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SEATING TECHNOLOGY

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SEAT PRODUCTION

Seat production for the automotive and furniture markets is one of the largest and best known consumers of Polyurethane world-wide.

Today's manufacturers must respond to the ever increasing market demands, constantly specifying higher levels of productivity and quality.

Long and extensive experience working in this field, means that Cannon are well-placed to satisfy these customer demands by offering dedicated technical and economical innovations.

Cannon is able to satisfy a specific customer requirement, ranging from a single mixing head to a complete, integrated turn-key plant.



WET SIDE

Various combinations of metering unit have been developed for this particular technology.

The main features of the Cannon machines are:

- machine operator interface with very precise control and quick programming of process parameters;
- open-frame design allowing easier access for machine maintenance and replacement of consumable parts;
- wide choice of solutions for setting component outputs, ranging from manual adjustment of a calibrated handwheel to the sophisticated 'closed-loop' control of components;
- software packages for planned maintenance and fault finding, offering invaluable assistance to the maintenance staff;

- software packages for quality and production control, leading to a reduction in operating costs;
- on-line programming to modify process parameters during machine operation;
- total integration into Computer Integrated Manufacturing plant (CIM) through direct interface of the machine with main-frame computer systems.



Ergonomic study for a mould carrier.

Cannon can see the project through from its initial stages to completion, evaluating all process parameters necessary for the required production.

CAD 3-D software allows our design engineers to produce three-dimensional layouts for the plant, ergonomic studies for each workstation and detailed technical drawings for even the smallest plant component during the project phase.

High pressure pump with closed-loop control.



Multi-component metering group with high efficiency pumps.



MIXING HEADS

The mixing head can be considered the heart of the production plant; it is inside the head where the component chemical reaction begins.

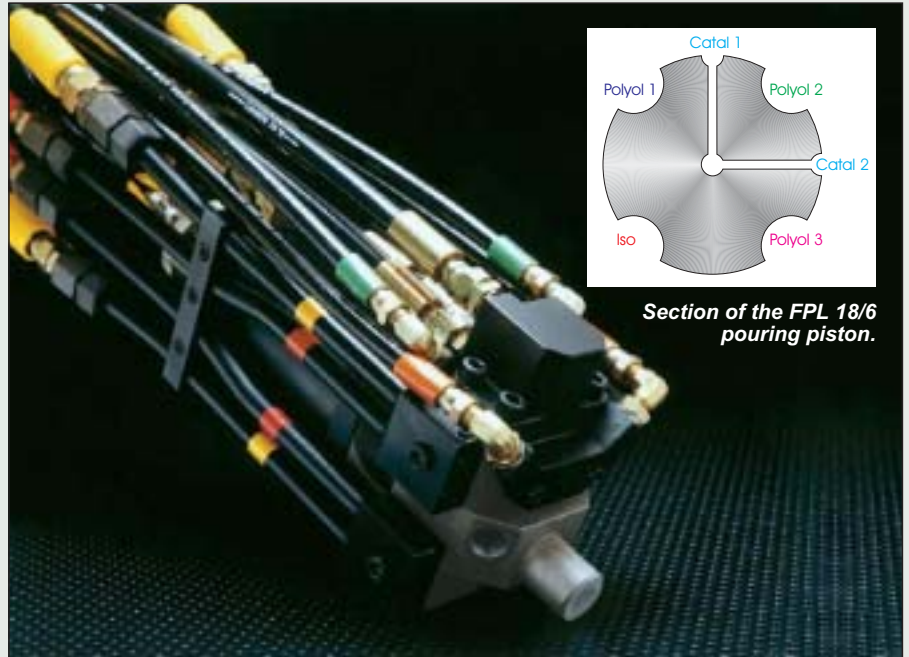
The main function of the mixing head is to achieve a high mixing efficiency and a laminar flow (no spray or air traps).

These features are achieved with the Cannon FPL high pressure mixing head through the reduced dimensions and 'L-shape' of the mixing chamber.

A special range of mixing heads are available for seat technology:

- FPL18/6: L-shaped mixing head which allows the metering of six different components. During the high pressure recycle all the components flow through recirculation grooves machined in the mixing chamber piston.
- FP2L: L-shaped mixing heads with two independent mixing chambers and one single outlet. This allows two different formulations to be used in the same mould, in rapid sequence.

