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### SCHAEFFLER

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# Good as mould: setting the standard for medical injection moulding

Since its inception in 1988, mouldmaker and moulder Avenue has gone from strength to strength. To keep pace with ongoing expansion and increasingly large orders in the burgeoning Irish medical and pharmaceutical sectors, Avenue invested in four FANUC ROBOSHOT electric injection moulding machines.

#### A FOOTHOLD IN EUROPE

Based in Sligo, Ireland, Avenue – has been operating in the medical moulding market for over 30 years. Built off the back of a wave of US-based companies looking to get a foothold in the European markets, Avenue quickly established itself as leader in the sector, supplying tooling and plastic components to medical market leaders around the globe.

In 2017, it was acquired by GW Plastics, a global thermoplastics and silicones solutions provider with facilities across North America, Mexico, and China. This underpinned Avenue's ambition to become a world leader in the supply of



medical devices and tooling, as Brenan Riehl – President & CEO explains:

"GW Plastics was looking to expand in Europe, not only to support a number of existing customers, but also to build new relationships in what has become a very important market for us. Avenue's already prominent position in the sector, alongside its track record of success, made it a perfect partner."

#### ACCURACY IS KEY

Tasked with both mould making and moulding for high-profile medical and pharmaceutical clients, Avenue is required to provide significant assurances in terms of the accuracy of its output. It predominantly supplies medical devices within two categories: delivery devices, such as auto-injectors; and airway management products, such as cannulas or those used in tracheotomy procedures.

Given the nature of these devices, and the safety-critical aspect of their application, precision is absolutely crucial. To help with this, Avenue's facility is home to two Class 8 clean rooms with a combined footprint of 400m2, alongside an environmentally controlled area for moulding. Such facilities are important for a company operating in the medical sector, as Gerard Henn, General Manager at Avenue – A Nolato Company, explains:

"We are living in an increasingly connected world, and the demands of our customers reflect that. For example, we will often find that we are tasked with making half a dozen identical moulds, that are shipped off around the world for simultaneous product launches. "This means that we have to be able to work fast, necessitating a high level of productivity, but we must also be extremely accurate, to ensure everything we produce is to an exact specification. We knew that the best way to achieve this combination of speed and accuracy was to invest in the latest electric injection moulding technology."

#### **IDENTIFYING THE SOLUTION**

Avenue worked closely with JL Goor – machinery suppliers to the Irish polymer market – to identify which machines represented the best investment for the anticipated growth.

Michael Reynolds, Sales Manager at JL Goor, comments: "We've worked with Avenue for a number of years, growing alongside them as the Irish polymer market starts to make its mark on the global scene. When we were tasked with identifying an electric injection moulding machine that could meet the high-pressure demands of the medical market, we had no hesitation in recommending FANUC's ROBOSHOT."

Avenue invested in four FANUC ROBOSHOT electric injection moulding machines, ranging from the 50T model through to the largest 300T model. These were delivered bespoke to their exact requirements having passed through JL Goor's brand new customisation centre.

Des Forde, Commercial Director at Avenue – A Nolato Company, comments: "Opting for an all-electric injection machine was vital from a cleanroom point of view, and the ROBOSHOT is very impressive in terms of its footprint to performance ratio. Given FANUC's extensive portfolio, it's also ideal for adding on automation and robots – for example, on the ROBOSHOT 150iA we use a FANUC LR Mate 200D 7L, which provides a seamless integration of electric press and automation.

"But the biggest advantage of opting for FANUC was the global recognition and trust it has as a brand in general, but also specifically with its proven track record in electric press manufacture. We've got customers from all corners of the world, many of whom use FANUC machines and robots themselves. The medical moulding market is built on accuracy and reliability, and you need that confidence in the product. If we've tested moulds at our own facility on the ROBOSHOT, then we know it will work at our customers' sites too."

#### LOOKING TO THE FUTURE

With Avenue continuing to enjoy success, its position in the global medical moulding market looks set to increase following GW Plastic's merger with the Nolato Group – a leading Swedish-based polymer solutions provider in Europe, Asia and North America specialising in developing and manufacturing products in polymer materials such as plastic, silicone, and TPE for leading companies within the healthcare industry. Des concludes:

"When you are looking at investing in new machinery, you have to ask yourself a number of different questions. Above all else, will these new machines positively impact your business, and how easy will it be to implement them into existing production processes?

"FANUC is an internationally recognised name, and our customers across the globe are confident in the precision and reliability of the ROBOSHOT machines. The local support offered by both FANUC and JL Goor also means we can be assured of a painless installation process and ongoing support should any issues arise, which means we'll undoubtedly be making further investment as we continue to grow."

For more information, please visit www.fanuc.eu/uk/en, www.jlgoor.ie, and www.avenuemouldsolutions.ie/





Short pitch precision roller chains EXL (A & B series)

## New High Precision Roller Chain Developed for the UK's After-Market

new high precision Roller Chain, called EXL Chain, is available in the UK and offers superior quality and durability over standard Roller Chain.

Developed by the Hangzhou Donghua Chain Group, one of the world's largest chain manufacturers, and supplied through their UK headquarters in the Midlands, the EXL chain is a premium product positioned within their new Solution range.

Aimed specifically for the UK's aftermarket, EXL Chain is designed, manufactured and tested for unbeatable accuracy and performance in arduous conditions, offering enhanced wear and fatigue resistance and greater precision than their Standard Roller Chain range. By utilising different materials, material treatments and layer technologies, EXL Chain offers the best possible quality/ price ratio for all applications.

New hardened, shot-peened wide waist plates deliver increased fatigue strength

and a seamless cold forged solid bush and roller give full contact between the pin, bushing and roller for higher durability. Optimised cylindrical parts improve sliding contacts which help increase service life.

Bob Wellsbury, managing director of Donghua Limited, says: "EXL Chain has been specifically developed to incorporate Donghua's unique Easy Break Technology. This unique feature enables EXL Chain to be cut in the field using Donghua's Plate Extractor tools."

"I'm thrilled to introduce this new Chain to the UK and our Stockists are keen to see a new design of chain which offers significant benefits over standard Roller Chain. Our EXL Chain is the new Roller Chain solution of choice for UK stockists."

EXL Roller Chain is supplied pre-loaded with 40-50% of the breaking load. Roller Chains can be matched in pairs to close tolerances in Donghua's UK workshop. For chain lengths over 5 meters, the chain can be supplied matched & tagged for fitting in sequence. Pre-lubricated, as standard, using high performance synthetic lubricant ensures high workload performance in arduous and abrasive conditions.

Donghua's EXL Roller Chain is available in standard pack sizes of five metres, reels available on request, and bespoke cut-to-length sizes in British standard 06B to 32B, American standard ANSI 35 to ANSI 160 in simplex and duplex ex-stock. Donghua Chains are marked with production batch codes for full traceability.



To download a catalogue, visit: www.donghua.co.uk/exl-chain







## Easy Break Technology. Ground Breaking Quality.

Donghua EXL Roller Chain provides premium quality, unparalleled durability and unique Easy Break Technology - the perfect solution when producing cut chain lengths in the field or fulfilling bespoke orders in the workshop.

Utilising a variety of different materials, material treatments and layer technologies, EXL Roller Chain offers the best possible quality:price ratio for all applications.

EXL Chain is designed, manufactured and tested for unbeatable accuracy and performance in arduous conditions, offering enhanced wear & fatigue resistance and greater precision than Standard Roller Chain. Available in: British Standard 06B-32B, American Standard ANSI 35-160 in simplex & duplex ex-stock.

#### **Key Features & Benefits:**

- Hardened, shot-peened wide waist plates deliver increased fatigue strength
- Seamless cold forged solid bush and roller give full contact between the pin, bush & roller for greater durability
- Optimised cylindrical parts improve sliding contacts to help increase service life
- Unique Easy Break Technology allows easy chain-cutting using Donghua Extractor tools









ISO 9001 BUREAU VERITAS Certification

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# Robotic Automation used in the fight against Covid-19

he Covid-19 pandemic has been tough for a lot of businesses. However, a number of companies have been busier than ever, as they rise to challenge of fighting the Covid-19 threat. Wesbart Limited are one of these companies who have a 40-year heritage of expertise in designing and manufacturing aluminium and stainlesssteel sample storage systems for laboratories, hospitals, universities, and the pharmaceutical industry across the globe. With the global programme of Covid-19 vaccination their products have been in high demand.

