



Low Pressure

Metering Machines for Polyurethanes

General Purpose Applications

Micro-Shots & Small Outputs

High Outputs

Silicones

Epoxy Resins

Elastomers

cannon

POLYURETHANE TECHNOLOGY

Low Pressure

Modern approach: continuous evolution

Forty years of experience in the mixing, metering and foaming of polyurethanes, more than 10,000 metering machines installed around the world and an ongoing commitment to R&D, have all contributed to continual technological improvements for Cannon machinery, especially in terms of quality, performance and safety.

The success of the Cannon Group and its leading position in the world of polyurethanes is based on the total commitment towards customers and markets, being able to accept ever new and exciting technological challenges, supply an efficient technical consultancy, as well as sales and after-sales service.

The well-established collaboration with the customer together with the thorough analysis of the requirements by a continuously developing market are the qualities which form the basis of Cannon's ability to manufacture some of the most modern industrial solutions available today and, in many cases, to influence and anticipate future manufacturing trends.

Progress is driven by the ever growing market demand for metering machines requiring simplicity of management, high technical and quality standards, efficiency and reliability, with the need to keep investment costs low to produce more and implement highly-automated processes.

Cannon low-pressure machines are the actual response to these needs. They can solve the production problems of the small and medium-size business, being very well conceived and at the same time having advanced technical and technological content.

Their use has certainly been shrunk by the advent of more modern techniques and equipment, however the specific nature of some applications (low outputs, small production volumes) requires features, that only the low-pressure foaming process can offer.

For those reasons and also thanks to the development of alternative and more ecological washing systems based on chloride-free solvents, the low pressure technology it is still nowadays the most suitable, competitive and some times, the only possible solution.

Low pressure: high reliability

For general purpose applications Cannon basically produces two families of low-pressure machines, which can be used in different foaming processes:

- Cannon "**B-System**", are characterized by submerged pumps in the component tanks. This is the right solution to avoid problems of potential leakages from the pump seals, reducing maintenance and environmental impact.
- Cannon "**B**", where pumps are traditionally positioned outside the tanks. This "basic" machine configuration is extremely suitable for those users who require frequent changes of production.

Both models are equipped with volumetric gear pumps, ensuring high reliability, accuracy and precision of the component metering.

As a result of the compact, rational and well-designed machine, tanks, dosing group, head boom and control panel are placed on a single frame, while the open structure allows excellent accessibility to all the parts for easy maintenance and cleaning operations.

Cannon has selected the world's best-known suppliers, to guarantee that the most important parts - control systems and electronics instruments, mechanical and hydraulic devices - are reliable and readily replaceable.

These units are easily transportable, need less room for installation, but above all do not need additional cabling, being ready to start the production, i.e. "**Plug and Play**"!

The main information on parameter values and processing data are managed and monitored in real time by an operator panel interfaced with a PLC.

Flexible Padding for Furniture Applications (Courtesy of B&B Italia).

Industrial Filters.

Thermal Insulation for Medium and Small Sized Parts.

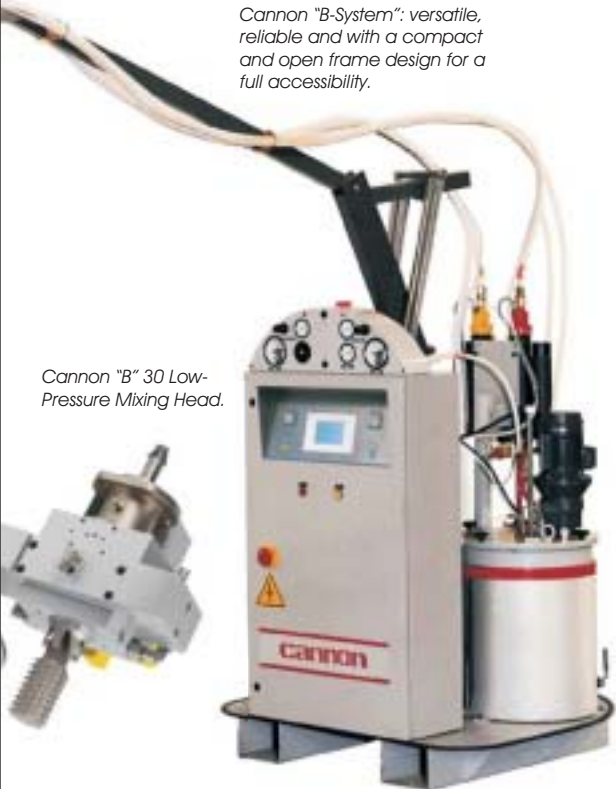


Rolling Shutters and Technical Parts.



