

# Mixing Heads

High & Low Pressure Technology

General Purposes

Multi-Component & Dual-Hardness Applications

Filled & Reinforced Formulations

Micro Shots & High Outputs

Spray & Cavity Filling

Pipe Insulation

Gaskets & Sealants

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**cannon**

POLYURETHANE TECHNOLOGY

# Mixing Heads



Cannon FPL range reliability, compactness and high performances.

## The Art of Mixing - The Core of a Polyurethane System!

Cannon offers a wide range of high and low-pressure mixing heads for polyurethane foaming, able to meet the different production and technical requirements of a great variety of applications, types of formulation, levels of output:

- from 0.20 g/s for micro-shot pouring
- up to 10,000 g/s used for fast-reacting polyurea systems
- from 2 up to 6 components mixed simultaneously.

## FPL /3

The **FPL/3** version is designed for all the applications requiring mixing of a third component. Basically, this additional component is metered directly into the mixing chamber by using the hole normally utilised for colour injection.

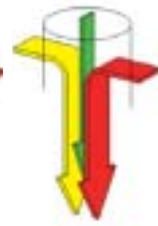
### Components Mixing

Radial Injection:



Poor Mixing

Axial Injection:

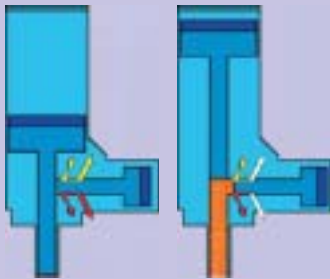


Efficient Mixing

Making the most of the high kinetic energy in the mixing chamber, already generated by the high pressure injection of the other components, the third chemical is generally dosed at a very low output.

Recycling

Pouring



Cannon FPL working sequence.

## HIGH PRESSURE

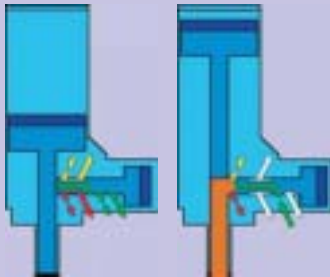
## FPL

The **FPL** model high-pressure mixing head offers many significant advantages in terms of quality, performance, productivity and environmental impact, such as:

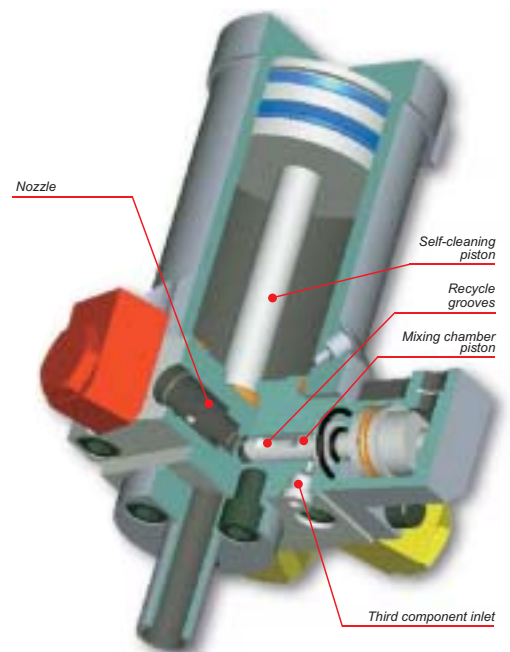
- homogenous mixing ensured by high-velocity impingement of components leaving the jets
- self-cleaning head: solvents are no longer required for head cleaning operations
- high repeatability of the pouring weight with pouring times less than 0.5 sec.
- manual or automatic regulation of the pouring pressure
- laminar flow granted also in case of open mould pouring.

Recycling

Pouring



Cannon FPL/3 working sequence.



