New Needs? New Heads!

All-round Competence in HP RTM

The Large Project Specialist

A Wide Range of Foam Product Solutions

Special: Cannon first 50 years
More than **33,000** Cannon Mixing Heads have been installed on more than **15,000** metering units, in the **5** continents. The output capacity of these heads covers a range up to **10,000 g/s**, meeting and exceeding the expectations of a wide number of end users of Polyurethanes, Epoxy, Silicone, Phenolics and DCPD. Dedicated models have been specifically developed for different applications, chemical components, injection or pouring methods. A continuous commitment for excellence is the driving force that pushes Cannon to search for new solutions, to provide reliable and profit-generating tools to their customers.

www.cannon.com
Editorial

The cover of this edition of the Cannon News already illustrates its leitmotif: Cannon turns 50 this year!

A memorable milestone in a person’s and in a Company’s life. Time for a reflection, usually. It’s like in a tough bicycle race, uphill: if you look back you see many others that did not make it and stopped half-way. If you look forward you see that the race continues, and there is always a steep, winding road in front of you – and competitors trying to beat you.

It’s never easy, but you keep pushing on the pedals, hoping to reach the summit and relax a bit... just to discover that there is another hill to climb. It’s life, nobody promised that it would have been easy! But eventually, when you make it up to the finishing line, it’s a great satisfaction.

So it is for us, this year. We’ll celebrate with a number of in-house activities, many of them in combination with the EXPO Milano 2015.

A good occasion to come to Italy and see where we have been able to climb in the past half century. Read on the next pages an analysis of this nice industrial venture, which started in a garage in Milano, by the voice of our President. The first steps, some errors, some brilliant intuitions, some bold actions... it all contributed to let us grow and mature.

Within the Cannon Group different “souls” are co-existing: all with the common factor of being equipment manufacturers. As of today we’re dealing with Polyureethanes, Composites, Thermoforming, Aluminum Diecasting, Industrial Electronics, Thermal Energy Plants and Water Treatments. With a common strategy, that can be resumed in **Energy Efficiency, Energy Saving and Clean Manufacturing**. In the next pages we’ll tell you how we work every day to reach these targets.

By the way, let us know what you think about this new format of Cannon News: we’re trying to make it more interesting for you, opening a new thread of digital lecture by using QR Codes here and there in the articles: if your smartphone is loaded with a simple App that reads them, you can jump directly from the magazine to our websites and navigate through pages that contain many more details, videos and other multi-media tools that – yet – cannot be printed on paper.

**Enjoy this new way of reading!**

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CANNON CELEBRATES THIS YEAR THEIR 50th ANNIVERSARY.
WE INTERVIEW THE PRESIDENT, MARCO VOLPATO, FOR AN INSIGHT COMMENT ON THIS IMPORTANT MILESTONE.

Cannon News: Mr. Volpato, when a person gets to the mark of 50’s it’s time for some reflection and analysis. What does a Company do in such an occasion, by the voice of its President?
Marco Volpato: An optimist looks forward, at least to the next 50! A pessimist looks more backward, fearing not to be able to repeat the good things done in the past. A realist makes a good blend of some retrospective analysis, some current day’s situation, and a bit of outlook into the future, assuming he’s got a good crystal ball to look into! I think we all need to be realistic, trying not to be overwhelmed by fear or dreams. Our first 50 years have been “a tale to tell”, no doubt about it.

CN: What’s your retrospective analysis, then? 
MV: We must put our origins in the historical context of the 1960s, Italy’s economic boom, after clearing up the rubble left by WW2, was in its hottest period. Italian genius was expressing itself in a number of new activities.

Early 1960’s, the first Cannon dispensers for rigid PUR foams.

Take Giovanni Borghi, an industrialist of white appliances located in Varese, Lombardy, for instance: he had just launched a new line of domestic refrigerators whose insulating media was rigid Polyurethane foam instead of classic rock wool. Great innovation, more space inside the fridge keeping the same outside dimensions, with better insulation properties and less electrical consumption. He used for his needs some Polyurethane dosing units made by a mechanical company that one of his partners had developed, thus he had a monopoly of that technology.

Cannon started making similar equipment but with better performances, adding a touch of finesse to the mixing phase, and sold it to other refrigerators makers that were cut off from the new development for lack of hardware. It worked. We took off quickly.

Similar story for another family of Polyurethanes, the flexible ones. We started moulding doll bodies with a flexible elastomer: we did it partly to make some cash, much needed to develop the small start-up Company that Cannon was in those years, and partly to get our fingers wet with the new stuff, to learn the trade by doing it, not by watching from outside. And this also worked, we gained a great deal of experience in the “mixing mysteries” that are behind the success or the failure of a different formulation. We designed and made tens of different mixers for our low pressure units, in those years, just because we were learning first-hand how to deal with different formulations made available by the major chemical companies. Learning by doing, they call it in management schools now.

CN: Any major mistake, in the pioneering age?
MV: We learned, after a lot of development efforts, that the rising field of the shoe soles was a matter for shoe specialists, which we weren’t.
We gave up after having supplied 20 or 30 Rota carousels and the relevant dedicated dosing machines. Results were technically good but we were not able to make them profitably, in simple terms. Same story for flexible continuous slabstock: another speciality that we were lacking, at that moment. You must be able to stop wasting time and money when you realise to be in the wrong path and re-focus your efforts towards other targets. As well as you must be looking for your customers where they are, not where it’s more comfortable for you.

CN: Do you mean by driving your activity with a marketing-oriented structure?
MV: I mean physically going where they are, talking their language, both ideationally and technically. We started very soon, 4-5 years after the beginning of our production, looking for international specialists able to distribute our equipment abroad. We started with the mostly industrialised countries, from Northern Countries, UK, Benelux, France, but also Spain and Greece, with our final aim being Germany.
A strong presence in the lion’s den – full of competitors with strong patents and of customers with high expectations – would have been strategic for us to be recognised as a reliable partner.

CN: How did you approach this market?
MV: Through an Agency, that became later, in the early 1980’s, one of our strongest Locations. We were – as we still are – independent from major chemical groups, therefore we were free to talk to them all. We cooperated with their R&D labs first with low pressure equipment – since a Bayer’s Patent was blocking the high-pressure technology solutions – and then, when that patent expired, we immediately launched an innovative head for RIM (Reaction Injection Moulding) that was able to handle also abrasive fillers like glass fibres, much demanded at that time by the automotive industry for making bumpers and other car body parts. High pressure really boosted our development, and we soon reached a leadership position in the industry. Our FPL head, providing good mixing with very laminar flow of the-reacting blend, opened the path to new applications, especially those requiring an open-mould pouring, like car and furniture seats. We immediately backed the high-pressure dosing units and mixing heads with all the demanded “dry side” hardware: mould carriers, large presses, complete foaming plants – developed, in the beginning, with partners specialised in mechanical plants, handling of large metal sheets, assembly techniques.

CN: A major switch, going from dosing units to complete plants: the construction mentality is different. How did you make it?
MV: Again, once more, learning by doing. Talking of domestic refrigerators, by working with them and with other specialists we got experience in our customer’s final product, we learned their methods and tricks, and we provided them proper technical solutions to apply them industrially. These were the years when Polyurethanes came out of their artisanal scale of production to become an industrially usable material. This brought volume and profit, and allowed us to think forward optimistically. And these were also the years of our great legal disputes with competitors around our patents on mixing heads: between 1979 and 1986 we fought 23 international court cases, winning most of them and settling others with cross-licence agreements. We spent a fortune in lawyers but we gained an incredible experience in intellectual property protection, one of our key factors of the future success.

CN: The innovative FPL mixing head, patented in 1979.

Early 1960’s, the first Cannon dispensers for rigid PUR foams.
We devoted all profits made in the 1980’s into a diversification strategy, acquiring in 1988 and 1989 some plastics equipment companies well established in the Composites area (TCS), in Thermoforming (Shelley) and in slabstock Polyurethane foams (Viking). And we looked outside the garden too, buying BONO, a prestigious Italian brand in the field of Energy production and Water Treatment process. A bold move, we’ve been told by many in these years, that took us a couple of decades to turn into a profitable activity: our steam generators, biomass boilers and water treatment plants are appreciated worldwide for their efficiency and skilled design.

CN: Did this diversification take your focus out of the plastics industry?
MV: On the contrary, it stimulated us to look for possible synergy between the new and the former Companies of our Group!
We strengthened our international network in those years: we had already opened locations in USA, Singapore, Japan, Russia. Our presence in China came naturally, already in 1982, through our Singapore arm. Later we opened our own offices in Mexico, Turkey, Brazil, Spain.
We reinforced our Agents, local independent companies specialising in various areas of the plastics business. By the way, the feared threat to the environment turned into a great opportunity, thanks to the Montreal Protocol of the late 1980’s, a massif research effort allowed for the replacement of ozone depleting substances: for the Polyurethanes industry this meant new Chlorine-free blowing agents to be metered and mixed with different equipment.
A major impulse to the modernisation of plants worldwide: the solutions that we developed also granted to Cannon in 1999 “The Stratospheric Ozone protection Award” by E.P.A., the US Environmental Protection Agency, and then in 2002 Carlo Fiorentini, now our Honorary President, was inducted into the “Polyurethanes Hall of Fame” by A.P.I., the US-based Alliance for Polyurethanes Industry.

CN: What did you learn from the involvement in the implementation of the Montreal Protocol?
MV: A lot, dealing daily with international authorities opens you up to a wholly new world of ideas and opportunities! Not only the Plastics Divisions of Cannon gained experience from the Montreal Protocol, but the same happened for them and for the Energy & Water Treatment Division from the Kyoto Protocol, aimed to reduce gas emissions that generate the greenhouse effect. Our vision of 1988 was right: the Energy and Water Treatment industry is a place to be in, with innovative solutions and a proper distribution network worldwide.

CN: Enough with the past: where do you stand now?
MV: We are in the middle of another industrial revolution, and we must be able to understand – quickly – the new rules of the game. The industry has generally gone eastward, for various reasons. But we should not forget the industrial potential – and the creative contribution – given by the Old World’s countries and the Americas. There is a design and manufacturing know-how that cannot be underestimated, ready to deliver high-quality products efficiently, with the proper tools.
We focus on these. We are working today on more than 50... let’s call them “projects” – “technology sectors” – “competences” – as you like. One skill different from the other, working with different methods and approaches, with the need to let them co-exist with our culture and place them in a leading position, or at least in the second-one with the ambition to become the leader. Our biggest effort, in terms of organisation, is now aimed to shape the local offices – our Local Cannon Units – for a multi-technology approach. They must learn to handle the whole portfolio of Cannon technologies as well as they were able, until now, to handle successfully the Polyurethanes and Plastics solutions.

CN: A vision for the next 50 years of Cannon?
MV: Our crystal ball is still under development, but I can state few solid facts:
• Ours is a family business with an international flavour and ethical rules.
• The second generation of shareholders is fully committed since years in this challenge, and they are quite ready now to take over the burden until now carried by their fathers.
• We are independent from larger financial corporations. We’ve got to appreciate the advantages deriving from this freedom, even noticing the great contribution that private companies of our size and structure are giving to the world’s Gross Domestic Product.
• We are innovative by nature, and will keep this profile because without innovation we wouldn’t be here talking of our 50th anniversary.

• We are international: this has been our best strategic move since ever and we won’t give up our commitment to a strong local presence.
• We claim that our integrity allows us to freely carry out our mission in the straightest possible way, without being distracted by other activities that are not bringing added value to the work we perform every day.
• We live now through the third phase of internationalisation, we’re switching from a multi-national to a global structure. We will increasingly involve specialists from outside Italy in our R&D projects and in production management. We remain an Italy-born Group that integrates an international culture and human resources.
• We do not need further diversification: our strategy – resumed in Energy Efficiency, Energy Saving and Clean Manufacturing – is more than sufficient to guarantee us the means for a sound development using the available tools and skills.

CN: A clear list of statements and of ideas. Thanks for your time and for the interview, Mr Volpato!
MV: I could not miss this opportunity, since I invented the Cannon News forty years ago. I’d love to see it printed for another half century!
New Needs? New Heads!

