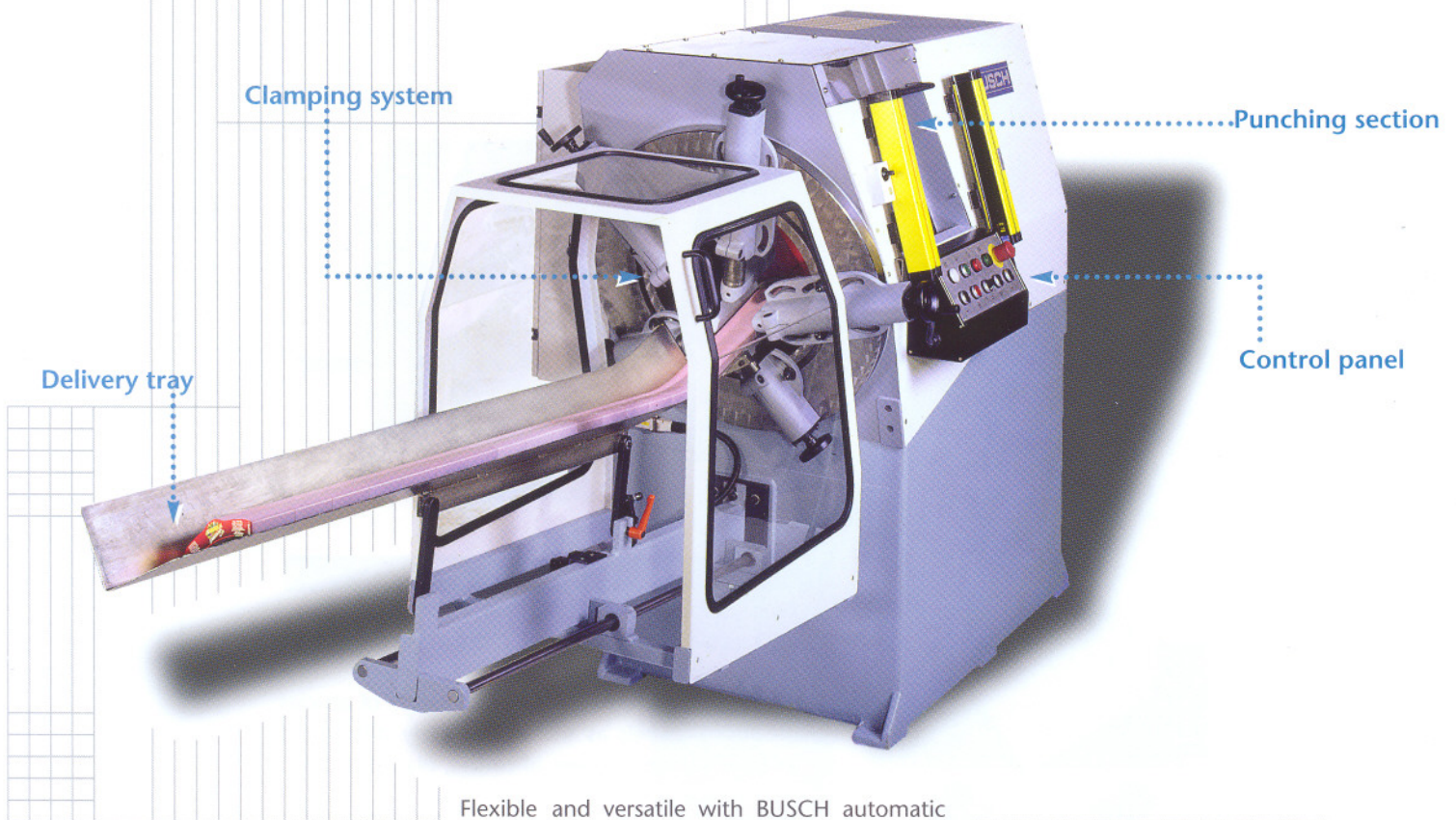


AUTOMATIC PUNCHING MACHINES

PUNCHED SHAPES





Flexible and versatile with BUSCH automatic punching machines.

A product with a contoured shape achieves a notable advantage - why ?

A label, a brochure or a children's booklet with a shape, an **outer contour**, multiplies the effect on sales.

The scope of shaping is wide, from almost rectangular shapes to complicated fancy forms - corner cut or rounding is, of course, included. The trend is towards ever more complicated forms, also with difficult material. All this requires the utmost precision of punching and high flexibility in the production plant. Various types of BUSCH machine configurations fulfil any individual requirement, suitable for small companies with constantly changing batches, but also for large-scale label printers - if desired, for combined punching and banding.

BUSCH ALL - AROUND

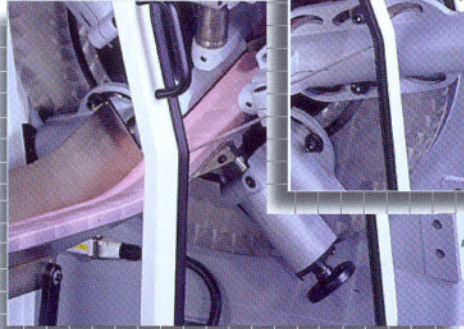
All machines are regularly controlled, and in respect to safety of labour are marked with the CE and GS label.

Since the beginning of the sixties the solid and durable BUSCH punch proves its ability world-wide. The BUSCH concept of punching has been recognised from the beginning for precision and performance.



← Know-how →

↕ Various possibilities ↕



UNLIMITED
BUSCH makes it possible

The punched outer contour

What is produced on BUSCH machinery ?

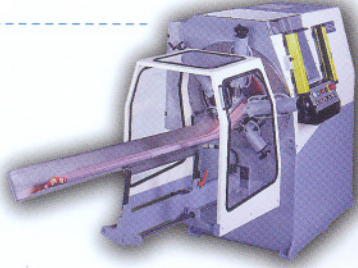
A considerable number of products is processed speedily and precisely.

These are just some of the wide range of articles produced. Labels as the most widely distributed advertising medium are, of course, placed on top.

- ▶ Labels for each kind of product: beer, wine, juice, champagne, food, cosmetics, medicine, detergent, etc.
- ▶ Large size labels for tins and jars
- ▶ Covers for ice-cream containers
- ▶ Blanks for ice-cream bags
- ▶ Inmould plastic labels e.g. for margarine boxes
- ▶ Wrappers for chocolate, razor blades, stockings, etc.
- ▶ Coffee cup and dessert mats