Component	FPL 7		FPL 10		FPL 14		FPL 18		FPL 24		FPL 32	
	A	B	A	B	A	B	A	B	A	B	A	B
Min Recommended	10	10	25	25	45	45	90	90	150	150	250	250
Max Laminar Flow	70 (T.O.)		150 (T.O.)		300 (T.O.)		400 (T.O.)		700 (T.O.)		1850 (T.O.)	
Max Recommended	45	45	130	130	300	300	550	550	1000	1000	2300	2300

All values are calculated in cc/s, considering a component viscosity < 1000 cps. Where not different specified, all values are considered for each single stream output (T.O. = Total Output)

	FPL 10/3		FPL 14/3		FPL 18/3		FPL 24/3	
Output (cc/s)	Min	Max	Min	Max	Min	Max	Min	Max
Single Component	25	130	45	300	90	550	275	1000
Third Component	5	25	5	30	10	50	15	70

## FP2L

Cannon's **FP2L** series can be considered as the first evolutionary step of the FPL range towards the idea of a multi-component head.

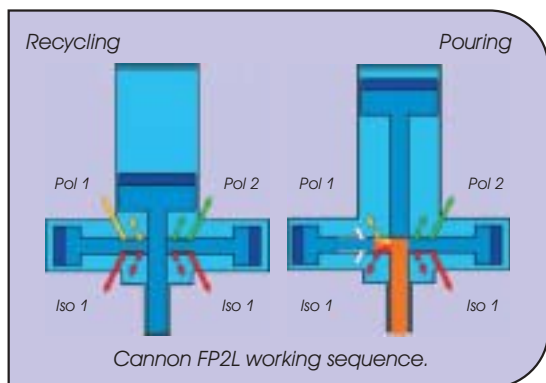
Basically, by connecting an additional mixing chamber mounted symmetrically to the existing one in a standard FPL head, it is possible to obtain a new double mixing chamber configuration.

*FP2L series  
a complete range of  
models dedicated to multi-  
component and dual-  
hardness applications for  
seating and flexible  
paddings.*



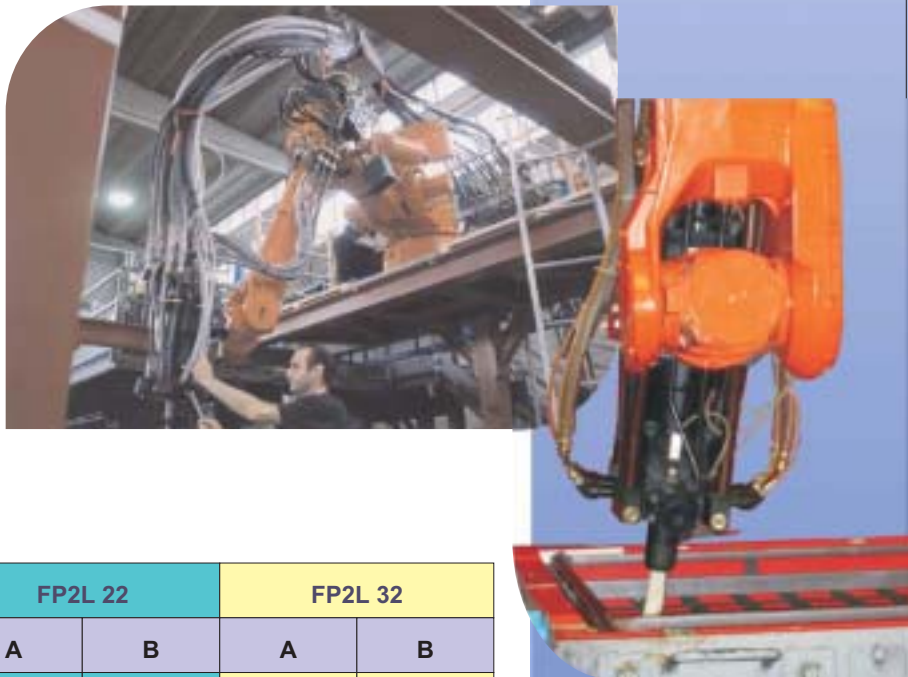
The model **FP2L 32** is the "L" shape high pressure mixing head ever manufactured by Cannon, able to produce foamed parts from just a few hundred grams up to more than ten kilos.

*Model FP2L 32  
the biggest "L" shape  
model ever produced  
by Cannon.*



This solution grants two important advantages: a higher production flexibility (unachievable using one only mixing head) and a significant increase of the plant productivity.

Being each chamber independent, the mixing head can be fed by two different formulations that can be used alternatively for the production of foamed parts having different characteristics or for the pouring of different materials in the same mould at a fast sequence.

