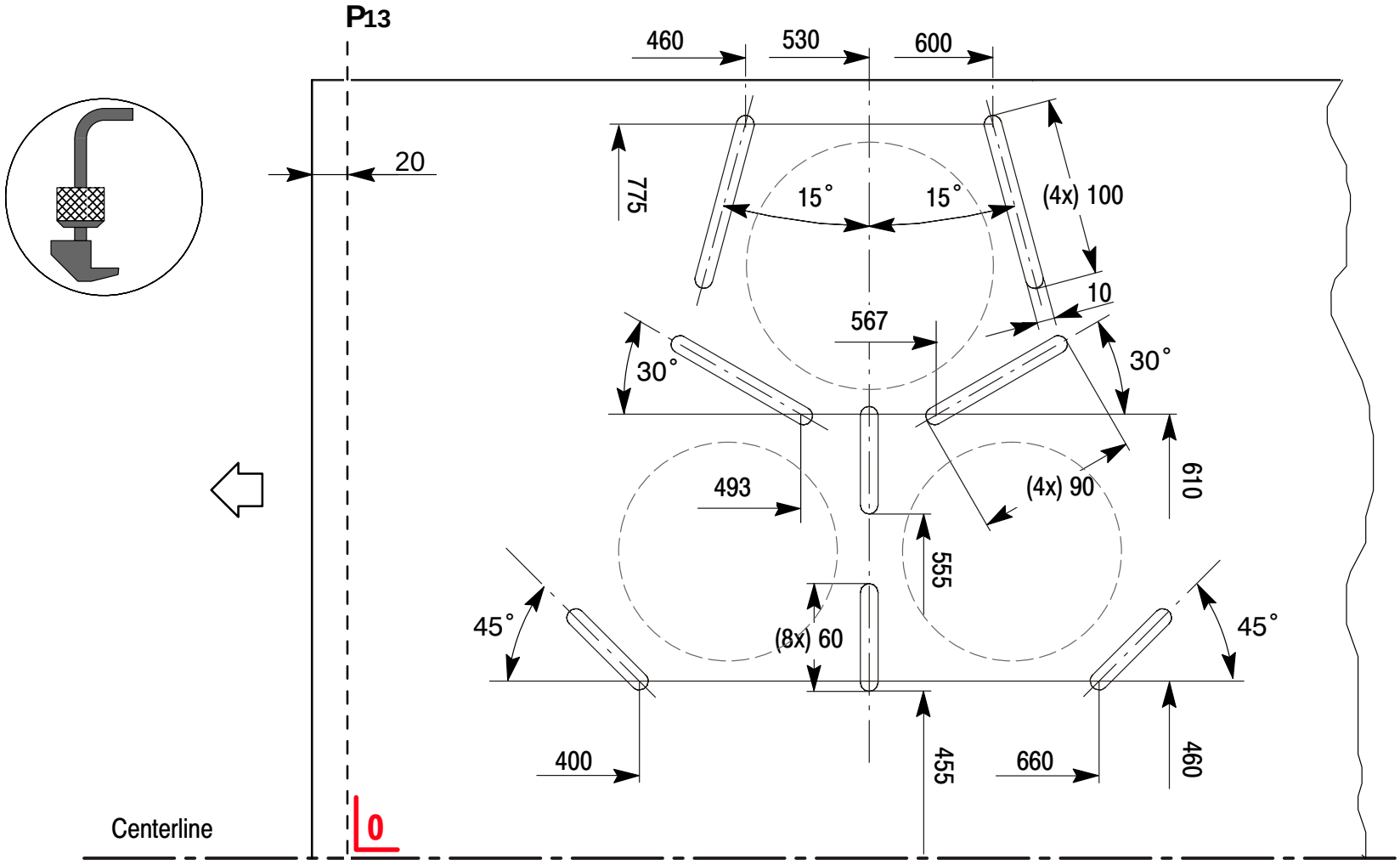
Position of the suspension notches for fastening hooks, SPO 160-S

The plan indicates the position of the notches which are possible to be made, os and oos, in order to correspond with those of the bottom plate of the upper frame.



Upper stripping tools

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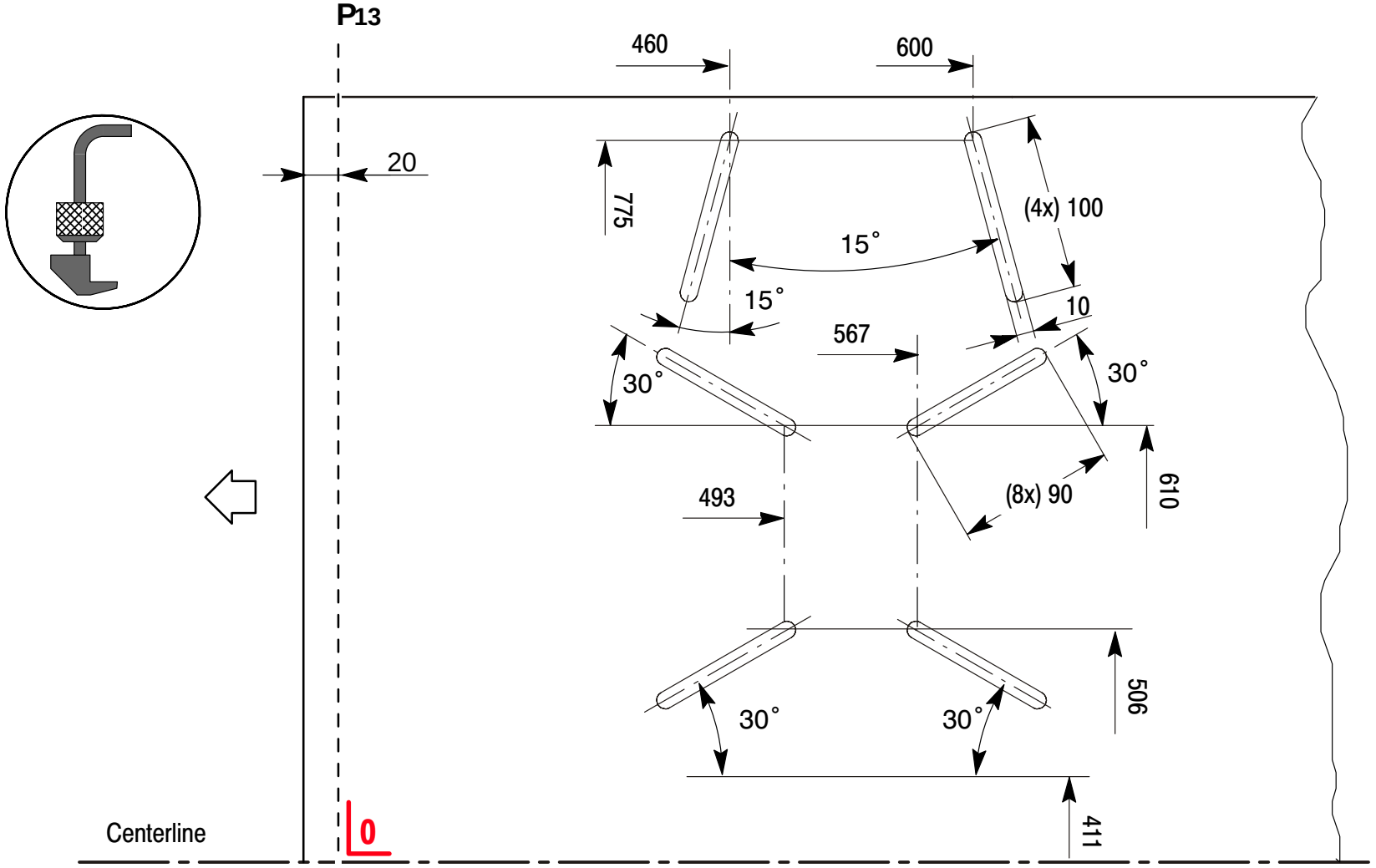
Position of the suspension notches for fastening hooks, SPO 160 VISION / Power Register

The plan indicates the position of the notches which are possible to be made, os and oos, in order to correspond to those with the bottom plate of the upper frame.



Upper stripping tools

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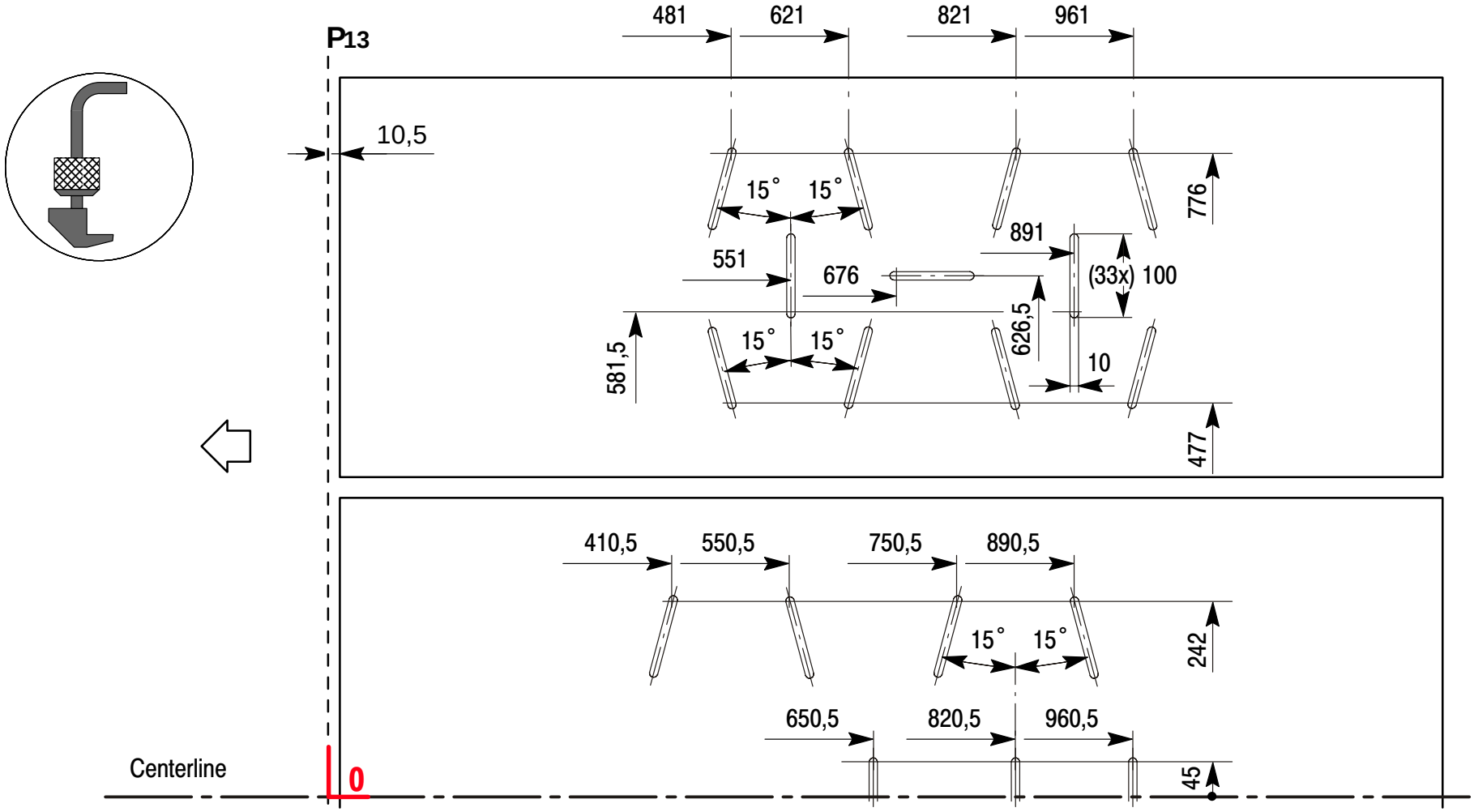
Position of the suspension notches for fastening hooks, MASTERCUT 1.7

The plan indicates the position of the notches which are possible to be made, os and oos, in order to correspond with those of the bottom plate of the upper frame.



Upper stripping tools

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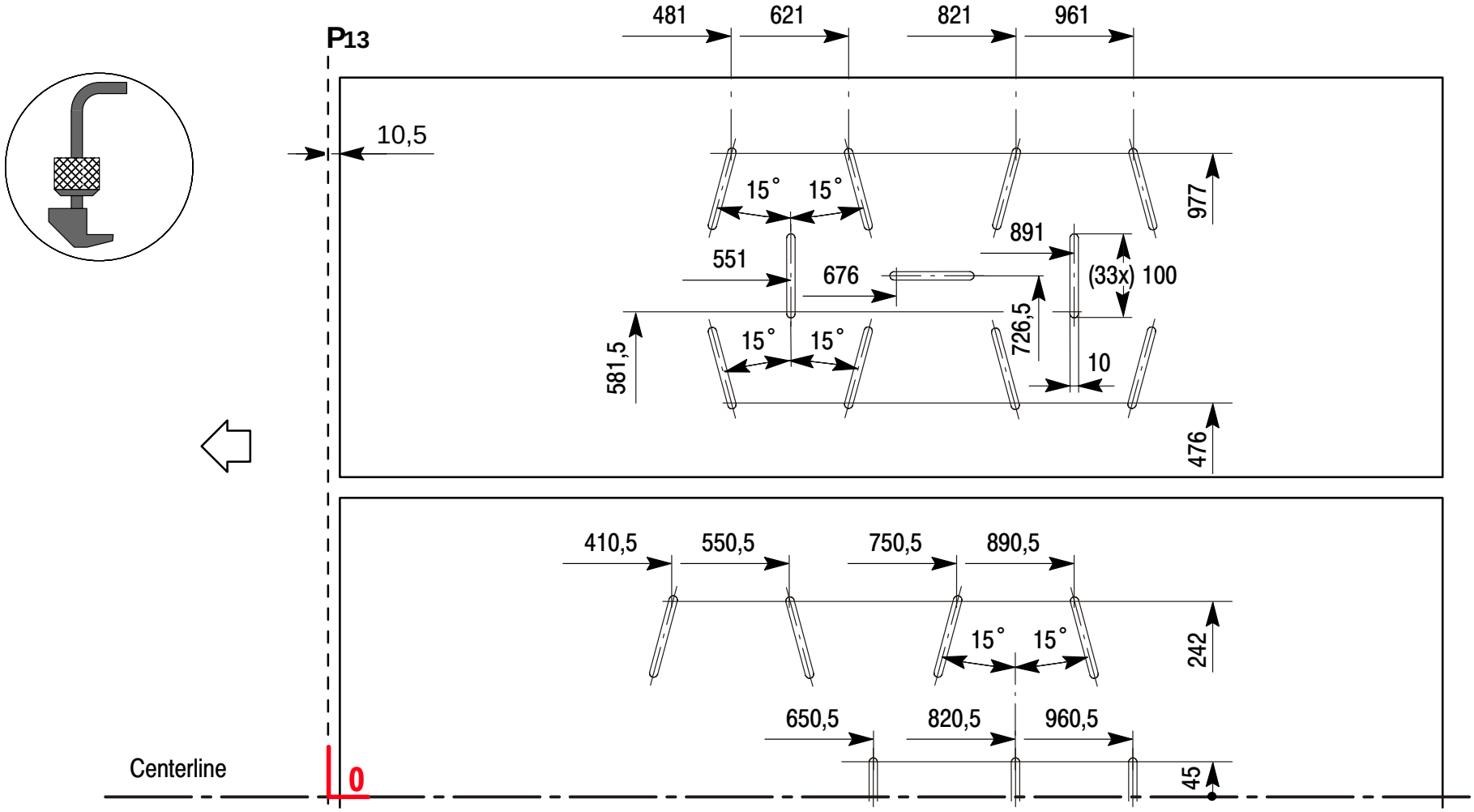
Position of the suspension notches for fastening hooks, MASTERCUT 2.1

The plan indicates the position of the notches which are possible to be made, os and oos, in order to correspond with those of the bottom plate of the upper frame.



Upper stripping tools

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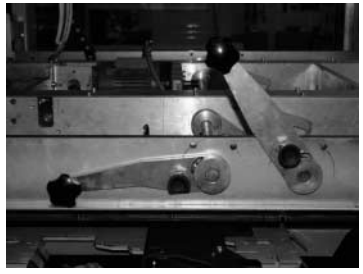
Position of the suspension notches for the lever device, SPO 203 A / matic / Power Register, MASTERCUT 1.7 and MASTERCUT 2.1

A lever device can be used to secure the upper stripping die without entering the machine. Provide **20 x 70 mm** apertures for inserting the tightening hooks.

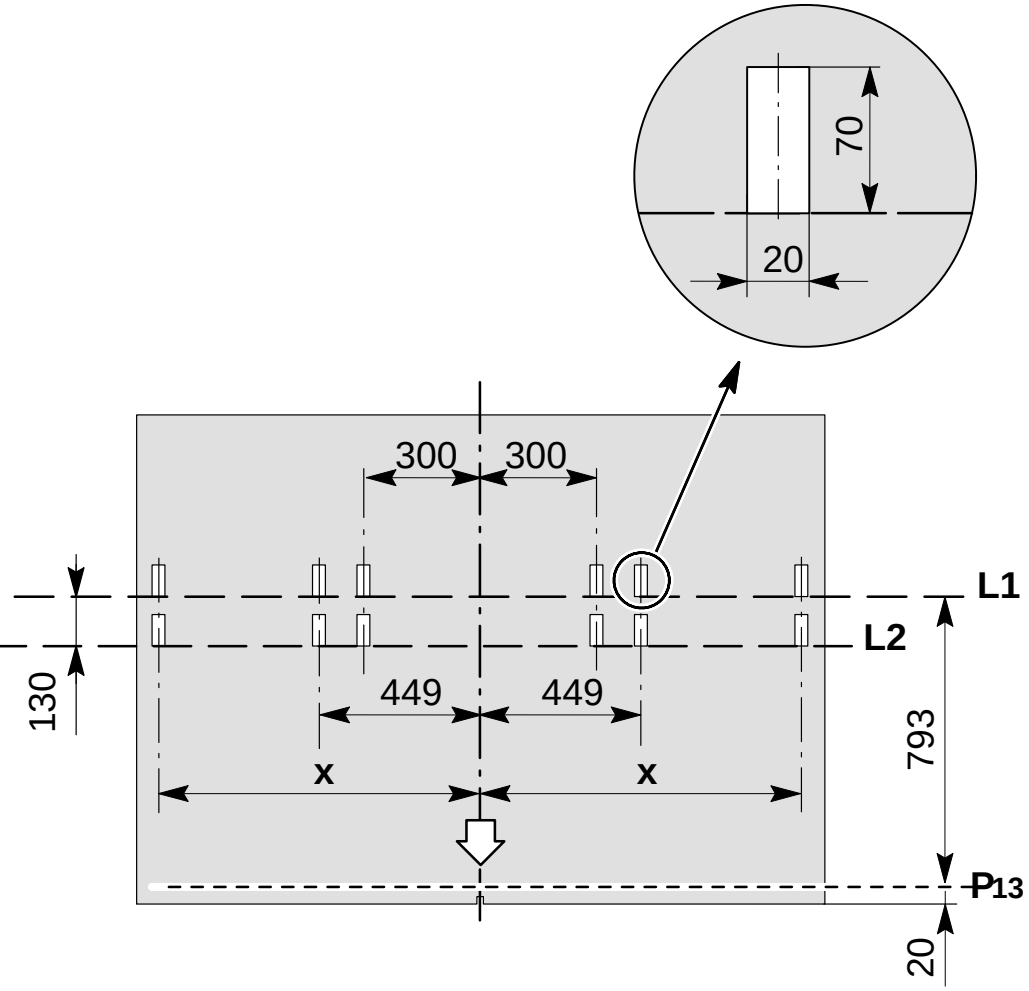
P12141

SPO 203 A / matic / Power Register



P18308

MASTERCUT 1.7 / 2.1



		x
SPO 203 A / matic / Power Register	mm	921
MASTERCUT 1.7		804
MASTERCUT 2.1		1004

Upper stripping tools

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If existing apertures are used for securing the board, they must always be situated behind imaginary line **L1 / L2**.

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Central stripping board

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Wooden board

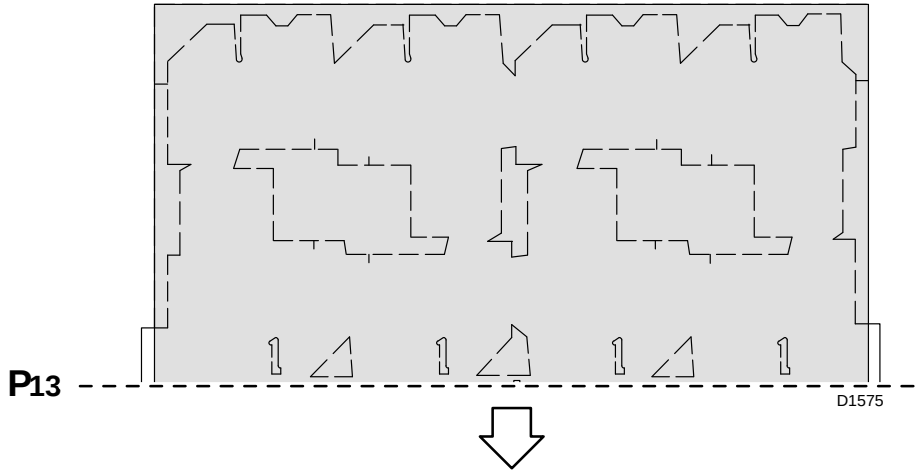
Use **12 mm** thick plywood.

Note: Using a board with varnished surfaces facilitates the cardboard transport and avoids streaks on the printing.

Front, lateral and rear edges

Front edge

Front edge of the central stripping board is straight and must correspond to the first rule P_{13} of the cutting die.



Central stripping board

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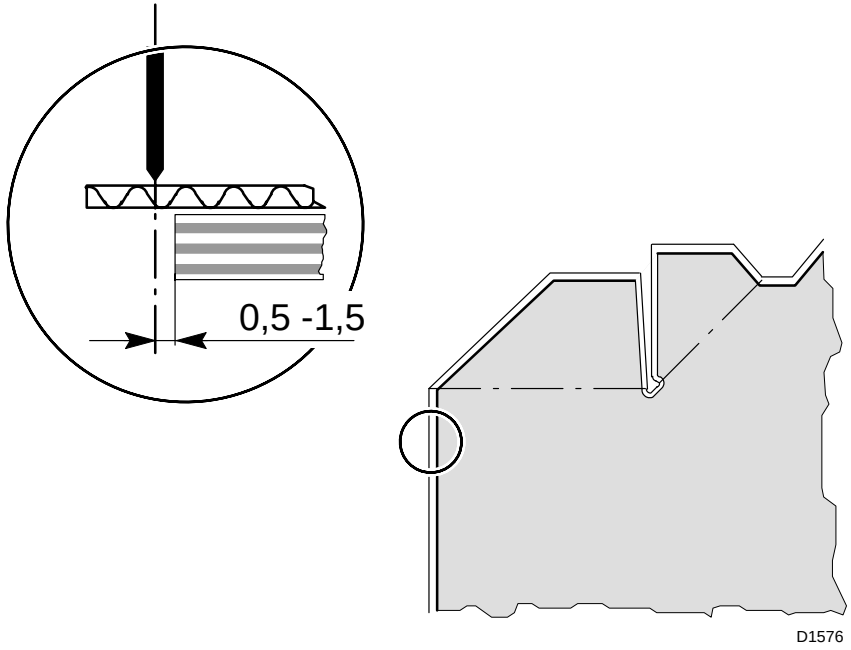
Lateral edges and rear edge

Side edges and the rear edge should follow the design of outer cutting rules at a distance of **0.5 to 1.5 mm** towards the inside of the board.



Central stripping board

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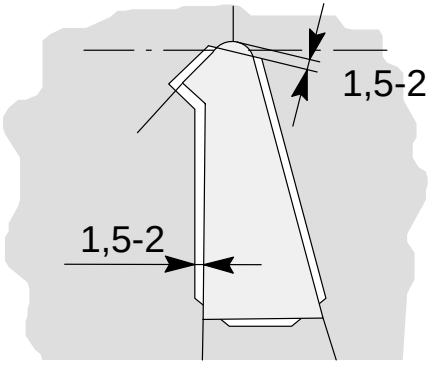
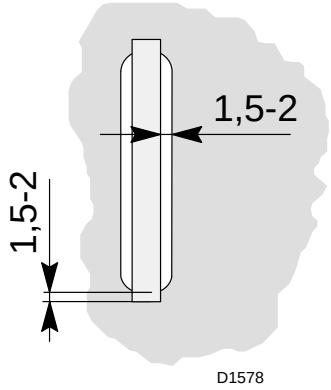
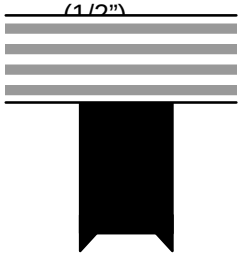
Inner apertures

Dynamic stripping

The inner apertures should be slightly larger than the waste. If the waste is small in size, the angles and ends of the aperture should be shorter than the waste. This is to avoid the waste from rising up through the aperture again (suitable for O, N, G, F, E, B and C-flute).

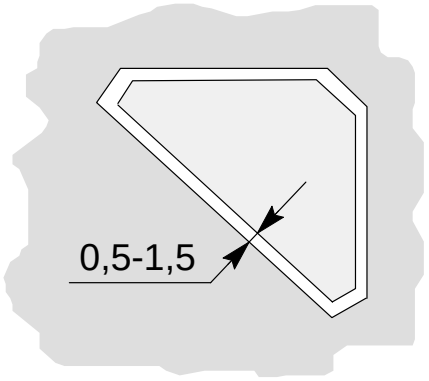


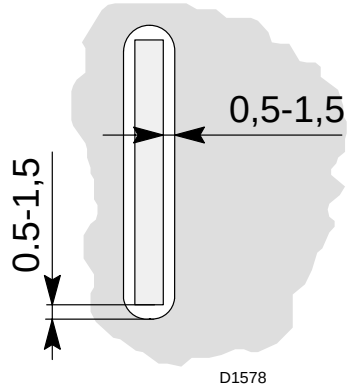


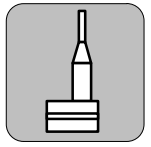


Conventional stripping

If lower stripping pins are used, leave a gap of **0.5 to 1.5 mm** on all sides of the waste (including the angles and ends).







Central stripping board

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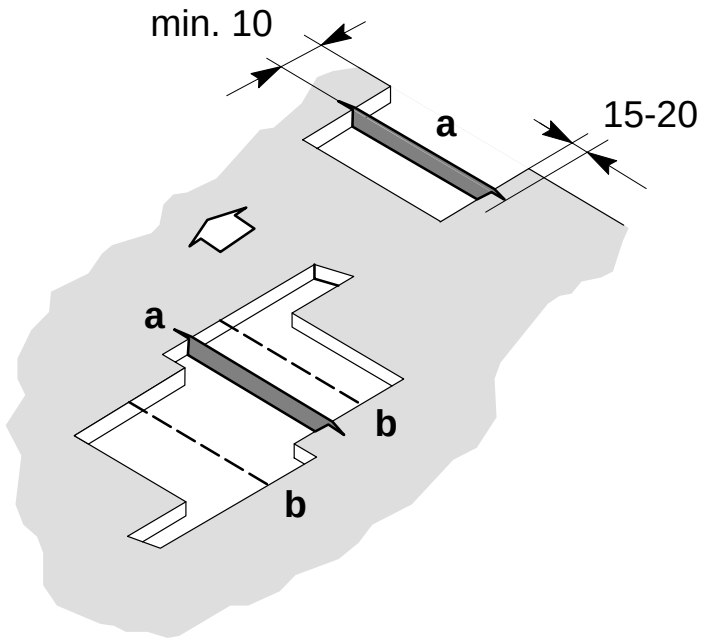
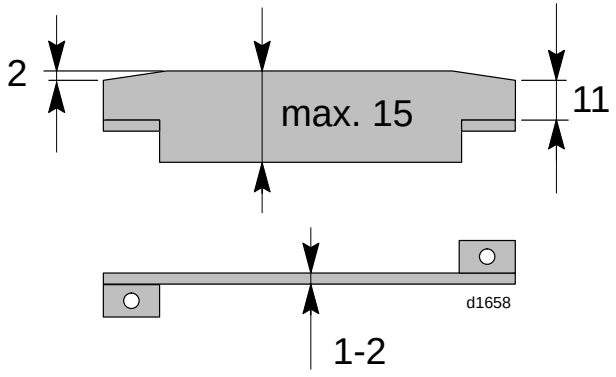
Supporting irons

It is important to provide supporting irons **a** within large-size inner and side apertures. Fastening slots with a length of **15 to 20 mm** are used for securing them to the female board.

If necessary, add perforating rules **b** in the cutting die to facilitate the fall of large waste.





Central stripping board

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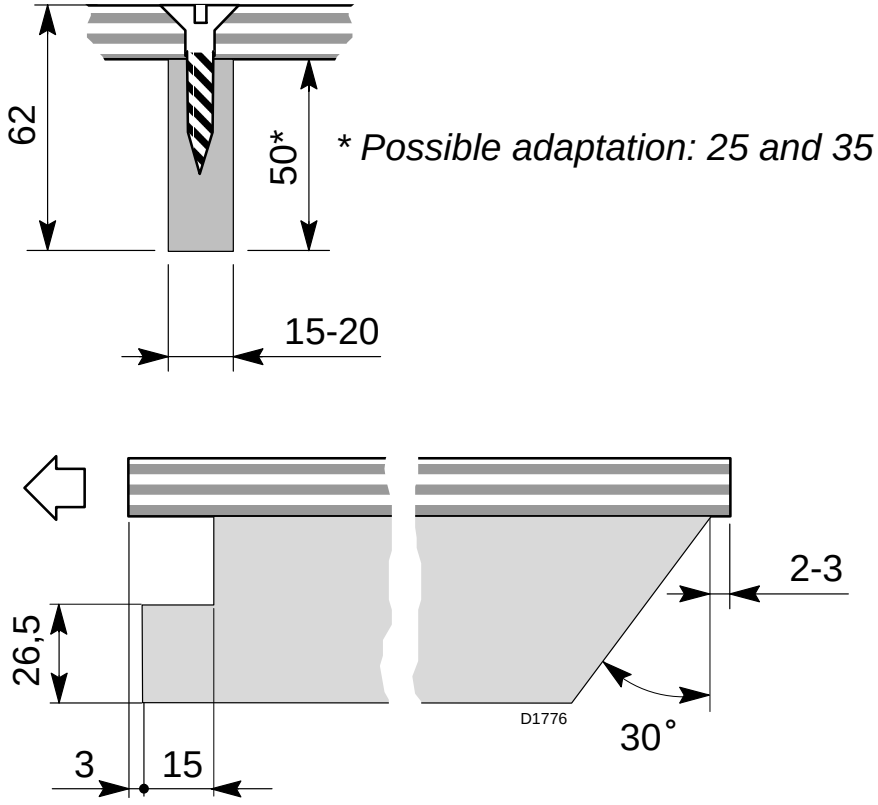
Wooden reinforcements

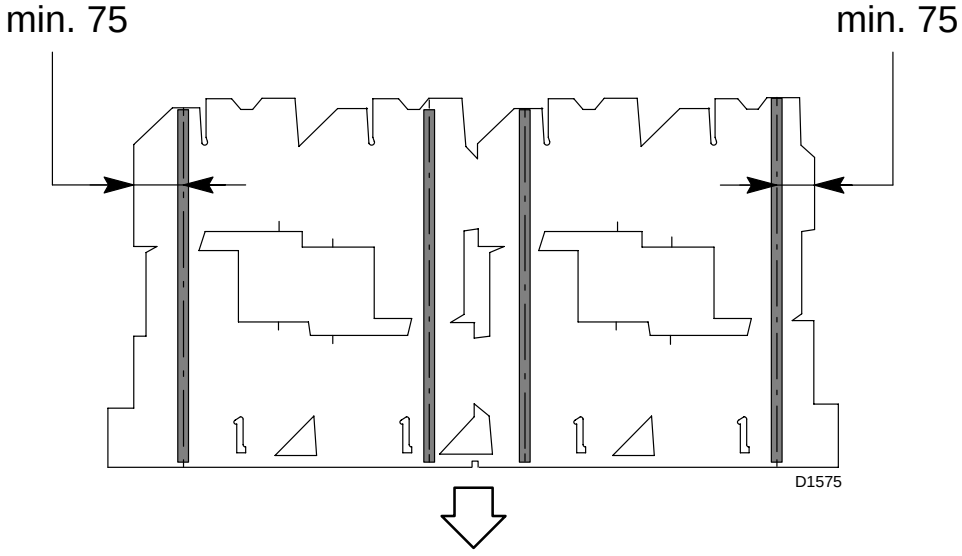
The height of wood must be **50 mm** and its width **15 to 20 mm**. The reinforcement must be **3 mm shorter** than the board. Saw off the back of the reinforcement at **30**° to allow the rear waste to drop off more easily.



** Possible adaptation: 25 and 35 mm*

Position of the reinforcements

Provide a minimum of **3 to 4 reinforcements**. Distribute them as evenly as possible over the width of the board, except for the Centerline axis (area taken up by the stop). Leave at least **75 mm** between the side edge and the center of the reinforcement, at the level of the rear waste separation.



Central stripping board

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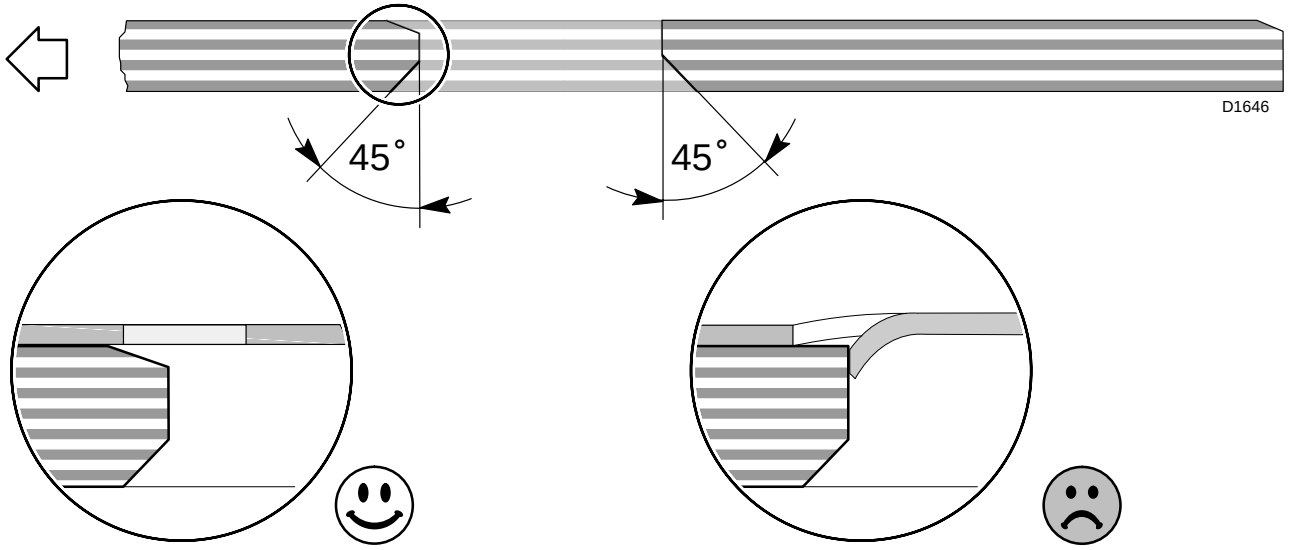
Chamfers

Bevel the upper section of the apertures in the direction of sheet passage. This prevents the sheet from catching the rear edge or the board apertures as it is transferred.

The more distinct the aperture is, the bigger the chamfer will be.

For inner waste, the aperture edges need to be provided with **45**° chamfers to facilitate waste ejection.



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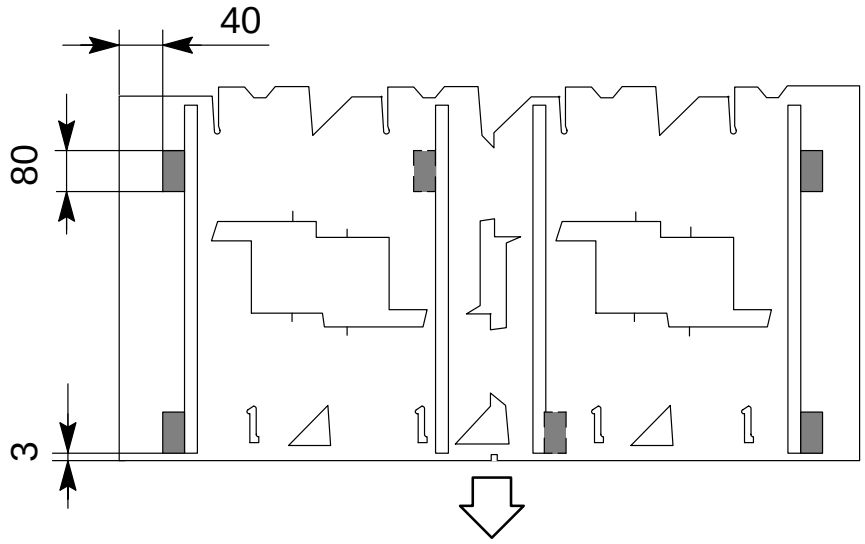
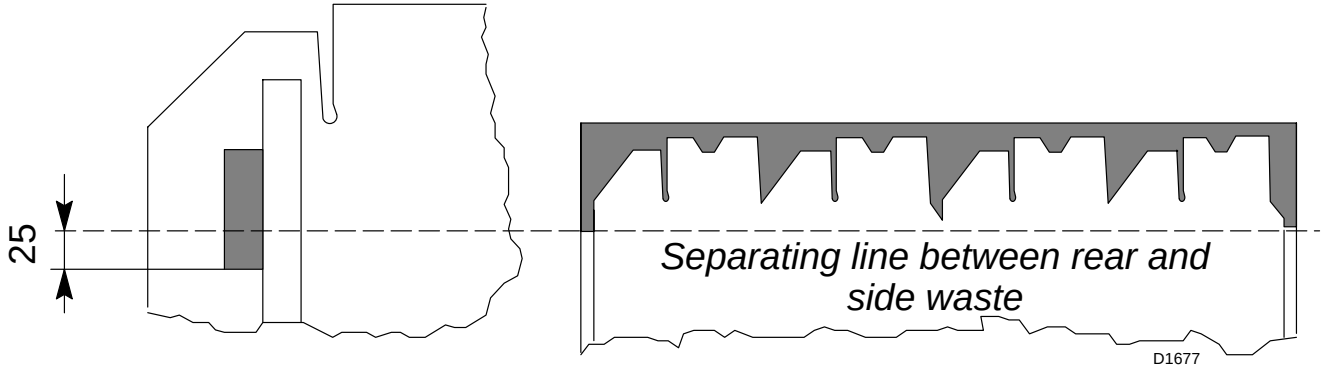
Centerline I

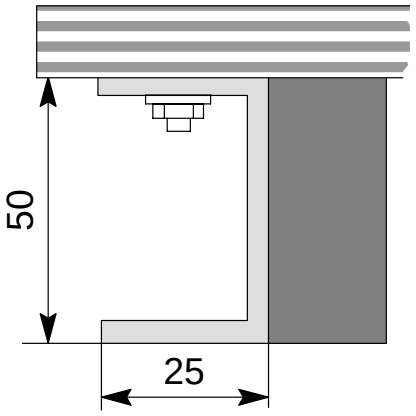
Four to six 80 mm long aluminium profiles are used for securing the board to the machine. These profiles are distributed over the board and secured against the outer edge of the reinforcement. Turn the opening of the “U” towards the outside.

