Gasketing Technology

Foam In-Situ Gasket

- Lighting
- Electrical and Electronic
- Containers and Packaging
- Automotive
- Appliance
- Filtration

cannon
POLYURETHANE TECHNOLOGIES

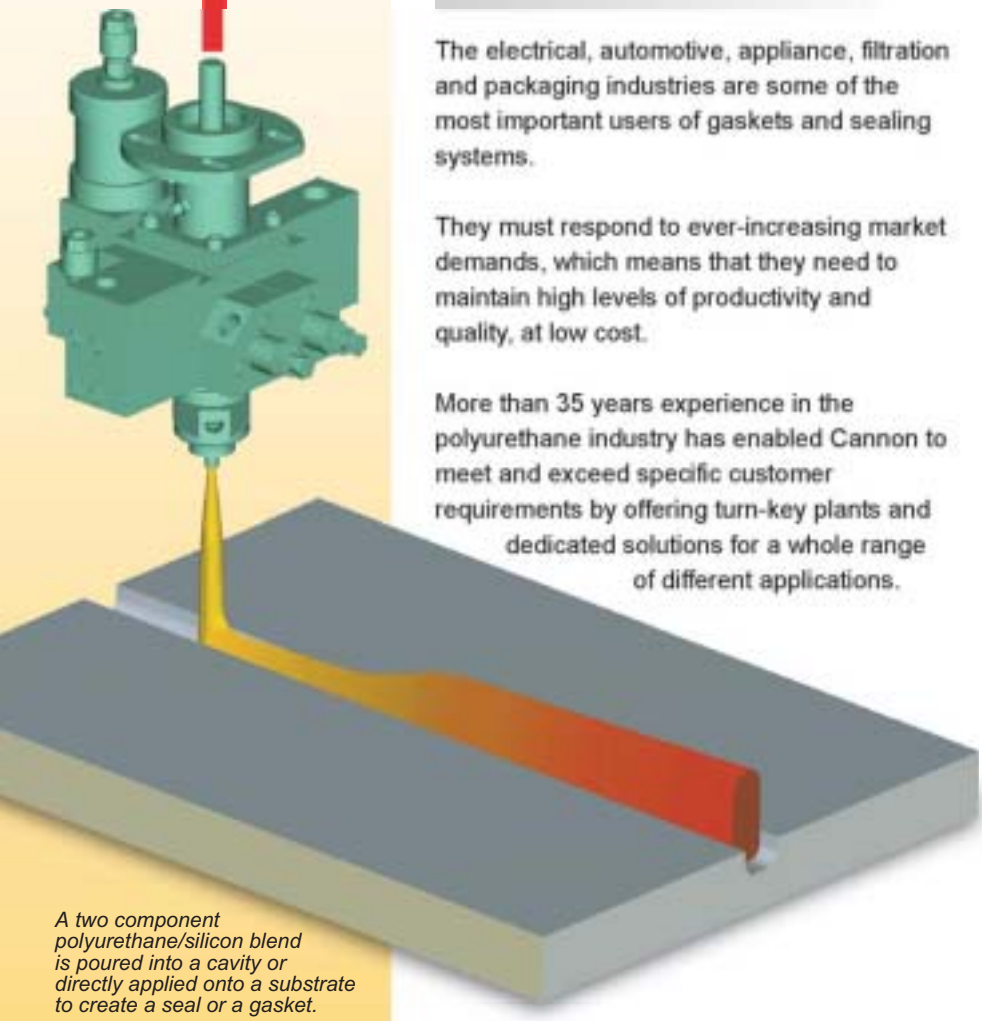
The Technology

The Cannon Group: Leading Supplier of Polyurethanes Technology

The electrical, automotive, appliance, filtration and packaging industries are some of the most important users of gaskets and sealing systems.

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

More than 35 years experience in the polyurethane industry has enabled Cannon to meet and exceed specific customer requirements by offering turn-key plants and dedicated solutions for a whole range of different applications.



A two component polyurethane/silicon blend is poured into a cavity or directly applied onto a substrate to create a seal or a gasket.

The Cannon Approach a Real Alternative for the Market

In view of the inproved quality and better technical properties achieved with a foamed gasket, Cannon Gasketing technology can be applied to a very wide and varied range of industrial applications, for the advantageous replacement of die-cut, strip, extruded and moulded gaskets.

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.