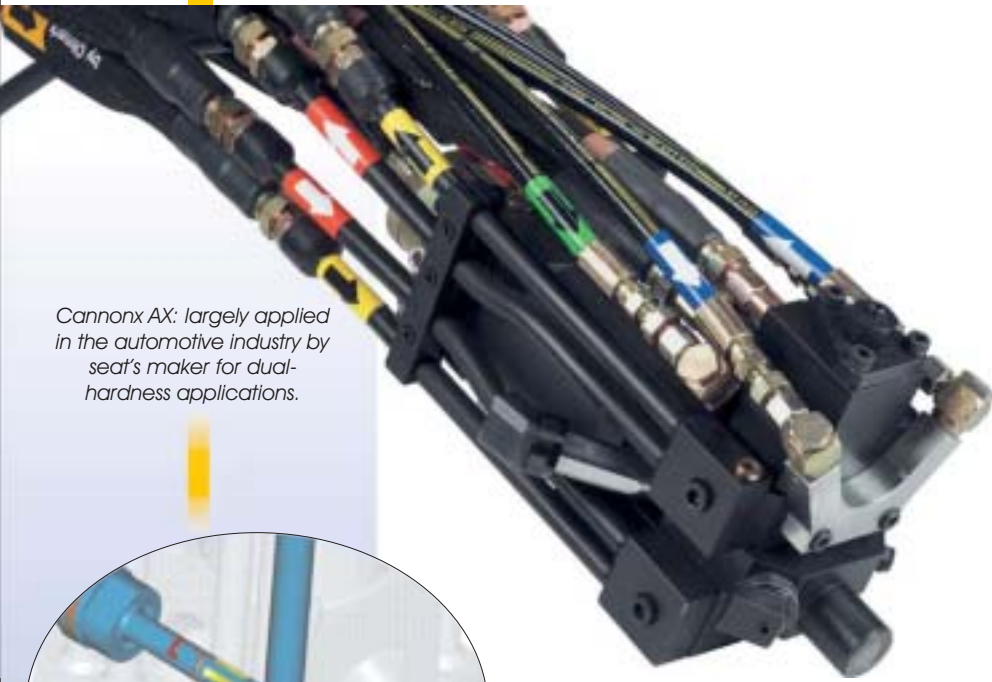


	FP2L 14		FP2L 22		FP2L 32	
Component	A	B	A	B	A	B
Min Recommended	35	55	90	150	280	280
Max Laminar Flow	300 (T.O.)		550 (T.O.)		1850 (T.O.)	
Max Recommended	250	350	600	800	2300	2300

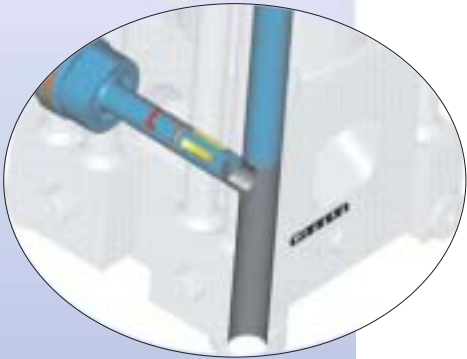
All values are calculated in cc/s, considering a component viscosity < 1000 cps.  
Where not different specified, all values are considered for each single stream output (T.O. = Total Output)



# Mixing Heads



Cannon AX: largely applied in the automotive industry by seat's maker for dual-hardness applications.



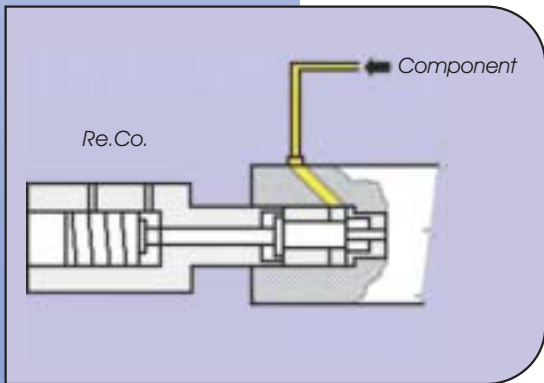
AX mixing head pouring piston section.

## Re.Co. System Injection Pressure Control

Cannon has realised a closed-loop system for controlling the injection pressure where set values are constantly compared with those measured in real time.