CREATIVITY

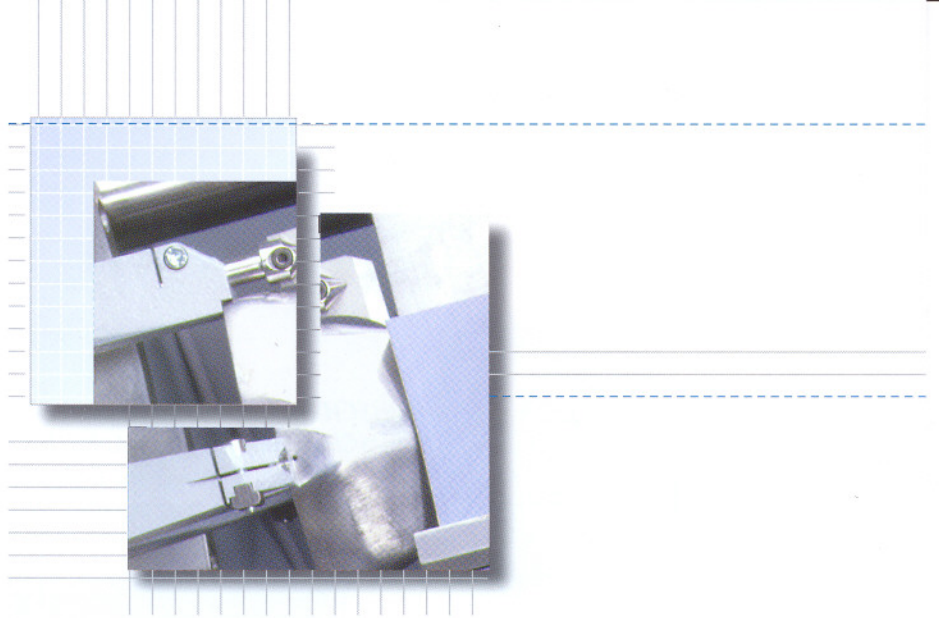
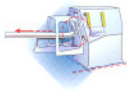
- ▶ Blanks for envelopes and cigarette wrappers
- ▶ Stitched and folded brochures
- ▶ Childrens' booklets
- ▶ Credit cards
- ▶ Playing cards
- ▶ Saving bank books
- ▶ Passports
- ▶ Plastic flower and plant stickers
- ▶ Calendars (tear-off and pocket calendars)
- ▶ Tags for textiles and luggage
- ▶ Note pads, glued



BUSCH aims for reliability.
BUSCH machines are notable for their
safe control, short set-up times
and almost maintenance-free operation.

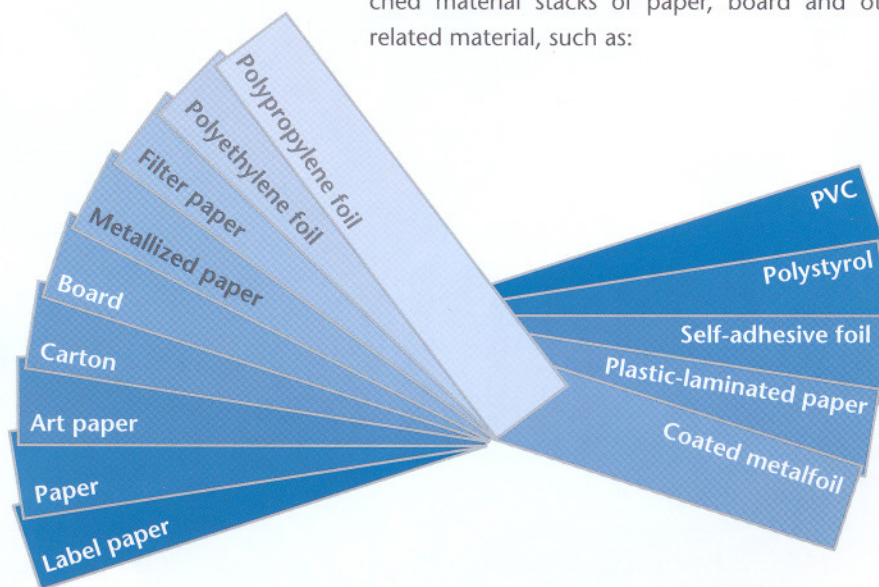


THE PRODUCT



As an introduction just some information about the material which can be punched and the different ways of punching jobs.

The machines process pre-cut, also folded or stitched material stacks of paper, board and other related material, such as:



CONVINCING
BUSCH is leading

THROUGH EFFICIENCY

The punching modes are:

- ▶ Full cut punching (of complete outer contour)
- ▶ Corner cut
- ▶ Corner rounding
- ▶ Unilateral and bilateral punching
- ▶ Trilateral punching of brochures, childrens' booklets, passports and saving bank books
- ▶ Full cut punching in a two-up system (in one or two working steps)
- ▶ Quadrilateral punching of quires for sheet separating



The punching dies are manufactured by die makers according to drawings or films showing the required punching contour.

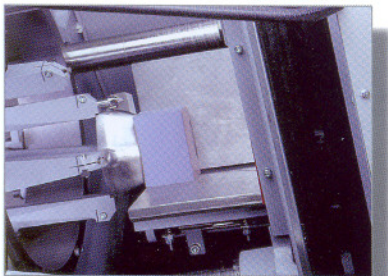
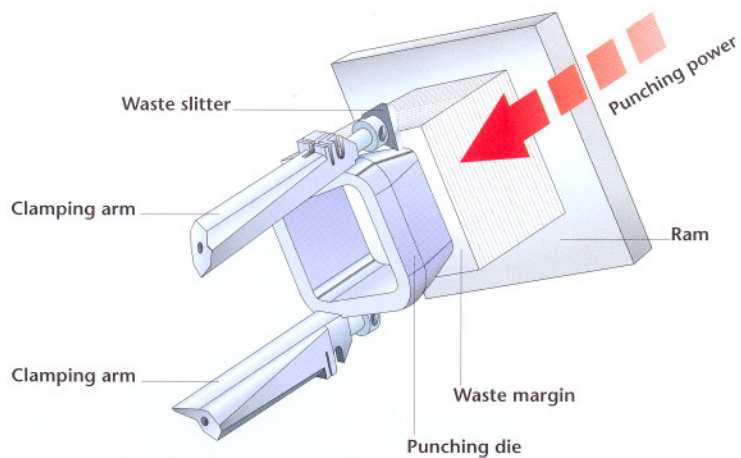
Competence

The ram-type principle

BUSCH punching machines work according to the ram-type principle, which means that the material is pushed through the punching die. The small waste margin of 0-3 mm ensures economical production. Square-cut stacks of blanks are placed into the right-angled feeding tray between the fixed die and the ram. After release, the ram pushes the stacks through the die onto the delivery tray in one stroke. Waste slitters are installed separately to split the waste at any required point.

The final millimeters of the stack remain in front of the die and are punched with the next stroke. This gives a longer die life and also increases the quality of the final cuts of the stack.

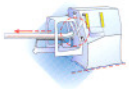
Alternatively the punching stroke can be adjusted to execute a 0-punch, which means that the stack is completely punched up to the final blank.



The machines use a hydraulic system, which builds up the necessary punching pressure - according to the type of machine between 2,5 and 6 tons.

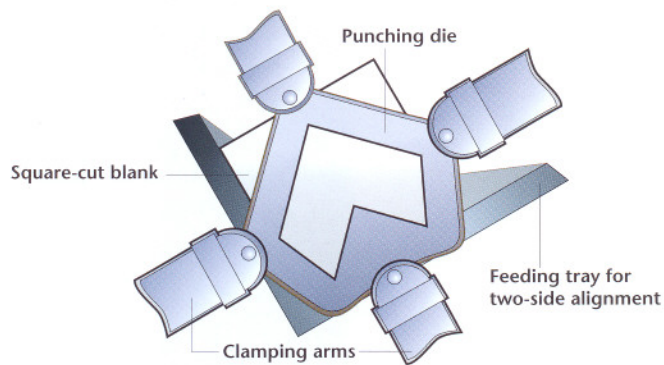
It is the operator who determines the working speed, as the machines are not controlled by a fixed rhythm. Once the material is completely inserted and aligned the punching stroke is released; idle strokes are thus avoided.