The profiles secured to the front of the board should be situated **3 mm from its edge**. Leave a clearance of at least **40 mm from the side edge** so as not to interfere with dropping waste.

To use a board with profile aluminium bars on a machine equipped with EASYSET, **arrange the rear profiles so that they project by 25 mm over the separating line for side and rear waste**.







Central stripping board

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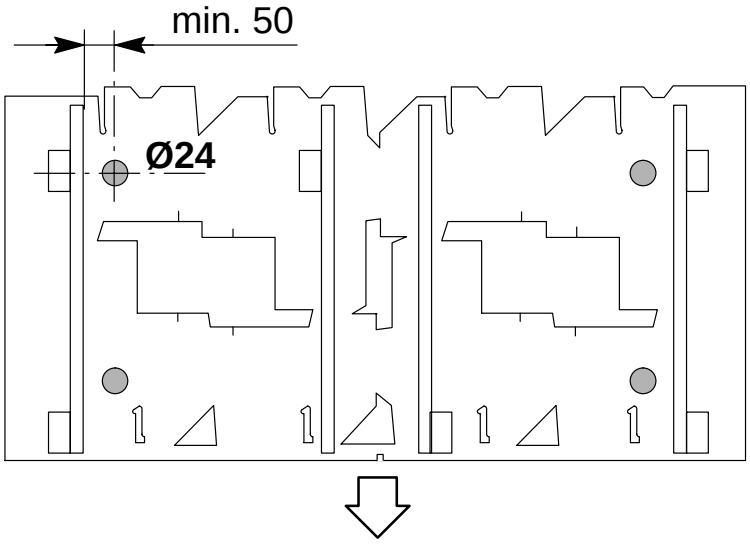
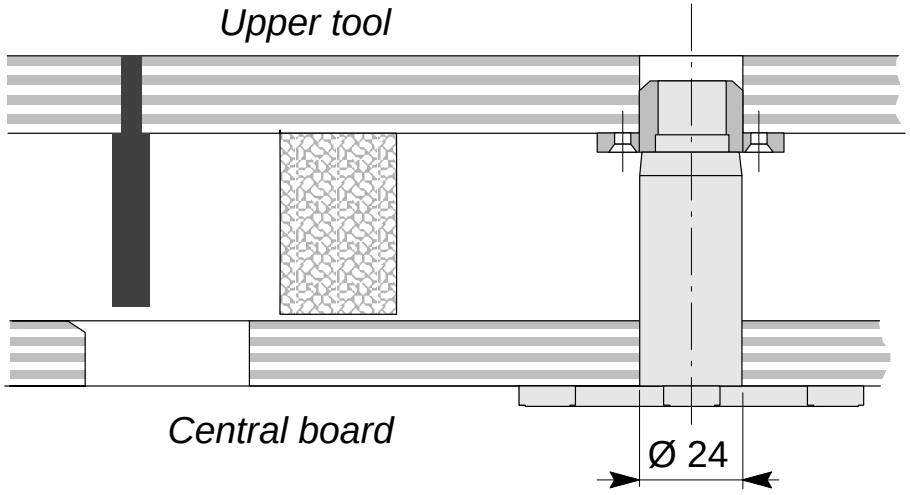
Holes for centering screws and nuts

Provide 4 holes with Ø 24 distributed over the 4 corners of the central board. These holes enable the fitting of the centering screws for the register of the stripping tools.

Note: For **Centerline II**, the screws and nuts serve only to assemble the upper tool and the central board for the transport and the storage.

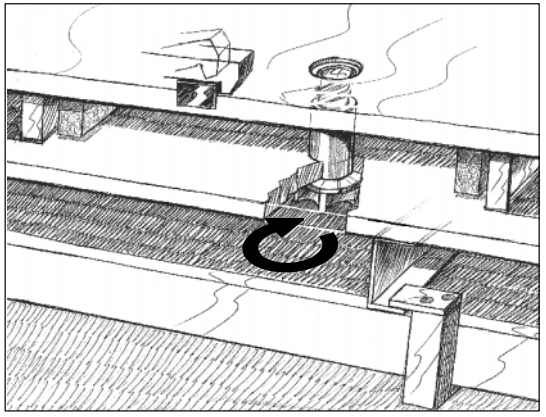
Take care not to drill at places where stripping foam or reinforcements are positioned. Take care to place them in such a way that the screws remain accessible.





BOBST 1004-436

BOBST 1001-877 (Centerline I)
BOBST 1001-879 (Centerline II)



D6021

Central stripping board

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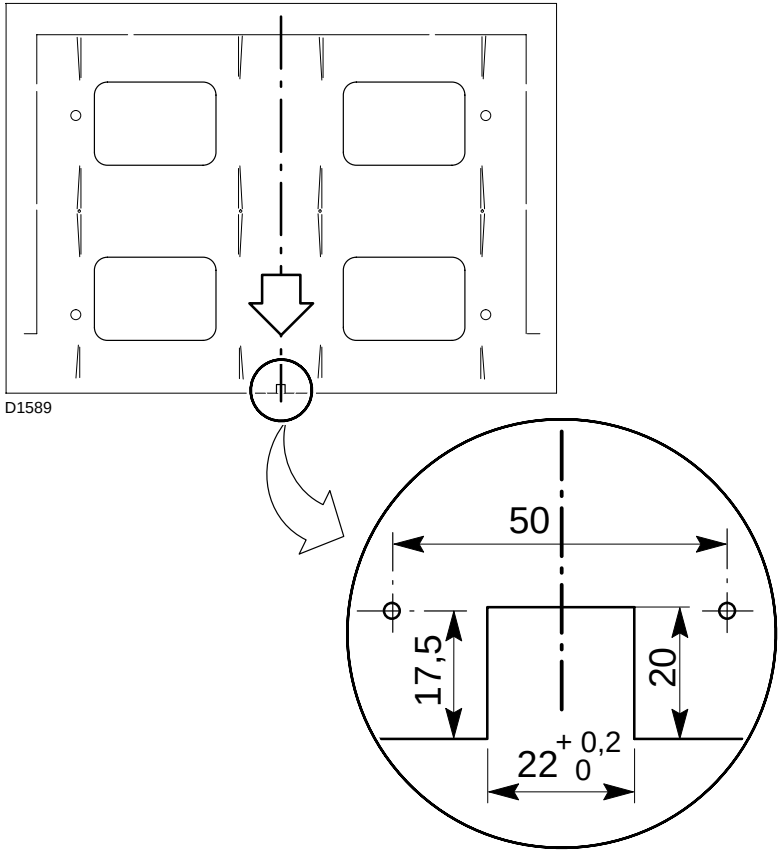
Centerline I and II

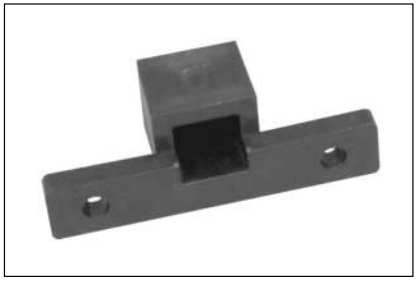
Notch for centering stop

Add a **20 x 22 mm** notch for engaging the Centerline centering stop.

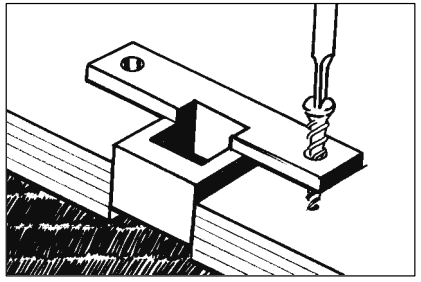


Centering stop

Place the centering stop in the Centerline notch with the shoulder on the stripper side and fasten it by means of wood screws.



BOBST 502-QU
(batch of 20 pieces)



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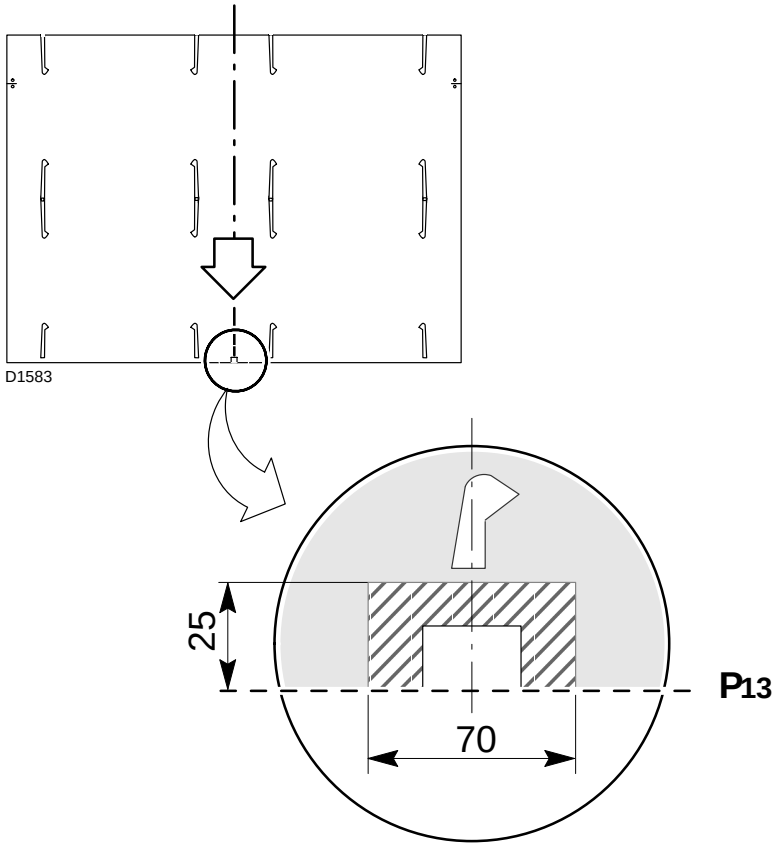
Restricted zones

Do not put strippers in the hatched zone of the Centerline locking system.



Central stripping board

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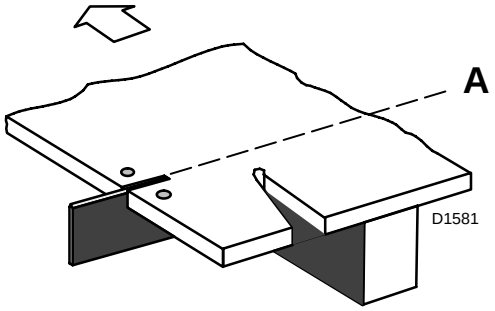
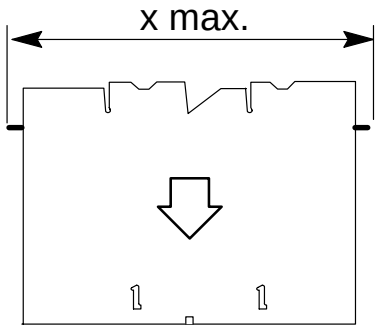
Separating rules

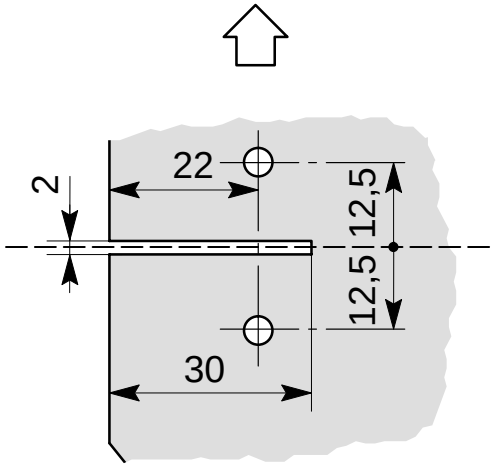
Provide two grooves with a length of **30 mm** and a thickness of **2 mm** as well as fastening holes with a diameter of **6 mm** to secure the separating rules. The position of both these grooves is given by the separating line **A** for side and rear waste.



BOBST 502-QW
(batch of 20 pieces)



		x max.
SPO 160-ER MATIC	mm	1614
SPO 160 A / matic / Power Register		
SPO 160-S		
SPO 160 VISION / Power Register		
SPO 203 A / matic / Power Register		2040
MASTERCUT **1.7**		1714
MASTERCUT **2.1**		2114



Central stripping board

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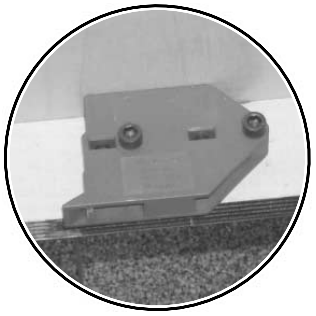
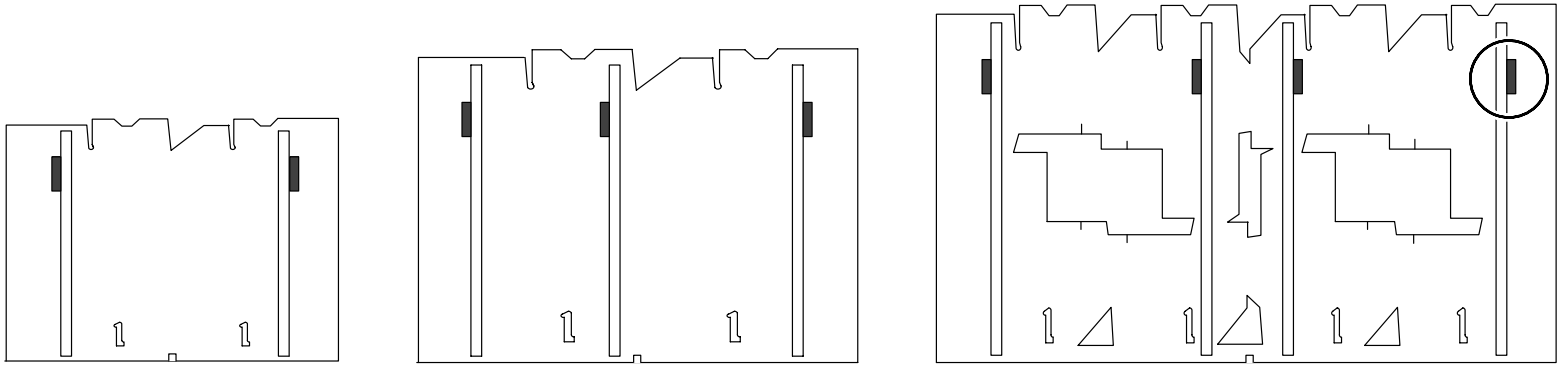
Clamping jaws

The central stripping board is secured in the machine using clamping jaws. Position a sufficient number of jaws to ensure that the board is rigid.



BOBST 502-QX
(batch of 20 pieces)



2 claws *2 to 3 claws* *3 to 4 claws*

Central stripping board

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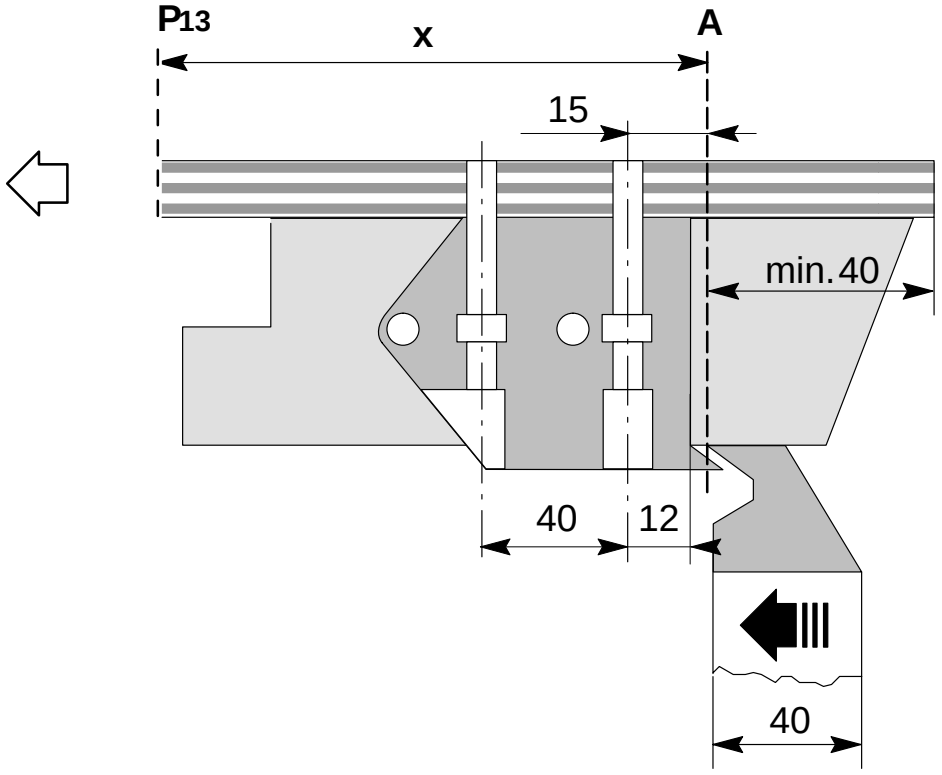
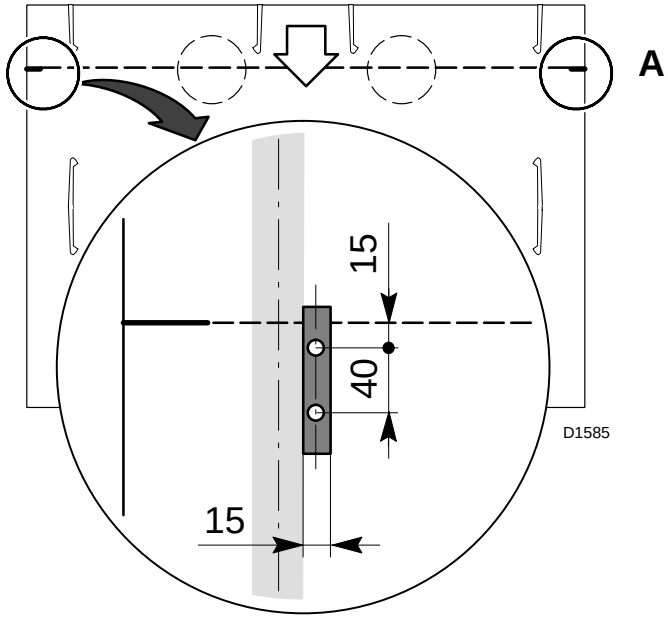
Position of clamping jaws

The clamping jaws should be positioned accurately in relation to fictive line **A** of separation between the lateral and rear waste.

Press the jaws against the wooden reinforcements.

Note: In order to pre-position the clamping device and thus to facilitate the fitting of the central board in the machine, it is recommendable to engrave distance **x** on the front side of the board.





Central stripping board

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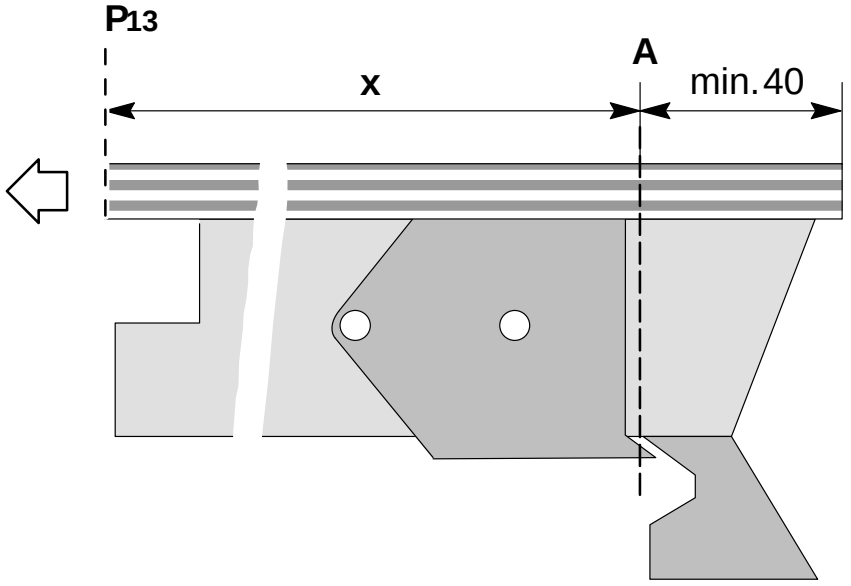
Minimum size

Maintain a minimum distance **x** between the front edge of the central stripping board (first rule) and the theoretical separating line **A** for side and rear waste.

		x
SPO 1600	mm	410
SPO 160-S		280
SPO 160 VISION / Power Register		
SPO 160-ER MATIC		410
SPO 160 A / matic / Power register		
SPO 2000		
SPO 203 A / matic / Power Register		
MASTERCUT **1.7**		
MASTERCUT **2.1**		



Central stripping board

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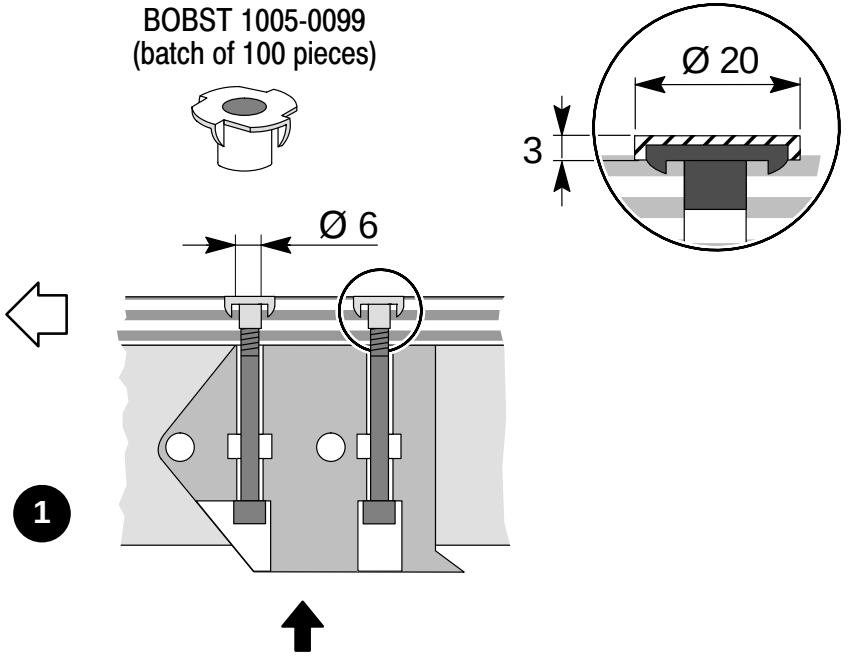
Fastening of clamping jaws

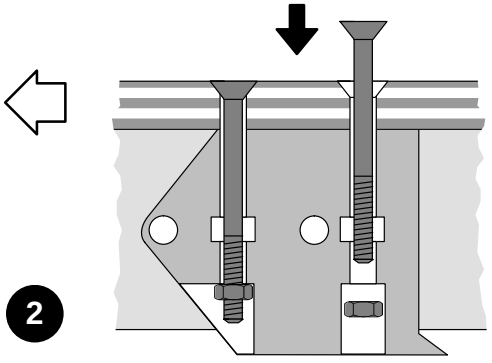
There are three ways of fastening the clamping jaws to the central stripping board:

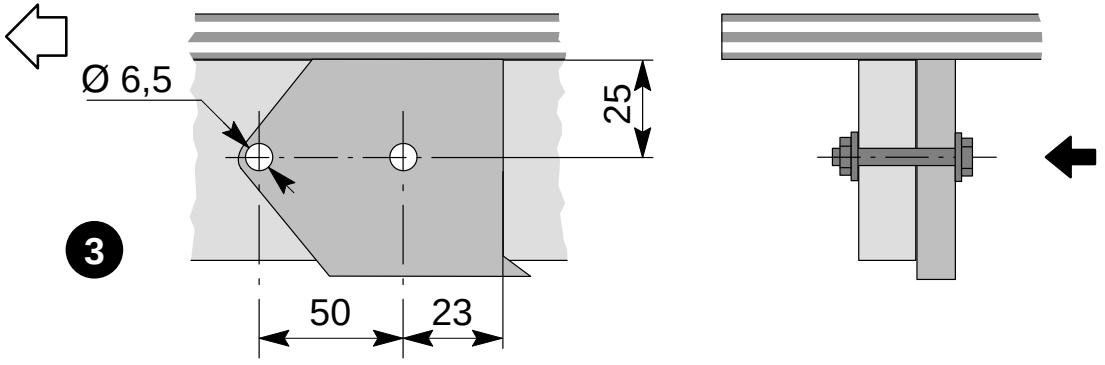
Fig. 1. From underneath, using **M5 x 50 mm (M5 x 2”) screws** and **M5 T-nuts**.

Fig. 2. From above, using **M6 x 50 mm (M6 x 2”) counter-sunk screws** and **M6 nuts**.

Fig. 3. From the side, using **M6 screws and nuts** screwed into the wooden reinforcement. This solution is to be avoided, since it requires to remove the reinforcements in order to drill clamping holes. Furthermore, there is a risk of an error in the parallelism causing a poor locking of the tightening bar.







Central stripping board

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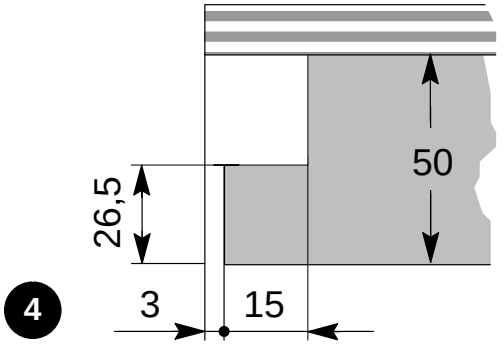
Wooden reinforcements

The front section of the wooden reinforcements should allow the central stripping board to press against the bar of the female board carrier frame.

Fig. 4. Make a recess in this part of the reinforcement.

Fig. 5. In order to modify the old tool of Centerline II, shorten the reinforcement by **20 mm** in order to fit the supporting plates (BOBST 502-2094).

Note: On principle, **do not fit any reinforcements in the Centerline axis.** If there is no other possibility, decrease the aperture of the reinforcement from 26.5 mm to 20 mm.



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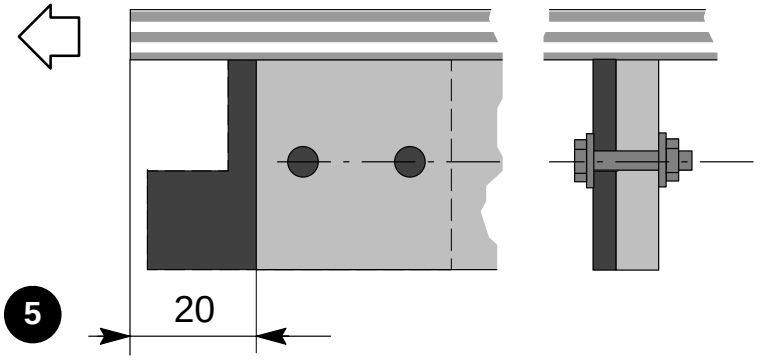

5

Central stripping board

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Lower stripping pins

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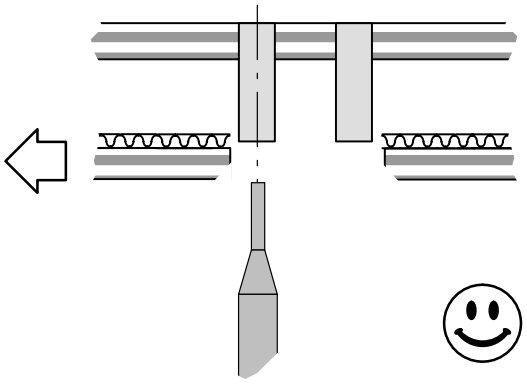
Introduction

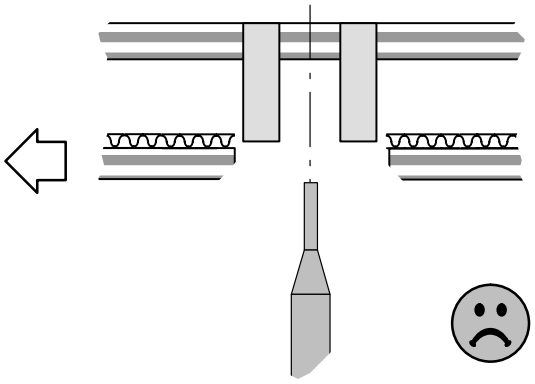
Lower stripping pins are used to facilitate the stripping of difficult waste (small size, narrow side waste) or for ensuring 100% stripping.

Keep the use of stripping pins down to the absolute minimum necessary!

Rules for positioning the pins

Always place a lower stripping pin opposite an upper stripping pin.





Lower stripping pins

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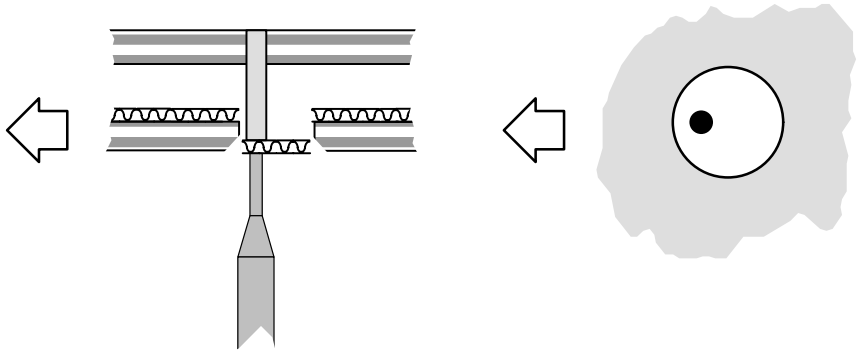
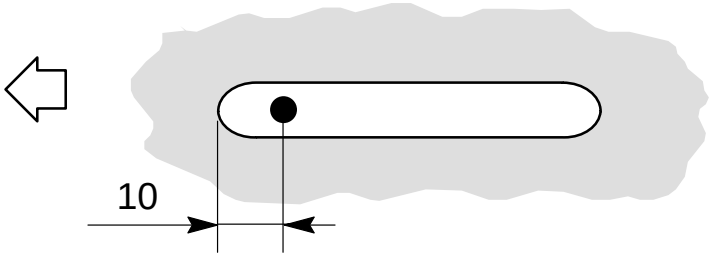
Small-size waste

Place the pin in front of the waste that it will tilt and fall down.



Narrow waste (running direction)

Place the pin approx. **10 mm** from the front of the waste.



Lower stripping pins

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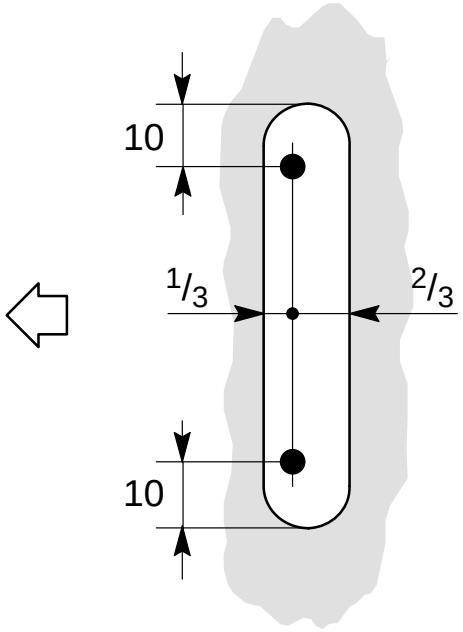
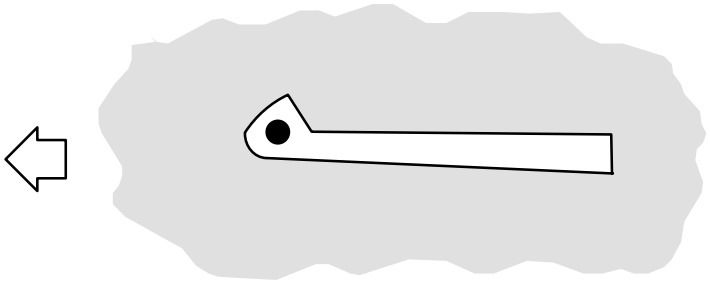
Narrow waste (perpendicular to running direction)

Place a pin on either side of the waste, off-center towards the front by $^1/_3$ - $^2/_3$.



Waste with undesirable nicks

Place a pin in the area where the undesirable nicks are situated.



Lower stripping pins

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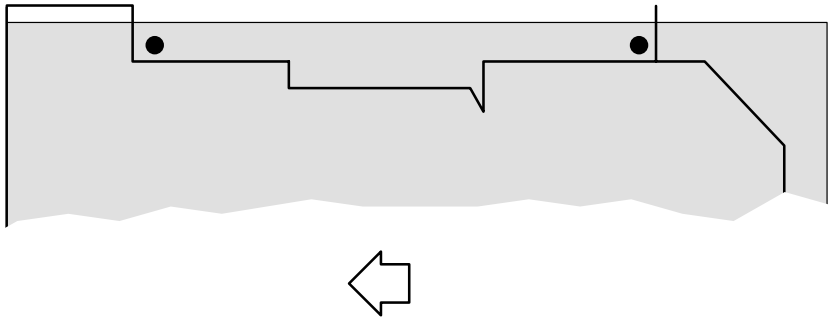
Side waste

Depending on the shape of the waste, it is possible to place a pin beside the separating rules.



Lower stripping pins

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Front waste separator

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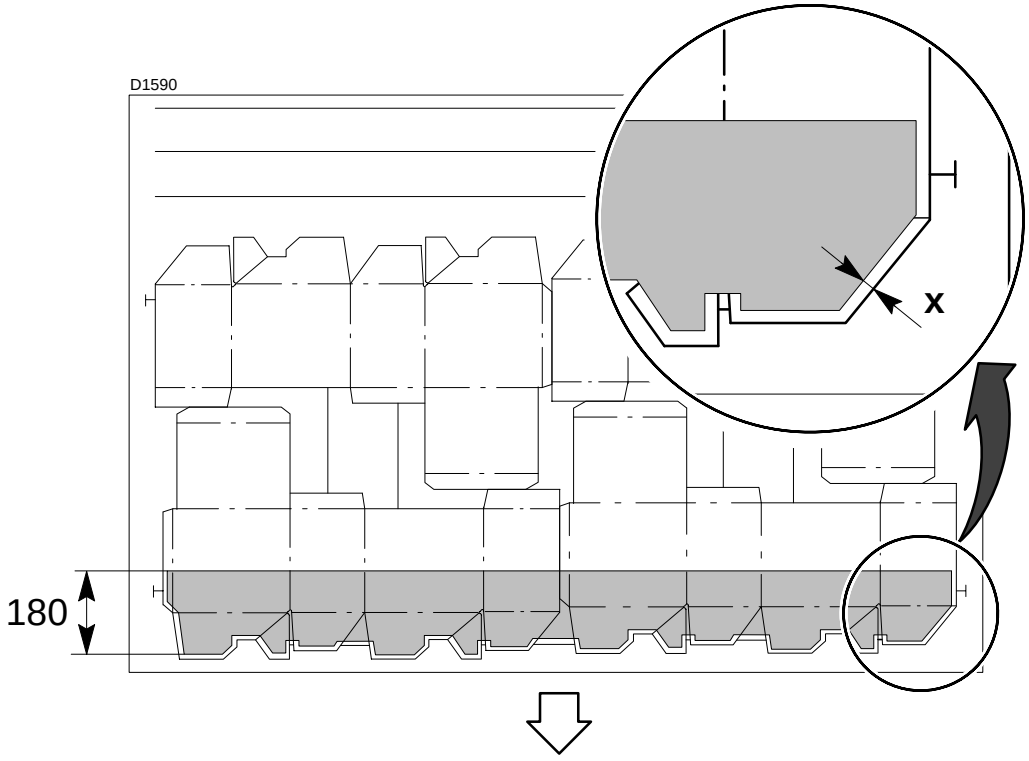
Upper tool

Dimensions

Draw the outline of the frontal cut by keeping a distance **x** inside of it depending on the type and the quality of the cardboard. As a general rule, the more rigid the cardboard is, the longer the distance will be.

Use **15 mm** thick plywood.