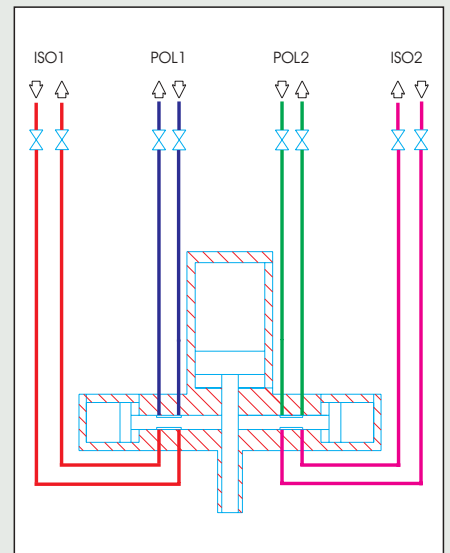
FPL: Cannon Patent.



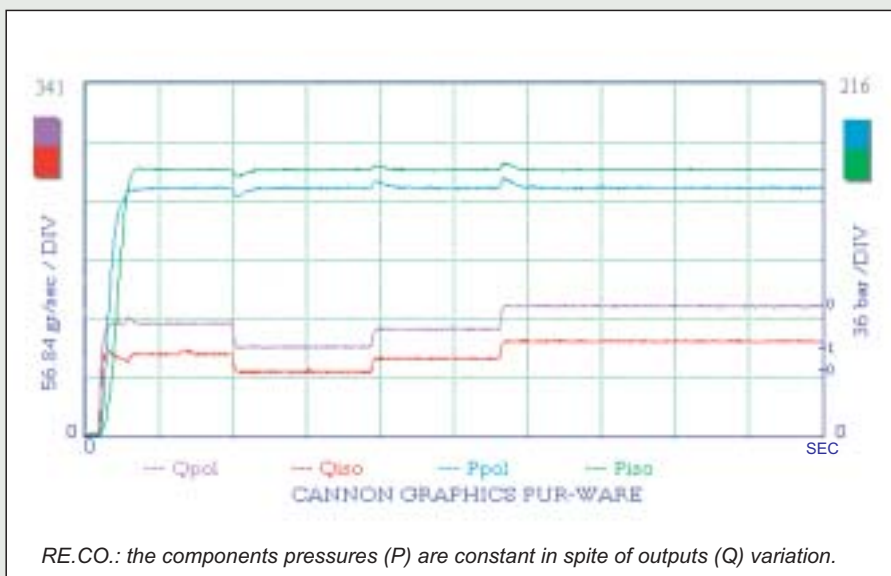
FPL 18/6 mixing head.



FP2L mixing head.



Flow diagram of the FP2L mixing head.



RE.CO.: the components pressures (P) are constant in spite of outputs (Q) variation.

RE.CO. SYSTEM

For those applications requiring varying outputs with the same mixing head, the mixing pressure becomes the critical parameter to be controlled.

To solve this problem, Cannon developed the RE.CO. System (Remote Control Systems for component pressures).

It is essentially a closed-loop control system, hydraulically operated, which allows control of the position of the injection nozzles in order to keep the mixing pressure constant even with diverse variations in output.

DRY SIDE

More than 50% of Cannon turnover comes from integrated packages which include all the equipment required to set up a complete production unit - the so called 'dry-side'. An extensive range of products have been specially developed in response to specific market needs:

- **turntables**

- step-by-step or continuous;

- **carousels**

- traction by chain;
- Cannon drive system: the electric frictional drive system is composed of two driven Vulkolan wheels in contact with the mould carrier guiding plates incorporating a specially designed guide system.

