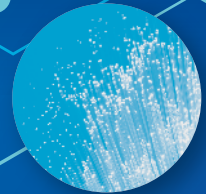
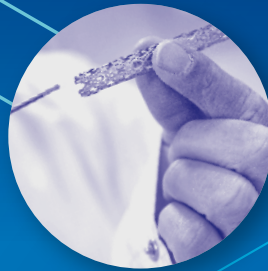




Polymer Technology
Ireland
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Polymer Technology Ireland 2020 Strategy

Polymer technology: the backbone of Irish manufacturing

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Chair's foreword

In the late 1950s Ireland's industrial take-off was bolstered by manufacturing output growing 6% annually, 1958-1963. Manufacturing played a major role in the development of the Irish economy at a time when it was a predominantly agrarian economy. And in these early years the Federation of Irish Manufacturers, a precursor of Ibec, played an important role leading the business agenda and driving growth.

The manufacturing industry in Ireland has expanded significantly since then. The sector now comprises 4,000 enterprises employing 230,000 people, making it the second largest employer in Ireland and accounting for nearly a quarter of economic output.

Irish manufacturing has evolved from traditional industries such as textiles and steel to a higher technology, higher value businesses, such as ICT, biopharma, medtech, agri-food and automotive.

Polymer Technology companies, represented by Polymer Technology Ireland, have played a major role in the growth of these high technology manufacturing industries. These companies are driving growth and creating jobs across Ireland and across key sectors such

as agri-food, automotive, medtech, ICT and biopharma.

The polymer technology industry is the backbone of Irish manufacturing with world-class processors, suppliers and service providers employing nearly 7,000 people across 230 businesses with exports of €1.62 billion.

Polymer technology businesses are manufacturing autoinjector devices for diabetes treatment, plastics components for Jaguar and Land Rover cars, engineering materials for use in cardiovascular stents, and designing packaging to extend the shelf-life of food products, as well as leading the way in using recycled materials for use in the automotive industry.

We've brought together some of these leading companies in a series of interviews to outline their strategies for success and

vision for the future in this special publication.

While the sector continues to be ambitious with 4.2% growth forecast for the Irish economy in 2018, we must continue to work with our members to ensure they are adequately equipped to face challenges and seize opportunities in the years ahead.

Polymer Technology Ireland, as part of Ibec, will continue to provide industry foresight and business services to our members to help them compete and thrive. Thank you to our member organisations and expert colleagues who helped us develop our 2020 strategy.

John Wallace
Chair, Polymer
Technology Ireland



Director's welcome

The Irish polymer sector continues to evolve as one of Ireland's premier manufacturing and technology industries. It has been very rewarding for Polymer Technology Ireland to be part of this success story and to watch companies from across Ireland mature, win new customers and invest in their technology and people. Many of the member companies of Polymer Technology Ireland have developed beyond recognition over the last ten years to become world class providers of the most advanced polymer solutions.



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“ Polymer Technology Ireland will continue to be the voice of the sector in Ireland. We will work with our colleagues in Ibec to deliver a high-quality environment where businesses can grow and prosper.”

Polymer Technology Ireland is developing alongside its membership. We have changed our name from Plastics Ireland and we continue to develop our services. Our focus has traditionally been on developing skills and on promoting the industry. The First Polymer Training Skillnet centre in Athlone continues to go from strength to strength and is consistently adding to its offering of training courses for the sector. In this fast-moving world, it is essential that our training centre adapts to the needs of industry and stays up to speed with the latest technologies and techniques. First Polymer Training Skillnet is highly regarded by the industry because of the quality of training that it provides, its cost effectiveness and its ability to meet the industry's requirements. There is no doubt that First Polymer Training Skillnet has made an enormous contribution to the skills profile of the polymer industry in Ireland and Polymer Technology Ireland is proud to continue to support this.

Polymer Technology Ireland is also the backer

of the Polymer Processing Technologist Apprenticeship that is delivered in conjunction with Athlone Institute of Technology and IT Sligo. The Apprenticeship is geared towards providing the polymer industry with an attractive long-term career path for new employees who can become apprentices in the knowledge that they will work towards a level 7 qualification and a rewarding career in polymers. With a growing industry and extremely strong demand for skilled people, the apprenticeship will play an important role in attracting the highest calibre of young people into the polymer sector – this is fundamental to the future development of our industry.

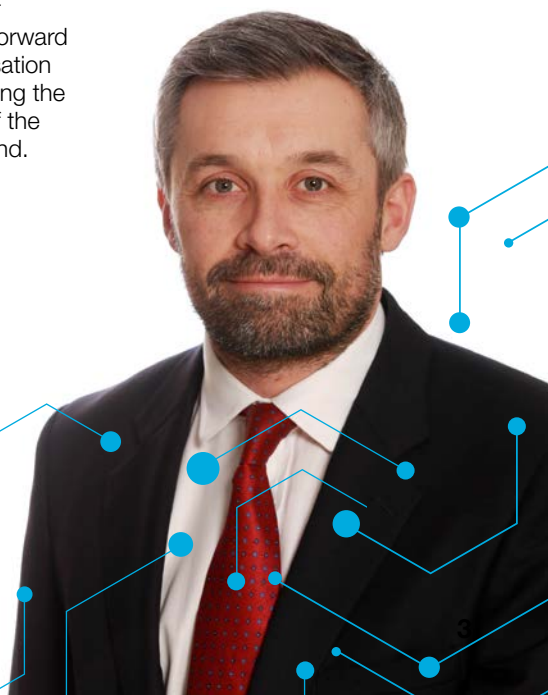
Polymer Technology Ireland will continue to be the voice of the sector in Ireland. We will work with our colleagues in Ibec to deliver a high-quality environment where businesses can grow and prosper. Skills and training will remain core elements of what we do whilst we continue to bring companies together to make connections, develop business links and identify opportunities. PTI enables our members to work together

to tackle challenges arising from the evolving policy and regulatory environment. With the support of our colleagues across Ibec, PTI promotes industry best practice through working groups on Operational Excellence, Advanced Manufacturing, EHS/OHS, Skills, Employer Relations and Gender Leadership Development.

The European Union plays a vital role in the evolution of the industry particularly through its regulation of the industry, the EU Plastics Strategy and its work in the area of the circular economy. PTI's memberships of EuPC and Plastics Europe enable us to effectively represent the industry's interests in these areas.

Polymer Technology Ireland will continue to deliver a strong, industry-specific offering to the polymer industry and we look forward to growing our organisation further and to supporting the continuing evolution of the polymer sector in Ireland.

Mark McAuley
Director, Polymer
Technology Ireland



Polymer Technology Ireland

Polymer Technology Ireland is part of Ibec, Ireland's leading business organisation. It represents the polymer industry including suppliers of raw materials and technologies, polymer processors and support services.

Vision for the industry

The polymer industry in Ireland is a dynamic, innovative and competitive industry where technology-led firms provide high quality products and services and give employees excellent careers in a sector where firms are growing and prospering.



Strategic pillars:

1. Represent the polymer sector



- Represent the Irish polymer industry sector to key stakeholders including the Government, state agencies, the EU and partner manufacturing sectors.
- Advocate for policies and conditions that support a competitive business environment where polymer companies can prosper and grow.
- Support an ambitious national planning strategy which invests in infrastructure to address the needs of all regions of the country.

2. Build awareness of the value of the polymer industry to key stakeholders

- Build awareness of the scale, diversity and value of the polymer industry to the Irish economy by showcasing end market application across manufacturing sectors.
- Promote the polymer sector as an innovative high-tech industry.
- Publicise the environmental credentials and initiatives of the polymer industry and ensure that the correct information about plastics is fed into the environmental debate.
- Provide information about the positive contribution of plastics to the health sector and the environment.



3. Deliver high quality information to Polymer Technology Ireland members



- Improve awareness of policy and market developments affecting members. Identify key areas for specific focus such as skills, the circular economy, health and safety and trade.
- Establish appropriate forums to enable industry leaders to share knowledge, discuss the impact of changing business models and prepare for the future.
- Collaborate with the Technology Gateways which provide close-to-market technology solutions and work closely with centres, such as APT in Athlone IT and PEM in Sligo IT.
- Encourage businesses across the polymer sector to become early adopters of new technologies in areas such as additive manufacturing.

4. Support the development of a world class talent pool for the polymer sector

- Promote policies and conditions that will make Ireland a leader in talent development for the polymer industry.
- Continue to develop Ibec's First Polymer Training Skillnet Centre in Athlone which upskills and reskills talent for the sector.
- Grow the Polymer Processing Technologist Apprenticeship in line with global best practice and evolving industry needs.
- Publicise job opportunities and raise awareness of the exciting career development in the sector.
- Support the development of skills required for new business models and emerging technologies.



5. Provide opportunities to maximise B2B engagement and support business development



- Facilitate interactions with relevant sectors which offer business-to-business opportunities.
- Help members to identify opportunities and new markets in the light of changing market and economic trends.
- Host events and collaborate with strategic partners to provide opportunities for networking.

Polymer Technology Ireland will:

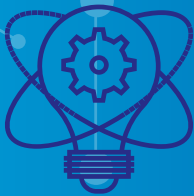
- + Be the voice of the polymer industry in Ireland.**
- + Further the objectives of the polymer industry through Ibec.**
- + Promote skills supply and development in the sector, grow and develop the First Polymer Training Skillnet Centre and the Polymer Processing Technologist Apprenticeship.**
- + Connect member companies to exchange views, develop business links, address industry concerns and identify opportunities.**
- + Provide members with industry relevant information, expertise, knowledge and insight.**
- + Support industry best practice through working groups in the areas of Operational Excellence, Advanced Manufacturing, EHS/OHS, Skills, Employer Relations, Gender Leadership Development.**
- + Support the industry across Europe through EuPC and Plastics Europe.**

Organisational structure

Polymer Technology Ireland Chair

Polymer Technology Ireland Council

Innovation



Skills



Business Excellence



Advanced Manufacturing Working Group

First Polymer Steering Group

Operational Excellence Working Group

Polymer Apprenticeship Consortium

Gender Leadership Development Taskforce

Manufacturing Apprenticeship Consortium

OHS/EHS Forum

IR/HR Forum

The Council and working groups allow Polymer Technology Ireland members to work on strategic issues for the industry and share best practice.



Polymer Technology Ireland
Ibec



To find out more about business trends, Ibec member supports, and how to get involved in initiatives like this special publication, contact Polymer Technology Ireland Executive Ciara Finlay by emailing ciara.finlay@ibec.ie.

Model of substance



The business environment in Ireland is characterised by substantial activity in key areas, which means opportunities and a bright future for the polymer industry.

The Irish economy is now in a very new phase. While it may feel similar, nothing that went before can be compared to what we are experiencing now, according to Ibec CEO Danny McCoy. “I don’t believe we have ever had a better set of circumstances in terms of the business environment,” he says.

A report released by Ibec recently shows how the Irish business environment is built on what the OECD terms “substance”. In McCoy’s view, the polymer industry is well placed to take advantage of the immense opportunities for Ireland that this represents.

Entitled ‘*Ireland: A Model of Substance*’, the report points out that economies of substance have depth, diversity, and years of tactical policy planning and implementation behind them. In contrast, insubstantial economies don’t encourage a diversity of industries; they don’t do research and development (R&D) or high-value manufacturing and don’t generate indigenous firms of scale or outward investment.

One of the reasons that the economy is in a new phase – which is particularly

favourable to the polymer industry – is the fact that Ireland is bang in the centre of the latest industrial revolution, known as Industry 4.0, McCoy notes. This is concerned with automation, the interoperability of machines and devices and the ability of information systems to virtually represent the physical world.

“Historically, Ireland missed previous industrial revolutions. What is driving innovation in manufacturing now are not natural resources such as iron ore, but rather computer-aided design, technology and intellectual property. A lot of substance in terms of these intangible assets has been moving to Ireland,” says McCoy.

“I believe the polymer industry has a unique advantage in this regard as it is in the vanguard in terms of manufacturing. It doesn’t have to deal with the legacy of post industrialisation and the baggage of Brownfield sites.”

While Ireland’s economy of substance presents huge opportunities, it brings with it certain challenges. However, in McCoy’s view these challenges are a function of success not failure and should be viewed as largely positive.

“We are grappling with

the problems of too much of a good thing. In order to deal with the emerging challenges, we need to move quickly to ensure we have the right infrastructure to sustain prosperity,” he says. “This includes modern housing solutions, maximising interconnectivity and broadband and modernising the education curriculum to be geared towards artificial intelligence and robotics.”

Seen by many in the business world as one of Ireland’s biggest challenges in the coming years, Brexit may well be more of an opportunity for manufacturing and the polymer industry, according to McCoy. “We have no idea of the impact of Brexit or the form it will take. It could be disastrous but equally manufacturing could actually benefit from it. This is because it is involved in global value chains and is not affected in the same way as agri-food, for example, which is dependent on the British consumer market,” he says.

Low cost, but highly productive, jurisdictions such as China, Indonesia, Malaysia and South Korea present much greater challenges to Irish manufacturing than Brexit does, McCoy adds. “These

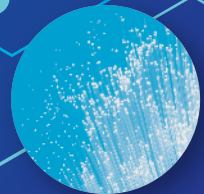
markets are becoming more and more sophisticated. They are moving away from mass manufacturing and commoditisation. The capacity of their workforces to deliver sophisticated solutions has increased,” he says. “In order to stay competitive with these countries we need to keep going further and further up the value chain and continue to embrace new technologies in manufacturing.”

Looking to the future, McCoy believes it is very bright for the polymer industry because of globalisation as well as Ireland’s access to European markets and talented, skilled workers.



Business case studies

From plastics processors, suppliers and service providers, the industry in Ireland is leading the way. Get to know some of these businesses here.



Over 30 years ago, JL Goor started out as a supplier of machinery and later moved into supplying polymer raw materials.

Going a step further

Recognising that there was an opportunity to add to the knowledge of polymer materials in the growing medtech sector in particular in Ireland, Dublin-based JL Goor decided to make this a point of difference for it as a distributor and become more proactive in this area.

The polymer industry in Ireland started in a modest way in the 1980s. It was made up of injection moulding companies, sheet manufacturers, film and rotomoulders and, until about ten years ago, there was a predominance of relatively basic products," says **JL Goor's** sales director Joe Wall. Injection moulding is the most widely used plastic process, producing high volumes from all polymers in every shape and size while rotomoulding is used for products with larger hollow sections, such as oil tanks.

"The medtech sector really began to grow and more research and development was happening in Ireland. Our approach on this was to meet market demand but go a step further," says Wall.





“We decided to be a resource for customers or potential customers in the medtech sector and guide them on the most appropriate materials to use to begin initial product approvals.”

Currently employing a team of nine people, in recent years JL Goor hired two polymer scientists and also invested in logistics expertise to ensure it is offering added value. It has two strategic warehouses in Dublin, one in Cork; one in Belgium and another in Singapore.

“The logistics process for medtech products can be complicated and time consuming. It is very important to ensure the right amount of materials is held in stock at the right time so companies can quickly ramp up once they get US Food and Drug

Administration approval,” notes Wall.

Over 30 years ago, JL Goor started out as a supplier of machinery and later moved into supplying polymer raw materials. In addition to the medtech sector, it serves clients in the automotive, aerospace, pharmaceutical, general packaging and food and beverage markets. No one sector accounts for more than 30% of turnover. Food and beverage is the largest followed by pharmaceuticals and automotive.

In Northern Ireland, JL Goor works closely with Denroy Plastics in supplying injection moulded components to a wide range of customers in the aerospace industry and with coachbuilder and pioneer of the low-floor bus Wrightbus International.

Based in Co Waterford, Mira Films, one of the country’s leading suppliers of stretch film for the containment of pallets, is also a client of JL Goor, as well as Boran Plastic Packaging in Co Kildare – a company which invested heavily in innovation through the economic downturn to ensure its packaging keeps food fresher longer.

JL Goor’s partnership approach in sharing polymer expertise extends beyond the medtech sector. In food packaging, it has worked with a number of customers which were looking to do things differently, for example, modifying cheese packaging using layering of different materials.

“We work with these clients to help them to identify how

such films are made before they decide to make major capital investments,” explains Wall. “Cheese packaging needs to protect the cheese and extend its shelf life for as long as possible. Many cheese packs may have up to seven layers to control the barrier properties. This design it is driven by a mix of commercial reasons and the desire to reduce food waste.”

JL Goor has also worked with Irish Custom Extruders in finding the right materials for its unique comfort slat mats for cows and Oral-B in coming up with a material for toothbrushes that was resistant to biting and could withstand being in a dishwasher.