Cannon "B-System": versatile, reliable and with a compact and open frame design for a full accessibility.

Cannon "B" 30 Low-Pressure Mixing Head.



According to the machine model and to specific customer's requirements, the control interface is available in different intuitive and easy-to-use configurations: LCD display with keyboard or Touch Screen™ panel.

It is also possible to choose a dedicated machine version supplied with a "closed loop control" of the component metering. In this case, the system ensures that set values are constantly compared with those measured in real time.

Whenever deviations beyond the tolerances allowed are recorded, the control system automatically adjusts the parameters, keeping output and ratio values constantly stable.

Rigid Polyurethanes for Furniture Applications (Courtesy of CRB Tecnapol - Italy).



The quality of the end product heavily depends on the ability to get to an efficient mixing in order to obtain a homogeneous mixture, such as also upon the correct and precise pouring and distribution of the foam within the mould and foaming cavities.

Cannon offers a wide and complete range of low-pressure heads which can be combined with a great variety of mixers characterised by different shapes and designs, responding to the most specific application needs.

Cannon heads guarantee, up to the injection nozzles, the mechanical separation of each component stream thus avoiding any contamination, obtaining excellent foam quality and preventing any risk from blocking the mixing head during the foaming process.

Basically, the component pressures are manually adjusted by means of conical injectors mounted on the mixing head.

The internal head's geometry has been specifically designed to avoid potential pre-flows, placing a dedicated pre-mixing area before the main chamber.

The washing cycle is automatic and can be set by means of a timer.

Respect for the environment

The optimisation of power consumption as well as the reduction of environmental impact resulting from the emission of polluting gases, are today main topical subjects on which Cannon is highly focused in order to get towards more right and balanced solution for a sustainable growth.

Aimed at improving and safeguarding working conditions, Cannon has developed dedicated washing systems, with low environmental impact and compatible with a wider range of machine available on the market:

- Cannon **Water Wash** has been specifically designed for processes using formulations with low viscosity and reactivity (e.g. rigid low-density polyurethane foams).

This system operates a mechanical cleaning action based on the detergent properties of water when it is continuously recycled close to the mixing head with a temperature of about 75-80°C, optimising the washing efficiency.



"Wood-imitation" Parts for the Furniture Industry (Courtesy of Niccolò Esposito - Italy).



Roller Blade Wheels is typical Application of Elastomer Casting Technology.



Seats for Cycles and Motor-Cycles.

Low Pressure

- Cannon **EcoCleaner** represents the right solution for medium-high viscosities (integral, micro-cellular foams and particularly reactive flexible foams).



Cannon "EcoCleaner" ecological washing system for free chloride cleaners.

This washing unit allows the use of "ecological" chemical solvents, i.e. chloride free cleaners.

The well-tested efficiency of this device shows that cleaning does not need to be frequently made as the solvent recirculation system allows that the detergent to be used for several cycles, until its cleaning power is exhausted.

Moreover, the final washing waste is generally not a toxic one and, in some cases, it can be considered as a common industrial waste.

Colour the Shapes

Sometimes a production change only requires a colour switch over: basically a quite simple and easy operation that in most cases, could cause intolerable inefficiencies due to long machine downtimes and consequent waste of raw materials.

The Cannon Colour System gives maximum production flexibility, the opportunity to use neutral raw chemical resins and allows the quick colour change, offering significant advantages in terms of cost reductions.

In particular, thanks to a dedicated distributor mounted on the mixing head, several independent colour streams are ready to be used.

Something "Special"

Working in highly specialised sectors and niches, standard "catalogue" machines are more often not enough to fully satisfy the customer's requirements.

On the contrary, the design, manufacturing experience and production flexibility have to be analysed case by case thoroughly and carefully to engineer turnkey, customised and competitive industrial systems.

Micro Shots and Low Outputs

The electrical, automotive, appliance, filter and packaging industries are some of the most important users of foaming processes where micro-shots with very low outputs are required.

They must respond to ever-growing market demands, which means that they need to maintain high levels of productivity and quality, at low costs.