During the first lockdown ICS Robotics and Automation Limited were approached by Wesbart Ltd who were looking for assistance to add robotic automation to their factory. With the main aims of increasing the capacity of the factory and maintain high levels of quality needed for the pharmaceutical industry.

Wesbart Ltd were looking to automate the tending and operation of two Bystronic press brakes being used to fold the extensive range of products needed for the Covid-19 vaccination programme such as freezer racks and trays.

Most brake press cells with robotic automation are designed to fold small steel parts, which are stacked within the brake press cell itself. This makes it easier for robots to operate but limits the usefulness of the automation itself. Due to the extensive range of parts being produced by Wesbart Ltd, the standard brake press (with robotic automation) solutions on the market were not capable of folding the full range of parts.

ICS Robotics & Automation Ltd were engaged to develop a custom solution capable of folding the complete range of Wesbart Ltd components. The current Wesbart Ltd CNC punching process meant that parts were lightly oiled and were not easely stacked. Therefore, an infeed and outfeed solution using conveyors and a vision system was developed to ensure sufficient buffering was achieved and parts were not damaged by avoiding the traditional mechanical chute in a pallet box.

ICS Robotics & Automation Ltd developed the interface between the Bystronic press brakes and the Kuka robots to allow for a full automatic control of the brake presses in a safety interlocked system. The system was designed such that one of the



press brakes can be used as a manual operation while the remainder of the machine is utilised in full automatic mode. ICS Robotics & Automation Ltd provided the full Turnkey solution which included full training to cover robot programming, vision training and overall system operation. Full on site commissioning and support was also provided with remote support utilising the VPN connection to the system was also included to allow ICS Robotics and Automation Ltd to provide timely breakdown and support services.

The main Components used in the robotic automated brake press system were

- Robots 3 off Kuka KR10 R1100 with Ready to Pilot option and safe range monitoring.
- Vision System Keyence XG-X2200 vison controller with 2Mp Monochrome vision cameras
- Pneumatics SMC ZK2 Vacuum ejector
- Press Brakes 2 off Bystronic Xpert 40

The investment made by Wesbart Ltd in this automation process has allowed them to continue to compete across Europe with the view of opening new markets in the US. For larger batch production, it also improves their quality and production costs.

Robotic automation has removed the monotonous task of folding thousands of the same component allowing staff members to focus on more challenging and involved bespoke products. It has allowed Wesbart Ltd to offer their products to the market with a reduced lead time due to increased production hours and increased efficiency whilst reducing waste caused by human error. Staff members will not develop repetitive strain injuries as a result of carrying out the same tasks for serval days. Staff members selected to programme the automation equipment also have the opportunity to increase their skill set.

Based on their positive experience with ICS Robotics and Automation Ltd, Wesbart Ltd are now looking at other areas in the manufacturing process that can be automated. There are plans to extend the conveyor or add a pick and place robot so the punched parts can be placed directly onto the conveyor ready to be folded, this removes the need to collect parts after punching and place them on the conveyor. There are also plans to review other processes within the company such as product assembly with the option of introducing future automation.

www.ics-robotics.co.uk



## **BestConnect** A Permanent Flexible Solution

The warehousing and distribution industry is an ever-changing monster. We hear it countless times from customers new and old, the stories of system specifications that are impossible to tie down or requirements that never seem to stop shifting. This has led to a lot of wasted resource in the industry, but also a tremendous wave of growth and improvements that are paving the way for its success - long into the future.

At FMH, we have spent the last 25 years aiming to stay on top of this wave. The constantly fluctuating requirements of vehicle loading and unloading could never be solved with a fixed piece of equipment. In general, by the time a company has signed off the installation of their new generic conveyor equipment, its already too small, cannot adapt to new requirements or it is in the way of another expanding area of the warehouse. In other words, the system is too rigid - too permanent for today's environment. At FMH we solved this issue years ago, we became 'flexible'.

We have an array of flexible material handling solutions in our catalogue, none more famous than our BestFlex and PowerFlex models. These conveyors are probably what we are 'Best' known for. Renowned throughout the world, these conveyors solve the issues discussed above, in a very flexible way. Simply extend and curve your conveyor into whatever form you need it to take. What if you need something like a sortation system or full conveyor application though? Our solution, BestConnect. The BestConnect platform is based around the principle that it does not matter how definite you are of your conveyor systems requirements, it will change. Our BestConnect modules offer infinite options to arrange and rearrange sortation lines depending on the needs of our growing customers.

Powered BestConnect modules are comprised of 2 main unit variants, BestConnect Masters (BLSM) and BestConnect Secondaries (BLSS). To create a driven system, the BestConnect Master is connected to the Secondary units, via the onboard Harting plugs, allowing the power and communications to run down the whole line. These BestConnect Master/ Secondary connections are what give the product its modular and reconfigurable qualities.



BestConnect Master units support all the power and control features needed for a BestConnect system. Secondary modules give the ability to extend that system, but are by name, reliant on the feed from the Master Module upstream.

Needing only a 16A power feed, the Master's onboard control box and adjustable speed controller can support a maximum of 16x motors. Typically (using our 6000mm long modules) that equates to 1 BestConnect Master and 3 BestConnect Secondary modules – 24 meters of driven conveyance. Adding more Master Modules and varying styles of Secondary Modules makes it possible to create larger and more complex systems.

It is this architecture that makes BestConnect as appealing as it is for today's industry - everything is modularised. The system is designed to provide rapid assembly of conveyor solutions for a changing workplace. Any style of system can be easily configured and re-configured as required to suit your immediate requirements. With a simple 230v power supply and our renowned 'lift and latch' connections, the engineering input is minimal. Simple wheel your desired modules into place, plug them in and start your operation.

Throughout the years, BestConnect has taken on various shapes and sizes to solve the conveyance problems of some of the world's largest companies. Its steel side plates and sturdy construction make it a reliable work horse for the distribution industry and its operators. FMH offer a plethora of conveyor widths, pitches, heights, and styles - the modules are tailored to your requirements. Sorting letters or poly-bags? Ultraclose roller pitch is a must - ensuring efficient transport of all parcel variants. Transporting large goods? Extra wide +1000mm module widths will give you sufficient transport surface to get your parcels to their destination. The list goes on.

Performance options are another key area of BestConnect's success, and it goes much further than simply getting the modules painted to match your corporate colour scheme. FMH offer a wide array of intelligence options from optical electronic flow control to fully automated sortation. Delicate shipments can be transported around your factory in the knowledge that the BestConnect ZLP system will keep the items in a separated, organised, and efficient flow. Other performance options you could select for your BestConnect conveyor systems include castor/ leg upgrades, a variety of side guide styles and an abundance of flow control/ transition assists - for manual sortation applications.

The BestConnect platform lends itself incredibly well to the additions of other operational equipment. Weigh Scales, Ball Tables and Manual Sortation (OMNI) Tables can all be easily connected into a BestConnect system. Belt Conveyor options can also be integrated through our Group Partners, allowing for limitless system potential. FMH also offer a variety of Walkover Steps giving regular operations or emergency access over any style of BestConnect system. The 1200mm wide stairwell gives capacity for efficient 2-way traffic that could dramatically improve your systems usability.

BestConnect has become a stable platform for solving countless process challenges across multiple industries. It is highly regarded throughout our customer base and has become a firm industry favourite. Its unprecedented versatility means it can be transformed into what the operation needs, when the operation needs it.

For enquiries into BestConnect, or any of our other catalogue products, please do not hesitate to get in touch with our globally interacting Sales Team. FMH would be delighted to help improve and resolve your material handing requirements.

https://fmhconveyors.com/en-in/ products/bestconnect/

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## Keeping our customers going...

Delivering quality products and first-class service

n these crucial times, it is important to work with a fastener company that knows your industry. As a leading supplier of fasteners to businesses ranging from small enterprises to blue chip companies in most major industries, Alfast Fixings & Fasteners ensures our customers are supplied with quality fasteners to maintain continued production line performance and productivity.