Proactive partners

As the demand for more cutting-edge plastic products has increased, distributors of polymer materials based in Ireland have become more focused on engaging with clients at the research and development phase.

With offices in 27 countries and 50 warehouses across Europe, polymer distributor **Ultrapolymers Group** brands itself as “a partner from design to production”.

In Ireland, the healthcare sector has become a particularly strong focus recently as local medical device manufacturers engage in the material selection process for new product designs and/or seek alternatives for materials which can often be specified on other continents and converted at plants here. Ultrapolymers hired a business development manager dedicated exclusively for medical applications two years ago.

Ultrapolymers’ philosophy is to work in partnership with designers, converters and original equipment manufacturers, providing a significant competitive advantage through effective material selection, improved part performance and process optimisation.

“Where we are trying to step in is by getting involved at the start of a research and development process by proposing new and/or alternative materials produced locally in Europe that are fully medically accredited with a notification of change process which is critical for that industry,” says Jeff Hobbins, managing director of Ultrapolymers Ireland.

“By utilising tools such as Moldflow we can offer guidance on topics such as common issues in component design, design features to avoid when using certain materials as well as trade-offs between aesthetics and mechanical performance.” Moldflow simulates the injection moulding process in order to improve plastic part designs, injection mould designs and manufacturing processes.

“Moldflow allows us to make material recommendations, pre-empt problems and suggest doing something different,” Hobbins adds.

Headquartered in Belgium, Ultrapolymers employs

Jeff Hobbins, Ultrapolymers



250 people. In 2002, it was acquired from BASF by the Ravago Group, a service provider to the plastics industry founded by Raf Van Gorp in 1961. Ravago Group was one of the first companies in the world to get involved in the recycling of plastics. Since becoming part of Ravago in 2002, Ultrapolymers' footprint has grown beyond Ireland and UK to now having a pan-European presence.

"Ever since then we have been on a steep growth

curve and Ultrapolymers now has offices all over Europe, including South Africa and Turkey," notes Hobbins. "We have always maintained a strong presence in the Irish market because we firmly believe that a local supplier has a better understanding of customer expectations so we can adapt and continuously improve our service level to all customers."

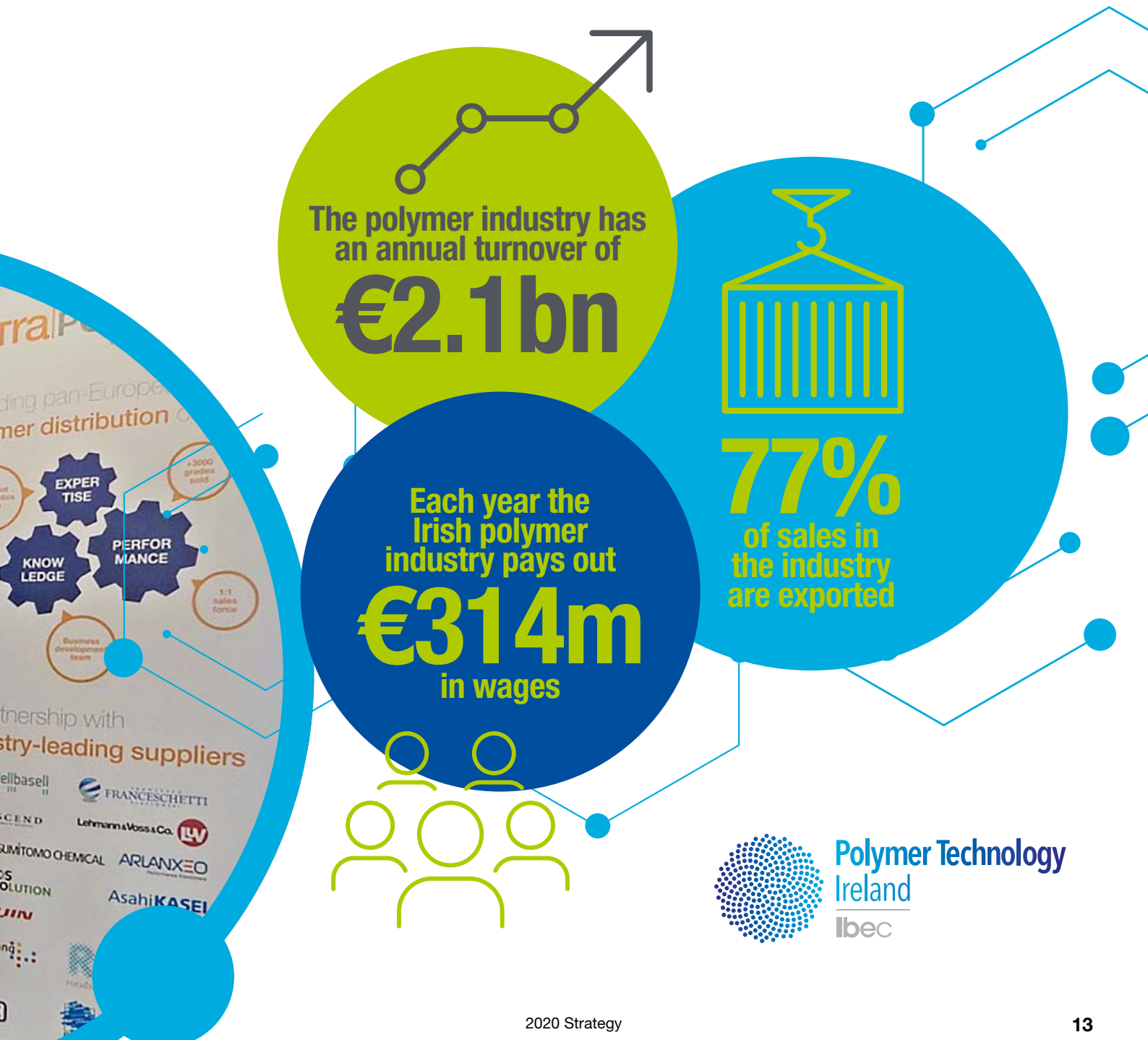
In terms of market segments for Ultrapolymers, these include healthcare, automotive, construction,

consumer packaging and also rotomoulding. It works with around 15 major polymer manufacturers, including global leaders such as LyondellBasell – which Ultrapolymers works exclusively with in supplying Polyolefins to clients – and the world's largest Styrenics manufacturer INEOS Styrolution.

"We work very closely with our suppliers. That allows for penetration into multiple markets around Europe through our large customer network whilst also

becoming a one-stop shop for our customers," says Hobbins. "We have chosen to be exclusive with each of our suppliers and not to offer the same resin type from competing manufacturers. This allows us to work closely with suppliers whilst simultaneously providing support to and being more innovative with our customers."

Ultrapolymers also acts as the Irish agent for Romi Moulding Machines (formerly Sandretto).



Global grasp

Spotting a gap for the supply of polymer compounds to the medtech sector in Ireland in 2008, Innovative Polymer Compounds has gone on to successfully grow its export business around the world.

Innovative Polymer Compounds (IPC) was set up in Kilbeggan, county Westmeath in 2008 as a joint venture between polymer compounding company Associated Plastics of Ireland and polymer and chemicals distributor National Chemical Company (NCC) – each of which has over 30 years' track record in the polymer industry.

The joint venture partners saw an opportunity to supply compounded materials to original equipment manufacturers (OEMs) and first- and second-tier suppliers serving the medtech sector in Ireland.

"NCC had been supplying polymer raw materials to the medtech sector as far back as 1996 so it knew the customer base well. Instead of just selling raw materials, the aim with IPC was to work with clients such as Boston Scientific, VistaMed and Teleflex by adding capability and value," explains sales and marketing director of IPC David Howard.

"Until IPC was established not a single granule of compounded materials was supplied from within Ireland – historically it all came from the US. We wanted to compete with the American companies on the basis of local service, faster lead times and research and development [R&D] support."

IPC's state-of-the-art white room facility in Kilbeggan features the latest in material

drying, dosing and dispersing technologies. It is currently evaluating putting its current product range of around 2,000 different polymer compounds into 3D filament format.

In each instance, a special formulation is made for medtech clients in volumes ranging from as small as 5kg for engineering trials up to 5 tonnes for mass production.

The compounds processed by IPC end up in products in a number of key areas: cardiovascular tubing/stents; neurovascular treatment; intrauterine devices; orthopaedics; gastric balloons and surgical tools.

"We take the basic engineering polymer and then put additives into it to improve its performance. These include radiopaque materials – which allow clinicians to see devices inside the body on x-rays – specialist colours or antimicrobial materials," explains Howard.

"From the outset we recognised that it was imperative that IPC is involved at the very beginning of a client's product life cycle so we can recommend materials and ensure they are suitable for application. Once a specification is written by engineers and materials are validated on a product, this cannot be changed without huge cost and revalidation."

IPC is unusual in Europe for its medtech specialisation and in 2010 decided to leverage this to extend its footprint outside Ireland.

“Historically in Europe industrial materials compounders have been focused on electrical or automotive applications. We are a small unit employing nine people, purpose-built to only serve the medical technologies sector,” notes Howard.

Further to taking on German distributor Velox as

its European agent IPC won contracts with a number of large clients in Germany, France and Italy. It has since built up a customer base of over 100 clients in 23 different countries.

A key driver of IPC’s business has been attendance at major medical tradeshows such as MedTech Europe in

Stuttgart and Compamed in Dusseldorf. “We are also very well supported by Enterprise Ireland across Europe as well as in the US. We recently won a client in South Korea having visited the country there as part of the EU Gateway/Business Avenues programme,” says Howard. EU Gateway/Business

Avenues is an initiative funded by the EU aimed at helping European companies to establish long-lasting business collaborations in Asia. Selected companies get to participate in a one-week business mission focused on a specific sector in South Korea, South East Asia, China or Japan.

“ IPC won contracts with a number of large clients in Germany, France and Italy. It has since built up a customer base of over 100 clients in 23 different countries.”



David Howard, Marketing Director, Innovative Polymer Compounds (IPC)

Achieving process perfection



Andrea Cawley, Director of Sales and Marketing, Automatic Plastics

The pace of process innovation is accelerating in manufacturing and Irish-owned companies are making sure to adapt to compete.

Based in Tinahely, county Wicklow since 1972, **Automatic Plastics** differentiates itself from other injection moulding companies through its focus on improving product design for manufacture for its clients in the pharmaceutical, medtech and food packaging sectors.

“Clients come to us with a design for food packaging with specific requirements, for example. We give feedback on a better way to go about the design to avoid quality issues – this could be the use of different materials or slightly different processes to reach the finishing line,” explains director of sales and marketing Andrea Cawley.

In food packaging or pharma, Automatic Plastics’ clients might be making millions of units to run down fast filling lines. This can require precision down to +/- 0.10 of a millimetre.

“Our clients come with a product design, but small changes can drastically

improve pricing or quality,” Cawley explains. “This requires expertise not only on the design side, but also on the technical side – as frequently visits on-site to see the client lines identifies root-cause problems that design tweaks can eliminate.”

Once the design is agreed, Automatic Plastics builds the custom-made tool or mould for its injection moulding machines to make the client’s product or parts. Having started out as heavily focused on the automotive sector, the company gained certifications such as the 13485 (ISO) quality management standard for medical technologies, which allowed it to diversify in the past five years.

An increased emphasis on operational excellence has been a major driver of Automatic Plastics’ success. During the past 12 months it has used the Mór Benchmark Model devised by members of Ibec’s Irish Medtech Association to measure the company in areas of lean manufacturing. This

incorporated a mentoring partnership with Waters Technologies in county Wexford involving reciprocal site visits and the sharing of templates for lean tools.

“The mentoring partnership fast-tracked our lean implementation. The whole area of lean is really collaborative in Ireland. Other companies such as Rottapharm and Depuy Synthes have been happy to open their doors to us and show us what they have achieved,” notes Cawley.

Automatic Plastics has also worked closely with Enterprise Ireland on lean manufacturing programmes. Richard Keegan, head of the competitiveness department at Enterprise Ireland – who has led over 1,500 best practice lean missions to Toyota’s Deeside plant in the UK – visited Automatic Plastics and said it was “like a little piece of Japan” in county Wicklow, Cawley points out.

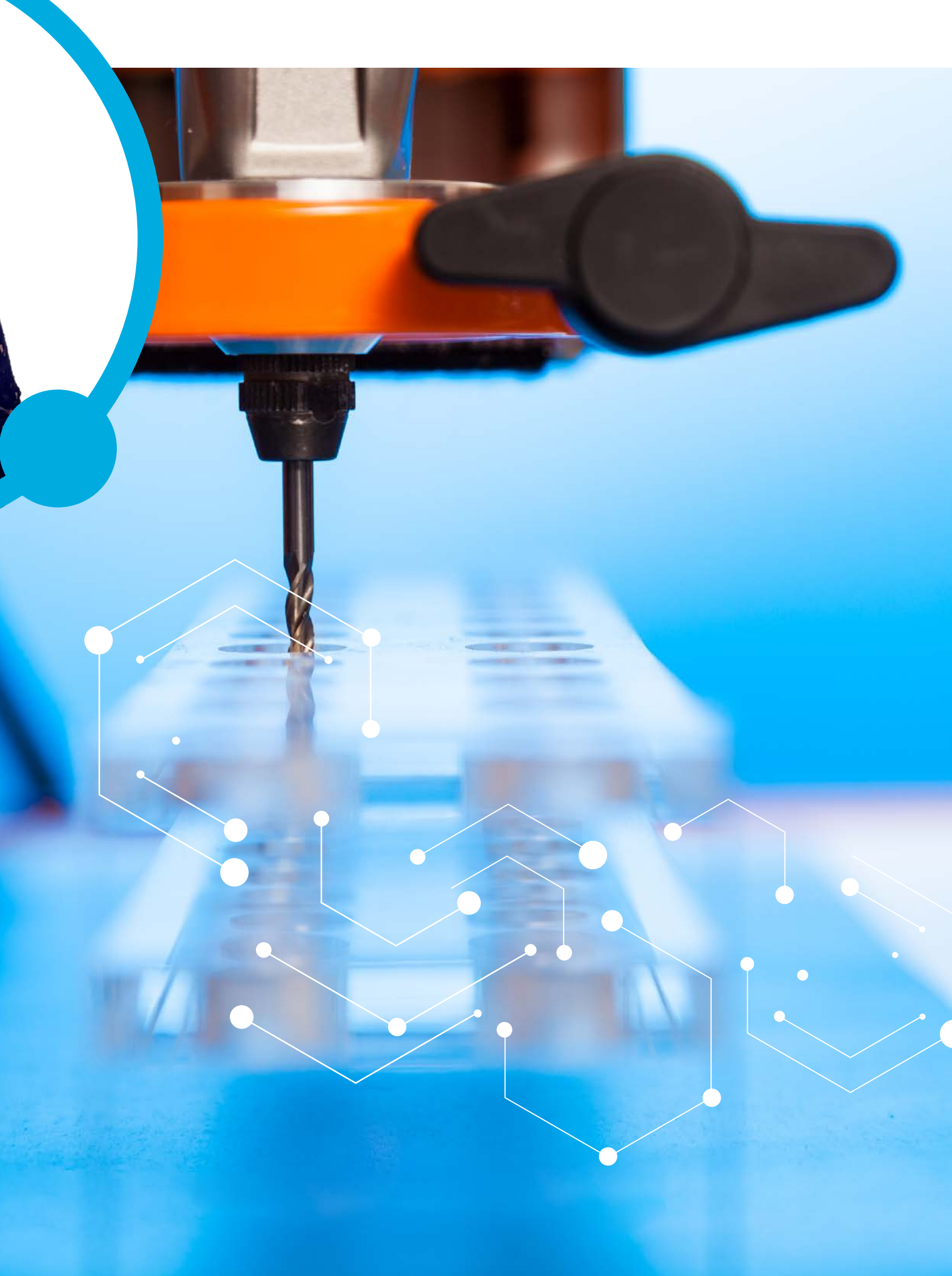
“We recognise that if we can be lean and efficient in our processes, this is a major

strength to play to,” she says. “It has been transformational for us in terms of reducing waste as well as staff engagement and up-skilling.”

Automatic Plastics recently launched its APL2020 vision which includes, for example, further up-skilling of its 90 staff and aiming to have all staff trained to lean manufacturing white belt in 2018, with a core team of 12 accredited to green belt.

The company has served the UK market for many decades, mainly focused on the medical technologies and food packaging sectors. It represents a significant part of its portfolio.

