SECO

# INSPIRATION THROUGH INNOVATION

## MANUFACTURING BEST-PRACTICE EVENT

## 2018 PROGRAMME

**KICK-OFF: 9TH & 10TH OCTOBER**

INSPIRATION THROUGH INNOVATION

INSPIRATION THROUGH INNOVATION 2018

Name: Richard Jelfs
Position: Managing Director
Team: Seco Tools UK

## DIFFERENT STRUCTURE...
## DIFFERENT STRATEGY...
## DIFFERENT TACTICS

# IT'S A WHOLE NEW BALL GAME!

Continuous improvement is a business process that involves systematic monitoring, analysis and evaluation of an organisation's performance.

Seco Tools is no stranger to continuous improvement. We design and implement process improvement programmes for customers, and employ the same best-practice methods to benchmark our own performance too. This includes reviewing the ongoing effectiveness of our annual Inspiration through Innovation event.

Using visitor and partner feedback from last year and combining it with our knowledge and understanding of UK manufacturing and the issues that will likely confront component manufacturers, has resulted in us altering the focus of the event this year. Still built on the principles of innovation, collaboration and sharing best-practice, the primary focus has changed by putting best-practice machining methods right at the heart of the event.

Visitors to Inspiration through Innovation 2018 will notice and, I'm confident, will appreciate the change in direction.

This year there are 16 different machining demonstrations taking place which is more than ever before. All have been designed in partnership with our Technical Partners. And all are based on real customer components. To accommodate the increase in number we have changed the lay-out of the event to provide visitors with better visibility and access to the machining demonstrations.

In addition to the demonstrations there is our topical, manufacturing issues-based Seminar and Tutorial Programme which will run over the two days. The final thing to mention is that there are over 40 Technical Partners attending the event. These Partners are involved in at least one machining demonstration, and each will also be showcasing their latest relevant technology solutions to visitors in the new exhibition area located in our Design and Planning facility.

**More information about the different machining demonstrations taking place, the Technical Partners involved and the Seminar and Tutorial programmes taking place at Inspiration through Innovation 2018 can be found in the remaining pages of this brochure or by visiting www.secotools.com/iti where you can also register your attendance.**

INSPIRATION THROUGH INNOVATION 2018

# ITINERARY AND FIXTURES


## FIRST HALF
### TUESDAY 9TH OCTOBER

| | |
|---|---|
| 9:00: | Arrival |
| 9:00 - 10:00: | Demonstrations/Exhibition/Refreshments |
| 10:00 - 10:30: | SEMINAR 1 NEXT STEP - A STATE-OF-THE-ART MODEL FOR COST-EFFICIENT 'HIGH MIX LOW VOLUME' PRODUCTION |
| | TUTORIAL 1 GETTING THE BEST AND THE MOST FROM SECO: A NEW BUSINESS DEVELOPMENT MODEL |
| 10:30 - 11:30: | Demonstrations/Exhibition/Refreshments |
| 11:30 - 12:00: | SEMINAR 2 'GREEN BUTTON' PROCESS CONFORMANCE AND OPTIMISATION AT ROLLS-ROYCE - THE CHALLENGE |
| | TUTORIAL 2 MACHINING STAINLESS STEELS |
| 12:00 - 13:30: | Complimentary BBQ lunch/Networking |
| 13:30 - 14:00: | SEMINAR 3 SMART TOOLING: THE FUTURE OF JIGS, FIXTURES AND TOOLING |
| | TUTORIAL 3 MACHINING NICKEL-BASED ALLOYS |
| 14:00 - 15:00: | Demonstrations/Exhibition/Refreshments |
| 15:00 - 15:30: | SEMINAR 4 ACCELERATE YOUR DIGITAL TRANSFORMATION: ENABLING THE INDUSTRIAL INTERNET OF THINGS (IOT) TO DELIVER RESULTS...NOW |
| | TUTORIAL 4 MACHINING TITANIUM |
| 15:30 - 16:30: | Demonstrations/Exhibition/Refreshments |
| 16:30 - 17:00: | SEMINAR 5 THE MECHANICS OF MODULATION-ASSISTED MACHINING |
| 17:00 - 19:00: | LATE NIGHT OPENING<br>Including complimentary curry and refreshments |

## SECOND HALF
### WEDNESDAY 10TH OCTOBER

| | |
|---|---|
| 9:00: | Arrival |
| 9:00 - 10:00: | Demonstrations/Exhibition/Refreshments |
| 10:00 - 10:30: | SEMINAR 1 TITANIUM ALLOY DEVELOPMENT; OPTIMISING "MANUFACTURABILITY" |
| | TUTORIAL 1 MACHINING NICKEL-BASED ALLOYS |
| 10:30 - 11:30: | Demonstrations/Exhibition/Refreshments |
| 11:30 - 12:00: | SEMINAR 2 DESIGNING AND DELIVERING TURNKEY AND PROCESS IMPROVEMENT SOLUTIONS - THE SECO WAY |
| | TUTORIAL 2 MACHINING TITANIUM |
| 12:00 - 13:30: | Complimentary BBQ lunch/Networking |
| 13:30 - 14:00: | SEMINAR 3 PROCESS AUTOMATION FOR HIGH-VALUE, LOW-VOLUME COMPONENTS: THE CHALLENGE UNCOVERED WITH OUR VISION |
| | TUTORIAL 3 MACHINING STAINLESS STEELS |
| 14:00 - 15:00: | Demonstrations/Exhibition/Refreshments |
| 15:00 - 15:30: | SEMINAR 4 IDEM: INTRODUCING A NEW DEVELOPMENT CONCEPT FOR TOOL ID (IDENTITY) |
| | TUTORIAL 4 GETTING THE BEST AND THE MOST FROM SECO: A NEW BUSINESS DEVELOPMENT MODEL |
| 16:00: | Close |

**Name: Mike Fleming**
**Position: Strategic Marketing, Products and Services Manager**
**Team: Seco Tools UK**

## SEMINAR PROGRAMME

# TEAM TALKS!

Sharing knowledge and best-practice is at the heart of Inspiration through Innovation - and nowhere is this commitment better exemplified than in our Seminar Programme.