Based in Milton Keynes and trading exclusively for over 40 years within the industrial fasteners industry, Alfast specialises in the nationwide distribution of metric and imperial fasteners and accessories to customers within the automotive, manufacturing, engineering, medical, construction, and electronics industries.

Alfast stocks an extensive range of products, all sourced from quality accredited manufacturers. We also supply products that require to be manufactured to the customer's own specification. Registered to BS EN ISO9001:2015 certification, Alfast is able to provide that added quality assurance to our products and Alfast stocks an extensive range of products, all sourced from quality accredited manufacturers.

supply high quality fasteners to our customers.

A range of additional services is offered to our customers that provide significant cost saving and production time. To help accommodate their need for a smooth running of their production facility, Alfast offers kits and packing services, stock management and Kanban systems, tailored to the customers' requirements.

Starrett

1

During the coronavirus pandemic in 2020, Alfast was asked to supply fasteners for the manufacture of medical equipment urgently needed by hospitals to save lives. This was a mammoth task due to the very short timescale specified by the manufacturer and supplied 1.4 million fastener components, ready for the production run of the medical equipment being manufactured.

In October 2020, Alfast launched a new e-commerce website to facilitate tradespeople and the general public by purchasing our products online and has proven to be very popular and successful.

Alfast's dedication to bringing satisfaction to its customers in providing products and services at competitive prices, backed by a wealth of experience from our sales team and warehouse staff offering a comprehensive level of service to all our customers, are key factors why companies choose Alfast as their premier supplier for their fixings and fasteners.

Alfast is <u>the</u> fastener company you can trust.

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- Cutting Fluids and Pastes
- Lubricants & Sprays
- Cutting & Abrasives
- Key Steel & Silver Steel
- Studding

#### **Services**

- Nationwide distribution
- 24/48 hours delivery
- Kanban/stock management systems
- Kits and packing service
- Trade counter

#### **E-commerce Website**

- Instant purchasing of products
- Next day delivery
- Click and Collect Service
- New products added daily







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# RMGroup becomes the UK's first certified robot integrator

RGroup UK (Rees Machinery Group) has become the first integrator in the UK to be accredited under the RIA/BARA Robot Integrators' Certification Scheme. The leading automated packaging machinery and service company was awarded (26 January 2021) certified status following a successful audit at their headquarters in Newtown ('Y Drenewydd'), Wales. It required the integrator to meet a rigorous set of national and international standards to ensure business compliance and capability.

The certification scheme is the benchmark to assess robot integrators' technical knowledge and safety practices The UK scheme was born out of the need to standardise integrators' quality and workmanship, plus recognise



effective safety controls to help give companies a competitive edge.

Rosie Davies, director of RMGroup UK, said: "We are delighted to be the first integrator to achieve certification in the UK. It demonstrates RMGroup's ability to deliver systems as per the required technical expectations. It also assures end users that our expert programming team has the skillset to undertake a variety of integration projects.



"The audit process was thorough, which gave us a great deal of confidence to know that we meet all the key performance and safety indicators from two reputable trade bodies.

"To have an independent register of certified robot integrators is vital for companies that are looking to automate, as it serves to verify customer reference sites and recommendations. We would certainly recommend the certification scheme to other UK integrators," added Davies.

Meanwhile, Jeremy Hadall, principal auditor for RIA (Robotic Industries Association) and BARA in the UK, said: "Integrators need to demonstrate that they are committed to providing the best service possible for their customers. The audit looks at the integrator's technical approach, their project management processes, and how they ensure their system safety, service facilities and staff competencies all operate to the highest standards.

"RMGroup's expert technologists were audited on an ABB IRB460 robot to prove their proficiency using the robot safely, its functionality and creating a programme based on a palletising operation.

"I was really impressed how seriously the team at RMGroup took the audit, which included having the evidence and staff available to back up the selfassessment scorecard they completed prior to formal audit. It ensured the audit went smoothly," added Hadall.

All companies certified under the RIA/ BARA Robot Integrators' Certification Scheme are required to be re-audited every two years using the same 25-point list of measurable criteria. Therefore, choosing an independently audited integrator means that the risk to the end-user making the investment is reduced.

More information on the certification scheme and a list of certified robot integrators can be found on the BARA website (www.bara.org.uk).

UK-based robot integrators who are interested to become certified can complete a free self-assessment here to ensure they meet the necessary criteria.



www.rmguk.com www.ppma.co.uk/bara



## Digitisation in the field of explosion safety

REMBE iQ Safety Cockpit - smart home for factories

Visualisation of safety-relevant faults in the control room are only half the battle. In order to appropriately react to such faults, pre-defined counter measures have to be initiated – what sounds simple is a true challenge for plant operators in practice. Although protective systems and plant components react autonomously, the right behavior of employees in critical situations is mandatory. Given the risk of human error, the REMBE iQ Safety Cockpit was developed and launched:

Similar to a process control system, the REMBE iQ Safety Cockpit offers an overview of all relevant protective and equipment system status, which can also be monitored in real time from any location remotely via smart phone. However, in addition to the PLC, detailed and automatic and semi-automatic action plans can be linked and initiated: In case of an event in a certain area, sending an email or an SMS to a pre-defined distribution group can be automated to bring the incident to their attention. Such a scenario could for example be, that in the event of an explosion the responsible safety officer might be informed by text message via his service phone, the surveillance cameras in the affected area could be activated or set to a different mode and the management would receive an email. Nevertheless, more importantly, the REMBE iQ Safety Cockpit guides the logged in user through the pre-defined plan of action.

Forced guidance thereby would ensure that all desired and necessary process steps are followed in the event of a



GSME and HOTSPOT detector

disruption. Those applications and process scenarios of the REMBE iQ Safety Cockpit can be individually configured for each plant; both analog and digital signals can be processed. In addition to the REMBE autonomous protective systems, GreCon spark extinguishing systems, camera systems or even fire detectors and other plant components can be combined and connected to the REMBE iQ Safety Cockpit.

Learnings from incidents and systematic root cause analysis are subject to be implemented in improved safety concepts. REMBE iQ Safety Cockpit supports as all data recorded during the emergency plan are compiled and archived in a comprehensive log. This data can be practically expended or adjusted via the various end devices. When the location of the accident is inspected, photos can be conveniently taken and loaded into the log (via app) for subsequent evaluation.

In the end, this means, that all conventional autonomous protective systems from REMBE have become smarter without sacrificing their actual strength, the fast and reliable function.

In the age of digitization, it is just as important to ensure a fast response time and the resulting high availability.



REMBE iQ Safety Cockpit: Example of individually configured application and process scenarios

The REMBE iQ Safety Cockpit also enables optimal integration of other interfaces through the individually coordinated visualization of each process. Faults or, in the worst case, explosions not only require a regulated emergency plan, but also a predictive maintenance that is not only possible through the pure workforce of the employee on site. By detecting the operationally relevant components such as explosion vents, quench valves for explosion protection or pyrolysis gas and fire detectors or grounding systems for explosion prevention, all these can be registered and connected to a material management system.

With the GSME and HotSpot detectors from REMBE, an artificial intelligence has been created that detects fire and explosion events at an early stage. The GSME detector is an artificial nose, "trained" for pyrolysis - popularly known as smoldering gases, while the HotSpot detector represents an artificial eye that already detects surface temperature changes of 1 ° C.

Connected to the REMBE iQ Safety Cockpit, the two explosion prevention systems can evaluate changes in state and bring the system into a safe state either automatically or via precise instructions to the operator.

If an event, such as an explosion occurs, the system recognizes which areas are affected and provides information about which spare parts are required in order to restore the system to a safe state as quickly as possible. These functions can be submitted in the operator's system as a "suggestion" or sent directly to the manufacturer as a non-binding request. This creates the option to reduce, the time of plant downtime.

In a nutshell: REMBE iQ Safety Cockpit is nothing else than a smart home control or driver assistance system in the automotive industry. Those are used to improve the efficiency and safety of driving a car and enable, in the right mix of auxiliary sensors and smart detectors, autonomous driving. Staying in that picture, simply spoken, REMBE iQ Safety Cockpit, such as an driver assistance system for plants will allow autonomous operation and push safety and efficiency to the highest possible level in the industry 4.0.

www.rembe.de



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## Steam is money:

Levaco Chemicals rely on EBE Engineering Venturi orifice steam traps

t Levaco Chemicals, process steam is the principal heating medium used in the reactors. To ensure that this valuable energy source is used as efficiently as possible, they now rely on ECOFLOW venturi orifice steam traps manufactured by EBE Engineering.

