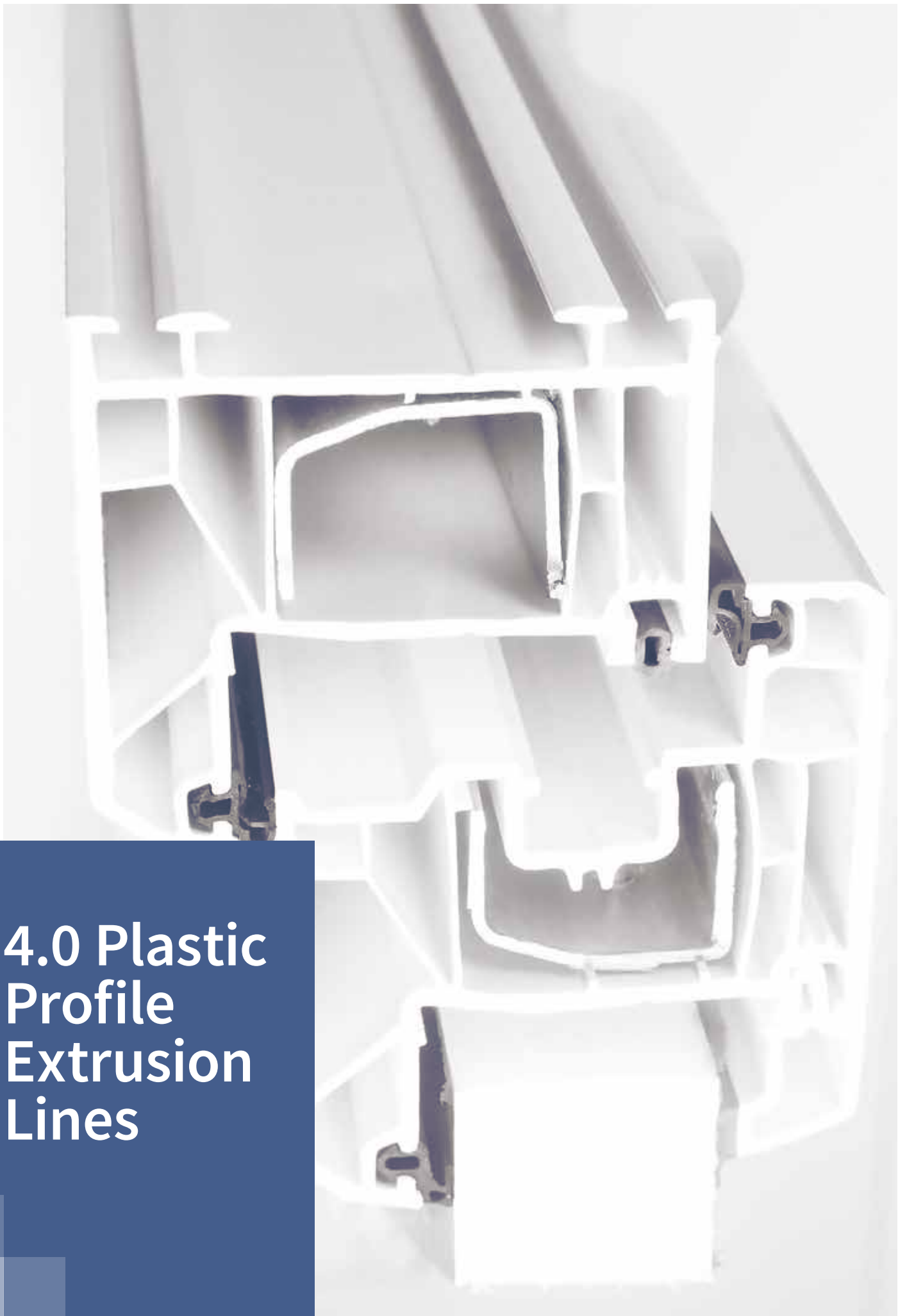


Your Extrusion Allies



PROFILES EXTRUSION

4.0 Plastic Profile Extrusion Lines



Extrusion Lines for technical and window profiles

Made in Italy Quality

Choosing Bausano means pick out a strategic partner that can help you to process plastics. We design and manufacture customised extrusion lines completely MADE IN ITALY for the production of pipes, granules, profiles, medical tubes and pockets in thermoplastic materials. The quality of the extruders and the products is unquestionable: the best technology at the service of the plastic industry, to improve productivity and reduce energy consumption.