Focusing on the latest technological developments and on new ways to improve productivity, component quality and process reliability - the seminars taking place at this year's event are a 'must' for manufacturers looking to 'up their game'.


Each seminar is being led and facilitated by an industry expert, and all seminars are guaranteed to be thought-provoking, informative and inspiring.

There are nine strategic seminars taking place over the two days. Five seminars have been scheduled for Tuesday 9th October, and four for Wednesday 10th October.

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# OUR SEMINARS:
# TUESDAY 9TH OCTOBER

## 1 10.00-10.30 NEXT STEP - A STATE-OF-THE-ART MODEL FOR COST-EFFICIENT 'HIGH MIX LOW VOLUME' PRODUCTION

### SEMINAR SYNOPSIS:

NEXT STEP is a sophisticated production philosophy aimed at helping manufacturing companies achieve unrivalled process optimisation. It involves adopting a holistic approach, identifying and examining all variables that impact on a company's performance - and then mapping out what the current position 'is' against what it 'could be' through optimisation. Time and care is taken to identify the current de-limiting factors (i.e. production inefficiencies), and, through discussion, recommend strategies to help overcome them - thereby enabling companies to realise their full potential.

### SPEAKER:

**Patrick De Vos, MSc, Seco Corporate Business Manager Consultancy Services and STEP Educational Services Manager**

### SPEAKER BIOGRAPHY:

Patrick De Vos was born in Belgium in 1959 and has a Master's degree in Mechanical and Electrical Engineering. From 1981 to 1983, he was Post Graduate lecturer and researcher specialising in strategies for optimising metal cutting processes and production economics.

From 1983 to 2006, he was employed by Seco Tools Benelux in a number of technical, commercial, marketing and management positions. Since 2006, he has been employed as Seco's global STEP Educational Services Manager. Over the last 35 years, he has trained over 70,000 people in more than 65 countries worldwide. He has also authored the books, "Metal Cutting, theories in practice", "Applied Metal Cutting Physics, Best Practice", "Tool Deterioration, Best Practices" and "The NEXT STEP - Metal Cutting Technology and Production Economics."

## 2 11.30-12.00 'GREEN BUTTON' PROCESS CONFORMANCE AND OPTIMISATION AT ROLLS-ROYCE - THE CHALLENGE

### SEMINAR SYNOPSIS:

With over 70 mill-turn machines at seven Rolls-Royce manufacturing facilities each making Rotative components from the most challenging aerospace materials, the challenge has been (and continues to be) designing and developing robust, transferable and secure Green Button machining processes that do not compromise the standard platform.

This seminar outlines the approaches Rolls-Royce has adopted to ensure process compliance and optimisation.

### SPEAKER:

**Simon Dutton, MSc, Machining Specialist, Rolls-Royce**

(cont'd)

### SPEAKER BIOGRAPHY:

Employed at Rolls-Royce for 27 years initially as a draughtsman and then a NC Programmer before assuming responsibility for creating and developing the company's mill-turn platforms and Blisk adaptive machining processes.

Currently the technical lead for developing and implementing a standard platform for the manufacture of Rotative components and for pioneering the use and application of new technologies within Rolls-Royce.

## 3 13.30-14.00 SMART TOOLING: THE FUTURE OF JIGS, FIXTURES AND TOOLING

### SEMINAR SYNOPSIS:

Evolution of Artificial Intelligence (AI) and Machine Learning technologies offers a unique opportunity to make jigs, fixtures and tooling smarter. Industry 4.0 is influencing entire product manufacturing life cycles, and jigs, fixtures and tooling play a key role in making, assembling, measuring and validating parts and products.

This seminar covers the principles behind, and the creation of, the Smart Tooling Framework developed by Jaivel Aerospace - and how tomorrow's jigs, fixtures and tooling will be manufactured and how they will transform the user experience.

### SPEAKER:

**Vipul Vachhani, Founder & CEO, Jaivel Aerospace**

### SPEAKER BIOGRAPHY:

As the Founder and CEO of Jaivel Aerospace, Vipul is responsible for ensuring the company's effectiveness in delivering success outcomes to its customers.

He is driven by a firm belief that the company's (Jaivel's) long-term growth and profitability will always be determined and assured by its customers' success - making Jaivel a truly customer-focused enterprise. Vipul's key role in the company is to provide corporate governance, and to create and implement business strategies and initiatives throughout the company that ensure that Jaivel maintains its preferred partner status with customers and that it is recognised internally and externally as a market-leading, solutions-based technology provider.

From Jaivel's UK base and Group HQ in the East Midlands, Vipul strongly supports Anglo-Indian trade relationships and speaks at many events - sharing his experience in establishing Jaivel as a truly international organisation with operations in UK & India.