The main functions of the Re.Co. system are:

- closing of the injection nozzle for not required components of each formulation
- keeping the injection pressure of each component constant independently of the output.



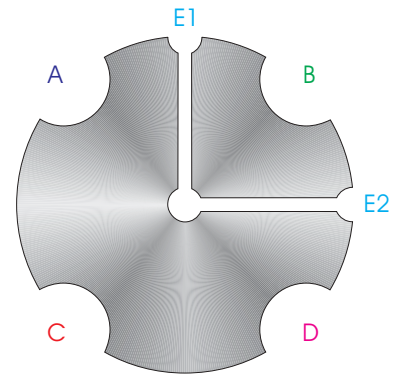
Re.Co. System: closed-loop remote control of component injection pressures.

## AX

The Cannon "AX" is the most advanced multi-component foaming head, specifically developed for the production of hot and cold cure flexible foams.

The AX mix-head is designed to manage and process up to six components simultaneously and in different combinations, including water-based additives and low-viscosity TDI-based Isocyanates.

The AX offers a unique feature: TDI based Isocyanates and low viscosity components (water, silicon, catalysts, etc.) can be injected axially at lower pressures, minimising the risk of leakage in the dosing circuit and the need for complex and expensive maintenance to the dosing pump.



AX mixing head pouring piston section shows the 6 components injection (4 radially + 2 axially).

	AX 18	AX 24
Min Recommended	180 (T.O.)	180 (T.O.)
Max Laminar Flow	400 (T.O.)	700 (T.O.)
Max Recommended	1100 (T.O.)	1300 (T.O.)

AX Mixing Head	Radial Stream						Axial Stream					
	18	24	18	24	18	24	18	24	18	24	18	24
Viscosity (cps)	1000	1000	2000	2000	3000	3000	<10	<10	<300	<300	<1000	<1000
Minimum	6	6	6	6	6	6	6	6	6	1	1	1
Maximum	380	450	300	350	200	230	130	200	80	110	30	40

All values are calculated in cc/s, considering a component viscosity < 1000 cps. Where not different specified, all values are considered for each single stream output (T.O. = Total Output)

## LN

The **LN** range has been specifically developed with a straight-through mixing chamber.

The hydraulics and mechanics used are simple making this head cost-effective and easily managed and maintained.

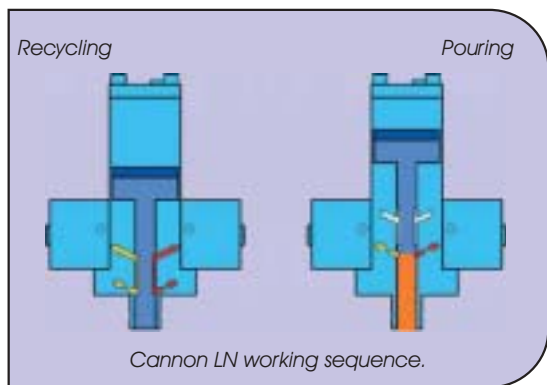
For foaming inside closed panels only, another filling system is also available based on a dedicated head characterised by an extremely flat design.

*Cannon LN 10  
suitable for closed mould pourings  
of low density rigid foams.*



This model is dedicated to spray and cavity-filling applications where low/medium outputs, space saving and simple accessibility to the parts are of the essence.

For cavity filling, the **LN5** is able to insulate portable coolers, flasks, small containers and low-density rigid moulded products (i.e. small panels and small boxed cavities for cars).

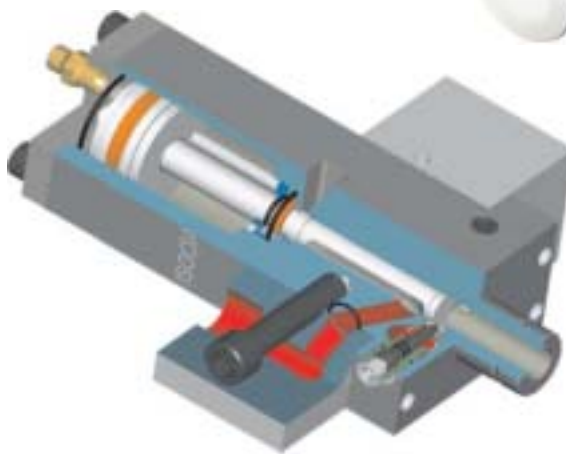


Conversely, Cannon **LN5** is a compact and extremely lightweight version of the LN, with an ergonomic handle for an easy handling.