THE PROCEDURE



The two-side aligning system

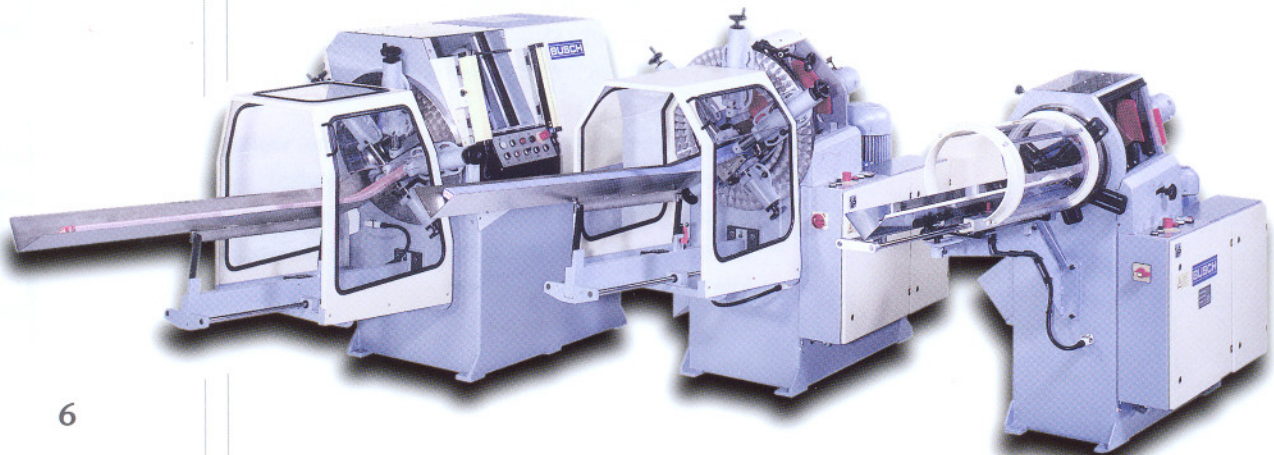
offers a great advantage, as only the two lower surfaces of the feeding tray are used for alignment.



These are the advantages:

- ▶ the one-way system ensures low tolerance, as the material is inserted directly in front of the die (always protected by the safeguarding systems)
- ▶ the slit waste cannot pile up, because it escapes easily towards the bottom
- ▶ the largest possible flexibility of punchable shapes, from very small sizes of 10 x 10 mm up to large formats of 230 x 320 mm (round label shapes up to 285 mm diameter)
- ▶ size tolerances due to 'sagging' of blanks are minimised, as the punching direction of the upright standing blanks is inclined.

VERSATILITY
Nobody creates
more

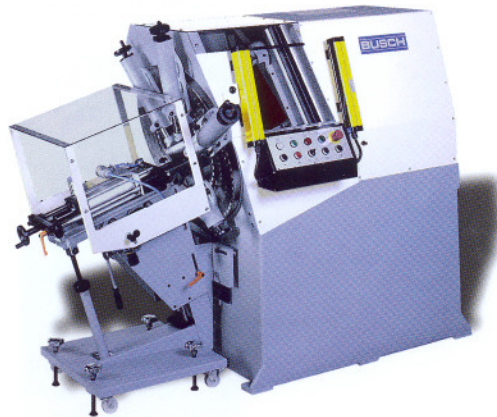


Flexibility

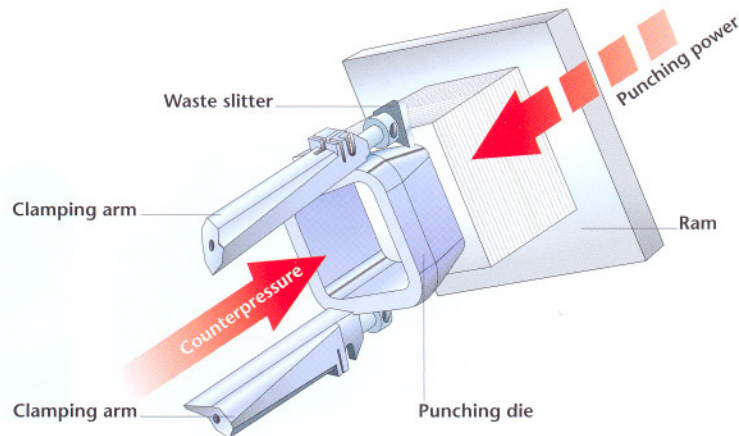
Counterpressure punching

It is advisable to utilize a counterpressure device, when it comes to extreme accuracy, or when large-size labels are punched, which might collapse in front of the die due to the nature of the material. It is also used for punching plastic foils (PE or PP), especially for in mould labels.

Counterpressure systems have been offered by BUSCH since 1972. Long experience guarantees optimal engineering.

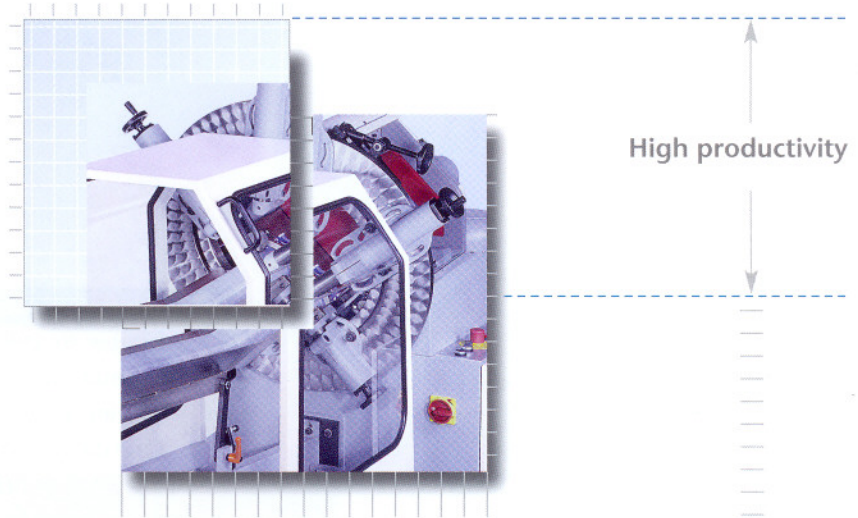
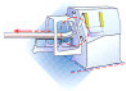


The movable pneumatic counterpressure device is mounted to the punching machine instead of the delivery tray (on models B, B+P, BL, BLS) and is connected to the central plant for compressed air.



The matrix is located in the die. The material is straightened and pressed against the matrix loaded with pneumatic pressure, before the hydraulic driven ram pushes the stack of blanks through the punching die. Then the punched product is pushed back into the feeding tray for removal by the operator. The performance slows down the output by abt. 50 %.

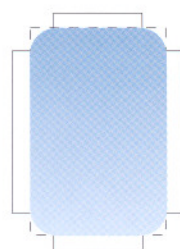
THE PROCEDURE



Corner rounding or full cut punching?

For instance of playing cards, credit cards, passports, saving bank books, etc. - all products with rounded corners. According to quality requirements full cut punching or just corner rounding is used.

Full cut punching with waste margin - for demands of high quality



Corner rounding without waste margin (saving on material). The punching die is manufactured with guide surfaces at those sections, where no punching is executed.

Punching of brochures and childrens' booklets

Three sides of the article are contour punched. The die is manufactured with a guide surface for the stitched or glued side of the brochure or booklet, as this side is not punched.