A wide range of applications has been already developed: filters for automotive and conditioning/ventilation systems, gaskets and seals, insulation of small cavity parts,



PU Gaskets for Quarter Windows.

panel insulation for building, gaskets for quarter windows, industrial and street lamps, cooking plates and sinks, wire encapsulation and electronic device insulation.

Specific application niches do not only require to meter and mix polyurethanes formulation, to meet these particular needs Cannon engineered dedicated mixing heads, dosing equipment and processes able to pour other type of mixture with different physical properties such as silicone, elastomers and epoxy resins.

For these applications Cannon offers integrated solutions and complete "turnkey" systems including metering machines with a pouring capacity from 0,2 up to 30 g/s, together with automated systems to move the mixing head and load/unload the manufactured products, fully assuming the accuracy and the complete repeatability of the process.

- **Gasketing Technology** means a complete production system for PU gaskets based on an in-situ pouring process using a two-component polyurethane or silicon foam in order to create a seal or a gasket.

Foam-in-Situ Technology for the Production of PU Gaskets.



This component blend is poured into a cavity, a mould or directly applied onto a substrate, depending upon the application.

In particular, foam in-situ seals meet the most stringent requirements in terms of physical and mechanical properties,



sealing and insulating, preventing dust, moisture, lengthways and crossways water penetration and also dampening-out of vibration and sound.

For this specific application fields, integrated solutions for the automatic mixing-head handling based on Cartesian or anthropomorphic robots are also available to offer increased flexibility, ensuring higher productivity with extreme accuracy and repeatability.

Cannon Cartesian handling systems are equipped with an easy interface for the simple setting of all working parameters, such as pouring paths, speed and acceleration/deceleration ramps.

- **Potting Technology** is dedicated to the encapsulation of electrical devices and components (printed circuit boards, wires, capacitors, connectors, etc.) in order to provide a complete insulation and protection.



Potting Technology for the Electric/Electronic Industry.

For these specific application niches, Cannon has developed dedicated dosing units, specially designed to allow the use of polyurethane or epoxy resins.



These two materials, thanks to their intrinsic chemical and physical characteristics, are the most suitable for the applications where chemical resistance, adhesive and electrical properties are strongly required.

The mixing head is compact, ergonomic and light-weight with remote mixing motor. It has the possibility to mount either a dynamic or a static mixer, both available on the market.



Elastomer Casting Technology: roller blade wheels (Courtesy of Xero Wheels - Italy).

- **Silicones** are generally used for the production of technical articles (i.e. rolls and rollers for paper mills and printing, such as for bending machine) and soundproofing insulation.

The need to work with high viscosity components means that the metering machine must be equipped with pressurised tanks, frequency controls on all the motors and special flexible pipes improving the silicone flowability.

- **Elastomer Casting Technology**, for the production of technical articles: roller blade and skateboard wheels are typical applications.

Components are dosed at low or high temperatures.



Cannon "B" 30 Silicone Low Pressure Dosing Unit: able to work with high viscosity chemical components.



Potting Low Pressure Mixing Head.

Low Pressure



Cannon "B" 300 equipped with Water Wash and dedicated boom for mixing head handling.

The metering group is supplied with a pre-heating and degassing unit and it is also complete with heating unit for water/oil temperature control.

Moreover, the whole machine and the pipes where the components flow - to the mixing head - are equipped with devices to keep stable the working temperature needed for the elastomer components.

High Outputs

Blocks of flexible, semi-rigid and rigid foam, produced by discontinuous processes, are used for some specific applications in the insulation, furnishing and car industry sectors.

In this case the production lines require metering units, able to work at very high-outputs by pouring large quantities of material in a relatively short time.

Generally, these models are equipped with gear pumps, but are also available with screw pumps.

Again on request the system can be equipped with closed-loop output control by means of mass flow transducers.

Other applications concern the production of rigid low-density blocks for insulation, filled and compact compounds (e.g. with glass micro-spheres) for the insulation of "offshore" piping and rigid medium-density blocks.

Global Service

Customer satisfaction is the mainstay of Cannon's business philosophy as well as recognizing new trends and creating products and services enabling customers to keep up with competition.