Since the Brexit vote, the family-run company has realigned its strategy with the aim of targeting the French and Benelux markets. “We believe that the larger injection moulding companies in Europe are not as agile and flexible as we are. Our aim is to always come up with new ideas,” says Cawley.





Embracing automation

Over the past year family-owned business Gem Plastics Ltd has undertaken a number of key measures as part of its continuous pursuit of general process innovation at its 10,000 square metre plant in Regaskin, county Cavan.

“With turnover now in excess of €21 million and employing 90 people, Gem Plastics supplies a full range of industrial containers that are used across a spectrum of industries in the UK and Ireland.”

This general process innovation is focused on implementing improved production methods through the use of different techniques, equipment and technologies such as new ways of measuring data and an upgraded material handling system.

Alec Milligan established **Gem Plastics** in 1988 as a sister company to his lubricant distribution company Gem Oils, which was founded in 1962. He started out with one blow moulding machine making plastic drums to supply the oil industry. Blow moulding mainly produces hollow products, such as bottles, drums and ducts.

“The company grew rapidly from there to have a life of its own,” says managing director Maura Burke. With turnover now in excess of €21 million and employing 90 people, Gem Plastics supplies a full range of industrial containers from 1-litre to 220-litres in size that are used across a spectrum of industries in the UK and Ireland. Containers include anything from wholesale washing-up liquid bottles to rigid packs to contain highly dangerous chemicals.

“We supply the largest chemical distributors in the UK and Ireland. We also supply the Irish and UK manufacturing sites of top global pharmaceutical companies as well as serving global brands in beverages,” says Burke.

Investment in automation and achieving the quality management system standard (ISO 9001) and the food safety system certificate (FSSC 22000) in recent years led to the company’s focus on high-end food, chemical and beverage packaging.

“The nature of our work has changed largely because of investment in high-tech equipment and automation,” says Burke. “There used to be one person to every blow moulding machine and a lot of heavy lifting. Now, there is one person running multiple machines and the skill needed to do an entry-level job has moved on quite a lot. Traditionally, we had general maintenance people to fix things when they broke down; now we have skilled electrical, electronic, design, quality and project engineers. We are recruiting further for 2018.”

Re-investment in a sophisticated material handling system in the past 12 months

has given Gem Plastics the ability to monitor the dosing of polymer materials into the machines to an accurate level.

“With blow moulding there are so many variables and variability impacts cost and quality. Every shot is unique. This smart piece of kit allows us to monitor dosing in terms of the weight and volume of the materials going in, which will then be converted to produce the containers,” explains Burke.

Gem Plastics’ process involves three materials being mixed at all times: virgin resin, colour masterbatch and regrind (material that has undergone at least one processing method). The company has adopted blending and control systems from TSM to ensure a consistent mix. It is piloting a system which measures the trend of weight of containers and alerts engineers if there is a variation outside of the specification. In addition, it has invested in a vision system unit used for measuring containers as they are produced and spotting any malformations.

“All of our own data combined with TSM systems gives us an advanced picture of the true performance of a machine,” says Burke.

Over the past 12 months Gem Plastics undertook a Sedex Members Ethical Trade Audit (SMETA), which involved a deep investigation and holistic review of its plant focusing on labour standards, health and safety, environment and business ethics. A global not-for-profit organisation, Sedex is home to the world’s largest collaborative platform for sharing responsible sourcing data on supply chains.

“The SMETA audit started as a key customer requirement but since then we have used it as a positive selling angle. More and more companies have requirements for their suppliers in this area,” says Burke.

Gem Plastics recently hired a full-time HR manager focused on skills development and team building. “We have a rigorous training system in place. Presently we are rolling out a new food safety programme to all operations staff building on good manufacturing practices (GMP) training which they had previously completed.”

From its base in county Cavan, fibre specialist Wellman International has addressed commoditisation and competition by carefully targeting four key market segments and focusing on R&D.

Staying well ahead

In October, **Wellman International** announced a new research collaboration with the Royal College of Surgeons in Ireland (RCSI). It is the latest step in the county Cavan-based company's strategic R&D programme to deliver higher value added fibre-based products to the market.

Together with RCSI clinical researchers, Wellman International will develop a novel bedding material with the aim of preventing pressure ulcers by controlling moisture levels on the skin's surface and evenly distributing pressure while a person is seated or lying in bed.

"Otherwise known as bed sores, pressure ulcers cost the NHS in the UK £4-6 billion a year. As people get older and living standards continue to rise, healthcare systems and care homes could potentially face more problems like this," says CEO of Wellman International Donal Breen.

"We are looking at designing fibres that can facilitate the absorption of much larger volumes of fluid compared to those used in baby diapers and other care products."

Founded in 1973, Wellman International is owned by global chemicals company Indorama Ventures and employs around 270 people directly. The largest European producer of polyester staple

fibre with a capacity of 88,000 tonnes, it mainly exports to mainland Europe. Ireland accounts for about 3% of sales.

At its plant in Mullagh, county Cavan, it started out making fibres for domestic bedding and home furnishings – which have become increasingly commoditised in recent years due to competition from the Far East.

To address this challenge, it diversified into specialist solutions for the hygiene and healthcare and automotive markets in the past ten years. It has also evolved from being a mainly a polyester fibre provider to providing multiple polymer and fibre types. It is continuously learning how to further enhance and improve the performance and efficiencies its fibres can offer, according to Breen.

"We are focused on using engineered fibre design to solve specific problems in our four key segment areas: hygiene and healthcare; technical fibres; automotive; and home and apparel," says Breen. "This has required capital expenditure every year in order to upgrade our plant to meet the needs of the products of the future."

In order to be turned into fibres, polymers go through a process where they are heated into a liquid and extruded through small capillaries,

then cooled and spun into a continuous fibre. At the Wellman International plant, the fibres are then collected in special containers and put through a second process.

"We elongate the fibres under tension to improve the tensile properties. This allows us to do things to the fibre to engineer it to a specific application, such as specialised crimping or adding attributes such as inherent antimicrobial properties," Breen explains.

Wellman International has several unique fibres undergoing trials with key customers at the moment in areas such as moisture management, microbe inhibition, skin health promotion, blood flow enhancement and optimum comfort. The type of products which may result from these unique fibres include special bandages for people with conditions like diabetes.

Automotive advances

The automotive market is going through quite a change at present as it moves more towards hybrid and electric vehicles, notes Breen. "Weight becomes even more critical with these new types of vehicles and we have focused on designing lightweight fibres for that purpose."

Recent product developments for the automotive market from Wellman International have included bespoke hollow and coloured solid fibres for aesthetically critical parts such as carpets, door panels and parcel shelves and black and white fibres for acoustic and thermal insulation in cars and light trucks.

"We supply tier 1 and tier 2 suppliers to the original equipment manufacturers of Ford, BMW, Mercedes, Audi, Volkswagen, Volvo, Hyundai, Nissan and General Motors and work as a development partner with them," says Breen.

Back in its early days, Wellman International was one of the first companies in Ireland to use recycled materials to produce polyester staple fibres and this ethos has been maintained ever since.

"At least 75% of our polymer base now comes from recycled materials. Drinking bottles are turned into flakes at Wellman manufacturing units in France and the Netherlands and shipped to our plant in Mullagh, where we convert them into fibres," says Breen.

"For our home and apparel segment, we have recently produced fibre from plastic reclaimed from the sea which will eventually be transformed into fabrics for T-shirts and other types of clothing."

“ At least 75% of our polymer base now comes from recycled materials. Drinking bottles are turned into flakes at Wellman manufacturing units in France and the Netherlands and shipped to our plant in Mullagh, where we convert them into fibres. ”

Bang on trend

Trend Technologies' plant in county Westmeath has constantly adjusted to changes in the marketplace, ensuring it has the expertise and capability to stay competitive.

Currently employing 175 people, **Trend Technologies'** state-of-the-art facility in Mullingar, county Westmeath is the centre of excellence for injection moulding for the whole group. Since it was set up in 1981, the facility has come through a number of phases of reinvention to enable it to adapt to the needs of different industries.

The most widely used plastic process, injection moulding produces high volumes from all polymers in every shape and size; this was Trend Technologies' core technology from the outset.

"We started out manufacturing and supplying products to the young computer industry at the time, such as tape reels and floppy disk boxes," explains Brendan Murtagh, business development manager at Trend Technologies. "Within a few years, this business was declining so we decided to become a sub-contract manufacturer of plastic components for the computer industry."

From the mid 1980s to the late 1990s Trend Technologies' Mullingar operation supplied global companies such as IBM, Apple, 3Com and Dell with outer housings for desktop computers, keyboards and mice. "By 1999 there was none of that type of computer manufacturing left in Ireland – one by one the companies moved it to the East," says Murtagh.

When Hewlett Packard (HP) arrived in Leixlip, Co Kildare 20 years ago, Trend

Technologies became one of its major suppliers and, by the early 2000s, the computer giant accounted for 40% of its business. Nowadays, the medical technologies and automotive sectors make up the lion's share of Trend Technologies' output, although it does still supply inkjet cartridge mouldings to HP. Most of its clients are in Ireland and the UK.

"In order to be able to serve the medical technologies and automotive industries, we had to develop a lot of expertise and achieve certifications, including, the standard to supply the automotive industry (ISO16949) and the standard to supply the medical technologies industry (ISO 3485)," says Murtagh.

Trend Technologies built its first clean room in Mullingar in 1997, mainly geared towards HP. It now has three Class 7 clean rooms, with one dedicated to post-moulding operations.

"In order to work with medical technologies companies, we had to have an area like an operating theatre – the products have to be produced in a very clean environment and are packaged and sealed before they leave the clean room," says Murtagh. "The next time the package is opened is in a similar clean room at the client's manufacturing site."

Trend Technologies invested €3 million in upgrading the site and adding clean-room capacity in 2017. "We want to be able to add as much value as possible to the raw plastic component and have introduced new technologies such as digital printing and

laser welding specifically for that purpose,” notes Murtagh.

Medtronic, Cook Medical, Olympus Medical and KCI are among Trend Technologies’ medical technologies customers. It supplies the sector with wound care products, diagnostic laboratory consumables, ventilator housings, surgical handles and stent delivery systems.

From 2000 to 2007, Trend Technologies built up capability in serving the automotive industry and by 2007 Donnelly Mirrors in Naas accounted for 50% of its business. When Donnelly Mirrors closed its Irish operation and moved much of the business to Slovakia, Trend Technologies replaced that business with other automotive clients.

It now ships two containers

of plastic components every day to Draexlmaier in the UK, which then converts them into complete car interiors for Jaguar and Land Rover. “The components we supply are used for everything you see in the front of a car, including the dashboard, heater controls, glove box and Sat Nav,” notes Murtagh.

Trend Technologies uses moldflow analysis to develop tooling before it is built. This simulation technology allows engineers to assess how the polymer material will flow through the tool and to predict and eliminate potential problems. It has also built up particular expertise in product and process validation after a tool is built and in advance of production start.

“Customers expect production processes to be validated to the highest level to

ensure that a good product is consistently made, regardless of any kind of variation in the environment (such as a change in temperature or moisture in the air) or in material supply,” Murtagh explains.

Typically, when a client comes to Trend Technologies they have the general concept of a product developed and know how it is going to work. What they don’t know is how to move the design on so that it can be manufactured in volume at the lowest possible cost.

“We provide a huge amount of advice and support in this area,” notes Murtagh. “We would usually be involved six months to two years with a client during the product development stage onwards to manufacture.”

“Trend Technologies now ships two containers of plastic components every day to Dräexlmaier in the UK, which then converts them into complete car interiors for Jaguar and Land Rover.”



Brendan Murtagh, Business Development Manager, Trend Technologies



The path to industrial 3D manufacturing

3D printing is now viable for large scale manufacturing

HP is investing heavily in industrialising nylon based 3D technology to transform manufacturing industry. The HP Multi Jet Fusion Technology allows for final part production economically in volumes of up to 110,000 small parts when compared to traditional injection moulding techniques. This along with design improvements and single process production for complex parts means that many industries can make better parts whilst reducing inventory and total cost of production.

3D printing is one of the most disruptive technologies of our time, spearheading a new 4th Industrial Revolution that will radically change the way we conceive, design, produce, distribute, and consume pretty much everything.

But until now, 3D printing hasn't been a viable means of large-scale industrial manufacturing (think big factories) because of prohibitively expensive production costs and limited technology. In order to realize HP's vision of digitally transforming the \$12 trillion global manufacturing industry, the economics of 3D printing needed to be completely rewritten.

At the end of 2017, HP announced that it has smashed that economic barrier and paved the way for cost-effective, industrial-scale 3D manufacturing with the new Jet Fusion 3D 4210 Printing Solution.

The new solution increases production volume for HP Jet Fusion 3D printers by enabling continuous operation, greater overall system efficiency,

and the ability to handle larger quantities of 3D printing materials, while significantly lowering production costs with reduced pricing on HP's 3D materials and shared service contracts.

When put together with HP's industry-leading Multi Jet Fusion technology, those enhancements double the existing "break-even point" at which 3D printing remains cost-effective to an unprecedented 110,000 parts, and drastically reduces the cost-per-part, up to 65% less than other methods.

"The new 3D 4210 Printing Solution enables our customers to mass-produce parts using HP's Multi Jet Fusion technology for significantly less than other processes, and fully benefit from the economies of scale," said Ramon Pastor, General Manager of Multi Jet Fusion for HP's 3D printing business. "HP's Jet Fusion 3D systems have now reached a technological and economic inflection point that combines the speed, quality, and scalability needed to accelerate manufacturing's digital industrial revolution."

Today, HP also announced the further expansion of its industry-first Open Materials Platform, a collaborative development and distribution model where HP and its growing ecosystem of 3D partners work together to drive materials innovation, reduce costs, and create new applications and markets for Multi Jet Fusion technology. There are already over 50 leading companies actively engaged on the platform. Materials companies can use HP's Materials Development Kit to quickly test compatibility with Jet Fusion printers.

Materials companies can use HP's Materials Development Kit to quickly test compatibility with Jet Fusion printers.

It was announced that leading chemical companies Dressler Group and Lubrizol have joined the growing HP 3D partner ecosystem, and also that three new engineering-grade 3D printing materials are coming to the open platform: PA 11, PA 12 Glass Beads, and Polypropylene.

The new materials raise the bar on production quality,

strength, versatility, and flexibility, but only one of them is going to space (for now).

The new HP 3D High Reusability PA 12 Glass Beads, an innovative new nylon material filled with tiny glass beads, was used to make one of the most complex parts in a specially-designed HP ENVY Zero-Gravity printer developed with NASA that's being sent to the International Space Station this February. The printer's output tray needed to be particularly lightweight, watertight, and durable for its journey to space, and 3D printing with PA 12 Glass Beads provided the perfect solution.

HP continues to unlock the economics and technology of 3D manufacturing, with a deeply-engaged network of partners committed to accelerating the digital industrial revolution.

Says Corey Weber, co-founder of leading printing service bureau Forecast 3D, "It has never been more clear to us that HP's Multi Jet Fusion represents the future of digital manufacturing."

Expanding operations through manufacturing excellence

With contract manufacturing operations in Dublin since 1998 and following its acquisition of ‘The Tech Group’ in 2005, West recently expanded its operations in Ireland, both in Dublin and with a new site in Waterford.

A global manufacturer of packaging components and delivery systems for injectable drugs and health products, **West Pharmaceutical Services** has built up its presence in Ireland significantly since acquiring the Tech Group, which included a contract manufacturing operation in Mulhuddart in Dublin 13 years ago.

Now West's largest contract manufacturing site globally, the Dublin facility started out in 1998 with 17 employees in a 40,000 sq ft facility, initially serving the consumer electronics sector. By 2004, when a further 40,000 sq ft was added, it was 100% focused on serving medical technology and pharmaceutical customers.

Demand for autoinjector devices for the treatment of diabetes drove further expansion in 2014 and in 2016, the ribbon was cut on

a new 60,000 sq ft building facilitating the manufacture of medical devices with electronic component integration to meet the increasing global needs of customers and patients for connected devices. Today, around 500 people are employed at West's Dublin facility.

The Dublin site is to produce around 35 million devices and 2 billion components this year to support its medical technology and pharmaceutical customer base, according to senior director Tom Clarke. These devices will be shipped all over the world.

"We have 95 injection moulding machines in Dublin supporting 14 high-volume assembly lines," says Tom Clarke, senior director, at West. "Currently processing almost 6,000 tonnes of polymer resin per year, we expect this will grow even more in 2018."

In recent years, West has invested in the digitisation of its Dublin contract manufacturing facility to allow real-time process and product monitoring across the machines and automation systems that produce the devices.