The venturi orifice steam trap project began by measuring the performance of the existing mechanical steam traps on one of the three largest reactors. For this, Levaco began by identifying two products with a wide reference range. Both products were specifically chosen due to their different physical properties, in particular their viscosity. As a consequence the steam volumes required for the processes and the heating times were very different. This made it possible to investigate a larger operating range for the ECOFLOW venturi orifice steam traps.

During this analysis, (conducted as part of a university thesis), the ECOFLOW venturi orifice steam traps reduced steam losses by up to 22% compared to conventional mechanical traps. They also showed a reduction in the heating cycle time for the process. The average cycle time saving was between 4 to 27 min or 11.3% to 16.6 % depending upon the products heated.

The thesis established that the cycle time improvements were due to the start up operation of the ECOFLOW venturi orifice steam trap. When the condensate (water) is cold, the liquid is discharged from the heating coil quicker and the steam can heat up the process faster. It also concluded that the continuous discharge of condensate allowed the required heat energy to be introduced into the process more quickly, which also saves time.

The venturi orifice steam traps lifecycle costs are significantly cheaper than the mechanical float steam traps. Due to the steam savings of the venturi orifice steam trap, the payback on replacement is as little as one and a half years and is a permanent solution requiring no further maintenance or repair.



www.ebe-eng.com





## Delivering permanent solutions for all steam trapping requirements

The ECOFLOW Venturi orifice steam trap, from EBE Engineering, is the most advanced Venturi orifice steam trap on the market today. The fully flanged cast housing was designed, developed and refined using 3D modelling and casting simulation software. Producing a Venturi orifice steam trap to meet the rigorous requirements of todays steam plant users.

Developed on a modular concept, the ECOFLOW Venturi orifice steam trap encompass a wide range of capacities, from minimal condensate flow requirements on line drainage and trace heating systems, through to the high flow volumes and variable loads of process heating applications.



#### **Benefit from:**

- Improved production efficiency without downtime due to failed steam traps
- Elimination of expensive steam leaks
- Reduction in maintenance with a full ten year performance guarantee on all Venturi orifice steam traps

Increasingly the first choice for blue chip and forward thinking businesses.

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# Overcoming the Challenges to Automate Manufacturing

orking with an expert fabricator and integrator that is flexible enough to customize can help meet requirements while expediting completion

For manufacturers, the continual need to increase production speed and efficiency while reducing labor has spurred a shift toward implementing automated systems.

However, off-the-shelf equipment will not accommodate every application, particularly those that are complex with robots and conveyors, as well as a host of equipment for manufacture, assembly, packaging, labeling, palletizing, etc. that must be flawlessly coordinated. For this reason, even some large automation companies will not take on applications considered too difficult.

In such cases, companies looking to increase the speed and efficiency of their manufacturing lines need an automation partner that can quickly and cost-effectively deliver tailored, even custom solutions. This includes the ability to design, build, and integrate high-speed, high-volume automated equipment and systems for some of the largest companies in the world, as well as growing corporations seeking to become world-class.

For projects of any size, however, it can be crucial to partner with an expert supplier to overcome a range of obstacles such as meeting specifications and regulatory requirements, system integration, and necessary customization, as well as completing the work on time and within budget.

"While implementing off-the-shelf solutions can be a starting point for some projects, automating and incorporating robotics frequently requires a custom solution that meets very specific process requirements. For this reason, even large suppliers in this space will often pass on opportunities if they are not easily resolved," says Leon Gurevich, founder and Chief Technology Officer of Rapid Development Services (RDS).

RDS is an industrial automation equipment builder, providing design, engineering, integration and fabrication of production machinery. The company has implemented over 300 complex, robotic, assembly and manufacturing projects worldwide, and has been awarded more than 40 patents.

So, at the risk of delay or failure on larger, more complex projects it is particularly important to work with a supplier that not only has expertise, but is also nimble and flexible.

"When it comes to automating production, equipment can range from very small to complete lines several hundred feet long that can consist of robots, conveyors, vision systems, server drives, etc.," says Gurevich, who has worked with companies such as Anheuser Busch, Johnson and Johnson, Cargill, General Mills, Abbott Labs, Pfizer, Medtronic, and Cooper Industries. "So, automation suppliers and integrators need a 'tool box' full of solutions including the ability to design and build from scratch in order to fit together all the pieces of the puzzle."

In the case of RDS, the company typically uses standardized off-the-shelf solutions and integrates it with other systems, but can design and manufacture equipment and sub-systems from scratch, as needed. This includes equipment such as automated assembly solutions, inspection systems, packaging equipment, labeling/ marking systems and palletizing automation, as well as filling systems and machine tending automation.

As an example, after trouble with an initial vendor, this approach helped Monsanto Dairy Group stay on schedule with the construction and start-up of a veterinary pharmaceutical facility in Augusta, Georgia, according to Chris R. Redford, P.E., Principal Pharmaceutical Engineer, Monsanto AG Engineering, St. Louis, MO.

"The custom handling system [originally] purchased by the construction was found unacceptable after a full year of design and fabrication effort. This put us in a very difficult position. We either had to accept a poor-quality piece of equipment – and modify it to meet our requirements, or accept a lengthy schedule delay," stated Redford.

In response, Redford turned to RDS, and credits its effort in getting the facility rollout back on track.

According to Redford, in working with RDS, "We were able to design a new handling system from scratch in just a few weeks. [Rapid Development Services] designed the new system in modular sections that could be brought into the facility through standard door openings. This allowed us to continue facility construction with no delay."

Despite the complexities of manufacturing automation, due to market requirements even very technical systems often have to be developed and put into production under compressed time schedules.

Such was the case when wireless communications manufacturer Triton Network Systems created a high-volume manufacturing line for the assembly of high frequency, RF modules used in the



broadband wireless industry, according to Joseph Kreuzpaintner, Principal Engineer at Orlando, Florida-based Triton Network Systems.

Kreuzpaintner stated that the manufacturing requirements involved precision alignment and mounting of odd shaped components, dispensing of epoxy, electrical testing of product on laser equipment, in-line processing of modules at a heated test station, installation of cables, and mechanical assembly of a circuit card to a housing. He notes that after conducting a survey of integration companies meeting Triton's manufacturing work cell requirements, RDS was selected as the primary equipment integrator for the Module Factory at Triton, which helped to expedite project completion.

"Rapid Development Services' technical expertise in handling products, test socket and integration methods, precision in machining, robotic, PLC and actuator integration, and customer support allowed Triton Network Systems to complete the integration of five work cells within 9 months. Their participation in the project has provided... solutions that were identified by other integrators as "not possible" or "need 12 months to develop," stated Kreuzpaintner.

When automated manufacturing systems are developed, the equipment must also be robust enough and the integration reliable enough to operate with near flawless capability and minimal supervision for the long haul. In this regard, a distinct advantage can be gained when working with an integrator that can couple the knowledge of custom machine building with standardized robotics, as well as develop specific control and communication support between production machinery and operator or inventory management systems.

Pohlman, Inc, a Chesterfield, MO-based manufacturer of screw machine products benefitted from such an approach, according to Hank Studt, Pohlman President.

"RDS has provided 3 different automatic robotic pick and place machines that have been in use at Pohlman, Inc for over 10 years. The machinery has operated without any service needed by them. This technology helped us to get our products into mass production with a competitive advantage," stated Studt.

He concludes, "The flexibility of 6-axis robotic technology...allows us to produce an array of products on the same equipment while maintaining a highquality product. We have relied on this equipment ... to continue serving our customers."

For more information, call (866) 900-1033; visit https://rapidds.com; email info@rapidds.com; or write to Rapid Development Services at 4329 Green Ash Drive, Earth City, MO 63045.