The constant technical development and innovation of the MD twin-screw and E-GO single screw extruders enables Bausano to offer a comprehensive range of auxiliary equipment and accessories for the extrusion of rigid and flexible profiles.

Our extrusion lines are personally designed and installed in-house to guarantee perfectly matched and complementary components that ensure high efficiency, energy-efficient production and more important excellent end-product quality. Plastic extrusion is the process of transforming a fixed, cross-sectional profile by forcing raw materials through a die. The raw materials are fed from the top of the extruder through a hopper into the barrel of the extruder and then heated and mixed for production. The melted plastic is pushed into the die, which transforms the plastic into the desired shape of profile. The compound is then pushed through the extrusion tool, exceeded through a chain of forming gates and is cooled with chilled water. Plastic profiles are extruded in continuous lengths which is achieved by pulling the finished product out of a die.

The profile then is passed through an automated cutting system, that will cut it into pre-determined lengths. At Bausano, we are committed to manufacturing high quality extrusion tools that meet your expectations, are delivered on time and on budget – all supported by superior customer service. We understand that the extrusion lines components and parts we deliver to you are critical to the performance of your finished products and that the quality of our extrusion lines impacts the quality of your products.

We have a fully equipped in-house CNC machine facility, which allows us to be very efficient in the production process of customized extrusions. This is particularly helpful for our customers because we can easily make modifications to the tooling prior to approval. It also gives us complete control over quality as we are accredited with the ISO 9001:2015 Quality Management System.



The Plastic Extrusion Process Simplified

The plastic extrusion manufacturing process creates two-dimensional shapes from melted, raw plastic material. While details may vary based on the unique customized project, the plastic extrusion process in general follows these steps:

- Raw plastic in the form of granules or resin is fed into a hopper/extruder
- Raw plastic travels to the feed throat and onto a large screw within the barrel
- The plastic is heated until the melting point of the specific material is passed
- The melted plastic is mixed when it is along the screw, after which it flows across the profile die head. This step is critical to remove any contaminants or inconsistencies in the plastic
- The plastic is then forced through a die where the profile is extruded in a continuous shape

Due to the continuous shape of the profile, extruded plastics often undergo other processes such as cutting, punching, bending, or forming, to reach the final shape, design or technical specifications.



Benefits of our in-house extrusion lines design

We design our extrusion lines with the same goals every day:

- Development of solutions that solve the everyday problems of people working in this sector
- Efficiency and reduction of energy consumption and scraps production
- Improve our systems, ensuring that their life cycle is sustainable
- To simplify the electronic control panels of the machines, to make them easy to use also by unspecialised operators

Our single and twin-screw extrusion machines excel in producing technical profiles, window profiles, vinyl siding, and profiles of wood and natural fiber plastic composites (WPC). We can help with challenging projects that require complex system solutions for thermal sensitive compounds, complex shapes or precision extrusion.

In addition, we utilize sustainable, environmentally responsible manufacturing practices, to minimize waste and maximize energy efficiency in our manufacturing. We can assist you in selecting more environmentally friendly thermoplastic alternatives for your project.

Profiles Extrusion Materials

Extruded plastic profiles are used in the automotive, construction, marine and household industries.