“This has significantly enhanced our competitiveness and business growth. 2018 will see us embark on another enhancement of the facility, as we are going to look at automation from the receipt of orders right through to the shipping of products,” notes Clarke. “This pilot project,

specific to Dublin, is going to enhance our efficiencies and make us an even leaner operation.”

West recently expanded its global manufacturing operations to include a new site in Waterford on the back of increased demand from pharmaceutical and biotech customers. The new facility will produce packaging components for insulin injector cartridges and other high-value packaging components.

Situated at a 44-acre site, the facility is around 20,500 sq m in size and is designed to accommodate expansion

for multiple product lines in the future. It was built in a campus layout to ensure flexibility to grow in all directions.

“Waterford will be a centre of excellence for our proprietary elastomeric sheeting, which is used to package insulin for use in pen injectors,” explains Clarke. “It will also offer high-value finishing for West’s elastomer products, such as stoppers and plungers. These capabilities include washing, vision inspection and sterilization.”

Founded in 1923, West is headquartered in the US


and has 28 sites around the world employing a total of 7,300 people. The Waterford facility currently employs 80 people, with plans to continue hiring in 2018. Commercial production is planned to begin there by the end of the year.

West won the inaugural Partner/Supplier of the Year 2016 at the Medtech Rising: The Irish Medtech CEO Conference and Awards hosted by Ibec’s Irish Medtech Association, Enterprise Ireland and IDA Ireland.

“ [West’s] Dublin site is to produce around 35 million devices and 2 billion components this year to support its medical technology and pharmaceutical customer base.”



West



Tom Clarke,
Senior Director,
West Pharmaceutical
Services

The test of time

Over the past 24 years Anecto has evolved from being an electronics device test laboratory to having a state-of-the-art test facility serving multiple sectors including 80% of the world's top 20 medtech companies.

One of the standard, and perhaps surprising, tests **Anecto** carries out for automotive manufacturers is to see what happens when sun tan lotion is put on the internal plastics in a car.

"Plastic can discolour in instances when you put sun tan lotion on it," says Mike Connolly, sales director and director of testing services at Anecto. "The performance of a product largely depends on the stresses plastics are going to get, including vibration, heat, cold and compression. Our job is to establish how a product made out of plastic will perform in real life."

The Galway-based company offers a full range of services that support companies in their efforts to increase product reliability and reduce the risk of failure throughout the product lifecycle.

Currently employing over 90 people, its 40,000 sq ft facility contains over €2.5 million worth of equipment, including vibration systems and specialist medical device systems. "Our engineers will design and build specialist test equipment to meet a specific need if it is not already available," notes Connolly.

Medtech and life sciences now account for 60% of Anecto's business, followed by energy and power, which makes up a quarter of its turnover. Electronics and mechanical and packaging are its other main areas of focus.

"The size of the medtech industry in Ireland – with key players having a base here, including nine of the world's top ten medtech companies – was perfect for a company such as ours to develop expertise. It gave us a competitive advantage to expand throughout Europe," says Connolly. "In some European markets the medtech industry was too small to concentrate on, while in others, such as the UK and Germany, there was so much testing going on in so many areas that it wasn't important to specialise in medtech."

Regarding polymers, there are two strains to Anecto's work with medtech companies – packaging and products. "The challenge for medtech companies is to deliver their devices sterile at points of use anywhere in the world. The product may have a five-year shelf life, but still has to be sterile," explains Connolly. "We work with medtech companies to ensure that is

the case by looking at plastic performance. If the packaging is problematic, we figure out what we can do about it in a cost efficient manner."

On the product side, medtech companies face a range of challenges and issues involving polymers and plastics. Anecto assesses everything from making sure Luer fittings don't crack and leak to testing the bendability of catheters. "We always look at performance issues against standards but can also evaluate against a database of similar products," says Connolly.

He believes where Anecto is of real value to clients is in understanding why something happens, rather than just reporting what has happened – it is the expertise beyond the test.

"For example, we identified that the interaction between three components in the

packaging of a medical device was causing it not to seal properly. Rather than the company having to reengineer everything, we found that a small formula change to the adhesion component meant the problem was solved."

Anecto won Partner/Supplier of the Year 2017 at the Medtech Rising: The Irish Medtech CEO Conference and Awards hosted by Ibec's Irish Medtech Association, Enterprise Ireland and IDA Ireland.



Mike Connolly, Sales Director and Director of Testing Services, Anecto

Categories of company in the polymer industry

Processors



Injection moulding: The most widely used plastic process, producing high volumes from all polymers in every shape and size.



Blow moulding: Predominantly produces hollow products, such as bottles, drums and ducts.



Rotational moulding: Used for products with larger hollow sections, such as oil tanks.



Thermoforming: Products are formed by shaping flat sheets with heat and vacuum to form 3D parts such as shower trays, blister packs and car dashboards.



Tube extrusion: Polymer is extruded into a thin circular tube. Used in variety of medical devices including catheters and electrical cable wrapping.



Pipe extrusion: Polymer is extruded into a thick circular tube. Used predominantly in construction, drainage and packaging.



Film extrusion: Polymer is blown or cast into a thin film for products such as plastic bags, cling film, silage wrap and bin liners.



Sheet extrusion: Polymer is extruded into sheet, which can be used in signage and bathroom products, or thermoformed as described above.



Foam moulding: Foaming agent is added in the production process to give lighter products for insulation and packaging.



Non-woven/fibre: Fibres extruded from polymer are used for textiles and in the fashion industry. Non-woven fibres are found in upholstery and bedding products.

Suppliers



Raw materials: Any company involved in supplying raw materials into the polymer sector.



Tool and mould: Create and/or design tools and moulds for the polymer industry.



Machines and ancillaries: Suppliers of polymer processing equipment and ancillaries to the industry.



Compounds and pigments: Suppliers of polymer compounds and pigments to the industry.

Services



Design: Providers of polymer engineering solutions, prototyping, polymer conversions and part/product development solutions.



Other: Companies supplying services to the polymer industry, such as recycling, packaging and clean room validation.

Mapping Ireland's polymer technology industry

Processors

INJECTION MOULDING



- 1 Abbott Sligo (Pharmaceuticals) | Sligo
- 2 Abbott Donegal | Donegal
- 3 Abbott Longford (Diagnostics) | Longford
- 4 Aclare Plastics Ltd | Sligo
- 5 Advanced Technical Concepts | Clare
- 6 Advant Medical | Galway
- 7 Advant Medical | Galway
- 8 Aerogen Ireland Ltd | Galway
- 9 AJ Plastic Components Ltd | Clare
- 10 Allergan Pharmaceuticals Ltd | Mayo
- 11 Allsup Europe Ltd | Waterford
- 12 Alps Electric Ireland | Cork
- 13 APM Manufacturing & Display | Meath
- 14 Aptar Ballinasloe | Galway
- 15 Ardtech Industries Ltd | Cork
- 16 ArraVasc | Galway
- 17 Arrotek Medical Ltd | Sligo
- 18 Astora Women's Health | Westmeath
- 19 Automatic Plastics Ltd | Wicklow
- 20 Avenue Mould Solutions Ltd | Sligo
- 21 Bantry Technical Products Ltd | Cork
- 22 Bausch + Lomb Ireland | Waterford
- 23 Becton Dickinson & Company (Drogheda) | Louth
- 24 Becton Dickinson & Company (Dun Laoghaire) | Dublin
- 25 BorgWarner Tralee Ltd | Kerry
- 26 Biancamed Ltd | Dublin
- 27 Boston Scientific (Galway) | Galway
- 28 Braun Oral B -Kildare | Carlow
- 29 Cambus Medical | Galway
- 30 Carl Zeiss Vision Ireland | Wexford
- 31 Conductix Wampfler Ltd | Wicklow
- 32 Consort Case Company | Kilkenny
- 33 Contech Medical | Galway
- 34 Cook Medical | Limerick
- 35 Covidien Ireland (Galway) | Galway
- 36 Creganna Medical Ltd | Galway
- 37 CUBIS Industries Ltd | Roscommon
- 38 Custom Components Moulding Ltd | Dublin
- 39 D.C.P Plastics | Cork
- 40 Dairymaster | Kerry
- 41 El Company Ltd | Clare
- 42 Embankment Plastics Ltd | Wicklow
- 43 Filtertek - An ITW Medical Company | Limerick
- 44 G&G Engineering Ltd | Mayo
- 45 Harmac Medical Products | Roscommon
- 46 Hasbro - Ireland | Waterford
- 47 Hewlett Packard Ltd | Kildare
- 48 Hitachi-Koki Europe | Dublin
- 49 Hollister Ltd | Dublin
- 50 Inblex Plastics Ltd | Sligo
- 51 Inmo Tech Ltd | Sligo
- 52 Irish Micro-Mouldings Ltd | Galway
- 53 JOH Holdings Ltd | Meath
- 54 K Plastics Ltd | Sligo
- 55 KCI Manufacturing | Dublin
- 56 Key Plastics | Wicklow
- 57 KHP Products Ltd | Kerry
- 58 Kostal (Cork) Ireland GmbH & Co. | Cork
- 59 KUM Ireland Ltd | Meath
- 60 Lake Region Medical (Galway) | Galway
- 61 Lisk Ireland Ltd | Galway
- 62 Listal Ltd | Kerry
- 63 Litec Moulding Ltd | Sligo
- 64 Logstrup Ltd | Galway
- 65 Mediplast | Carlow
- 66 Medisize (PhilipsMedisize Ireland Ltd) | Donegal
- 67 Covidien Medtronic (Tullamore) | Offaly
- 68 Medtronic Athlone | Westmeath
- 69 Medtronic Galway | Galway
- 70 Melvin Plastics Ltd | Leitrim
- 71 Merck Serono Ltd | Dublin
- 72 Merck Millipore Ltd | Cork
- 73 Mergon International | Westmeath
- 74 MGS Mfg. Group, Ltd | Kildare
- 75 Microbrush International Ltd | Waterford
- 76 Mirror Controls International (MCI) | Leitrim
- 77 Molex Ireland Shannon | Clare
- 78 Moll Industries Ireland Ltd | Donegal
- 79 Moulding Technology | Longford
- 80 Nypro Healthcare Waterford | Waterford
- 81 Nypro Healthcare Bray | Dublin
- 82 O'Flynn Plastics Ltd | Cork
- 83 Oglesby & Butler Ltd (Portasol) | Carlow

- 84 One Stop Engineering Solutions | Cork
- 85 One51 ES Plastics Ltd | Dublin
- 86 Ophardt Ireland Ltd | Sligo
- 87 Oral B Laboratories | Kildare
- 88 Organic Lens Manufacturing | Clare
- 89 Premier Plastics Ltd | Cork
- 90 Prior PLM Medical | Leitrim
- 91 United Caps Ireland Ltd | Wicklow
- 92 Procter & Gamble Manufacturing Ireland Ltd (Newbridge) | Kildare
- 93 Protech Performance Plastics | Cork
- 94 Protek Medical, A Molex Company | Sligo
- 95 Pro-Tek Medical, A Molex Company | Galway
- 96 Proxy Biomedical Ltd | Galway
- 97 PVC Fabrications Ltd | Cork
- 98 RO-RA Motion Production GmbH | Kerry
- 99 Shadow Creations Ltd | Dublin
- 100 Smallwares Ltd | Louth
- 101 Stalcop Ireland Ltd | Cork
- 102 Steripack Ltd | Offaly
- 103 Stern Plastics Production GmbH | Cork
- 104 Streamstown Moulding Co Ltd | Westmeath
- 105 Tech Group Europe Ltd | Dublin
- 106 Technicast | Clare
- 107 Tente Ireland Ltd | Sligo
- 120 The Hanger Company | Louth
- 108 The sterplastic group | Cork
- 109 Thomac | Clare
- 110 Tool & Gauge Ltd | Sligo
- 111 Tool & Plastic Industries Ltd | Longford
- 112 TR Mouldings (Typerite) Ltd | Dublin
- 113 Transitions tr Ltd | Galway
- 114 Trend Technologies Mullingar Ltd | Westmeath
- 115 Ultra Precision | Clare
- 116 Vascular Solutions Zerusa | Galway
- 117 Verus Precision Ltd | Sligo
- 118 Vistakon Ireland Ltd | Limerick
- 119 Vivasure Medical | Galway
- 121 Weener Plastics Ltd | Limerick
- 122 West Pharma (Waterford) | Waterford

BLOW MOULDING



- 9 AJ Plastic Components Ltd | Clare
- 123 Boxmore Plastics Ltd | Cavan
- 124 C.B.M. Plastics Ltd | Waterford
- 126 Connabride Plastics Ltd | Cork
- 42 Embankment Plastics Ltd | Wicklow
- 127 Gem Plastics Ltd | Cavan
- 50 Inblex Plastics Ltd | Sligo
- 128 Limerick Blow Moulding Ltd | Clare
- 68 Medtronic Athlone | Westmeath
- 73 Mergon International | Westmeath
- 129 Schutz Irl Ltd | Mayo
- 130 Shabra Group | Monaghan
- 131 Stryker Instruments | Cork
- 132 Stryker Orthopaedics Ireland | Cork | Limerick

FILM EXTRUSION



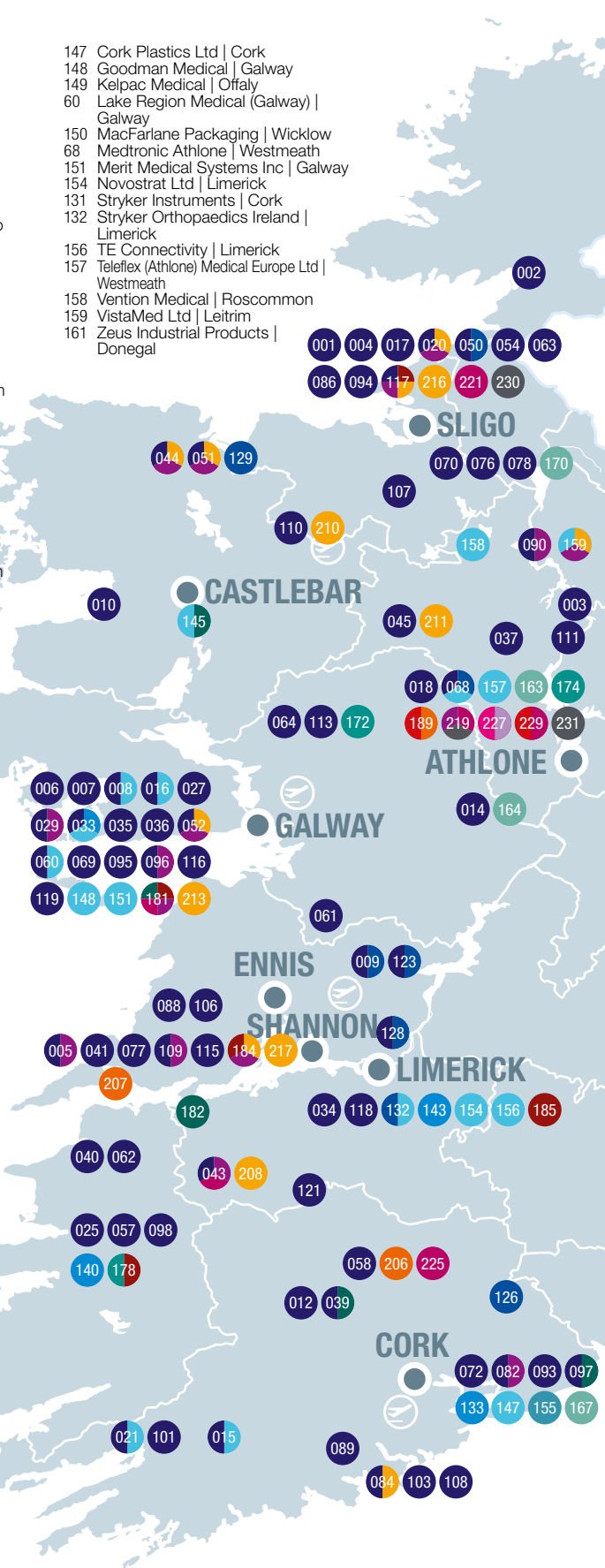
- 228 Boran | Kildare
- 133 Boston Scientific Cork | Cork
- 134 BPI Industrial Ireland | Dublin
- 135 Clondalkin Pharma & Healthcare | Dublin
- 33 Contech Medical | Galway
- 136 Gnó Group | Dublin
- 137 Silawrap | Wexford
- 138 MIMA Films | Waterford
- 139 Irish Custom Extruders Ltd | Dublin
- 140 Metpro Ltd | Kerry
- 141 Shabra Polymex | Monaghan
- 142 SPG Packaging Systems Ltd (Part of signode) | Kildare
- 143 Teleflex Medical (Limerick) | Limerick