# T&D's TR4 series with various reporting features

&D has launched another innovative app for their successful TR4 series that allows permanent and reliable temperature monitoring, and report creation - perfect for transport and storage, from cold chain to vaccines

Japanese market leader T&D Corporation offers measurement and monitoring solutions that can be tailored to meet individual customer needs. They are ideal for real-time monitoring and accurate logging of data in the food and transport sectors, and for vaccines too. The TR4 series comprises three models, two of them waterproof. Equipped with low-energy Bluetooth, the loggers can measure a wide range of temperatures: TR41 internal sensor type can measure from -40°C to 80°C and is waterproof (IP67), TR42 can measure from -60°C to 155°C external sensor type (IP64) and TR45 for industrial use is available for thermocouple types K, J, T, S, R covering -199 to 1.760°C, or for types Pt 100/ Pt 1000 with a range of between -199 and 600°C. Simultaneous data collection from multiple loggers is also possible. Each logger can be set to 15 different recording intervals, from one second to 60 minutes, and has a logging capacity of up to 16,000 readings. Battery life is up to 18 months.

T&D also offer various apps that support the user with real-time monitoring using smart devices, data upload from several loggers to the cloud storage and on-site report creation, downloading, sending and printing. With T&D's TR4 series, three helpful apps can be utilized: ThermoRec, ThermoStorage and the new TR4 Report app. By registering devices to the free T&D WebStorage Service, temperature data can be easily uploaded by the app and managed via the cloud – anytime, anywhere.

The free mobile app TR4 Report quickly creates and summarises reports, and graphs, of the temperatures measured – in less than a minute on site. These can then be named and supported with other important information, and are available in the app as PDF files for saving, sending via email or printing. That means manual logging or time-consuming analysis of recorded data on a computer is no longer necessary, and reporting can be contactless. The app can be used on a smartphone or tablet, and ensures error-free workflow and flawless documentation.



The data loggers of the TR4 series and the tailor-made apps are ideally suited to use in the transport, storage, food and pharmaceutical sectors. At one-minute intervals, the T&D data loggers measure whether or not the desired temperature is being maintained.

The new TR4 Report app operates on mobile devices and does not require a computer or USB connection, reports can be sent via email or messenger apps. An ideal application for the TR4 series and the TR4 Report app is, for example, the transport control of sensitive goods such as fresh and frozen food, or medical products. Furthermore, both are perfectly suited to the control of heating in buildings, temperature monitoring in agricultural businesses and the protection of laboratories, refrigerators and storage facilities.

In addition, the free Thermo REC app works perfectly together with the new

TR4 report app, and shows the current temperature graph in real-time. The application is also capable of monitoring and consolidating data for up to four loggers simultaneously. With T&D's free ThermoStorage app, all recorded data can be seamlessly uploaded to the cloud.

T&D offers various constantly updated and improved software solutions, including the free T&D Cloud WebStorage Service. This is available for computers and mobile devices such as smartphones or tablets. With the help of another T&D app, the free T&D Graph, users can merge and store a larger number of recorded data files in one chart, and use more effective tools for data management and analysis.

For further information, please visit: www.tandd.com or email europe.office@tandd.de



# **TR4 Series**

### Now with new report features

Easy Temperature Management on Mobile Devices
Three Apps Available to Match your Needs

The TR4 series are data loggers equipped with Bluetooth low energy. With a smartphone/tablet and our dedicated apps, logger communication and data management have never been easier.

We offer dedicated apps for the realtime monitoring of fluctuating data, the uploading of recorded data to our free cloud-based "T&D WebStorage Service", and the creation of PDF reports for specified periods.





#### tandd.com europe.office@tandd.de

## Integrating PAT and robotics to bring pharmaceutical manufacturing to the next level

merging technologies in process control can lead to a quantum leap in process intensification that will help pharmaceutical industries to thrive, even in an increasingly competitive global market. A particularly powerful and compelling application consists of combining factory automation and robotics with process analytical technologies (PAT). By implementing such a system, drug manufacturers can become more accurate and agile satisfying regulatory compliance while ensuring efficiency in their R&D and manufacturing operations. Martin Gadsby, Director at Optimal Industrial Technologies, looks at why robotics and PAT are a match made in heaven on the manufacturing line.

Ensuring high-quality, effective drugs that meet regulatory requirements and customers' expectations are challenges that the pharmaceutical and life science sectors constantly need to address by means of robust and comprehensive quality assurance and process control strategies. The digitization and automation of laboratories and drug manufacturing processes can be a powerful ally to these industries, specifically, the cooperation of PAT and robotics.

This establishes a real-time link between process control and process automation, which can be used to promptly implement quality assurance and manufacturing decisions. In this environment, the physical information from sensors and analytical instruments are passed on to a higher-level system for adaptive decision-making, i.e. PAT knowledge management, that communicates with industrial or collaborative robots to act promptly on the basis of the decision taken.

By leveraging real-time testing and dynamic responsive robotic process

automation (RPA), drug developers and manufacturers can create a truly continuous processing framework that requires minimal intervention and reduces downtime to a minimum. This higher degree of visibility, traceability and responsiveness can lead to both improved and accelerated product development and manufacturing, as well as more effective risk management and associated corrective actions to ensure product quality and compliance.

When looking at innovations in the pharmaceutical field, it is evident that implementing integrated PAT-RPA systems can offer a pathway to success in offering more commercially viable precision medicine.

#### INTEGRATED PAT-RPA SOLUTIONS ARE ALREADY A REALITY

Pharmaceutical filling and preparation of growth media for life science, for instance, is turning into an increasingly robotic process in order to reduce cycle times and increase consistency. When coupled with PAT monitoring quality via spectral analysis, this system can further increase its speed whilst reducing waste.

Researchers in this field have been able to create a high-performance, high-throughput automated robotic workflow for monoclonal antibody (mAb) and glycan purification that enabled the implementation of PAT and Quality by Design (QbD) approaches. Plate-handling robots are used to collect, prepare, incubate and test liquid samples. The solution reduced cycle times from over 18 hours to only 5.1 This specific innovative system offers a fast and efficient method to produce biotherapeutics for cancer and autoimmune diseases treatment and prevention of xenograft rejection.

#### PAT AND ROBOTIC ARMS ADDRESS CHALLENGING APPLICATIONS

In addition, the use of integrated PAT-RPA systems can be extremely useful in sensitive applications such as those conducted within cleanroom environments. In these situations, rigorous aseptic conditions are a must to produce regulatory compliant sterile products. The use of fully automated manufacturing and quality assurance tools can significantly reduce contamination risk as well as particulate generation, resulting in higher drug quality and lower production of waste and off-spec material.

In particular, recent advances in robotics have allowed articulated robots to meet even the most demanding ISO 3 (Class 10), 2 and 1 cleanroom standards. In addition, these robots can be easily cleaned, are waterproof and can withstand sterilization procedures, such as hydrogen peroxide vapor disinfection.

Conversely, the use of robots and PAT in particularly hazardous conditions can minimize human operator exposure to certain compounds and ingredients. In this way, the combination of real-time testing, process control and process automation can increase operational safety and reduce health risks. More precisely, PAT knowledge managers can guide industrial robots in handling pathogens, highly reactive, corrosive and hazardous substances, conducting chemical reactions in extremely cold or hot environments, as well as ensure the materials are used and processed correctly.



When looking at innovations in the pharmaceutical field, it is evident that implementing integrated PAT-RPA systems can offer a pathway to success in offering more commercially viable precision medicine. Within this framework, the pharmaceutical product composition determines the processes that are required, and the associated factory robots and machines carry out the necessary operations.

In fact, PAT is the sole method that allows manufacturers to economically produce low volumes of personalized drugs and treatments according to different, unique recipes -customized to the individual patient - and test them individually, rather than in batches. RPA, on the other hand can be controlled by a PAT knowledge management platform to follow a specific recipe, providing the high level of accuracy and speed needed to perform different manufacturing tasks whilst keeping production costs low.

#### **INTERCONNECTED PHARMA 4.0**

The connection of PAT and RPA also offers a starting point to integrate data from system-wide physical, operational, and robotic assets to drive not only manufacturing and quality assurance activities, but also maintenance, inventory tracking and many other variables and KPIs across an entire plant. This is, in essence, the level of interconnectedness that Industry 4.0 and Smart Manufacturing aim at.