Advantages of the Cannon Drive System: continuous movement with positive and precise

positioning eliminating speed fluctuations; ability to increase the number of stations; drive system without wear; no wear of the guides; no lubrication needed; easy maintenance and replacement of the drive groups; multi-directional movement; instant stop on alarm;

- **mould carriers**

- opening and closing by pneumatic/hydraulic cylinders on off-line stations;
- tilt cylinders operated by off-line cam;
- parallel stroke by air bag;
- quick couplings for fast mould changes;

- **moulds**

- resin or aluminium moulds;
- computerised temperature control;

- **cell crushers**

- vacuum crusher;
- mechanical crusher;
- combined crusher (vacuum and mechanical);

- **ventilation & safety equipment**

- suction hoods, air ducts and fans;
- air/air heat exchanger;
- filters and fume treatment systems;
- operator safety devices.



Double arm pouring robot.

**ROBOT**

The quality of the end-product depends heavily on the correct distribution of foam within the mould.

Cannon has developed pouring robots which can follow complex pouring patterns with extreme accuracy and repeatability. These single or double-armed robots provide excellent flexibility when programming difficult pouring patterns.

Cannon's dedicated electronic control system means that programming can be achieved by simply setting the machine output and pouring time available, without the need for setting up difficult robot speeds and acceleration.

FPL mixing head pouring over an open mould.

Oval carousel (32 stations) with combined crusher.



Turning tables for automotive seating production.



LIQUID CO₂ BLOWING TECHNOLOGY

The search for a good CFC-substitute to expand Polyurethane has led Cannon to the most obvious, and yet most difficult to use, alternative - Carbon Dioxide in its liquid form.

ADVANTAGES

Flexible foam can be moulded in soft grades without CFC; reduction in density for the same foam hardness and physical properties; reduction in foam costs, because of the reduction in weight coupled with the fact that liquid CO₂ is by far the cheapest blowing agent available; improved flow properties into the mould and faster demoulding times; environment-friendly, safe, readily available and non-flammable blowing agent, with direct benefits to health, safety and insurance costs in the workplace.

SOLUTIONS AVAILABLE

Cannon have developed dedicated equipment for the precise metering and mixing of liquid CO₂ with conventional formulations.

CannOxide™

- For medium-high levels of CO₂;
- direct injection in the mixing head;
- CO₂ level changeable from shot to shot;

- open and closed mould pouring;
- TriOx - a CO₂ optimised head - or 'L-shaped' heads for peculiar applications.

EasyFroth™

- For medium-low levels of CO₂;
- liquid CO₂ pre-mixed either in the Iso or in the Pol tanks;
- high pressure metering of blended Iso/Pol by means of transfer piston or pumps, according to the level of blended CO₂;
- especially suitable for multi-mixheads plants;
- 'L-shaped' mixing heads or TriOx mixing heads for medium CO₂ levels.

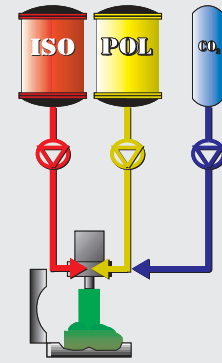
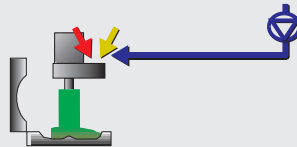


TriOx mixing head.

Blending CO₂ : Direct Injection

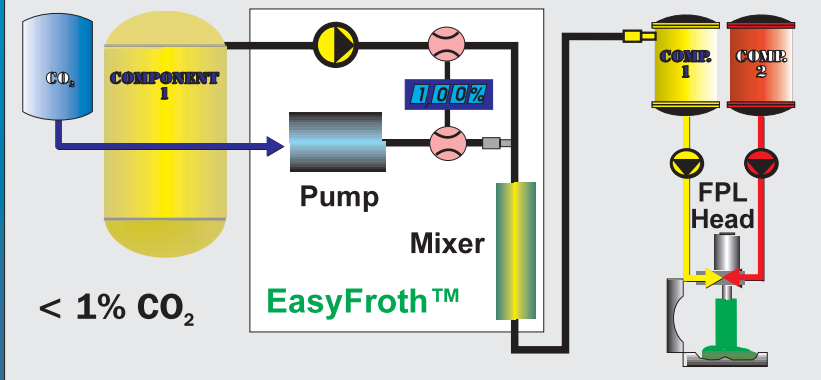
* Percentages > 1% = from DXP pump to TriOx head

* Percentages < 1% = from DXP pump to FPL head



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Blending CO₂ : Premixed in the Tank



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