Some of our most popular profile material include:

- **PVC profiles** are very cost-effective for general purpose applications, making them one of the most popular non-latex profile materials
- **Polyethylene profiles** feature good flexibility, are lightweight, and are simple to produce
- **Polypropylene profiles** are easy to produce, have fair impact strength, and good chemical resistance
- Polystyrene profiles are affordable, offer outstanding electrical properties, and maintain good dimensional stability, but shouldn't be used with high temperatures
- **Thermoplastic elastomers** feature high flexibility, absorb vibrations well, and retract to their original form after being elongated





The main features

RIGID PVC

Economical and tough, Rigid PVC, or RPVC, is inherently resistant to most chemicals. Rigid PVC can be offered in weather resistant, high tensile, impact resistant, clear, and opaque formulations that are easily produced. RPVC is the third most produced plastic material and is often used in construction applications like doors and windows profiles.

FLEXIBLE PVC

Flexible PVC is offered in a wide range of consistencies from rubbery soft to semi-rigid. This type of material is generally used for profile extrusions because of its resistance to abrasion and capacity to insulate. Thanks to its specific physical properties, flexible PVC can be utilized in place of rubber as it can be a more reliable and sometimes more cost-effective option. Gaskets can be an example of that.

ACRYLONITRILE BUTADIENE STYRENE (ABS)

Acrylonitrile Butadiene Styrene has a good chemical resistance to most non-aromatic compounds. ABS is a rigid, versatile, and high-impact plastic and its application is primarily where outdoor exposure is not required. ABS has a satin to high gloss finish and is available in different, also customizable, colors.

POLYETHYLENE (PE)

Polyethylene ranges from flexible (LDPE) to rigid (HDPE) and it is an inexpensive material. Due to its properties PE is good for plastic profile applications requiring low surface resistance. Polyethylene also has very good chemical resistance and is available in different colors.

THERMOPLASTIC ELASTOMER (TPE)

Thermoplastic Elastomers have the efficiency of plastic but also the look, feel and elasticity of thermoset rubber. Because TPEs are thermoplastics, their melt-processability makes them very suitable for the custom profile extrusion process.

Twin-Screw Extruder Series

Bausano offers a wide range of counter-rotating twin screw extruders, providing an optimal and tailor-made solution for every need and application. All our Twin-Screw Extruders Series have different lengths and drive motors to assure a proper plasticizing and output. Additionally, they are synchronized with the various components of the line.

- High specific output for gentle plasticization of PVC
- Optimized material feeding system for stable production of PVC-U powder
- Equipped with degassing zone
- The patented MULTIDRIVE technology of Bausano MD Extruders and the long-standing experience in plastic processing guarantee performance and great reliability over time

TECHNICAL DATA

Models		MD 52	MD 66	MD 75	MD 92	MD 118	MD 130
Screw diameters	(mm)	52	66	75	92	118	130
L/D ratios	L/D	23	19-30	24-30	25-30	20-26-30	25-30
Heating zone	no.	4	4-6	5-6	5-6	5-7-8	7-9
Cooling zone	no.	3	3-4	3-4	4	4	5-6
Total power	(kW)	40	45-55	85-100	127-165	190-210	240-260

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Application

The extrusion technique allows you to create products with even very complex geometric shapes, but always with a longitudinal development, so in the direction of exit from the extruder die head.

Among the three-dimensional profiles with large surfaces, the most interesting ones are certainly represented by window profiles, these have many partitions (any comb voids or sectors) inside that make them structurally resistant and thermally insulating.

PVC PROFILE MAIN APPLICATIONS

- Window profiles
- Door profiles
- Wood-plastic composite profiles
- Ceiling profile
- Concrete profile
- Panels
- Sidings
- Shutters
- Window sills
- Frames
- Sealing strip profiles
- Special customer requests

VINYL SIDING

Vinyl siding is made from extruded PVC, a durable lightweight plastic. It doesn't dent, rot, or corrode, and is resistant to water. Most of today's formulations are a co-extrusion of a Ultraviolet-resistant capstock and a resilient substrate.