Nonetheless, the synchronicity of PAT and RPA not only helps to build a Pharma 4.0 factory, but also it improves the practical everyday operation of pharmaceutical manufacturing systems by streamlining operations, lowering production costs and cycle times whilst increasing throughput and performance. Hence, the large-scale adoption of these technologies is not a matter of 'if' but 'when'.

When committed to implement a

successful integrated PAT-RPA, it is important for manufacturers to rely on skilled and knowledgeable specialists that have extensive experience in process automation, robotics and PAT. They can design and build bespoke solutions that address specific plant requirements in the most efficient manner, smooth the process before and after installation as well as ensure that the automated line is running at its optimal performance level. In this way, industries in the pharmaceutical and life science sectors can be sure to benefit from the most suitable solution for their specific applications.

Photo Caption: PAT and robotics can help drug manufacturers deliver highquality products in a highly efficient manner, even in the most challenging environments.

www.optimal-tech.co.uk



## What is the Research and Development tax credit scheme?

Research and development (R&D) tax credits is one of the government's top incentives designed to reward UK companies for investing in innovation and to increase spending on R&D activities. When companies take a risk and spend money on developing new or enhancing existing products & services or creating the most efficient processes, they can make an R&D tax claim and receive either a cash payment and/or a corporation tax reduction.

#### WHO IS ELIGIBLE?

R&D can occur in any sector: whether it is the food industry, engineering, healthcare or digital development to name just a few. To be eligible for R&D tax credits, the company must be a limited company in the UK and have spent money undertaking qualifying research and development activities.

#### WHAT QUALIFIES?

The key to eligible activity is attempting to resolve scientific or technological uncertainties, which requires iterative development, prototyping, proofs of concept, experimentation or testing.

#### WHAT CAN YOU CLAIM?

Claimable R&D expenses relate to the in-house or subcontracted trial and error undertaken to resolve the



scientific or technological uncertainties you face. These differ in nature from the commercial project and the entire development project which might include routine work and other elements not related to R&D.

#### WHAT IF I AM ALREADY CLAIMING?

Although many companies are well aware of and are already benefiting from the generous R&D tax relief/ credit scheme, only a small minority of companies are actually claiming the correct amount.

Knowing what you can and can't claim for is a crucial part of the process. The rules for R&D tax claims are complex and nuanced in places, and it is only through experience and a thorough understanding of the different qualifying costs and activities that allows us to prepare robust claims with confidence.

#### WHY CALL TIM (A REGIONAL DIRECTOR OF RANDDTAX)?

RandDTax are respected by HMRC for upholding the highest standards in our industry. We offer a Free Audit for companies that have claimed before, to ensure they are maximising their claim and not exposing themselves to compliance risk through the reports they are submitting or the records they are keeping.

If you believe you have a claim or have any queries on a previous claim, we are happy to talk through any concerns you might have and give you peace of mind on 01903 256 777.

For readers of ACE, we are offering a 20% discount from our usual rates. To access this special rate, please send enquiries to info20@randdtax.co.uk

More information and testimonials can be found on our website www.randdtax.co.uk

## Finding the Goldilocks Zone when claiming your R&D tax credits

Goldilocks tried three bowls of porridge, three chairs and three beds before she found the Goldilocks Zone. HMRC won't give you three attempts to get your claim right!

Yet a high proportion of incorrect claimants are overstating their R&D and leaving themselves vulnerable to lengthy HMRC enquiries.

Whilst maximising the value of your claim seems a reasonable thing to do so as not to miss out on vital cash, maximising it without strong evidence of qualifying activity is a risky undertaking, which means that instead of a cheque HMRC might send you a letter triggering a lengthy and unpleasant enquiry and a long delay of your claim.

Whilst HMRC offers exhaustive guidance on the legislation, it is not always straightforward when it comes to putting all the figures together. The definition of R&D is broad, however, it's not that generous and only includes specific activities which meet strict criteria.



Whilst there are intentionally fraudulent claims being submitted to HMRC, there are cases when inaccuracies and errors creep up in totally eligible claims. It is also common for businesses to unwillingly repeat the same mistakes in subsequent years until the numbers in their claim grow, along with the risks of inquiry and penalties. If R&D is not your daily job, a serious misunderstanding of either the costs calculation or technical evidence preparation processes can jeopardise the claim and leave you with less cash and more stress. This is why you should think carefully before going solo, and why you really shouldn't underestimate the value of specialist R&D tax advice.

Our Free Audit can identify inaccuracies to optimise your claims, to maximise your benefit and minimise your risk of an investigation.

We are at the forefront of our industry, sitting on multiple HMRC committees to raise standards and our reputation is paramount. We do far more than just process claims: we guide you through your claim preparation process identifying activities, calculating expenses and putting it into the correct wording to ensure that your claim will stand up to HMRC's scrutiny.

We are here to give you confidence around R&D so you can improve your claims and use the credit gained to invest in the future.

More information and testimonials can be found on our website www.randdtax.co.uk





## ABB robots boost productivity at Nestlé's Brazilian plants by over 50 percent

BB's SafeMove collaborative robot technology enhances employee safety while increasing efficiency at Nestle's confectionary factories.

ABB robots are supporting Nestlé, the world's largest food and beverage company, to improve the productivity of pallet loading in its chocolate manufacturing facilities in Brazil by 53 percent, using a new ABB palletizing robot solution.

While the company currently uses ABB Robotics palletizing solutions, the latest requirement was for a more compact cell that could fit into a smaller area and easily be replicated at other sites. An important requirement was for the robot to safely interact with employees, who occasionally need to enter the palletizing area to speed up pallet changes. ABB's new, compact robotic palletizing cell, co-developed by ABB and Nestlé's engineering team, features an ABB IRB 660 robot with a



suction gripper head to move boxes from the end of the production line to the pallet, stacking them accurately to ensure a balanced load, while SafeMove technology enables safe intermittent collaboration between the robot and production line workers. "Food and beverage manufacturers like Nestlé increasingly need more flexibility on their production lines to enable them to adapt to changing consumer tastes and demands, allowing their employees to collaborate intermittently with robots in their production centers. At the same time, they require higher levels of productivity and efficiency while maintaining the highest levels of product quality," said Sami Atiya, President of ABB Robotics & Discrete Automation. "Collaborative robot technologies like SafeMove help us deliver on all of these requirements, and by removing the need for extensive fencing, enable us to bring automation to smaller spaces, anywhere on the production line."

SafeMove, ABB's robot monitoring software, detects movement and restricts a robot's speed, motion and position when a person comes near. This allows large industrial robots to work safely and reliably alongside people, without the need for fences, safety switches, doors and locks.

At Nestlé's Caçapava factory, the use of SafeMove instead of fences resulted in an approximately 30 to 40 percent smaller footprint compared to previous ABB cells at the Nestlé site.

The new installation has been so successful that it has now been installed in three other Nestlé factories in Brazil, with 13 palletizing cells already in operation and further installations and commissioning underway. Financial details of the contract were not disclosed.

Michey Piavantinha, Plant Director for Nestlé Caçapava, said: "Thanks to the partnership with ABB, it has been possible to develop solutions that make our manufacturing process more agile





and efficient, ensuring that our products continue to have the same high level of quality and excellence that make the Nestlé brand successful."

To demonstrate to the customer how the finished cell would work before installation, ABB used its Ro-botStudio® software to simulate the complete solution in a virtual environment, including showing the cycle time for the robot's operations. This ensured a shorter implementation time and avoided any fail-ures that might occur in the start-up process.

Nestlé in Brazil supplies a range of confectionery to South and Central America and Canada and the company's Caçapava site is the largest Nestlé Kit Kat factory in the Americas.

www.abb.com



## TRI-SHARK... 100% Control Valve, 100% Tight

wick developed the patented throttling trim cartridge Sharktooth which turns its triple offset butterfly valves into excellent control valves. This revised design is equivalent in control performance to a globe valve or rotary plug valve, but has much better shut-off characteristics. Combining the Sharktooth throttling trim cartridge with the TRI-CON triple offset butterfly valve series creates TRI-SHARK, the leakagefree shut-off and control triple offset butterfly valve.