Prior to founding Jaivel in 1998, Vipul graduated as a Mechanical Engineer from Bangalore University. During the early stages of his career, in India and the USA, Vipul worked for new product development organisations where he acquired a strong foundation in technology R&D in the field of Turbo Machinery & Aerospace Engineering. Right from his engineering school days he was fascinated by the application of computers in engineering and, even in these early days, developed several unique engineering industry solutions.

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## 4 15.00-15.30 ACCELERATE YOUR DIGITAL TRANSFORMATION: ENABLING THE INDUSTRIAL INTERNET OF THINGS (IOT) TO DELIVER RESULTS…NOW

### SEMINAR SYNOPSIS:

Industrial IoT has been on the minds of manufacturers for a few years, but there have been few truly successful implementations. As a consequence manufacturers are hesitant about fully embracing the technology.

According to McKinsey, of all global industries, manufacturing produces the most amount of data yet has the least digital penetration. One primary reason is that it is difficult to extract data not only from machines but also from machine operators and manufacturing systems.

In this seminar you will find out how, by simplifying machine connectivity, you can quickly and successfully implement IoT in the workplace, and drive real change, improvement and value in your business.

### SPEAKER:

**Mr Bill Bither, CEO, MachineMetrics**

### SPEAKER BIOGRAPHY:

Bill Bither is a serial entrepreneur who has successfully founded (and exited) from several high-growth software companies including Atalasoft, acquired by Kofax (NASDAQ:KFX) in 2011.

He began his career as a mechanical engineer at United Technologies, where he worked on early design automation systems. His latest company, MachineMetrics, founded in 2014, harnesses factory floor data and simplifies Industrial IoT to drive efficiency and empower manufacturers to make smarter, faster and more confident decisions using powerful and sophisticated integrated software.

MachineMetrics has won a number of awards:

- Recognised as Top 20 tech-ecosystem partner (McKinsey and Co.'s Digital Manufacturing Growth Initiative).
- Top 10 Manufacturing Intelligence Solution Provider 2017 (Manufacturing Technology Insights).
- Winner 2018 Smart Manufacturing Solution, IoT Breakthrough Award.

## 5 16.30-17.00 THE MECHANICS OF MODULATION-ASSISTED MACHINING

### SEMINAR SYNOPSIS:

Modulation-Assisted Machining (MAM) superimposes a controlled oscillation into the machining process to radically improve machining conditions. MAM technology improves efficiency and process capability in precision machining processes, especially those using difficult-to-machine materials that are required in high-performance ultra-precision products.

The seminar will focus on, and explore, the principles and methodology underpinning Modulation-Assisted Machining. Real and relevant case studies will be used to demonstrate its application, commercial successes and future potential.

### SPEAKER:

**Dr. James B. Mann, Assistant Professor, University of West Florida; CEO, M4 Sciences LLC.**

(cont'd)

### SPEAKER BIOGRAPHY:

Dr. Mann is an Assistant Professor in the Department of Mechanical Engineering at the University of West Florida. His research and teaching interests include Materials Processing, Deformation Mechanics, Tribology, Metrology, Mechanical Design, Manufacturing, and Entrepreneurship in Engineering.

His industrial experience includes engineering and operations management in the defence, aerospace and automotive engine sectors as well as contract manufacturing and assembly.

In 2005, Dr. Mann co-founded M4 Sciences, a manufacturing technology business that develops advanced technologies for ultra-precision machining that includes TriboMAM, a special modulation drilling system for precision machine tools.

James has authored 20+ peer reviewed technical journal publications and co-authored 10+ issued US and foreign patents related to machining and materials processing technology.

# OUR SEMINARS:
# WEDNESDAY 10TH OCTOBER

## 1 10.00-10.30 TITANIUM ALLOY DEVELOPMENT; OPTIMISING "MANUFACTURABILITY"

### SEMINAR SYNOPSIS:

Titanium alloys have been extensively used within the aero-engine and aero-structure sectors since the 1950s. Beneficial attributes including high strength to weight ratio, good corrosion resistance and good fatigue performance have led to increased use of Titanium in applications ranging from the large-scale fan blades and supporting discs at the front of the engine, through to relatively small vanes and blades in the high pressure compressor section.

As aero-engine design and component development continues, TIMET has been working with customers to improve alloy performance and reduce raw material and component manufacturing costs.

The seminar aims to give a high level overview of the alloy development process within TIMET and the approaches used to define (and ultimately solve) the manufacturing and performance challenges such as machinability, forgeability and the recycling of waste material.

### SPEAKER:

**Matthew Thomas, UK R&D Manager, TIMET**

### SPEAKER BIOGRAPHY:

Dr Matt Thomas is UK Research and Development Manager at TIMET. He studied Materials Engineering at Sheffield Hallam University before investigating advanced Titanium aerospace alloys with Dr Brad Wynne at Sheffield University to obtain his PhD.

Throughout his education Matt spent extended periods of time in industry working for Sheffield Forgemasters International ltd. and collaborating with Firth Rixson.

Since joining TIMET in 2007, Matthew's responsibilities have included; the characterisation and development of Titanium alloys, products, manufacturing routines and process routes, as well as the initiation, development and management of technical links with academic and commercial institutions. Matthew is a chartered engineer and a member of the IOM3.

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## 2 11.30-12.00 DESIGNING AND DELIVERING TURNKEY AND PROCESS IMPROVEMENT SOLUTIONS - THE SECO WAY

### SEMINAR SYNOPSIS:

Making things better and making things different!