This year Cannon will celebrate fifty years in business – half a century spent researching and developing innovative solutions, especially in the field of mixing technologies for reactive formulations. Unrelenting commitment and dedication have earned Cannon a worldwide leading position in this market. Over the years, more than 33,000 cannon mixing heads have been installed on 15,000+ metering units around the globe, and most of them are still in operation!

There are mixing heads for virtually every application, injection method and chemical compound. Every time a new formulation is developed, it is soon provided with the best processing tools to ensure its industrial success. Cannon is committed to constantly improving and upgrading its range of mixing heads to meet the latest developments in the field of flexible, rigid and reinforced polyurethanes as well as fast RTM epoxy resins.

From the FPL to the FPL SR
The FPL SR is a new head featuring significant improvements in terms of laminarity of flow, reliability, cleaning and maintenance. It has been an industrial success with nearly 300 units sold since its launch at the K show in 2013. It is an excellent solution for formulations that require higher outputs, while maintaining a laminar flow during the closed-mould injection phase or the open-mould pouring phase.

The design of the mixing chamber and the dispensing nose of the “L-shaped” mixing head has been optimised while preserving the overall compact size of the unit. The new FPL SR series was originally conceived for refrigerator manufacturers who wished to upgrade their existing foaming plants, but it works equally well with fast-reacting foams and dosing units characterised by high outputs.

It is available in a range of diameters (18, 24 and 26 millimetres), widely used by refrigerator manufacturers who run conventional foaming jigs and plants, and has proved very successful. The FPL SR features a long injection nose: the new 26 mm model comes with a 190-mm-litre piston for a total nozzle length of 150 mm, and an external diameter of 32 mm.

This enables the unit to reach remote injection holes along the side of a large sandwich panel press. Total output, with laminar flow at the nozzle, can reach 1,800 g/min normal operating conditions.

To improve long-term reliability, a "scraper-like" self-cleaning plunger has been developed to prevent potential sticking caused by today’s high-isocyanate-index formulations. This new, double-diameter, cylindrical rod effectively removes the smallest residue of foam from the head at the end of each shot, significantly reducing the heat generated by component friction and eliminating the main cause of sticking.

To facilitate the periodical cleaning of the internal parts of the head, Cannon has improved the plunger’s lubrication system by introducing a larger spacer between the discharge duct and the hydraulic drive of the self-cleaning plunger. And to make maintenance easier, a new kit consisting of a self-cleaning rod and delivery bushing is now available. The Cannon facilities that provide a head repair service will now be able to replace a worn-out plunger much more quickly and cost-effectively.

A critical advantage provided by the new FLS SR is the opportunity to save foam! Its longer nose allows for increased laminar flow at higher outputs, enabling the use of faster formulations, which feature finer cells and lead to a more even foam distribution across the cavity. This results in a reduction in foam generally used to over-pack the mould (to ensure that it fills up) and helps to save as much as 3% in chemicals compared to a conventional injection head.

The FPL SR can be used with Cannon’s Varinject, a system designed to vary the chemicals’ output in a rapid sequence as the foams injected in a closed mould. This allows to fill the different areas of the mould with the proper amount of foam, optimising the mould-filling operation.

This system has proved very effective with complex moulds like multiple-door refrigerator cabinets as well as with large panels or long insulated pipes for district heating or oil/gas applications.

The Varinject system allows to vary the chemicals’ output in a rapid sequence as the foam is injected.

The advantages offered by these technical improvements are gradually being extended to the entire range of Cannon FPL mixing heads with significant benefits – both technical and financial – for the end user. Take no chance, buy a genuine Cannon mixing head!

The new AX for car seat foaming
The AX was designed a long time ago to be the most compact, multi-component mixing head on the market for the production of moulded car seats. Today, it is widely used by leading car and car parts manufacturers around the world.

The AX provides a coherent flow in the open mould at output levels above 750 g/sec.

To win this challenge, Cannon has designed a new version of the AX multi-component mixing head: the AX22/6+1. The new head features six component streams for radial injection into the mixing chamber and one stream for a lower-output component that is injected axially through the piston that controls the mixing operation.

The presence of seven different chemicals in a small mixing chamber provides for maximum flexibility during operation. The chamber can be easily operated owing to the small size and length of its internal parts and a special software tool. The new head makes it possible to manufacture a variety of car seat models in a sequence using different moulds mounted randomly on the same carousel.

AX 22+1 head for multi-hardness automotive seats.

It is still the fastest head in operation and the most compact solution for this sophisticated application. The consistent trend towards building lighter vehicles and offering better interior roominess has made designing car seats more and more difficult. Thinner seats and seatbacks are now installed in virtually every car model.

To compensate for the reduction in the weight of foam, car parts manufacturers have opted for a more varied distribution of the density and hardness of the foam across the surface of the moulded part. This results in the use of more complex formulations requiring up to seven different chemicals for one shot. Metering and mixing devices must be able to frequently change the output of the individual chemicals based on the design of the seats, which need to be moulded in a random sequence on the same line that carries scores of different moulds.

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The presence of seven different chemicals in a small mixing chamber provides for maximum flexibility during operation. The chamber can be easily operated owing to the small size and length of its internal parts and a special software tool. The new head makes it possible to manufacture a variety of car seat models in a sequence using different moulds mounted randomly on the same carousel.
Smaller heads can be used to make simpler seats with less foam. The new AX 14/4 is the ideal solution for car seat manufacturers who need less sophisticated injection solutions and use formulations featuring a maximum of four component streams and lower outputs. With its four component streams radially injecting chemicals into a compact mixing chamber, the AX 14/4 is the natural evolution of the original AX series and covers a lower range of outputs.

Given the relatively low weight of the new head, a standard pouring robot can be used, which carries a smaller number of pipes for components and hydraulic fluid and provides for fast set-up of pouring pressures and easy maintenance. Improved thermal treatment of the parts most prone to mechanical stress has extended their reliability and operating time. Today Cannon recommend preventive maintenance after one million movements on these models.

The new JL 26-420 for panel foaming

Designed without the conventional jets that regulate the injection pressure of chemical components, Cannon’s patented JL mixing head has been a real breakthrough in the world of PUR mixing technology. Since its introduction in 2007, the JL has been improved and simplified. More than 100 JL heads are now in operation around the world. The JL comes in four sizes (with inner injection nose diameters of 18, 24, 26 and 32 millimetres) and new important developments are on the way for a lower throughput model.

The JL series provides a unique opportunity for manufacturers investing in a new foaming plant. Thanks to its longer injection nose, moulds and jigs can be designed to a higher degree of customisation for better production flexibility.

A new version of the JL head has been developed featuring a 370mm-long injection nose and a total piston stroke of 420 mm.

The JL saves more foam

Speed mixing and lower injection pressures are known to maximise the chemical recipe and make a more efficient use of the blowing agent, which provides for improved foam-expanding action and lower “minimum-fill” density. Many industrial users have reported foam savings up to 5% with the new JL head. Equally interesting is that the JL can be used in combination with Cannon’s Varinject (see FPL SR above), which helps to save even more foam and better distribute densities across a large moulded panel or a fridge.

The new LN 4 HP for cavity filling

This new head works well with all types of chemical agents used in the automotive industry for cavity-filling applications. Please read more about this head at pag 15.

New heads for HP RTM, the high-productivity technology for carbon-reinforced composites

The small size of carbon-reinforced composite mouldings, often required by car and leisure parts manufacturers, calls for the use of low-output dosing machines and mixing heads. A total output of 4 to over 100 g/sec is very common in these applications and leads to the production of one cured part every two or three minutes. The part is obtained by injecting the resin blend at a low output rate.

The most popular Cannon head for the HP RTM process is the LN6 EPX. Specially designed for epoxy chemicals, the LN6 EPX has a total output of 8 to 130 g/sec and features all its external parts – including injectors – in a circular section of 120 mm in diameter. Its very small footprint and 15 mm injection nose allow it to be mounted on the thinnest of moulds. The new LN10 EPX, designed for outputs between 40 to 400 g/sec, was released in 2014 and is currently used in production plants across Europe.

The new FPL 7 for PUR composites

The recent success of HP RTM formulations made from epoxy resins has prompted research into similar applications for Polyurethanes. The lower cost of Polyurethanes and the opportunity to obtain more resilient polymers from them is making them a preferred choice by end users in the automotive industry especially for mechanically stressed components such as leafsprings and other parts.

While epoxy resins can be easily mixed with a “straight” head, Polyurethanes have more stringent requirements when it comes to mixing efficiency and require an “L-shaped” head that can ensure effective turbulence in the first part of the mixing chamber and laminar flow when the blended chemicals leave the discharge duct to enter the mould.

Cannon has developed the new FPL 7 head for this specific application. Equipped with a ceramic injection nose bushing, the FPL 7 is designed to work at the low output rates required by car and car parts manufacturers. Thin, small composite parts are made in closed moulds containing one or more layers of carbon fibre reinforcement. The chemicals are injected through a tiny hole; their flow must be very smooth to prevent the displacement of the reinforcement layer.

Learn more about the technical details of Cannon’s new mixing heads using the QR code reader on your smartphone.
Cannon: all-round competence in HP RTM

CANNON IS PROVIDING – UNIQUE AMONGST ITS COMPETITORS – THE COMPLETE SET OF TECHNOLOGIES AND EQUIPMENT FOR THE INDUSTRIAL MANUFACTURE OF LIGHTWEIGHT COMPOSITES, GLASS- OR CARBON-FIBRE BASED, WITH POLYURETHANE AND EPOXY CHEMICAL FORMULATIONS, MADE AT THE LEVEL OF AUTOMATION AND PRODUCTIVITY DEMANDED BY THE AUTOMOTIVE INDUSTRY.

THE ARTICLE HIGHLIGHTS THE SEVEN DIFFERENT TYPES OF EQUIPMENT THAT CAN BE FOUND AT CANNON UNDER ONE SINGLE “UMBRELLA” OF RESPONSIBILITY.

Top Priority: reduce emissions in the atmosphere and increase energy efficiency

It would be useless here to spend time in detailing the reasons that drive the whole automotive and transportation industry towards the production of lighter and more energy-efficient vehicles. Meeting the requirements of the Kyoto Protocol, in terms of emission’s reduction of climate-changing gases, has become the prime target for all nations of the World. Saving non-renewable fuels – oil first – is another priority. Major sources of pollution are the heating systems of residential, commercial and industrial buildings, the engines of all sort of vehicles, the energy plants. Both targets can be achieved optimising the combustion of gas-emitting substances.

As far as the transportation industry is concerned, the proposed solutions involve the reduction of the weight of vehicles and the use of more energy-efficient engines. Replacing steel and other heavy construction materials with lighter metal alloys and resin-based reinforced composites represents today the most efficient approach to the problem: a substantially lower environmental impact has already been obtained using these materials in combination with hybrid drive systems.

Cannon have, in their 50 years of history, developed a number of Polyurethane-related solutions that contributed to the reduction of the environmental impact of human activities, providing technologies for a more efficient thermal insulation of buildings, for the replacement of Ozone-depleting foam’s blowing agents, for the manufacture of energy-efficient vehicle components.

In more recent years a whole set of technologies and equipment has been developed by Cannon for the manufacture of Lightweight Composites based on both Polyurethanes and Epoxy chemical formulations, utilizing both glass- and carbon-fibre reinforcements to provide the required stiffness and structural resistance to the finished parts.

The most important aspect in this development work has been the definition of industrially-capable solutions, able to provide high-quality Composite parts with the high level of automation and the fast production cycle demanded by the automotive industry.

The complex sequence of operations required to “assemble” a lightweight structural or aesthetic Composite component, opposed to the relative simplicity of injection moulding a thermoplastic part, needs a proper combination and integration of different skills, not simple to be managed and organised.

This complex know-how has been mostly developed by the leading car manufacturers, investing – for more than 10 years – huge financial and human resources in the search of “their” optimum solution, thus developing...
proprietary manufacturing solutions and Composites products. Today the results of this massive effort are circulating on the road: a whole new horizon opens up now for the manufacturers of car components that intend to invest resources for the industrial production of these – and of new – types of lightweight and energy-efficient Composites. It’s now clear that the shopping approach for these companies cannot be limited to the search for the right single piece of equipment, because their lack of specific know-how and of the capacity to coordinate this complex sequence of processes would lead them to an endless struggle before reaching production readiness.