This control valve offers a multitude of advantages. On the one hand this valve includes all the above mentioned advantages of triple eccentric butterfly valves, and on the other hand, this valve combination has all the special characteristics of an excellent control valve. Now only one type of valve can be used for both open-close and control applications. The throttling cartridge (Fig. 1) is designed closed to the swivel movement of the butterfly disc in order to keep the flow between disc and cartridge as low as possible. Furthermore the cartridge is manufactured with several, optimized slots that divide the flow and release a precisely calculated cross-section when the valve opens or closes. With the throttling trim cartridge the valve's flow characteristic is changed to an equal percentage flow characteristic, which is known as the preferred inherent flow characteristic for the majority of control applications. TRI-SHARK's flow characteristic ensures that the valve provides an



effective control range at 5 up to 30 degrees of travel, the control area where traditional triple eccentric butterfly valves seem to reach their limits. Typical butterfly valves have good control limits between 30 and 70 degrees of travel. TRI-SHARK valves significantly extend this range through its' throttling trim cartridge. The design of the cartridge and valve, in terms of flow, is such that ideal flow control is possible in this range.

Further advantages of TRI-SHARK valves are anti-cavitation properties. The flow is divided by the slots and reduces cavitation, as the vapor bubbles created in the area of the cartridge slots reach a smaller size due to the lower flow rate of each channel. As a result, the energy generated when the vapor bubbles implode is lower. In addition, TRI-SHARK valves are able to direct water jets concentrically to the center of the pipe, especially at small opening angles, thus converting the kinetic energy to a lower level in the fluid before contacting the pipe wall. Thus less damages, e.g. at the pipe wall, can occur. As the mass flow through the Sharktooth choke slots is divided into smaller parts, the sound frequency increases, and the resulting development is that sound can be more easily absorbed by the pipe because the frequency is in a range where the human ear is less likely to perceive it. Another very important aspect of the throttling trim cartridge is that the dynamic torque reduced by the altered pressure field. This means that at critical opening angles and flow conditions in relation to the dynamic torque that occurs a smaller actuator with less torque can be used.

TRI-SHARK can be offered in various designs. In addition to the standard Lug-Type and Sharktooth design (DN900, Fig. 2), integrated versions like double flange (DN200, Fig. 3) and valves with buttweld ends (DN800, DN700 Trim, Fig. 4) are also available.

Compared to other control valves, TRI-SHARK valves offer enormous advantages in terms of purchase cost, weight and geometric dimensions, with excellent tightness and outstanding control characteristics, especially for larger diameters.

www.zwick-gmbh.de/en/tri-sharkcontrol-valve/

## HIGH STANDARD VALVES FOR NON-STANDARD CONDITIONS.

2

2

### WWW.ZWICK-ARMATUREN.DE

### **TRI-CON** SERIES FOR H2 APPLICATIONS



## Warner Electric XS & WR Series brakes reduce footprint of six-axis robot

Six-axis robots have become the standard solution for automated assembly tasks due to their ability to carry out complex manoeuvres. As they have grown in popularity, robot OEMs have strived to reduce the size and mass of their six-axis designs to promote space efficiency and productivity. When a German manufacturer of stepper motors was approached by a robot OEM to downsize its assemblies for a six-axis robot, they turned to Warner Electric to deliver highly compact X-Small (XS) and WR Series brakes.

Able to approach a work piece from any angle, six-axis robots are now a common sight on manufacturing lines. However, floorspace is still at a premium, so there is a continuing design trend towards decreasing the size and mass of robots. Reducing size improves space efficiency, allowing for the addition of more robots or other equipment on the line. Minimising mass allows for six-axis robots to enhance speed and acceleration without compromising payload – which results in increased productivity.

The end goal is a production line with a high density of robots, working within reduced space, delivering high output. Therefore, any advantage that can be gained from reducing the size and mass of components and assemblies must be seized by robot OEMs.

#### SPECIFYING AN OPTIMAL ROBOT BRAKE

This has been exemplified by a robot OEM, which asked its German supplier of stepper motors to assess downsizing opportunities for an updated sixaxis robot design optimised for small component assembly. The German manufacturer quickly identified the brakes mounted on the back of each stepper motor as an area for optimisation. The brakes provide static holding in precise positions, ensuring the accuracy of the assembly process. Particularly, the stepper motor controlling the sixth axis of movement, which holds and turns the tooling at the end of the robot arm, required a specialised braking solution.





The manufacturer contacted Warner Electric, a leading brand of Altra Industrial Motion Corp., due to its exceptional expertise regarding advanced braking technologies. After collaboration with the customer's engineering team, Warner Electric experts recommended a XS electrically-released, spring-set brake to fit the stepper motor on the sixth axis.

Warner Electric's range of XS brakes is specifically designed for applications where weight saving and space efficiency are paramount. Each model offers reliable braking to an optimised torque level. Consequently, XS brakes are often specified for applications in aeronautics and robotics. It is a highly versatile range featuring six standard sizes, with Warner Electric able to customise designs to exactly match application requirements.

The XSB33S supplied to the German motor manufacturer offered a torque rating of 35 Ncm and a weight of only 90 g. Its design ensured a significant size and mass advantage compared to the previously utilised brake. A customised adaptor flange was also included to allow for customer-specific mounting.

#### DELIVERING TANGIBLE IMPROVEMENT

For the higher braking torques required on the other five axes of the robot, Warner Electric supplied highly compact Model WR220 and WR225 spring-applied, electrically-released brakes. These are specifically designed as statically engaged/disengaged holding brakes, ensuring reliable positioning of the robot arm in operation.

With the new brakes now installed, the German motor manufacturer could approach the robot OEM with a highly optimised design that reduced footprint without compromising productivity. This delivered increased space efficiency for end users, improving available floorspace and enhancing production capacity.

Warner Electric provides a global design, development, manufacturing and supply service to its customers – offering standard and bespoke braking solutions tailored to specific application requirements. Experts worldwide work closely with customers' engineering teams to provide products that deliver tangible operational improvements. This ensures that the special requirements of advanced industries such as robotics can be met with exact solutions.

www.warnerelectric.com



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#### Matara launches new linear rail and shaft clamping elements

atara UK Ltd, specialist in automation, pneumatics and linear motion products, has launched a new range of linear rail and shaft clamping elements designed and produced in-house and exclusive to Matara.

Designed to complement its linear rail and linear shafting products, the new Matara clamping elements are aimed at machine builders who require their machinery to perform key positioning, braking and holding tasks. The shafting type suits diameters from Ø12 to Ø60, with the linear rail units suitable for linear rails from 9 to 65.

The Matara linear rail and shaft clamping elements range features both manual and pneumatic clamps.

The manual clamps - the FRCMAN series of Linear Manual Rail Clamping Elements and the FRCCMAN LT Manual Clamping Element for Round Bars Light Line provide simple yet reliable manually controlled clamping. They feature an adjustable locking lever where the contact sections press with sync on the



surfaces of the rail. For maximum effect, the floating profiles of contact ensure a symmetrical distribution of the force on the linear guide.

The pneumatic clamping elements - the FRC series of Linear Rail Clamping and the FRCC Pneumatic Clamping Element for Round Bars -use the air from the machine's pneumatic system in place. The FRC series is available as single or double acting to allow customers to choose how they want the clamps to operate, making them suitable for a very wide range of applications, including material handling, and printing and packaging applications. Furthermore, they can also be used as a failsafe on vertical applications; if there is a failure in the pneumatic system and the air is shut off, the clamp automatically locks

the load in position for added safety.

The new Matara linear rail and shaft clamping elements provide exceptional positional accuracy with a high holding force, are easy to install and use, and are competitively priced whilst maintaining the quality that Matara is renowned for. The FRCMAN and the FRC series have the added benefit of a space saving ergonomic design and can be used on any manufacturers' linear rail, making them highly versatile.

As the new Matara linear rail and shaft clamping elements are designed and built in the UK, they are readily available with a high UK stock holding resulting in low lead times and, in the event of a machine breakdown, reduced downtime for customers.

For maximum convenience, the products are directly interchangeable with Zimmer equivalents.

www.store.matara.com/products/ linear-motion/linear-motionclamping-elements/



## Siemens and Google Cloud to cooperate on AI-based solutions in manufacturing

G oogle Cloud and Siemens, an innovation and technology leader in industrial automation and software, today announced a new cooperation to optimize factory processes and improve productivity on the shop floor. Siemens intends to integrate Google Cloud's leading data cloud and artificial intelligence/machine learning (AI/ML) technologies with its factory automation solutions to help manufacturers innovate for the future.