Board	x (mm)
E-flute	1,5
A, B und C-flute	2
Double wall	2,5

Front waste separator

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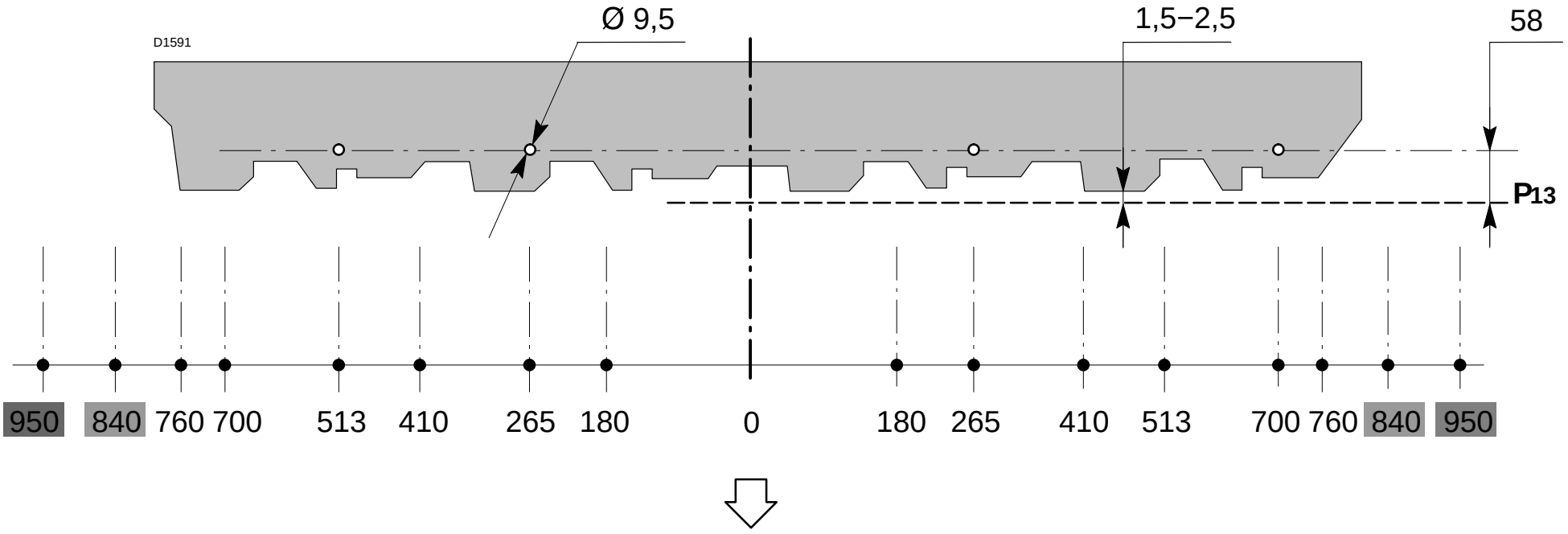
Fastening holes

Depending on the size, between 2 and 6 fastening holes measuring **9.5 mm** in diameter should be provided. These holes are to be located **58 mm from the first cutting rule**.

MASTERCUT **1.7**

MASTERCUT **2.1**



Front waste separator

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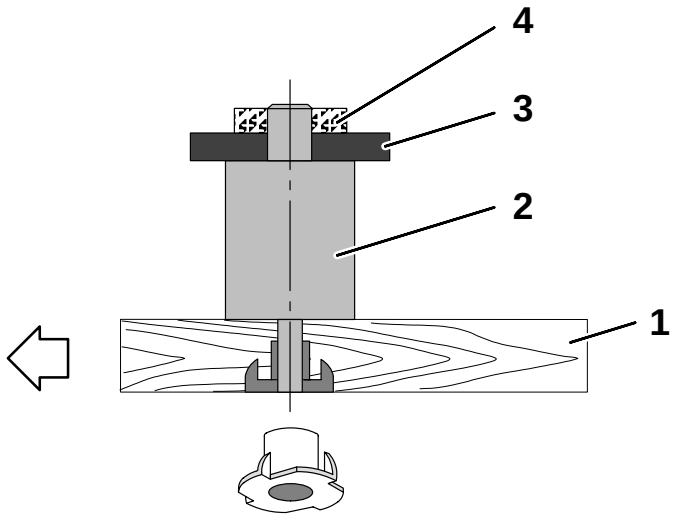
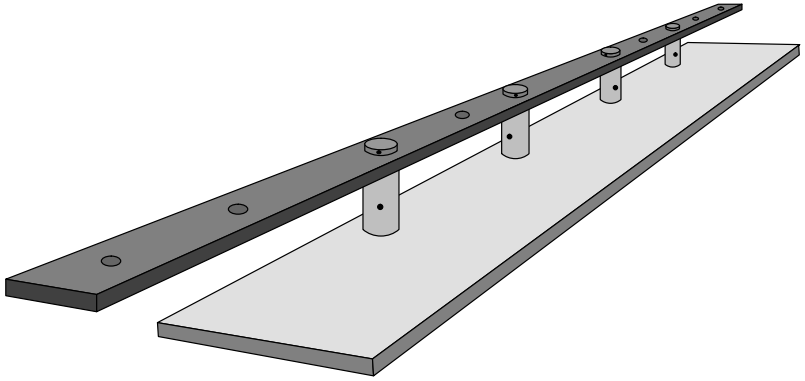
Fastening

The front waste separator **1** is fastened onto a supporting bar **3** outside the press using fastening elements **2** and nuts **4**. The device is then secured into place from outside the machine.



BOBST 1005-0089
(batch of 100 pieces)

The example below shows how the separator is secured into place on a press AUTOPLATEN SPO 160 A / matic / Power Register.



P9611

Front waste separator

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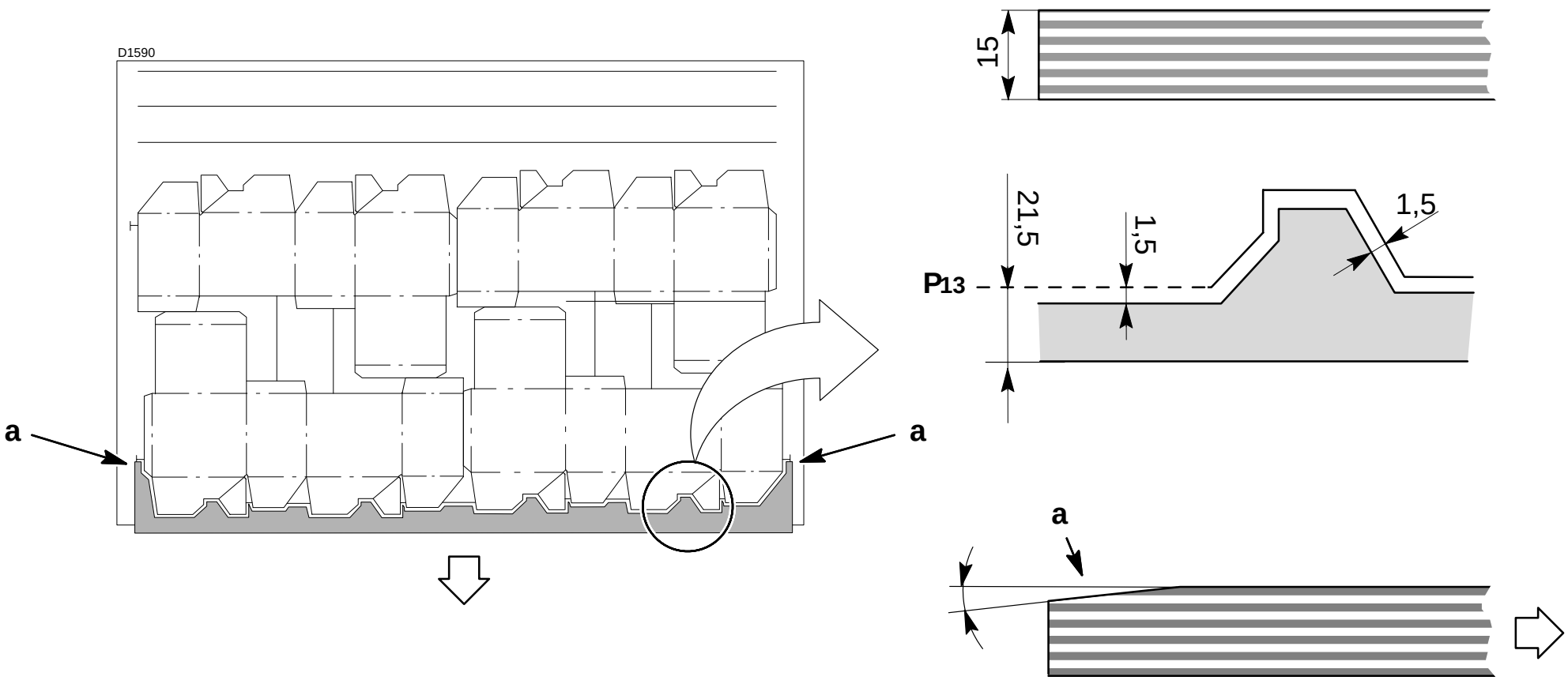
Lower tool (SPO 160 VISION / Power Register, MASTERCUT 1.7 and MASTERCUT 2.1)

Dimensions

Design the outline of the front waste keeping **1.5 mm** inside it.

Use **15 mm** thick plywood.

Chamfer the upper part of the ends **a** of the lower tool in the running direction. This avoids the sheet being tripped during its transport.



Front waste separator

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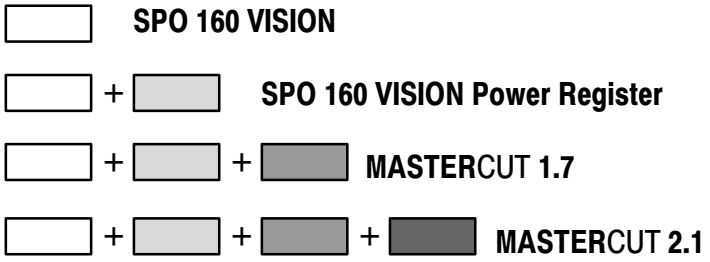
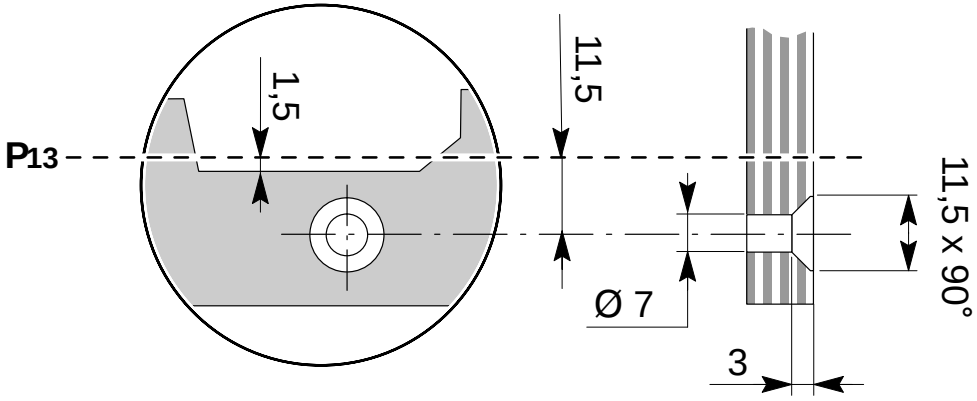
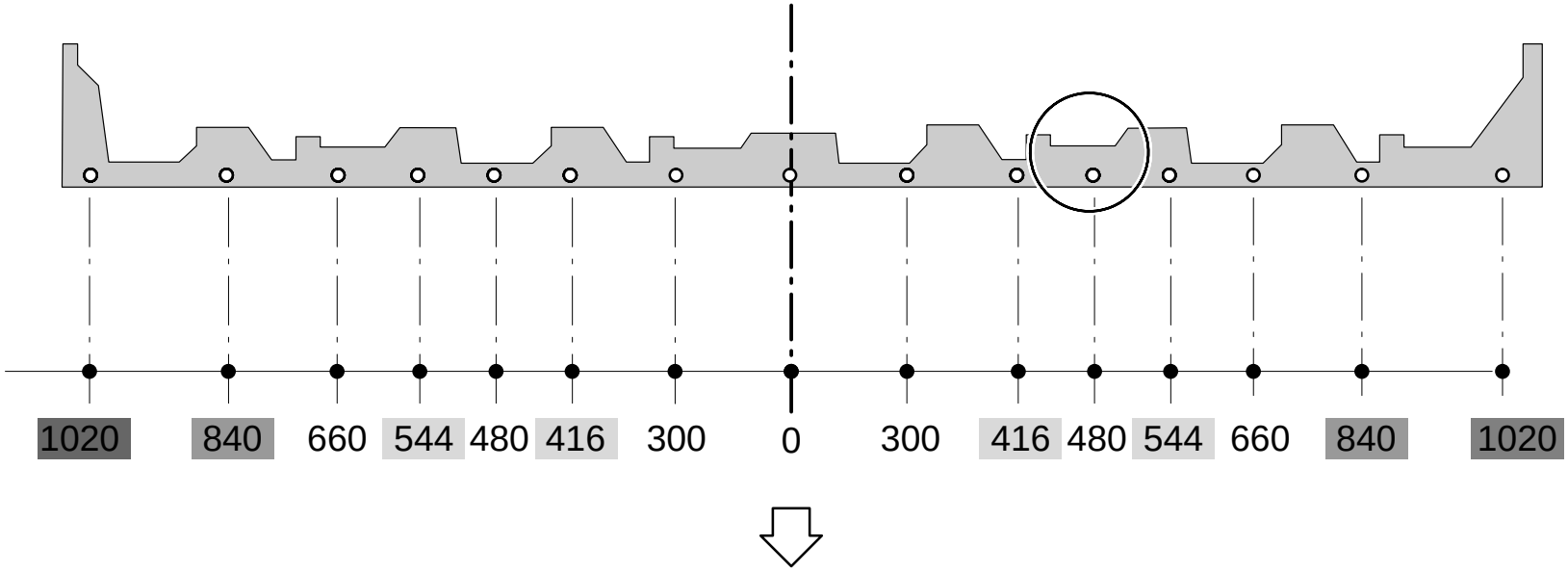
Fastening holes

Depending on the size, between 3 and 7 fastening holes.







Front waste separator

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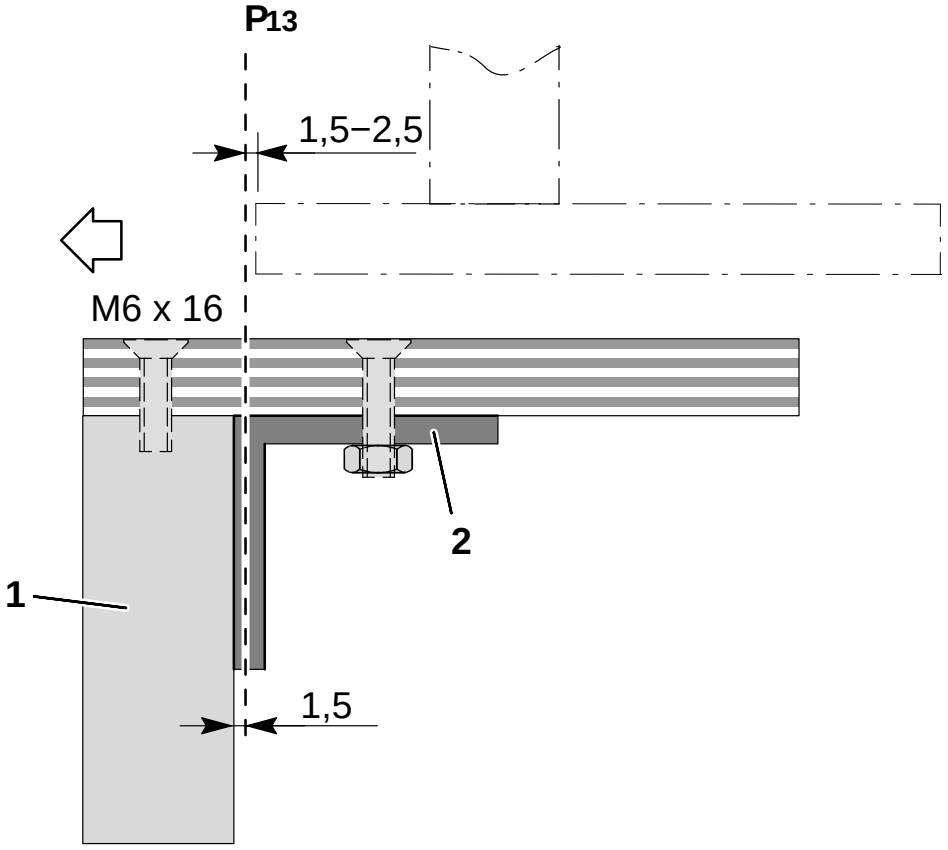
Fastening

Fit and screw the lower tool on the front jogger **1**. Depending on the lenght of the outline, it is recommended to fit a reinforcing angle **2** to rigidify the tool.



P16446

Front waste separator

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Centerline system

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Centerline II adaptation

A. Tools without registering system

Centerline II adaptation concerns the cutting die, the upper stripping tool and the central stripping board as well as the manufacture of the front waste separator.

We recommend the use of an EASYSET drilling jig for converting older tools. They must first be adapted for the EASYSET system, then for the Centerline system. The upper stripping tool must be provided with a front compensating bar.

Note

If you do not have an EASYSET drilling jig to convert your older tools, contact the BOBST After-Sales Service for more detailed information.

B. EASYSET system tools

The upper stripping tool must be provided with a front compensating bar and the central stripping board must be converted to hold the Centerline II elements. Use the BOBST 490-BG adapter jig to convert the central stripping board.

C. Centerline I system tools

Centerline I to Centerline II adaptation only concerns the central stripping board, which has to be converted to hold the Centerline II elements.

Precision

The manual interventions (tracing, drilling, sawing) necessary to adapt the older tools result at best in a precision of **± 0.5 mm**. Tools designed using CAD, then cut on numerically controlled machines offer a precision of **± 0.05 mm**.

The job change speed and the production rate depend on the precision and accuracy of the converting tools.

Centerline system

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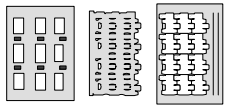
EASYSET system to Centerline II tools

Method with 490-BG jig.



1	Remove the stripping foams	●			
2	Remove the M5 T-nuts		●		
3	Position the central stripping board on the upper stripping tool	●	●		
4	Insert 2 centering rods to assemble the tools (ø 9.5 mm)	●	●		
5	Drill 2 positioning holes ”blue bushing”, **ø 9.5 mm**	●			
6	Shift the centering rods to the ”blue bushing” positioning holes	●	●		
7	Drill 2 or 4 series of 2 ”yellow bushing” holes, **ø 9.5 mm**	●			
8	Drill 2 or 4 times the ”yellow bushing” holes, **ø 6 mm**	●			
9	Widen the old centering holes to dia. **ø 24 mm**	●	●		
10	Remove the centering rods and separate the tools	●	●		
11	Bezel the top of the holes for the T-nuts: **ø 6/20 mm**	●			
12	Drive the T-nuts into the fastening holes	●			
13	Check the presence of anti-vacuum apertures and provide such apertures where necessary	●			
14	Fasten the plastic centering nuts	●			
15	Fasten the front compensating bar and its supports	●			
16	Glue down the stripping foams	●			
17	Determine the position of the rear waste separating rules		●		

OPTIONAL

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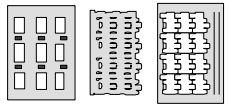

18	Position the adapter jig 490-BG onto the central stripping board		●		
19	Insert the 2 pins for centering the jig		●		
20	Check the alignment between the front edge of the board (1st rule) and the jig		●		Ok ☞ 23
21	If the front edge projects beyond the jig, trace out the position of the 1st rule		●		
22	If the front edge is shorter than the jig, provide front stops		●		
23	Trace out the position of the Centerline notch: **20 x 22 mm**		●		
24	Drill 2 fastening holes for the Centerline stop: **2 x ø 2 mm**		●		
25	Position the mobile arm carriage on the marking of a separating rule		●		
26	Trace out the position of the grooves for the separating rules (os and oos): **30 x 2 mm**		●		
27	Drill the fastening holes for the separating rules (os and oos) **ø 6 mm**		●		
28	Position the mobile arm of the jig near the reinforcements		●		
29	Drill 2 fastening holes for each clamping claw: **2 x ø 6 mm**		●		
30	Remove the centering pins and remove the adaptation jig		●		
31	Bezel the holes according to the fastening system used		●		
32	Cut out the grooves for the separating rules (os and oos): **30 x 2 mm**		●		
33	Saw the front edge of the board at the 1st rule		●		
34	Cut out the Centerline notch		●		

OPTIONAL

Centerline system

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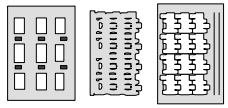

35	Adjust and secure the Centerline stop (red)		●		
36	Recess the front section of the wooden reinforcements by **20 mm**		●		
37	Trace out the position of the support plates: **3 mm** back from the 1st rule		●		
38	Drill the fastening holes for the support plates: **ø 6.5 mm**		●		
39	Fasten the support plates		●		
40	Fasten the front stops 502-2138		●		
41	Fit the clamping claws according to the fastening system used		●		
42	Fit the separating rules		●		
	Other possibility		●		
35	Remove the wooden reinforcements on the central stripping board		●		
36	Manufacture reinforcements with a recessed front end		●		
37	Trace out the front position of the wooden reinforcements: **3 mm** back from the 1st rule		●		
38	Fasten (nail and glue) the wooden reinforcements while observing the tracing		●		

OPTIONAL

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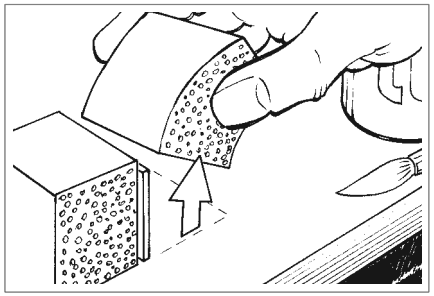
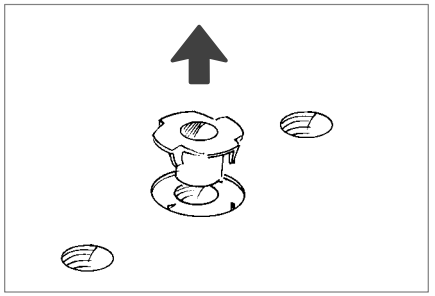
1



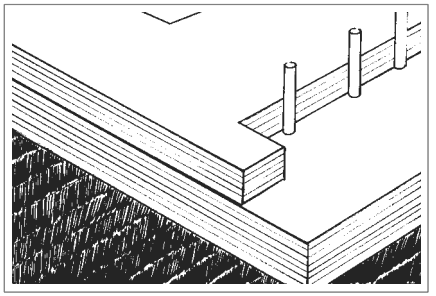
Remove the stripping foams.

2



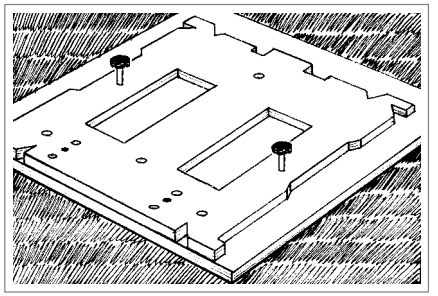
Remove the M5 T-nuts.

3



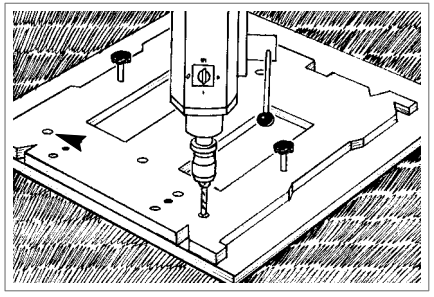
Position the central stripping board on the upper stripping tool.

4



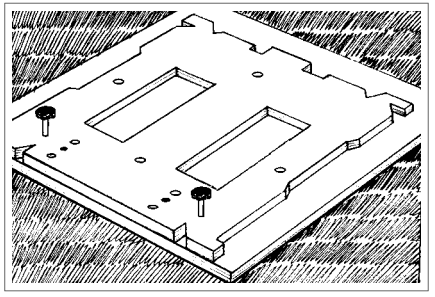
Insert 2 centering rods to assemble the tools (ø 9.5 mm).

5



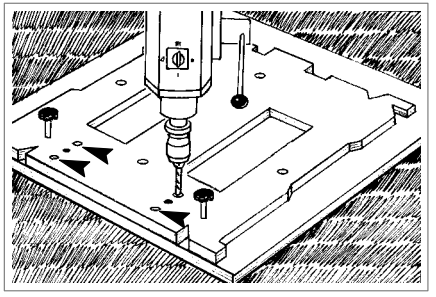
Drill 2 positioning holes "blue bushing", **ø 9.5 mm**.

6



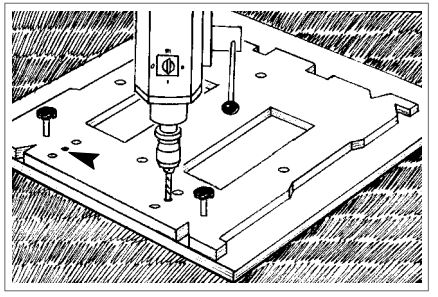
Shift the centering rods to the "blue bushing" positioning holes.

7



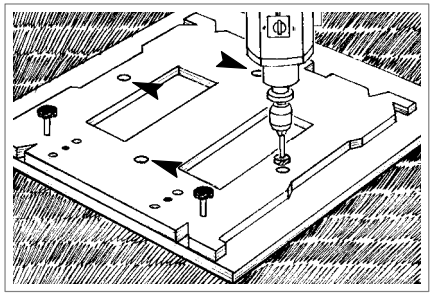
Drill 2 or 4 series of 2 "yellow bushing" holes, **ø 9.5 mm**.

8



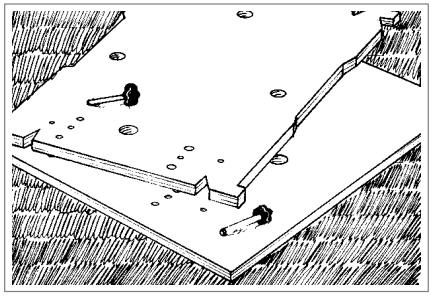
Drill 2 or 4 times the "yellow bushing" holes, **ø 6 mm**.

9



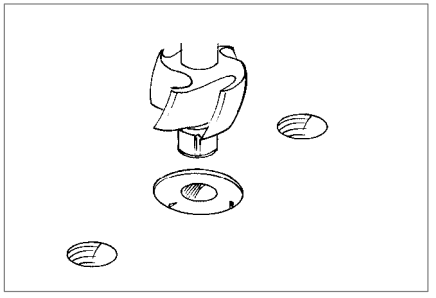
Widen the old centering holes to **ø 24 mm**

10



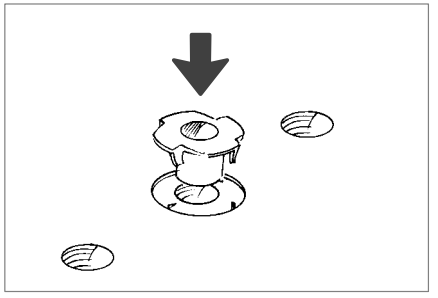
Remove the centering rods and separate the tools.

11



Bezel the top of the holes for the T-nuts: **ø 6/20 mm**.

12



Drive the T-nuts into the fastening holes.

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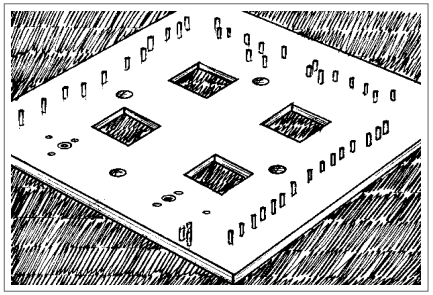
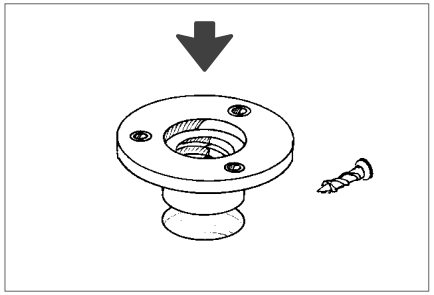
13



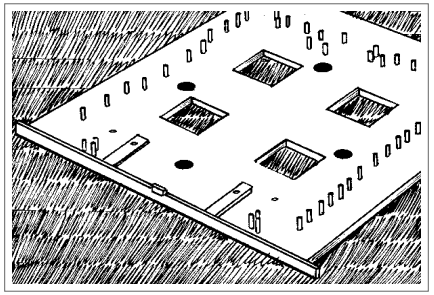
Check the presence of anti-vacuum apertures and provide such apertures where necessary.

14



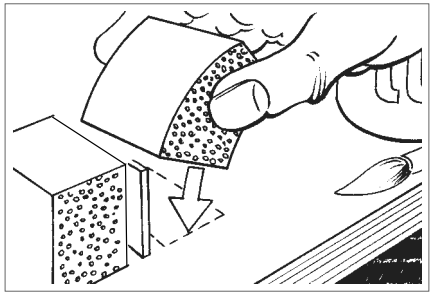
Fasten the plastic centering nuts.

15



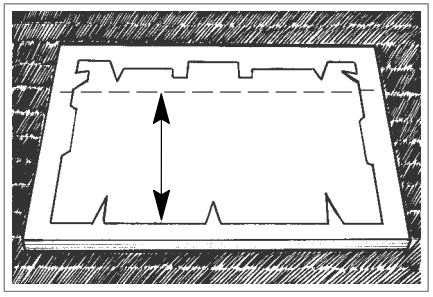
Fasten the front compensating bar and its supports.

16



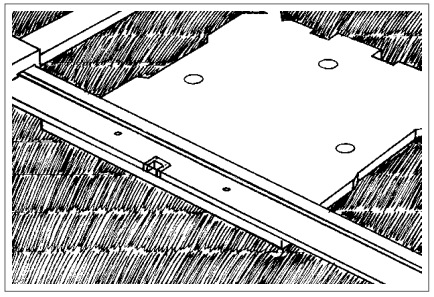
Glue down the stripping foams.

17



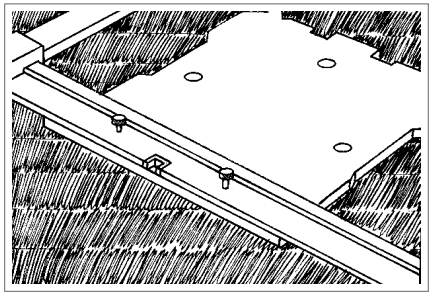
Determine the position of the rear waste separating rules.

18



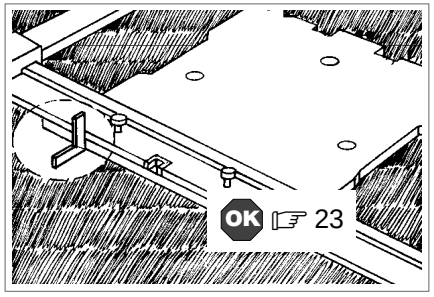
Position the adaption jig 490-BG onto the central stripping board.

19



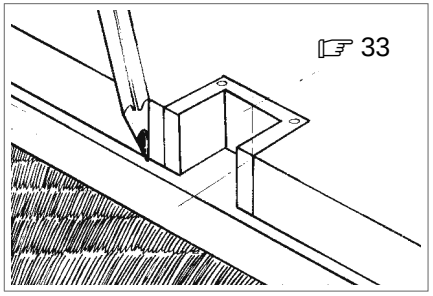
Insert the 2 pins for centering the jig.

20



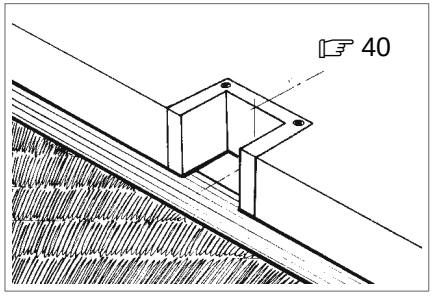
Check the alignment between the front edge of the board (1st rule) and the jig.

21



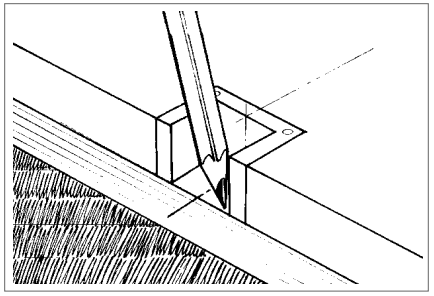
If the front edge projects beyond the jig, trace out the position of the 1st rule.

22



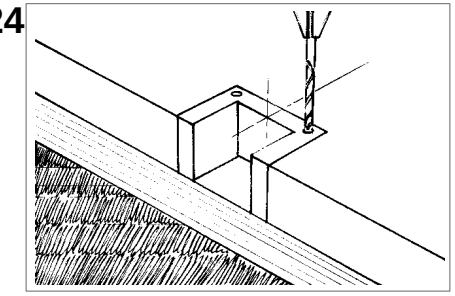
If the front edge is shorter than the jig, provide front stops.

23



Trace out the position of the Centerline notch: **20 x 22 mm**.

24



Drill 2 fastening holes for the Centerline stop: **2 x ø 2 mm**.

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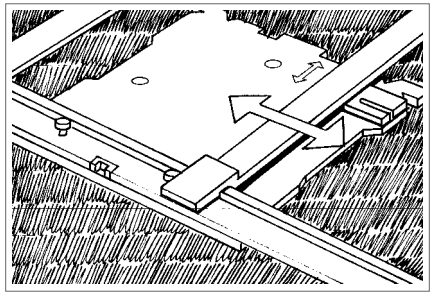
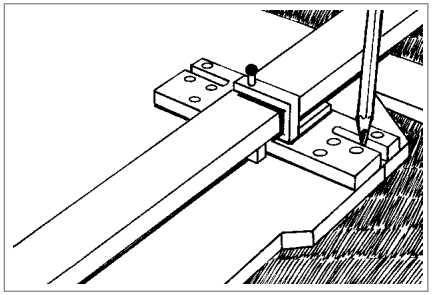
25



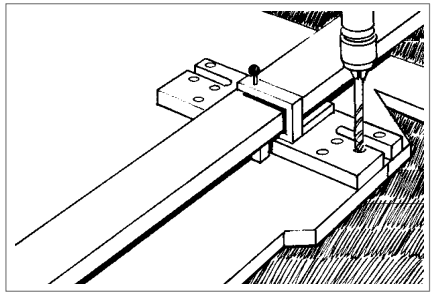
Position the mobile arm carriage on the marking of a separating rule.

26



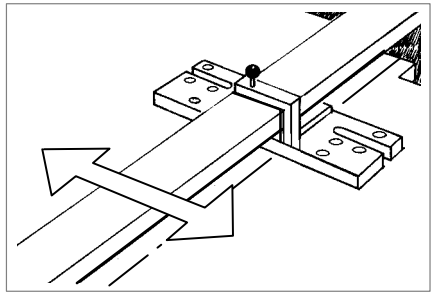
Trace out the position of the grooves for the separating rules (os and oos) **30 x 2 mm**.

27



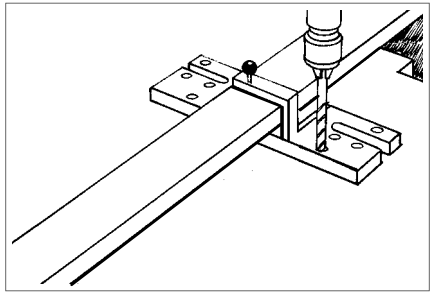
Drill the fastening holes for the separating rules (os and oos) **ø 6 mm**.

28



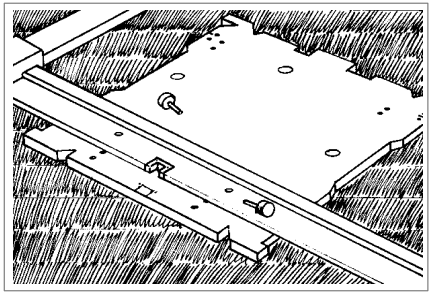
Position the mobile arm of the jig near the reinforcements.

29



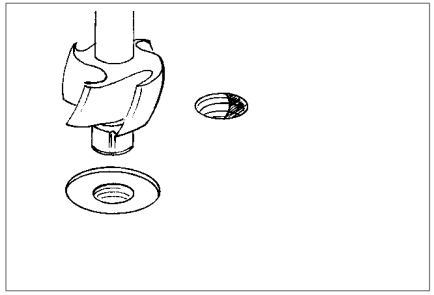
Drill 2 fastening holes for each clamping claw: **2 x ø 6 mm**.

30



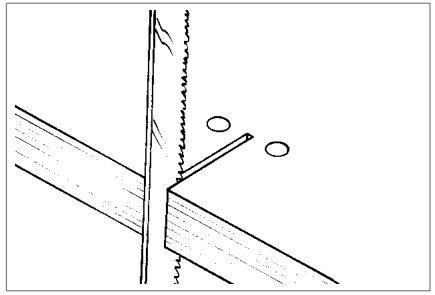
Remove the centering pins and remove the adaptation jig.

31



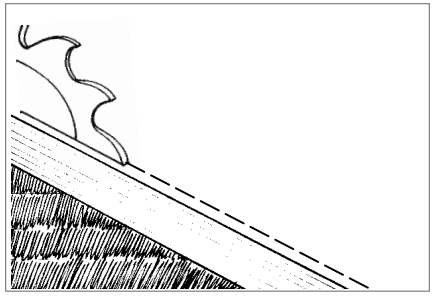
Bezel the holes according to the fastening system used.