**A whole set of technologies for energy-efficient composites**

Cannon is providing – unique amongst its competitors – the complete set of technologies and equipment for the industrial manufacture of lightweight Composites, glass- or carbon-fibre based, with Polyurethane and Epoxy chemical formulations, made at the level of automation and productivity demanded by the automotive industry.

Cannon have worked in these decades as “integrators” of technologies, combining the skills of various work groups to provide a solution characterised by a unique interface and responsibility, an integrated process control and a common production philosophy. This approach guarantees to the highly-skilled end user the simplification of the complex problems of integration of a new manufacturing island within an already existing production plant, while providing the less skilled client with a turn-key solution free from the complex interfacing aspects deriving from the purchase of single pieces of equipment from different vendors.

**The available integrated Cannon solutions** for the production of Composites can be summarised in eight groups of products.

**Smart Preformers**

The manufacture of complex, three-dimensional Composite parts requires that the reinforcing material – usually composed by one or more layers of glass- or carbon-fibres – is preformed precisely to reproduce the shape of the mould, without creases or wrinkles that might disrupt the aspect of the final part. Applying manually this reinforcement into the mould is practically impossible in an industrial environment for cycle time reasons, difficulty to handle the drapes, non-constant final effect.

Aspecially designed preformer is a must.

Dedicated machines able to shape precisely a sandwich of different drapes of glass- or carbon-fibres have been manufactured by Cannon in the past 20 years for the major OEMs and Tier One producers of Composites. Two remarkable characteristics are worth a mention here:

- The patented **Intelligent Gripping System** that makes possible the correct draping of the reinforcement in the mould, using an high number of “draping grippers” or “hands” positioned on two sides of the sandwich of fibres. Individually calibrated according to its position over the mould, each gripper holds with a controlled pressure its part of drape, releasing it under the action of the male plug in a way that avoids creases.

- The **Automatic Unrolling System** able to hold several different rolls of reinforcement fibres, to comply with the most stringent demand of strength required by the components of the automobile’s structure. It’s also possible to integrate it in a bi-dimensional cutting system for the preparation of irregular shapes of drapes. This kind of preformer has been used for many years by BMW and Lamborghini for the preliminary development of all their composites parts, and is now industrially producing large roofs and other parts.

The latest delivered preformer features a clamping area of 3 by 3 meters, with a vertical stroke capacity of 2 meters.

A part-to-part cycle time of 80 seconds is obtained with this specific preformer, for a 2 by 2 meter finished preform.

Innovative energy control methods have been applied to reduce the energy consumption of the unit. Advanced electronic controls allow for the definition of a library of preforming programs, minimising the set-up time of the unit when a mould change occurs.

**Dedicated Presses**

After the pre-forming operation, a properly shaped preform is transferred to the press where the impregnation with chemicals will occur. These presses must withstand the pressure generated during the injection and the curing phases of the process. Designed and built upon customer’ specifications, they must provide a number of features that are somehow conflicting in terms of final result: a fast opening and closing operation is required, to reduce the dead times of the cycle, but at the same time a very precise control of the parallelism is demanded for the dimensional constancy of the produced parts. These two requests can be fulfilled using a short-stroke press with Active Parallelism Control performed during the last few millimetres of closing. The precise measurement of the position of the four corners of the platens guarantees a real-time control of the parallelism between the two halves of the mould even in presence of bulky preforms.
Loading of preforms and unloading of large finished parts is facilitated by the use of **double shuttling system**, that – performing two operations at the same time – speeds up the cycle time, reduces labour and avoids the presence of operators within the press area. Press dimensions with platens of up to 4.5 by 4 meters, with up to 2 metres vertical draw and 36,000 kN of clamping force have currently been supplied, with possible extension of these sizes according to specific needs.

**Moulds**

A fundamental element for the success of the project, a mould designed for HP RTM or S-RIM today includes an impressive number of parts and functions that must be strictly **monitored and interfaced** with the remaining equipment. Pressure, vacuum and temperature sensors, limit switches, moving inserts, all must be controlled and integrated in the production sequence, with continued dialogue with metering unit and mixing head. **Mastering in-house the design and manufacture of moulds**, as Cannon do, guarantees smooth set-up of the moulding process and constancy of results.

**New Dosing Units**

A new dosing unit for HP RTM is available from Cannon, featuring innovative characteristics and practical advantages. Basically designed for two components, the new **E-System Enhanced high-pressure machine meters precisely the hardener by means of a plunger piston controlled hydraulically in closed loop**.

The output range covers the most typical demand of this technology, between 20 and 250 g/sec but with the possibility of reaching lower or higher limits in case of specific needs.

An **innovative degassing system** on the resin circuit provides an air extraction capability up to 10 m³/hr in a very short time, to reduce the set-up downtimes when loading this component from a drum during production.

The **control of chemical’s temperatures**, very important for this process, is performed by a powerful heating unit able to heat the resin up to 90°C, maintaining the fluid at this temperature up to the mixing head with a constant recirculation.

**Dedicated moulds are supplied by Cannon for all types of Composite and foamed parts.**

A **third component – the release agent** – can be added to the resin stream through a static mixer built into the mixing head. The release agent’s dosing unit, engineered for a direct integration with the main metering machine with a Plug&Play configuration, works at a very low output (few grams per minute) with a new plunger-piston high-pressure dosing system.

**Mixing heads**

Cannon’s preferred head for the HP RTM process is the **LN6 EPX**. Designed specifically for Epoxy chemicals, it keeps all its external components in a circular section of 120 mm diameter, injectors included. The LN6 head has been conceived with all **fittings and controls mounted on the rear side** opposite to the nose. This configuration leaves a very sleek design on the sides – basically on its circumference, since it has an almost cylindrical shape – so to reduce its impact on the mould even further.

Holding a pending patent, this new Cannon mixing device allows for both a manual and an automated regulation of the injectors position, obtaining a perfect control of pressures through a micrometric adjustment. The small size of the mouldings, often demanded by car and leisure parts manufacturers, requires the use of low-output dosing machines and mixing heads: a total output going from 4 to more than 100 g/sec is very common in these applications, allowing the manufacture of one cured part every two-three minutes, obtained by injecting the resin blend at a low output. This way, avoiding a too violent flow of liquid, the reinforcement positioned in the mould undergoes no stress.

As said before, the **third component, the release agent**, is dosed with extreme precision into the resin stream through a **static mixer** housed right in the mixing head. This integrated solution contributes to the compactness and the usability of the head.

A new LN10 model, designed for output values up to 400 g/sec, was released during 2014.

In addition to the ESTRIM fast injection technology for HP RTM in closed moulds, Cannon have developed the ESTRIM LLD (Liquid Lay Down) system: here the Epoxy formulation is laid over the Carbon mat in “liquid ribbons” of varying width, typically from 40 to 120 mm, perfectly impregnating the reinforcement and limiting the possibility of air inclusions in the moulded part. This technique, wetting uniformly the huge, almost flat preforms that characterise parts such as roofs, engine hoods, fenders and doors, is **suggested for very large parts**.

The optimisation of this process not only keeps low part-to-part cycle time, but also requires lower compression force, and thus **reduced capital investments** which in the end leads to lower part cost.

We should not forget the development of a new alternative for the traditional high-pressure injection of resins in closed moulds: the **gap injection method**. This works by injecting the formulation while leaving the mould partially open during the injection – still guaranteeing with a special sealing system the tightness of the mould cavity – and applying the final compression stroke at the end of it.

**Controls**

The most difficult component of a complex moulding island for composites is the electronic control: each piece of equipment must work in total coordination with the rest of plant. Purchasing machinery from various vendors and letting them communicate properly is the nightmare of every production manager. Cannon develop in-house their own electronic controls through the Automata Division; specialising in dedicated automation systems. **Working with proprietary as well as commercially available electronics**, Automata builds the integrated controls according to the specifications pertaining to the individual plant. An example of this vertical integration comes from the **RTM Cell Manager**, a unique interface

**The LN6 head controls are mounted on the rear side, opposite to the nose, to reduce its impact on the mould.**
Analysis, Piece Traceability & Identification, Raw Materials Provisioning, connection to other production phases and to smart devices like tablets and smartphones.

**Finishing**
A moulded Composite part usually requires some finishing operations, like trimming its rough edges or cutting holes on its surface. Cannon provides the full integration of third parties 5- and 6-axes milling and contour-cutting equipment and of all relevant handling robots.

**Recycle**
Environmental sustainability is a fundamental component of every industrial process. Using limited energy resources during manufacturing and giving a second life to products significantly contributes to the environmental friendliness of Composites. Cannon is actively pursuing these two pathways in the design of their equipment and in the definition of their processes.

Read more in this page about the CRESIM project, aimed at the development of processing methods for the manufacture of CFRP parts using recycled Carbon fibres!

... plus the Know-How!
Cannon have developed a core competence in the manufacture of Composite parts that covers the whole set of required processes and technologies, with a 360° approach. A unique portfolio of dedicated, industrially tried-and-tested solutions is available, with equipment tailored to the customer requirements. A **staff of competent specialists** provides, in a modern application development laboratory equipped with industrial press and multiple dosing units, all the needed support to optimise the production process. A **prototyping service is available**, for the preliminary set-up and the production of large pre-series of Composite parts, allowing for the industrial evaluation of the moulded component.

**Ask the nearest Cannon office**, or consult the dedicated web pages, to know more about the options that are available for your next Composite projects!

A **staff of competent specialists is available!**

Cannon CRESIM:
environmental sustainability and recycling awareness

IN 2012 CANNON STARTED AN EU-SPONSORED LIFE+ PROJECT CALLED CRESIM (CARBON RECYCLING BY EPOXY SPECIAL IMPREGNATION)! AIMED AT DEVELOPING PROCESSING METHODS FOR THE MANUFACTURE OF CFRP PARTS USING RECYCLED CARBON FIBRES (CF).

CRESIM HAS ADDRESSED WASTE REUSE FROM A VARIETY OF ANGLES AND HAS PRESENTED A NEW INNOVATIVE MANUFACTURING PROCESS THAT CAN POTENTIALLY REUSE UP TO 100% CF WASTE AND SCRAP FROM DIFFERENT INDUSTRIES TURNING ONE OF TODAY'S COSTLY ISSUES INTO AN OPPORTUNITY FOR GREENER PRODUCTION AND MORE PROFITS TOMORROW.

An intense R&D programme was set up, which involved:

- Characterising the different types of recovered carbon fibre;
- Developing a suitable process for impregnating the types of reinforcement obtained from recovered CF;
- Characterising the test plates obtained;
- Developing new, financially sustainable applications for the process.

A major investment in laboratory space, new equipment and time of specialist staff has enabled Cannon to allocate a large portion of its refurbished R&D Centre for Composites in Caronno Pertusella, near Milan (Italy), to the CRESIM project. The lab contains a new high-tonnage hot press that can carry multiple test moulds as well as tools designed or supplied for trial by interested partners.

The CRESIM area of the R&D lab is equipped with **two 6-axes anthropomorphic robots** for parts manipulation and the handling of the mixer head in addition to other necessary hardware.

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Lightweight Composites Technology

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Looking for a reliable and affordable production line for Lightweight Composites?

Preformers for Carbon and Glass Fiber Mats
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Ask Cannon for a complete package of technologies.

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DEDICATED INDUSTRIAL SOLUTIONS
A challenging project for an innovative vehicle

AN INNOVATIVE PROJECT HAS BEEN DEVELOPED BY BENTELER-SGL, A JOINT VENTURE OF BENTELER AUTOMOBILTECHNIK GMBH AND CARBON FIBRE SUPPLIER SGL GROUP, FOR THE PRODUCTION OF A GLASS FIBRE REINFORCED POLYURETHANE LEAF SPRING FOR THE NEW VOLVO XC90 SUV.