WINDOW PROFILE

Probably the best example of very complex profile is the one extruded to make the sash, frames, and various other profiles needed to assemble windows. These are very complex shapes with multi hollows on the interior of the parts to improve structural strength and thermal performance.

FENCING

Hollow profiles, often with internal ribs to add structural strength, are made in the shape of boards, pickets, and posts to build low maintenance privacy, picket, and rail fencing.

Single-Screw Extruder Series

Our company successfully developed a small profile production extrusion line suitable for the different requirements from clients. This small profile production line is based on single screw extrusion technology. There are many outstanding features of this small profile line, like good plasticizing, high output capacity(kg/h) and low energy consumption.

- Extruder barrel made in nitrided or bimetallic steel
- Extrusion screw nitrided or hard metal coated
- Made in Italy certified reducers
- AC motors in a laminated package, driven by inverter

TECHNICAL DATA

Models		E-GO 45	E-GO 60	E-GO 70	E-GO 75
Screw diameters	(mm)	45	60	70	75
L/D ratios	L/D	25-30	25-30	25-30	25-30
Heating zone	no.	4	4-5	4-5	4-5
Cooling zone	no.	4	4-5	4-5	4-5
Total power	(kW)	25-30	41-50	41-60	57-65

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Application

Extruded plastic profiles can be used in a wide variety of applications. Examples of application are the lighting industry and shelf construction, for high-quality displays or many other areas: There aren't any limits on potential application, profile extrusion is highly customizable. With an extrusion line based on a Single Screw Extruder, First-class quality profiles are extruded with precision and surface quality, to create a precise fit and high functionality.

Profiles are Extruded and Co-Extruded in Polycarbonate, Acrylic, ABS, PC/ABS and PVC in Clear, Opal, Satin and Colored materials with various surfaces to satisfy the most particular technical needs and requirements of customers.

PLASTIC PROFILES FOR **LIGHTING**

- Technical
- Industrial
- Architectural
- Rail Train and Subway
- Outdoor & Indoor
- Illuminated advertising

PLASTIC PROFILES FOR **LED**

PLASTIC PROFILES FOR **ELECTRONICS**

PLASTIC PROFILES FOR **FURNITURE AND KITCHEN**

PLASTIC PROFILES FOR **AUTOMOTIVE**

- Bus and Trains

PLASTIC PROFILES FOR **BUILDING**

- Partitions Wall Systems
- Glass Wall Partitions



Coextrusion

The co-extrusion process combines two or more different materials in a single extrusion process. Two or more extruders deliver the desired plastics to a single extrusion head, or die, to manufacture the part. The materials can be combined or layered, using different compounds for the layers.

Introducing a coextruder in a profile extrusion line allows to produce:

- Profiles with two layers using double hardness using multiple resins
- Simple and complex shapes, according to customer project
- Small and large shapes
- Wide range of thermoplastic materials, including PVC, ABS, HDPE, TPU, TPE and HIPS

While every project is different, some of the more common thermoplastic coextrusions line include:

- Layered clear and opaque materials
- Different colored materials
- Rigid and flexible materials
- A thin capstock over a thicker substrate
- Flexible “living hinges” that join two rigid materials and more

In addition, we utilize sustainable, environmentally responsible manufacturing practices, to minimize waste and maximize energy efficiency in our manufacturing. We can assist you in selecting more environmentally friendly thermoplastic alternatives for your project.

Profile Die Head

The profile die heads are designed to make extruded shapes along the desired profile and they are associated to a tailor designed cooling system. Bausano relies on well-known partners to deliver the tooling for its complete profile lines.

Our partners can manufacture dies and calibrators for the extrusion of profiles in RIGID PVC, FOAM PVC, COEXTRUDED AND SOFT PVC, ABS, PC, POLYAMIDES PA 6.6. and WPC, typical of the automotive, furnishing and building fields. The equipment is made using stainless steel with high content of chrome, with one or more exits according to the customer's needs.