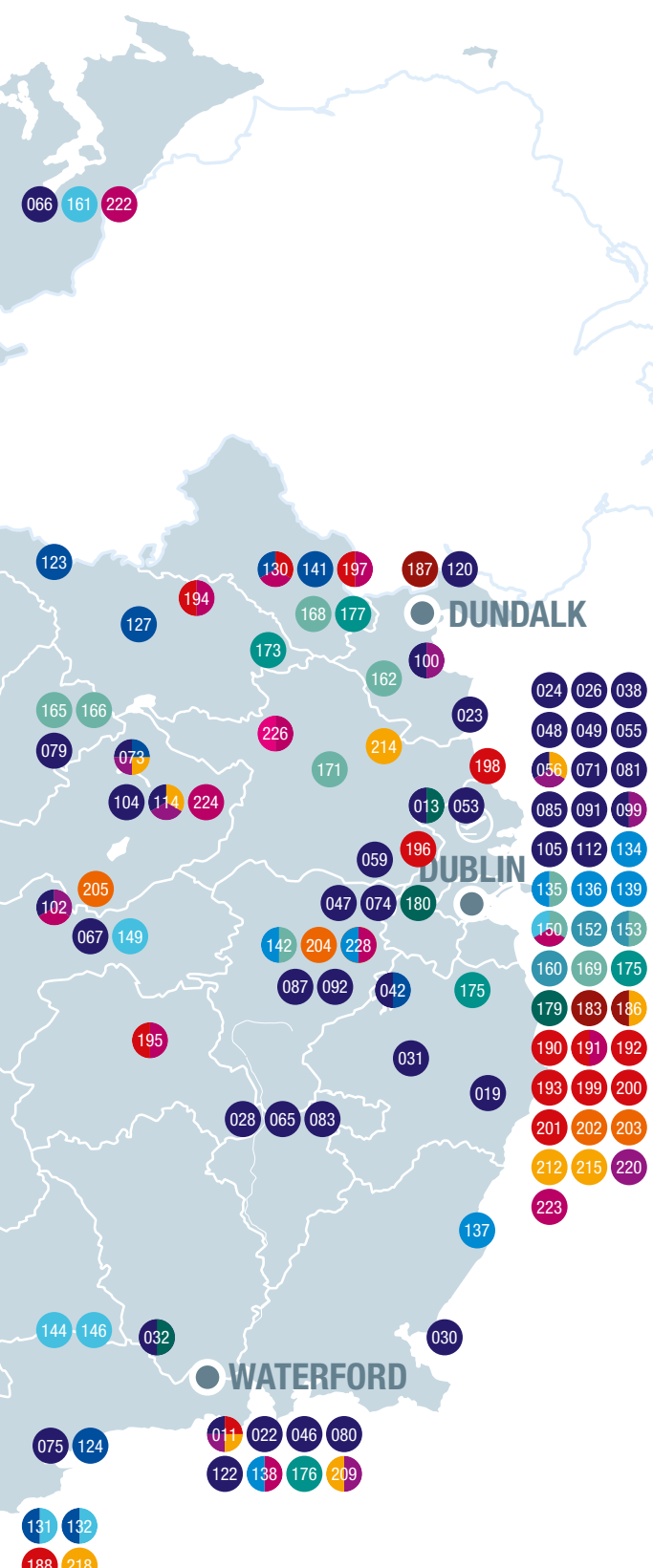
TUBE EXTRUSION



- 144 Abbott Vascular | Tipperary
- 8 Aerogen Ireland Ltd | Galway
- 15 Ardtech Industries Ltd | Cork
- 16 ArraVasc | Galway
- 21 Bantry Technical Products Ltd | Cork
- 145 Baxter Healthcare(Castlebar) | Mayo
- 146 Boston Scientific Ltd - Clonmel | Tipperary
- 33 Contech Medical | Galway

- 147 Cork Plastics Ltd | Cork
- 148 Goodman Medical | Galway
- 149 Kelpac Medical | Offaly
- 60 Lake Region Medical (Galway) | Galway
- 150 MacFarlane Packaging | Wicklow
- 68 Medtronic Athlone | Westmeath
- 151 Merit Medical Systems Inc | Galway
- 154 Novostrat Ltd | Limerick
- 131 Stryker Instruments | Cork
- 132 Stryker Orthopaedics Ireland | Limerick
- 156 TE Connectivity | Limerick
- 157 Teleflex (Athlone) Medical Europe Ltd | Westmeath
- 158 Vention Medical | Roscommon
- 159 VistaMed Ltd | Leitrim
- 161 Zeus Industrial Products | Donegal





PIPE EXTRUSION



- 152 MFP Plastics Ltd | Dublin
- 153 MSI Plastics Ltd | Dublin
- 155 Pipelife Ireland Ltd | Cork
- 160 Wavin Ireland Ltd | Dublin

SHEET EXTRUSION



- 162 Ardee Extrusions Ltd | Louth
- 163 Athlone Extrusions Ltd | Westmeath
- 135 Clondalkin Pharma & Healthcare | Dublin
- 164 Creagh Medical | Galway
- 165 Enplast | Longford
- 166 Foamalite Ltd | Cavan
- 167 Freefoam Plastics Ltd | Cork
- 168 Gernord Ltd | Monaghan
- 169 Holmac Ltd | Dublin
- 150 MacFarlane Packaging | Wicklow
- 170 Merenda Ltd | Leitrim
- 153 MSI Plastics Ltd | Dublin
- 171 Reilly Plastics | Meath
- 142 SPG Packaging Systems Ltd (Part of signode) | Kildare

ROTATIONAL MOULDING



- 172 JFC Manufacturing Co. Ltd | Galway
- 173 Kingspan Group Ltd | Cavan
- 174 Rotofab Ltd | Westmeath
- 175 Sturdy Products Ltd | Wicklow
- 176 Swan Plastics Ltd | Waterford
- 177 Titan Environmental Ltd | Monaghan
- 178 Total Plastic Solution Ltd | Kerry

THERMOFORMING



- 179 Alpha Plastics Ltd | Dublin
- 13 APM Manufacturing & Display | Meath
- 145 Baxter Healthcare (Castlebar) | Mayo
- 126 Connabride Plastics Ltd | Cork
- 32 Consort Case Company | Kilkenny
- 39 D.C.P. Plastics | Cork
- 180 Future Plastics | Kildare
- 181 Nelipak Healthcare Packaging | Galway
- 182 Profile Developments | Limerick
- 97 PVC Fabrications Ltd | Cork

Suppliers

MACHINES AND ANCILLARIES



- 183 J L Goor Ltd | Wicklow
- 184 Modular Automation | Clare
- 181 Nelipak Healthcare Packaging | Galway
- 185 Sys-Pro Ltd | Limerick
- 178 Total Plastic Solution Ltd | Kerry
- 186 Tritech Precision Ltd | Dublin
- 187 TSM Control Systems | Louth
- 117 Verus Precision Ltd | Sligo

RAW MATERIAL



- 11 Allsop Europe Ltd | Waterford
- 188 BASF Ireland Ltd | Cork
- 189 Delta Q | Westmeath
- 190 Distrupol Ireland Ltd | Dublin
- 191 Irish Farm Film Producers Group | Dublin
- 192 J L Goor Materials Ltd | Dublin
- 193 National Chemical Company | Dublin
- 194 Retech Processing Ltd | Cavan
- 195 Roc Recycling Solutions Ltd | Laois
- 196 Scott Bader Company Ltd | Meath
- 130 Shabra Group | Monaghan
- 197 Shabra Recycling | Monaghan
- 198 TCL Plastics | Dublin
- 199 Total Polymer Solutions | Dublin
- 200 UltraPolymers | Dublin
- 201 Univar Ireland Ltd | Dublin
- 229 Zenith Adhesive Components | Westmeath

COMPOUNDS AND PIGMENTS



- 202 Baxter Healthcare (Deansgrange) | Dublin
- 203 Baxter Healthcare (Sandyford) | Dublin
- 204 Clariant Masterbatches Ireland Ltd | Kildare
- 189 Delta Q | Westmeath
- 205 Innovative Polymer Compounds - IPC | Westmeath
- 206 MICAM Ltd | Cork
- 207 Saint Gobain Performance Plastics (Chemfab) | Clare

TOOL AND MOULD



- 6 Advant Medical | Galway
- 208 Abbey Moulding Contractors | Limerick
- 209 Abbey Rubber Mouldings Ltd | Waterford
- 11 Allsop Europe Ltd | Waterford
- 210 Alpha Precision | Sligo
- 20 Avenue Mould Solutions Ltd | Sligo
- 211 CL Precision Engineering Ltd | Roscommon
- 212 Collins Engineering Ltd | Wicklow
- 44 G&G Engineering Ltd | Mayo
- 213 Galway Tool & Mould | Galway
- 214 Global Green Composites | Meath
- 51 Inmo Tech Ltd | Sligo
- 52 Irish Micro-Mouldings Ltd | Galway
- 56 Key Plastics | Wicklow
- 73 Mergon International | Westmeath
- 184 Modular Automation | Clare
- 84 One Stop Engineering Solutions | Cork
- 215 Rockwell Precision Engineering | Dublin
- 216 Sligo Tool & Die Co. Ltd | Sligo
- 217 Smithstown Light Engineering | Clare
- 218 T & T Precision | Cork
- 114 Trend Technologies Mullingar Ltd | Westmeath
- 186 Tritech Precision Ltd | Dublin
- 117 Verus Precision Ltd | Sligo
- 159 VistaMed Ltd | Leitrim

Services

DESIGN



- 209 Abbey Rubber Mouldings Ltd | Waterford
- 5 Advanced Technical Concepts | Clare
- 219 AIT (Research) | Westmeath
- 11 Allsop Europe Ltd | Waterford
- 20 Avenue Mould Solutions Ltd | Sligo
- 29 Cambus Medical | Galway
- 43 Filtertek - An ITW Medical Company | Limerick
- 44 G&G Engineering Ltd | Mayo
- 220 Human Scale Ltd | Dublin
- 51 Inmo Tech Ltd | Sligo
- 52 Irish Micro-Mouldings Ltd | Galway
- 56 Key Plastics | Wicklow
- 73 Mergon International | Westmeath
- 184 Modular Automation | Clare
- 181 Nelipak Healthcare Packaging | Galway
- 82 O'Flynn Plastics Ltd | Cork
- 90 Prior PLM Medical | Leitrim
- 96 Proxy Biomedical Ltd | Galway
- 99 Shadow Creations Ltd | Dublin
- 100 Smallvares Ltd | Louth
- 102 Steripack Ltd | Offaly
- 109 Thormac | Clare
- 114 Trend Technologies Mullingar Ltd | Westmeath
- 117 Verus Precision Ltd | Sligo
- 159 VistaMed Ltd | Leitrim

OTHER



- 219 Athlone Institute of Technology (Research) | Westmeath
- 228 Boran | Kildare
- 221 Bruss GMBH Dichtungstechnik | Sligo
- 222 LC Packaging | Donegal
- 43 Filtertek - An ITW Medical Company | Limerick
- 191 Irish Farm Film Producers Group | Dublin
- 223 Kayfoam Woolfson Ltd | Dublin
- 150 MacFarlane Packaging | Wicklow
- 138 Mima Films | Waterford
- 181 Nelipak Healthcare Packaging | Galway
- 194 Retech Processing Ltd | Cavan
- 195 Roc Recycling Solutions Ltd | Laois
- 130 Shabra Group | Monaghan
- 197 Shabra Recycling | Monaghan
- 102 Steripack Ltd | Offaly
- 224 Taconic International Ltd | Westmeath
- 225 ThermoSafe Brands Europe Ltd | Cork
- 226 Wellman International Ltd | Cavan
- 227 VitaBond Ltd | Westmeath
- 229 Zenith Adhesive Components | Westmeath

NON-WOVENS/FIBRES



- 226 Wellman International Ltd | Cavan
- 227 VitaBond Ltd | Westmeath

FOAM MOULDING



- 227 VitaBond Ltd | Westmeath

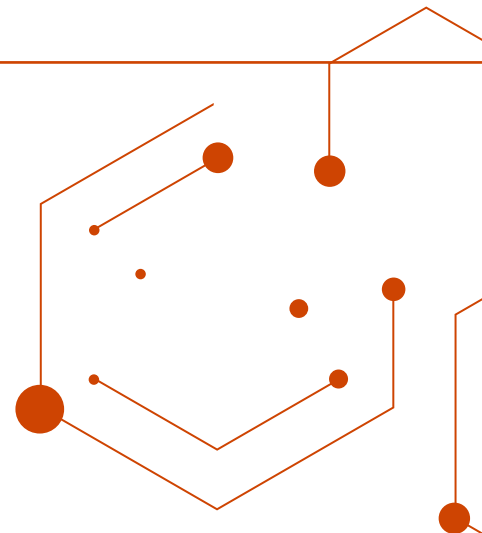
EDUCATIONAL INSTITUTES



- 219 Athlone Institute of Technology (Research) | Westmeath
- 230 IT Sligo | Sligo
- 231 First Polymer Training Skillnet | Westmeath

While the coordinators have made every effort to ensure that the information in this map is accurate, we do apologise for any inconsistencies. Stakeholders who wish to amend map, please contact Polymer Technology Ireland on 01 605 1562 or info@plasticsireland.ie. It is anticipated that updates will be supported on an ongoing basis and completely at the discretion of Plastics Ireland.

Continuous industry improvement



The training provided through First Polymer Training Skillnet has been crucial in supporting the growth of Litec Moulding over the past ten years.

When Jonathan Read joined Litec Moulding in Sligo as managing director in 2007, one of his priorities was to review the training and development needs of personnel to support the company's growth plans.

He decided the following year to establish a relationship with First Polymer Training (FPT) Skillnet as the company's baseline training provider. Initiated by Polymer Technology Ireland, FPT Skillnet's objective is to provide technical training to polymer processors, both at its centre in Athlone and in-company as required.

Since then, Litec Moulding has used FPT Skillnet consistently every year so that now every manager and technical person on the operational side of the business have gone through FPT's injection moulding modules 1, 2 and 3.

"We employ 70 people and operate on a 24-seven basis. The training modules are essential for understanding the baseline technologies and processes in this setting," says Read. Injection moulding is a widely used plastic process, producing high volumes from all polymers in every shape and size.

Founded in 2000, Litec Moulding provides high precision components used in the making of aerosol valves and dispensing solutions. It is the in-house moulding operation of Lindal Group, which is a leading manufacturer of the valves, serving global clients including Unilever and Biersdorf. "About 30% of the global volume of aerosol valves, actuators and spray caps contain components manufactured out of Sligo," says Read.

Litec Moulding has been on a continuous growth path since it was set up, notes Read. Between 2007

and this year, the number of components it has processed has increased from 2 billion to 5 billion.

"In the past ten years we have more than doubled our output, while only increasing staff numbers by 20%. This could only be achieved through ongoing continuous improvement and having a team that understands the injection moulding process," notes Read.

The team includes engineering facilities manager Ray Fox who completed the FPT Skillnet injection moulding module 4 in October. Meanwhile, newly appointed continuous improvement leader Jonathan Pugsley and production supervisor Enda Dineen did module 2 as part of their induction.

Ronan Collevy did the first three FPT Skillnet modules off his own bat after leaving school and was recommended as a good hire, so Read agreed to take

him on three years ago. He is currently studying for his Bachelor of Engineering in Polymer Processing at Institute of Technology Sligo with the company's support.

"Technical skills are vital to us as we are dealing with thin-walled, high precision components with a very fast cycle time. We measure our parts in microns. Producing 5 billion components means you can't rely on traditional inspections; it is our people and our processes that deliver quality."

First for skills

First Polymer Training (FPT) Skillnet was one of the first funded Skillnets when it was established nearly 20 years ago. This was driven by Polymer Technology Ireland in 1999. It is one of only three Skillnet networks from the very first cohort still in existence and is managed by Catherine Collins.

FPT Skillnet injection moulding modules

Module 1

This course starts with a full overview of injection moulding from the moulding parameters/mould opening and closing parameters, up to injection pressure curves and why troubleshooting issues occur.

Module 2

This course starts by covering the cycle with an in-depth review of each of the parameters making up the stages in the cycle. Theory sessions include parameters and their control, setting up a mould with no setting sheet, plastic materials, mould design and troubleshooting – with an emphasis on troubleshooting during all sessions. The remainder of the course is practical, focusing on setting up moulds from scratch, selecting pressures, speeds, times and strokes before building the shot up and dealing with defects as they arise.