**PUNCHED
Advanced
technology**

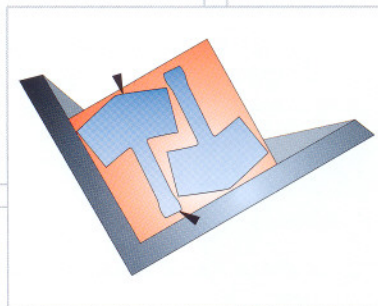
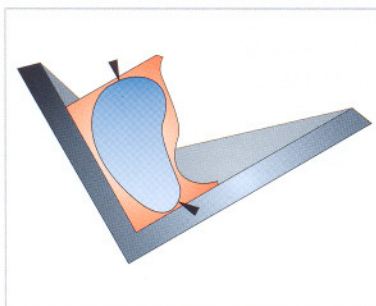
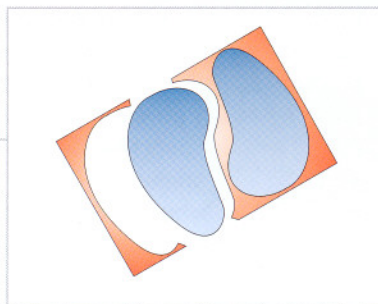
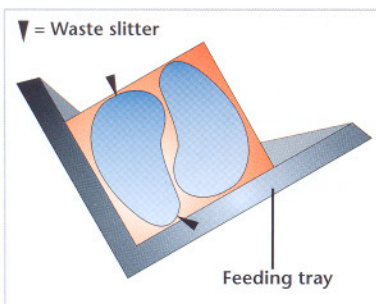
QUALITY

An advertising brochure or a childrens' booklet punched to the shape of the subject or product achieves a particular interest and influences perfection, as market research has clearly confirmed.

Punching in a two-up system

For saving on material, a blank with two labels is produced. The two e.g. detergent labels are composed interlocked, one of them turned through 180°. Punching is done in two steps. In the first step the lower label stack is punched completely,

whereas the upper one is just separated. The operator removes this upper label stack manually from a support, turns it through 180° for feeding into the machine for the second punching step. The punching die remains unchanged, in its fixed position.



The favourable alternative - for saving on material and reducing cutting costs

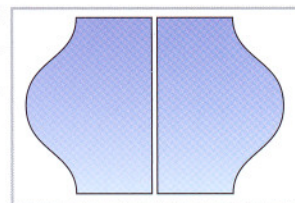
This method can be achieved due to the BUSCH concept, which allows stacks of blanks with **just one right angle**. The two other sides of the blank can show any other shape. Normal punching dies, as

used for blanks with one single label, are fitted for this punching mode.

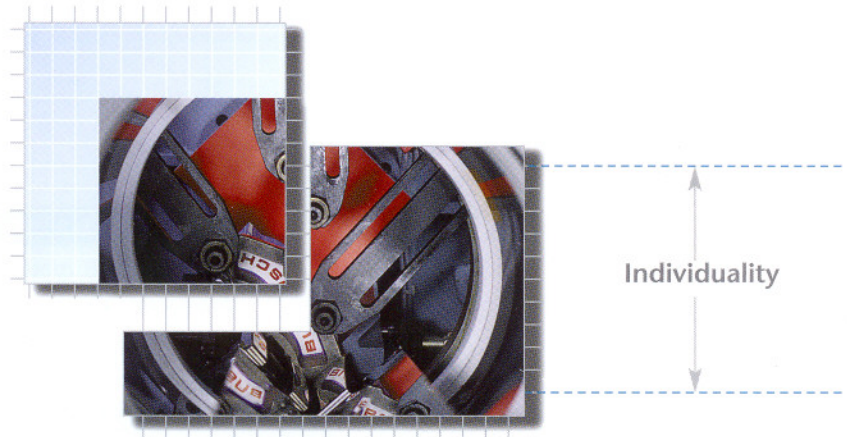
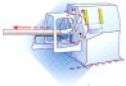
Advantages:

- saving of almost 50 % of cutting time on the guillotine (compared to blanks with just one label)
- saving on paper material by 20 % and more
- normal punching dies can be used.

Labels with one straight punching line on one side can be punched in a two-up or even multi-up system in one step.



THE PROCEDURE



Model A with the maximum punching size 180 x 180 mm is often installed in printing houses producing labels in smaller batches. Due to the lower punching power of 2.5 tons, the machine is mostly used for punching labels.

Standard equipment includes 5 clamping arms, located on a clamping ring and adjustable to reach any required position of the punching die.

Vertical adjustment is quick and easy by shifting the arms after having loosened two locking screws.

Waste slitters with holders are supplied as standard, which can be inserted in any clamping arm to split the waste at any required point of the die.

PUNCHED Proven technique

QUALITY

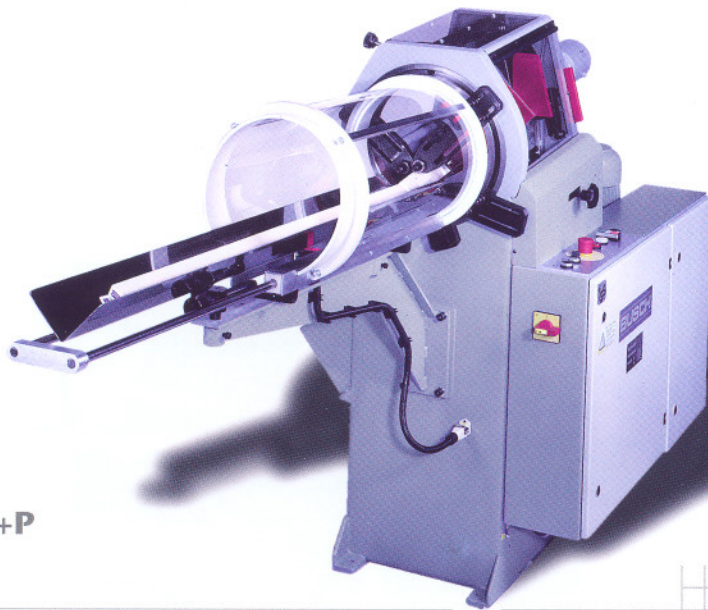
Once the material is inserted and the protective plexiglas door is closed manually, the punching stroke is released (secured by auto-controlled limit switches). The door opens automatically when the ram runs backwards. The punched labels are removed from the delivery tray.

The model A+P has a pneumatic door closing system. The protective door is closed by pressing a push-button on the control panel. Handling is thus easier and the output is increased. A compressed air supply is needed.

Model AL belongs to the A-series. The machine construction is identical to models A and A+P. However, the safety system differs for feeding the material and releasing the punching stroke. Instead of the protective door the machine is equipped with an electronic light curtain in front of the punching section. The punching stroke is released after the operator has fed the material in and his hand has been withdrawn from the punching section - a significant combination of safeguard and release.

The machine stops at once should the operator touch the punching section during the punching process.

The machine output increases due to the quicker feeding sequence.