The planning of the dies and calibrators is carried out starting both from drawings of the profiles supplied by customer and from our drawings studied in close collaboration with customer in the way to respect his exigencies and the production constraints. This preliminary phase is followed by the real planning, that defines the geometry of the tool and the working phases of the raw steel block which the final mould must be obtained from.

Calibration Tool

The calibration toolings are made from stainless steel for better life due to the abrasive nature of filled plastics rubbing over the polished surfaces. The internal surface is cut in the shape of the desired profile and highly polished for low drag resistance. Cooling channels are cut into the tooling for flow of the critically important cooling water. In addition, channels are cut into the tool for vacuum to draw the plastic part out against the calibrator wall to make good contact to ensure cooling and obtaining the proper dimensions.





Cooling Bench

CENTRALIZED CONTROL PANEL

The centralized location of the extrusion line control panel near the die allows for convenient and efficient management of the entire profile extrusion line. There is the option to mount the panel to a swivel boom.

The modular design of Bausano's profile calibration bench ensures accurate and efficient set-up. It is possible to save time changing the profile calibration module with another module which has been preset, switching quickly from one profile to another. For exceptionally wide profiles Bausano offers an auxiliary tank mounted on the calibration table after the initial calibration tooling to offer additional cooling for the profile.

The cyclone unit ensures higher vacuum stability in the tanks, and the improved positioning of the water discharge pump ensures that the extracted water is safely returned to the water circuit. The upstream dirt particle filter protects the water discharge pump from contamination or even failure.

ADVANTAGES:

- Reduces vacuum fluctuations to the technical minimum
- Avoids vacuum shocks, thus preventing profile surface defects
- Possibility of controlling vacuum pumps by means of an inverter

TECHNICAL DATA

	BP3/2P4/ML	BP6/2P4/MB	BP6/2P5.5/MB	BP6/3P7.5/MB	BP10/4P9/MB
Length of calibrator holder beam (mm)	3500	5600	5600	5600	10000
Longitudinal transverse of calibrator holder beam (mm)	1000	1000	1000	1000	1000
Transversal displacement (mm)	40	40	40	40	40
Vertical adjustment (mm)	880-1130	880-1130	880-1130	880-1130	880-1130
Vacuum pump (nxkW)	2x4	2x4	2x5.5	3x7,5	4x9

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TECHNICAL FEATURES:

- Base made of electro welded profiles, with lateral inspection panels locked by quick hooks
- Stainless steel water collecting tanks with free discharge
- Liquid ring vacuum electro pumps, each with asynchronous 3-phase motor
- Groups distributing cooling water/vacuum in stainless steel. Each element has cooling/vacuum sockets
- Adjustable control of the line centralized on panel board near to the front head
- Calibrator-holder beam, made of special hardened and anticorrosion aluminium profile with:
 - ✓ Longitudinal translation driven by motor reducer, with chariot sliding on self-lubricating polyamide guides
 - ✓ Transversal displacements (rear and front), by means of screw and scroll
 - ✓ Electronic Control Panel for adjusting
 - ✓ Vertical adjustments by means of mechanical jacks

An option designed to save energy

The Bausano calibration bench can feature a closed water circuit. With this closed water circuit the used cooling water from the calibrations is collected. The tanks are filled with cooling water from the collection pipe and the excess water is returned directly to the water tank. Using the closed water circuit reduces cooling water consumption significantly, while also preventing unnecessary heat absorption of the cooling water and saving energy during water treatment.





Haul-off unit

Bausano's profile take-off units are driven by dual independent epicyclical gear motors with variable frequency inverters for smooth continuous speed adjustment over a wide range.

The upper tilting track is pneumatically actuated with micrometer adjustment; the lower track is equipped with a mechanical vertical adjustment. The traction pads, which are of a sectional design for easy replacement, are easy to adapt to specific profile requirements.