32



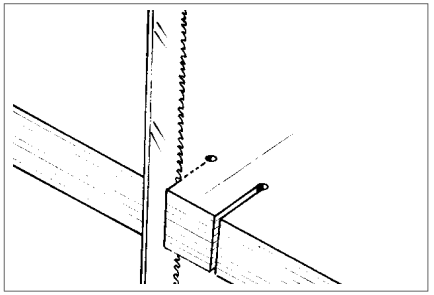
Cut out the grooves for the separating rules (os and oos) **30 x 2 mm**.

33



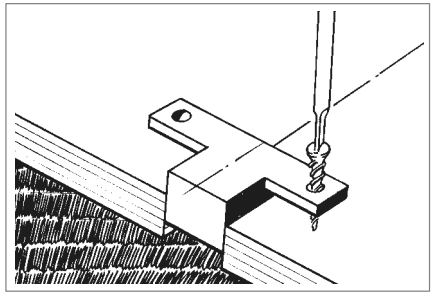
Saw the front edge of the board at the 1st rule.

34



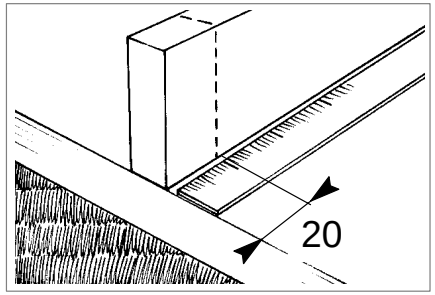
Cut out the Centerline notch.

35



Adjust and secure the Centerline stop (red).

36



Recess the front section of the wooden reinforcements by **20 mm**.

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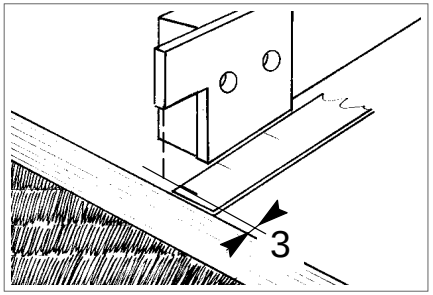
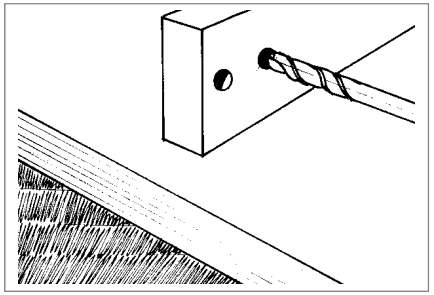
37



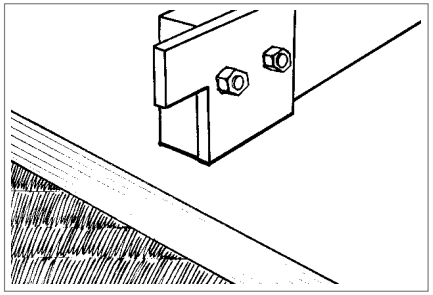
Trace out the position of the support plates: **3 mm** back from the 1st rule.

38



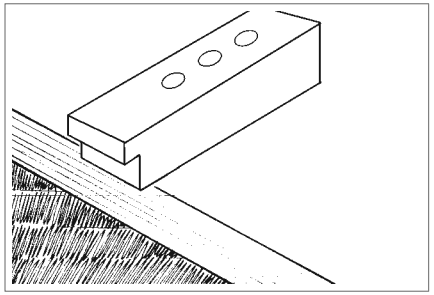
Drill the fastening holes for the support plates: **ø 6.5 mm**.

39



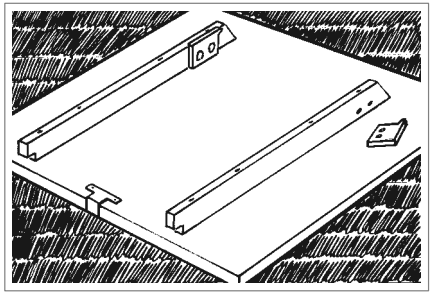
Fasten the support plates.

40



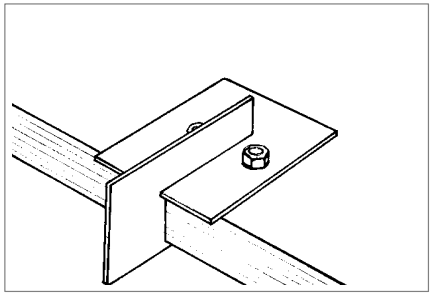
Fasten the front stops 502-2138.

41



Fit the clamping claws according to the fastening system used.

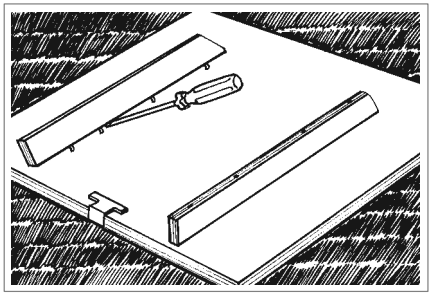
42



Fit the separating rules.

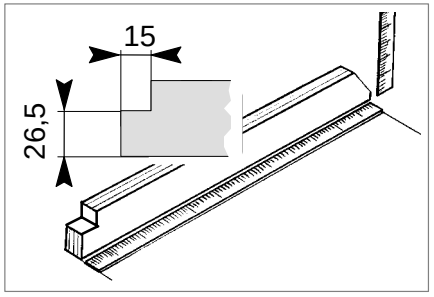
Other possibility

35



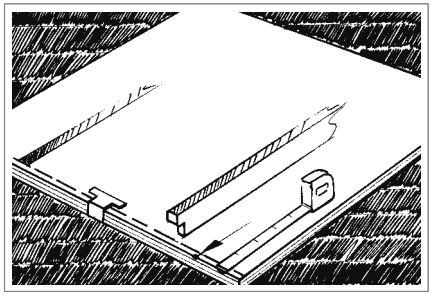
Remove the wooden reinforcements on the central stripping board.

36



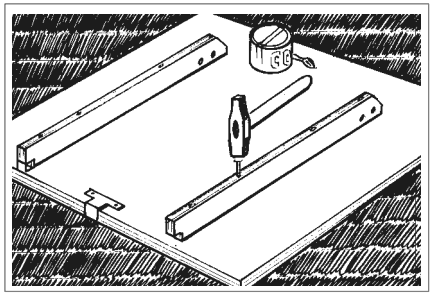
Manufacture reinforcements with a recessed front end

37



Trace out the front position of the wooden reinforcements: **3 mm** back from the 1st rule.

38



Fasten (nail and glue) the wooden reinforcements while observing the tracing.

Centerline system

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Productivity

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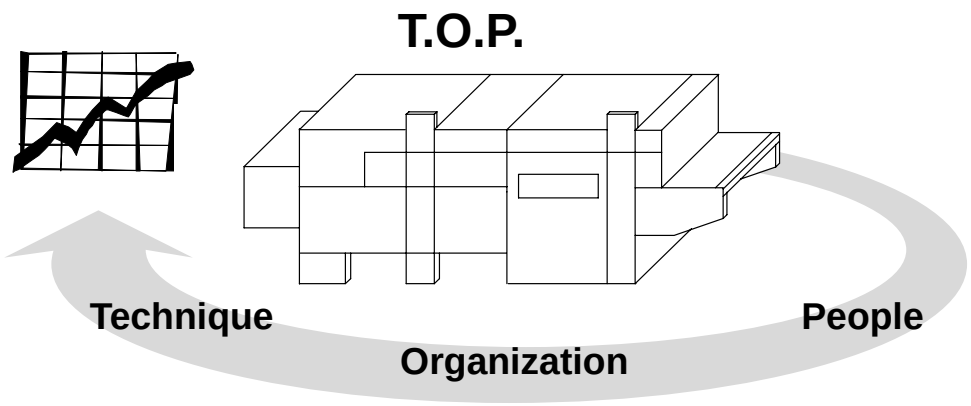
The T.O.P concept

The level of productivity depends on the following factors:



Technique

The productivity of the AUTOPLATEN® press is undeniably linked to the technical characteristics of the machine. The most important of these are:

- Machine configuration (equipment, improvements, peripherals, etc.)
- Operating conditions of the machine
- Quality of the converting tools
- Available handling resources
- Flow processing equipment

Organization

The organization of the machine environment has a direct effect on its productivity. A number of different points are involved, the most important of which are the following:

- Location of the machines and links with the different sectors of the enterprise
- Job planning and follow-up
- Management of converting tools
- Cleanliness and organization of the workplace
- Working and inspection procedures
- Maintenance schedule and policy

People

Finally, it is self-evident that staff with a profile appropriate to the work play a crucial role in the optimum utilization of the AUTOPLATEN® press. The essential characteristics that operators must possess are:

- Skill, knowledge and experience
- Behaviour and motivation
- The will to progress

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Job planning and follow-up

Good job planning and follow-up are essential factors to reach a high production level.

Follow-up does not concern only the production managers and operators of the machines, but also all those who have any connection with the manufacturing process (die makers, preparers, etc.).

Computer-assisted planning

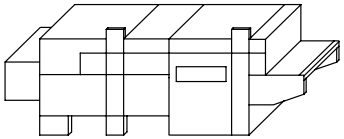
Computerized tools for production planning and management have become indispensable to companies wishing to control their production. Their objective is:

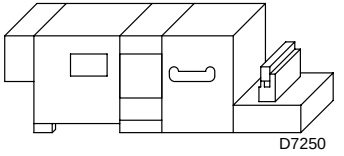
- Reducing stocks and work in progress
- Meet delivery times
- Monitor and establish production statistics (stoppages, waste, etc.)
- Check and manage converting tools
- Make better use of the company's resources and potential

Machine allocation

Machines are of course allocated to an order in accordance with their availability and the order deadline. Certain parameters with an indirect influence on the machine's productivity also have to be taken into account:

- **Using the same machine for the same order** (no need to remake a makeready sheet and possibility of reusing the setting data)
- **Run duration according the machine's equipment** (short runs should be allocated to machines with equipment adapted to quick job changes)
- **Working format of machine appropriate to format of job** (avoids conversion problems linked to balancing of the load)





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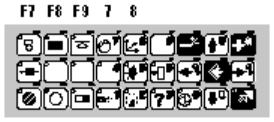
Job sheet

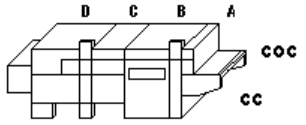
The operator of the SPO AUTOPLATEN® diecutting press fills out a job sheet when an order is first executed. He then stores and files the sheet near the machine or attaches it to the tools at the end of the job.

The sheet contains all the various setting values for the job as well as any other information likely to save time once the next job is set up.

Fiche de travail

N° FICHE DE TRAVAIL:
MACHINE:





COMMANDE				CUBE				REGLAGES MACHINE		
Nom du client:				F7	Soufflerie latérale	0 1		A	Joue latérale coc	m m
N° de commande:					Presseur	0 1			Joue latérale cc	m m
N° d'outillage:					Présélection des appuis des feuilles	1 2 1+2			Jauge d'introduction	m m
Format des feuilles:					Mode de taquage	0 1 2 1+2			Chariot d'appui arrière	m m
Nb. de poses:					Couplage FLEXO + SPO	0 1				
Type de carton:					Brosse de freinage	0 1		B	Force de découpage à vide	MN
Epaisseur / grammage:					Dispositif de soutien des feuilles	0 1			Force de découpage avec carton	MN
Prise de pinces:										
Ejection des déchets	❑ OUI	❑ NON		F8	Nombre de feuilles par paquet			C	Barre de serrage forme sup.	m m
Séparation du déchet frontal	❑ OUI	❑ NON			Interruption intro. des feuilles	1 2 3 4 5 6 7 8 9 10			Barre de serrage planche centrale	m m
					Ouverture retardée des volets					
					Nombre de feuilles découpées	RESET		D	Position du rangeur coc	m m
									Position du rangeur cc	m m
				F9	Force maximale de découpage		MN		Position du rangeur arrière	m m
					Force de découpage définie		MN			
OUTILS DE FAÇONNAGE				7	Contrôle présence de feuille		°AM			
B	Feuille de mise	❑ OUI	❑ NON							
	Plaque à découper	❑ Standard	❑ Tôle 1 mm	8	Jauge d'intro. - plaque aspirante		m m			
	Contreparties	❑ OUI	❑ NON		Position du rangeur coc		m m			
C	Outil supérieur	❑ Ejecteurs	❑ Forme		Position du rangeur cc		m m			
	Aiguilles inférieures	❑ OUI	❑ NON		Position du rangeur arrière		m m			
D	Séparateur déchet frontal	❑ Outils	❑ Forme							
									Cadence de production:	t/h
									Date:	
									Opérateur:	

See model page in chapter “Various information”

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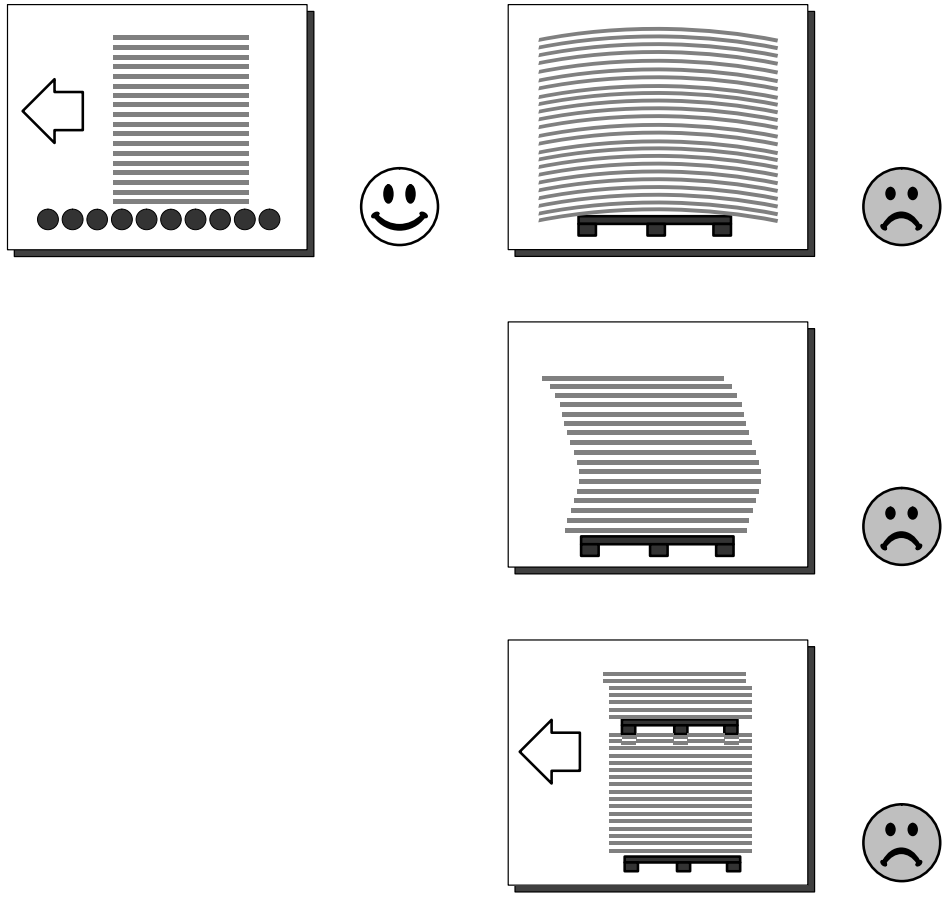
Logistics

Sheet pile transport

There are different ways of transporting piles between the corrugator outlet, intermediate storage and the SPO AUTOPLATEN® diecutting press. The system best suited is automatic conveying on rollers. Its advantages are as follows:

- **Flatter sheets**
- **Considerable reduction in pile deformation**
- **Fewer sheets damaged by fork lift**



Good pile quality makes for easier sheet infeed into the machine and cuts down stoppages!

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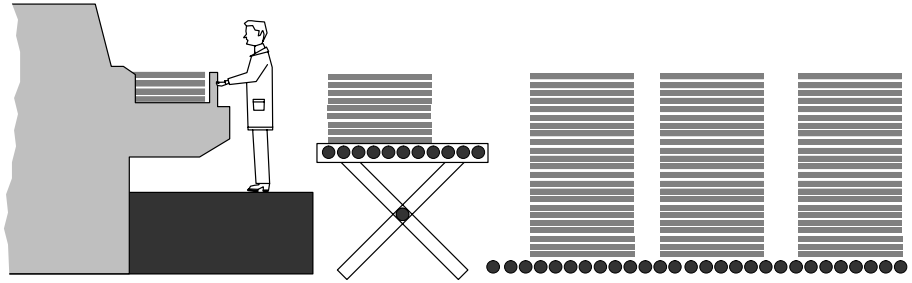
Sheet supply

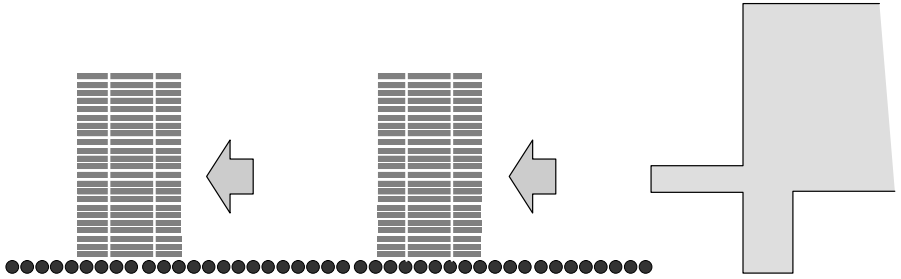
The machine has to be continuously supplied to prevent any production stoppages due to a lack of sheets. If the machine is not part of a production line (off-line), make provisions for an automatic loader or an elevating table.

A constant store of sheets ensures that the machine is continuously supplied.



Evacuation of converted sheets

Whether the machine is equipped with a polydelivery or followed by an automatic or even manual palletizer, it is important to ensure that the piles of blanks are regularly evacuated. The aim is to avoid production stoppages due to pile congestion at the line outlet.



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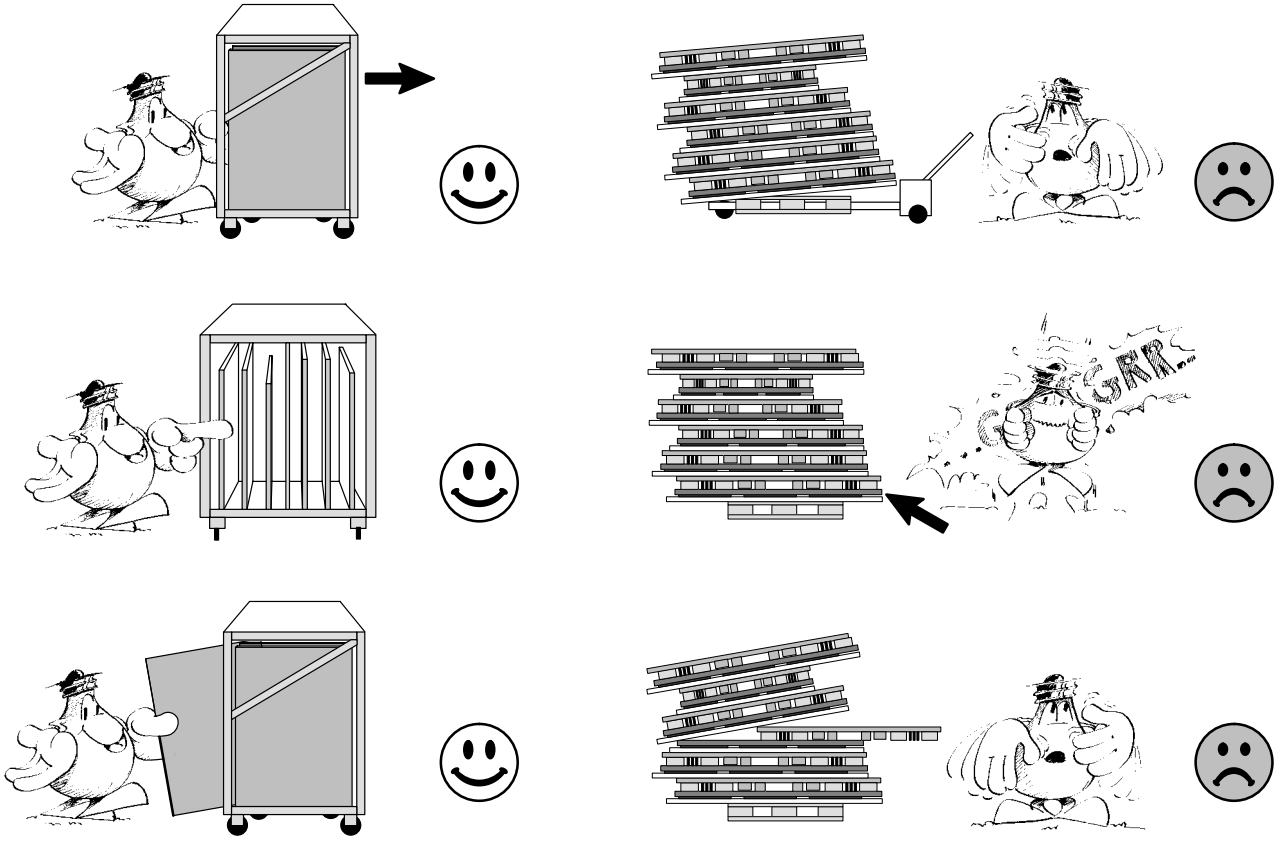
Conveying the converting tools

The converting tools need to be transported vertically using a trolley. This system has the following advantages:

- It avoids damaging the tools.
- It provides direct access to the required tool.
- It facilitates and simplifies tool handling.



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Intermediate converting tool storage

It is important to provide an intermediate storage for the tools next to the machine. This stock should always contain **2 to 3 complete sets of tools** corresponding to future jobs scheduled to run on the machine.

This buffer stock allows the operator:

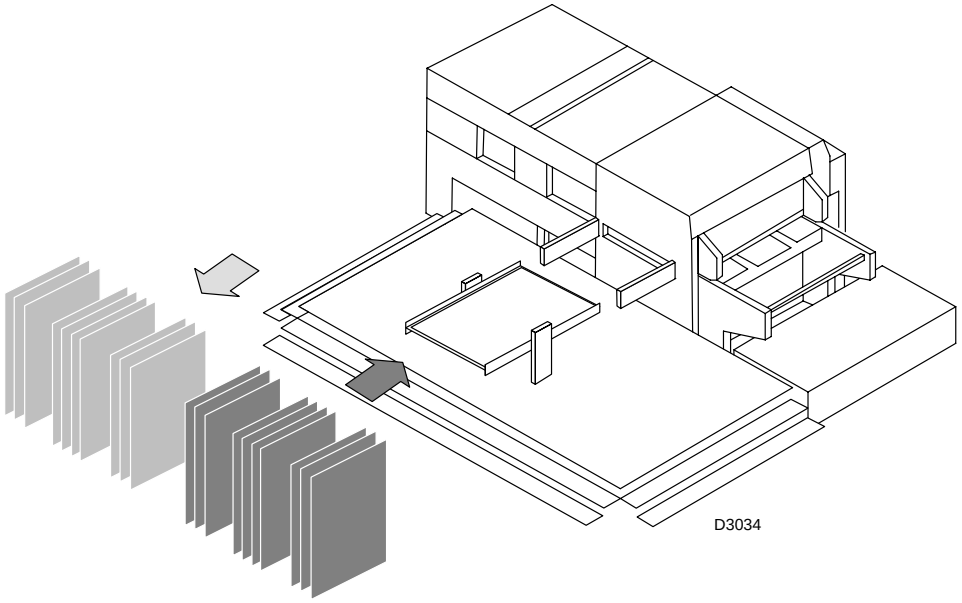
- to prepare the tools for the next job in time,
- to change jobs quickly in the event of a change in the production program,
- finally, to **limit any risk of production stoppage due to lack of tools**.

A similar storage area must also be provided for the used tools, before they are collected by the preparer.

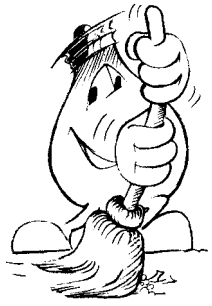
Waste removal

A good waste removal system must be sufficiently powerful to cope with the stripping waste from one or several SPO AUTOPLATEN® diecutting presses operating at maximum capacity.

It should also be designed to remove and deal with even the largest stripping waste, front trim and entire blanks.



We recommend that you contact a specialist before installing or transforming any machine!



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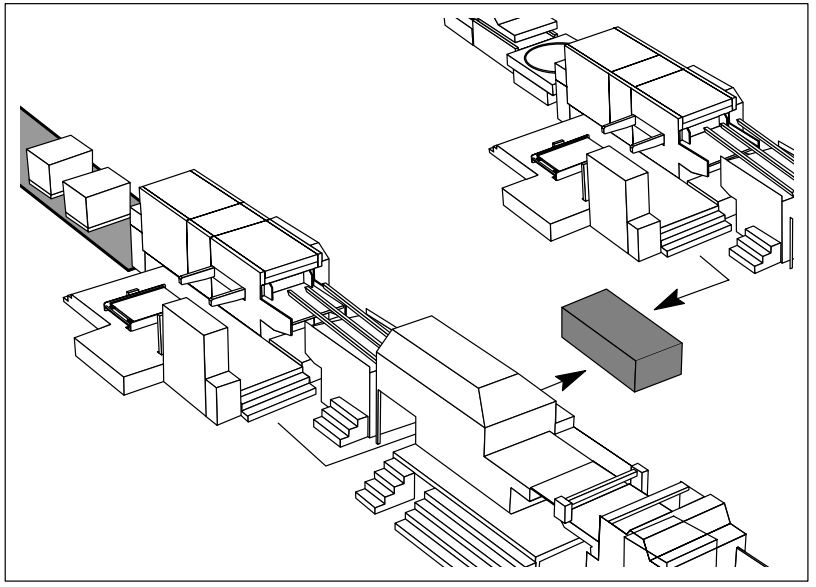
Adjacent workshop

A small adjacent workshop shared by 2 or 3 machines allows operators to carry out small urgent repairs (changing a rule, rubber, stripper, etc.). This workshop is essential for night shifts, when diemakers are not available.

It consists simply of a workbench equipped with the following tools:

- vice, fixed grinder, single shears and hooked shears, bridge punch, rule bender, special cutter for counterparts, wood and metal saws, screwdrivers.

A stock of diecutter supplies is also close to hand (cutting and creasing rules, rubbers, stripping foams, strippers, creasing counterparts, wood screws, nails, glue, etc.).



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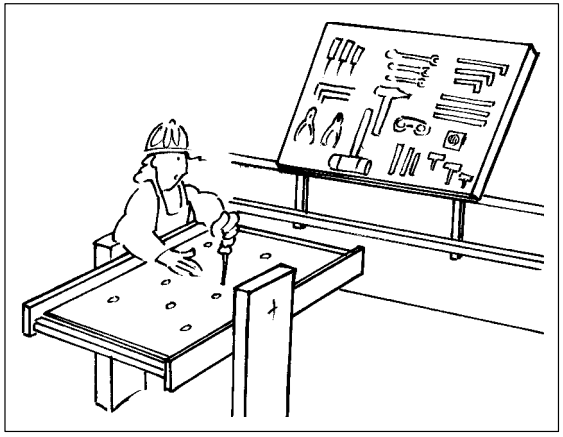
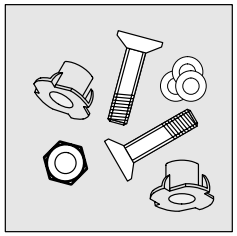
Organization of the work place

Operator equipment

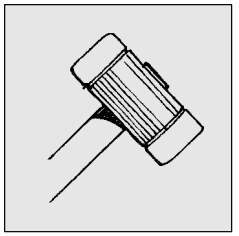
In order to reduce job change and machine start-up times to a minimum, the operator should have equipment appropriate to his type of machine at his disposal at all times. A tool box containing the basic tool kit is supplied with the machine. Provide also additional material.



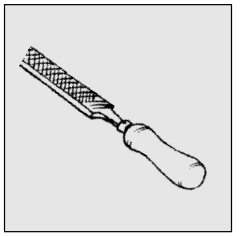
Do not hesitate to replace any worn tools at once.



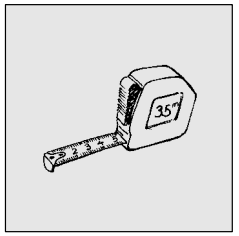
Nuts and bolts



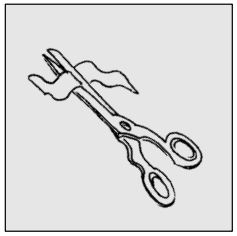
Nylon hammer



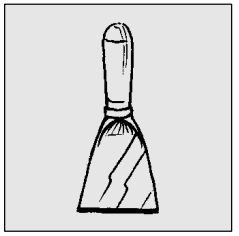
File



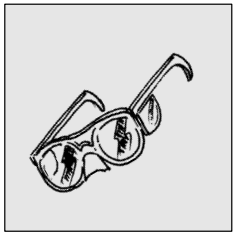
Measure tape



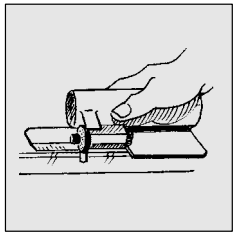
Scissors



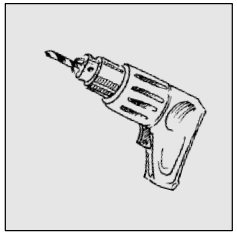
Spatula



Goggles

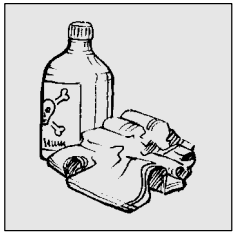


Nick grinder

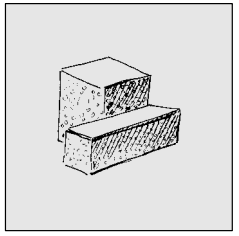


Drill/screwdriver (battery powered)

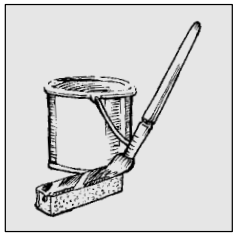
Hand grinder



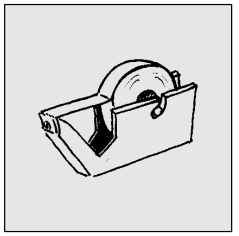
Cleaning agents



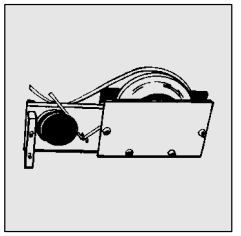
Rubber blocks and stripping foam



Rubber glue



Adhesive tape



Makeready paper tape

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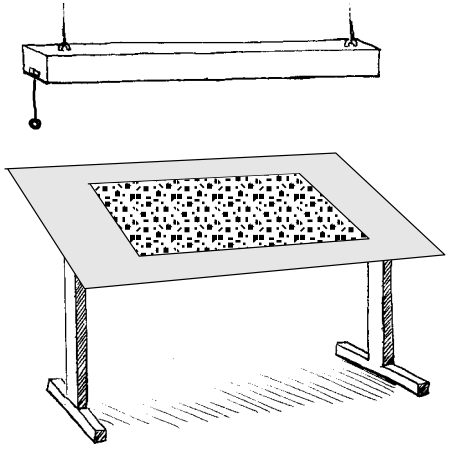
Work table

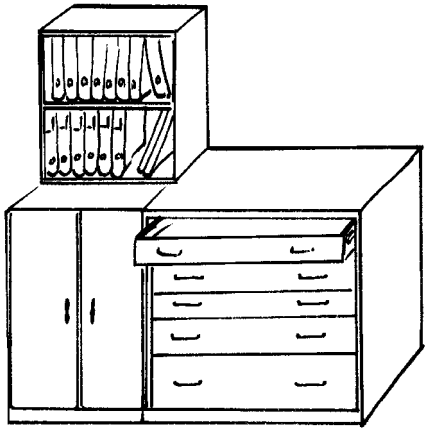
A work surface of sufficient size and adequately illuminated must be provided so that the operator can carry out his work, quality control, etc. properly.

Storage unit

To avoid waste of time spent looking for equipment, provide a small storage rack on the platform or beside the machine.

It should provide space for job and tool order sheets, the operator’s equipment, the technical documentation and a few personal effects.

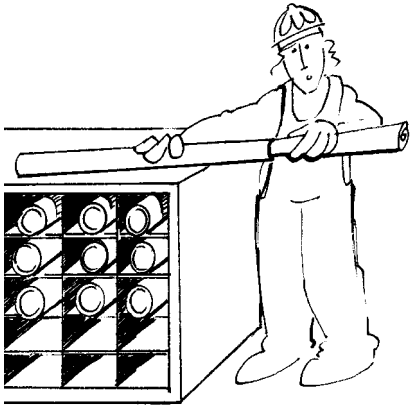


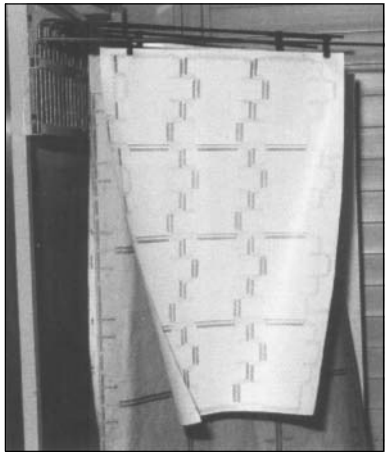


Makeready sheet storage rack

The makeready sheet is specific to a job on a particular machine. It takes up little storage space, and if possible should be stored in a special rack (the sheets rolled up or hanging).

If the makeready sheet is stored with the converting tools, however, an effective system of protection for its storage and transport must be chosen.





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Maintenance

In a context of production with reduced stocks and work in progress, maintenance takes on considerable importance. It should not be forgotten that the aim of «just in time» is the systematic fight against waste, of which stocks and work in progress form a part. A machine that breaks down can then stop an entire production line if buffer stocks have not been provided to ensure supply to the next stage of production.

Types of maintenance

There are several types of maintenance, the most common types being:

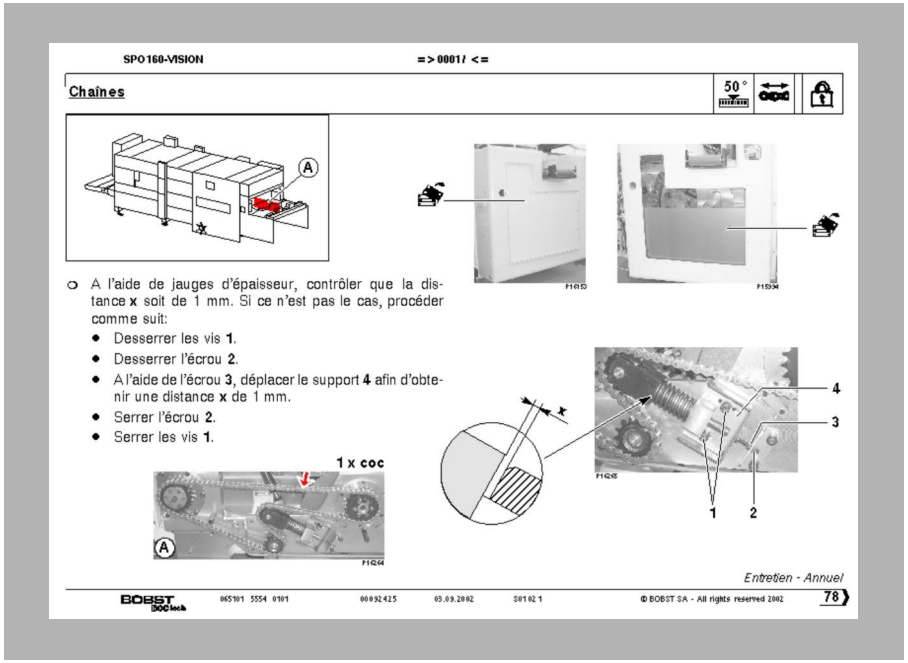
- Preventive maintenance (active maintenance)
- Reactive maintenance (troubleshooting)

Preventive maintenance

A modern maintenance system gives preference to preventive maintenance in order to reduce troubleshooting operations. It is carried out outside production hours and only shuts down the machines for a short time.

Lack of preventive maintenance results in production stoppages, troubleshooting and prolonged machine stoppages. It is therefore important to observe the operation instructions and intervals described in the maintenance manuals supplied with the machine.

BOBST is proposing maintenance contracts. For further information please contact your representative.



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Reactive maintenance

Since preventive maintenance reduces the number of breakdowns, it becomes easier to clear them efficiently. If a breakdown occurs, reaction must be rapid to limit machine downtime.

This is the responsibility of the maintenance team or, in the case of complex or major breakdowns, BOBST technicians.

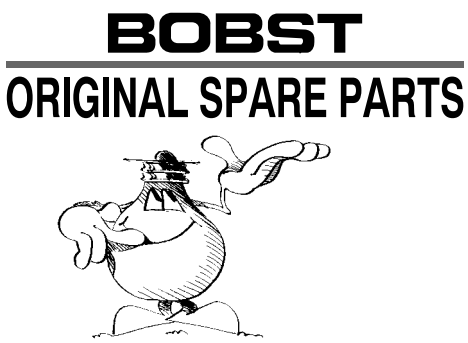
Spare part stocks

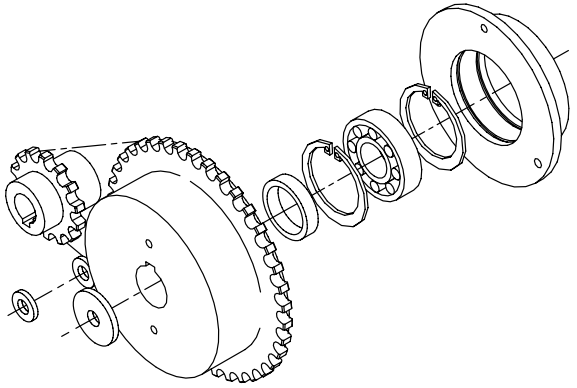
A minimum of spare parts should be kept on hand in the factory for quick replacement of wearing parts (brushes, rollers, suction cups, etc.) or damaged parts.