Technological Improvements and Economical Advantages

The Cannon foam in-situ process offers several advantages, not only from an economical point of view, but also technologically and on the quality of the final product: the polyurethane gasket.

In order to achieve a very accurate gasket lay-down, allowing high repeatability and consistency in the process, meeting quality standards and reducing any possible

Cannon Gasketing Technology

Cannon have developed 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.

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

The resulting chemical reaction (polymerisation) changes the liquid to a foamed gasket, usually with an increase in volume.

Electrical enclosure gasket production with PU thixotropic blend.

Plasma unit for surface treatment .

production scraps, the foaming phase must be robotically (not manually) assisted.

Since the resulting foamed gasket is continuous with no recognisable joints or cut ends, the foam in-situ gasket is characterised by excellent performance in comparison with other kinds of seals.

Foamed gaskets on car parts.

The material, during the curing phase, forms an external skin eliminating any open cells on the gasket surface, guaranteeing a superior barrier against potential leakages.

High levels of automation mean that only one single operator is needed to drive the entire system, representing a significant labour cost reduction, which is often a high proportion of the total cost of a seal or gasket production.

Furthermore, since the foam in-situ process foams the gasket with perfect adhesion onto the end product, significant cost savings can be achieved as additional finishing stages, such as gasket gluing and assembling, are no long required.

Last but nor least, other economical benefits lie in the fact that:

- a gasket inventory is no longer required
- the flexibility of the Cannon foaming process enables the processor to create a dedicated gasket (exact dimension and pattern) according to his current specific need
- Cannon Gasketing is a “room temperature” technology: no heat is required for the chemical reaction, so there is no increase in energy consumption
- the cost of the raw materials is lower than those used to produce other kinds of gaskets.

Silicon thixotropic foam application.

All these factors contribute to an investment pay-back in very reasonable time.

Shuttle table system for parts handling.

The Application Field

Electrical and Electronic

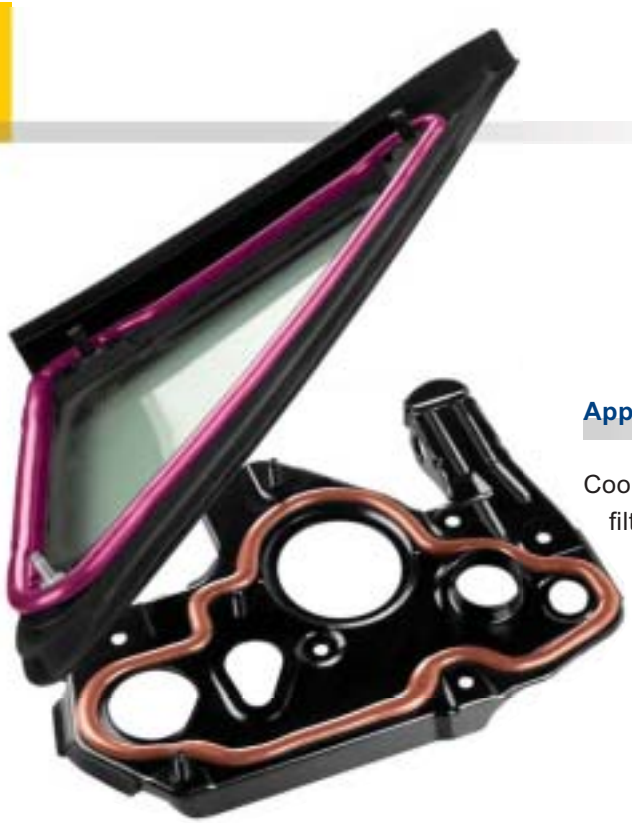
Electrical enclosures and housings require good protection against dust and water penetration. In this case a thixotropic PU blend is foamed onto the enclosure cabinet, door and panel. For smaller electrical junction and terminal boxes characterised by narrow groove, specific soft polyurethane foam formulations can be used.

Lighting

Industrial indoor lamps, domestic outdoor lamps and also casings for road lighting are manufactured using two-component soft polyurethane foam, while for high-powered outdoor lamps (eg: for buildings, stadiums, sports courts) requiring high temperature resistance, a two-component silicon is recommended, allowing high IP protection values to be achieved.

Containers and Packaging

A typical application is the production of gaskets for container lids, where high productivity rates and fast production cycles are needed. The Cannon foam in-situ process offers significant advantages thanks to the its high automation level in terms of cycle time reduction.