The challenge was deriving from the new, peculiar concept of rear axle designed by the Volvo specialists. The suspension of the Volvo XC90 is based on a transverse fibre-reinforced composite leaf spring instead of the usual array of coil springs. This results in a very compact design – the finished part weighs only 3 kg – as well as a weight saving of some 4.5 kg compared to the conventional concept. Further benefits include a smoother ride and improved NVH (noise, vibration, harshness) behaviour. The trunk volume is also increased because there are no suspension turrets.

The Polyurethane matrix resin used is Loctite MAX 2 from Henkel, which worked with Benteler-SGL to develop the optimum HP RTM process for the leaf spring. The result of a preliminary set of trials was the definition of a multi-cavity tool holding, side by side, 12 leaf springs to be injected in a single operation. Some process characteristics, deriving from the required final mechanical properties, complicated the definition of the required equipment.

The spring leaf is composed by 50% of a glass fibre reinforcement and 50% of Polyurethane formulation. The presence of 12 mould cavities full of glass mat and the fast injection rate demanded to guarantee a productive demoulding cycle – parts are extracted about 15 minutes after injection – demanded to rise the working temperature of the resin, rather thick at room temperature, in order to lower its viscosity.

This would allow for a rapid mould filling phase and a quick impregnation of the fibre reinforcement, resulting in the desired short injection times. With the curing rate also substantially faster than that of Epoxy resins, cycle times are shorter overall. Selected additives also would made the curing process faster and more flexible.

The very high pressure generated in the closed mould during the injection phase – due to the strong resistance of the glass reinforcement – specified that the nose of mixing head had to constantly resist to a working pressure higher than 100 Bar. Therefore, high temperature processing and high pressure resistance for the injection device were two of the major concerns.

A Dedicated Solution
Cannon, consulted for the supply of dosing unit and mixing head, had to design a dedicated equipment for this application. Cannon Afros specialists decided for a modular construction design, where the two main components are recirculating in heated enclosures kept ad different temperatures.

Prior to the high pressure pumping the two components are heated well above 50 °C and undergo a thorough degassing procedure in order to eliminate any residual gas dissolved in the basic liquids, to avoid any possible air bubble in the moulded part. Then they are metered by means of rotary axial pumps, and sent through an insulated piping to the mixing head, which is constantly fixed on the mould.

The selected mixing head for this task – the plant currently counts two of them, with a possible extension to four for a future doubling of the plant – is a special version of the FPL 14, with machining tolerances and inner parts designed to withstand the high temperatures used in this case and some tough pressure conditions when the counter-pressure builds up in the mould during the injection, which is performed in 22 seconds, for a total of 11 kg of formulation.

“The example of our leaf spring for Volvo Cars demonstrates that fibre composite mass production is today already a reality,” says Frank Fetscher, Head of Business Development at Benteler-SGL Automotive Composites. “What’s more, with this flexible component design, we are able to cover an entire platform with a relatively small number of spring variants.”

The new composite rear axle is destined to be incorporated into additional models in the years to come, leading to several hundred thousand vehicles being fitted with it every year, and BENTELER is aiming to produce several hundred thousand of the leaf springs annually.
Cannon ERGOS: the large project specialist

ERGOS IS THE ENGINEERING COMPANY OF THE CANNON GROUP RECENTLY THEY HAVE DELIVERED A NUMBER OF LARGE SYSTEMS FOR COMPOSITE MANUFACTURING TO CUSTOMERS IN THE AUTOMOTIVE AND TRANSPORTATION INDUSTRIES AS WELL AS EQUIPMENT FOR OTHER INTERESTING APPLICATIONS. ERGOS GENERAL MANAGER, ALBERTO ZARANTONELLO, BRINGS US UP TO DATE ON THE LATEST NEWS ABOUT HIS COMPANY.

Cannon News: What does 2015 look like for Cannon ERGOS, Mr Zarantonello?
Alberto Zarantonello:
A very busy year, to say the least.
Our two-year-old, 3,000sqm-large assembly plant has been churning out some of the largest ever pieces of equipment made by our company and will continue to do so in the future. We have brought activities from various Cannon companies together under the same roof and can now watch individual machines and entire lines take shape and be tested in the same place and at the same time. Our guests seem to find the experience inspirational when they come to visit our premises.

CN: Any recent projects that are worth mentioning?
AZ: There are plenty, I should say. We have just shipped a complete line for large composite elements to a major multinational supplier of automotive parts in Germany, who works for a leading car manufacturer. The line can use different technologies: HP RTM, gap injection and SMC. It consists of two dedicated machines: a carbon fiber preform and a clamping press, both of which are huge. The automatic preformer can work from either rolls to make conventional parts or pre-assembled sandwiches made from different fibres pre-cut in irregular shapes. It can handle preforms up to 2.5 by 2.5 metres, with a clamping force of 3,000 kN.
Acting like a giant iron to the fibres, an energy-efficient heating station brings the fibre temperature up to 200-220°C in less than a minute, optimising cycle time. Two sets of intelligent grippers pick up the hot sandwich and transfer it to the forming station where an in-mould, integrated hold-slip frame ensures optimum draping control of the carbon fibre layers when pressed in the forming mould.

In less than a minute a complex preform is made, which is then extracted by a robot as the next hot sandwich comes in from the heating station.
After preforming, the process continues in the huge polymerisation press. It is a short-stroke clamp with active control of parallelism and is designed to work with HP RTM, Gap Injection and SMC. This offers excellent production flexibility and return on the investment.
The size of the platen can be up to 4.5 by 4 metres and more than one large part can fit on it with two moulds mounted side by side.
With a clamping force of 36,000 kN, this press combines very fast opening and closing phases, executed at speeds up to 400 mm/sec, with a very accurate final clamping phase, which can be set from 1 to 20 mm/sec.

A special design allows us to use a semi-closed mould when resin is injected and then shut it completely to squeeze out all the air trapped in the bulky fibrous preform. This design makes it possible to have some vacuum in the mould even when the press is not completely shut offering the benefits of vacuum moulding and those of squeeze moulding.

CN: What do you consider to be the advantages of this solution?
AZ: When comparing ERGOS presses to conventional presses for composites, customers are happy to find that our units are 30% less tall, which helps streamline the layout of their factories, and provide for a 20% reduction in energy consumption. Faster cycle time is also to be mentioned. The design of our press is such that it can work on a limited amount of hydraulic oil leading to shorter pressure build-up time. Customers also appreciate the dimensional consistency between the parts, which is hardly negligible when dealing with bulky, irregular preforms that can interfere with the closing of the press. Active control of parallelism is of great help.

CN: Are you planning to build more of these large lines in the near future or is this a solution for a niche market?
AZ: A timely question indeed!
We have just signed a contract to supply a similar line to a major Italian manufacturer of composites for the automotive industry. We will release more details during the year. Another large order is being prepared as we speak. We are to provide a complete line, consisting of huge preformer and press, to a US customer, who will use it to make an innovative product for the transportation industry.
I cannot say more for the moment, but when the line becomes operational, it will hit the headlines and not only in plastics trade publications!
I should mention that in 2014 we delivered another major preformer to a German customer, who makes parts for the latest models of a leading German car manufacturer. The unit has a preforming capacity of 3 by 3 metres and a vertical stroke of up to 2 metres!

The composites industry is a healthy one and the solutions for its industrialisation are available. It has been hard work, but we have identified what the industry needs to comply with the demanding cycle times of auto and auto parts makers. And the results are showing!

CN: Cannon ERGOS does not just deal in composites and automotive parts. How are your other markets doing?

AZ: They reflect the general economic trend with some areas doing better than others. We see good business coming from the thermforming market with some very special solutions being supplied to customers in Europe, Japan and Latin America.

In addition to production lines for automotive car parts, we have worked on a very special application of our technology – the creation of refugee shelters – a project sponsored by the IKEA Foundation in Sweden.

Another interesting application that we have worked on is that of front entry doors for residential homes. We are currently supplying Rodenberg in Germany with a dedicated thermoformer that makes inner and outer shells for a variety of entry doors.

After the flood of orders we received in the last few years, domestic refrigerators seem to have slowed down a little. We got a nice contract in China for an in-line thermoformer for refrigerator cabinets coupled with a very large number of dosing units and metering devices for blowing agent blends. Far from the vagaries of consumers’ behaviour when purchasing fridges for their homes, commercial refrigerators have proved a very interesting sector. We have just sold a complete line to an Austrian manufacturer for their production plant in Brazil. The RotoJig is an innovative solution for the manufacture of domestic refrigerators. We developed it a few years ago and have just sold one to customers in the Far East. The machine allows us to polymerise two refrigerator cabinets using a single foaming station. Two complete curing jigs are installed on a rotating platform and can be served by one mixing head. Once a mould has been filled with foam, the platform rotates by 180°; the entire first jig goes up one level and the second one comes down to the ground. This is where the mould is opened to remove the cured fridge, fed with a new empty cabinet and injected with foam before the whole cycle starts again. This solution saves room as well as part of the hardware usually required to build two jigs. The jigs are already fitted with all the accessories needed to apply vacuum to the mould so that refrigerator production too can benefit from the advantages of our V.A.I. technology.

CN: EXPO 2015 will soon get into full swing just a few kilometres off your factory. Have you planned any special activities for the six months of the exhibition?

AZ: Of course, we have. Cannon has planned an intense programme of visits to their factories located in the outskirts of Milan, and ERGOS will have a big part in it. We have scheduled general Open Days for late May and early June, when major pieces of equipment will be in an advanced stage of testing at our facility.

We will organise visits to our premises by individual companies and treat our customers to a special programme. After meeting with us, they will have the chance of going on a guided tour of the Italian Pavilion at Milan’s EXPO 2015. It is going be an intense year considering the tight delivery schedule we have to meet!

But I am confident that we will make it. We always do.

View here a video on Cannon Composites Technology!
India clean energy investments set to breach the $10bn mark in 2015

Bloomberg New Energy Finance estimates that 2015 will be the second time ever that clean energy investments will pass $10bn. A record $13.5bn was deployed in 2011. BNEF analysis shows that India has one of the lowest levelised costs of renewable energy generation in the world. With the rising cost competitiveness of renewables and increasing interest in clean energy consumption by large commercial and industrial consumers, project installations are also expected to rise this year. Wind installations are estimated to reach 2.8GW~ – up 22% from 2014. The government is working on introducing big ticket reforms in the power sector by amending the Electricity Act of 2003.

Windblades: Suzlon selects Cannon for dispensing and gluing equipment

THE INDIAN SUZLON GROUP (www.suzlon.com) IS RANKED AS THE WORLD’S SIXTH LARGEST WIND TURBINE MANUFACTURER, IN TERMS OF CUMULATIVE CAPACITY IN 2014, WITH 7.1% WORLD MARKET SHARE. SUZLON HAS SELECTED CANNON AS SUPPLIER OF BOTH RESIN AND GLUE MIXING MACHINES.

The seeds of Suzlon were sown by Mr. Tulsi Tantul’s venture into the textile industry. Faced with soaring power costs and the infrequent availability of power, he looked to wind energy as an alternative. Beginning with a wind farm project in the Indian state of Gujarat in 1995, with a capacity of just 3 MW – he set forth to acquire the basic technology and varied expertise to set up Suzlon Energy Limited, India’s first home-grown wind technology company. The Group offers today one of the most comprehensive product portfolios – ranging from sub-megawatt onshore turbines at 600 Kilowatts (kW), to the world’s largest commercially-available offshore turbine at 7.5 MW – with a vertically integrated, low-cost manufacturing base. Headquartered in Pune, India, Suzlon’s domestic market share was 21% during 2014. The company’s global spread extends across Asia, Australia, Europe, Africa and North and South America with over 26,000 MW of wind energy capacity installed, operations across over 31 countries and a workforce of over 10,000. Suzlon is credited with developing one of the world’s largest operational onshore wind farms in the western Indian state of Gujarat & Rajasthan. The Kutch Windfarm & Jaisalmer wind farm have a cumulative installation capacity of over 1,000 MW (1GW) each and capacity build up ongoing.