Module 3

This course focuses on techniques used to understand and 'map' the injection moulding process, reducing moulding inconsistency by understanding its causes and effects. A strong emphasis is placed on giving participants the practical skills to apply both statistical process control and troubleshooting techniques.

Module 4

This course focuses on the polymer engineering and processing principles related to achieving the optimum injection moulding process. Strong emphasis is placed on giving the practical skills to achieve optimum performance but supported by engineering principles. It includes an element of home study to reinforce the principles applied throughout the course.



Jonathan Read, Managing Director, Litec Moulding

Since then, the network has been successfully developing and delivering technical training to the polymer industry and driving the upskilling agenda for the sector with more than trained 6,500 participants trained to date.

FPT's voluntary steering group is made up of leading figures from the polymer industry who oversee the management of the network and give strategic direction and guidance. Companies represented on the group include the Spectrum Plastics Group, Polymer Technology Ireland, Irish Micro Mouldings, Trend Technologies, JL Goor, MFP Plastics, Nypro Healthcare, West Pharma, Athlone Extrusions and Medtronic.

This group has been fundamental to the network's success to date and has driven its development to be a real partner to industry with a very strong enterprise focus. At the beginning, Chair Pat Whyte played a key role sharing his expertise to help the network

achieve its early objectives.

FPT has a dedicated polymer training facility in Athlone, which houses four injection moulding machines, an extruder, thermoformer and purpose built maintenance training boards.

A wide range of courses is offered at the centre exclusively and companies can benefit from Skillnets funding on these programmes which are tailored to specifically meet their needs. FPT is currently the sole provider of many of these QQI accredited polymer programmes (including injection moulding, extrusion and part & tool design) and originally developed these as a career progression route for those working in industry.

FPT is an integral part of the sector and continues to work as a partner with industry. Current network membership of 78 companies includes leading plastics processors in a range of sectors, medtech companies and suppliers to the industry.

Practical career progression

New apprenticeship programmes are helping to create a pipeline of talent in the area of polymer processing and manufacturing.

By the end of this year around 110 people will have started on two apprenticeship programmes which mark a new departure for training and skills development in the plastics industry in Ireland – the Polymer Processing Technologist Apprenticeship and the Manufacturing Engineer Apprenticeship.

Based on the 'earn and learn' principle, these new industry-led apprenticeships involve a work placement combined with studying for a level 7 degree. They are part of a general Government push to expand apprenticeship into new sectors of the economy, which was initiated in 2014 with the establishment of the Apprenticeship Council.

Polymer Technology Ireland, the Ibec association representing the sector, developed the Polymer Processing Technician Apprenticeship with a consortium of 14 companies and Athlone Institute of Technology (AIT) and Sligo Institute of Technology (Sligo IT) as education providers. At the end of the three year programme, successful apprentices will have a Bachelor of Science in Polymer Processing Technology.

According to Aisling Nolan, general manager of Mergon International and chair of the Polymer Technology Ireland Apprenticeships Consortium, this apprenticeship fills a gap that has been in the industry for a long time.

"There was a route for qualification for people who will work in maintenance and on the tooling side, but we always had a gap in terms of a practical route for qualification on the side of processing the plastic in the blow moulding or injection moulding machine," she says.

"As long as I have been in the industry [20 years], this has been a topic of conversation. I took on the position of chair of the consortium as I have a vested interest to ensure we ended up with a programme that truly met industry requirements."

An Irish-owned company established in 1981, Mergon International employs 270 people in Castlepollard, County

Pictured at the launch of new manufacturing and polymer technology apprenticeships (l-r): Chair of Polymer Technology Apprenticeship Consortium and Mergon International General Manager, Aisling Nolan; Chair of the Manufacturing Apprenticeship Consortium and CEO Cambus Medical, Barry Comerford; and Apprenticeship Project Manager Denise Carthy.



Westmeath and also has operations in the Czech Republic and the US.

It serves clients in the automotive and healthcare sectors, designing, manufacturing and assembling components using both blow moulding and injection moulding. Blow moulding mainly produces hollow products, such as bottles, drums and ducts while injection moulding produces high volumes from all polymers in every shape and size.

Last May, the company hired two polymer processing technician apprentices from within as part of the first intake to the apprenticeship programme of a total of 15 people. They have completed their phase 1 work element and started their college training at AIT in September.

Twenty nine year old tool setter Allan Devine is one of the Mergon International apprentices. Having grown up in Castlepollard, he served his time as a carpenter and joiner before being hired as an operator with the company in 2010.

“My experience so far has been of blow moulding. The apprenticeship opens up the opportunity to learn about all aspects of plastics processing, including injection moulding and extrusion,” he says.

“The end goal for me is to know the machines inside out, be able to manage the moulding process from scratch and eventually run the production line. I couldn’t have afforded to take time off work to do a degree. As I had done an apprenticeship before I jumped at the chance of doing this one as it really interests me.”

Other companies that took part in the first intake of the polymer apprenticeship programme like Nyprom Healthcare in Bray, County Wicklow.

“Through this new programme, we get to train people to industry standards,” says Nolan. “The apprentices learn how we do things and get to understand the company culture. We are very focused on talent management and look to promote people from within.

The role of SOLAS

There are formal requirements for approval of an employer’s suitability to train apprentices and for the registration of apprentices as part of the national apprenticeship system. SOLAS, the Further Education and Training Authority, is responsible for delivering on these requirements.

Its network of over 40 authorised officers (AOs) located in the 16 Education and Training Boards around the country work on an ongoing basis with employers, apprentices and the consortia engaged in rolling out apprenticeship programmes.

They carry out site visits to employers’ premises to assess their suitability in terms of their ability to provide quality, relevant, on-the-job training to apprentices. AOs are also tasked with supporting apprentices during their training.

“The Irish polymer industry is well established and offers a broad range of career opportunities,” says Martin Carrigan, development officer at SOLAS. “The Polymer Processing Technologist Apprenticeship allows people to learn in a real working environment, generally in state-of-the-art, high-tech production facilities.”

SOLAS Learning works



Our aim is to develop the skills people have so they can move into more senior and management positions. The apprenticeship is a key way of doing this.”

Nolan expects more existing employees of Mergon International to be trained as polymer processing technicians under the programme and will also hire new people as apprentices in the coming years.

“In our industry, we are certainly back to an acute level of shortage in the engineering area, including quality, process, automation, mechatronics and robotics engineers,” she notes. “We hope that the new programmes will lead to the development of further apprenticeship models, particularly on the automation and mechatronics side where they are much needed.”

Twelve people started their induction as polymer processing technician apprentices for the second intake in October. Companies taking part include BD Medical Technology in Dublin, Litec Moulding in Sligo, West Pharma in Dublin, Delta Q in Athlone, County Westmeath, Tool and Plastic in Longford,

Boston Scientific Clonmel, County Tipperary and Key Plastics, Bray, County Wicklow.

“It is significant that SMEs are taking a leap forward and getting involved in the programme. This gives confidence to others to do the same,” says Denise Carthy, apprenticeship manager at Polymer Technology Ireland. “Smaller companies often have a loyal and committed core team that has been with them for years. The apprenticeship facilitates such people to stay working and upskill. Those that take part can then become mentors to others and there is a cycle of talent to build on.”

Carthy points out that while polymer processing is quite a niche area, there is a demand for polymer engineers across the country as so many larger companies – such as medtech giant Medtronic in Galway for example – have moulding capability within their organisations now.

She believes this type of model is the best way to turn out high quality engineers. “A standard engineering degree takes three years. During the same timeframe, the apprentices will gain a huge

amount of experience, which will make them very valuable to the company they’re placed in. It offers them a career path,” she says. “It takes at least 12 months for companies to see the benefits of recruiting engineers through the normal routes. Once hired, it takes a while for them to understand the industry and start giving back.”

Once apprentices graduate with their Bachelor of Science in Polymer Processing Technology, they can then springboard to level 8 and 9 qualifications to take them down the path of tooling precision, notes Carthy. “Polymer processing and tooling precision combined is a very sought-after set of skills. Companies want people who understand how materials perform and behave and can make sure the production process is consistent; the downtime is kept to a minimum and the quality of the output is good.”

There is a polymer module in the third year of the Manufacturing Engineer Apprenticeship which incorporates a lot of learning around tooling precision. Last June, 52 people started on this programme at Limerick

Institute of Technology, Cork Institute of Technology and Galway-Mayo Institute of Technology. There will be a second intake in November that will include Sligo IT.

“If a company is generating polymers, this apprenticeship programme allows it to acquire a hybrid skill-set with manufacturing focused on tooling. Employers need to assess where their talent gaps are when weighing up the apprenticeship programmes,” says Carthy.

For anyone interested in pursuing a career as a polymer engineer, AIT now offers a combined mechanical and polymer engineering level 8, four-year honours degree. The entry requirements are higher than for the three-year apprenticeship (295 points versus 250 and two honours subjects are required where the apprenticeship requires only a pass Leaving Cert).

Sligo IT and First Polymer Training Skillnet offer combined programmes in the polymer space. There is a programme that offers a level 7 polymer degree, delivered online, but a level 6 qualification in a relevant discipline is required for entry.

“A standard engineering degree takes three years. During the same timeframe, the apprentices will gain a huge amount of experience, which will make them very valuable.”

Getting on the road to polymer technology careers

Oleg Aleksandrov, Kingspan

What is your job title?

Divisional Polymer Engineer for Kingspan Light and Air Division

What was your previous role (3 roles)

- Polymer Engineer for Kingspan Insulated Panels Division
- Process Technician for Tool and Plastic
- Trainee Process Technician, Nypro

What did you study and what educational qualifications do you hold?

- Diploma in Automotive Manufacturing, Riga Valsts tehnikums, Latvia
- BSc Business and Finance, University of Ulster, Northern Ireland
- BEng Polymer Processing, IT Sligo
- MSc Polymer Science and Technology, Loughborough University, UK

What first attracted you to working in manufacturing?

Having moved from manufacturing to a career in business and finance, after a number of years I realised that the manufacturing was the area that interested me the most. It is a very rewarding career that gives you an opportunity to be involved in a process that will produce a tangible product, which will make somebody's life easier, help to cure somebody's illness or build a better building. As well as that the pay rates are quite good too.

What do you like about your job?

Working for a company with a global presence and an opportunity to apply polymer materials knowledge to improve manufacturing process and develop new products, ultimately making our planet a better place.

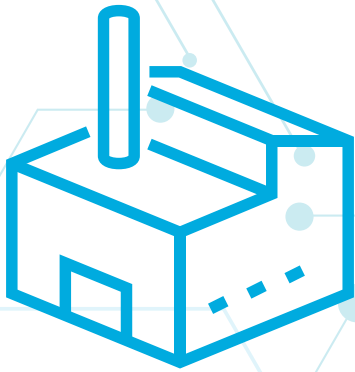
How has manufacturing changed since you started working in the industry eg new technologies, processes, business growth etc?

I can remember operating a Metalworking Lathe to produce a part for a complex assembly that took me 4 hours to complete, now the same part can be produced by CNC machine within minutes and then assembled by a robot to a much greater accuracy.

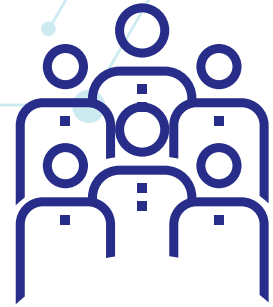
In the last 20 years manufacturing has been transformed with the help of Information Technologies making it a leaner process. Many widely used polymers did not exist 20 years ago, bringing a whole new range of opportunities for innovation and product development. Polymers and technology have made it possible for processes like 3D printing to emerge, opening a whole new industry.



230
polymer
companies
in Ireland



Nearly
7,000
people are
employed in
the polymer
sector



€1.62bn
annual value of Irish
polymer exports

Getting on the road to polymer technology careers

Clara Bracken, Nypro

What is your job title?

Senior Process Engineer, Nypro

What was your previous role (3 roles)

- Senior Site Moulding Engineer, Bausch & Lomb
- Injection Moulding Engineer, Bausch & Lomb
- Moulding Technician, Greenbank Plastics

What did you study and what educational qualifications do you hold?

- BSc Polymer Technology, Athlone Institute of Technology
- Diploma Applied Project Management, University College Cork
- Master Molder I & II through Nypro University

What first attracted you to working in manufacturing?

In school I was more interested in science and engineering rather than manufacturing, I picked polymer on CAO form because I'd covered some of this in leaving cert chemistry and it caught my interest. My first job was in Mallinkrodt Medical in Athlone and this led me to where I am today. I think when you start off in a certain area you tend to stay in it, which in my case was injection moulding, some of my classmates ended up in quality, extrusion, R&D and even sales.

What do you like about your job?

The fact that you're helping make medical devices that can enhance people's lives, plus the diversity. No two projects are the same in terms of design or materials used so while it is very challenging it is great to get this exposure.

How has manufacturing changed since you started working in the industry eg new technologies, processes, business growth etc?

Ireland has a good history when it comes to medical device manufacturing, but I think the design of parts and their functionality are getting more complicated, with that equipment and materials are constantly evolving. Processing itself has developed a lot, use of scientific injection moulding is now the norm, 20 years ago it was a bit more 'unscientific' and most people thought it was a black art. Now it's easier for a process engineer to come in and develop or match a process by following basic principles.



Gateway to growth

The innovation ecosystem for the polymer industry stepped up a gear in 2016 with the formation of EMD Ireland, a cluster group of six technology gateways focused on engineering, materials and design.

Funded by Enterprise Ireland, **EMD Ireland** provides a broad range of expertise to companies of all sizes, effectively becoming an important extension of their research and development (R&D) capability.

The cluster connects with over 300 industry researchers in areas such as precision engineering, biotechnology, polymers, protective coatings, prototype design, medical imaging technologies and 3D metal additive manufacturing.

The six gateways that make up the cluster are: Applied Polymer Technologies (APT) at Athlone Institute of Technology (AIT); the Centre for Research in Engineering Surface Technology (CREST) at Dublin Institute of Technology (DIT); South Eastern Applied Materials Research Centre (SEAM) at Waterford Institute of Technology (WIT); Precision Engineering & Manufacturing (PEM) at Institute of Technology Sligo (IT Sligo); Medical & Engineering Technology (MET) at Galway-Mayo Institute of Technology and Design + Gateway at

Institute of Technology Carlow.

Specialised research resources are leveraged from within the six participating institutes of technology and applied to industry problems. The gateways send work around between each other and companies regularly access the expertise of more than one gateway for specific projects.

For example, chemical and consumer goods company Henkel's operation in Tallaght, County Dublin worked with three different gateways recently as part of its R&D into novel adhesive solutions for 3D printing.

Ahead of the announcement of a new partnership with HP to develop 3D material solutions last May, Henkel engaged with CREST to carry out a colorimetry test – an essential quality control test for which Henkel didn't have a suitable instrument at the time. Colorimetry is a technique used to determine the concentration of coloured compounds in solution.

In addition, Henkel accessed the expertise of

SEAM in 3D metal additive manufacturing to study the porosity of materials used in the manufacture of 3D printers. It also worked with APT to assess how a new coating to facilitate over-moulding would work in an injection moulding environment.

EMD Ireland can assist companies with Enterprise Ireland funding mechanisms in the form of Innovation Vouchers, Innovation Partnerships and Innovation Partnership Feasibility Studies. Companies can also directly fund their work with the gateways.

Since 2013, €23 million worth of innovation projects have been completed between over 900 Irish-based companies and a total of 15 Technology Gateways funded by Enterprise Ireland.

"Manufacturing exports are worth nearly €103 billion, and the sector now employs more than 230,000 people across the country. Thanks to our dynamic talent pool, supportive business environment and collaborative ecosystem, manufacturing

has become exemplary of why Ireland is recognised as a model of business substance," says Ibec's Medtech and Engineering Director Sinead Keogh.

"The world-class ecosystem here includes key sectors such as polymer technology, which has 230 companies in Ireland collaborating with industries such as agribusiness, automotive, construction, medtech, and pharmaceuticals."

The immediate gains of working with Technology Gateways are obvious for Irish-based companies, according to Enterprise Ireland Technology Gateway manager Paddy Byrne.

"Nearly two thirds of companies report the development of new products while more than a third have accessed funds to develop their business," he says. "In the long term, the fact that seven out of ten said that working with these gateways has helped them foster a culture of innovation will help these companies to scale and grow."

