

Carrier Tape

product overview



speed. independence. reliability.

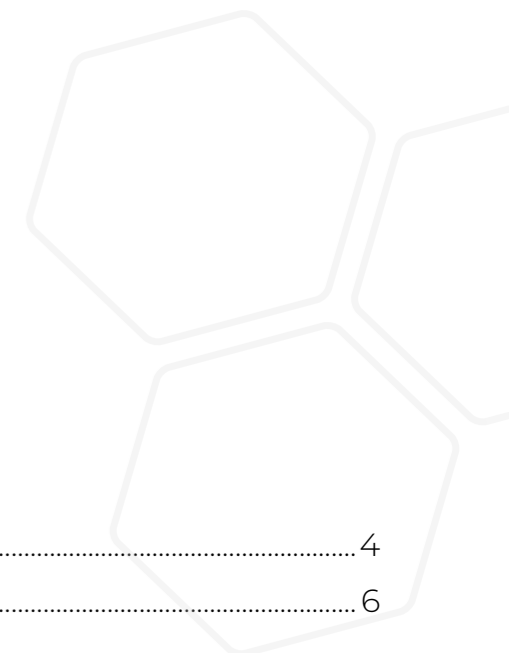
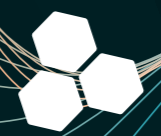


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SERVING BILLIONS OF PEOPLE.
every day.

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MUEHLBAUER GROUP AT A GLANCE

The Muehlbauer Group is a German high-tech company that is known worldwide for its innovative solutions in the field of automated production. With over 40 years of experience, Muehlbauer develops customized technologies for the future of industry and everyday life. The company is the secret driving force behind many developments that make our modern lives safe and efficient.

Around 4,000 employees at over 30 locations worldwide ensure that Muehlbauer's visions become reality around the globe. Sustainability, quality and unwavering trust in partnerships are the pillars on which our company has built its success story. Muehlbauer is not just a service provider, but a creative problem solver that shapes the future every day with innovative ideas and technological excellence.

>160 m

ID-Documents
produced & delivered

~4.000

Employees worldwide

>90.000

Machines in the field

40

Service Hubs & Sites
around the globe



MPS

PRECISION PARTS & SURFACE ENGINEERING

Since its foundation in 1981 in Roding, Bavaria, Muehlbauer has stood for maximum precision. The Muehlbauer Parts & Systems business unit consists of the company's own precision parts production with a state-of-the-art electroplating facility. All components for machines and other products are manufactured here in-house – individually and, if necessary, overnight! Our MPS makes us extremely agile and independent.

AUTOMATION

PRODUCTION EQUIPMENT & SYSTEMS

Our AUTOMATION division goes far beyond the assembly of customized production systems! We provide intelligent software solutions for the automation of different production steps and drive Industry 4.0 forward. We are passionate about serving 90 % of the global RFID market with our high-speed bonders, and have achieved market leadership in the semiconductor industry with our unique die sorting technology.

MB ATECH

BATTERY & FUEL CELL TECHNOLOGIES

Our newest and currently most dynamic division ATECH – Advanced Energy Technologies – brings unique machine requirements to series production. In the field of eMobility, we offer highly efficient production lines for the manufacture of pouch cells and prismatic cells for lithium-ion batteries, as well as MEAs & stacks for fuel cells. Our newly built ATECH Giga Center with dry room provides optimal conditions for gigascale manufacturing.

TECURITY®

GOVERNMENT & TECHNOLOGY SOLUTIONS

Our TECURITY® division is the leading specialist when it comes to implementing innovative security systems for identifying and verifying documents and people. For example, we manufacture systems for the production of chip cards, IDs and passports or supply electronic gates and self-registration kiosks, along with the associated software, for airports and border crossings. With more than 30 years of experience and over 300 successfully implemented ID projects worldwide, we provide our customers with unmatched expertise and trust.

BUSINESS UNITS



MUEHLBAUER

PRODUCTION, TECHNOLOGY
& SERVICE LOCATIONS

Muehlbauer operates a global network of production, technology and service locations, ensuring close customer proximity, fast response times and consistent support across all regions.

WORLDWIDE PRESENCE

CT 8/24 D

ROTARY TAPE FORMING SYSTEM WITH DUAL-ROW OPTION

The CT 8/24 D is a rotary forming carrier tape system with a throughput of up to 600 meters per hour, depending on cavity size, positive or negative forming and used material thickness. The CT 8/24 D offers a tape range from 8 mm to 24 mm for both positive and negative forming. Dual forming is possible for the following tape size ranges: 2 x 8 mm, 2 x 12 mm.