With an extensive network of global sales & service operations, Cannon offers a useful and well-appreciated "plus", such as:

- prompt local service
- spare parts availability
- laboratory usage for machine evaluation
- laboratory usage for trials
- technical advice
- technical consultancy
- remote service connection
- direct help-line assistance
- periodical training courses



Blocks of Rigid, Semi-Rigid and Flexible Foam for Insulation and Furniture Industries.



Cannon has available a great variety of Mixing Heads and Mixers with different geometric shapes



Cannon "B" 30 dedicated to filled and compact compounds.

Technical Features

Machine Model		B-Sys 7	B-Sys 15	B-Sys 15 FL	B-Sys 30	B-Sys 60	B-Sys 60 FL	B-Sys 100
Min./Max.* Total Output (ratio 1:1)	kg/min	1.3 7.3	2.7 14.8	2.1 10.4	5.0 27.8	12.4 68.1	8.7 47.7	24.8 136.4
Min./Max.* ISO Output	kg/min	0.7 3.9	1.4 7.9	0.7 3.9	2.7 14.8	6.6 36.3	2.7 14.8	13.2 72.8
Min./Max.* POL Output	kg/min	0.6 3.4	1.3 6.9	1.3 6.9	2.4 13.0	5.8 31.8	5.8 31.8	11.6 63.7
Tank Vdume (each)	litres	90	90	90	90	90	90	90
Total Absorbed Power	kW	3.6	4.4	4.4	7.8	11.5	11.5	14
Air Consumption	NI/shot	100	100	100	130	130	130	130

* The output is calculated assuming a density of 1.0 kg/l for Polyol and 1.2 kg/l for Isocyanate. The absorbed power is calculated at 20 bar and takes account of all the electrical uses expected for the standard machine configuration.

** Dosing Unit with submersed pumps.

Machine Model		B 2	B 7	B 15	B 30	B 60	B 100	B 300	B 500
Min./Max.* Total Output (ratio 1:1)	kg/min	0.2 1.8	1.3 7.3	2.7 14.8	5.0 27.8	12.4 68.1	24.8 136.4	— 300	— 500
Min./Max.* ISO Output	kg/min	—	0.7 3.9	1.4 7.9	2.7 14.8	6.6 36.3	13.2 72.8	— —	— —
Min./Max.* POL Output	kg/min	—	0.6 3.4	1.3 6.9	2.4 13.0	5.8 31.8	11.6 63.7	— —	— —
Tank Vdume (each)	litres	40	70	70	70	70	70	300	500
Total Absorbed Power	kW	2.6	3.6	4.4	7.8	11.5	14.0	35.0	50.0
Air Consumption	NI/shot	100	100	100	130	130	130	180	180

* The output is calculated assuming a density of 1.0 kg/l for Polyol and 1.2 kg/l for Isocyanate. The absorbed power is calculated at 20 bar and takes account of all the electrical uses expected for the standard machine configuration.

** Dosing Unit with external pumps.

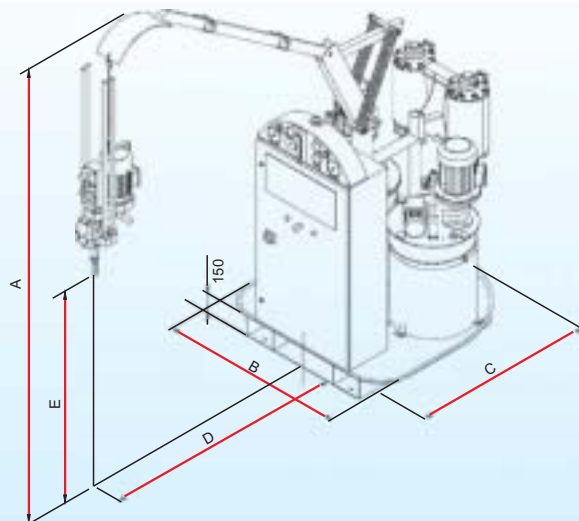
Overall Dimensions (mm)

B-System Dosing Units

A	: 2.600 mm
B	: 1.200 mm
C	: 1.200 mm
D	: 1.700 mm
E	: 1.000 mm

B Dosing Units

A	: 2.600 mm
B	: 1.140 mm
C	: 1.200 mm
D	: 1.900 mm
E	: 1.000 mm



Dimensions are related to machine range, except is made for B300 and B500 models.



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POLYURETHANE TECHNOLOGY

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Due to the continuous developments in the processes, all data contained in this leaflet are subject to variation by the manufacturer, without notification.

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