As component designs are becoming ever more complex combined with the advent of new and more challenging materials, many component manufacturing companies approach Seco to help them design, develop and implement secure and reliable machining processes.

This seminar covers all aspects of Seco's turnkey and process improvement solutions and services…how we work in partnership with customers…and how, through working collaboratively, we help customers make parts faster, better and more economically.

### SPEAKER:

**Gary Scott, Component Engineering Team Leader, Seco Tools (UK) Ltd.**

### SPEAKER BIOGRAPHY:

Over 35 years industry experience in engineering, principally gained in the aerospace and mould tool and die sectors. Joined Seco Tools UK in 2007 as a regional project engineer before moving to Seco's Component Engineering Team (CET) in 2010. Promoted to CET Team Leader in 2014.

Main strengths include providing CNC programming expertise and delivering innovative manufacturing solutions for aerospace components that include Fan Discs, Engine Casings etc.

## 3 13.30-14.00 PROCESS AUTOMATION FOR HIGH-VALUE, LOW-VOLUME COMPONENTS: THE CHALLENGE UNCOVERED WITH OUR VISION

### SEMINAR SYNOPSIS:

Manufacturing low-volume, high-value complex components from exotic materials brings its own unique set of challenges for manufacturers.

A specific challenge, certainly for those manufacturers looking to improve their productivity, performance and profitability, concerns the best-practice methods to automate their machining and manufacturing processes.

In this seminar, key implementation issues and considerations will be explored in more detail as well as a number of tools and systems that can be used to ensure a smooth transition to automation.

### SPEAKER:

**Germain Forgeoux, Manufacturing Engineering Systems Manager, Safran Landing Systems Ltd.**

### SPEAKER BIOGRAPHY:

Employed at Safran UK for 15 years as a Manufacturing Development Graduate Engineer involved in research and development, collaborative projects and machining and assembly project management.

Currently employed as Manufacturing Engineering Systems Manager, at Gloucester, with a team responsible for developing and improving manufacturing performance by embracing and implementing new technologies and new ways of working.

## 4 15.00-15.30 IDEM: INTRODUCING A NEW DEVELOPMENT CONCEPT FOR TOOL ID (IDENTITY)

### SEMINAR SYNOPSIS:

Manufacturers often have hundreds or even thousands of high-value tools stored in their manufacturing plants and workshops without the necessary organisation or classification, detailed product descriptions or effective tracking systems in place to run an efficient operation. Inspiration through Innovation 2018 sees the UK launch of a new tool identification system called IDEM which addresses this situation.

Using radio frequency identification tags and a state-of-the-art Pen Reader, IDEM makes it possible for manufacturers to maintain, track and effectively manage their complete tool library, providing them with the ability to locate 'lost' tools and avoid the purchase of costly and unnecessary replacements.

This seminar introduces the principles, features and technology behind IDEM, and explains the customer benefits that includes having access to a database of product information and cutting data on over 900,000 tools and the ability to request support from their tooling suppliers.

### SPEAKER:

**Quentin Hardoin, Product Manager, Seco Consultancy Services**

### SPEAKER BIOGRAPHY:

Quentin Hardoin has worked for Seco Tools for 14 years where he has occupied a number of positions. Beginning his employment in Seco's Research & Development Department as a Project Manager (Milling), he then moved into Custom Tool Product Development focusing on Crankshaft, Power Transmissions and Energy applications and standard milling solutions i.e. disc milling, helical milling and ceramic milling. He headed up Seco's SET (Sensor Equipped Tooling) operations during 2017 before moving to, and being in charge of, Seco's new IDEM-Tool ID Department which is part of Seco's Consultancy Services.

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# TUTORIAL SCHEDULE

# HELPING YOU RAISE YOUR GAME!

**Name: Dave Magnall**
**Position: Sales Team Leader**
**Team: Seco Tools UK**

Running parallel to the Seminar Programme at this year's Inspiration through Innovation event is our new Tutorial Schedule.

These tutorials, taking place in smaller meeting rooms over the two days, are practical, are more informally-delivered than our seminars and focus on the best-practice machining of Titanium, Stainless Steels and Nickel-based alloys. There is also a tutorial that outlines how Seco's new business approach that integrates our range of Business Services, improves manufacturers' productivity, performance and profitability.


Four tutorials take place on Tuesday 9th October and are repeated on Wednesday 10th October.

# OUR TUTORIALS:
# TUESDAY 9TH OCTOBER & WEDNESDAY 10TH OCTOBER

## 1 GETTING THE BEST AND THE MOST FROM SECO: A NEW BUSINESS DEVELOPMENT MODEL

**TUES 9TH OCT 10.00-10.30 & WEDS 10TH OCT 15.00-15.30**

**FACILITATOR:**

**Steve Bell, Business Development Manager UK & ROI**

Seco has always worked in collaboration with customers. This modus operandi has been refined and streamlined with the creation and implementation of a new business approach that, using advanced digital platforms and cloud-based technology, delivers stronger mutually-profitable partnerships and more effective and efficient account management. Find out more about Seco's new business approach and its benefits.

## 2 MACHINING STAINLESS STEELS

**TUES 9TH OCT 11.30-12.00 & WEDS 10TH OCT 13.30-14.00**

**FACILITATOR:**

**Patrick De Vos, MSc, Corporate Business Manager Consultancy Services and STEP Educational Services Manager**

Stainless Steels are hard, strong and able to resist corrosion - all characteristics that affect the materials' machinability. This tutorial will cover best-practice machining methods and strategies, including high-productivity and high-performance tooling solutions, that can be employed to successfully machine all types of Stainless Steels.