New resources for Suzlon wind blades

Suzlon manufacture in four nations – India, Germany, Portugal and US – the whole range of products required to make power from wind: generator, rotor blades, control systems, towers, nacelle assembly, hub castings, transformers. After having utilised for several years various brands of epoxy resin dispensers, Suzlon has now investigated the supplier’s market for this specialist equipment and have decided to select Cannon for a new investment in India. The decision was based on both technical and strategic drivers. On one side in fact, Cannon is taking benefit of its experience on highly sophisticated mixing process control coming from the manufacturing of equipment for polyurethane and composite components mass production, delivering advanced dosing units to a field (blades manufacturing) once accustomed to lower precision mixing. On the other, Cannon, as a consolidated global player, could offer to Suzlon an unprecedented local service, guaranteeing short response times and local presence of spare parts thanks to the local partner Expanded Polymers that, through a dedicated team of 10 engineers, is servicing the more than 2,500 Cannon machines operating in India.

Six Cannon Epoxy DX 35 two-component metering units will be supplied for the infusion process of the Epoxy resins that are used as binder for the infusion of glass-reinforced composites blades. Designed for maximum reliability and high performances, these giant blades are manufactured in two half-shells that, when cured and inspected, must be assembled bonded depositing through the use of a special adhesive on their entire edge. This delicate process requires high precision in dispensing the two-component glue, a certain velocity (to exploit the advantages deriving from the reactivity of the formulation) and an ergonomic design of the dispensing equipment, that must travel along the whole length of the blade. Cannon designed for this application a special machine – the G-System – to that fulfil and exceed these requirements. Various innovations have in fact been implemented (recirculation, high flow rate of up to 30 kg/min) to redefine the standards of the process. Suzlon order includes also six G-S system machines. Six units will be delivered by the end of 2015 to allow for the industrial production start, foreseen for the first quarter of 2016. We at Cannon perceive this project as the first important milestone towards the lead of Indian infusion and bonding machines market.

GAMESA confirms the choice of DX 35 in India

THE FOURTH LARGEST PRODUCER OF EOLIC PLANTS CONFIRMED THEIR TRUST IN CANNON EPOXY DISPENSING EQUIPMENT. AFTER A POSITIVE EXPERIENCE IN SPAIN, MORE DX 35 MACHINES WILL BE INSTALLED IN THEIR INDIAN PLANT.

The news just arrived before closing this edition of the Cannon News: GAMESA, the Spanish manufacturer ranked as World’s #4 producer of aerolic plants (www.gamesacorp.com), confirmed a supply order for two Cannon DX 35 Epoxy resin dosing units and one resin degasser for their Indian plant in Halol. The decision follows their positive experience with the first six machines that the Group installed less than 18 months ago in their Spanish factory.
Automotive cavity filling made easier

WE KEEP REPORTING IN OUR CANNON NEWS ABOUT THE ONGOING DEVELOPMENTS IN THE FIELD OF CAVITY FILLING FOR AUTOMOTIVE CHASSIS. DIFFERENT TYPES OF FORMULATIONS ARE USED FOR NVH (NOISE, VIBRATION AND HARSHNESS) CONTROL, EACH HAVING DIFFERENT PROCESSING SPECIFICATIONS AND TECHNICAL REQUIREMENTS. SHOTS OF LESS THAN 20 G ARE NOW MORE AND MORE COMMON; THEY ARE DELIVERED INTO TINY HOLES DRILLED IN THE CAR BODY Pillars.

Cannon has a machine specially designed for this application: it can perform small shots and ensure consistent filling quality.

Cannon has recently designed a new series of mixing heads - the LN series - with a view to meeting the need for compact size, foam quality, ease of use and durability in challenging conditions like a non-stop car production line. The LN 4HP, for example, works well with all types of chemical agents used in the industry and can be either mounted on a robot - as Chrysler did in its highly automated plants - or used manually like Audi in China.

The LN 4HP is specially designed to assist manual injection and is used by Audi in China for the production of its vehicles. Yet the chemicals that flow into the mixing head are hot as they tend to be processed at temperatures over 50°C. This causes the temperature of the standard head grip to go up until it becomes unbearable to the operator and a bulky layer of insulating foam needs to be applied. Cannon has recently fitted this model with a new polymeric handle with a net-like structure in thermoplastic resin that prevents heat transfer. The handle is compact and very practical and protects the operator’s hand during injection.

Dedicated units for Cavity Filling are manufactured by Cannon in Italy and in USA for the specific formulations used in different markets.

New blowing agent’s blends: we have the solution for you

BLOWING AGENT BLENDS ARE BECOMING MORE AND MORE POPULAR IN THE MANUFACTURE OF RIGID POLYURETHANE FOAMS DUE TO THEIR ABILITY TO PROVIDE GOOD INSULATION AT A REASONABLE COST. THE SAME RESULT CAN BE OBTAINED BY MIXING A SMALL AMOUNT OF A NEW, MORE EXPENSIVE AGENT WITH A LARGER AMOUNT OF CONVENTIONAL CYCLO- OR N-PENTANE. SPECIAL EQUIPMENT IS NEEDED TO HANDLE THESE BLENDS FOR THE PHYSICAL CHARACTERISTICS OF THE CHEMICALS REQUIRE SPECIFIC TECHNICAL SOLUTIONS TO ENSURE PROPER STORAGE, DOSING AND METERING.

CannonAfros has been pioneering the mixing and metering technology for alternative blowing agents since the late 1980s when the recommendations of the Montreal Protocol set new rules for the expansion of Polyurethanefoams. Today, with 25 years of experience in the field, Cannon can offer a number of dedicated industrial solutions to the users of modern blowing agents. These include HFOs (hydrofluoroolefins), a group of “fourth-generation” expanding agents with moderate global warming potential, and HFCs (hydrofluorocarbons).

A new version of the EasyFroth™ premixing unit is now available. It was designed to meter blends of Honeywell Solstice® 1233zd (trans-1-chloro-3,3,3-Trifluoropropene), a liquid HFO with a boiling point of 19 °C and Cyclopentane. Engineered with special polymeric seals and other plastic parts to comply with the chemical features of CannonAfros.

Solstice, the new dosing unit is equipped with a membrane pump that can also handle HC (Hydrocarbon) blowing agents.

A cooling system keeps the chemicals well below their boiling point, while closed-loop control of the output ensures accurate dosing throughout the metering phase.

A large contract was recently awarded to Cannon in Far East for numerous dosing machines and premixing units using blends of blowing agents: here some of them are in an early phase of assembly.
INTERESTING NEWS FROM THE THERMOFORMING DIVISION OF CANNON: NUMEROUS PROJECTS ARE CURRENTLY UNDERGOING WORLDWIDE, WITH SIGNIFICANT CONTRACTS CONCERNING BOTH THERMOFORMERS AND PUR FOAM DOSING EQUIPMENT.

The Cannon Group trusts the thermoformers business. It's an increasingly complex technology and complex moulding challenges are those preferred by Canon. A strong team of thermoforming experts, with more than 30 years of experience in all the crucial departments, from design to manufacture to service, runs the thermoforming equipment activities of Cannon.

Formerly run by Cannon Forma, the manufacture of these machines has been merged under the new Cannon Ergos company two years ago, within the scope of the project that has streamlined the activities of the four Italian engineering companies dealing with plastics and foams. And the results are coming.

The thermoforming equipment activities are doing very well this year, with numerous projects obtained thanks to the possibility of offering a more integrated set of technologies to the same final user.

Refrigerators
A large project in China has been granted through Cannon Ergos East for the supply of the foaming and the thermoforming equipment for refrigerator cabinets to Hangzhou Huari.

The supply includes one sophisticated in-line thermoformer for the cabinet liners, plus the wet side for foaming, supplied by Cannon Afros. To be specific about the peculiar aspects of this job, the multi-station thermoformer, which turns out one cabinet every 45 seconds, is equipped with a pressure forming system.

The 60-ton clamping station, able to form sheets up to 2x1 meters, provides a more efficient forming than the conventional ones: working under pressure it allows faster cycle times and important savings in material usage.

The plastic liner’s quality gains from this method, since it undergoes less thermal stress and maintains better mechanical characteristics on the final part.

This solution allows for a significant saving in three different cost areas: by reducing the thickness and the weight of the plastic sheets by 5%, by using less energy for preheating the flat sheet and for cooling the formed cabinet, and by saving cycle time, enhancing the productivity.

The Polyurethane foaming equipment supplied by Cannon Afros, consists of 8 high-pressure dosing units, double and single A-System Penta Twin models, with Penta EasyFroth modules to dose mixtures of two different blowing agents (Pentane plus HFC-245fa, a hydrofluorocarbon, or Pentane plus HFO-1233zd, a hydrofluoroolefin) and 8 FPLSR mixing heads.

All in all, this has been again an example of well-coordinated project, carried out in strict cooperation between three Group’s companies.

Automotive
The supply of large thermoformers for automotive applications continued also in 2014, with the supply of five machines to Magneti Marelli, FCA Group, producer of interior automotive parts.

Already announced on the August 2014 edition of Cannon News, when the first machine was supplied for the production of the complete instrument panel of the Jeep Renegade model, the program of deliveries has been extended to two more similar RotoCrea models – supplied in Italy also for the production of the dashboards of the new Fiat 500X – and two single station machines supplied to their Brazilian plant producing belly pans for the Jeep Renegade. This project in Brazil, in particular, has been executed with a very wide scope of supply. In addition to the two Crea thermoformers, a complete production system has been provided, including: the manufacture of 700 belly pan prototypes in the Italian thermoforming laboratory of Cannon, the supply of moulds for prototyping and production, two Belotti CNC centres for the trimming of the parts, with their relevant milling jigs and a trimming press.

Another prestigious project has been obtained by Cannon Ergos in 2014 for the supply to Calsonic Kansei (www.calsonickansei.co.jp) in Japan of the production equipment for the dashboard of the new Infiniti, the top class automotive brand of Nissan.

This soft-touch, elegant instrument panel is obtained through a thermo-covering process, involving the application of an outer layer of TPO and expanded PP over an injection moulded PP structure. A precise length of TPO is unrolled, cut, heat, lined with a layer of adhesive and automatically formed in mould over the PP insert. The CREA forming machine, holding moulds up to 2x1 meters, laminates the skin over the substrate until they are perfectly glued. The resulting dashboard is then manually unloaded, with a part-to-part cycle of 90 seconds performed by one operator.

Enquiries are welcome for any type of complex forming project; the solution that you are looking for now might already be available, at Cannon!
Safeman & Cannon partnering for the benefit of refugees

THE IKEA FOUNDATION IS DEVELOPING AND TESTING A BETTER HOME FOR REFUGEE FAMILIES, IN PARTNERSHIP WITH THE UN REFUGEE AGENCY (UNHCR) AND BETTER SHELTER.

CANNON PROVIDES THE SWEDISH THERMOFORMERS SAFEMAN THE INNOVATIVE EQUIPMENT REQUIRED TO PRODUCE THE PLASTIC MODULAR SHELTER.

Many of the textile or plastic shelters currently used in refugee camps often have a lifespan of as little as six months before the impact of sun, rain and wind calls for their replacement. Unfortunately, refugees can stay in camps for several years. Not only does this leave vulnerable families even more exposed to the challenges of life in a refugee camp, but it also presents a huge burden to the aid agencies and governments trying to create a more dignified life for the millions of people who have had to flee their own homes. Thanks to the IKEA Foundation’s focus on funding innovative projects and developing connections between its partners, that could be set to change.

Collaborating for the benefit of refugees

The IKEA Foundation provides to this project funding and management support. UNHCR brings the know-how and field experience, while Better Shelter – a social venture – develop the prototypes and specifications for houses that are put up in modules and can be delivered in flat packs, a well-known IKEA concept that simplifies transport.

A smart, portable shelter

The houses are designed to be easily set up and taken apart and are also easy to carry. A tubular steel structure, similar to that used for camping tents, supports modular panelling elements for the roof and the walls; these panels, made by thermoforming rectangular sheets of expanded TPO (thermoplastic polyolefin), are characterised by an excellent resistance to UVs and rain. These lightweight panels are fixed one another through simple plastic buttons and, when installed, they guarantee a certain degree of thermal insulation, a complete tightness to light, wind and rain, while preserving "optically" the privacy of the family living in the shelter – a defect much criticised of the textile tents widely used as shelter until now.