A / A+P

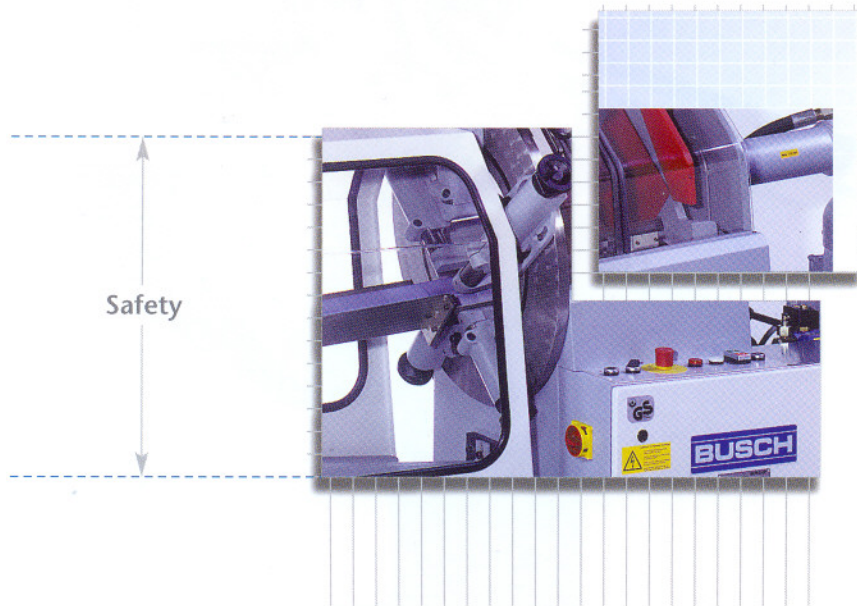
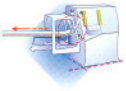


AL

Technical data

Model		A	A+P	AL
Max. punching size	mm	180 x 180	180 x 180	180 x 180
Min. punching size	mm	20 x 20	20 x 20	20 x 20
Max. feeding height (height of punching die 60/70 mm)	mm	200	200	200
Punching pressure	kg	2500	2500	2500
Punching strokes	p/min	9	10	12
Machine output (insertion 1000 sheets/80 gsm)	sheets/h	540.000	600.000	720.000
Weight	kg	570	575	575
Release of punching stroke		by manual closing of protective door	by pneumatic closing of protective door (push-button control)	by light curtain

MODELS A / A+P / AL



The model B offers the larger punching size of 230 x 230 mm and considerably higher punching power. The machine construction is more robust; the oil tank capacity is higher. The clamping arms are equipped with a handwheel operating a spindle for the vertical adjustment of the die. Standard equipment includes 5 clamping arms and waste slitters with holders.

The machine punches labels and all other stated material, especially plastics for credit cards, as well as playing cards, stitched passports and saving bank books.

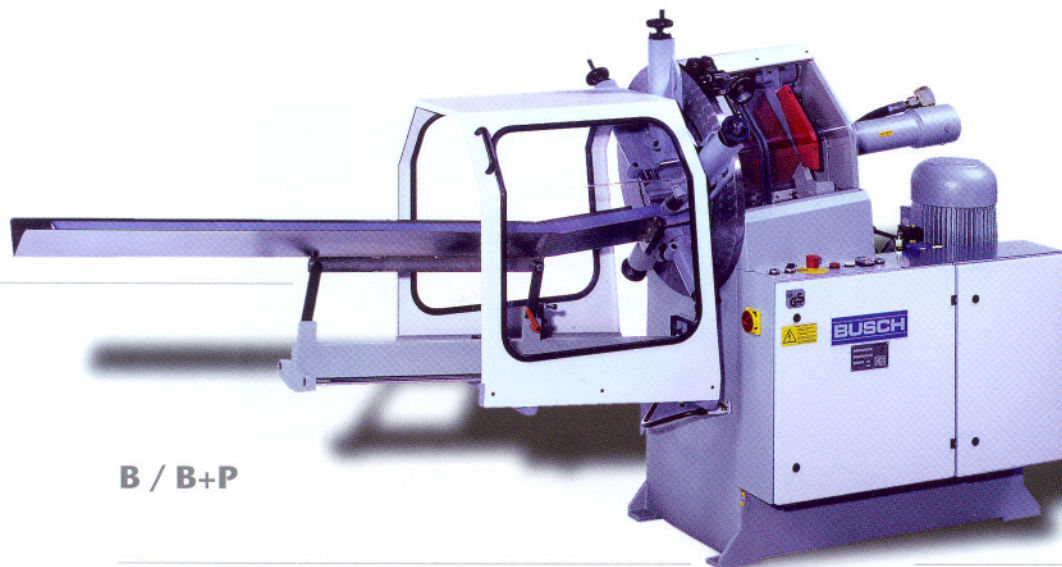
PUNCHED Special technique

QUALITY

The punching section is safeguarded by a protective plexiglas door, which releases the punching stroke after manual closing (by auto-controlled limit switches). The delivery section of all BUSCH machines is protected by a movable hood.

Model B+P corresponds to the model B. Door closing is, however, effected pneumatically by push-button control. Handling is, like model A+P, much easier; the output is increased. The punching stroke is released automatically after the door is closed.

A compressed air supply is needed.



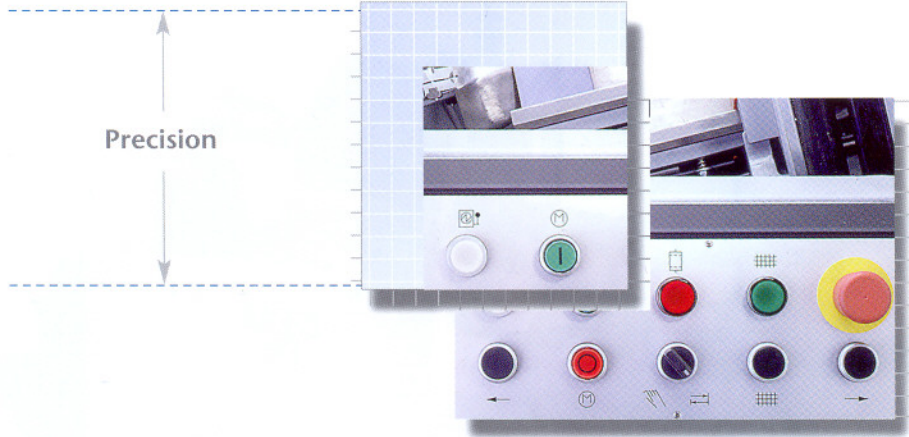
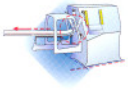
B / B+P



Technical data

Model		B	B+P
Max. punching size	mm	230 x 230	230 x 230
Min. punching size	mm	10 x 10	10 x 10
Max. feeding height (height of punching die 60/70 mm)	mm	180	180
Punching pressure	kg	5.700	5.700
Punching strokes	p/min	10	12
Machine output (insertion 1000 sheets/80 gsm)	sheets/h	600.000	720.000
Weight	kg	855	860
Release of punching stroke		by manual closing of protective door	by pneumatic closing of protective door (push-button control)

MODELS B / B+P



The model BL is constructed for the punching size 220 x 260 mm; the maximum diameter for round labels is 250 mm. This robust and powerful machine is capable of punching all sorts of material. The punching section is safeguarded by a light curtain.

The punching stroke is released after the operator has fed the material in and his hand has been withdrawn from the punching section - a significant combination of safeguard and release. The machine stops at once should the operator touch the punching section during the punching process.