## 3 MACHINING NICKEL-BASED ALLOYS

**TUES 9TH OCT 13.30-14.00 & WEDS 10TH OCT 10.00-10.30**

**FACILITATOR:**

**Patrick De Vos, MSc, Corporate Business Manager Consultancy Services and STEP Educational Services Manager**

Nickel-based alloys are used to manufacture high-precision components found in aero-engines and industrial gas turbines. These alloys are not prone to deformation under high temperatures, and display excellent oxidation and creep resistance. They do, however, present particular challenges when being machined. In this tutorial the machining of Nickel-based alloys takes centre stage - the focus being on best-in-class machining methods.

## 4 MACHINING TITANIUM

**TUES 9TH OCT 15.00-15.30 & WEDS 10TH OCT 11.30-12.00**

**FACILITATOR:**

**Patrick De Vos, MSc, Corporate Business Manager Consultancy Services and STEP Educational Services Manager**

Titanium is light and strong. It is used extensively in many automotive, medical and aerospace applications...to name but a few. However, many of the qualities that make Titanium the material of choice for design engineers, also contribute to it being difficult to machine. This tutorial highlights Titanium's characteristics in more detail and provides the inside information to help manufacturers machine the material more effectively and efficiently.

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Name: Jon Shipley
Position: Technical Manager
Team: Seco Tools UK

## MACHINING DEMONSTRATIONS

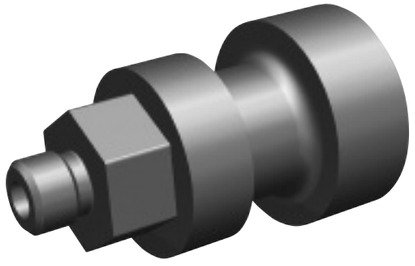
# KEEPING YOU AHEAD OF THE COMPETITION

In conjunction with a number of our Technical Partners we have organised 16 different machining demonstrations for Inspiration through Innovation 2018.

All the demonstrations taking place are innovative, challenging and relevant. They are all either actual recently-machined customer components or replicate specific machined features from real customer parts.


The demonstrations highlight how, by working collaboratively with Technical Partners and by harmonising their different technologies, significant improvements in productivity, component accuracy, surface finishes and process reliability can be achieved.

## MAZAK NEXUS MACHINING DEMONSTRATION STAINLESS STEEL SHAFT COUPLING



### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Mazak
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Vero/Edgecam
- Metrology: Alicona
- Coolant Saver System: Wogaard

### DEMONSTRATION SYNOPSIS:

Many machined components used in the oil and gas industry have to withstand harsh, unforgiving environments. As a consequence the raw material selected, the component design and the machining process selected are all critical in achieving a reliable and consistent lifecycle for the component.

Using 316 Stainless Steel, a common material in the oil and gas industry due to its molybdenum content for increased corrosion resistance and improved resistance to pitting, this machining demonstration highlight the strategies used to achieve an excellent surface finish to help improve component performance.

## DMG MORI CTX MACHINING DEMONSTRATION ACTUATOR

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: DMG MORI
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Edgecam
- Metrology: Renishaw
- Workholding Leader Chuck

### DEMONSTRATION SYNOPSIS:

The actuator being machined on the DMG Mori CTX has gone through a process improvement programme, as the customer wanted to improve the existing process to achieve a significant reduction cycle time and production costs. To do this required re-engineering the total machining process.

By combining the resources of a number of Technical Partners, it was possible to reduce the part cycle time by 43% and reduce production costs by 32%. This was achieved collaboratively, where the respective engineering teams combined their expertise, skills and resources to fully optimise the manufacture of the part.

This machining demonstration showcases the optimised machining process and highlights the problems encountered and how they were overcome.

Further insights into process improvements can be gained by attending the seminar ‘Designing and Delivering Turnkey and Process Improvement Solutions’ that takes place on Wednesday 10th October at 11.30.

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## DMG MORI SVD 503 MACHINING DEMONSTRATION AUTOMOTIVE RIB

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: DMG Mori
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Autodesk
- Workholding: MicroLoc

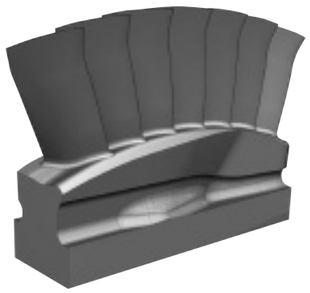
### DEMONSTRATION SYNOPSIS:

An automotive ribbed gearbox bearing housing is often referred to as a gearbox connection cover and is located between the gearbox and drive shaft. Although typically made from aluminium, in this machining demonstration, the base material has been changed to EN8 Steel to allow the component to be dry machined enabling better visibility of the machining process to event visitors.

To keep the strength-to-weight ratio as low as possible, rib sections are often designed with several pockets. Pocketing creates many challenges when machining, especially maintaining a constant and optimum feed rate when machining deep pocket radii.

This machining demonstration illustrates the advantages of vortex (dynamic) milling. Two components will be machined in the demonstration, one using standard pocket milling strategies and the second using vortex milling. Surface finish, tool life and cutting forces will be compared, contrasted and discussed during the event.