Each house is fitted with a flexible type of solar power unit, which is sufficient to power one lamp, that comes with the house, and a USB port. The USB option may look odd, but it shows the high conceptual level behind the project: the refugees – right now, 3.5 million of them live in UN-provided tents! – not only demand comfort, security and dignity, but also need a way to communicate with the rest of the world, and their mobile phones, tablets and computers plug into the same four-pin ports that we all use.

"The prototypes of the shelter have been tested in refugee camps in Ethiopia and Iraq and the families who live in the shelter have had a direct say in how the product is developed, contributing with their experience to this collaborative process.

The prototyping of parts was done in Cannon Ergos, producing more than 1,000 thermoformed walls and roof panels in expanded TPO (thermoplastic polyolefin).

The project, started in 2008, required a number of refinements prior to the definition of the ideal shelter. When the decision was made to use thermoformed plastic walls and roof, NORTEC-Cannon AS, the Cannon agency in Europe's Northern countries, was consulted by the Swedish company Safeman for the supply of a proper industrial solution able to provide the high number of parts in a rational and fastway. Safeman manufactures everything from custom parts to high-volume units and assembled products for the industrial sector, offering to their customers a total concept, from initial idea to finished product. They design and manufacture products and details in materials such as plastic, textile, foil, leather and metal, and were involved since the beginning in the development of this innovative shelter.

Cannon Ergos was involved with this request and responded designing a complete production solution, while offering their laboratory facilities to supply the desired prototypes for the field tests. The suggested thermoforming solution aimed to produce a totally trim-less panel: no peripheral scrap is generated in this project, contributing to the economy and the environment friendliness of the process.

A dedicated, environment-friend solution

The plant, supplied by Cannon Ergos in the first quarter of 2015, includes:

- two forming presses to shape five different types of panels served by four handling robots
- three presses to punch the holes for the connecting buttons
- five thermoforming moulds
- the heating stations for the plastic sheets
- the complete engineering of the plant
- two prototyping moulds and all the relevant production of prototypes

When fully operative, this plant will be able to produce panels for about 30,000 shelters/year.

"This is a clear example of how we use design and the design process to create benefits based on the user's needs," explains Anders Recare Thulin, Chief Executive of Better Shelter "We create added value for every euro with houses that are cheap and durable."

Cannon is proud of having contributed to the project with the supply of a complete solution – from the technological concept to the production plant, including tooling and prototyping service – Cannon Ergos confirmed once more their mission of One-Stop-Shop supplier of complex moulding plants.

We thank IKEA Foundation (www.ikeafoundation.org) for parts of the article and for the shelters pictures!
Thank You, Nitti!

Stefano Rissi passed away on 28th December 2014 after a long battle with an incurable disease. This page is to commemorate, with the help of those who knew him well, an invaluable colleague and friend, but most of all a remarkable artist whose humorous calendars have entertained us since 1994.

Stefano Rissi was born in Taranto on 22nd August 1934. His father Luigi was a navy officer temporarily stationed at the local naval base. His father’s career took him to Venice and Pola, where he spent his childhood before returning to Chiavari, his family’s hometown.

On 10th June 1940, a few months after the start of the war, the Palestro, the ship commanded by Stefano’s father, sank into the Adriatic Sea after being tor pedoed by a British submarine. Luigi Rissi was awarded the Silver Medal for Military Valour and a street was named after him in the district of his hometown called “The Rocks”, where his ancestors had built wooden ships for generations. The tragedy considerably affected the life of young Stefano (called Nitti by one of his father’s batmen) for his mother opposed his ambition to follow in his father’s footsteps and join the navy.

A life around the world
In 1959 Stefano graduated with honours from the University of Genoa. His degree in mechanical engineering with emphasis on naval machines qualified him for a career as a ship’s engineer. Yet he took a job with Rhodiocte, a manufacturer of cellulose acetate based in Pallanza, but eventually his love for the sea got the better of him and brought him back to Chiavari. He got a job at the Shell refinery in La Spezia, where he worked until the beginning of 1962, when he joined Grace.

His natural communication skills and great love of mechanics led him to take up a career in sales in 1970 studying and selling food packaging equipment across Eastern Europe and the Middle East.

In 1971 Stefano married his wife, Andreina Varani, “Gigia” to him, and they became inseparable ever since.

In October 1973 Stefano he joined Afros, where he first covered Romania and later Yugoslavia – a market he helped develop with great commitment for many years thanks to his extraordinary flair for languages.

In 1975 Nitti turned to the Russian market and in August 1979, after more than three years of hard work, he won the first contract for the supply of a car seat cushion production line in the region. This opened the way to an avalanche of orders for automotive applications.

Working with Gries in, March 1983 Stefano landed the first contract for the refrigerator industry in Russia. Many more followed.

Soon afterwards, Cannon was able to open an office in Moscow, which Nitti directed remotely for many years. In the meantime, he had started to look further on to the East to find a way into the Chinese market. In May 1983 Stefano took part in Cannon’s first trade show in China and from the booth managed to sell equipment and machines for a record 2.5 billion lira!

This is how our business in China started: a rocambolique enterprise with Stefano and his colleagues from Singapore visiting customers by day and typing out quotations at the hotel by night.

Back to the roots
Nitti retired from Cannon in 2004 and returned to Chiavari, where he could indulge his old-time love for sailing and studying the history of navigation. A keen expert on everything navy – whether civil or military, ancient or modern, domestic or foreign – Stefano Rissi continued to speak at crowded conferences at Chiavari’s Lega Navale and on local TV stations until the last months of his life. Exceptionally well-read, Nitti was gifted with a formidable memory.

Marine model making was yet another passion of Nitti’s, one he pursued by building sections of ancient galleons down to the tiniest detail. He would replicate on a small scale what his ancestors had built for real making perfect reproductions of legendary ships. He knew the entire nomenclature of the equipment aboard large vessels and could easily list it as if he were reading out a manual.

It was only with some reluctance that Nitti, a walking encyclopaedia, accepted to buy himself a computer for he often joked about the Internet being already “in his head”.

Cannon’s calendars
Nitti was most famous for his calendars, which he drew entirely by hand and in colour for Cannon. They depict some of the milestones of human history seen through Stefano’s eyes and featuring myriads of figures so small that it is incredible that he could draw them freehand.

And yet he did, often inventing them like only his bright mind and gifted hand could.

He would set the story in a context of technological innovation and enrich it with surprising historical details and a good deal of humour.
Nitti would first make a sketch in pencil, then ink it with an extra fine nib and eventually colour it using watercolours and mixed media.
Whirlpool Corporation opens a new refrigeration technology center in the USA with Cannon equipment inside.

In 2010, Whirlpool broke ground on a campus of buildings close to their world headquarters in Benton Harbor, Michigan, USA. Their goal was to consolidate 15 owned and leased facilities in the Benton Harbor and St. Joseph areas into three central campuses within 5 miles of the corporate headquarters.

In 2012, the first of the buildings on the Riverview campus opened, much to the delight of the people from Benton Harbor.

The campus was designed to bring teams from Sales, Marketing, Brands, Engineering, Product Testing, Supply Team and Manufacturing to one location, enabling much closer collaboration and expediting innovation to market.

One of the next buildings constructed was the Benton Harbor Technology Center (BHTC); located two blocks away. It was completed in December 2014 and houses the refrigeration design engineers, along with all of the refrigerator prototyping equipment and the testing and evaluation equipment for the refrigerators.

BHTC was the machining center for washing machines before being repurposed into the new 80,000 square foot technology center. Every part of the building was changed except for the original structure and even the outside and inside of the original structure is no longer visible. Approximately 200 people work in the new center. As mentioned, the technology center includes prototyping facilities and fortunately for Cannon, that means insulating foam equipment.

In the past, much of Whirlpool Corp.’s refrigerator design, prototyping and evaluation was done in Evansville, Indiana. Crios and Cannon USA installed nearly all of the foaming equipment (fixtures and custom metering machines/piping) into Evansville and most of the equipment has now been relocated to Whirlpool facilities in Mexico. One piece was left - and as part of the new technology center project, Cannon won the bid to move the Crios fixture line and provide new foaming equipment for the new prototype lab.

Of course, the equipment is ready for the blowing agents of today and the future. Whirlpool benefited from a turnkey approach from Cannon. The project included:

- New lab concept layouts
- New lab final layout and detailed design
- Assistance with reviewing the safety system required for use of pentane blowing agents
- Build and test new equipment in the USA
- Removal and transport of the equipment in Evansville, Indiana
- Installation of the equipment and field wiring of the new lab in Benton Harbor
- Start up and testing of all equipment

Whirlpool gained from Cannon USA’s long relationship with them and deep understanding of Polyurethane. The person that led the field team, Tom Augustine, installed the fixture the first time in Indiana, watched the equipment move from Indiana, and led the team that installed and tested the equipment in the new lab. Both companies were happy with Tom’s efforts and dedication.

It is fitting that the largest home appliance manufacturer in the world, Whirlpool, looks to Cannon, the largest Polyurethane equipment company in the world, when selecting a partner for the new technology center. Cannon is very happy to support them.

The old Evansville Plant front door—many Cannon employees passed through these doors to make the Evansville Indiana facility a reality.

The new lab has all the equipment necessary to foams and cabinets for the foreseeable future. The centerpiece for the lab is the Crios fixture from Evansville – still in good shape as it has been located in the Evansville Lab since the 1990s. The fixture is the perfect prototype tool because it is a production grade piece of equipment. Any prototype made here can be made on the production equipment. The walls in the lab enclose the fixture so with the installed safety system, the fixture can be used to fill a cabinet with insulating foam containing the Pentane blowing agent.

The chemical dispensing equipment is new and versatile. A Penta Twin 200 was designed and built in the USA and was provided as part of the project along with all new piping and wiring. Variable pumps were used to increase the flow range.
CLOSED FOR SOME TIME, THE CANNON – SANDRETTO PLASTICS COLLECTION WILL SOON REOPEN IN PONT CANAVESE, NEAR TURIN, ITALY. HUNDREDS OF OLD PLASTIC OBJECTS WILL BE ON DISPLAY IN FULLY REFURBISHED ROOMS.

Cannon owns the world’s largest collection of old plastic objects, hosted in an elegant 19th century villa in Pont Canavese, a half-hour drive from Turin. The town of Pont is located at the foot of the Alps and was once at the centre of an important network of roads that crossed the mountains – a place to trade and meet different cultures. The villa is an annexe to Sandretto’s (formerly part of the Cannon group) factory in Pont and was originally a guesthouse. The building required significant renovation and this, of course, was incompatible with keeping the Cannon – Sandretto Plastics Museum open to visitors.

Today, after more than two years of intense refurbishing, the site is ready to be reopened. It will be a non-profit cultural organisation known as the “Cannon – Sandretto Plastics Collection.”

Seven fully refurbished rooms host one of the richest collections of plastic materials ranging from conventional ebonite, celluloid, casein plastic and Bakelite to the most modern polymers. Brand-new graphics help the visitor familiarise with the history of polymers, the main types of plastics and their applications.

A century of research, patents and inventions has generated a huge number of products that have changed the way we live on this planet. These products are now back on display in Pont. An agreement has been signed between Cannon and the town’s government to ensure that a guide is available at all times to open the site to the visitors who booked their visit in advance.

Cannon – Sandretto Plastics Collection
Via Modesto Sandretto
10085 Pont Canavese (TO) - Italy

To book a visit or receive more information, please contact:

E-mail: communication@cannon.com
Website: plasticscollection.cannon.com
A Wide Range of Foam Product Solutions from Cannon Viking

As the world market recovers from the recession, greater emphasis is being placed upon product differentiation and development of new product lines. There is a growing debate and deliberation among foam producers on the best composition of foam products that are required to satisfy the changing needs of the end consumer and also achieve their corporate goals.

Cannon Viking has been in the forefront in adapting to these needs and offers equipment and technology to produce various foam grades and types. This helps foam producers to accelerate product development and introduction in markets, thus successfully retaining their customer base and tapping into emerging market opportunities.