PUNCHED Speeding up technique

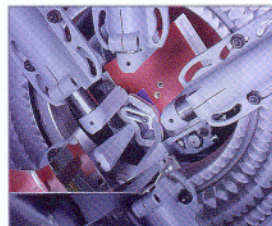
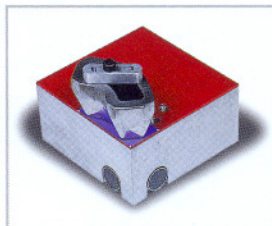
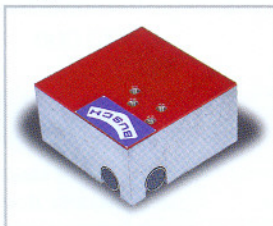
QUALITY

A safety bar/security device enables the operator to feed material in advance into the machine whilst the ram runs backwards. The protective hood over the delivery tray can be shifted backwards (as on all other models) to facilitate the die mounting and readjustments.

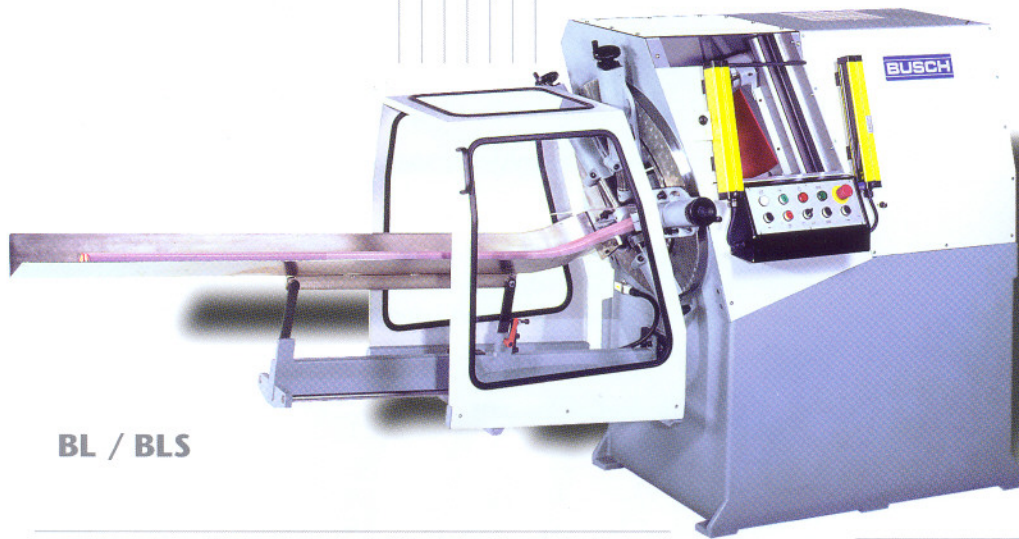
The machine is employed for higher volume jobs, especially for punching in a two-up system, e.g. large size detergent labels composed interlocked and turned to each other - and similar other articles. Furthermore the machine is often used for punching with counterpressure (see page 7 'The procedure').

The model BLS offers the larger punching size of 230 x 320 mm; and the maximum diameter of round labels is 285 mm. The machine construction and operation corresponds to the model BL. The only difference is the larger punching size, and consequently a larger machine body and punching section. The machine is supplied with 6 clamping arms.

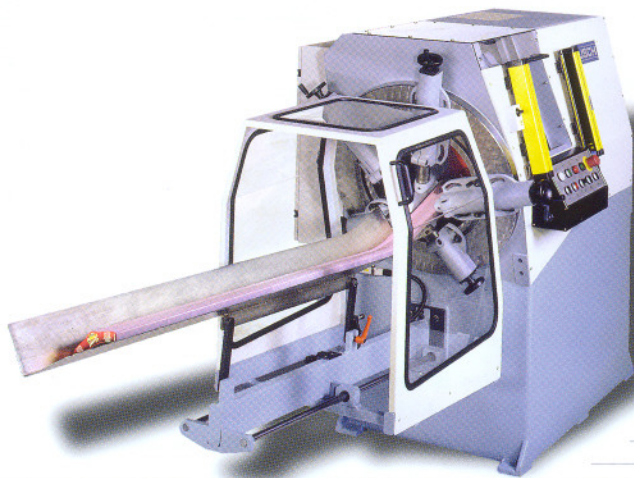
*By the way...
Included as standard equipment with all machines is an ALUMINIUM DIE POSITIONING BLOCK. Set-up time is reduced considerably with the help of this block, as only a few manual tasks are necessary to prepare a new punching job.*



A square-cut blank is fixed to the block, flush with the edges. The die is layed exactly onto the cutting line and fixed to the block. Then the mounted block is positioned into the feeding tray of the machine, held by magnets. The clamping arms can then be fastened on the die.



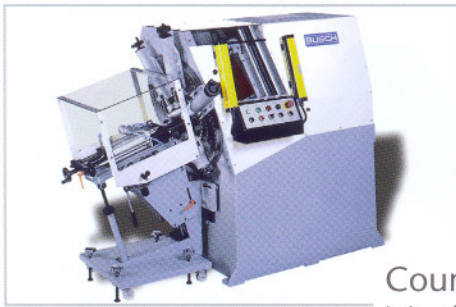
BL / BLS



MODELS BL / BLS

Technical data

Model		BL	BLS
Max. punching size	mm	220 x 260	230 x 320
Min. punching size	mm	10 x 10	14 x 14
Max. feeding height (height of punching die 60/70 mm)	mm	180	180
Punching pressure	kg	5.700	5.700
Punching strokes	p/min	16 - 18	14 - 16
Machine output (insertion 1000 sheets/80 gsm)	sheets/h	1.000.000	900.000
Weight	kg	1350	1450
Release of punching stroke		by light curtain	by light curtain



Counterpressure Device

It is advisable to use counterpressure for punching plastics (PE or PP) and large size labels with a special nature.

A detailed description of the procedure is given on page 7. The counterpressure device can be mounted to the models B, B+P, BL, BLS. The delivery tray is removed from the machine, instead of which the counterpressure unit is connected. When extreme accuracy is required, then punching with counterpressure is necessary.



A trolley is supplied for easy dismantling and removing the delivery tray with support.

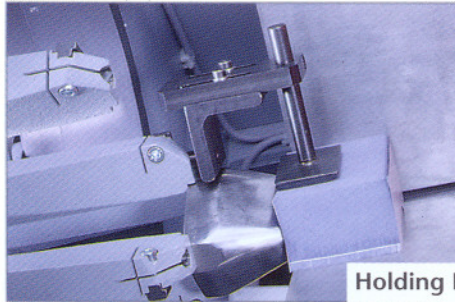
Technical Data - Counterpressure Device		
Compressed air requirements	nl/min	64
Pressing power	bar	8
Dimensions (LxWxH)	mm	800x600x1300 for B/B+P
	mm	800x600x1150 for BL/BLS
Weight	kg	124 for B/B+P, 108 for BL/BLS
Technical data - Trolley		
Dimensions	mm	900 x 500 x 450
Weight	kg	21



BUSCH Waste Conveyor

for the removal of punching waste conveyed into containers. Available conveying heights: 110 and 145 cm.

The conveyor can be positioned on the righthand or lefthand side of the punching machine or straight away from the machine. They are useful, quick and keep the working environment clean.