Whether the profile is small or large that requires a lot of power, Bausano's take off units can manage it without leaving marks or deforming the shape.

TECHNICAL DATA

	TNP10-50N	TN 10-70N	TNP15-110ML	TNP20-150MB	TNP20-250MB	TNP80-250MB	TNP120-250MB
Track length (mm)	belt 500	belt 700	1100	1500	2500	2500	2500
Track width (mm)	100	100	150	200	200	800	1200
Max track opening (mm)	70	100	95	160	160	160	160
Hauling speed (m/1')	0,25-120	0,25-120	0,2-10 1-25	0,2-6 0,8-24	0,2-6 0,8-24	0,2-2,7 0,8-10	0,2-2,7 0,8-10
Take off force max (KN)	2,4	7,6/1,5	23	70	70	50-192	50-192

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Caterpillar Haul-off

The Bausano pad haul-offs are characterised by their robustness and versatility. Easy to use, robust, versatile, compact and simple to maintain. The tracks are easily accessible for fast replacement of the cleats:

- Different dowel dimensions guarantee gentle removal of the profiles without influencing the profile geometry or surfaces (cleat marks)
- Special cleats adapted to the profile shape
- Cleat quick-change system
- Both chain carriages are fully accessible at the front for easy pad exchange

For both versions, we can propose a large range of contact lengths and widths, min. and max. linear speeds as well as haul-off forces with associated torque.

All our chasses are precision-welded in order to guarantee overall stability.

Belt Haul-off

Bausano supplies a wide range of haul-off belts which ensure high resistance to abrasion, excellent grip properties and a precise finishing that guarantee an homogeneous coating, for a perfect adherence to the extruded material.

The Bausano belt haul-offs are used for continuous extrusion of profiles. They are known for especially consistent performance even at high production speeds. The belts are driven by brushless AC servo drives. Both belts can be mechanically or pneumatically adjusted in height. The belts can also be supplied with a cellular vulcanised or rubber layer.





Cutting Unit

KNIFE HEATING SYSTEM OPTION

An alternative to the standard cutter is the knife heating system. Heating the knife blade can improve cut quality for some rigid plastic extrusions. A hot knife can also reduce the number of imperfections of plastic that can form when cutting some products. The blade is heated by heating blocks located on both sides of the knife. The blade stops in this position between the cuts. A thermocouple controls the temperature of the blocks and prevents overheating.

Bausano has carefully engineered the vertical profile cutter to satisfy the most stringent safety requirements without a loss of operational functionality.

All standard production adjustments, cut-off length, feed speed and carriage return are controlled electronically. Bausano offers a special Horizontal Cutter for exceptionally wide profiles. The optimized Bausano cutters ensure clean perfect cutting, for any profile, from basic to even material combinations profiles.

ADVANTAGES:

- Variable cutting speeds for more flexibility
- Electronic device for the pre-setting of cutting length, controlled by encoder
- Ball-bearings sliding on hardened and chrome-plated guides
- Milling cutter-holder carriage

Bausano's profile cutters also have the option for movement of the carriage with the brushless motor (for more precise cutting).



VERTICAL CUTTER

	TAV/90	TAV/160
Cutting system	millar	millar
Cutting movement	vertical	vertical
Max cutting stroke (mm)	95	160
Min cutting length (mm)	300	500
Cutter power (kW)	1,5	1,5
Power of suction motor (kW)	1,1	1,1
Air consumption per cycle (NI/cy)	1,5	1,5

HORIZONTAL CUTTER

	TAO/500	TAO/800	TAO/1200
Cutting system	millar	millar	millar
Cutting movement	horizontal	horizontal	horizontal
Max cutting stroke (mm)	600	850	1250
Min cutting length (mm)	200	200	200
Cutter power (kW)	1,5	1,5	1,5
Power of suction motor (kW)	2,2	2,2	2,2
Air consumption per cycle (NI/cy)	2	2	2

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