## HERMLE (1) MACHINING DEMONSTRATION BLISK AERO BLADE



### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Hermle
- Cutting tools: Seco Tools & Nikken
- Metalworking fluid: Houghton
- CAD/CAM: Vero/WorkNC
- Workholding: Thame

### DEMONSTRATION SYNOPSIS:

Traditionally, jet engine compressor fan disks are produced with a single disk and multiple removable blades.

The development of multi-axis machine tools with sophisticated CNC controls combined with the latest programming strategies now enables the manufacture of blisks - components where the disk and blades are intrinsically machined in one piece.

The trend from disc to blisk manufacture is increasing due to the latter’s weight saving and efficiency advantages.

Manufactured from either Titanium or Nickel-based Superalloys, aerospace blisks present a number of machining challenging due, to a large extent, to the nature of the material being machined and a blisk’s complex and difficult-to-machine profile. This demonstration will highlight the latest roughing strategies that optimise part cycle time.

On the side wall profile of the blisk, a new finishing technique called ‘lens milling’ will be employed. Lens milling delivers significantly improved surface finish results over those achieved by adopting a typical scanning finishing strategy.

## HERMLE (2) MACHINING DEMONSTRATION FUEL CONNECTOR A350

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Hermle
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Tebis
- Metrology: Bowers

### DEMONSTRATION SYNOPSIS:

Due to the complex form of aircraft fuel connectors, they are often machined in two separate and distinct operations and set ups. This is not ideal from both a productivity perspective or for meeting the exacting quality requirements for achieving air worthiness compliance.

The challenge (and the solution) in this machining demonstration will be to machine the complete fuel nozzle in one operation. This will be achieved by optimising all aspects of the machining process and all the technologies involved to enable the component to be machined, to completion, in just one operation.

## HERMLE (3) MACHINING DEMONSTRATION ANNULUS FILLER HOOK SECTION

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Hermle
- Cutting tools: Seco Tools
- Metalworking fluid: Blaser (Jemtech)
- CAD/CAM: Open Mind
- Workholding: Roemheld

### DEMONSTRATION SYNOPSIS:

A key component in an aerospace blisk is the annulus filler hook section - a component that is attached to the blisk hub between each of the blades.

Its primary function is to separate the blades and, by doing so, resist the significant radial forces (as well as directing an axial airflow surface) for air being drawn through the engine.

The complex geometry of an annulus filler and the requirement to be manufactured from a solid billet create several manufacturing challenges. A significant and unacceptable issue in the machining process can be excessive surface vibration which occurs when machining deep pockets with tools with long overhangs.

In this demonstration optimised roughing and finishing machining strategies will be employed with a specific emphasis on 'barrel milling' techniques utilising custom Jabro® solid carbide convex profile milling cutters.

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## HERMLE (4) MACHINING DEMONSTRATION FEMORAL & TIBIAL

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Hermle
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Majenta PLM
- Workholding: Brown & Holmes, Craftsman & Laser Lines (3D Printing)

### DEMONSTRATION SYNOPSIS:

Global demand for knee and hip replacement parts is increasing, with worldwide sales, last year, exceeding £9 billion.

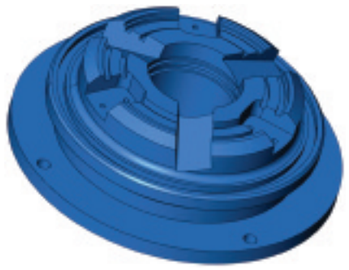
Typically a total knee replacement assembly comprises three individual parts: 1) the femoral component, which replaces the rounded bottom end of the femur bone; 2) the tibial tray, which replaces the top end of the tibia bone; and 3) the tibial or bearing insert, which is positioned (and acts as a cushion) between the other two parts.

Femoral and tibial tray components are commonly produced in cobalt chrome (Co-Cr) and Titanium. These biocompatible materials are strong and hard, and exhibit high stiffness and abrasiveness when being machined.

Machining challenges facing component manufacturers are many and varied, and include producing parts with a superior and consistent surface finish that are also burr-free (to minimise the need for secondary polishing operations). Machining processes also need to be secure, optimise productivity and ensure high tool life.

To deliver these requirements Seco has produced a range of material-specific cutting tools which, in combination with optimised machining strategies, help manufacturers machine high-precision orthopaedic components. In this machining demonstration a complete process for machining femoral and tibial components will be showcased.

## GROB 550T MACHINING DEMONSTRATION DRIVE ACTUATOR



### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: GROB
- Cutting tools: Seco Tools
- CAD/CAM: Open Mind
- Workholding: Schunk

### DEMONSTRATION SYNOPSIS:

Drive actuators are common components in both the aerospace and oil and gas industries. Their complexity and the demand for improved productivity has created some innovative machining strategies. They are typically manufactured in Stainless Steel and require coolant, however this demonstration will be machined dry in P3 Steel.

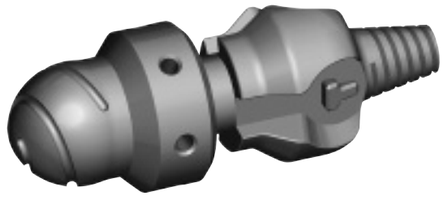
The demonstration is a joint venture between GROB, Open Mind, Schunk and Seco Tools and employs a number of new and different machining processes that include:

- 3-axis simultaneous turning to allow the insert wear to be distributed over a wider area of the cutting edge thereby extending tool life;
- Dynamic milling that uses the full length of a cutter to reduce cycle times and improve tool life;
- In-process broaching which enables the part to be machined in one operation and negates the need for additional machining operations or investment in expensive right-angled heads.