Appliance

Cooker plates, rear and internal panels, filters for cleaners and many other small appliance components. Top plates for washing machines and tabletop refrigerators also need to be sealed.

Automotive

Many different applications can be found in this sector: car bodies, supporting plates for pedals and steering wheels, fire plates and a range of panels (which separate the cockpit from the engine), encapsulated quarter windows, heating ducts, ventilation grills, tail and headlight-caps, air conditioning systems and internal door panels.

Filtration

Typical applications are: oil and air-conditioning filters for the automotive industry, industrial filters for residential or commercial air conditioning systems, walk-in coolers and clean rooms.

Cannon Solutions

Domestic lamp.

Cannon's Gasket Foaming System

As you would expect of a worldwide supplier of complete Gasketing production systems, Cannon has applied its manufacturing philosophy to this specific market: ie. to be at the customer's disposal to provide bespoke, engineered solutions, and increasingly featuring higher process flexibility in order to suit a wide range of production needs and quick production changeovers.

Cannon Gasketing plants are based on several core items: the dosing unit, the head washing system, the manipulator, and the product handling system.

Metering Unit & Mixing Head

The Cannon "b2G Plus" is a low pressure dosing unit specially developed for micro-shots. Its main features are low maintenance, ease of use and the capacity to process any kind of raw materials supplies (to process different formulations polyol tank is supplied with an air nucleation system).
The machine is equipped with electronic process control (Siemens PLC S7) and a friendly operator panel.

Pallets carousel line.

Material feed to the mixing head is achieved using a double pumping group: a feed group placed downstream of the working tanks and a second group with a metering function very close to the mixing head. This special system configuration guarantees high precision and reliability in the pouring process.

Cannon's "b2G Plus" mixing head has been specially designed to cover an output range from 0.2 to 7 g/s, and it can be also customised for higher outputs: car filters, for example.

The mixing head can be fitted with one of a range of mechanical mixers, which feature

Multi-component mixing head.

continuously variable speed and shape to ensure perfectly mixed foams, regardless of formulation.

Material temperature control is achieved by recycling the chemicals through the feed line and by a special tank group configuration (jacketed tanks with stirrers, connected to a closed circuit thermoregulator unit).

EcoCleaner: Environmentally Friendly System

Cannon have always been very aware of environmental issues. For this reason we have developed a mixing head cleaning system which allows the use of chlorine free cleaners.

Depending on the cleaner used, the final mixture is generally a non-toxic waste that, in some cases, can be disposed of as urban waste.

Cannon EcoCleaner.

Cannon EcoCleaner is equipped with a dedicated recycling system allowing the cleaner to be used several times over (depending on the type of cleaner).

With this system, mixing head cleaning is highly efficient for all formulations and results in theworking time between maintenance cycles being increased.

Six positions drum for lamp handling.

Part Handling Systems

The handling equipment covers the moving and locating of parts into the correct foaming position, holding parts in position during the foaming process, removing them from the process area after foaming and storing them during the polymerisation period.

Foaming line for industrial lamps.

A variety of different solutions are available depending on part size, required productivity, space availability and possible integration into existing production lines, such as:

- automatic buffer loading system complete with, conveyor belt, a variable-geometry holding system for the different part sizes and a pallet racking system for foam in-situ parts;
- shuttle-tables available in different sizes and dimensions;
- n-position foaming drum, reducing space and increasing the plant productivity;
- pallet carousel line;
- single and multi-position turntable.

Obviously, dedicated solutions can be engineered according to each customer's specific needs.

Mixing Head Handling Systems

The quality of the end product heavily depends upon the correct and precise pouring and distribution of the foamed gasket.

For this reason, Cannon have developed dedicated automatic mixing heads handlings based on Cartesian system (with one or two movable axis and also available with one or two programmable pouring stations) and able to follow complex patterns with extreme accuracy and repeatability.

Cannon Cartesian handlings are driven by a proprietary electronic control supplied with an easy interface for the simply setting of all the production parameters, such as output and pouting values, different speed and acceleration ramps at the beginning and at the end of the patterns for obtaining accurate overlapping.

In order to meet the widest customer's production needs and technical specifications, offering more and more flexibility to end-users, other integrated solutions are also available: in this case the mixing head is fitted on anthropomorphic robots purchased from relevant market leading manufacturer.

Car pedal support.

POLYURETHANE TECHNOLOGIES

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