APT Gateway

Over the past 20 years, **AIT** has grown the polymer research area into an interdisciplinary hub, connecting with the plastics industry across multiple platforms on thousands of projects.

The APT Gateway is an important part of the hub, providing polymer and technology solutions for industry in the medical, composite, recycling and pharmaceutical sectors.

APT was funded by Enterprise Ireland as a gateway in 2013. Last year its team of 16 full-time staff worked on over 150 projects with industry ranging from two-hour problem solving to an 18-month project costing €300,000. Areas covered include design for manufacture, simulation prototyping, small-scale production, compounding, pipe extrusion, injection

moulding and blow moulding.

Used in a variety of medical devices including catheters and electrical cable wrapping, pipe extrusion involves polymer being extruded into a thin circular tube. Blow moulding mainly produces hollow products, such as bottles, drums and ducts while injection moulding produces high volumes from all polymers in every shape and size.

Housing the only dedicated pilot and industrial-scale polymer processing R&D facility in Ireland, APT is equipped with sophisticated analytical equipment as well as a variety of pilot-scale processing equipment including injection moulders, extruders and blow moulders.

“We work hand-in-hand with industry partners throughout a project and our researchers become part of their teams, helping them to solve the problems they are facing,” says

Dr Sean Lyons who worked as the centre manager from 2013, before becoming the Athlone Institute of Technology Acting Dean of Engineering in 2018.

“This could be anything from developing materials for production to working on new production methods and devices. Our facility is based on a factory setting which is easily translated into an industrial setting. Companies can try out ideas using our pilot production lines without having to make a capital investment.”

Industry partners gain not only the knowledge they need, but also the ability to train

their own staff in new areas, Lyons adds. “Sometimes companies have the expertise in-house but don’t have the bandwidth or time to try things out. In other cases, they don’t have the specific skills or equipment required, and this is where our unique, state-of-the-art facility really comes into its own.”

APT works across all industry sectors on developing parts for a wide range of applications. One of the key sectors it serves is medtech where the use of injection moulding components is very common, for example in the

“ In the area of polymers, PEM is engaged in a lot of work around tool design and tooling for injection moulding for a wide spectrum of industries. Johnson & Johnson, and Abbott Nutrition and Avenue Mould Solutions in Sligo have been partners in this area.”



Dr Sean Lyons,
Acting Dean of
Engineering,
Athlone Institute
of Technology

Pictured (from left to right): Dr Brendan Duffy, Centre Manager, CREST; Dr Alan Hernon, Centre Manager, PEM; and Dr Ramesh Raghavendra, Centre Director, SEAM.

development of catheters or interventional devices.

"We work with a lot of large medtech companies on improving the performance and reliability of components, or on altering the way they perform for different applications," explains Lyons. "In many cases, we may see foreign matter in the production process which the company can't identify or there may be issues in terms of the stability of the product over time."

APT has engaged with numerous original equipment manufacturers in the areas of lightweighting and strength optimisation of parts supplied to the aerospace and automotive industries.

Otherwise, APT has conducted a lot of work on behalf of industry partners in the use of recycled materials in their products and processes. For example, it helped Condron Concrete in Tullamore, county Offaly with the testing and manufacturing of recycled plastic for use in its underground piping.

CREST Gateway

Based in Dublin Institute of Technology since 2004, **CREST** provides coating solutions for industry in the engineering, construction, healthcare and biomedical sectors.

The only dedicated surface coatings laboratory in Ireland, CREST offers expertise in areas such as protective coatings for challenging environments, surface treatment of metal components, coatings for environment applications and biomedical devices.

Working on 60-70 projects a year with industry partners in various sectors, CREST employs a team of 30 people, including 14 full-time staff, postgraduate researchers and academic colleagues.

"A lot of our work is focused on coating metal

parts or getting polymers to stick together better – which can often be a problem with these materials," says centre manager Dr Brendan Duffy. "We have just finished a project with Sherwin-Williams, one of the biggest industrial suppliers of paints and coatings in the world. But equally, we work with small, local companies which have come up with an idea and want to use an Innovation Voucher to explore it."

One such small company is Dublin-based Smarter Surfaces, which is manufacturing and distributing paint which turns any surface into a white board. CREST carried out a material development investigation on its paint with a view to enhancing its functionality and capacity to be used with a variety of visual aids.

In the automotive sector, CREST has licensed a technology to C&F Automotive in county Westmeath, which is coating trim parts for Volvo, Daimler Benz and Porsche. "The trim surfaces on car parts in the new Volvo XC60 are made out of our patents," notes Duffy.

Through an Enterprise Ireland Innovation Partnership project CREST and C&F Automotive developed a sol-gel coating technology called dualion that was applied to the company's aluminium trim. It is already being used on Volvo's 2017 models. Volvo is sourcing parts from up to ten other Irish companies.

A spin-out company has emerged from CREST, which is projecting multi-million euro revenues over the next five years. Kastus creates antimicrobial coatings and additives proven to provide 99.9% resistance to superbugs like MRSA or E. Coli.

"Kastus's unique technology was developed here at CREST; then was tested in a lab at Shannon Applied Biotechnology Centre

and trialled on machine parts at APT," says Duffy.

"Researchers from the Biomedical Manufacturing Technology Centre in South Korea have visited us twice recently as they are so impressed with the Enterprise Ireland Gateways model for polymer research. There are other examples of research centres trying to replicate the model in South East Asia."

PEM Gateway

Funded as a gateway by Enterprise Ireland last year due to its strong track record with industry projects, **PEM** provides a unique industry support offering in precision engineering, manufacturing and materials.

Its expertise spans precision engineering and design, manufacturing process modelling and simulation, advanced process monitoring and control and advanced material synthesis and characterisation.

"While these capabilities are listed individually, we aim to offer the full suite to partners as industry moves more towards the development of smarter tools that collect data," says centre

manager Dr Alan Hernon. "Projects are focused on not just embedding a sensor into a process, but also trying to make sense of the data and how it can bring down manufacturing costs."

Last year, PEM worked on 26 industry projects ranging in cost from €5,000 to €20,000. It has conducted a total of 100 industry projects since it was established in 2013.

PEM has a fully equipped engineering tool room further to acquiring a high-end five-axis CNC machine, which provides more precise and exact cutting capabilities than the standard three-axis machine used in precision engineering.

In the area of polymers, PEM is engaged in a lot of work around tool design and tooling for injection moulding for a wide spectrum of industries. Johnson & Johnson, and Abbott Nutrition and Avenue Mould Solutions in Sligo have been partners in this area. PEM also covers design for manufacture and early stage product design.

Last year, PEM researchers completed an EU-funded project entitled Bio-PolyTec, which has cut the cost





of production of medical implants using bioresorbable polymers by a quarter, according to Hernon.

Bioresorbable polymers have key advantages over metal. These include improved patient recovery and fewer follow-up operations. They also break down naturally into the body's system when they are no longer needed. The main obstacle to wider use of the material up to now has been high processing costs.

The two-year Bio-Polytec initiative involved partners from five nations and was funded by the EU's Seventh Framework Programme. "Our contribution involved using soft sensors to assess whether filler was being evenly distributed in the bioresorbable material used in a device supporting arthritic joints," says Hernon.

"The new instrumentation and technology we developed allowed this to be done online, rather than having to wait until the medical device was finished to be taken away for microscopic analysis and then scrapped if it wasn't right."

SEAM Gateway

An Enterprise Ireland funded gateway since 2012, SEAM provides innovative materials engineering solutions for a wide range of sectors, including medtech, pharmaceuticals, micro-electronics and industrial technologies. It has served over 150 companies to date, 45 of which came from the medtech sector.

Technological expertise unique to SEAM includes x-ray microtomography (XMT), finite element analysis and metal additive manufacturing. XMT is used in design verification of product components while finite element analysis is a computer-based technique used to analyse engineering applications and sealing components to understand their behaviour under a variety of conditions.

This analysis involves finite element modeling, which is often used for new component design, or to refine an existing product design. The virtual environment allows engineers to predict how sealing components will perform in real-life applications.

Metal additive manufacturing enables engineers to produce complex customisable components and

is of particular interest to high value added sectors such as medtech where implantable devices can be made customised to the patients specific needs, for example in orthopaedic applications.

Each year SEAM's team of 15 people work on more than 200 industry projects ranging in size from those costing a few hundred euros all the way up to €1 million.

"Around 30% of our work in the polymer area is focused on product design optimisation, which involves identifying failures in the process and coming up with solutions to prevent problems," says centre director Dr Ramesh Raghavendra. "For example, a couple of years ago we used finite element analysis to investigate vial integrity and the factors that influence sealing."

SEAM recently entered into an innovation partnership with APT which is exploring material identification selection and characterisation for gaming mice devices on behalf of technology company Logitech. "A lot of the time the selection of materials for injection moulding components lead to the failure of the product identification," says Raghavendra. "In the case of the medical devices, the materials have to be low

weight but high quality."

In 2015, SEAM formed a unique collaboration with Boston Scientific, precision engineering company Schivo and tool manufacturer Lisnabrin to work on a ground-breaking metal 3D printing additive manufacturing research programme.

"We were collaborating with the three companies on the emerging 3D metal printing technology to understand how far it would be of benefit to them," says Raghavendra.

The project completed in June of this year with each company finding significant merits of this technology to their business. SEAM began another 24-month project with Boston Scientific in September on metal 3D printing technology applicable more specifically to its business and products.

"The new technology we are developing offers enormous potential to manufacturing industries in Ireland," says Raghavendra. "It allows streamlining of the manufacturing process by removing multiple process steps, reducing materials handling and the number of components in an assembly as well as enabling rapid prototyping of functional metal components."

Brexit: challenges with solutions

The departure of the UK from the EU represents a profound change for Ireland and Irish businesses.

Ireland's unique exposure

Any change in the EU-UK trading relationship, either through the introduction of tariffs or non-tariff barriers, would impact Ireland more than any other EU27 country due to its unique trade and business exposure. The UK accounts for 14% of Irish goods exports, the highest share of any European country and double the exposure of the EU as a whole.

Ireland's exposure to the UK is even higher for imports, as 32% of goods imports come from the UK. This is more than three times the share of the next highest country, and much higher than the EU average of only 4%. If tariffs were placed on these imports, it would put upward pressure on the overall price level and would increase business costs as many of these imports are used as intermediate goods.

Service exports also play a central role in the Irish economy. These exports are also exposed to Brexit as the UK accounts for almost 20% of service exports. This is the third highest share in the EU, after Spain and Malta. The UK is the most important market for transport services, 60% of total exports. It is also an important market for travel and financial services exports, which represents roughly 30% of these exports.

The impact of Brexit is already being felt

Given that Ireland is so exposed to the UK, the weakening of sterling that happened in the later part of 2016 had a significant impact. While sterling has strengthened in 2017, the negative movements at the end of last year highlight just how exposed Ireland is and how greater volatility in

the future could adversely impact on the economy and particularly on indigenous sectors.

Export performance down

Exports played a huge role in our economic recovery, but 2016 saw a slight slowdown in this growth. In 2016 the exports of goods and services grew by 2.4%, the weakest performance since 2008.

Headline figures do not, however, capture the more significant impact of Brexit to date on exposed sectors, even before the application of any potential tariff or non-tariff trade barriers.

While goods exports increased by 5%, if chemicals and electrical equipment are excluded, exports actually fell by 3%. Food exports in particular saw a significant decline, as these exports to the UK fell by 5.3% in 2016

compared to the previous year.

This weak export performance meant that output in traditional manufacturing fell by 2% in the second half of 2016, while food output fell by 4.3%. If this continues it will have severe impacts on the overall economy as these sectors spend a higher proportion of turnover on wages and intermediate purchases than other sectors of the economy.

Brexit toolkit – What's ahead in manufacturing?

Irish manufacturing in 2015 had a net sales value of €52.6 billion, excluding the pharmaceuticals and food sectors, contributing to 21% of Irish GDP. There are 14,600 manufacturing businesses in Ireland employing 230,000 people. Indigenous manufacturers



account for 23% of total Irish manufacturing turnover.

Certain Irish sectors are over-reliant on the UK market. Cheaper sterling has already increased competitive pressure for Irish manufacturers exporting to the UK. In 2015, Ireland exported €15.6 billion (13.9%) of goods to the UK. The largest three manufacturing sector goods exported to the UK were: medical products (€1.5 billion); organic chemicals (€1.0 billion); and essential oils, perfume materials (€0.8 billion). UK and Irish manufacturing industry supply chains are tightly integrated, both between the Republic and Britain and north-south on an all-island basis.

Irish manufacturers have already undertaken extensive cost-cutting over the last 10 years and continue to operate on tight margins. Irish SME manufacturers rely heavily on bank funding and particularly short-term funding.

Key Brexit impacts for the manufacturing sector

Weak Sterling: Weak sterling makes Irish goods more expensive in the UK and UK substitutes are more attractive to UK businesses.

Interlinked supply chains: Non-tariff barriers will introduce new costs and time delays for Irish manufacturers with interlinked supply chains across the UK and Ireland.

Capability gaps: The introduction of trade barriers will require Irish manufacturers to invest in capabilities to fill gaps in trade experience. These capabilities may be scarce and in high demand following Brexit.

Investment decisions paused: Investment decisions are being put on hold as a result of Brexit uncertainty



Pictured above: Ibec CEO Danny McCoy met with British Prime Minister Theresa May as part of a delegation of key EU businesses federations.

Access to finance: Brexit-based uncertainty may cause a slowdown in the UK economy, reduce demand for Irish exports and in turn make lenders less inclined to support Irish business. This risk is particularly relevant for Irish SME manufacturers.

FDI opportunity: The UK's loss of Single Market access may make Ireland a more attractive location for FDI.

Financial trade barriers: The introduction of tariff and other tax barriers may increase the cost of Irish manufacturing exports to the UK. It may also increase the cost of UK imports into Ireland, impacting both finished and unfinished products.

Divergent standards: Regulatory divergence from EU standards may require Irish manufacturers to meet new UK standards. This could increase costs and complexity to produce for Irish business. Divergences could include new content, labelling and process requirements specific to the UK.

Switching notified body: Medical devices must adhere to stringent EU regulations. Regulators, known as notified bodies, ensure products meet required European standards. Irish producers with approvals from UK regulators may need

to switch to notified bodies in other EU countries to retain Single Market compliance.

Over-reliance on UK market: Some Irish manufacturing sectors are overly reliant on the UK market. This makes them more prone to Brexit impacts and makes business planning harder. Irish SME manufacturers are more exposed to this risk than international businesses with Irish operations.

New market entry: With so many uncertainties in the UK, Irish manufacturers are assessing how they could enter new EU and international markets. Irish business, particularly small firms, have limited experience in developing other channels in new markets, and it can typically take 3-5 years.

Competitiveness: Irish manufacturers are assessing whether operating in both the UK and the Republic will remain viable following Brexit. Moving production to the UK may limit heightened currency and trade risks of serving the UK market. This will be more difficult for SME businesses as the investment and skills required may not be easily accessed.

The voice of Irish business

Ibec has been working to ensure that Irish business concerns are heard at both domestic and EU level as well as providing support to members while navigating Brexit uncertainty.

Ibec's Brexit campaign recent engagements and activities include:

- Brussels launch of Ibec Brexit priorities paper 'Brexit: challenges with solutions', 12 July 2017
- Meetings with Task Force 50, the EU Commission Brexit negotiating team and the Irish Permanent representation in Brussels, 13 July 2017
- Ibec hosts a breakfast at the Irish embassy London with Political and business stakeholders to highlight the key concerns of Irish business, 20 October 2017
- Launch of the Ibec Brexit tracker, providing a quick snapshot of progress in negotiations to date in key areas, 23 October 2017
- Ibec CEO Danny McCoy meets British Prime Minister Theresa May and Brexit Secretary David Davis in Downing street, as part of a delegation of key EU business federations, 13 November 2017
- Ibec hosts the House of Commons Foreign Affairs Committee as part of their Brexit fact-finding mission to Dublin, 17 November 2017
- Ibec CEO Danny McCoy addresses the House of Commons Select Committee on Exiting the EU, 25 January 2018
- Ibec CEO Danny McCoy addresses the House of Lords Select Committee on the EU, 30 January 2018



Medtech regulations, a landmark for EU manufacturers

After five years of negotiations, the European Commission published the Medical Device Regulation (MDR) and In vitro Diagnostic Medical Device Regulation (IVDR) in 2017.

This marked a new phase for medtech and contract manufacturing businesses with the transition period commencing and the new rules coming fully into effect by the end of May 2020 for medical devices and May 2022 for IVDs.