## WILLEMIN-MACODEL 508 MT MACHINING DEMONSTRATION MEDICAL EXPO STENT HOLDER

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Willemin-Macodel with Fanuc robot
- Cutting tools: Seco Tools
- Metalworking fluid: Motorex
- CAD/CAM: Gibbs CAM
- Workholding: Schaublin



### DEMONSTRATION SYNOPSIS:

A stent holder is a key element of a collet system that is used to hold delicate medical stents securely and without causing any deformation.

Utilising the Willemin-Macodel 508 MT2 machine's multiple driven spindles, the stent holder is machined from solid (bar) to completion in one set up.

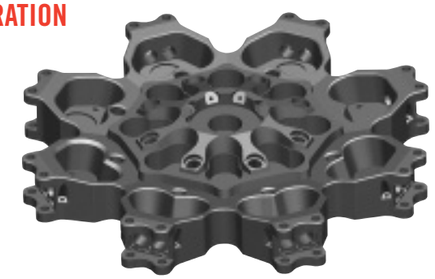
The machining demonstration will show this small and intricate Stainless Steel stent holder (the completed part measures a diameter of 4mm by 8mm long) being machined without manual intervention.

Additional automation technology will also be demonstrated via the use of a bar feeder and the integration of a Fanuc robot for loading/unloading operations.

## MATSUURA MX-520 PC4 MACHINING DEMONSTRATION AEROSPACE ROTOR CRANK

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Matsuura
- Cutting tools: Seco Tools
- Metalworking fluid: Blaser (Jemtech)
- CAD/CAM: Vero/Edgecam
- Metrology: Renishaw
- Workholding: Craftsman



### DEMONSTRATION SYNOPSIS:

Made from aluminium, this complex 'scaled' helicopter rotor cover has been produced by optimising the 5-axis machining capabilities of a Matsuura MX-520 PC4 machining centre - a machine with integrated automatic pallet change capability. The demonstration also features a bespoke fixturing plate from Craftsman Tools, solid carbide cutters and Feedmax™ drills from Seco Tools, Blaser B-Cool 755 metalworking fluid from Jemtech and machine programming strategies developed using Edgecam CAD/CAM software.

INSPIRATION THROUGH INNOVATION 2018

## ROMI D800V5 MACHINING DEMONSTRATION SS AEROSPACE BRACKET

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Romi
- Cutting tools: Seco Tools
- Metalworking fluid: Jemtech
- CAD/CAM: SolidCAM
- Workholding: Schunk

### DEMONSTRATION SYNOPSIS:

The UK debut of the Romi D800 version 5, provides the ideal machine tool platform to demonstrate the machining of a Stainless Steel aerospace bracket.

As with most aerospace components, material microstructure integrity and machined surface finish and accuracy are of paramount importance. To meet these exacting requirements, SolidCAM tool path strategies were employed to help optimise productivity and Schunk rigid workholding and fixturing equipment to hold the component securely, without deformation, was also used. Cutting tools from Seco designed to achieve the exacting surface finishes and surface integrity required, and a high-performance Blaser metalworking fluid from Jemtech that enhances tool life and chip evacuation were also specified.

By bringing these Technical Partners and their respective technologies together in a collaborative environment, the machining of this Stainless Steel aerospace bracket has been optimised.

## DOOSAN NHP 5000 MACHINING DEMONSTRATION DIFFERENTIAL CASING & SUSPENSION UPRIGHT

### TECHNICAL PARTNERS INVOLVED:

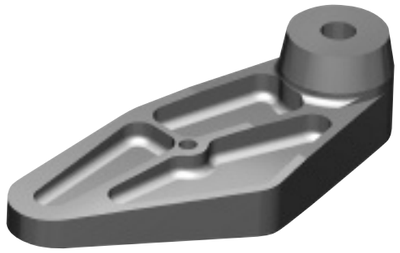
- Machine tool builder: Doosan
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Autodesk
- Metrology: Renishaw
- Workholding: Brown & Holmes

### DEMONSTRATION SYNOPSIS:

Commonly referred to in the automotive industry as a steering knuckle, this component is the focal point in a car's front axle and connects the wheel to the suspension and steering. To machine this critical component, a rigidly-designed and built high-performance Doosan NHP 5000 horizontal machining centre will be demonstrated combined with Autodesk CAM machining strategies, Seco Tools' Aeromaster and Jabro® solid carbide tooling, Houghton Hocut 4940 high-lubricity metalworking fluid, adjustable and rigid work-holding from Brown & Holmes, and high-precision measuring equipment from Renishaw.

The demonstration will focus on process time reduction and component accuracy improvement.

## HELLER HF 3500 MACHINING DEMONSTRATION TI RIB



### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Heller
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Jaivel in conjunction with Autodesk
- Workholding: Schunk

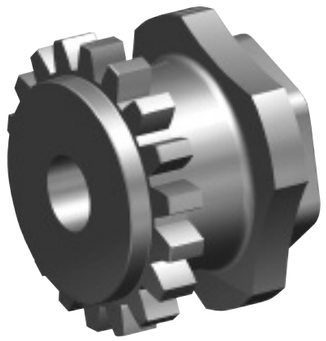
### DEMONSTRATION SYNOPSIS:

In order to maximise metal removal rates when machining Titanium, the latest innovative technology solutions from Autodesk PowerMill (CAD/CAM), Schunk (Workholding), Houghton (Metalworking Fluid) and Seco and Nikken (Cutting Tools and Tooling) will be used to machine a Titanium aerospace rib component from solid on a Heller HF 3500 machining centre.