*Cannon LN 30  
grants high outputs and  
good foam distribution.*



*Cannon LN 5  
applied to spray and  
cavity filling applications.*



Component	LN 5		LN 10		LN 18		LN 30	
	A	B	A	B	A	B	A	B
Min Recommended	10	10	50	50	150	150	400	400
Max Recommended	70	70	350	550	1000	2000	2750	4500

All values are calculated in cc/s, considering a component viscosity < 1000 cps.

# Mixing Heads

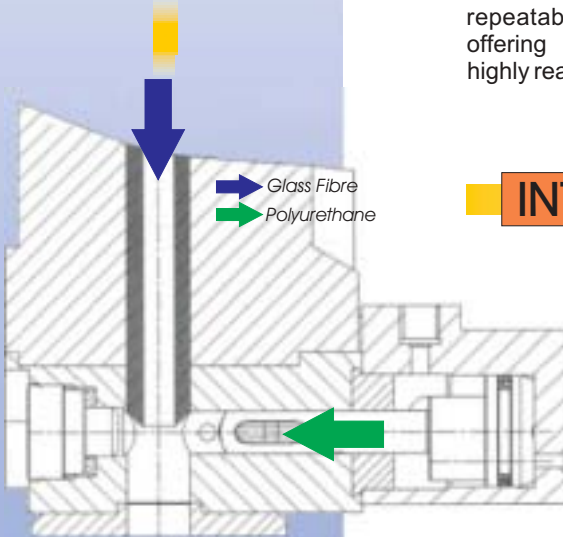
## TRIO

The Cannon **Trio** series is recommended for moulding processes where pre-blended filled formulations are used, even at high outputs. This mix-head is equipped with three independent injectors mounted at an angle of 120° to each other, eliminating the problems traditionally generated by the difference in output pressure and viscosity.

The main developing concept applied to **Trio** heads is to use the third available stream to split the feeding of the higher viscosity component (usually the filled one) into two streams in order to improve mixing efficiency.

The short piston stroke configuration ensures repeatability and precision of injection, offering high quality mouldings even with highly reactive formulations.

*TRIO: the first Cannon head fully designed for reinforced/filled PU formulations.*



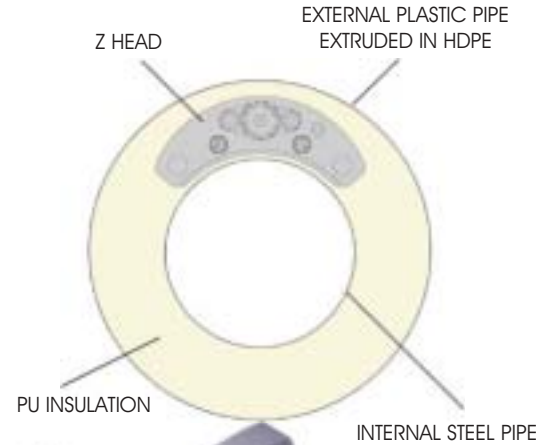
*Cannon InterWet allows the co-injection of PU and solid fillers directly into the head.*



*Body parts makers for earth-moving machines are big consumers of reinforced PU with glass fibres (GMP Italia).*

## Z

The Cannon **Z** is a high-pressure head specifically designed for pipe-in-pipe insulation. Most of the piping service lines are for district heating networks and water, oil and gas distribution.



*Cannon Z specifically designed for pipes insulation.*

The **Z** head has an extremely compact and slim design (the head's thickness is less than 25!) with a curved shape, making it particularly suitable for continuous production lines.

*Mounted on a special device, the Cannon Z mixing head can be directly introduced between the two coaxial pipes.*



## INTERWET

The Cannon **InterWet** mixing head model has been developed for the co-injection of polyurethane and solid fillers (powders or glass fibres) and it is able to mold composite materials with particular physical-mechanical properties.

The innovative and original technological aspect lies in the dosing and mixing of fillers directly into the head. The co-injection process ensures a homogeneous dispersion of the filler inside the polyurethane foam.