Driven by new furniture designs and changes in the bedding industry to cater to superior foam quality demands of end users, high quality foam producers around the world are looking for a balance between softness and hardness, between conventional and non-conventional technical foam grades, between production cost and product quality and are investing in product solutions to produce newer and better foam grades. Some of the product solutions are:

1. Visco Elastic Foam/ Memory Foam – Still considered premium grade foam in many markets, the Visco foam is the ultimate solution to cradling comfort and durable support. Recent developments with both MDI and TDI based Visco foam are very popular with end users. Cannon Viking has been involved in Visco foam production technology from the beginning and offers equipment to produce on Continuous and Discontinuous machines.

2. High Resilience Foam – HR foam is open-cell, flexible foam that has a less uniform (more random) cell structure that increases support, comfort and resilience (bounce). Both TDI and MDI are used to produce HR foam and Cannon Viking offers dedicated metering lines for HR chemicals along with technical help.

3. Filled Foam – Cannon Viking has many years of experience in providing dedicated solutions to produce Filled Foam using Calcium Carbonate

4. Fire Retardant Foam – Since flexible foam material are very inflammable and produce excessive smoke, there is a growing demand for foam with improved fire retardant characteristics in hotels, hospitals, embassies, studios, railways and even homes. Cannon Viking provides dedicated chemical metering lines to help tap this fast growing market. Melamine based FR Foam for UK/USA and other markets can also be produced using Cannon Viking equipment.

5. Acoustic Foam – Also known as Sound Proof Foam, this is a perfect solution for studios, machine rooms, engine compartments, compressor enclosures etc. Cannon Viking provides equipment and technical help to produce this foam grade.

6. Outdoor Foam / Fast Drying Foam – These are suited for outdoor use where rain and moisture is prevalent, such as in patio furniture, or in marine boats. The large, open cells provide a degree of airflow, allowing it to dry quickly. Cannon Viking provides equipment and technical know how to produce this foam grade.

7. Anti-Bacterial Foam – In markets where rain is prevalent with acute dampness, anti bacterial foams are more popular due to their tendency to suppress micro organism growth. Dedicated chemical metering lines are available from Cannon Viking to produce this foam grade.

8. Body Foam / Anti UV Foam – This grade of foam is now extensively used in the Lingerie industry and has two popular variants – light stable PU foam and delayed yellowing PU Foam. Cannon Viking provides dedicated equipment for the additives used to produce this grade of foam.

9. Gel Infused Memory Foam – Getting increasingly popular, this foam provides a plush but supportive feel with enhanced cooling comfort. The gel is mostly available as a Polyol mix and Cannon Viking provides dedicated metering line to produce this foam grade.

10. Soft and Ultra Soft Foam – Mostly produced using high Ethylene Oxide (EO) Polyether Polyol as an additive, these two foam grades are integral part of very high quality and luxurious foam mattresses. They have a unique silky feel and are in high demand and in high quality upholstery as well. Cannon Viking provides dedicated chemical metering lines to produce this foam grade.

11. Polyester Foam – Using high pressure chemical streams and Liquid Laydown foam production equipment from Cannon Viking, this foam grade can be produced with evenly spaced cell structure with a high proportion of open cells. Polyester foam is a good choice for a number of applications due to superior mechanical strength, compressibility, cut resistance and solvency.

12. CO Foam – Cannon Viking offers patented CarDio™ technology to produce foam using Carbon Dioxide as a blowing agent. The CarDio™ equipment can be supplied complete and incorporated with a new continuous foam slabstock plant, or installed as an addition to a customer’s existing foam block production machinery asa retrofit package.

Cannon Viking, based in Manchester – UK, has many years of experience in providing equipment and technology to produce various foam types and grades to flexible foam producers all around the world.

Visit our website
www.cannonviking.com
for more information!
Lusocolchao grow with Cannon Viking in Portugal

CANNON VIKING HAVE RECENTLY MANUFACTURED, INSTALLED AND HAVE JUST COMMISSIONED A TURN KEY CONTINUOUS FOAMING PLANT TO LUSOCOLCHAO, PART OF THE LOURINI GROUP IN PORTUGAL.

Lusocolchao are located near to Santarem in Portugal and are a part of the Lourini Group which is one of the country’s largest furniture producers and manufacturers. Lourini have a number of factories located throughout Southern Portugal from where they supply the Portuguese, Spanish and Southern European furniture markets.

Cannon Viking was asked to provide a dedicated turnkey solution which consisted of a fully integrated chemical tank farm and a Cannon Viking Maxfoam Varimax 800 continuous foam block production plant. The Maxfoam Varimax Plant has high pressure metering lines for the key TDI, MDI and water metering lines as well as Cannon Viking’s patented silicone air pre mixer system to enable Lusocolchao to manufacture optimum quality continuous foam blocks with fine and regular cell structure and optimum foam density distribution.

The foam plant is equipped with Cannon Viking’s latest square block system to also enable the customer to produce optimum rectangular shaped flattedfoam blocks. A key part of the equipment package was the Omega control system which is fully integrated with both the chemical tank farm and Maxfoam Varimax Foaming Plant providing all chemical raw material data and information such as tank volume, temperature and in line temperature conditioning fully integrated with the foaming plant which controls the foam formulation with precision monitoring during production as well as full data logging for reporting and cost controls. The Omega control system is developed and fully supported in house by Cannon Viking’s team of five controls engineers.

The installation is now in daily operation and is being used to manufacture Standard, High Hardness, HR High Resilience as well as Viscoelastic Memory Foams for conversion by Lourini into mattresses and sofas both under the Lusocolchao and Lourini brands.

A turnkey plant for LNG panel production

LNG, A LIQUEFIED NATURAL GAS, IS BECOMING MORE AND MORE IMPORTANT AS A FOSSIL FUEL TO COMPETE WITH CRUDE OIL ALL OVER THE WORLD. GATHERED IN WARMER REGIONS LIKE QATAR IT HAS TO BE TRANSPORTED OVER GREATER DISTANCES BY SEA. THE NATURAL GAS (COOLED FOR TRANSPORT TO –163°C) IS SHIPPED IN LNG TANKERS, WHICH ARE SPECIFICALLY EQUIPPED FOR THIS KIND OF OVERSEAS TRANSPORT.

THE STANDARDS FOR INSULATION AT CRYOGENIC TEMPERATURES ARE DEMANDING.

The highest priority is given to keeping low storage temperatures and to minimising expensive losses during transport. LNG storage tanks are insulated with Polyurethane foam and cargo containments are often insulated with glass fibre reinforced Polyurethane foams (R-PUR). The latest project undertaken by Cannon Viking is a turnkey plant which will produce glass fibre reinforced foam panels, used for lining the hulls of LNG tankers.

Cannon Viking has been working closely with GTT who are the designers and licensees of the product in order to comply with their strict guidelines and safety assessments. The plant is being installed in a purpose built factory just 3 hours inland from Shanghai.

The first phase of the equipment supply consists of temperature controlled bulk storage tank farm system, fibre glass unwind system and inclined continuous rigid foam slabstock block machine with block length cut off machine and automated stacking system, which is currently being installed.

Phase two will be delivered to China by July 2015 and will concentrate on the conversion of the reinforced foam blocks into fully fabricated ready to fit panels for installation in the tanker ships.

Cannon Viking has worked with the Yoke management team over the last 3 years in order to bring this new manufacturing centre to fruition.
Race track line for the production of automotive seating

LARGE SCALE PRODUCTION FOR THE AUTOMOTIVE SEATING INDUSTRY IS A VERY DEMANDING CHALLENGE FOR THE VENDORS. THE TIER ONE’S AS WELL AS THE OEM’S STRIVE TO MEET THE REQUIREMENT OF FLEXIBILITY AND HIGH PRODUCTIVITY. CANNON SOLUTION OFFERS SEVERAL OPTIONS, ALLOWING THE CUSTOMER TO IMPLEMENT EITHER A FLEXIBLE OR A HIGH PRODUCTIVE LINE.

It is well-known that the automotive cushions are made of injected Polyurethane foam into an open mould by robots moving in a precise pattern and that only a continuous conveying system makes technological and economic sense. A lesser known fact is that customers are looking for extreme customised systems that fit their requirements. For this type of industry a “one size fits all” approach does not exist. Nowadays car and truck owners have different tastes and desires on their concept of perceived quality, comfort and feel and this is translated into the request for different seat sizes, foam densities, number of chemicals (read streams), reactive compounds, fillers and colours. Moreover, equipment devoted to the production of seats for a mass market car is significantly different from the one devoted to the production of a niche sportscar.

In this scenario either one can require a different density foam for the front and the rear cushions or different densities on the same cushion. It is clear that these requirements affect the design of the dispensing unit and its capability to handle multiple stream components. In the most challenging scenario the dosing unit and the mixing head have to perform multiple shots of different sizes, ratios and streams in the same mould within a limited time of down to 4.5 sec. One robot is not enough and more robots have to perform the tasks with precise coordination to avoid overlapping and collisions.

Many other variables (as polymerisation time, plant constraints, investment budget...) have to be taken into consideration in the design of a seating line and each of them can consistently affect the reliability and dimension of the line. All the variables are linked to each other with a precise cause-effect phenomena. For example, the time required to perform the shots determines the minimum time to close the mould, as a consequence, the system has the constraint of the cream time (the start of the reaction) of the foam that is directly linked with the curing time of the foam itself. Finally, the curing time, coupled with the required productivity, is the main determinant of the size of a line. Everything is linked to each other and everything can determine a big change in the size or price of the line.

Innovation into the customisation

Cannon, a worldwide leader in the production of Polyurethane equipment, believes that only companies and people with experience on both the “wet” and the “dry” sides of a moulding plant can deliver a superior product to the customers: all the determinant variables in the design of a system have a high degree of correlation and only a company well inside the dynamics and the implication of every single choice can address the issue and implement the solution.

The Wet system: metering and mixing PUR chemicals

Customers and raw material suppliers are now using multi-streams for the production of different density/hardness foam; MDI or TDI are the choices for isocyanate, but the multiplication of the streams belong to the choices for polyol.

In order to speed up and balance every change in the formulation, the seat manufacturer adjusts the quantity of the pre-blended polyol with the different catalysts, additives and prepolymer. With the TDI choice for isocyanate the request for simultaneous four streams is not rare. When MDI is the choice, usually one
The Dry system: the equipment related with foam curing

Traction and shape
In simple terms the productivity, the polymerisation time of the foams and the size of the moulds determines the bulk size of the line. It is common to have an oval conveyor line rather than a circular line. The former is longer, but with an overall smaller footprint.
Special plant needs require the implementation of different shapes, in order to stretch the line around plant constraints. The Cannon conveyor system lies on a steel race track and the carts are pulled by a series of independent drives located in the back of the carts. These drives are attached to a variable-frequency drive and guarantee the traction needed to pull the conveyor line. If one or more than one fail, the others can supply enough traction without jeopardizing the production. It is a solid and reliable way to guarantee continuous traction to the line and the perfect shape for all plants.

Temperature control
A good product, as well as a good polymerisation, is determined by the temperature of the moulds in the different stages of the production phase. Some formulations are more or less forgiving than others. Anyway it is a trend in the market to precisely control the temperature of the moulds, sometimes with different values between the upper part and the lower part of the mould. Cannon offers the possibility to use and combine different ways for the optimal temperature control. The more precise one is based on one dedicated thermostat for every cart, controlled by its PLC; this solution allows single temperature control per each tool carrier.

Carts and mould change
A high degree of productivity and flexibility demands a quick tool change system. Cannon has developed an automatic on-line mould change that is able to replace an entire mould carrier while the line is moving.

Ergonomics and safety
Cannon is sensitive to the continuous improvement in regards to the safety and the ergonomics of the operators. A cam rail system positions the upper and the lower mould at a precise tilting angle, adjustable and different in every station. Moreover the presentation of the upper mould to the operator can be enhanced with the swinging of the upper plate; in the pouring area there is no tilting for the lower mould, but instead a wider angle for the upper mould in order to allow the robot to perform the pattern with less constraints. An insert detection system can be added to the line.

Emergency and safety stops are positioned in every operator area, safety fencing, surrounding the production line and safety bars protect the operators when the tools are open. Customised paints can be applied to every part. Cannon also provides a Hydrocarbon Monitoring System (HMS) to monitor the air quality in the spray release area. The system will shut the line down when the safe threshold is passed. The drive motors are always explosion proof.