KEY FEATURES

- One machine for all applications on rotary forming (positive or negative)
- Well-proven, in-house developed dual-row forming system
- Suitable for high volumes

SYSTEM CAPABILITIES

DESIGN

- Welded steel frame with aluminium front & table plate on all workstations
- Easily accessible control electronics
- Automatic tape wind-on and production control
- Menu-driven software (different languages)
- Mechanism controlled by PLC
- Central control & programming unit
- Integrated vacuum pump
- CE-conformity

WORKSTATIONS

- Buffer station for wind-off
- Temperature-controlled forming station
- Buffer station with control unit for cutting process
- Tape width trimming cutting station with waste wind-on
- Buffer station
- Punching unit
- Split cutting station
- Buffer station with control unit for wind-on unit
- Wind-on on 200 mm crosswinder

OPTIONS

- Muehlbauer vision for 100 % quality control
- Multi-level / crosswinding wind-on up to 200 mm
- Tape cleaning station

SPOOLING SYSTEMS

- Automatic, sensor-controlled wind-off
- Different wind-on speeds for winding directions

TAPE MATERIALS

- Most thermo-formable materials available on the market (pre-slit thermo plastics)

TAPE WIDTH RANGE

- Single: 1 x 8 mm, 1 x 12 mm, 1 x 16 mm, 1 x 24 mm
- Dual: 2 x 8 mm, 2 x 12 mm

FACILITIES

- Power supply: 25 A / 4.7 kW
- Compressed air supply: min. 6 bar (90 psi), oil- and waterfree

ENVIRONMENTAL CONDITION

- Room temperature: 23 °C ± 5 °C
- Humidity: 50 % ± 10 %

DIMENSIONS

- Height: 2315 mm
- Length: 1900 mm
- Depth: 905 mm
- Weight: 530 kg

THROUGHPUT

- Single row up to 300 meter / hour depending on cavity size & used material
- Dual row up to 600 meter / hour depending on cavity size & used material



DUAL ROTARY

CT 12/88 D

LINEAR TAPE FORMING SYSTEM FOR BASIC PRODUCTION

The linear carrier tape forming system CT 12/88 D uses a common method of tape forming: First, the tape is pre-heated, and then the forming tools are applied stroke by stroke. With the optional "Deep Pocket Stamping" feature, a cavity depth of 30 mm can be achieved. This linear forming system has a maximum throughput of 330 meters per hour, depending on the cavity size, the material used, and the thickness.

KEY FEATURES

- One machine for all applications on linear forming
- 4th generation, meeting all current production demands
- Low tooling costs with easy structure
- Up to 30 mm cavity depth through optional "Deep Pocket Stamping"
- Able to produce 2 output rows from 12 mm tape width to 44 mm tape width



SYSTEM CAPABILITIES

DESIGN

- Welded steel frame with aluminium front & table plate on all workstations
- Easily accessible control electronics
- Automatic tape wind-on & production control
- Menu-driven software (different languages)
- Mechanism controlled by PLC
- Central control & programming unit
- CE-conformity

WORKSTATIONS

- Buffer station for wind-off
- Water-cooled forming station
- Buffer station with control unit for wind-on unit
- Wind-on
- Multi-level / crosswinding wind-on up to 400 mm

OPTIONS

- "Deep Pocket Stamping"
- Cutting station for tape width trimming for 12 mm & special 16 mm & 24 mm tapes
- Air booster for sharper pocket forming walls

SPOOLING SYSTEMS

- Automatic, sensor-controlled wind-off & wind-on system

TAPE MATERIALS

- Most thermo-formable materials available on the market (pre-slit thermo plastics)

TAPE WIDTH RANGE

- Single: 12, 16, 24, 32, 44, 56, 72 & 88 mm
- Dual: 2 x 12 mm, 2 x 16 mm, 2 x 44 mm

PROCESS PARAMETERS

- Max. cavity depth: 30 mm
- Optional "Deep Pocket Stamping"
- Punch pitch: 4, 8, 12, 16 & all pitch increments of 4 mm until 48 mm
- Standard punch stroke: up to 128 mm

FACILITIES

- Power supply: 16 A / 4.7 kW
- Compressed air supply: min. 6 bar (90 psi), oil- and waterfree

ENVIRONMENTAL CONDITION

- Room temperature: 23 °C ± 5 °C
- Humidity: 50 % ± 10 %

DIMENSIONS

- Height: 2255 mm (with signal lamp)
- Length: 3324 mm
- Depth: 656 mm
- Weight: Approx. 700 kg

THROUGHPUT

- Up to 330 meters / hour depending on cavity size & used material / thickness



LINEAR

CT-LM/D1 LASER MARKING

The Carrier Tape Laser Marking machine uses its advanced system to precisely laser-mark Carrier Tapes with individual data matrix codes.
With the alternative CT-D1 configuration, it is possible to laser vacuum holes with a diameter of up to 0.08 mm into the bottom of the cavity. Both machines can be operated in line.