Original spares

By ordering your spares through the BOBST organization, you gain the following advantages:

- **Services:** our technical advisers will analyse your orders according to your machine file and will propose you advantageous options.
- **Availability:** 90% of parts ordered are available immediately.
- **Quality:** all our spares respect the original characteristics of the parts and are guaranteed for 1 year.
- **Speed:** urgent orders recorded before 4 p.m. can be despatched the same day.





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Retrofit PIP

The **«Retrofit PIP»** programme enables customers possessing machines of former design to benefit from the technical development of BOBST products.

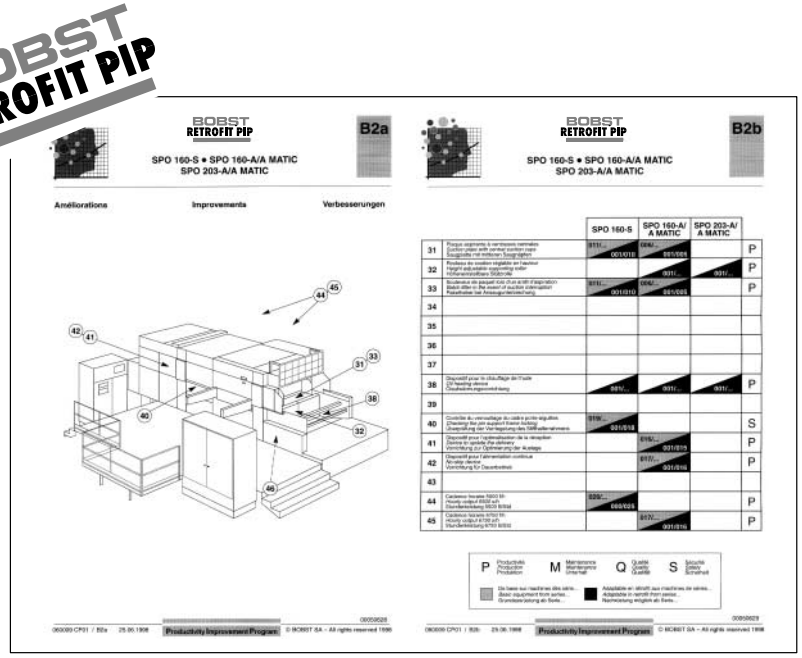
The advantage of this programme is the opportunity it provides to select improvements adapted to needs. For short runs, choose equipment which reduces the job change time. For long jobs, equipment which increases the speed and performance of the machine should be favoured.

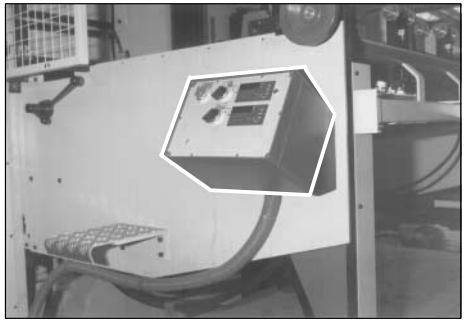
Example:

Motorized lateral guides

The primary objective of this product is to reduce the job change time. Its chief advantages are:

- Fast and accurate positioning of lateral guides according to the sheet size
- Digital display of the lateral guide position
- Possibility to preset the sheet size of the next job





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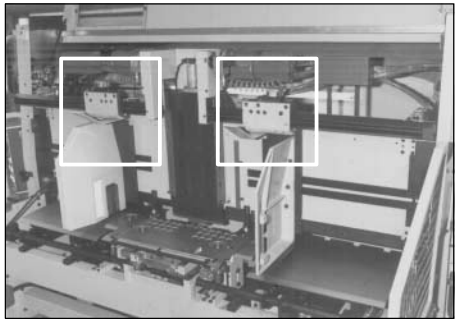

P3029

Contact your representative for more detailed information on this programme.

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Training

The increasing importance of training

People are still the central element in any production center and their responsibility in terms of productivity is considerable. The best way to assure the future of any enterprise is to possess an efficient team able to collaborate, improve and innovate in order to meet with the perpetually growing requirements of the customer.

This is even more true today now that techniques, reflecting markets, are developing more and more rapidly.

Training programme

The BOBST training department offers a complete programme of courses on its premises in Switzerland to improve the level of knowledge of staff and the working efficiency of everyone.

Participants are grouped by language and level of knowledge into groups of 4 to 6 people. Courses are given in French, English and German (Italian and Spanish on request) in the following fields:

- Executives and production managers
- Operators
- Maintenance mechanics
- Maintenance electricians
- Manufacturing converting tools
- Flexographic printing

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On-site training

Training courses can also be organized on your company. In such cases, the BOBST instructor travels to your factory to provide further training in the fields of your choice. This type of course offers the following advantages:

- Customized training adapted to practical cases
- All persons in the company can get into contact with the instructor
- Advice and answers to questions from your staff

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Training aids

DOC*training* aids are to spead and improve the know-how of converting and packaging professionals. The aids contain the technical information enabling you to make the most of your BOBST machine and equipment.

They are generally available in the form of manuals, guides and CD-ROM.

Document categories

The documents address the following subjects targeted at the activities and skills of the user:

- ***Design and manufacturing*** mainly intended for packaging designers, tool makers and operators.
- ***Production methods*** for production managers, workshop managers and operators.
- ***General training*** for everyone interested in the packaging market.

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Preparing the converting tools

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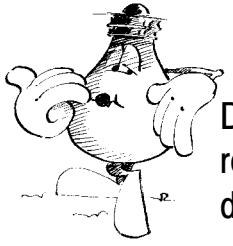
Functions of the preparer

The preparer is responsible for supplying the tools from the store or the diemaker's workshop to the machine. He is also in charge of returning the tools after they have been used.

The preparer must perform the following tasks:

- **Collecting** the complete set of tools required for the job in hand.
- **Checking** its condition and signaling any anomalies to the diecutter for immediate remedy.
- **Transporting** the complete set of tools carefully between the store (or the diecutter) and the machine.

The preparer must also take care not to damage the tools by taking all the necessary handling precautions.



Damaged tools can have serious repercussions on quality and productivity!

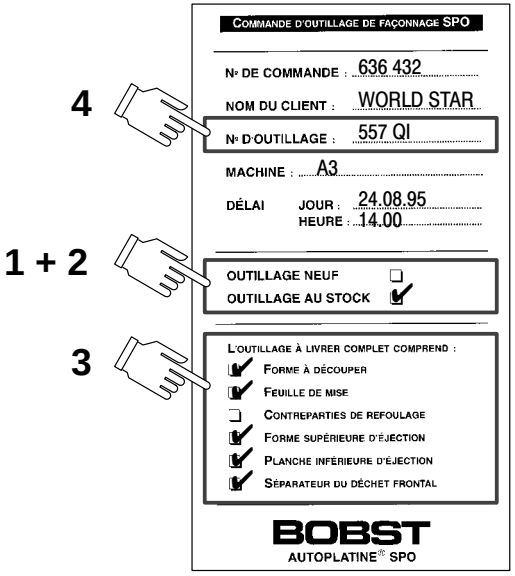
Collecting the tools

After receiving the tool order, the preparer proceeds as follows:

1. **For new tools**

   he collects the tools from the diecutter or takes delivery of the tools if the diecutter is not part of the company.
2. **For tools that have already been used**

   he collects the tools from the store.
3. In both cases, he must check that all the tools are there, as per the tool order.
4. Check the tool no.



Preparing the converting tools

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General check of the condition of the tools

Once the tools have been collected, the preparer must check their condition. If he detects a serious anomaly, he must notify the planning department and the diemaker immediately.

This check must include:

1 The condition of the wooden boards (cracks, breaks, etc.).

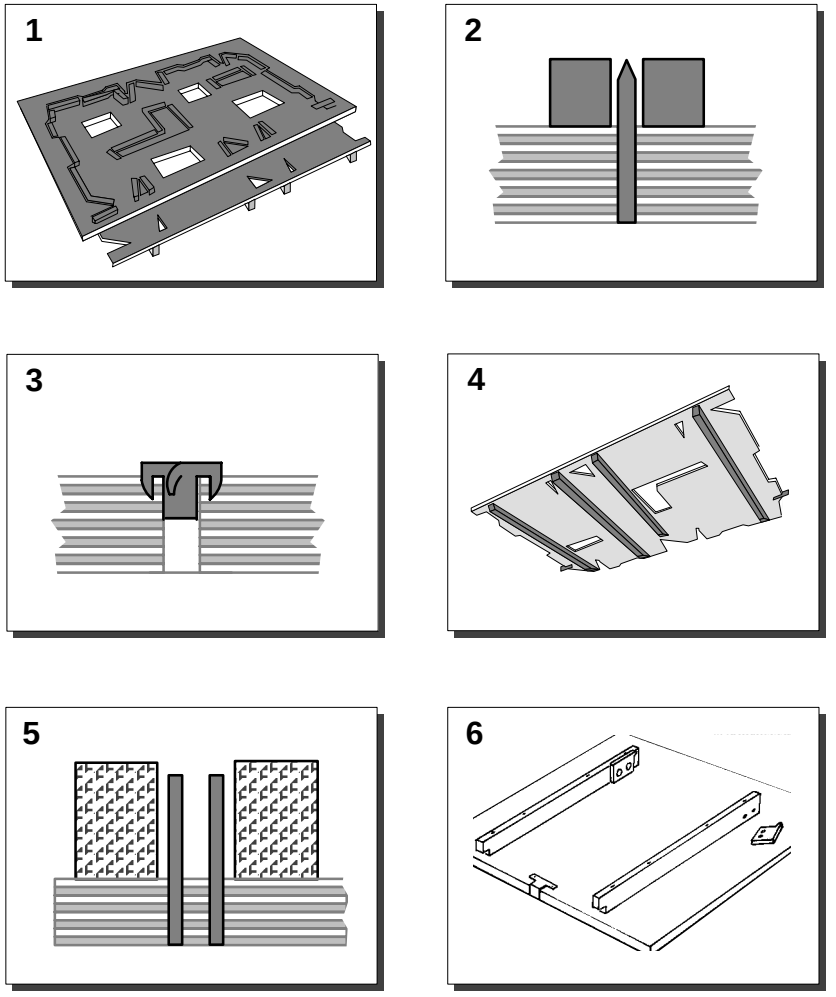
2 The condition of the rules and rubbers on the cutting die.

3 The presence of T-nuts in the tools (cutting die, stripping tools and front waste stripping tools).

4 The condition and fastening of the reinforcements and separating knives on the central stripping board.

5 The condition and presence of all the strippers and stripping foams on the upper stripping tool.

6 The condition and presence of the clamping system (claws, aluminum profiles) and centering system (stops, plastic screws) on the stripping tools.



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Supplying the tools

The preparer must ensure that he supplies the ordered tools to the relevant machine within the specified time.

When transporting the tools, observe the following points:

- Use the appropriate transport means.
- Handle the tools as little as possible.
- Avoid all direct contact between the various tools during transport.
- Follow safe and cleared routes.

Note

To save time and energy, never travel empty. Whenever a preparer takes tools to one particular machine, he should always come back with used tools, either for storage or for the diemaker.

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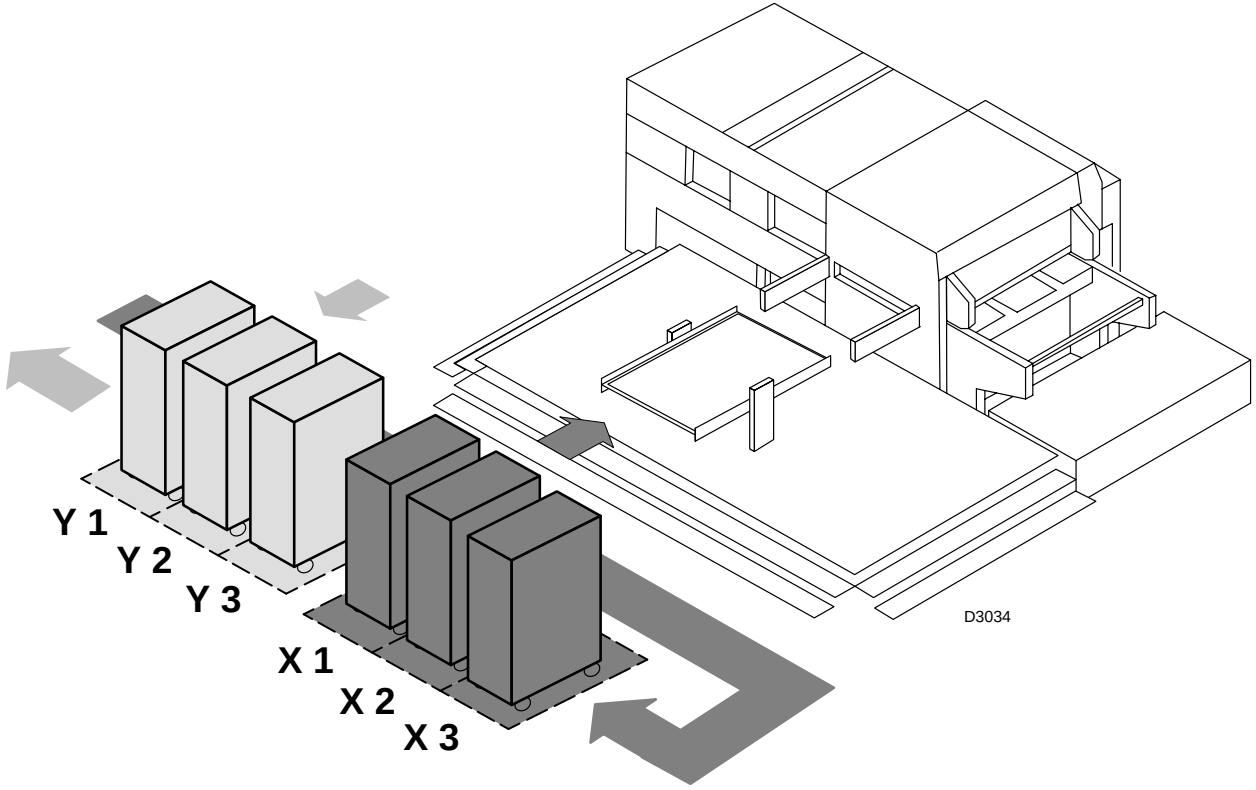
Intermediate tool storage

Place the tools in position, whenever possible in the order in which they arrived. Likewise, the operator should store used tools away in the order in which they were used.

This enables the preparer to identify immediately the next set of tools to be used and to identify the sets of tools to take back to the store or to the diemaker.

We recommend painting the location of the tool trolleys on the shop floor. Use different colors for jobs pending **X** and completed jobs **Y**.



Preparing the converting tools

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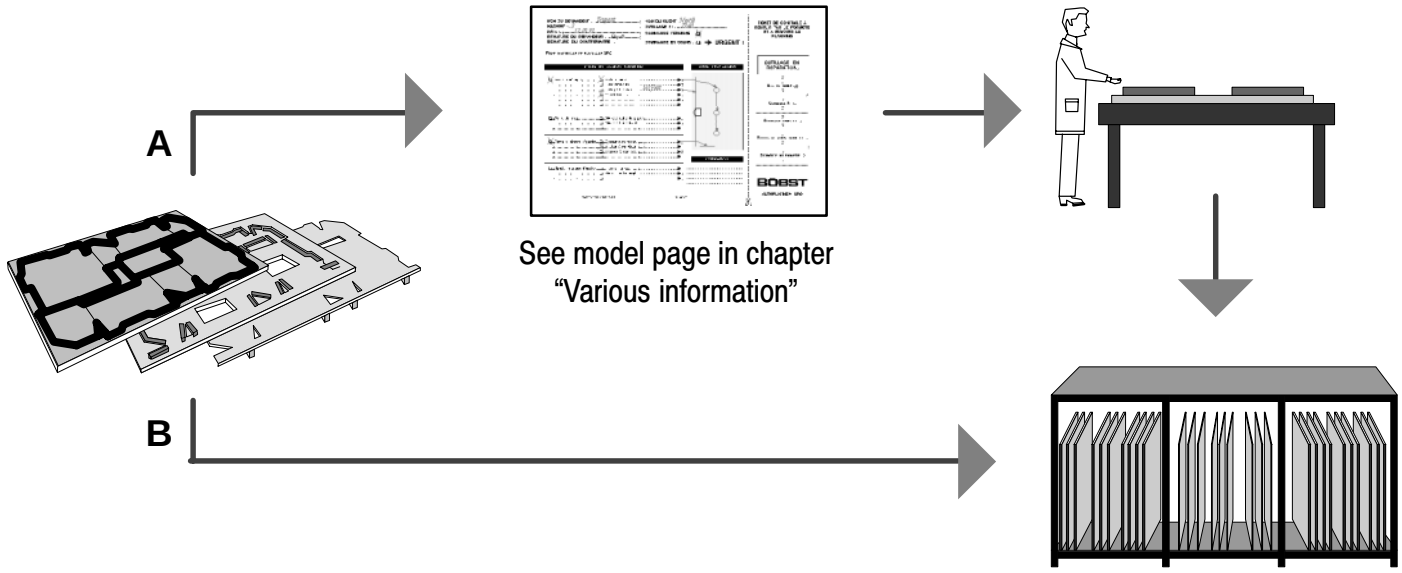
Returning the tools

A If the operator has filled out a tool repair sheet, the tools should be brought back to the diemaker along with the sheet.

The diemaker must then notify the preparer once the tools have been repaired so that the preparer can store them.

B If the tools are considered to be in good condition, they can be taken straight back to the storeroom.



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Preparing a job change

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Introduction

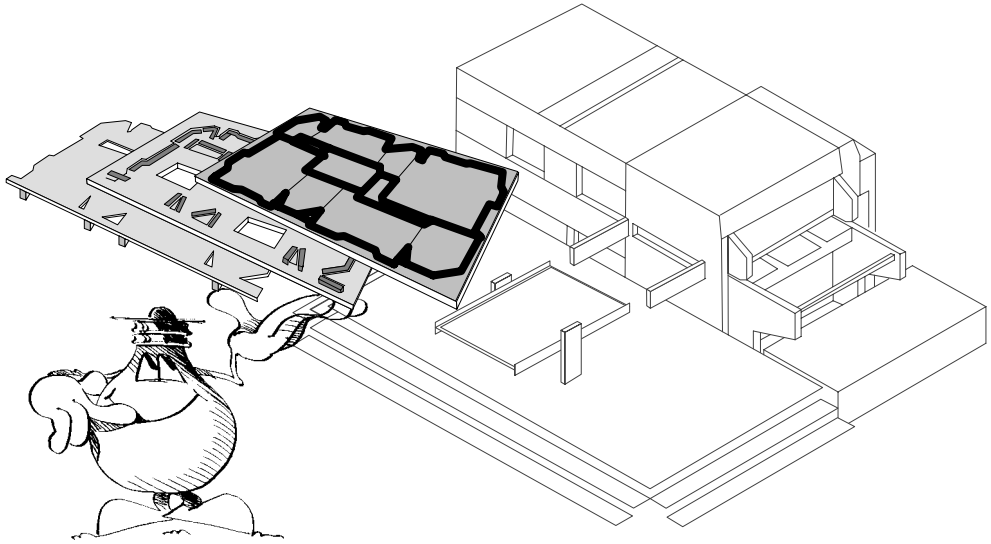
Job change preparations are very important for carrying out the job change correctly and quickly. Preparations are made next to the machine by the operator and his assistant(s).

The following conditions are essential for an effective preparation of a job change:

- **Manufacturing order, cardboard, pallets and reject have to be prepared before the end of the current production.**
- **A complete set of tools in good condition must be available to the operator in good time.**
- **The preparation for the job change must be carried out in masked time.**
- **The preparation must be completed before the end of production on the preceding job.**

Note

In this Section, we will be assuming that the SPO AUTOPLATEN® press is equipped with a chase loader and the Centerline system, essential elements for an effective preparation and a quick job change.



Preparing a job change

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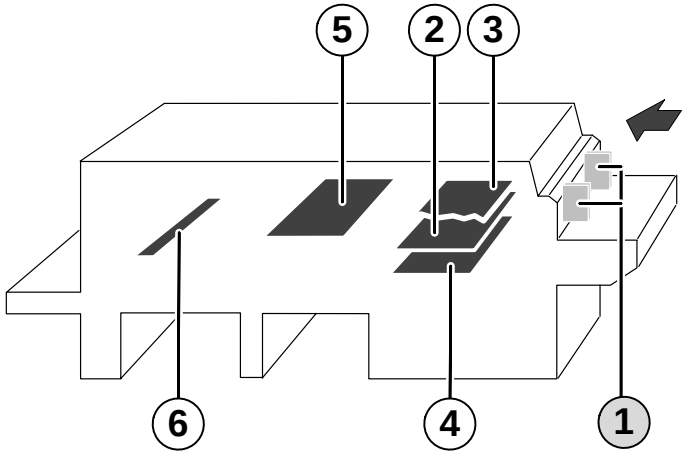
Protocol for a Centerline I machine



option

***** *non-Centerline tools*

	Element	Action	✎
1	*Motorized side guides*	*Enter data*	
2	Cutting die	Placing on chase	
3	Makeready sheet	Fixing	
		Pre-makeready	
4	Creasing counterparts	Placing of counterparts on creasing rules	
5 *	Upper stripping tool	Fixing front clamping bar	
6	Front waste separator	Preparing fixing elements	
7	Job sheet - Piles - Pallets	Checks	

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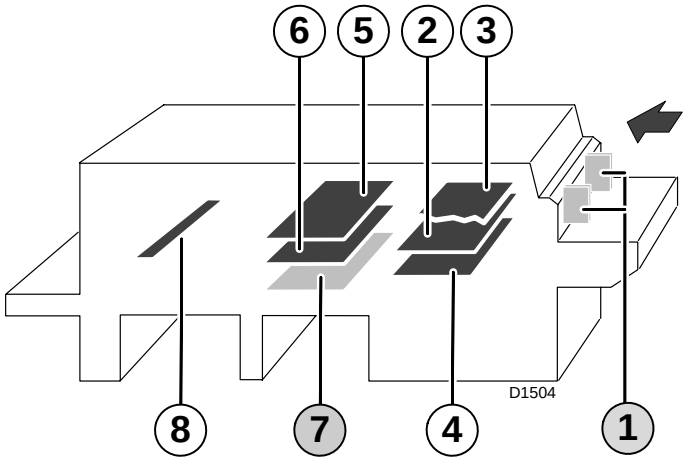
Protocol for a Centerline II machine



option

** non-Centerline tools*

	Element	Action	✎
1	*Motorized side guides*	*Enter data*	
2	Cutting die	Placing on chase	
3	Makeready sheet	Fixing	
		Pre-makeready	
4	Creasing counterparts	Placing of counterparts on creasing rules	
5 *	Upper stripping tool	Fixing front clamping bar	
6	Central stripping board	Fixing of Centerline II elements	
7	Stripping pins	Positioning and fixing	
8	Front waste separator	Fixing elements	
9	Job sheet - Piles - Pallets	Checks	

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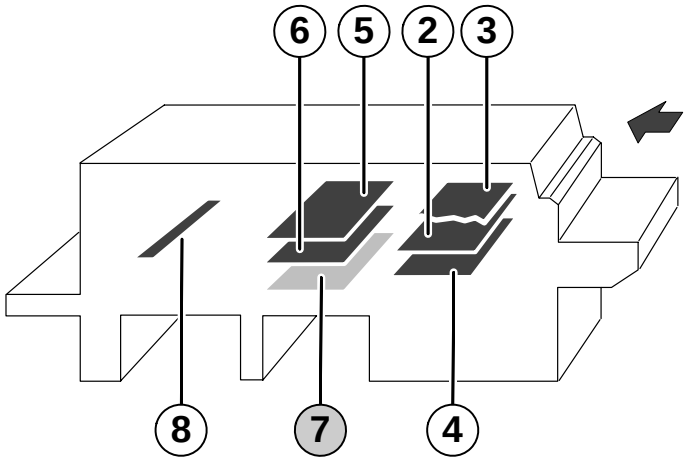
Protocol for a Centerline II MATIC machine



option

***** *non-Centerline tools*

	Element	Action	✎
1	MATIC system	Enter data (new job only)	
2	Cutting die	Placing on chase	
3	Makeready sheet	Fixing	
4	Creasing counterparts	Placing of counterparts on creasing rules	
5 *	Upper stripping tool	Fixing front clamping bar	
6	Central stripping board	Fixing of Centerline II elements	
7	*Stripping pins*	*Positioning and fixing*	
8	Front waste separator	Fixing elements	
9	Job sheet - Piles - Pallets	Checks	

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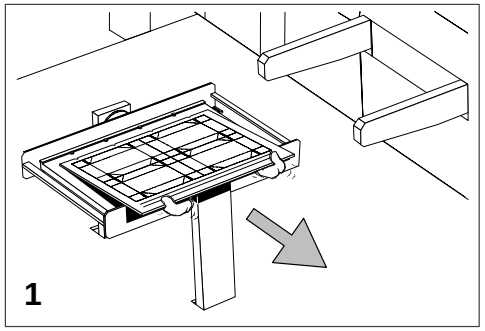
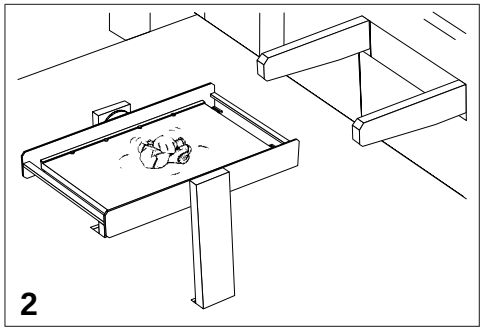
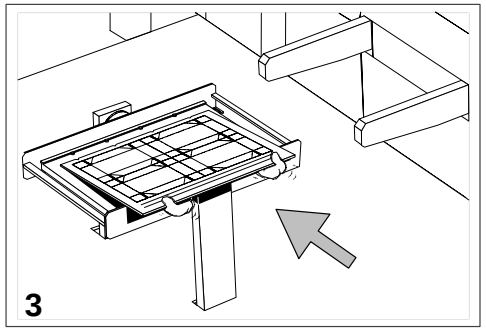
Placing the cutting die in the chase



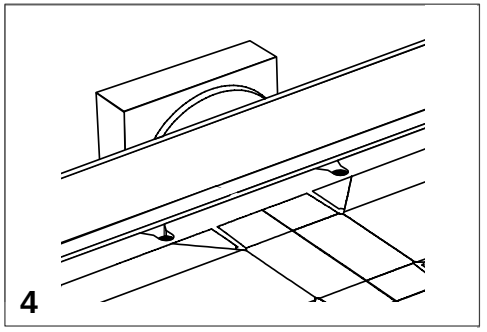
Remove the previous cutting die.



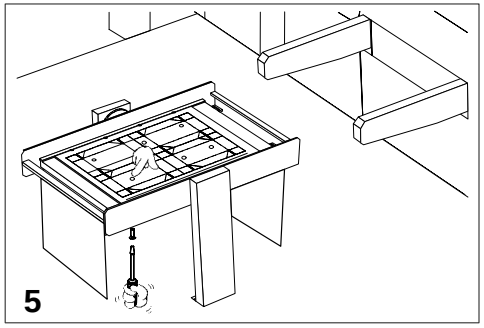
Clean the chase bottom plate and the back of the cutting die.



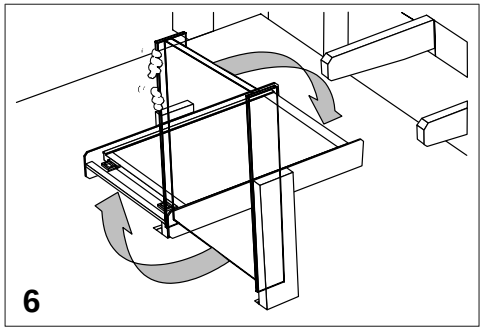
Insert the cutting die into the chase.



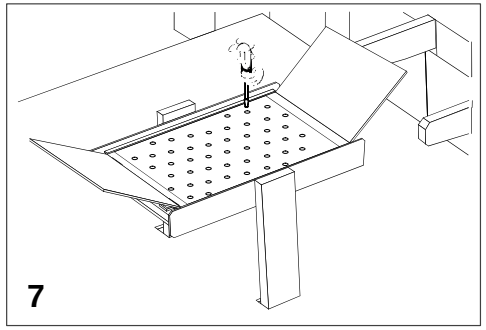
Position the cutting die using the centering pins and the notches.



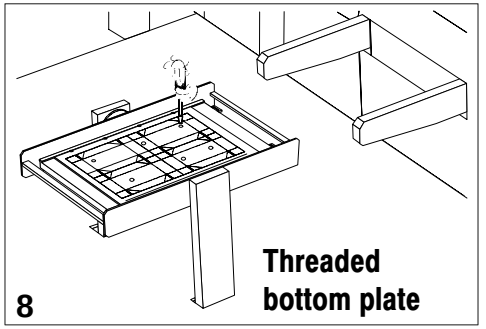
From underneath, screw 3 screws into the T-nuts of the cutting die (for threaded bottom plate, ☞ 8).



Turn the chase over.



Screw 5 to 10 countersunk head screws into the T-nuts of the cutting die.



Screw 5 to 10 countersunk head screws into the bottom plate (access from above), then turn the chase over.

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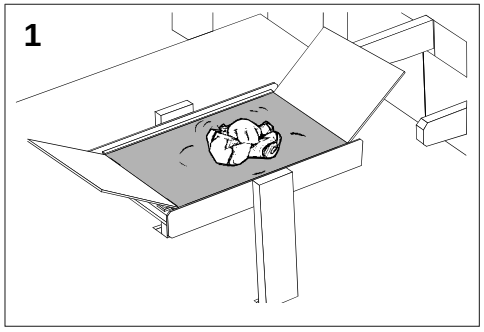
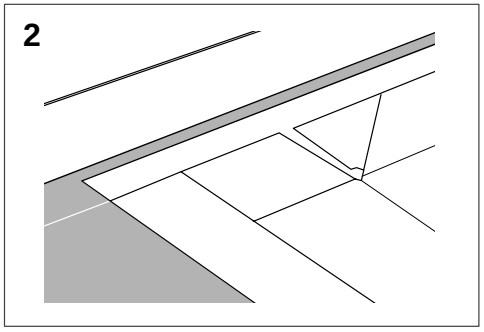
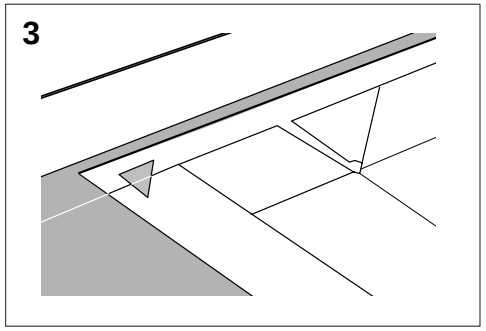
Fixing the makeready sheet into the chase



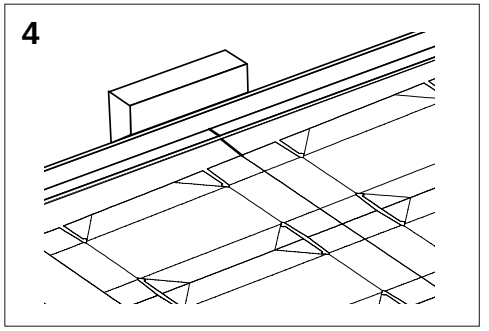
Clean the chase bottom plate.



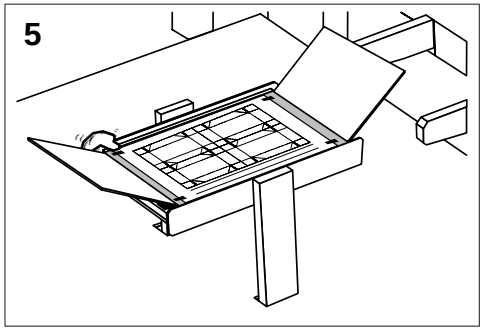
Prolong the line of the 1st rule to the side edge of the sheet, then align it with the corresponding line on the bottom plate.



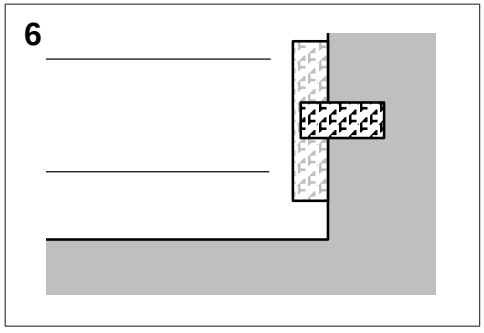
Make a triangular opening on the line of the 1st rule and align it with the corresponding line on the bottom plate.



Center the sheet using the Centerline mark on the chase.



Use adhesive tape to fix the makeready sheet at its four corners.



Provide strips of adhesive tape on the side edges of the sheet to enable the operator to fix and remove the sheet more easily.

Never use adhesive tape where a cutting rule is located!

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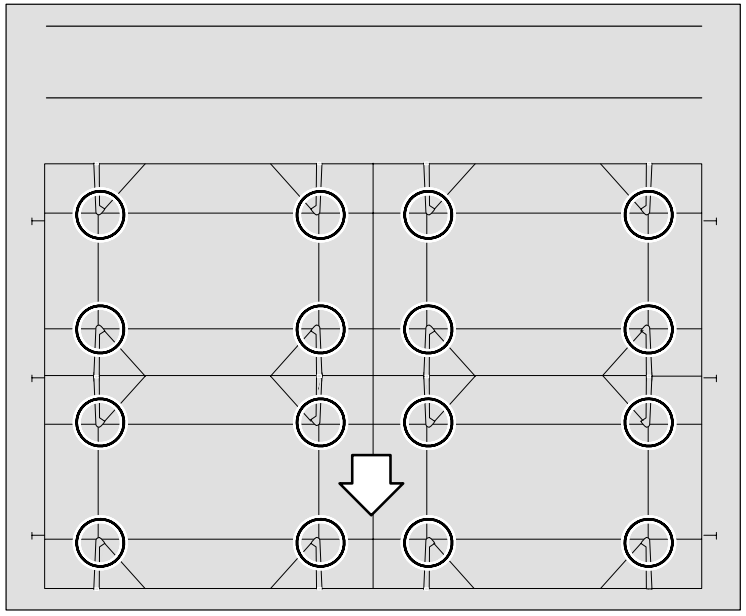
Pre-makeready

To cut down the start-up time for a job, we recommend that you carry out a pre-makeready. This operation consists of sticking makeready papers in places where the cutting rules show cutting weaknesses (small radii, narrow slits, etc.).



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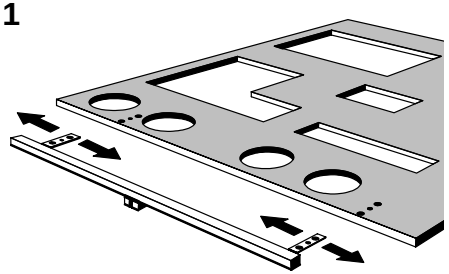
Fixing the front clamping bar

The old EASYSET upper stripping tools or those without register system are **20 mm** shorter compared to a Centerline upper tool.

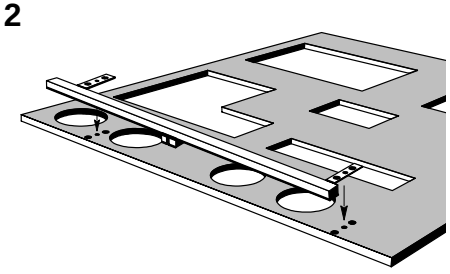
A front clamping bar is used for adapting the old upper stripping tools to the Centerline I and II systems. Two sets of clamping bars (small and large size) are supplied with the Centerline machines.

1



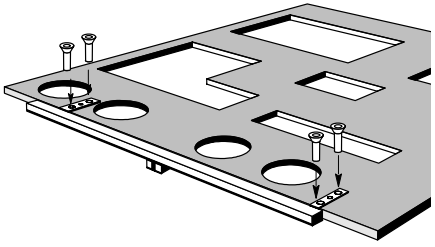
Position the plates so that the clamping bar is centered in the upper stripping tool.

2



Insert the pins into the corresponding holes, on the stripper side.

3



Fix the plates (4 screws M5 x 20 mm) into the T-nuts of the tool.

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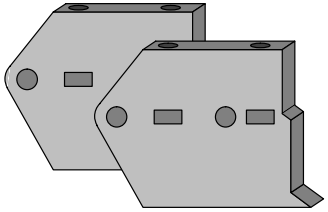
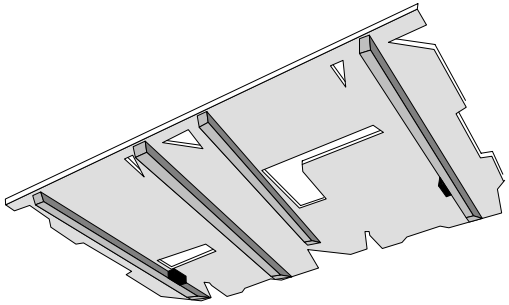
Fixing the Centerline II elements

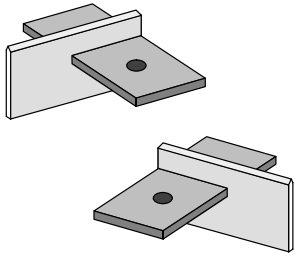
The Centerline II elements are to be fixed to the central stripping board. This operation only needs to be carried out if the elements are dismantled at the end of each job.