The **InterWet** mixing head is equipped with a glass-fibre chopper unit and it is provided with a dedicated system for monitoring every single production step (filler feeding, fibre glass cutting, co-injection and mixing phases of solid and liquid components), to ensure precise dosing, constant ratio and output and the possibility to change the filler quantity independently, shot by shot, during the pouring process.

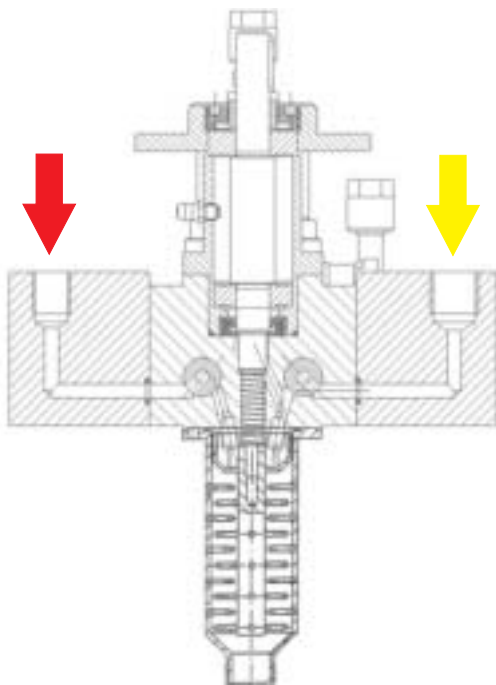
**InterWet** mixing head is also available to meter and pour powders. This version foresees a different feeding system configuration where the material is already powdered or in a granulated form before reaching the head.



## LOW PRESSURE

For low-pressure technology as well, Cannon offers a wide and complete range of reliable heads, to satisfy and meet the most severe technical requirements and production needs: general purpose applications, micro-shots and very low outputs, very high outputs and multi-component.

All Cannon low pressure heads can be equipped with a large variety of mixers having different shapes and designs, able to run at different speeds to give homogeneous mixing, regardless of formulations, satisfying the most complex mouldings needs.



*Low pressure mixing heads: with mechanical mixing of the components.*

The standard low-pressure mix-head range for general purpose applications is completed by a number of dedicated versions developed for specific production niches, requiring metering and mixing of not only polyurethane formulations, but also silicones, elastomers and epoxy resins with different chemical and physical properties.



*A wide range of low pressure mixing heads and mixers available with different shapes and designs.*

### Potting for Electrical Insulation

The Potting technology is dedicated to the encapsulation of electronic/ electrical devices and components in order to ensure complete environmental protection of circuits from moisture and chemical attack.

For this specific application, Cannon has developed a new dedicated low pressure mixing head for micro-shots with very low outputs, able to mix and meter both polyurethane or epoxy resin, using formulations with a wide working ratio (up to 10:1), high viscosity components and very small outputs (min output 0,20 g/s, max output 1,5 g/s).

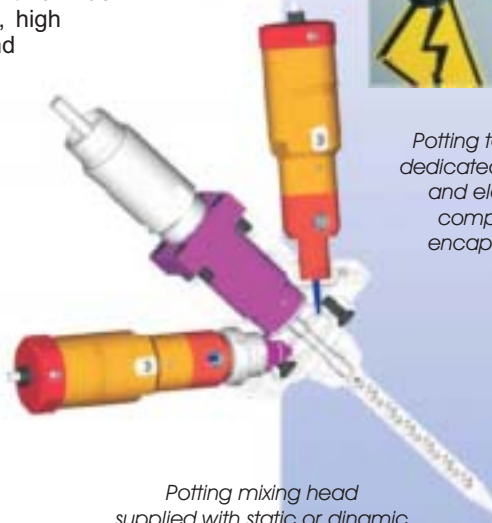
### Micro-Shots for Gaskets and Sealants

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.

Cannon has developed multi-component low-pressure mixing heads specifically designed for micro-shot pouring and able to cover very low output ranges: from 0,2 to 30 g/s.



*Potting technology: dedicated to circuits and electronic components encapsulation.*



*Potting mixing head supplied with static or dynamic mixers for high density resins.*



*New Cannon low pressure multi-component series: ideal for use both PU and silicone-based formulations.*



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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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