KEY FEATURES

- High precision DMC dot size of 0.1 mm
- Accurate vision system for checking position and gradeability
- In-Line capability
- D1-hole size down to 0.08 mm

SYSTEM CAPABILITIES

SIZES OF THE DMC CODES

- DMC Code size from 10 x 10 to 18 x 18 dots
- Dot size of 0.1 mm
- DMCs between transport holes and / or between the cavities (depending on the size of the cavity and pitch)

WORKSTATIONS

- Buffer station for wind-off
- Laser station for DMC engraving
- Vision system for checking position and gradeability
- Cutting station for automated cutting
- Wind-on system for film reels or cross-winded reels up to 200 mm in width

SPOOLING SYSTEMS

- Automatic, sensor-controlled wind-off & wind-on system

TAPE MATERIALS

- Most thermo-formable PC and PS materials available on the market

TAPE WIDTH RANGE

- 8 mm - 24 mm

FACILITIES

- Power Supply: 16 A / 2.0 kW

ENVIRONMENTAL CONDITION

- Room temperature: 23 °C ± 5 °C
- Humidity: 50 % ± 10 %

DIMENSIONS

- Height: 1910 mm
- Length: 1233 mm
- Depth: 87 mm
- Weight: 263 kg

THROUGHPUT

- Up to 45,000 UPH, depending on the DMC size and pitch

OPTION: D1 HOLE LASERING

D1 HOLE SIZES

- Min. D1 hole size of 0.08 mm
- Max. D1 hole offset of 0.01 mm
- Min. pitch of 2 mm

WORKSTATIONS

- Buffer station for wind-off
- Vision system for pre- and post-inspection
- Laser station for D1 hole cutting
- Wind-on system for film reels or cross-winded reels up to 200 mm in width

THROUGHPUT

- up to 15,000 UPH, depending on the hole size and pitch



LASER

CARRIER TAPE DEFINITION



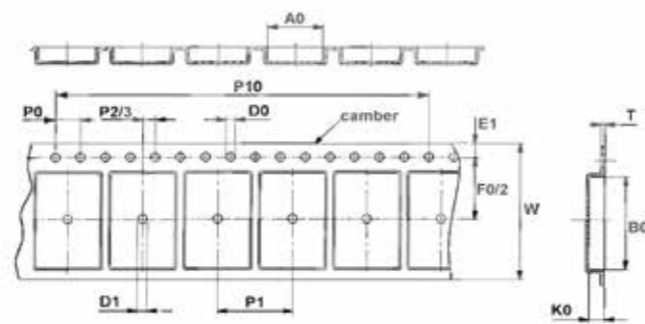
LEGEND

- A0** Pocket length (specified with A1, A2, ...; x-direction)
- B0** Pocket width (specified with B1, B2, ...; y-direction)
- K0** Pocket depth (specified with K1, K2, ...)
- W** Tape width
- T** Tape thickness
- E1** Distance from transport hole to cutting edge
- F0** Distance from center of pocket (center of B0) to center of transport hole (y-direction)
- F2** Distance from center of pocket hole to center of transport hole (y-direction)
- S0** Distance center around transport hole to center oval transport hole (y-direction)
- P0** Distance between two transport holes
- P1** Distance from pocket to pocket
- P2** Distance from center of pocket (center of A0) to center of transport hole (x-direction)
- P3** Distance from center of pocket hole to center of transport hole (x-direction)
- P10** Distance between ten transport holes
- D0** Transport hole diameter
- D1** Pocket hole diameter
- D2** Second transport hole diameter (x-direction)
- D3** Second transport hole diameter (y-direction)

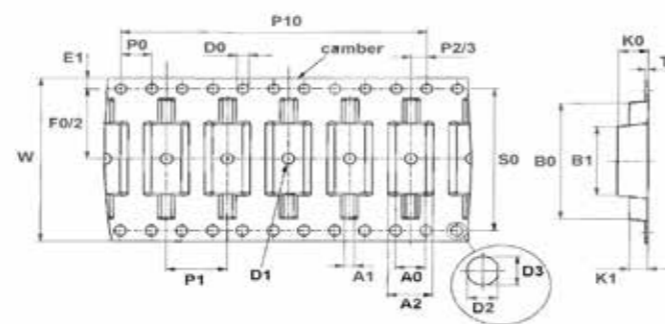
Definition of camber (curve of tape)

- camber (single reel): $\leq 1.0 \text{ mm} / 250 \text{ mm}$
- camber (crosswinding): $\leq 2.0 \text{ mm} / 250 \text{ mm}$