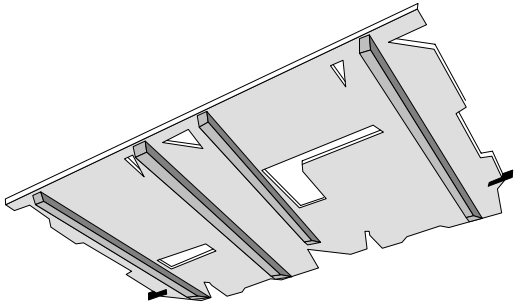
Clamping claws





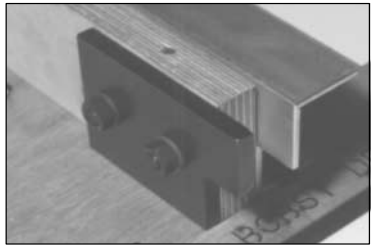
Separating rules





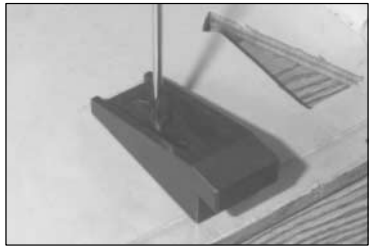
Front stops and support lugs

Depending on the level of equipment on the central stripping board, support lugs and front stops will have to be added.



P353

BOBST 502-2094



P656

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Changing tools and setting to size

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Introduction

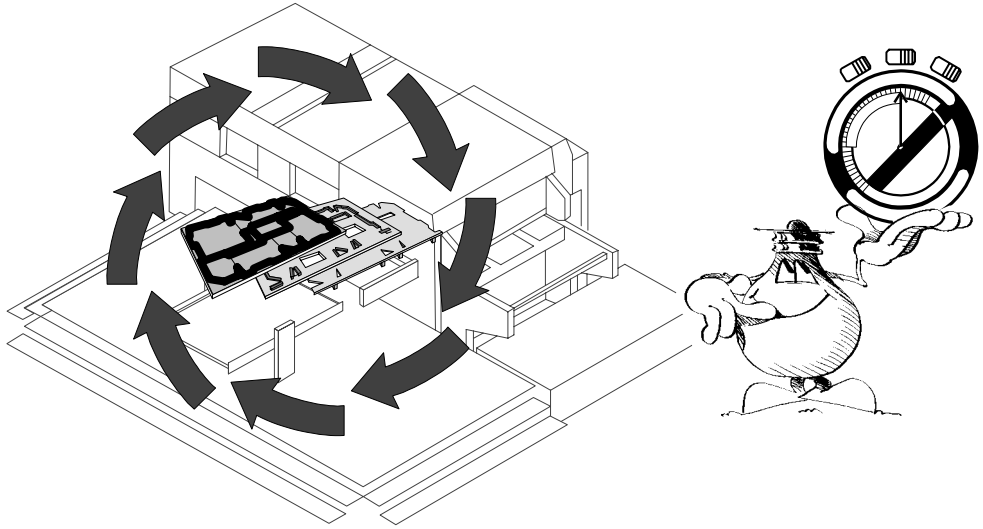
The following pages describe the procedure for carrying out a job change with two persons in the shortest possible time.

The procedures differ depending on the machine's equipment and options. Obviously, while we cannot deal with each individual case, the most common cases are illustrated:

- **EASYSET equipment with chase loader**
- **Centerline I equipment with options** (or retrofit)
  - chase loader
  - motorized side guides
  - **1 mm** thin plate
  - external adjustment of photocells
  - direct reflection photocells
  - quick change of front waste separator
  - delivery device adjustable from the outside
  - programmed stop
- **Centerline II equipment**
- **Centerline II and MATIC equipment**

Note

The operations listed in the following pages are described in detail in the machine operation manuals. All that matters here is the sequence in which these operations are carried out.



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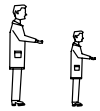
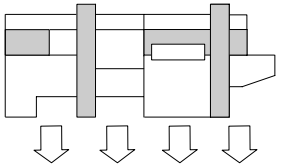
EASYSET equipment with chase loader



A = old job
B = new job
☆ = operation carried out inside the machine



1	●		Reduce the cutting force completely	A				●	
2	●		Stop the machine; gripper bar in the middle of the stations	A			●	●	
3	●		Remove the chase	A				●	
4	●		Insert the new chase	B				●	
5	●		Position the gripper bars to remove the stripping tools	A			●	●	
6	●		Open the flaps	A		●			
7		●	Set the lateral guides	B					●
8		●	Set the rear supporting carriage	B					●
9		●	Set the infeed gauge	B					●
10	●		Fit the upper frame	A			●		
11	●		Free the upper tool	A			●		
12	●	●	Remove the upper tool	A			●		
13		●	Move the batch delivery out of the way	A		●			
14	●		Unlock the central board	A			●		
15	●		Remove the central board	A			☆		
16		●	Evacuate the central board	A			☆		
17		●	Insert the central board and position the centering blocks	B			●		

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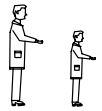
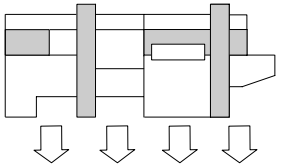


A = old job
B = new job
☆ = operation carried out inside the machine



18	●		Fix the central board and position the supporting apron	B			☆		
19	●	●	Insert and position the upper tool on the centering blocks	B			●		
20		●	Put away the old tools and tidy up	A		●	●	●	●
21	●		Lower the upper frame	A			●		
22	●		Fix the upper tool	A			●		
23	●		Raise the upper frame	A			●		
24	●		Remove the centering blocks	A			●		
25	●		Position the gripper bar in the middle of the stations					●	●
26		●	Remove the front waste separator	A		☆			
27		●	Fix the front waste separator	B		☆			
28		●	Set the side and rear guides	B		☆			
29	●		Remove, clean and re-insert the cutting plate	B				●	
30	●		Reposition the batch delivery	B		●			
31	●		Close and set the flaps	B		●			
32		●	Place a batch of sheets in the feeder	B					●
33									
34									

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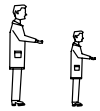
Centerline I equipment with options



A = old job
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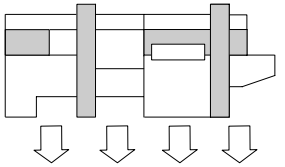

1	●		Reduce the cutting force completely	A				●	
2	●		Stop the machine; gripper bar in the middle of the stations	A			●	●	
3		●	Set the motorized side guides	B					●
4		●	Set the rear supporting carriage	B					●
5	●		Remove the chase	A				●	
6	●		Insert the new chase	B				●	
7		●	Place a batch of sheets in the feeder	B					●
8	●		Remove the supporting plate and take out the 1 mm thin plate	A				●	
9	●		Fix the new 1 mm thin plate (or clean the old one)	B				●	
10	●		Insert the supporting plate	B				●	
11	●		Reposition the machine (programmed stop)	A			●	●	
12		●	Set the infeed gauge	B					●
13	●		Unlock the central board then insert the centering screws	A			☆		
14		●	Remove the front waste separator	A		●			
15		●	Fix the front waste separator	B		●			
16	●		Fit the upper frame	A			●		
17	●	●	Remove the tools	A			●		

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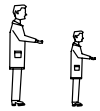

A = old job
B = new job
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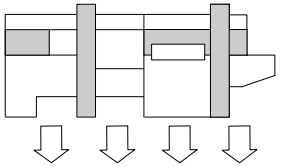

18	●		Position the rear bar on the upper frame	B			●		
19	●	●	Insert the tools	B			●		
20	●		Position the central board supporting crossbar	B			●		
21		●	Set the lateral and rear joggers	B		☆			
22	●		Set the flaps	B		●			
23		●	Put away the old tools and tidy up	A		●	●	●	●
24	●		Lower the upper frame	B			●		
25	●		Lock the central board	B			☆		
26	●		Remove the centering screws	B			☆		
27	●		Position the sheet supporting apron	B			☆		
28									
29									
30									
31									
32									
33									
34									

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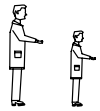
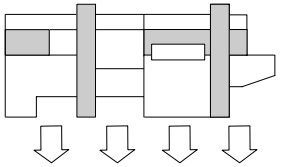
Machines equipped with Centerline II



A = old job
B = new job
☆ = operation carried out inside the machine



1	●		Reduce the cutting force completely	A				●	
2	●		Stop the machine; gripper bar in the middle of the stations	A			●	●	
3		●	Remove the front waste separator	A		●			
4		●	Insert the front waste separator	B		●			
5		●	Insert the front waste supporting tool	B		●			
6	●		Remove the chase	A				●	
7	●		Insert the new chase	B				●	
8	●	●	Remove the upper tool	A			●		
9	●	●	Remove the central board	A			●		
10	●	●	Remove the pin-supporting frame and the pins	A			●		
11		●	Remove the supporting plate and take out the 1 mm thin plate	A				●	
12		●	Fix the new 1 mm thin plate (or clean the old one)	B				●	
13		●	Insert the supporting plate	B				●	
14	●		Set the lateral guides	B					●
15	●		Set the rear supporting carriage	B					●
16	●		Set the infeed gauge	B					●
17		●	Position the central board supporting crossbar	B			●		

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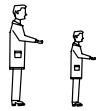

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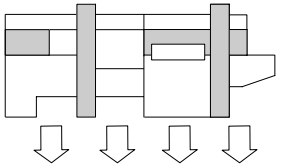

18		●	Set the side and rear guides	B		●			
19	●		Place a batch of sheets in the feeder	B					●
20		●	Put away the old tools and tidy up	A		●	●	●	●
21	●	●	Insert the upper tool	B			●		
22	●	●	Insert the central board	B			●		
23	●	●	Insert the pin-supporting frame and the pins	B			●		
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									

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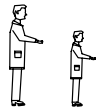
Centerline II and MATIC equipment



A = old job
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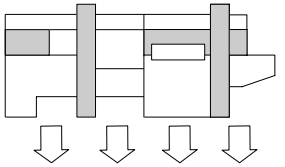

1	●		Stop the machine, gripper bar in the middle of the stations	A			●	●	
2	●		Remove the last few sheets	A					●
3		●	Remove the front waste separator	A		●			
4		●	Insert the front waste separator	B		●			
5		●	Insert the front waste supporting tool	B		●			
6	●		Remove the chase	A				●	
7	●		Insert the new chase	B				●	
8	●	●	Remove the upper tool	A			●		
9	●	●	Remove the central board	A			●		
10	●	●	Remove the pin-supporting frame and the pins	A			●		
11	●		Call up or enter the job data in the MATIC system	B				●	
12		●	Put away the old tools and tidy up	A		●	●	●	●
13	●		Remove the supporting plate and take out the 1 mm thin plate	A				●	
14	●		Fix the new 1 mm thin plate (or clean the old one)	B				●	
15	●		Insert the supporting plate	B				●	
16	●		Place a batch of sheets in the feeder	B					●
17	●	●	Insert the upper tool	B			●		

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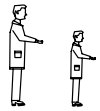

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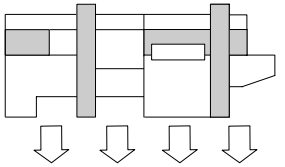

18	●	●	Insert the central board	B			●		
19	●	●	Insert the pin-supporting frame and the pins	B			●		
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									

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Setting up a job

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Introduction

Once the tool change and the size settings have been made, the job can be started up. This consists of carrying out a sequence of operations aimed at obtaining:

- **highest possible production rate**
- **minimum production stoppages**
- **maximum production quality**

Protocol for the first execution of a job

Note

Certain start-up operations are specific to the type of machine used (photocell adjustments) and are therefore described in the relevant operation manuals.

	Element	Action	✎
1 *	*Makeready sheet*	*Imprint*	
2 *	*Creasing counterparts*	*Glue to the 1 mm thin plate*	
3	Cutting force	Setting	
4	Makeready	Gluing of tapes	
5	Sheet traveling control	Photocell adjustments	
6	Cutting, creasing, register	Checks	
7	Number of sheets per batch/pile	Preselection	

***** OPTIONAL

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Protocol for repeat jobs

Note

Certain start-up operations are specific to the type of machine used (photocell adjustments) and are therefore described in the relevant operation manuals.

	Element	Action	✎
1	Cutting force	Setting	
2	Sheet traveling control	Photocell adjustments	
3	Cutting, creasing, register	Checks	
4	Number of sheets per batch/pile	Preselection	

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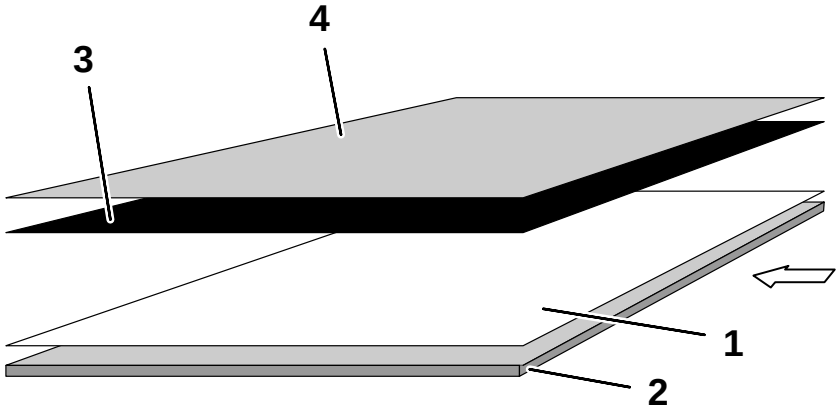
Imprint of the makeready sheet

If the tools are not CAD-designed, an imprint can be made on the machine using the following method:

1. Set the cutting force to 5 - 10 tons.
2. Remove the cutting plate on the guides and clean it with a degreasing agent.
3. Prepare a makeready sheet **1** cut to the size of the cutting plate.
4. Center and align the front of the cutting plate, then secure makeready sheet **1** to cutting plate **2** using adhesive tape.
5. Place carbon paper **3** so that it completely covers the size of the sheet.
6. Cover the entire assembly with solid board **4** (we recommend flat board approx. 250 g/m^2) and secure it with adhesive tape.
7. Insert the cutting plate into the platen press.
8. Run the machine by one cycle, without sheets.
9. Take out the cutting plate.
10. Check whether the imprint left by the cutting rules is sufficiently marked on the whole makeready sheet (if not, repeat the imprint and slightly increase the cutting force).
11. Remove the thin board and the carbon paper.
12. The makeready sheet now contains the imprint of the cutting rules and can be fixed to the bottom plate of the upper chase.

Note

If the imprint has to be made inside the machine, it is important not to place the creasing counterparts on the creasing rules of the cutting die.



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Creasing counterparts

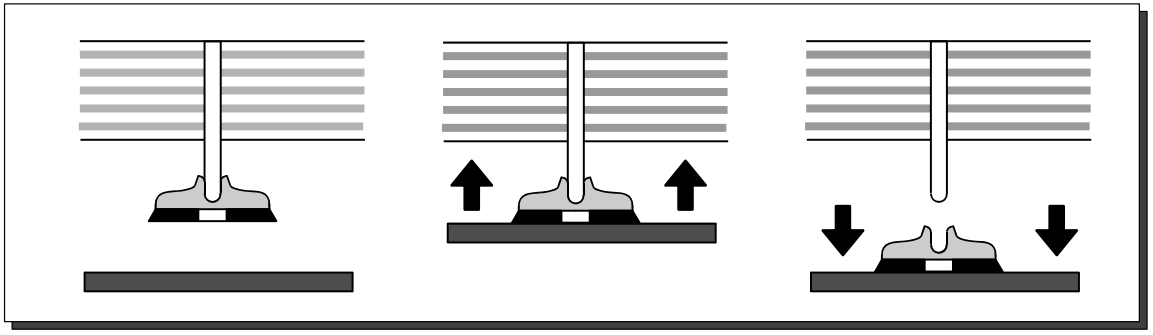
Gluing

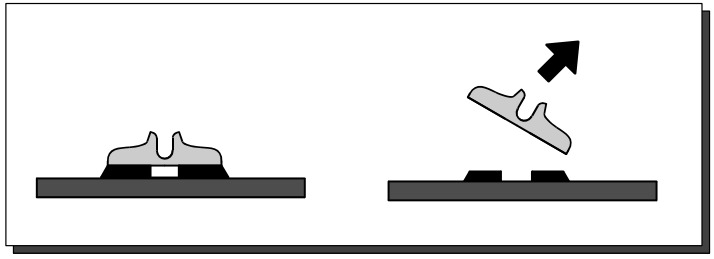
The counterparts can be glued to the 1 mm thin plate or to the cutting plate, in which case they cannot be recovered once the job is completed.

Method

Make sure the counterparts are correctly positioned on the creasing rules and that all protective papers have been removed.

1. Turn the chase over and insert it into the platen press.
2. Extract the cutting plate on its guides and clean it with a degreasing agent.
3. Insert the cutting plate into the platen press.
4. Run the machine by one cycle, without a sheet, then glue the counterparts to the cutting plate (or 1 mm thin plate).
5. Take out the cutting plate.
6. Remove the plastic fixing lips and check that all the counterparts are well glued down.





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Cutting force

Setting the cutting force is very important not only for the quality of the converting but also for the machine's productivity and the service life of the cutting die.

The cutting force should be high enough to cut the board correctly but also as low as possible not to damage the cutting rules.

Rule buckling

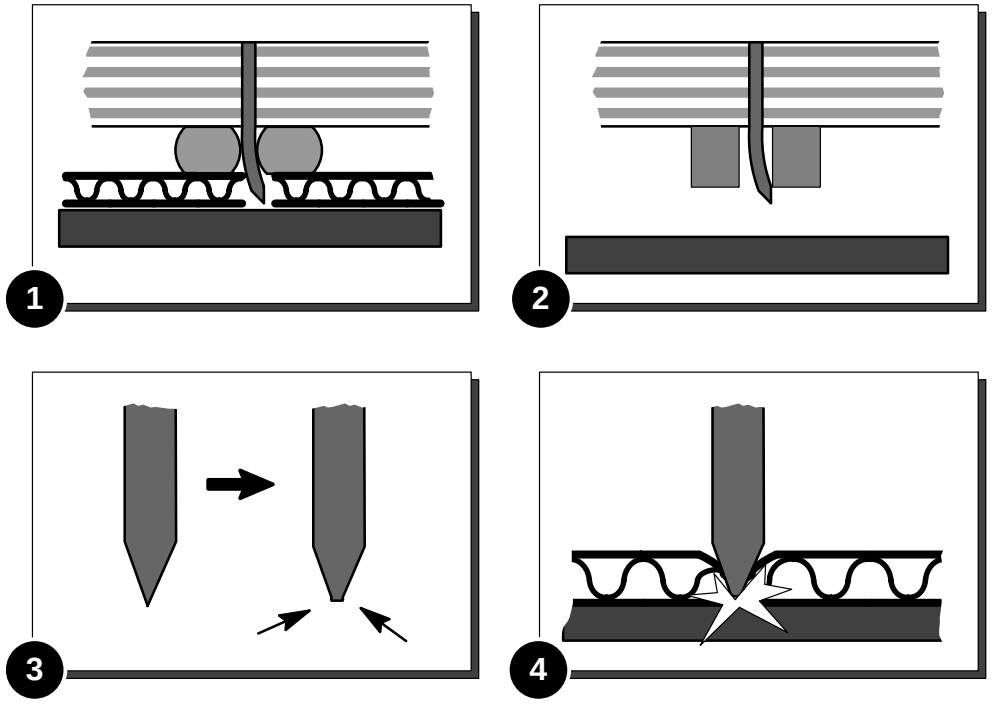
An excessive cutting force causes the cutting rule to buckle (Fig. 1), with the following repercussions:

- permanent deformation of the cutting rule (Fig. 2)
- reduction in cutting accuracy
- faster wear of the cutting rules (Fig. 3)
- bursting of the board due to a blunt rule (Fig. 4)

"Angel hair"

An excessive cutting force causes quicker wear of the cutting rules. The rule's cutting edge becomes flat. Instead of cutting correctly, the rule first crushes the board before causing a shearing effect due to the sharp angles of the flattened section.

The result is a very narrow strip of uncut board, commonly referred to as **"angel hair"**, which often remains dangling from the side of the die.



When the board bursts with the machine running at high speed, the nicks tend to break. This results in many machine stoppages and/or a limited production rate!

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Working with a new cutting die

1. Set the cutting force according to the total length of the cutting die's rules.
2. Diecut a sheet.
3. Gradually increase the cutting force until approx. 2/3 of the rules cut the sheet correctly.
4. Run the machine at an average speed (without sheet) for 2 to 3 minutes.

   Note: This allows the cutting rules to position themselves correctly in the cutting die. If the makeready work is carried out before this operation, it will have to be repeated as the cutting rules will have moved.
   It is therefore preferable to spend a few minutes working on the positioning of the rules rather than lose time later on due to makeready problems.
5. Diecut another sheet.
6. Increase the cutting force by successive trials until 80% of the rules cut the sheet correctly.
7. Move on to the makeready work.

Working with an already used cutting die

If there is a job sheet, set the cutting force according to the data on the sheet. If not, proceed as follows:

1. Set the cutting force according to the total length of the cutting die's rules.
2. Diecut a sheet.

A The makeready has already been carried out on this machine

3. Adjust the cutting force by successive trials until 100% of the rules cut the sheet correctly.
4. Adjust, if necessary, the putting into operation of difference in the board quality.

B The makeready has not been carried out on this machine

5. Adjust the cutting force by successive trials until approx. 80% of the sheet surface is cut.
6. Move on to the makeready work.

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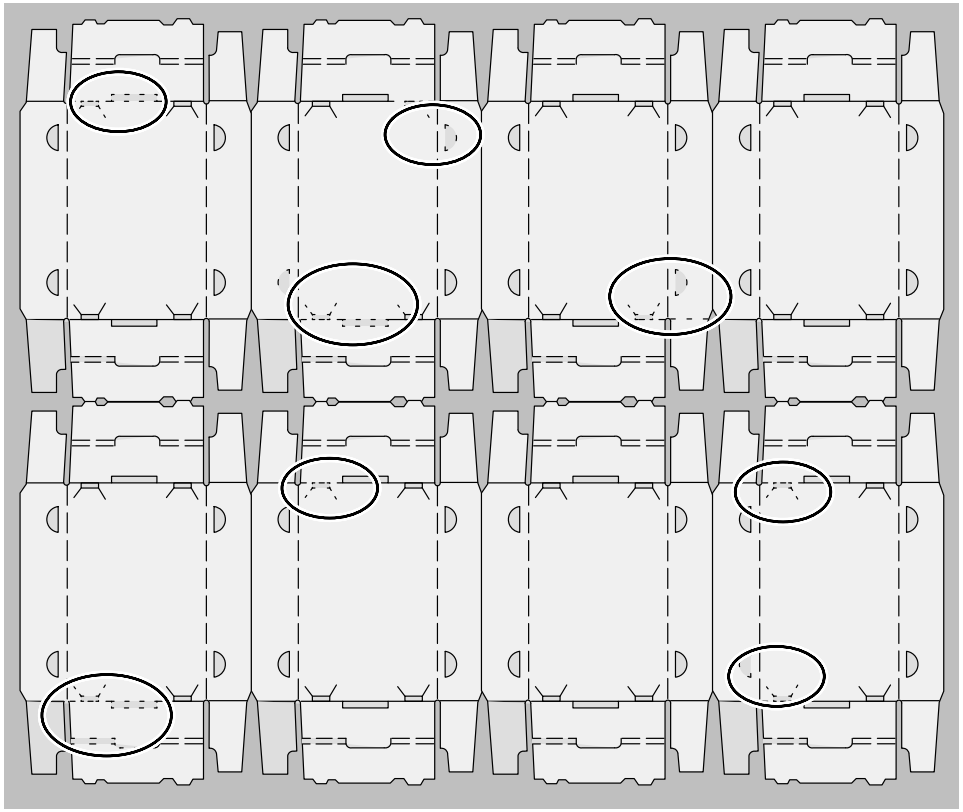
Makeready

The makeready consists of gluing strips of paper to the makeready sheet in the places where cutting weaknesses have appeared.



D1528

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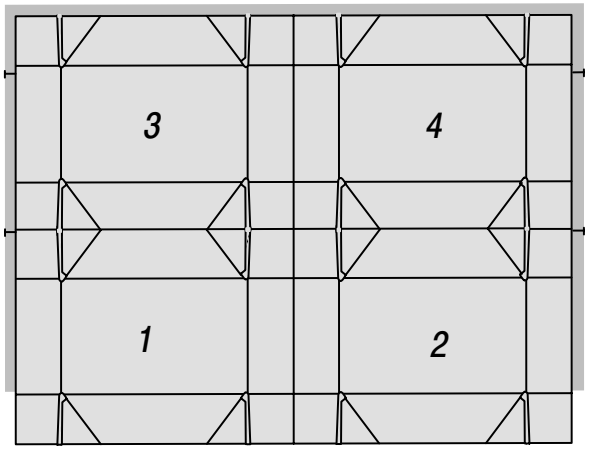
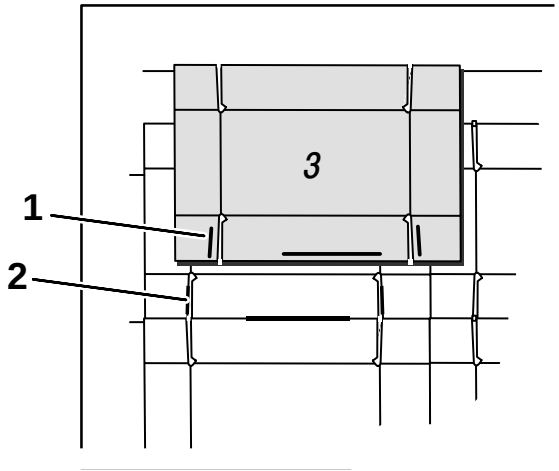
Gluing the paper strips

1. Diecut a sheet in inching mode, leaving the upper stripping frame in the raised position.
2. Stop the sheet inside the stripping station.
3. Detach the sheet and number the blanks (Fig. 1).
4. Separate the blanks from one another as well as the waste.
5. Make a note on the blank of the badly cut areas **1** that require a makeready.
6. On the makeready sheet (Fig. 2), glue strips **2** on the lines corresponding to the places previously marked.



1



2

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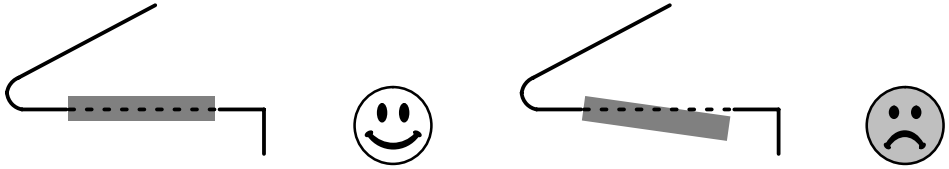
Makeready strip

The use of a non-compressible makeready strip between **0.03** and **0.1 mm** is recommended.

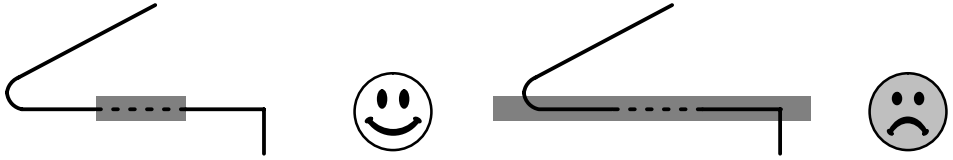
The use of transparent scotch tape **is not** advisable.

Rules to be observed

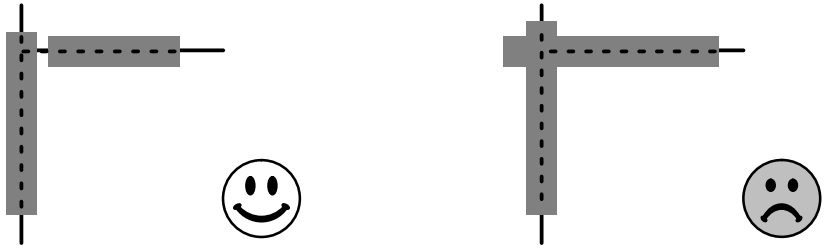
Always center the makeready strip in relation to the cutting line.



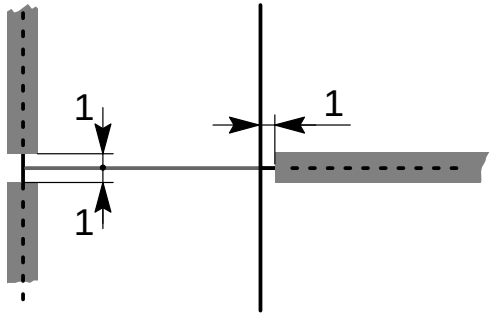
The length of the makeready strip must be identical to the badly cut section.



Never superimpose two makeready strips (double thickness).



Do not glue any strips less than **1 mm** from a creasing rule to prevent any increase in the creasing force (risk of bursting the crease).



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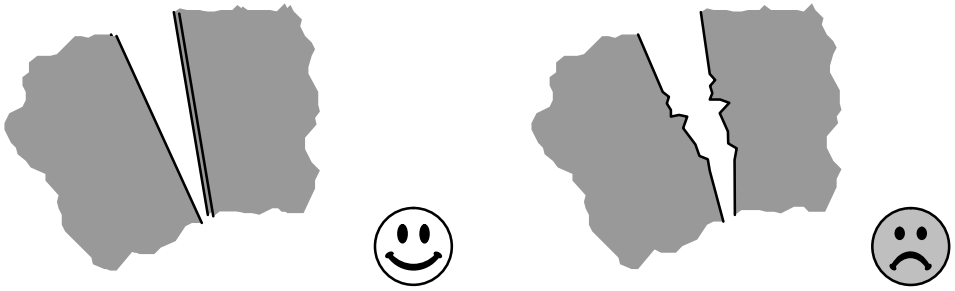
Checks

Diecutting

Sample a sheet from the stripping station and check the cutting quality on all the cut lines (back of the sheet), particularly the front edge of the sheet.

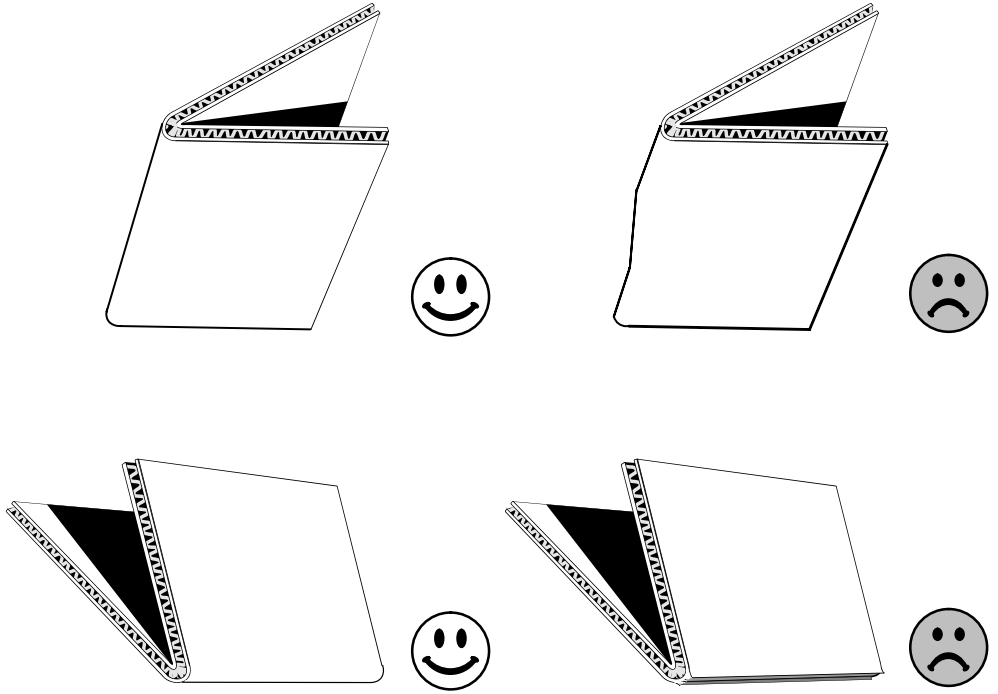
Remove the blanks and waste. **There should not be any tearing in the board.**



Creasing

Fold each crease on each blank by hand to **check that the fold is perfectly straight**, especially in the direction of the flutes since the creasing can be affected by a jump in flute.

Fold each crease on each blank by hand to **check that 180 degree folds can be made without problem**. The outer layer of the board should not tear.



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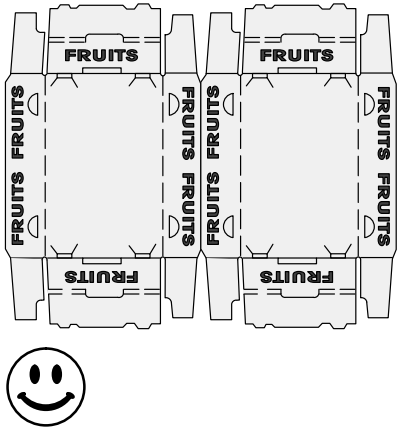
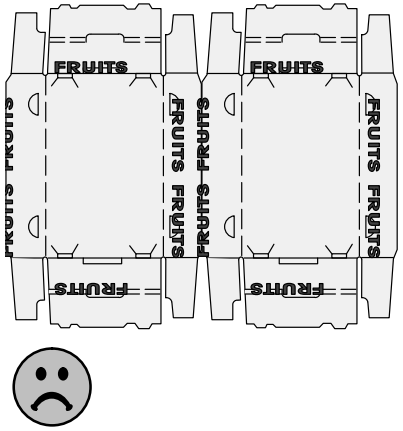
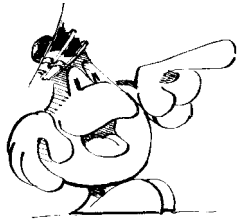
Print-to-cut register

Check the precision of the register between the print and the cut.



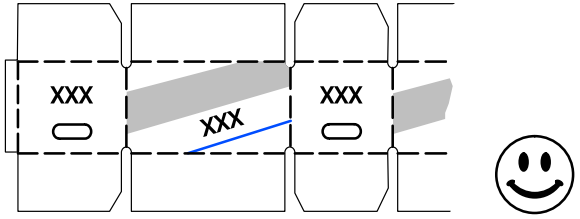


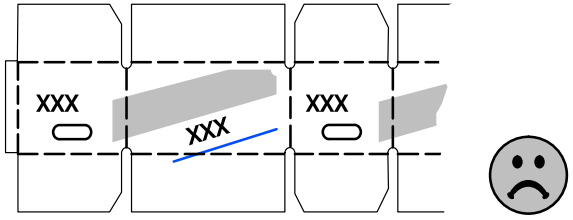


If necessary, correct any register faults by adjusting the gripper margin or the lateral guides of the SPO AUTOPLATEN® press. In an ON-LINE configuration, you can intervene directly on the FLEXO printer.

Print-to-crease register

Check the precision of the register between the print and the creases.





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Production

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Introduction

While a job is being produced, the tasks of the operator(s) are as follows:

- **Obtaining the highest possible production rate with a minimum of stoppages**
- **Maintaining the required quality level**
- **Preparing the next change of job**
- **Logging the setting data of the current job**

High production rate and minimum stoppages

The operator can intervene at the level of the nicks, of the quality of the rubber, the machine settings and the condition of the converting tools.

Nicks

Nicks are of capital importance for the machine's productivity and the quality of the products. Their number and size must be kept to a minimum to guarantee the quality of the blanks but sufficient to obtain a high production rate.

The basic nicks are made by the diemaker. However, their resistance depends to a large extent on the quality and humidity of the converted board. That's why the operator sometimes has to add nicks during production.

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Quality

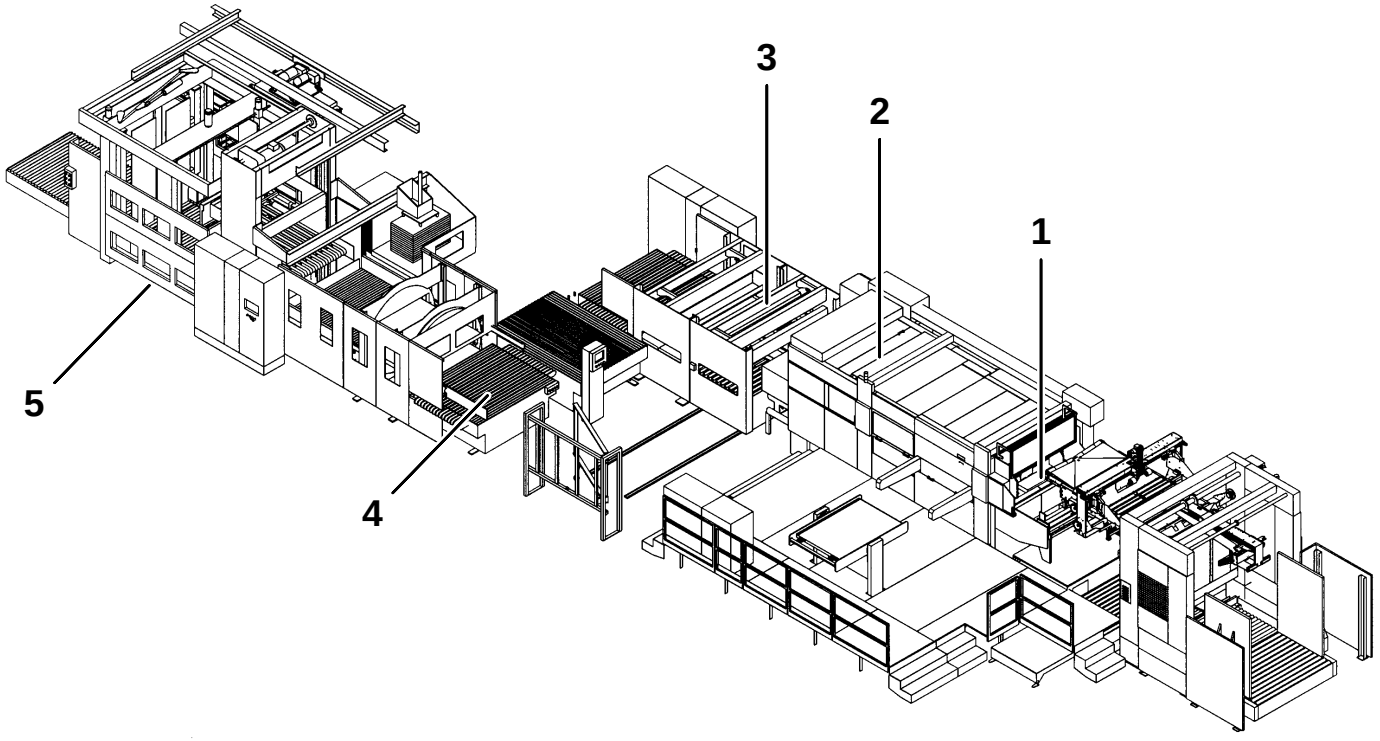
The operator must regularly check the quality of the cut, the creasings and the register. A quality control body must check production in statistical terms.