Data drives today's industrial processes, but many manufacturers continue to use legacy software and multiple systems to analyze plant information, which is resource-intensive and requires frequent manual updates to ensure accuracy. In addition, while AI projects have been deployed by many companies in "islands" across the plant floor, manufacturers have struggled to implement AI at scale across their global operations.

For more than 170 years, Siemens has built its business on pioneering technologies that have led the manufacturing industry forward. By combining Google Cloud's data cloud and AI/ML capabilities with Siemens' Digital Industries Factory Automation portfolio, manufacturers will be able to harmonize their factory data, run cloud-based AI/ML models on top of that data, and deploy algorithms at the network edge. This enables applications such as visual inspection of products or predicting the wear-and-tear of machines on the assembly line.

Deploying AI to the shop floor and integrating it into automation and the network is a complex task, requiring highly specialized expertise and innovative products such as Siemens Industrial Edge. The goal of the cooperation between Google Cloud and Siemens is to make the deployment of AI in connection with the Industrial Edge – and its management at scale - easier, empowering employees as they work on the plant floor, automating mundane tasks, and improving overall quality.

"The potential for artificial intelligence to radically transform the plant floor is far from being exhausted. Many manufacturers are still stuck in AI 'pilot projects' today – we want to change that," said Axel Lorenz, VP of Control at Factory Automation of Siemens Digital Industries. "Combining AI/ML technology from Google Cloud with Siemens' solutions for Industrial Edge and industrial operation will be a game changer for the manufacturing industry."

"Siemens is a leader in advancing industrial automation and software, and Google Cloud is a leader in data analytics and AI/ML. This cooperation will combine the best of both worlds and bring AI/ML to the manufacturing industry at scale. By simplifying the deployment of AI in industrial use cases, we're helping employees augment their critical work on the shop floor," said Dominik Wee, Managing Director Manufacturing and Industrial at Google Cloud.

Siemens and Google Cloud to cooperate to transform manufacturing by enabling scaled deployment of artificial intelligence.

https://new.siemens.com/global/ en/products/automation/topicareas/industrial-edge.html

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## New configurator increases control and speed of specification for industrial enclosures

ndustrial enclosures need to be rugged, but they also have to be flexible enough to create the right design for the application's requirements. With a wide range of options available for the GEOS industrial enclosure range, Spelsberg's new configurator now makes specification and selection a faster, easier task.

Chris Lloyd, Managing Director Spelsberg UK, explains the advantages of the GEOS enclosure configurator.

It's vital that industrial enclosures are sufficiently robust to protect the often sensitive components secured within; which are typically electrical in nature. Industrial and outdoor environments present arduous conditions, from the potential for a high degree of ingress and fluctuations in temperature, to the challenges of varying weather or possibility of impact.

Spelsberg's GEOS industrial enclosure is made for the task and is sufficiently durable for a wide range of environments and applications. As a result, there's an array of potential uses, each requiring their own specification and options. While Spelsberg's engineers are always available to talk customers through a specification, we still wanted to offer the customer the tools that would enable them to specify their own enclosure quickly. The GEOS enclosure configurator is aimed at specifiers and designers who know what they are looking for in an enclosure and want to find the best match quickly.

The first stage of the configurator, available on the Spelsberg website, includes selection of either enclosure or cabinet, followed by dimensions. The configurator then allows you to select all available accessory types, from hinge doors, to partition walls to mounting plates. To check the design, the configurator also provides a 360-degree view with zoom across three dimensions. The configurator will also price the enclosure and accessories for the order to then be sent directly to Spelsberg.

The configurator also features an optional configuration assistant which takes the user through steps to ensure that all possible considerations of design, from door opening to condensation, have been covered. This means that the customer, whatever their level of experience, can use the configurator to control their design.

The configurator is the same tool as that used by Spelsberg's engineers on a daily basis to design the layout of GEOS enclosures.

The GEOS enclosures themselves are constructed from high strength polycarbonate to ensure durability. This means that GEOS has an IK09 impact rating - one of the highest industrial ratings available – and offers up to IP67 ingress protection.

Should further customisation of the enclosure or cabinet be required, such as additional holes for cable entry, Spelsberg UK can carry out precision CNC machining. The on-site CNC machining service ensures that Spelsberg provides accountability through customization and reduces the time and cost of contracting a third-party machinist.

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# Accurate, precise dispensing for wearable technology

onsumer wearables, including smart watches and augmented reality glasses, have captured the imagination of many. One important market for wearable devices is medical and healthcare, where they fulfil a diverse range of functions, such as monitoring patient heart rate, oxygen levels, body temperature and respiratory rate. State of the art wearables have good reliability, precision and are compact. Here Peter Swanson, Managing Director of adhesives specialist Intertronics, discusses best practice for dispensing processes in wearable device manufacturing.

The comfort, flexibility and connectivity of wearables have been made possible through progress in sensor technology, power management and transmitter technology; these advances in wearable technology require improvements to the production process. One important part of the assembly process is the dispensing of materials like adhesives, silicones, thermally and electrically conductive materials and greases.

Dispensing technology is required for numerous functions when manufacturing a wearable device, such as bonding batteries to the housing, the application of conductive pastes for thermal management, and the sealing, encapsulation and bonding of sensors. Many Micro-Electronic-Mechanical Systems (MEMs) are bonded or encapsulated with a suitable adhesive, and materials are also used to coat or underfill processors, attach and bond RFmodules and seal and bond actuators.

When manufacturing a medical device, it is important that all processes are reliable, consistent and can be validated. The industry requires manufacturers to have a good understanding of process variables, and to control them to create a robust procedure across all dispensing processes. Dispensing processes must be done accurately and repeatably.

#### **DISPENSING IN ACTION**

To achieve the level of precision required, manufacturers can opt for progressive



pump technology, as it enables true volumetric dispensing. A progressive cavity pump typically consists of a singlehelix metal rotor and a double-helix hole in an elastomeric stator, which forms a sequence of small discrete cavities. These cavities progress through the pump as the rotor is turned, transferring the liquid. The output represents true volumetric dispensing — the amount of material is directly proportional to the number of rotations of the rotor, and is not affected by material viscosity, input pressure or ambient temperature.

One example technology is the eco-PEN330 preeflow dispenser, which enables the user to dispense volumes as small as  $0.001 \mu$ l within 1%, 99% of the time – a high level of repeatability and accuracy. It can be used for low or high viscosity materials, with or without filler content.

#### DISPENSING FOR DIABETES MANAGEMENT

Medical wearable devices have huge potential for diabetes management. For example, in the US, the digital diabetes management market size has a compound annual growth rate of around 20%. Examples of technologies include continuous glucose monitoring, smart glucose metres and closed loop systems.

One interesting example comes from a client of ViscoTec India, whose engineers created a closed loop system, consisting of a skin patch that measures blood glucose levels, a device that calculates the required insulin dose, and a smart pump that injects the dose. During the production process, the manufacturer required the precise dispensing of 0.7 microlitres of grease into a gearbox component of the electric motor in the insulin pump. These precise requirements were fulfilled with a preeflow eco-PEN330.

#### **AUTOMATING THE PROCESS**

In most wearable production processes, adhesive dispensing is automated to achieve a high degree of repeatability. Once the dispensing technology has been selected, manufacturers can repeat the application of materials with positional accuracy by incorporating a robot or other form of automation. Medical device manufacturers have several options to mechanise the process, which include rotary tables or simple 3-axis benchtop robots, usually at modest cost, right up to multi-axis robots with vision-based control and feedback.

As well as delivering productivity benefits from their speed, consistency and ability to run continuously, automation can enable results not possible manually. They can deliver rapid return on investment, particularly when precision and accuracy-based productivity gains are taken into consideration.

The use of wearable technology in consumer and healthcare applications is now widespread. To produce a compact, reliable and precise device that meets rigorous industry standards, manufacturers require a robust dispensing process. Working with an experienced adhesives and dispensing equipment supplier can help you to invest in suitable technology.

For more information, visit www.intertronics.co.uk

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