Example for rotation tape



Example for linear tape



CARRIER TAPE DIMENSIONS

Example for rotation tape

Ident number	Tool on stock	W	Ao	BO	KO	P	t	Contour 0/1	
LO-53	MB SP 35/3-2/1,0	35	4,10	2,10	1,00	6,65	0,20	Spacer	
LO-56	MB SP 35/2-1/2,0	35	4,00	2,00	2,00	2,66	0,20	Spacer	
LO-1973	MB SP 35/2-3/1,15	35	4,03	1,03	1,12	8	0,20	Spacer	
LO-194	MB SP 35/3-3/1,2	35	4,40	1,30	1,20	6,65	0,20	Spacer	
LO-1843	MB SP 35/4-5/0,8	35	5,00	2,00	1,00	6,65	0,20	Spacer	
LO-54	MB SP 35/3-1/0,8	35	7,5	2,00	0,8	15	0,20	Spacer	

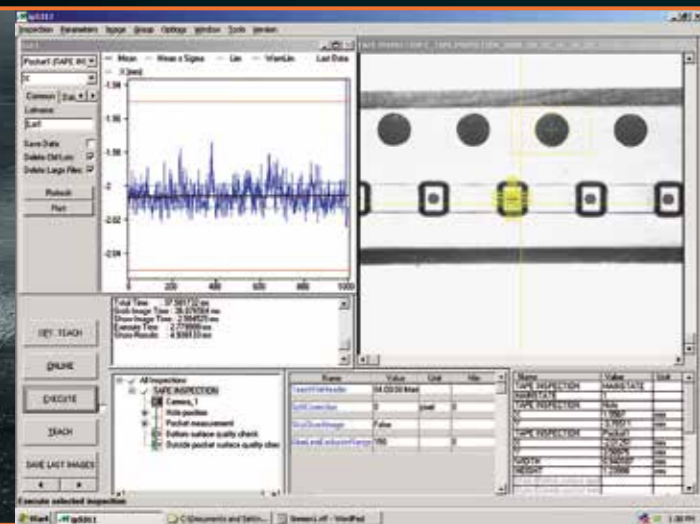
Spacer tape to protect the IC module on the reel

- Available material: polycarbonate
- Conductive
- Softening temperature: 154 °C

Customized solutions available

MUEHLBAUER VISION FOR 100 % QUALITY OUTPUT

To ensure 100% quality output, all our systems are available with the optional Muehlbauer Vision feature, which displays all inspection results and recognizes any deviations in the P2, F0, A, and B dimensions.



YOUR ADVANTAGES

- Immediate identification of quality problems
- Increased throughput & productivity
- Improved cost of ownership
- Highest quality standards
- No influence on equipment or machine throughput
- Less waste of material due to the fast failure identification

MATRIX SCAN

The matrix scan is another means of ensuring consistent quality, regardless of pocket size or tape width. Muehlbauer systems provide customers with the confidence they need to deliver superior tapes and ensure the utmost security when transporting highly sensitive components.

IN-HOUSE PRODUCTION COMPETENCES IN CARRIER TAPE PRODUCTION

At Muehlbauer, we also produce Carrier Tapes in our own facilities. We offer:

SMALL & THIN BARE DIE GEOMETRIES

- Incl. vacuum hole up to 0.08 mm
- 2.0 mm pitch
- 8.0 mm tape width

HUGE PORTFOLIO

- Positive or negative forming
- Linear forming
- Spacer tape for IC modules
- Single or multi-row

CUSTOMIZED SOLUTIONS

Contact us for any specific carrier tape requirements. Our experts will be glad to assist you.

PRODUCTION CENTERS IN MALAYSIA AND GERMANY

OPEN TOOL LIST

For more information about our specific products, please visit our website:
www.muehlbauer.de/carrier-tape



SYNERGIES WITH DIE SORTING

Die sorting and carrier tape solutions are closely linked in semiconductor backend production. Sorted dies are directly placed into carrier tape for safe transport, storage and further processing.

SEAMLESS FLOW



DIE SORTING

Mühlbauer die sorting solutions stand for precise handling, reliable inspection and maximum process stability. But this is only the beginning – Mühlbauer goes far beyond die sorting, delivering fully integrated solutions that seamlessly extend into downstream handling and packaging processes.



CARRIER TAPE

Sorted dies are directly placed into carrier tape, ensuring safe transport, secure storage and reliable processing in automated production environments. Mühlbauer develops customized carrier tape solutions tailored to specific product requirements, enabling maximum protection and process efficiency.



COVER TAPE

The carrier tape is sealed with cover tape to ensure secure fixation and protection of sensitive components throughout transport and handling. With perfectly matched cover tape solutions, Mühlbauer guarantees a reliable final packaging process and a smooth transition to shipment and customer integration.



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