Visual sheet check

Check the flatness of the sheets to be converted and set feeder **1** accordingly before a machine stop occurs.

Checking the batches or piles

Check the shape and arrangement of the batches or piles of blanks at the delivery **2.** Good batch and/or pile quality facilitates the separation of the blanks in the blank separator **3**. Check the quality of the diecutting on the check table **4** before their palletizing **5**.



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Blank separating tools (SPO 160-ER MATIC)

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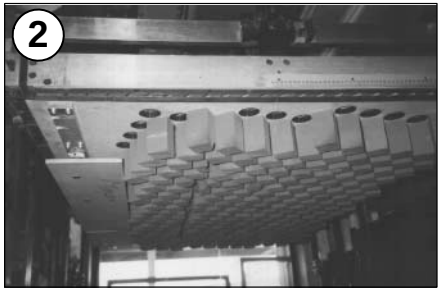
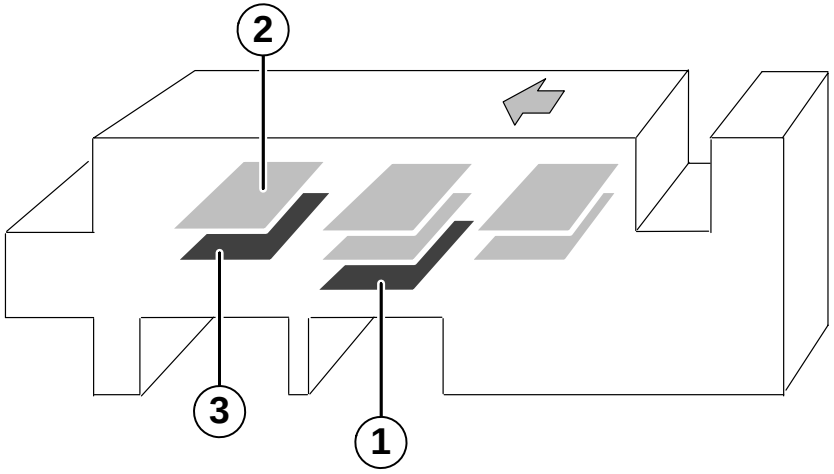
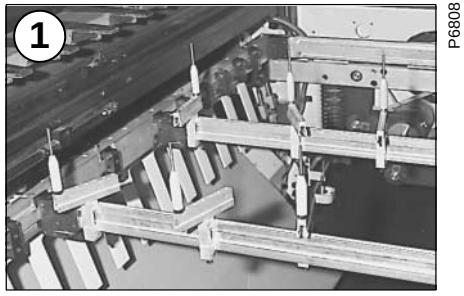
Description of the converting tools (SPO -ER)



Upper universal blanking tool



Lower universal blanking tool



Lower stripping pins

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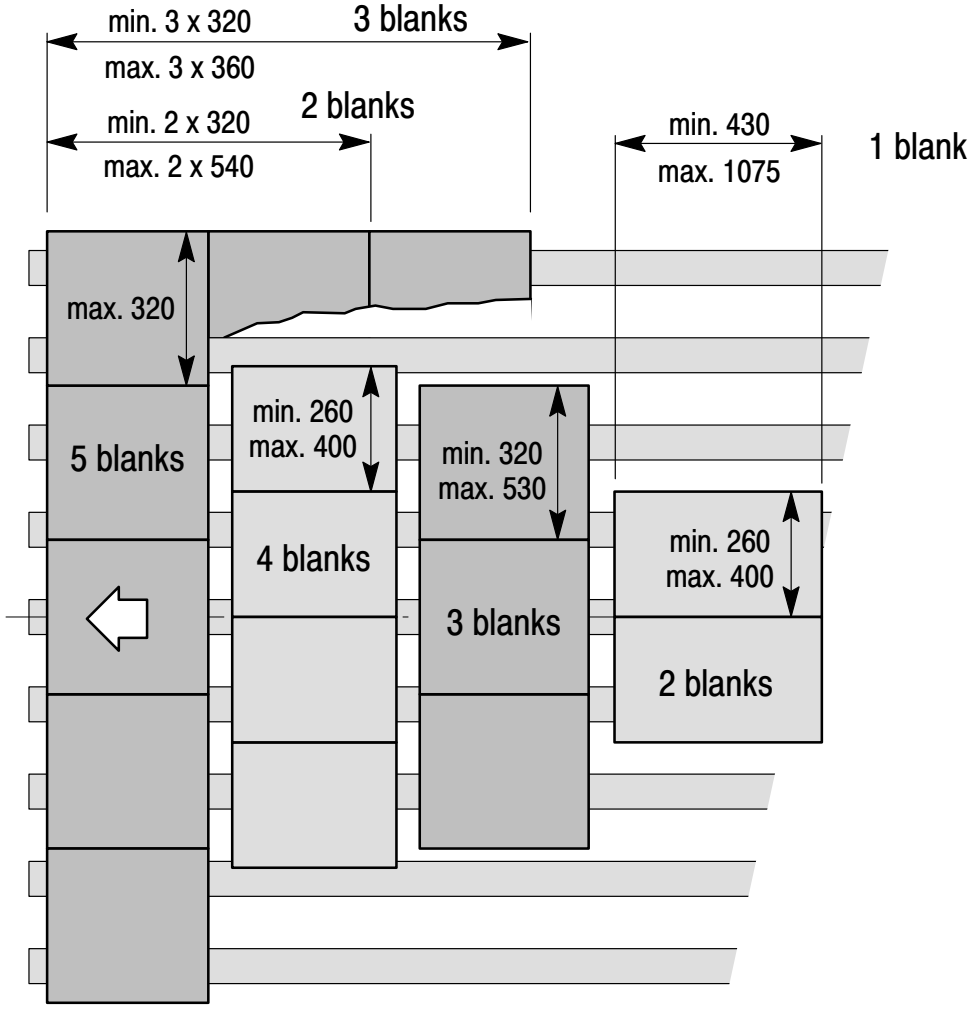
Minimum blank sizes for separation

Blanks placed side by side

Minimum and maximum dimensions for **n** number of blanks:



Blank separating tools (SPO 160-ER MATIC)

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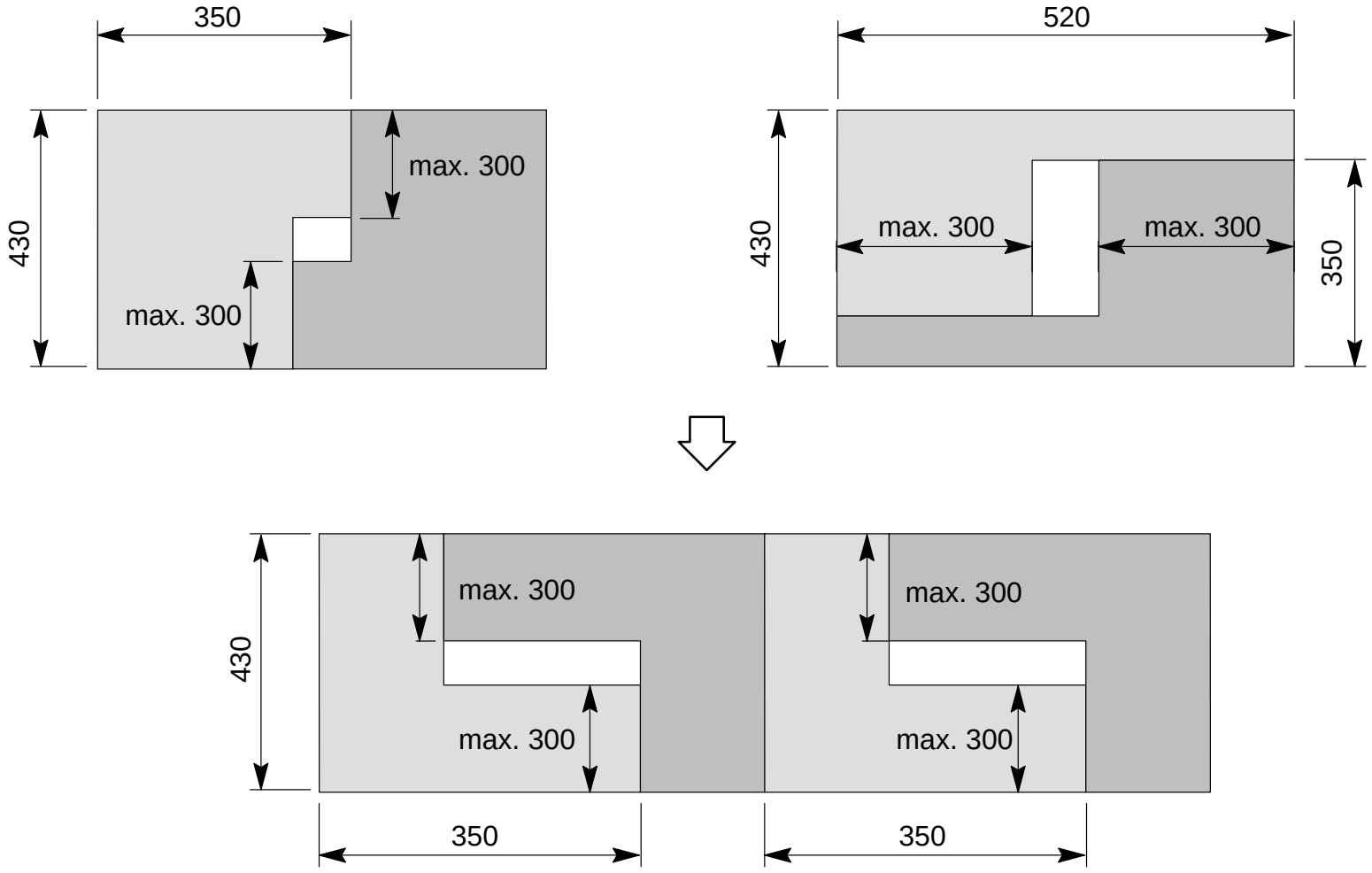
Interlaced blanks



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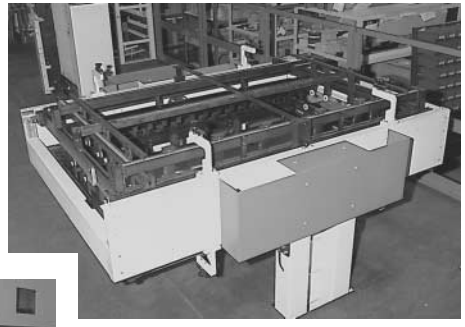
Universal tools

These types of tools are not manufactured specially for each job. They are **prepared before the change of job** and are therefore not stored for possible reuse.

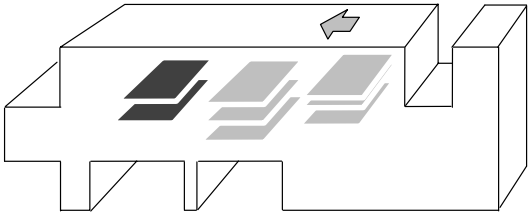
Lower universal blanking tool

The lower blanking tool consists of a frame and adjustable metal bars. The position and choice of these bars depend on the number, position and shape of the blanks.



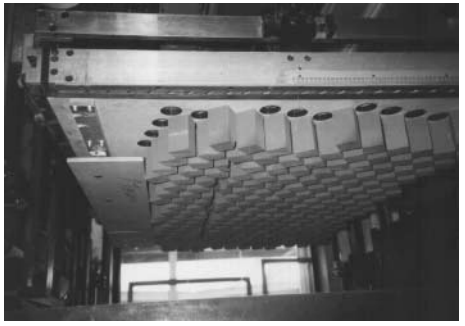
P3385

P3380

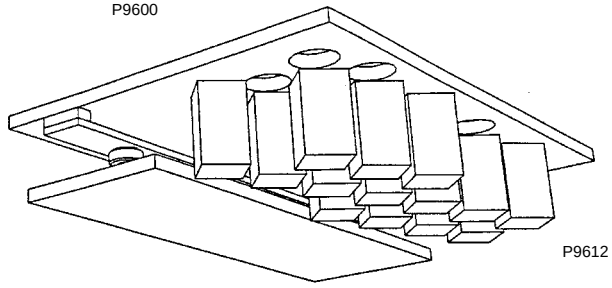


Upper universal blanking tool

The upper universal blanking tool consists of a wooden board with apertures under which blocks of hard synthetic foam are secured.



P9600



P9612

Blank separating tools (SPO 160-ER MATIC)

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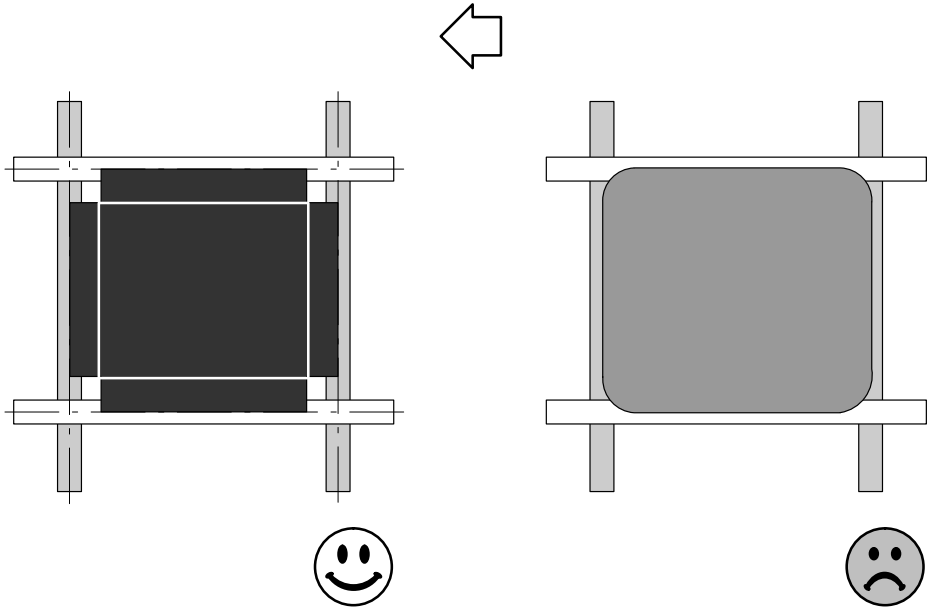
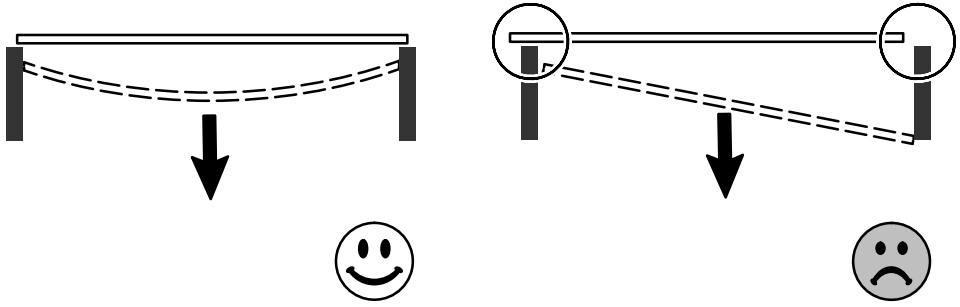
Lower tool

Rules to be observed

For jobs processed in single-cut, the blanks must be capable of being bent simultaneously in both directions without causing any folding or initial cracking.



Every blank has to be supported on both sides to drop straight.



Blank separating tools (SPO 160-ER MATIC)

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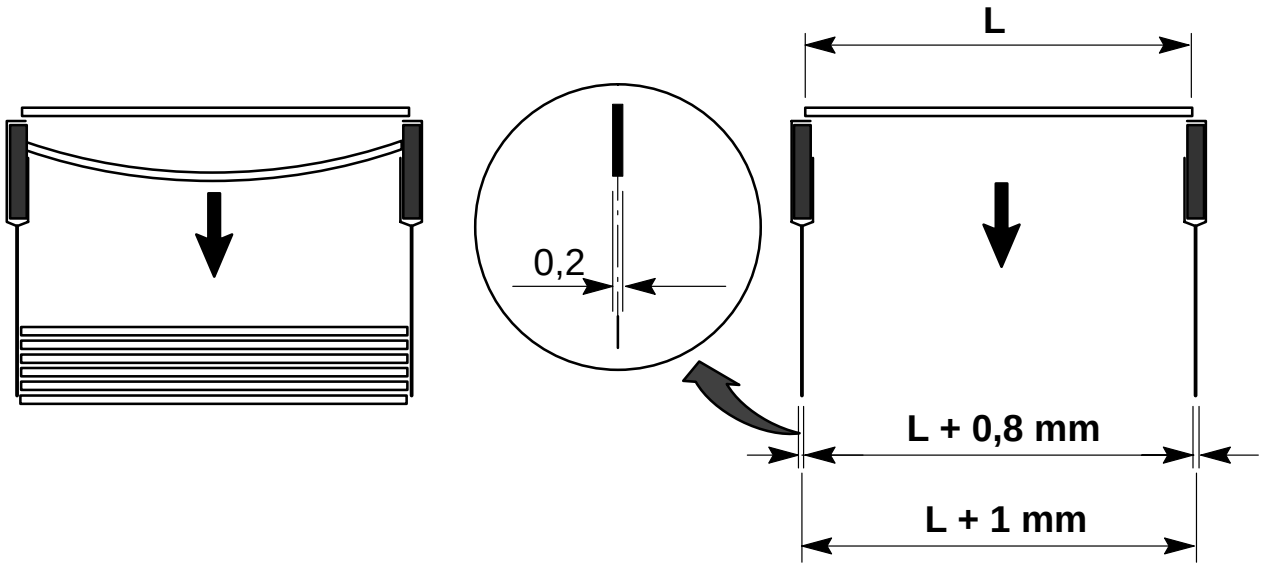
The grid bars are provided with steel blades which will provide correct guiding of the blanks when dropping onto the pile.

After piling, all blanks are separated from one another by the 0.2 mm blade. This distance is to be increased by a clearance of **0.8 mm** to ensure correct dropping. Consequently, every blank will require a cumulative clearance of **1 mm** between the blades.



Blank separating tools (SPO 160-ER MATIC)

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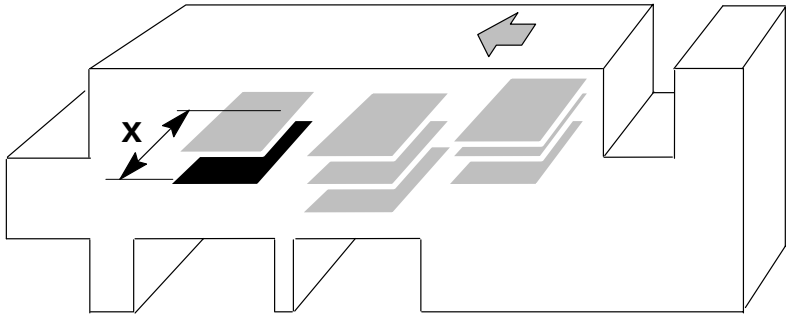
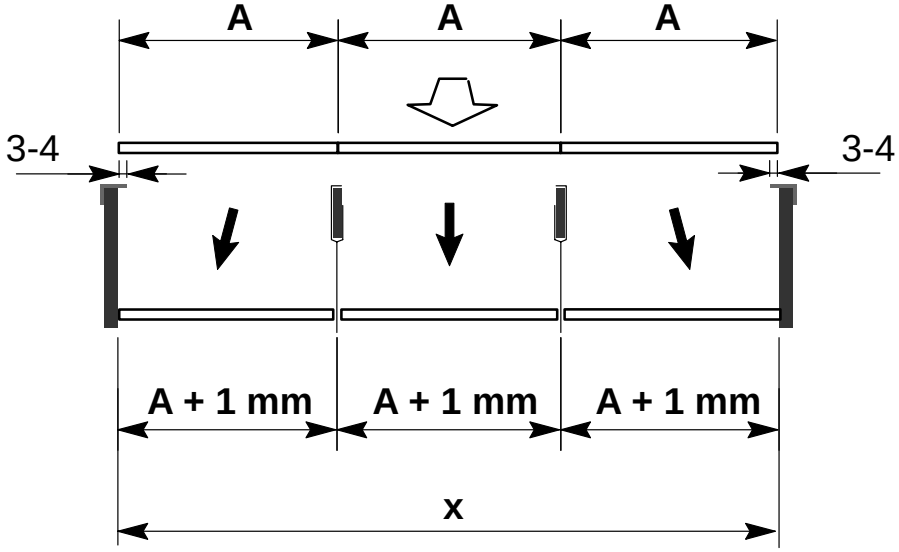
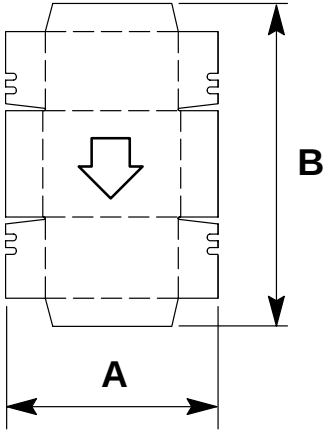
Setting in transverse direction x

The clearance of **1 mm** for each blank is to be multiplied by the number of blanks and will thus determine the distance between the jogger guides of the tool frame. The outer frame has the dimension **x**, i.e. the total width of all blanks plus the total of all clearances.

The lateral support below the blank should be **3 - 4 mm**.







Blank separating tools (SPO 160-ER MATIC)

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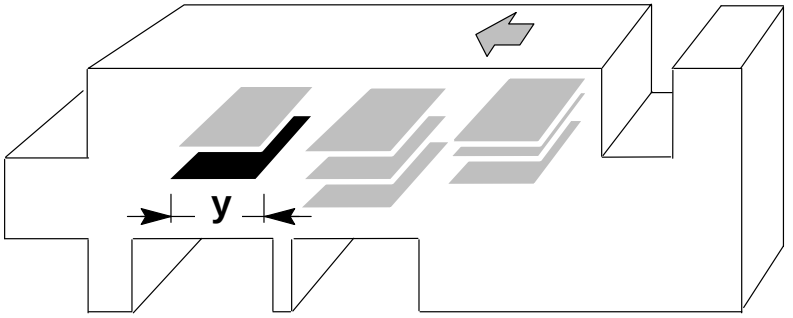
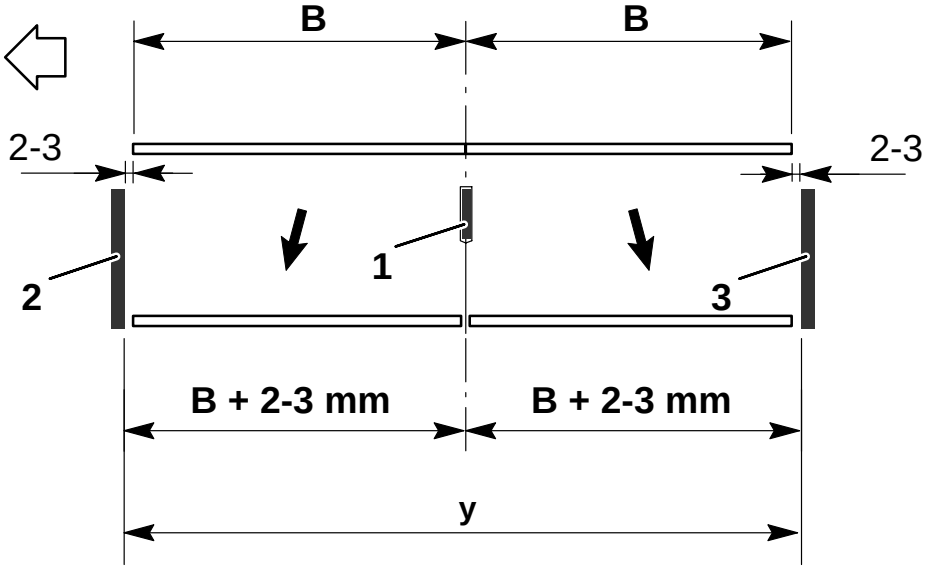
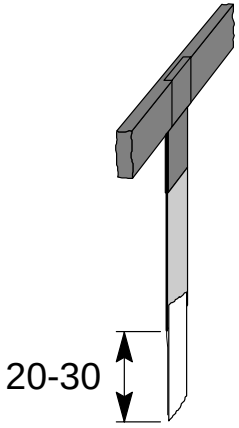
Setting in running direction y

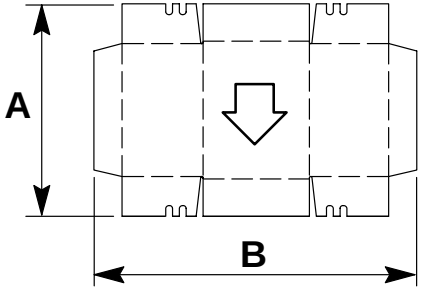
The separating blades have to be as thin as possible and should be extended by **20 to 30 mm** with adhesive tape to prevent the first blanks in the batch from overlapping.

The transverse bar **1** has to be centered under the cutting line. The front and rear jogger guides **2** and **3** must be spread to allow a gap of **2 to 3 mm**.









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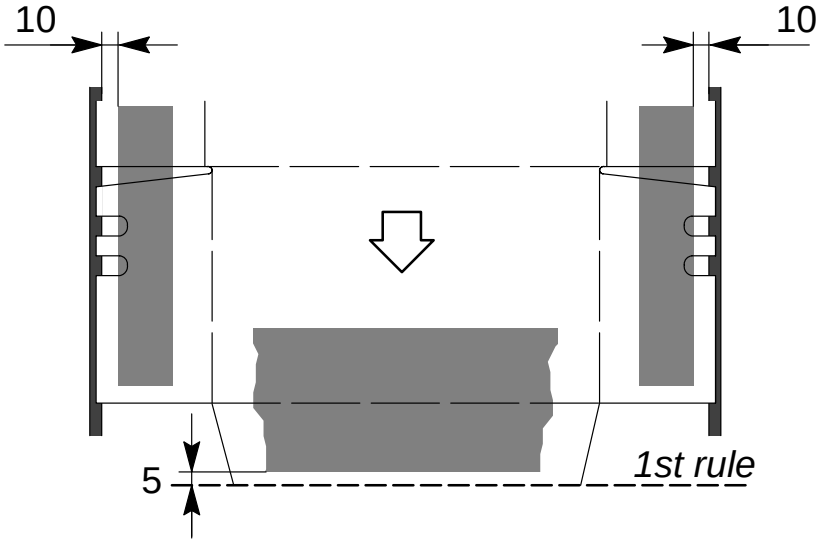
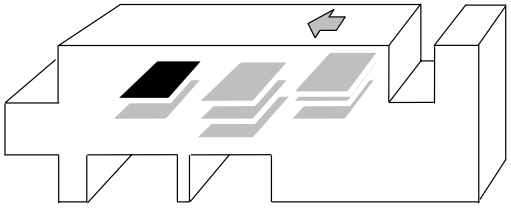
Upper tool

General rule

The blocks are positioned at a distance of **approx. 10 mm** from the bars of the lower tool. For the front part of the blank, reduce the distance to **5 mm** from the first rule.

At the level of the transverse separating bar, the blocks must be positioned in the machine running direction. For the front part of the blank, it is preferable to use a wooden separating board as upper tool.





Blank separating tools (SPO 160-ER MATIC)

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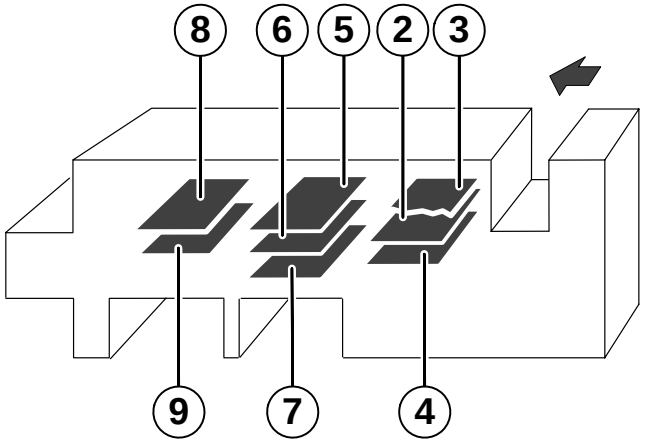
Preparing a job change



***** *non-Centerline tools*

	Element	Action	✎
1	MATIC system	Enter data (new job only)	
2	Cutting die	Placing on chase	
3	Makeready sheet	Fixing	
4	Creasing counterparts	Placing of counterparts on creasing rules	
5 *	Upper stripping tool	Fixing front clamping bar	
6	Central stripping board	Fixing of Centerline II elements	
7	Stripping pins	Positioning and fixing	
8	Upper blanking tool	Positioning of blocks	
9	Lower blanking tool	Positioning of crossbars	
10	Job sheet - Piles - Pallets	Checks	

Blank separating tools (SPO 160-ER MATIC)

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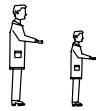
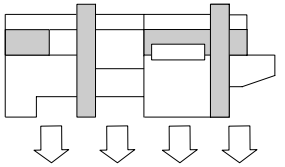
Changing tools and setting to size



A = old job
B = new job
☆ = operation carried out inside the machine



1	●		Stop the machine, gripper bar in the middle of the stations	A			●	●	
2		●	Check the evacuation of the last pile	A		●			
3	●		Raise the upper frame	A			●		
4	●		Raise the upper frame	A		●			
5	●	●	Remove the upper tool	A			●		
6	●	●	Remove the central board	A			●		
7	●	●	Remove the pin-supporting frame and the pins	A			●		
8	●	●	Remove the upper tool	A		●			
9	●		Call up or enter the job data in the MATIC system	B				●	
10		●	Put away the old tools and tidy up	A		●	●	●	●
11	●		Take out the chase	A				●	
12	●		Insert the new chase	B				●	
13		●	Take out the lower tool and turn it over	A		●			
14		●	Insert the lower tool	B		●			
15		●	Position the sheet supporting apron	B		●			
16	●		Remove the supporting plate and take out the 1 mm thin plate	A				●	
17	●		Fix the new 1 mm thin plate (or clean the old one)	B				●	

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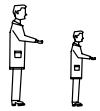
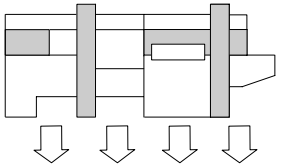


A = old job
B = new job
☆ = operation carried out inside the machine



18		●	Fill the inserter	B		●			
19		●	Feed the first pallet into the stacker	B		●			
20	●	●	Insert and lock the upper tool	B			●		
21	●	●	Insert and lock the central board	B			●		
22	●	●	Position the sheet supporting apron	B			●		
23	●	●	Place the pins and insert the pin-supporting frame	B			●		
24	●	●	Insert and lock the upper tool	B		●			
25									
26									
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Problems and solutions

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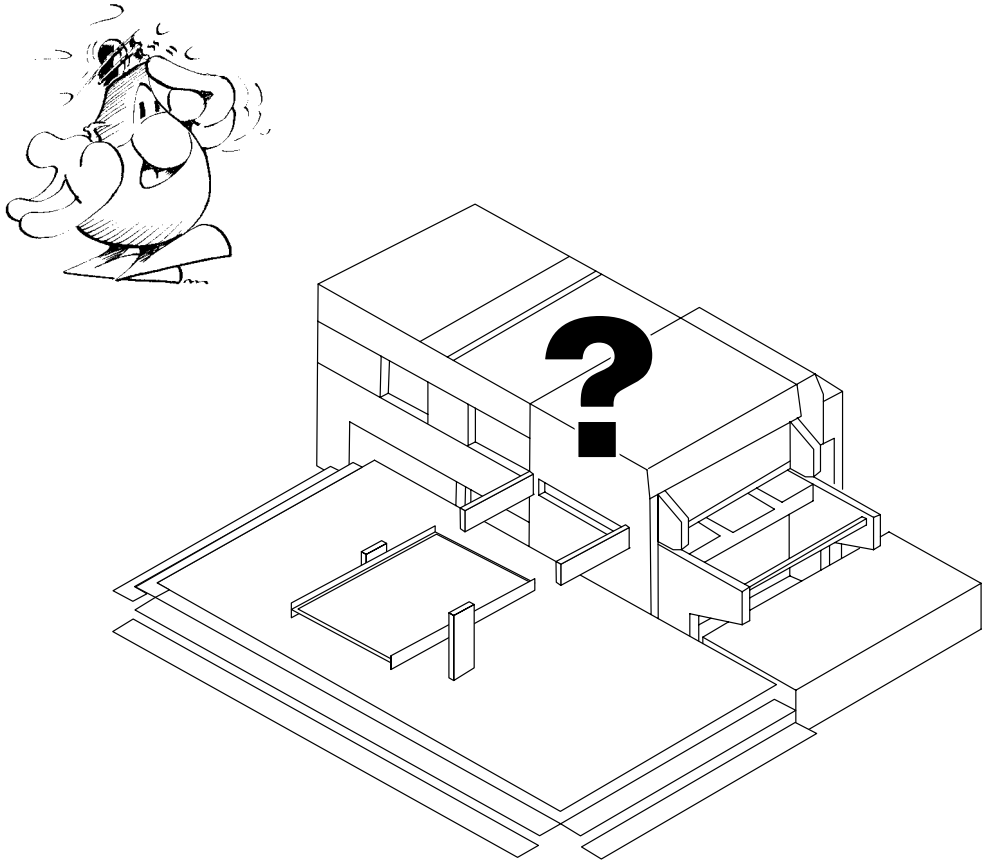
Foreword

This Section analyzes a few problems which the operator of an AUTOPLATEN® press may encounter during production. Each problem mentioned is illustrated and provided with a list of possible causes as well as the solutions needed to remedy the problem.

The competence level for the interventions is indicated by the following numbers:

1. operator
2. design and manufacture
3. organization
4. customer maintenance



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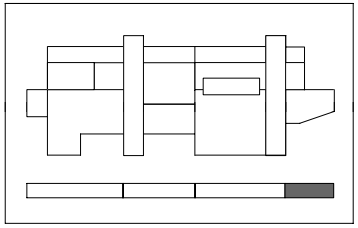
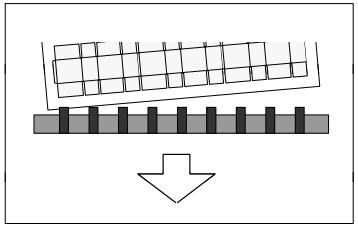
Feeder

Problem	Possible cause	Solution
Incorrect sheet departure  	❍ Infeed gauge incorrectly set.	[1] Set gauge to leave a clearance corresponding to 1/3 of board thickness.
	❍ Feeder overloaded.	[1] Reduce height of sheet pile.
	❍ Sheets stuck to one another.	[1] Check sheet manufacture and board storage.
	❍ Sheets too warped.	[3] Check manufacturing process of board sheets. [3] Check storage of board sheets. [1] Increase contact force of pressing device.
	❍ Rear sheet supports too high or too low.	[1] Position rear supports so that sheet is as flat as possible on the suction plate.
	❍ Lateral guides and/or rear supports too tight.	[1] Adjust feeder so that sheets have a lateral clearance of approx. 1 mm. [1] Adjust a sufficient lengthwise clearance so that the sheets can come down freely onto the support rollers and the oblique backstop.

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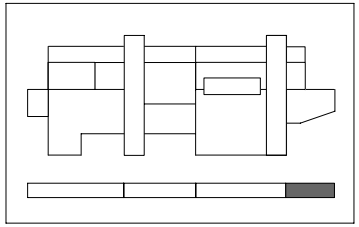
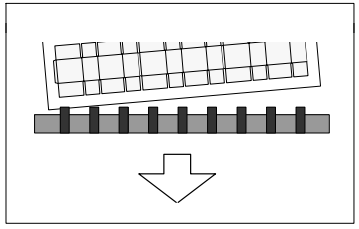
Problem	Possible cause	Solution
Incorrect sheet departure (cont'd)  	❍ Incorrect sheet load on the oblique backstop.	[1] Adjust height of support rollers.
	❍ Insufficient suction plate vacuum.	[1] Increase vacuum on vacuum pump. [4] Clean suction plate, filters and distributors. [4] Check hose tightness. [4] Check condition of suction cups on suction plate.
	❍ Lateral tablets incorrectly positioned.	[1] (Possible according to version) Adjust height of lateral tablets according to board deformation.