Holding Down Device

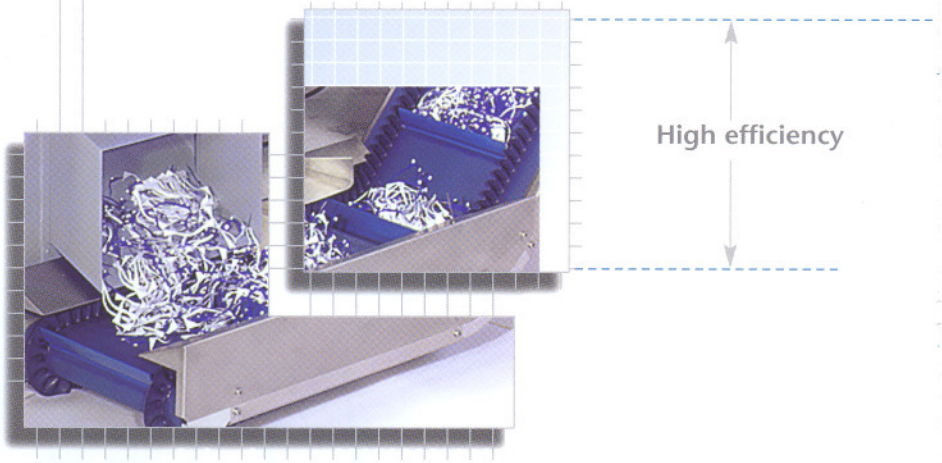
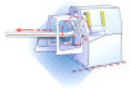
it can be inserted without any problem into one of the clamping arms of the punching machine. If the blanks are long and narrow or if varnished labels with high ink application tend to lift up in the feeding tray during the punching process, then an additional guide surface is obtained with the help of the holding down device. Punching tolerances are thus improved.



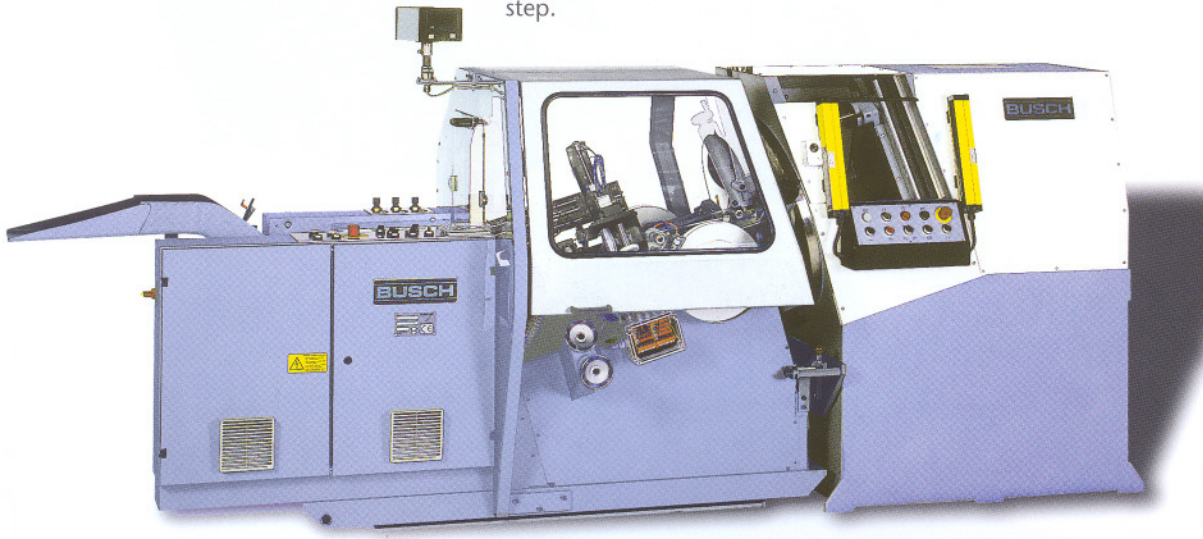
BUSCH Table Banding Machine

the versatile banding machine for simple and difficult banding work. Thousands of machines are sold. Products are banded either with kraft paper or with PP-foil in tape widths of 20 and 30 mm or 40 and 50 mm. Measurements of products to be banded are: length: unlimited, width: 24 cm (for foil banding 18 cm), height: 15 cm. Output: 20-25 strokes/min.

Separate literature for the waste conveyor and table banding machine is available on request.



The punching machine BL or BLS with in-line linked automatic banding machine BD 30 accomplishes both punching and banding of labels in one step.



Only one operator is needed for loading the punching machine, which improves productivity immensely, considering the saving of time, as well. The punched labels are conveyed in-line to the bander for banding the label stacks with polyethylene (PE) foil.

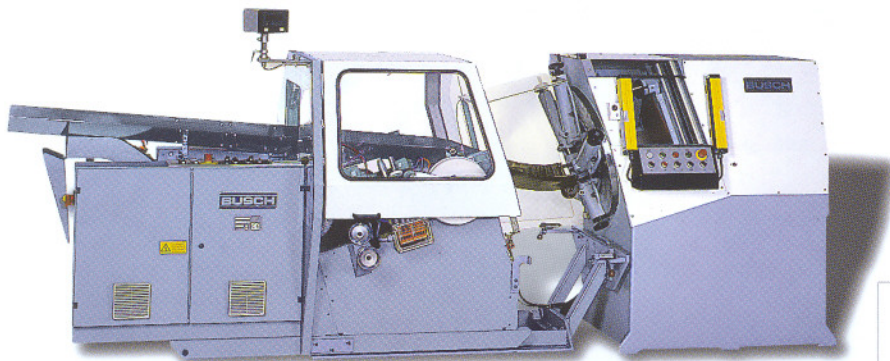
PUNCHED and banded

QUALITY

The banding process is guided by the working speed of the punching machine and is executed after each or each second punching stroke. The foil tape is drawn softly around the edges and roundings, without damaging the material.

A special flexibility of the plant is achieved by linking off the banding machine. The punching machine can thus be used for larger punching sizes, as well, if no banding is required. For this purpose an additional tray is supplied as an option. The tray passes above the linked-off banding machine.

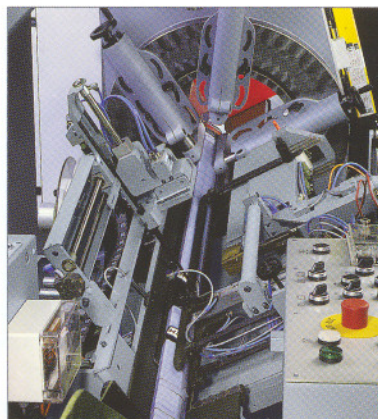
The equipment includes a clear text display for operating status, operator call and error message with torn tape control. The machine requires a compressed air supply.



The linked-off automatic banding machine with additional tray.