Cams vs cylinders
There are basically two systems for the opening and closing of the moulds, a cam rail system and independent cylinders. The former is more reliable, less expensive, but less flexible. The mould closes only when it passes the closing cam area. A speed variation of the line also affects the closing time of the mould. The cylinder option can avoid this problem and guarantees a smoother closing at higher speeds.

Controls and parameters
The overall system is controlled and monitored by a sophisticated control panel that record and manages hundreds of parameters.

The operator can control the line and implement modifications to the temperatures, speed and tilting features. The available software package also allows modification of the pouring patterns of the robots and controlling the line to monitor the reliability and productivity.

Conclusion
The flexibility, the continuous improvement and the capability to address customer requirements are key for the “perfect” system. There is not a unit concept that fits them all, but a series of choices that the purchaser has to share with the seller in order to create the proper solution that best fits the requirements of the entire system.

Cannon has devoted qualified engineers and technicians to the system and is proud to be the preferred supplier for most of the main Tier One seating manufacturers.
Visit the Museum of Iron in Netro!

The Museum of Iron at BONO Netro facility hosts a collection of ancient tools, machines and products from the metalworking industry.

The “Documentation Centre for Ironworking” is located inside Cannon BONO’s factory in Netro (Biella, Italy) and is part of the Elvo and Serra Valley Ecomuseum. It is one of Italy’s rare examples of industrial archaeology existing alongside a fully operating business, even though production has changed.

The earliest examples of ironworks along the Inganna creek in the area between Netro and Mongrado date back to the late 16th century. Industrial-scale production started at the end of the 19th century with the Rubino Ironworks where farming tools, ammunition (at wartime) and even some innovative automobiles were manufactured for decades.

The Museum of Iron is the fruit of the tenacity and dedication of Ugo Garzena, the factory manager of BONO Netro facility, who has built it virtually piece by piece. It exhibits products, machines, designs, technical manuals and administrative documentation testifying to the evolution of ironworking systems and techniques.

The Museum of Iron opens on request on working days. A popular destination for school trips, it has been visited by scores of enthusiasts and groups of tourists visiting the lovely valleys between Biella and Ivrea.

For special events, the museum also holds live demonstrations of hot forging.

For more information on the Museum of Iron:

Ecomuseo Valle Elvo e Serra
c/o BONO Netro SpA,
Via Rubino 7, Netro (Biella - Italy)
Ph. +39 01565124 - Fax +39 01565233

Contact persons:
Ugo Garzena
ugarzena@bononetro.com

Federica Faccarello
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See EXPO Milano 2015 & Celebrate Cannon 50th Anniversary!

The Cannon Group will hold some events at the EXPO Milano 2015, the universal exhibition that Milan, Italy, will host from May 1 to October 31, 2015. Over this six-month period, Milan will become a global showcase where more than 140 participating countries will show the best of their technology that offers a concrete answer to a vital need: being able to guarantee healthy, safe and sufficient food for everyone, while respecting the planet and its equilibrium. In addition to the exhibitor nations, the EXPO also involves international organizations, and expects to welcome over 20 million visitors to its 1.1 million square meters of exhibition area.

As their official website states: “A platform for the exchange of ideas and shared solutions on the theme of food, stimulating each country’s creativity and promoting innovation for a sustainable future, EXPO 2015 will give everyone the opportunity to find out about, and taste, the world’s best dishes, while discovering the best of the agri-food and gastronomic traditions of each of the exhibitor countries”.

Cannon, that celebrates this year their first 50 years of activity and was born a few kilometres away from the exhibition area, will participate to this important global meeting with some dedicated events, scheduled throughout the whole semester of show. Two major reasons to be there derive from Cannon strategic vision of the future.

Energy efficiency and energy saving are the two driving forces behind the Group’s development that characterised their history.

Energy Efficiency
When food is produced, it often requires immediate processing to be cleaned, cooked, packed. These operations require vast amounts of thermal energy, either utilised as steam or hot water or simply heat.

BONO is on the forefront of this important segment of the industry since 1958. Thousands of their dedicated boilers and thermal fluid heaters provide heat, steam and overheated water for any sort of food and beverage processing need, from sterilisation to distillation, from washing to cooking to packaging.

Dozens of dedicated thermal plants fuelled with biomass provide a viable solution to the recovery of agriculture surplus and scrap, saving thousands of tons of non-renewable fuels and contributing to an even increasing demand for cost saving.

Energy Saving
The whole “cold chain” which ensures the safe transport of food from their origin to our table is based on refrigerated transports and storages: large deposits of fresh product – be it vegetable, meat or fish – large containers that transport them overseas and deep into remote land regions, local distribution hubs, point-of-sale storages and displays, home refrigerators.

Cannon is a world leader in the refrigerator and panel making technology. Millions of parts – refrigerator cabinet and door, insulation panels, insulated refiners and trucks – are manufactured every year using Cannon fluorine equipment, with innovative production technologies that have changed the way these products are conceived and made.

Cannon Group’s interests in these two wide sectors of the human activity are spelled with innovative solutions, deriving from an intense and ongoing Research & Development work. It would have been unthinkable for Cannon to miss the EXPO Milano 2015 occasion to present them to an international, although non-specialised audience.

Several events have been organised during the six months of show, including dedicated meetings held in the auditorium of the exhibition, special Open Days in their nearby factories and guided tours to the Italian Pavilion. Here the food’s theme will be explained, in a thorough and content-rich way allowed by the Italian tradition in the business, in cooperation with Italy’s Industrial Association (CONFINDESTRIA). The coincidence of EXPO Milano 2015 with the 50th Anniversary of Cannon will give to the Group the opportunity to celebrate, with customers and visitors, an exceptional year full of opportunities and challenges.

The EU commends a clever solution for greener fridges

The LIFE-funded ENERG-ICE project, conducted in partnership by Dow Italia and Cannon Afros, led to the creation of innovative technologies to improve the insulation performance of fridges and freezers while increasing productivity. Each partner contributed their expertise to the project with a view to developing a joint solution that would improve the existing method of manufacturing and insulating domestic cold appliances with enhanced closed-cell PU foam.

The technologies had to be developed hand in hand in order to obtain better-insulated appliances. The result was a new energy-efficient insulation process for fridges and freezers that allows a carbon footprint reduction by at least 10% from cradle to grave.

The thin cavity walls of refrigerators are a source of friction for the foam flow, which becomes more critical with faster reactivity. This is less relevant when the walls are thicker and cavities are larger in insulation panels.

The cavity geometry of a fridge is very complex and features unevenly shaped walls that are rejointed together.

This can affect the filling up of the area to be insulated and the spreading of the foam across it. The presence of wiring in the cavity only adds to the complexity of the process and experience of a strong Location. Applying vacuum to the fridge cavity during the injection process is therefore essential to assist in the expansion of the highly reactive foam. This made the partnership between Dow Italia and Cannon Afros the key to the success of the entire project.

“Dow could increase the reactivity of the foam, but for the application to work, they needed us to improve the injection technology process”, explains Maurizio Corti, Chief Technical Officer of Cannon Afros.

The ENERG-ICE project was chosen as one of the six “Best of The Best LIFE Projects for 2013” during the ceremony for the 10th edition of the LIFE Environment Awards, which was held in Brussels in June 2014.

Federchemica, the Italian Federation of Chemical Companies, awarded the ENERG-ICE project the Product Stewardship Award, which was presented to Dow on 15th December 2014. Left to right: Maurizio Corti, Chief Technical Officer of Cannon Afros; Claudio Benedetti, General Manager of Federchemica; Alberto Fangareggi, Chief of R&D of Dow Italia; Cesare Pucconii, Chairman of Federchemica; Yanni Parenti, PU Appliances Global Technology Leader of Dow Italia.

In 1992 the European Commission launched LIFE, a programme aimed at developing and implementing environmentally friendly technologies.
Pirelli chooses BONO in Russia

CANNON EURASIA, BONO ENERGIA AND ARTES INGEGNERIA HAVE DELIVERED AN IMPORTANT TURNKEY THERMAL PLANT FOR THE TYRES FACTORY OF PIRELLI IN VORONEZH, 500 KM SOUTH OF MOSCOW, RUSSIA.

This project was started when Pirelli, owner of VSZ (Voronezh Shina Zavod), in the context of a general modernisation of the production plant for industrial tyres, made the decision to produce all the heat required by the vulcanisation process by itself, thus interrupting a procurement agreement with the local energy public utility. In 2012, after having replaced all production machineries and having installed the best devices on the market with an investment equal to 56 million Euro, VSZ started the installation of a biogas thermal plant.

Three large water tubes boilers, having a total capacity of 53 thermal MW, have been supplied by BONO Energia. The heat recovery units at flue level allow the feed water for the boiler to be pre-heated, thus increasing the energy efficiency up to 95% in full swing.
Using inverters on all engines of pumps and fans, as well as a complex network of sensors for the constant control of combustion parameters, have allowed to cut costs for electricity needed to run the plant.
The control panel manufactured by Cannon Group allows to automatically manage the workload of the three boilers according to the demand coming from the different departments.

For this project ARTES Ingegneria has provided the complete plant for the treatment of the feed water of the boilers, composed of a section for reverse osmosis and two degassing units. The water – about 50 ton/h, coming from the river Don near there – is filtered and sanitised in a pre-treatment area designed on purpose to manage a wide range of polluting substances. Thereafter, it is demineralised up to a conductivity value of 20 microSiemens, needed for the optimal operation of boilers. The presence of two parallel treatment lines ensures the continuity of all operations even during the maintenance periods.
The oxygen remover consists of two thermal-physical degassing units that can produce 75 ton/h of water perfectly degassed: the Spray&Tray technology, patented by ARTES Ingegneria, allows to get excellent levels of C02 and O2 extraction: the latter can reach minimum concentrations of 5 ppb (parts per billion).

A key role for the acquisition of this important order has been played by Cannon Eurasia, the Moscow-based company of the Cannon Group, that is authorised to sell and install turnkey plants on the whole Russian territory, holding an SRO (Self-Regulatory Organization) licence.
The three companies of the Cannon Group have cooperated really effectively in order to achieve this important job, and have once more applied the successful strategy of joining the best technological resources, present in the Manufacturing Centres, with the local presence and experience of a strong location.

Three BONO Energia’s water-tube boilers, for a total capacity of 53 megawatts, generate the heat for the vulcanisation of industrial tyres manufactured by Pirelli VSZ in Voronezh, Russia.
The new steam generator HE Smart guarantees:

- Thermal efficiency up to 98% and reduction of NOx emissions
- Reduction up to 13% in fuel consumption
- Reduction up to 40% in electric consumption
- More safety and simplicity of management of the not supervised plant

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BONO ENERGIA

Meet Us @...

**PLASTIC Japan** - Tokyo - Japan
from April 8 to 10, 2015
Plastics Technologies

**UTECH Europe** - Maastricht - Holland
from April 14 to 16, 2015
Polyurethane Technologies

**INTERZUM** - Koeln - Germany
from May 5 to 8, 2015
Flexible Foams for Furniture

**OGU** - Tashkent - Uzbekistan
from May 5 to 8, 2015
Oil & Gas Industry

**CHINAPLAS** - Guangzhou - China
from May 20 to 23, 2015
Plastics Technologies

**COMPOSITES Europe** - Stuttgart - Germany
from September 22 to 24, 2015
Composites Technologies

**CPI Conference** - Orlando - Florida, USA
from October 5 to 7, 2015
Polyurethane Technologies

**FAKUMA** - Friedrichshafen - Germany
from October 13 to 17, 2015
Plastics Technologies

**ADIPEC** - Abu Dhabi - UAE
from November 9 to 11, 2015
Oil & Gas Industry

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For 50 years we have chased your dreams and brought your ideas to life...

...here’s to the next 50! Happy Birthday Cannon!

You have granted us your patronage for 50 years, stimulating a number of successful ideas.

You can continue to share with us your thoughts, gaining time and money when using the equipment we developed with you.

We are proud of what we have been able to do with your help.

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