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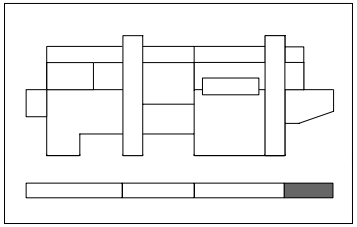
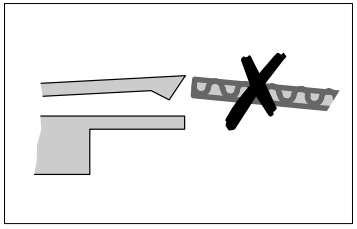
Problem	Possible cause	Solution
Incorrect sheet infeed into grippers  	❍ Height of suction plate and lateral tablets does not correspond to that of gripper counterplates.	[1] Check general condition of gripper bars (wear, deformation). [4] Check height and level of suction plate in relation to gripper counterplates. [4] Check os and oos guiding of gripper bars. [4] Check support rollers and gripper bar stops. [4] Check os and oos guiding of gripper bars.
	❍ Grippers damaged, bent or missing.	[4] Check condition of grippers on each gripper bar.
	❍ Gripper opening misadjusted.	[4] Check gripper opening on each gripper bar and adjust if necessary. [4] Check gripper opener control (rollers, pushers). [4] Check control of support rollers of gripper bars. [4] Check tightness and synchronization of gripper opener control chain.

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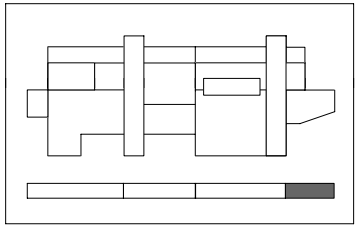
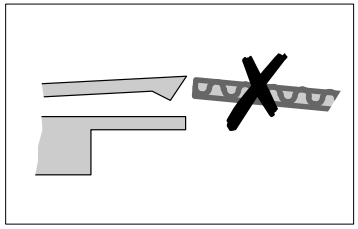
Problem	Possible cause	Solution
Incorrect sheet infeed into grippers (cont'd)  	❍ Travel of suction plate carriage misadjusted.	4 Concerns machines without Power Register. Adjust carriage travel so that suction plate stops 5 mm from gripper counterplates.
	❍ Vibrations disrupt suction plate movement.	4 Check condition of guidings of suction plate carriage (rollers and guides). 4 Check condition of suction plate control. 4 Check tension setting of flexible washers in the suction plate control.

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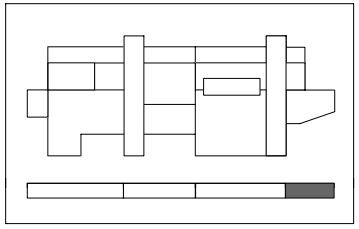
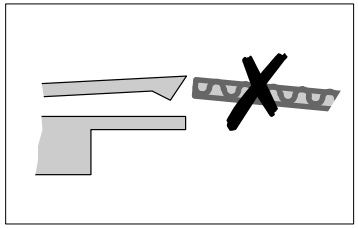
Problem	Possible cause	Solution
Incorrect sheet infeed into grippers (cont'd)  	❍ Air distribution malfunction.	4 Check synchronization and condition of control cams in air distribution unit. 4 Check condition and setting of control levers of air distribution unit. 4 Check operation of pistons in air distribution unit. 4 Clean air distribution unit.
	❍ Vacuum pump malfunction.	4 Check operation of vacuum pump. 4 Check filter cleanness and clean (replace) if necessary. 4 Check tightness of supply hoses to suction plate.

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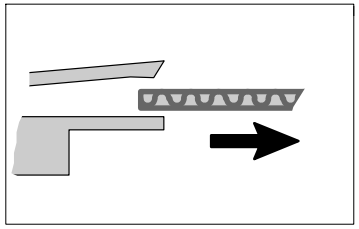
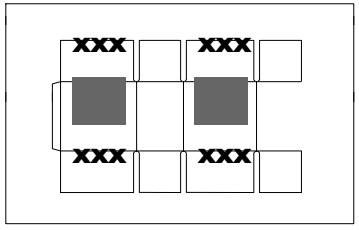
Problem	Possible cause	Solution
Sheets slip inside grippers 	❍ Grippers and gripper counter-plates worn.	[4] Check wear on grippers and gripper counter-plates and replace if necessary.
	❍ Height of suction plate and lateral guides does not correspond to that of gripper counter-plates.	☞ See previous page.
Incorrect sheet register 	❍ Unequal sheet length.	[1] Check sheet length and change board where necessary.
	❍ Sheets not square.	[1] Change board.
	❍ Sheets excessively warped.	☞ See previous page.
	❍ Vibrations when gripper bars stopped.	[4] Check general condition of clutch of gripper bar chains. [4] Check tightness of screws on driver of clutch of gripper bar chains.

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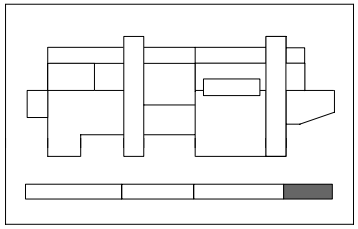
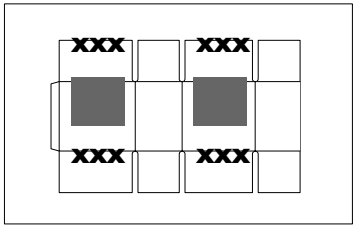
Problem	Possible cause	Solution
Incorrect sheet register (cont'd)  	❍ Vibrations when gripper bars stopped (cont'd).	4 Check tightness of gripper bar chains. 4 Check unobstructed passage of gripper bar chains. ✆ BOBST Technical Assistance.
	❍ Wear of gripper bar chains.	4 Check elongation of gripper bar chains and correct if necessary. 4 Check condition of gripper bars. ☞ Incorrect sheet infeed into grippers. ☞ Incorrect sheet departure.

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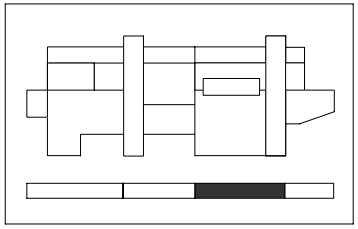
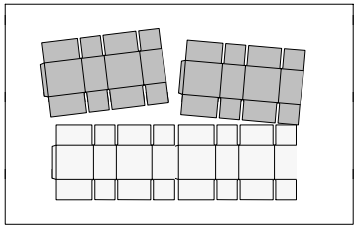
Platen press

Problem	Possible cause	Solution
Sheet separates inside platen press  	❍ Non-conforming cutting die.	☞ Check cutting die in detail: ☞ Rubbers (layout, size and quality). ☞ Cutting rules (condition, wear and fastening). ☞ Creasing rules (condition and fastening). ☞ Nicks (quantity, size and location).
	❍ Die shifting inside chase.	[1] Check fixing and locking of die inside chase.
	❍ Cutting force too high.	[1] Reduce cutting force.
	❍ Blanks staying glued to counterparts.	[1] Check condition and dimension of counter-parts in relation to creasing rules and board thickness. [1] Coat counterparts with talcum.

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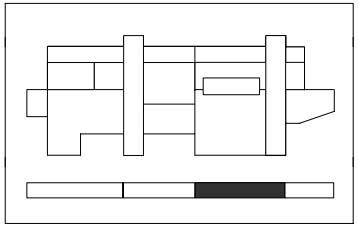
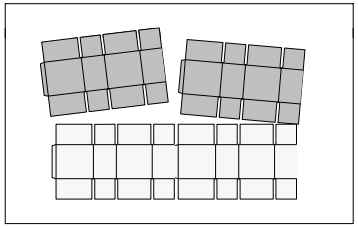
Problem	Possible cause	Solution
Sheet separates inside platen press (cont'd)  	❍ Sheet catching counterparts during conveying.	1 Use chamfered counterparts by preference or add chamfers. 1 Glue adhesive paper (adhesive tape) to facilitate sheet passage.
	Technical troubles: ❍ Vibrations when gripper bars stopped.	☞ Incorrect sheet register.
	❍ Height of gripper bar at platen press outlet does not correspond to that of movable platen.	4 Check height and adjust gripper bar supports if necessary.

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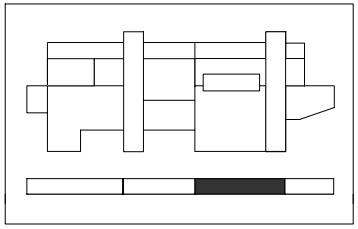
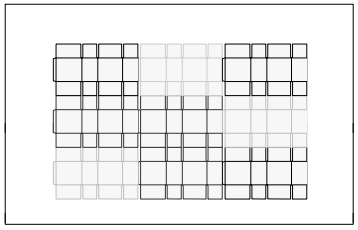
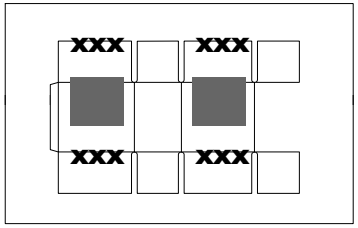
Problem	Possible cause	Solution
Irregular sheet cutting or insufficient register   	❍ Absence of compensating rules when working with a small cutting size.	☞ Add compensating rules in the cutting die.
	❍ Cutting equipment in poor condition.	1 Carefully check condition of following equipment: ● chase for cutting die ● cutting plate (or thin plate) ● supporting plate
	❍ Surface of platens in bad condition.	1 Check surface condition of movable platen and upper platen. Clean and service if necessary.
	❍ Die incorrectly tightened inside chase.	1 Check fixing and locking of die inside chase.
	❍ General wear and tear of cutting die (shifting rules).	3 Manufacture a new die.
	❍ Cutting rules of different quality and/or height.	1 Check quality and dimensions of cutting rules used.

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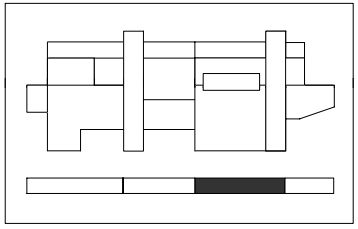
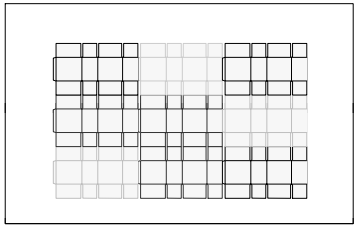
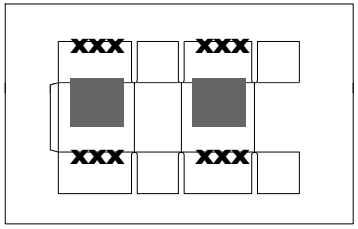
Problem	Possible cause	Solution
Irregular sheet cutting or insufficient register (cont'd)   	❍ Makeready sheet or material of poor quality.	[1] Check quality of material used for make-ready.
	❍ Back of cutting rules and creasing rules not clean.	[1] Check and clean back of cutting rules and creasing rules.
	❍ Fluctuation in board humidity.	[1] Leave board to rest or intervene in storage conditions.
	<u>Technical troubles</u>: ❍ Vibrations when gripper bars stopped.	☞ Incorrect sheet register.
	❍ Wear of gripper bar chains.	☞ Incorrect sheet register.
	❍ Lateral locking of gripper bars.	[4] Check wear of guidings os and oos and adjust support if necessary.

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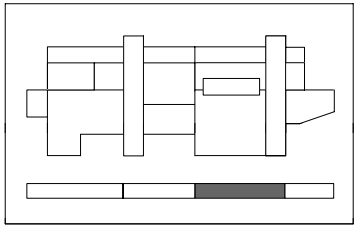
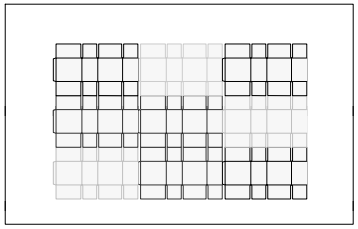
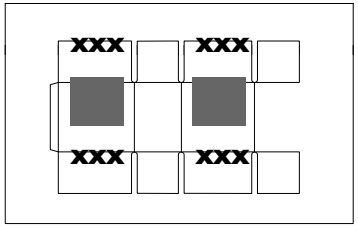
Problem	Possible cause	Solution
Irregular sheet cutting or insufficient register (cont'd)   	Technical troubles: (cont'd)	
	❍ Centerings of chase and supporting plate broken or loose.	1 Check condition or tightness of centerings os and oos.
	❍ Locking of chase and supporting plate incorrectly executed.	1 Check condition and setting of locking.
	❍ Control chain for cutting force is slack.	1 Retighten control chain.
	❍ Level or parallelism of movable platen incorrect.	✆ BOBST Technical Assistance.
	❍ Lateral guiding of movable platen incorrect.	✆ BOBST Technical Assistance.
	❍ Toggle levers out of position.	✆ BOBST Technical Assistance.
	❍ Mechanical parts are worn, cracked or broken (frame, machine base, platen, crankshaft, toggle levers).	✆ BOBST Technical Assistance.

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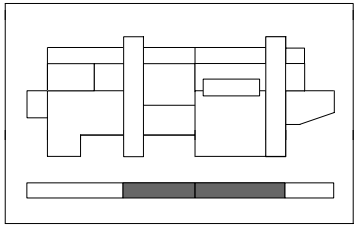
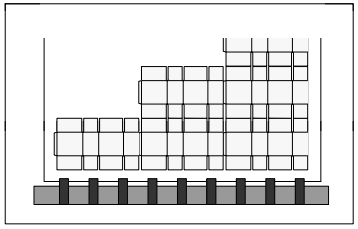
Problem	Possible cause	Solution
Incorrect sheet transport  	❍ Distance between supporting apron and central stripping board too great.	1 Bring supporting apron to within approx. 100 mm of rear board section.
	❍ Damaged supporting apron.	4 Replace apron.
	❍ Level of central stripping board not the same as that of supporting apron.	4 Check and align if necessary.
	❍ Central stripping board non-conforming.	☞ Check characteristics of central stripping board.
	❍ Nicks not adapted to machine operating conditions.	☞ Check rules for manufacturing nicks (quantity, size and location).
	❍ Waste attachment insufficient for machine operating conditions	☞ Check rules for manufacturing nicks (waste attachment).

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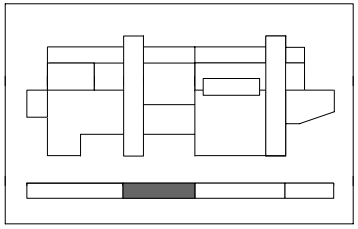
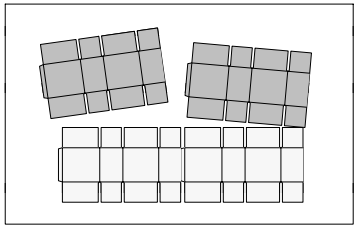
Problem	Possible cause	Solution
Sheet separates inside stripping station  	❍ Bad sheet cutting.	1 Check makeready sheet and correct if necessary.
	❍ Upper stripping tool non-conforming or insufficiently precise.	☞ Check characteristics for upper stripping tool.
	❍ Central stripping board non-conforming or insufficiently precise.	☞ Check characteristics for central stripping board.
	❍ Stripping not adapted to machine operating conditions.	3 Analyze imposition and correct where necessary.
	❍ Stripping tools incorrectly positioned in relation to the cut.	1 Check basic settings of positioning system used (EASYSET, Centerline I or II).
	❍ Upper stripping tool damaged.	1 Repair or replace if necessary.
	❍ Upper stripping tool vibrating and incorrectly fastened.	1 Add two to four fastening clamps.
	❍ Central stripping board damaged.	1 Repair or replace if necessary.
	❍ Central stripping board insufficiently stiff.	1 Add cross-pieces or aluminum profiles to stiffen it.
	❍ Central stripping board incorrectly fastened.	1 Increase number of fastening points for the board.

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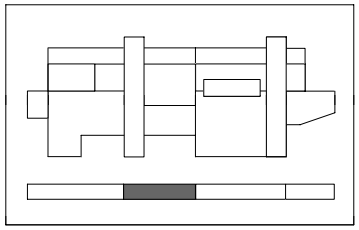
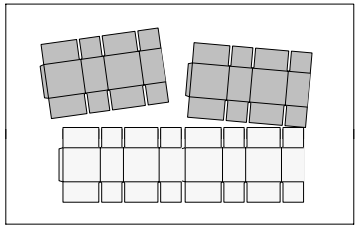
Problem	Possible cause	Solution
Sheet separates inside stripping station (cont'd)  	Technical troubles:	
	❍ Wear of gripper bar chains.	4 Check elongation of gripper bar chains and correct position of stripping tools.
	❍ Crossover between stripping tools insufficient.	4 Check mechanical elements of lower frame control (pull rods and bearings).
	❍ Excessive amount of play in locking of upper stripping frame.	4 Check upper frame locking elements and adjust if necessary.
	❍ Level of central stripping board does not correspond with that of gripper counterplates.	1 Set board to correct height.
	❍ Excessive lateral and longitudinal play in lower stripping board.	4 Check guides and lifting cams of lower frame and replace if necessary.
	❍ Excessive lateral play in gripper bars at a standstill.	4 Check side stops os and oos and adjust if necessary (stripping station outlet).

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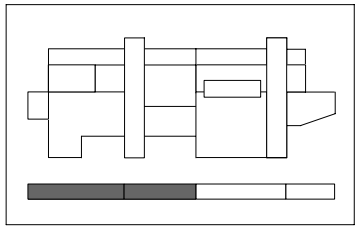
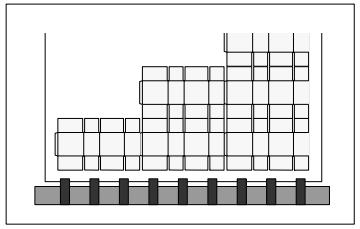
Delivery

Problem	Possible cause	Solution
Incorrect sheet transport  	❍ Delivery supporting apron damaged.	1 Repair apron or replace if necessary.

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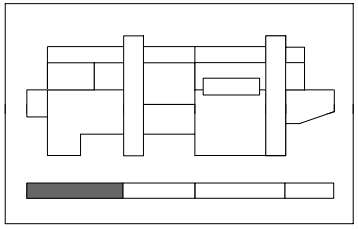
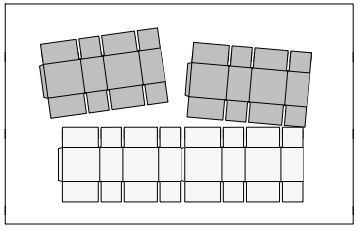
Problem	Possible cause	Solution
Blanks separate in the delivery  	❍ Nicks not adapted to machine operating conditions.	☞ Check rules for manufacturing nicks (quantity, size and location).
	❍ Non-conforming front waste separator.	☞ Check separator characteristics.
	❍ Incorrect sheet support provided by side supports.	1 Select putting side supports into or out of operation depending on the job.
	❍ Incorrect sheet braking.	1 Adjust braking force to suit sheet behaviour (or put it out of operation).
	❍ Side joggers incorrectly set.	1 Check position and adjust if necessary.
	❍ Rear jogger incorrectly set.	1 Check position and adjust if necessary.
	❍ Front jogger incorrectly set.	1 Check position and adjust if necessary.
	❍ Front waste incorrectly separated.	1 Check makeready sheet and correct if necessary.

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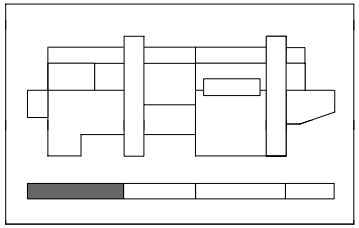
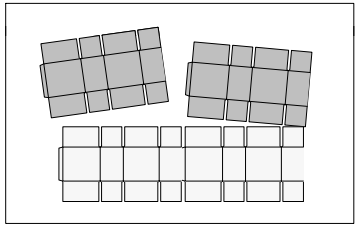
Problem	Possible cause	Solution
Blanks separate in the delivery (cont'd)  	❍ Front waste incorrectly separated (cont'd).	☞ Check rules for manufacturing nicks (quantity, size and location). 1 Check position of front waste separator and correct if necessary.
	❍ Machine running too slowly.	1 Try to increase production rate.
	❍ Flap position not adapted to job.	1 Set flap position in accordance with sheet size.
	❍ Position or number of wooden shoes not adapted to job.	1 Position wooden shoes in accordance with sheet size.
	<u>Technical troubles:</u> ❍ Front waste incorrectly separated.	4 Set setting of front waste separating tool (upper and lower). 4 Check position of front joggers. 4 Check control of front waste separating tools. 4 Check synchronization, setting and operation of side and rear tablets.
	❍ Incorrect flap operation.	4 Check synchronization and setting of flaps.

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Various information

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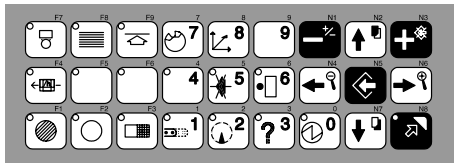
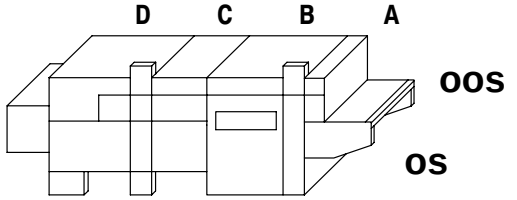
Job sheet

JOB SHEET No:

MACHINE:





ORDER				CUBE			MACHINE SETTINGS		
Name of customer:				F7	Lateral blower	0 1	A	Lateral guide oos	mm
Order No.:					Pressing device	0 1		Lateral guide os	mm
Tool No.:					Preselecting sheet supports	1 2 1+2		Infeed gauge	mm
Sheet format:					Alignment mode	0 1 2 1+2		Rear support carriage	mm
Number of blanks:					FLEXO + SPO coupling	0 1			
Type of board:					Braking brush	0 1	B	Cutting force without cardboard	MN
Thickness/basis weight:					Sheet supporting device	0 1		Cutting force with cardboard	MN
Gripper margin:									
Waste stripping	☐ YES	☐ NO		F8	Number of sheets per batch		C	Tightening bar upper die	mm
Front waste separation	☐ YES	☐ NO			Interruption of sheet infeed	1 2 3 4 5 6 7 8 9 10		Tightening bar center plate	mm
					Delayed opening of flaps				
					Number of diecut sheets	**RESET**	D	Position jogger oos	mm
								Position jogger os	mm
				F9	Max. admissible cutting force	MN		Position rear jogger	mm
					Defined cutting force	MN			
CONVERTING TOOLS				7	Sheet presence control	°MP			
B	Makeready sheet	☐ YES	☐ NO						
	Cutting plate	☐ Standard	☐ 1 mm plate	8	Infeed gauge - suction plate	mm			
	Counterparts	☐ YES	☐ NO		Position of jogger oos	mm			
C	Upper tool	☐ Strippers	☐ Die		Position of jogger os	mm			
	Lower stripping pins	☐ YES	☐ NO		Position of rear jogger	mm			
D	Front waste separator	☐ Tools	☐ Die						
								Production rate:	s/h
								Date:	
								Operator:	

Various information

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Repair sheet for SPO converting tools

SHEET No.: . . . . . .
MACHINE: . . . . . .
DATE: . . . . . .
OPERATOR: . . . . . .
SIGNATURE: . . . . . .

NAME OF CUSTOMER: . . . . . .
ORDER No.: . . . . . .
TOOL No.: . . . . . .
ORDER FINISHED: ☐
ORDER IN PROGRESS: ☐ **URGENT:** ☐

INDICATE DEFECTIVE COMPONENTS

Cutting die	☐ Cutting rules ☐ Creasing rules ☐ Perforating rules ☐ Rubber	☐ Makeready sheet ☐ Wooden board ☐ Fastenings . . . . .
Cutting plate	☐ Counterparts	. . . . .
Upper stripping tool	☐ Strippers ☐ Foam pieces ☐ Wooden board	☐ Fastenings . . . .
Central stripping board	☐ Separators ☐ Reinforcements ☐ Wooden board	☐ Fastenings . . . .
Upper blanking tool	☐ Pushers ☐ Telescopic pressers ☐ Wooden board	☐ Fastenings . . . .
Lower blanking tool	☐ Stiffness ☐ Polyester films	☐ Fastenings . . . . .
Front waste separators	☐ Wooden board	☐ Fastenings

POSITION

COMMENTS

. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .

BOBST
AUTOPLATINE SPO

INSPECTION TICKET

to be completed by the die maker
and sent to the planning department

NAME OF CUSTOMER:
. . . . . .
ORDER NO.:
. . . . . .
TOOL NO.:
. . . . . .
TOOLS SUBMITTED ON:
. . . . . .
RETURN TO STORE SCHEDULED FOR:
. . . . . .
DIE MAKER:
. . . . . .
SIGNATURE:
. . . . . .

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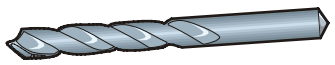
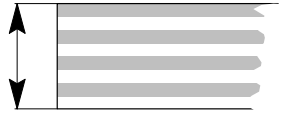
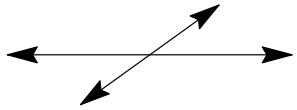
Conversion table



mm	Inch ”	
Ø 3		1/8
Ø 3,6		9/64
Ø 4		5/32
Ø 5		13/64
Ø 5,2		13/64
Ø 6		1/4
Ø 6.2		1/4
Ø 7,5		19/64
Ø 7		19/64
Ø 8		5/16
Ø 8,5		11/32
Ø 9		23/64
Ø 9,5		3/8
Ø 10		3/8
Ø 11		7/16
Ø 12		15/32
Ø 15		5/8
Ø 16,5		21/32
Ø 19		3/4
Ø 20		25/32
Ø 22		7/8
Ø 24		31/32
Ø 25		1
Ø 50		2
Ø 100		4
Ø 125		5
Ø 140		5 1/2



mm	Inch ”	
12		1/2
15		5/8
18		5/8



mm	Inch ”	
0,01	.0004	
0,02	.0007	
0,03	.0011	
0,05	.0019	
0,07	.0027	
0,1	.004	
0,15	.006	
0,2	.008	
0,25	.009	
0,3	.011	
0,4	.015	
0,5	.020	
0,6	.024	
0,7	.027	
0,8	.031	1/32
0,9	.035	1/32
1	.039	3/64
1,1	.043	3/64
1,2	.047	3/64
1,4	.055	1/16
1,5	.059	1/16
1,6	.062	1/16
1,7	.066	1/16
1,8	.071	5/64
2	.079	5/64
2,3	.090	3/32
2,4	.094	3/32
2,5	.098	3/32
2,6	.102	7/64
2,7	.106	7/64
2,8	.110	7/64
3	.118	1/8
3.2	.125	1/8
3,6	.141	9/64
3,8	.149	5/32
4	.157	5/32
4,5	.177	11/64
4,6	.181	3/16
5	.197	7/32
5,5	.217	7/32

Various information

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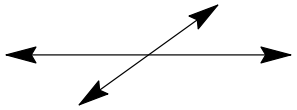

mm	Inch ”	
6	.236	15/64
6,35	.249	1/4
6,5	.255	1/4
7	.276	9/32
7,5	.295	19/64
8	.315	5/16
9	.354	23/64
9,5	.374	3/8
10	.394	25/64
11	.433	7/16
11,5	.453	29/64
12	.472	15/32
12,5	.492	1/2
13	.512	33/64
14	.551	9/16
15	.591	19/32
15,5	.610	5/8
16	.629	5/8
16,5	.649	21/32

17	.669	11/16
17,5	.688	11/16
18	.709	23/32
19	.748	3/4
20	.787	25/32
21	.827	53/64
21,5	.846	27/32
22	.866	7/8
22,5	.885	7/8
23	.905	29/32
23,5	.925	15/16
23,8	.937	15/16
24	.945	15/16
24,5	.965	31/32
25	.984	1
25,4	**1.000**	1
26	1.023	1
26,5	1.043	1 3/64
28	1.102	1 1/8
28,6	1.125	1 1/8
29	1.141	1 9/64
29,5	1.161	1 5/32
30	1.181	1 3/16

31	1.220	1 7/32
31,5	1.240	1 1/4
32	1.259	1 1/4
33	1.299	1 19/64
34	1.338	1 11/32
35	1.378	1 3/8
36	1.417	1 7/16
36,5	1.437	1 7/16
37	1.457	1 15/32
38	1.496	1 1/2
40	1.575	1 9/16
41	1.614	1 5/8
42	1.653	1 21/32
44	1.732	1 47/64
45	1.772	1 3/4
46	1.811	1 13/16
48	1.890	1 7/8
49	1.929	1 59/64
50	1.969	2
54	2.125	2 1/8
55	2.165	2 11/64
56	2.204	2 3/16
60	2.361	2 23/64

61	2.401	2 7/16
62	2.440	2 7/16
63	2.480	2 1/2
65	2.559	2 9/16
70	2.755	2 3/4
71	2.795	2 25/32
72	2.834	2 27/32
73	2.874	2 7/8
74	2.913	2 29/32
75	2.953	2 15/16
80	3.150	3 5/32
81	3.188	3 3/16
82	3.228	3 7/32
84	3.307	3 5/16
85	3.346	3 11/32
86,5	3.405	3 7/16
87	3.425	3 7/16
88	3.464	3 15/32
89	3.504	3 1/2
90	3.543	3 9/16
90,5	3.562	3 9/16
91,5	3.602	3 5/8
96	3.779	3 25/32

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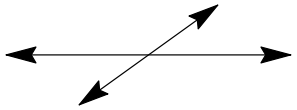

mm	Inch ”	
96,5	3.799	3 25/32
99	3.898	3 27/32
100	3.937	3 15/16
105	4.134	4 1/8
106.5	4.192	4 3/16
107	4.212	4 7/32
111,5	4.389	4 3/8
115	4.527	4 17/32
118	4.645	4 21/32
120	4.724	4 23/32
120,5	4.744	4 3/4
121	4.763	4 3/4
122	4.803	4 13/16
125	4.921	4 5/16
126	4.960	4 31/32
127	4.999	5
128	5.039	5 1/32
130	5.118	5 1/8
131,5	5.177	5 3/16

132,5	5.216	5 7/32
138	5.433	5 7/16
140	5.512	5 1/2
141,5	5.570	5 9/16
145	5.709	5 23/32
146,5	5.767	5 25/32
148	5.826	5 13/16
150	5.905	5 15/16
151	5.944	5 15/16
153	6.023	6 1/32
154	6.063	6 1/16
155,5	6.122	6 1/8
157,5	6.200	6 7/32
170	6.693	6 11/16
170,5	6.712	6 11/16
171	6.732	6 3/4
171,5	6.751	6 3/4
175	6.890	6 7/8
180	7.087	7 3/32
181,5	7.145	7 5/32
189	7.440	7 7/16
195	7.677	7 11/16
200	7.874	7 7/8

204	8.031	8 1/32
205,5	8.090	8 1/8
206	8.110	8 1/8
208	8.188	8 3/16
210	8.267	8 1/4
214	8.425	8 7/16
215	8.464	8 15/32
220	8.661	8 21/32
221	8.700	8 23/32
228	8.976	9
230	9.055	9 1/16
235	9.252	9 1/4
240	9.449	9 15/32
250	9.843	9 7/8
253	9.960	10
260	10.236	10 1/4
265	10.433	10 7/16
268	10.551	10 9/16
270	10.629	10 5/8
285	11.220	11 7/32
287	11.299	11 19/64
295	11.614	11 5/8
296	11.653	11 21/32

300	11.811	11 7/8
302	11.889	11 7/8
305	12.007	12
310	12.204	12 7/32
315	12.401	12 13/32
317	12.480	12 15/32
320	12.598	12 19/32
321	12.637	12 5/8
330	12.992	13
331	13.031	13 1/32
340	13.385	13 3/8
343	13.503	13 1/2
345	13.582	13 19/32
346	13.622	13 5/8
350	13.780	13 3/4
360	14.173	14 3/16
365	14.370	14 3/8
370	14.566	14 9/16
371	14.606	14 5/8
375	14.764	14 3/4
388	15.275	15 9/32
390	15.354	15 3/8
400	15.748	15 3/4

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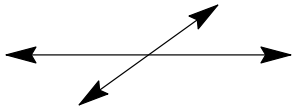

mm	Inch ”	
410	16.141	16 1/8
411	16.181	16 3/16
412,5	16.240	16 1/4
420	16.535	16 17/32
425	16.732	16 3/4
428	16.850	16 7/8
430	16.929	16 15/16
433	17.047	17 1/16
434	17.086	17 3/32
441	17.362	17 3/8
445	17.519	17 1/2
447	17.598	17 19/32
449	17.677	17 11/16
450	17.717	17 3/4
455	17.913	17 29/32
456	17.952	18
460	18.110	18 7/64
465	18.307	18 5/16
470	18.503	18 15/32

471	18.543	18 9/16
478	18.818	18 13/16
480	18.897	18 57/64
493	19.409	19 13/32
496	19.527	19 17/32
500	19.685	19 3/4
506	19.921	19 59/64
509	20.039	20 1/32
510	20.078	20 1/16
512	20.157	20 5/32
513	20.196	20 3/16
520	20.472	20 15/32
521	20.511	20 1/2
530	20.866	20 55/64
535	21.062	21 1/16
540	21.259	21 1/4
541	21.299	21 5/16
545	21.456	21 7/16
546	21.496	21 1/2
551	21.692	21 11/16
552	21.732	21 3/4
555	21.850	21 55/64
560	22.047	22 1/16

567	22.322	22 11/16
570	22.520	22 1/2
572	22.440	22 7/16
580	22.835	22 3/4
595	23.425	23 3/8
600	23.622	23 5/8
610	24.015	24
613	24.133	24 9/64
617	24.291	24 5/16
620	24.409	24 17/32
621	24.448	24 7/16
630	24.803	24 13/16
635	25.000	25
640	25.196	25 3/16
650	25.590	25 19/32
655	25.787	25 25/32
660	25.984	25 63/64
670	26.378	26 3/8
671	26.417	26 13/32
680	26.771	26 25/32
685	26.968	26 31/32
690	27.165	27 3/16
695	27.362	27 32/64

699	27.519	27 1/2
700	27.559	27 1/2
702	27.637	27 41/64
710	27.953	27 31/32
705	27.756	27 3/4
708	27.873	27 7/8
711	27.992	28
714	28.110	28 1/8
715	28.150	28 5/32
717	28.228	28 7/32
720	28.346	28 3/8
722	28.425	28 7/16
723	28.465	28 15/32
725	28.543	28 9/16
727	28.621	28 5/8
729	28.700	28 45/64
730	28.740	28 3/4
735	28.937	28 15/16
740	29.134	29 1/8
744	29.291	29 9/32
745	29.330	29 5/16
746	29.370	29 3/8
750	29.527	29 17/32

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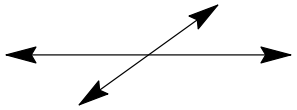

mm	Inch ”	
755	29.724	29 23/32
760	29.921	30
770	30.314	30 5/16
774	30.472	30 15/32
775	30.511	30 33/64
776	30.551	30 9/16
777	30.590	30 19/32
785	30.906	30 29/32
791	31.141	31 9/64
797	31.377	31 3/8
803	31.614	31 5/8
805	31.692	31 11/16
813	32.007	32
820	32.283	32 9/32
830	32.677	32 11/16
840	33.070	33 1/16
850	33.465	33 1/2
854	33.621	33 5/8
860	33.858	33 1/8

865	34.055	34 1/16
867	34.134	34 1/8
870	34.251	34 1/4
876	34.488	34 1/2
880	34.646	34 21/32
900	35.433	35 7/16
905	35.630	35 5/8
907	35.709	35 23/32
910	35.827	35 13/16
915	36.024	36
919	36.180	36 3/16
920	36.220	36 7/32
921	36.259	36 1/4
925	36.417	36 13/32
930	36.614	36 5/8
935	36.811	36 13/16
950	37.401	37 13/32
971	38.228	38 16/64
1005	39.567	39 9/16
1010	39.763	39 3/4
1015	39.960	40
1017	40.039	40 1/32
1020	40.157	40 1/8

1025	40.354	40 11/32
1028	40.472	40 15/32
1030	40.551	40 1/2
1036	40.787	40 25/32
1040	40.945	41
1043	41.062	41 1/16
1046	41.180	41 3/16
1050	41.339	41 11/32
1054	41.495	41 1/2
1055	41.535	41 17/32
1060	41.732	41 3/4
1063	41.850	41 1/8
1065	41.929	41 15/16
1070	42.126	42 1/8
1075	42.322	42 5/16
1098	43.228	43 7/32
1100	43.307	43 5/16
1102	43.386	43 3/8
1103	43.425	43 7/16
1105	43.504	43 1/2
1108	43.622	43 5/8
1110	43.700	43 11/16
1114	43.858	43 7/8

1117	43.976	43 31/32
1120	44.094	44 3/32
1121	44.133	44 1/8
1123	44.212	44 7/32
1125	44.291	44 9/32
1130	44.488	44 1/2
1133	44.606	44 19/32
1140	44.881	44 7/8
1150	45.276	45 9/32
1160	45.669	45 21/32
1171	46.102	46 7/64
1185	46.654	46 11/16
1245	49.015	49
1250	49.213	49 5/16
1260	49.606	49 5/8
1270	49.999	50
1273	50.117	50 1/8
1280	50.394	50 3/8
1284	50.551	50 9/16
1287	50.669	50 11/16
1300	51.181	51 3/16
1320	51.969	52
1328	52.283	52 9/32

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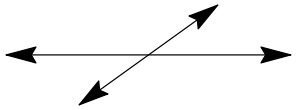

mm	Inch ”	
1350	53.149	53 5/32
1360	53.543	53 9/16
1415	55.709	55 23/32
1420	55.906	55 7/8
1430	56.299	56 9/32
1440	56.693	56 11/16
1448	57.007	57
1450	57.087	57 3/32
1480	58.267	58 1/4
1525	60.039	60 1/32
1575	62.007	62
1580	62.204	62 7/32
1587	62.480	62 1/2
1600	62.991	63
1605	63.188	63 3/16
1614	63.543	63 17/32
1620	63.780	63 3/4
1625	63.976	64
1630	64.173	64 3/16
1638	64.488	64 1/2
1648	64.881	64 7/8
1650	64.961	65
1670	65.748	65 3/4
1675	65.944	65 15/16
1680	66.141	66 1/8
2000	78.739	78 3/4
2032	79.999	80
2040	80.314	80 5/16
2060	81.102	81 1/8
2062	81.180	81 3/16
3050	120.078	120 1/16

Various information

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