Punched and banded label packages

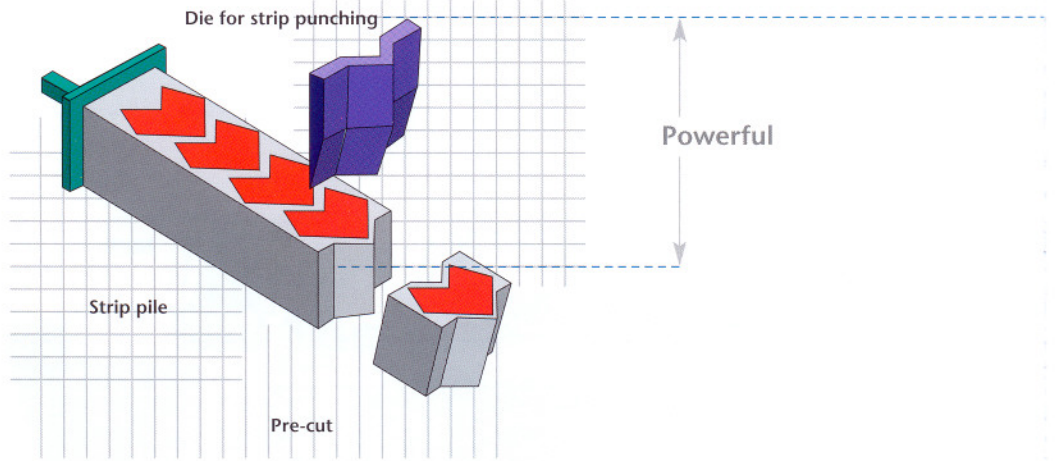
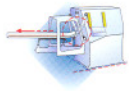


View into the banding machine

PUNCHING + BANDING

Technical data

Model		BL/BD 30	BLS/BD 30
Max. punching size	mm	220 x 260	230 x 320
Min. punching size	mm	10 x 10	14 x 14
Max. banding size	mm	140 x 200	140 x 200
Min. banding size	mm	25 x 60	25 x 60
Punching strokes	p/min	14	14
Machine output (punched and banded)	sheets/h	840.000	840.000
Total dimensions (LxWxH)	mm	3610 x 1100 x 1700	3610 x 1125 x 1730
Total weight	kg	1980	2080
Banding material	PE foil, reels 800 m long, thickness 80µm, widths 20,30 and 40 mm		



Punch cutting

is a punching concept, which is patented worldwide for the BUSCH company. The characteristics of 'punch cutting' are high levels of accuracy.

Punch cutting is used on the strip puncher STS to separate labels, composed interlocked in rows. It is a pre-cut, which must be followed by the final contour punching (on a BUSCH punching machine).

This concept uses an open die contour. The die cuts in a vertical movement through the pile. It can be manufactured with a straight or contoured cutting line. The contoured die separates interlocked composed labels, so that saving on material is considerable, e.g. for champagne labels up to 50%! The saved expensive material is thus product, and not waste anymore!

The machine produces square-cut labels, as well, when installing a straight die!

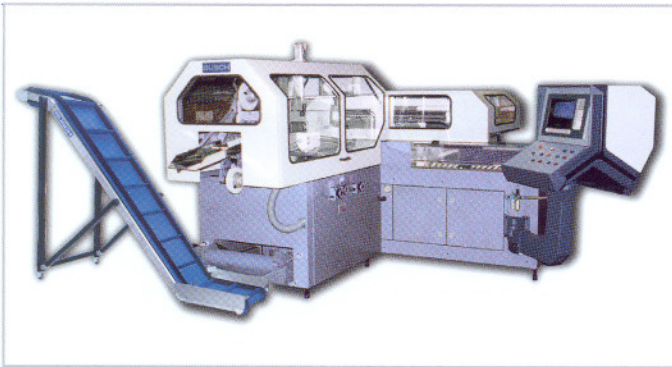


HIGHEST
through
material savings

EFFICIENCY



Strip puncher STS 72/102 for the pre-cut or separating cut of strip piles.



Label Line 72 / 102

In-Line production with the 'Label Line'

The equipment carries out:

- ▶ the pre-cut of strips - using the punch cutting concept
- ▶ final punching of outer contour with counter-pressure
- ▶ banding with PE-foil
(tape widths 20, 30 and 40 mm)

The equipment is used for large volume jobs with highest accuracy.

Considerable saving on material is achieved by interlocking of labels. If the label shape is uniform, it is also possible to process sheets with mixed multiple-ups, as each label package is conveyed through the machine individually.

Technical data

Model		STS 72	STS 102	Label Line 72	Label Line 102
Max. strip size	mm	720 x 260	1020 x 260	720 x 190	1020 x 190
Max. punching size	mm	720 x 260	1020 x 260	-	-
Min. punching size	mm	16* x 50	16* x 50	-	-
Max. pre-cut size	mm	-	-	140 x 190	140 x 190
Min. pre-cut size	mm	-	-	25** x 60	25** x 60
Max. final cut size	mm	-	-	135 x 185	135 x 185
Min. final cut size	mm	-	-	20 x 55	20 x 55
Feeding height	mm	30 - 125	30 - 125	30 - 125	30 - 125
Output	strokes/min	12 - 15	12 - 15	9 - 10	9 - 10
Punching press. (pre-cut)	kg	2180	2180	2180	2180
Pressing power (pre-cut)	kg	0 - 1180	0 - 1180	0 - 1180	0 - 1180
Oil tank capacity	l	180	220	180	220
Space requirements	m ²	4,6	5,3	6,5	7,2
Weight	kg	1880	2230	3320	3670

* last label blank on the strip: 30x50mm

** last label blank on the strip: 30x60mm

Technical Data - Summary

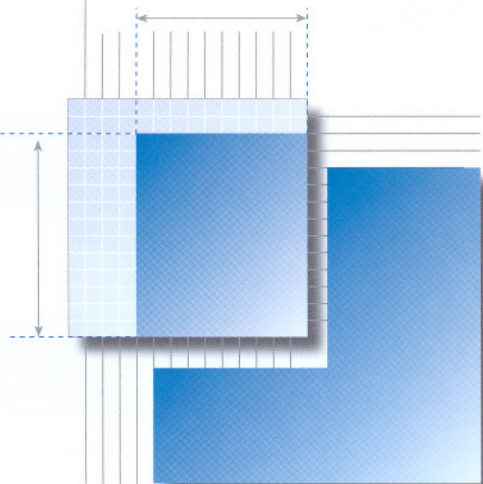
Model	Unit	A	A + P	AL
Max. punching size	mm	180 x 180	180 x 180	180 x 180
Min. punching size	mm	20 x 20	20 x 20	20 x 20
Feeding height (height of punching die 60/70 mm)	mm	200	200	200
Punching strokes	p/min	9	10	12
Max. machine output (insertion 1000 sheets/80 gsm)	sheets/h	540.000	600.000	720.000
Punching pressure	kg	2.500	2.500	2.500
Power requirements	kW	3,0	3,0	3,0
Compressed air requirements (for machines with pneumatically operated door closing)	nl/min	-	4	-
Oil tank capacity	l	80	80	80
Number of clamping arms (as standard)		5	5	5
Space requirements				
Length, without delivery tray	mm	1040	1040	1040
Length, with delivery tray	mm	2550	2550	2550
Width	mm	770	770	770
Height	mm	1310	1310	1310
Weight net, without oil	kg	570	575	575

The data specification refers to machines without optional equipment.

B	B + P	BL	BLS
230 x 230	230 x 230	220 x 260	230 x 320
10 x 10	10 x 10	10 x 10	14 x 14
180	180	180	180
10	12	16 - 18	14 - 16
600.000	720.000	1.000.000	900.000
5.700	5.700	5.700	5.700
7,5	7,5	7,5	7,5
-	4	-	-
120	120	190	200
5	5	5	6
1240	1240	1350	1410
3000	3000	3000	3000
840	840	1040	1090
1420	1420	1400	1450
855	860	1350	1450

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TECHNICAL DATA



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