Over the coming years, smooth implementation of the new regulations is a top priority for these sectors which have already begun to collaborate with key stakeholders to achieve this.

Resources are the key issue of the moment, in particular, the need to apply new resources to support designation of notified bodies under the new MDR/IVDR as early as possible during the transition period.

With the new regulations come significant changes for these sectors not least among them changes to vigilance and post market surveillance where manufacturers will now be required to collect post-market clinical data as part of their ongoing assessment of potential safety risks and there will be reduced reporting timeframes.

The new regulations will be much more prescriptive about the required content of technical documentation, particularly as there are more detailed requirements for quality management systems. The new MDR will require more clinical evidence and clinical evaluation in proportion to the risk associated with a given device.





Significant changes are also looming for labelling, UDI and transparency. Certain products have received special consideration in the MDR and are subject to re-classification. These new provisions will apply to cosmetic implants, standalone software, products without an intended medical purpose, certain spine products and reusable Class 1 devices.

For the IVD sector in particular, the new IVD Regulation represents a fundamental legislative change with new or major shifts in areas such as the classification system, performance evaluation and clinical evidence and conformity assessment of IVD's.

Recently, the European Commission and competent authorities consulted with stakeholders to develop an official implementation roadmap. It identified eight priority areas:

1. **Clinical Evaluation and Clinical Investigation (MD), Performance Evaluation and Performance Studies (IVD)**
2. **Scope and Classification**
3. **Notified Bodies and Conformity Assessment**
4. **Post-Market Surveillance and Vigilance**
5. **Eudamed and UDI**
6. **Market Surveillance**
7. **IVD-specific Issues**
8. **Over-arching and Cross-cutting Priorities.**

However, the European trade association, MedTech Europe, has called on the European Commission and Member States to: (i) invest necessary resources

to implement the new regulations and clarify the new governance system (ii) ensure the availability of notified bodies early in the transition periods and (iii) ensure that all stakeholders have a consistent interpretation for the transition periods, to ensure effective implementation.

Manufacturers cannot underestimate the time that will be required to implement the new MDR and IVDR. The major challenge is that some underlying details are not fully defined yet and will only become clear as secondary legislation emerges over the coming months and years.

It is important that manufacturers closely follow these developments and the implementing acts. A proactive approach to dealing with the challenges ahead will be hugely important for the sector and can help Irish manufacturers better compete by getting a head start.

Pictured at the Global Access conference: Tony Keaveney, Merit Medical Systems; Aine Fox, Irish Medtech Association; and Robbie Walsh, Boston Scientific.



Competitive advantage

A strong focus on the supply chain and maximising operational efficiency will help companies in the Irish polymer technology industry to navigate their way through the Brexit phase.

Tom Kelly, Head of the Industrial, Life Sciences and Consumer division at Enterprise Ireland; John Power CEO Aerogen and Minister of State Pat Breen, TD.



In order to remain competitive in light of Brexit, companies in the Irish plastics industry need to ensure they are as lean as possible in terms of operations, as well as actively looking at supply lines and sourcing raw materials to their best advantage.

This is particularly true for companies selling plastic parts into the automotive sector in the UK, as this is where competition can be very strong, according to Tom Kelly, Head of the Industrial, Life Sciences and Consumer division at Enterprise Ireland.

"The strategy around supply will be very important into the future," he says. "Companies need to position themselves so they are perceived as key suppliers, for example, by differentiating themselves in terms of design or innovation. They need to actively find the right solutions for the companies they are serving."

As well as encouraging plastics companies to have a strong proposition, Enterprise

Ireland is putting a lot of effort into helping them to diversify beyond the UK as a way of protecting themselves from any potential ill effects from Brexit.

"It is very important now that companies carry out a market opportunity review and seek out new opportunities, such as in the Nordic countries, the Benelux region, France and Germany," says Kelly.

He cites Mergon as a good example of an Irish company with a well dispersed marketplace and a good differentiation strategy.

"Mergon is one of Ireland's leading manufacturers with a reputation for excellence, reliability and innovation. It supplies into the industrial, healthcare and automotive sectors. It's customers include a host of global blue chip companies.," notes Kelly.

"Lean business practices are also important for all types of companies in the plastics industry, from those which make plastic sheeting, the ones that take in polymer material in flake form and process it to those that make components or parts," says Kelly.

Enterprise Ireland has supported a total of around 1,000 companies from various sectors through its lean programmes to date. "These programmes have been remarkably successful and the companies that took part have made significant savings as a result of them, as well as establishing practices of continuous improvement. Lean is an important part of Enterprise Ireland's wider approach to improving the competitiveness of companies."

What does the Circular Economy hold for plastics?

The European Commission launched the Circular Economy Package, in December 2015. The circular economy package seeks to maintain the value of products, materials and resources for as long as possible in the value chain.

What is the Circular Economy?

The aim of the circular economy package is to move us, as European citizens, from a buy-use-dispose lifestyle to a society where items are designed with easy dismantle after use in mind and therefore the parts can be reused again and again. This will be achieved through changes in product design, consumption and waste management.

The circular economy package is a suite of tools including an action plan, the development of strategies for specific issues, the revision of the EU waste directives and the setting of targets up to 2025, 2030 and 2035.

How will it affect the plastics sector?

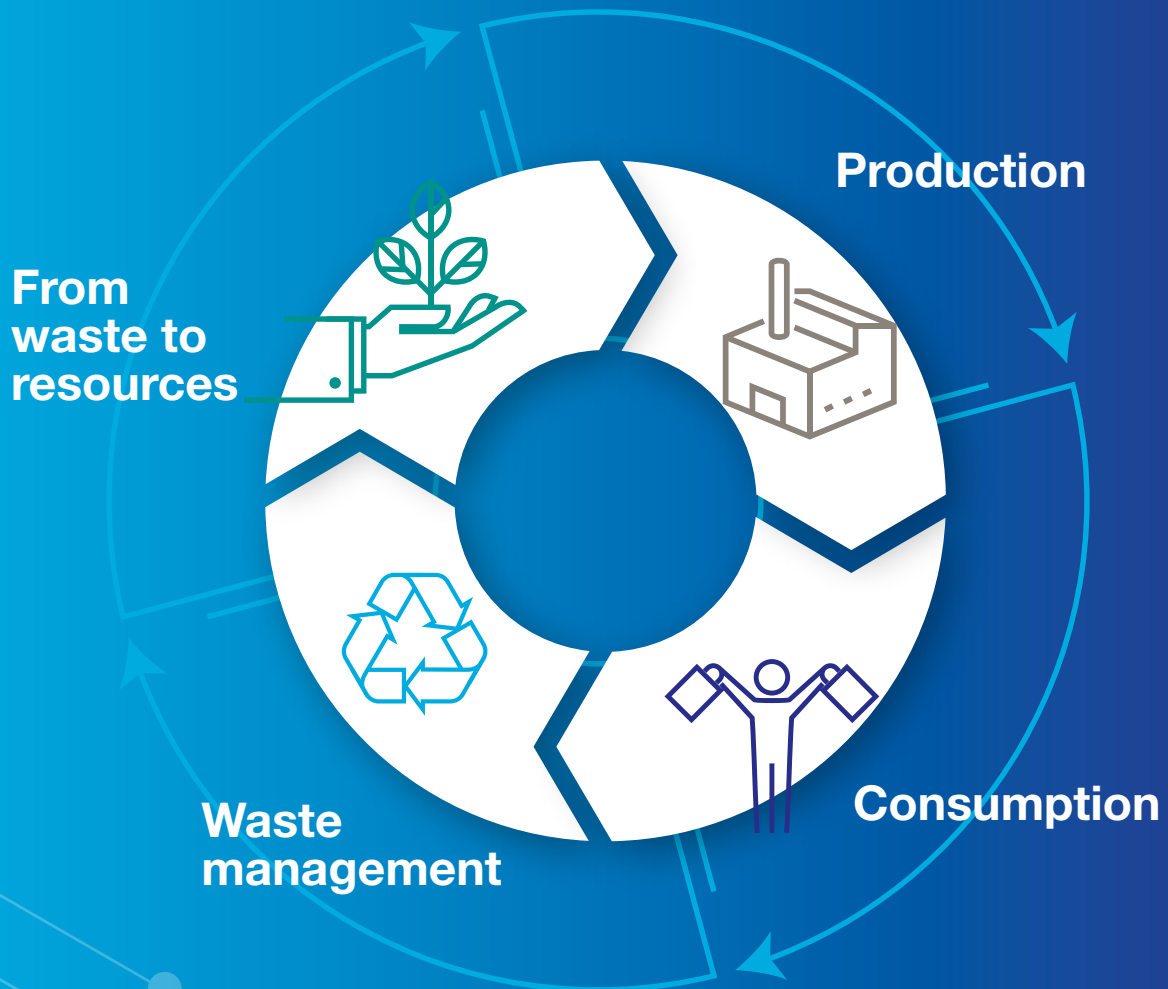
The circular economy package highlights the plastics sector as a priority area. The sector will face specific challenges in Europe's transition to a circular economy, because of the specificities of the products or value-chains, the environmental footprint or dependency on material from outside Europe

As part of the circular economy package, the EU is revising the current waste legislation. New waste directives will be adopted in Spring 2018 which set the following targets:

Anne Murphy, Green Business Executive, Ibec



The Circular Economy



The aim of the circular economy package is to move us, as European citizens, from a buy-use-dispose lifestyle to a society where items are designed with easy dismantle after use in mind and therefore the parts can be reused again and again.

- Re-use/recycle 65% of municipal solid waste by 2035
- Reduce landfill to max. of 10% of municipal waste by 2035
- Re-use/recycle 70% of all packaging waste by 2030
- Re-use/recycle 55% of plastic packaging waste by 2030

In addition to the above targets, in January 2018, the European Commission published A European Strategy for Plastics in a Circular Economy. The “Plastics Strategy”, aims to help all players in the plastic production chain in the transition to ensuring that all plastic packaging is reusable or easily recyclable in a cost-effective manner by 2030.

While recognising the contribution of the plastics industry to Europe’s future economic prosperity, the plastics strategy seeks to address the inter-related problem areas:

- The plastic sector’s continuing high dependence on virgin fossil feedstock for producing polymers;

- The low rate of reuse and recycling of plastic (compared to other waste streams) due to quality issues;
- New sources of plastic leakage such as microplastics which are unintentionally released into the air, land and water ways;
- Uncertainty over the fate of much waste plastic exported to the Far East;
- The growing consumption of single-use and short life plastics;
- Unacceptably high volumes of plastic waste that end up littering the environment, particularly in sensitive marine ecosystems.

The plastics strategy aims to boost investment in the plastics sector and promote well-regulated markets for secondary raw materials. Quality standards and new guidance for sorted plastic waste and recycled plastics will also be developed.

In addition to the plastics strategy, the European Commission is currently reviewing the relationship between chemicals, products and waste legislation. This

review is regarded as one of the most important with regards to the success of the Circular Economy package as the European Commission need to identify how to increase recycling and re-use of plastics while protecting human health, product safety, comply with REACH regulations and ensure that EU producers are not at competitive disadvantage.

Barriers to increasing recycling rates and re-use of materials have been identified by the European Commission. These issues include the chemical composition of recycled plastics; lack of information about the possible presence of chemicals of very high concern; incidental contamination during the recycling process; ensuring there is a level playing field between EU-produced and imported articles.

These uncertainties unless addressed could discourage demand for recycled plastics in new products with specific safety requirements and thus create a significant obstacle to achieving higher recycling rates. An EU wide public consultation seeking views on the issues identified will be open in early Summer 2018. Ibec will continue to work with member companies on this important issue.

“ The plastics strategy aims to boost investment in the plastics sector and promote well-regulated markets for secondary raw materials. ”

Plastics in Europe, contributing to welfare

PlasticsEurope is one of the leading European trade associations with centres in Brussels, Frankfurt, London, Madrid, Milan and Paris.



The European plastics industry makes a significant contribution to the welfare in Europe by

enabling innovation, creating quality of life to citizens and facilitating resource efficiency and climate protection. More than 1.5 million people are working in approximately 60,000 companies (mainly small and medium sized companies in the converting sector) to create a turnover above 340 billion EUR per year. The plastics industry includes polymer producers represented by PlasticsEurope and converters represented by EuPC and machine manufacturers - represented by EUROMAP.

Throughout the European Union, PlasticsEurope engages with national plastics associations to strengthen the voice of the plastics industry and to ensure a coherent

approach to the challenges we face today. PlasticsEurope is proud to have in Polymer Technology Ireland a strong and reliable partner.

This year, the European Commission launched its "Strategy on Plastics in the Circular Economy", supporting a shift to a more circular economy as an alternative to a linear economic model. This offers the opportunity to maximise the utility of resources by retaining the value of goods for as long as possible within the economy; describing how this can help make Europe's economy sustainable, low carbon, resource efficient and competitive. Plastics are among the key enabling materials. Indeed,

PlasticsEurope
Association of Plastics Manufacturers

PlasticsEurope and its members are committed to contributing to achieving a circular and resource efficient economy and we see innovation as being at the core of the Plastics Strategy.

Innovations made by, from and with plastics account for many of the advances that society is benefiting from today. The role of innovation becomes more essential than ever if we want to achieve an increasingly circular European economy. We must cultivate the breeding ground that encourages, stimulates and accelerates innovation to deliver the desired solutions. To make it happen, innovation has to be focused.

We look to Ireland with its dynamic, innovative and

competitive plastics industry, that offers an impressive range of suppliers, processors and service providers to contribute to make its voice heard at the European level, providing continuous input into the development of EU policies, including the Strategy on Plastics. This will be a unique opportunity to recognise the importance of plastics in our daily lives and contribute to address global challenges such as marine litter and waste management.

We are confident that the ambitious Polymer Technology Ireland 2020 Strategy will highlight how Ireland's industry will secure its role as important EU Member State and contribute to the overall efforts by the European Union.

Pictured above is Kim Christiansen, PlasticsEurope Regional Director

EuPC the voice for plastics converters in Europe

The European plastics industry makes a significant contribution to the welfare in Europe by enabling innovation, facilitating resource efficiency and creating jobs.

With plastics converters at the heart of the plastics industry thanks to their adaptability, durability and light weight making them a favourite in the construction, packaging and automotive industries amongst others.

The latest developments in the field of the European Circular Economy Package and the need for a clear European industrial agenda have seen many Brussels stakeholders active and especially EuPC, as the main interlocutor for policy makers on behalf of the plastics converting industry in Europe.

The Circular Economy Package has come with many sectorial actions and regulation proposals,

with a priority on plastics. This, in turn, has led to the revision of the waste legislation, comprising the Waste Framework Directive, the Packaging & Packaging Waste Directive and the Landfill Directive, together with the proposal to launch a European Plastics Strategy.

These activities have required EuPC to provide input to relevant institutions by identifying barriers and challenges to the circular economy in the chain and formulating recommendations both for the sector operators and policy makers during all the different moments of dialogue with European Commission and Parliament.

In particular, for the Plastics Strategy, EuPC has launched a very important

EU wide survey on the current and future use of plastics recycles in Europe, available for all Members. This first ever EU survey, initiated during the EuPC General Assembly in Madrid last June, is a very important tool to provide more insights for the EU plastics Strategy. This survey is the first of a larger set of initiatives to get more knowledge about the use of rPM in the plastics converting industry across Europe. Further surveys and workshops with national plastics associations are expected to follow in 2018 and beyond.

Moreover, in the context of economical strategies and the need to have a true EU industrial agenda, EuPC has published in June 2016 an industry study on the

“Competitiveness of the European Plastics converting industry” together with the consultant Dr Wieselhuber & Partner (W&P), focused on the assessment of the industries’ current and future level of competitiveness so to present issues currently faced by the industry. More recently, together with other European Associations representing all kinds of manufacturing industries, EuPC has signed the Joint Reaction Paper “For an ambitious EU industrial strategy: going further”, in order to call on the Commission to come up with an ambitious EU industrial strategy to maintain industrial jobs in Europe and allow the EU to remain a competitive global industrial power playing in a fair world market.



Alexandre Dangis,
Managing Director,
EuPC

Notes



Ibec is Ireland's largest lobby group representing Irish business both domestically and internationally. Its membership is home grown, multinational, big and small, spanning every sector of the economy. Together they employ over 70% of the private sector workforce in Ireland. Ibec and its trade associations lobby government, policy makers and other key stakeholders nationally and internationally to shape business conditions and drive economic growth. It has over 230 professional services staff in seven locations including Brussels and has 42 different trade associations in the group.



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