In addition to the high-accuracy drilled and milled features on the component achieved by using advanced holemaking and face milling cutting tools, machining operations also include using tools with long overhangs.

The demonstration highlights how the performance of these tools can be optimised to deliver high material removal rates and, as a consequence, reduced part cycle times and improved productivity.

## MAZAK I400 MACHINING DEMONSTRATION DUPLEX GEAR VALVE



### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Mazak
- Cutting tools: Seco Tools
- Metalworking fluid: Houghton
- CAD/CAM: Edgecam
- Metrology: Renishaw
- Workholding: Hainbuch

### DEMONSTRATION SYNOPSIS:

Duplex Stainless Steels are commonly used in the oil and gas industry due to their twin-phase austenitic and ferritic microstructure that gives the material a strength and toughness that is twice that of regular Stainless Steels. While these properties are attractive for component designers, they create a unique set of challenges and difficulties during machining operations.

Working closely with our technical partners, this machining demonstration focuses on machining strategies based around the Mazak I400 5-axis machining centre to maximise tool life and productivity. Using rigid Hainbuch workholding and Edgecam waveform cycles, new machining strategies were developed to overcome the issues. Coupled with Seco MDT grooving systems and Jabro® solid carbide round shanks tools, metal removal rates were significantly increased without comprising tool life.

INSPIRATION THROUGH INNOVATION 2018

## FANUC ROBODRIL α-DIB SERIES MACHINING DEMONSTRATION AUTOMATED CELL

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: Fanuc
- Cutting tools: Seco Tools
- CAD/CAM: Open Mind
- Metrology: Renishaw
- Workholding: Hainbuch

### DEMONSTRATION SYNOPSIS:

At this year's event, FANUC have partnered with Open Mind, Seco Tools and Renishaw to showcase their latest small footprint ROBODRILL machining centre integrated with a FANUC M10iA robot to create an automated manufacturing cell.

By incorporating a Renishaw Equator gauging system into the cell - machine components are measured/inspected on the shop floor and in-process meaning that production is not disrupted.

## CNC ROBOTICS MACHINING DEMONSTRATION POLO HELMET

### TECHNICAL PARTNERS INVOLVED:

- Machine tool builder: CNC Robotics
- Cutting tools: Seco Tools
- CAD/CAM: Tebis

### DEMONSTRATION SYNOPSIS:

Strength and weight are important requirements in the manufacture of Polo riding helmets. The first helps ensure rider safety - the second rider comfort.

To achieve both requirements helmets are manufactured using a honeycomb core sandwiched between two carbon fibre shells. A final part of the finishing process involves the inner and outer shells being trimmed and the required apertures being machined.

Due to the size and complexity of the helmet, and the need for a fast and reliable machining process, a CNC robotic multi-cube robot cell coupled with a Kuka KR10 Agilus robot has been created for this demonstration. By working in partnership with Tebis and Seco Tools, CNC Robotics have optimised part cycle times, consistency and trim quality.

## SECO TOOLING

# TELLING PASSES... SHARP TURNS... GREAT CHIPS... SUPERB FINISHES

**Name: John McGhee**
**Position: Product Manager Turning, Threading and Advanced Materials**
**Team: Seco Tools UK**

The 16 machining demonstrations taking place at Inspiration through Innovation 2018 all use Seco's latest and most advanced cutting tools and/or tooling systems.

You can find more technical information on the different milling, turning, holemaking and threading tools used in demonstrations in this section of the brochure.


INSPIRATION THROUGH INNOVATION 2018

# SECO SHOWCASE: TURNING SOLUTIONS FROM SECO TOOLS

In many machine shops in the UK, Ireland and across the world, you can find Seco's turning solutions at work.

With over 5,500 different (coated and uncoated) inserts and more than 3,000 tool holders in our product range it's clear that, when it comes to turning, Seco definitely has the edge.

All of our turning solutions deliver increased productivity and improved process security - and our range of turning products includes our new and revolutionary Duratomic® inserts…our productivity-boosting Jetstream® and Jetstream® Duo Technology…and our best-in-class MDT (Multi-Direction Turning) systems.

Whether you're involved with internal, external or heavy-duty turning we have the ideal solution for you - right here…right now.

## INSPIRATION THROUGH INNOVATION 2018: FEATURED PRODUCTS

### DURATOMIC® INSERTS

Designed for the efficient and effective machining of Steel, Stainless Steel and Cast Iron - Duratomic® TP and TK insert grades are tough, durable and ultra wear-resistant.

See our Duratomic® inserts in action in the following machining demonstrations:

- **The DMG MORI CTX demonstration**
- **The MAZAK I400 demonstration**
- **The MAZAK NEXUS demonstration**
- **The WILLEMIN-MACODEL demonstration**

### JETSTREAM® DUO TECHNOLOGY

Ideal for turning Titanium, Superalloys and other challenging materials, Seco's Jetstream® Duo Technology features two coolant jets positioned close to the cutting edge. This innovative configuration enables manufacturers to achieve higher cutting speeds, longer tool life, improved chip control and increased productivity.

See Jetstream® Technology in action in the following machining demonstrations:

- **The GROB demonstration**
- **The MAZAK I400 demonstration**

### MULTI-DIRECTIONAL TURNING (MDT)

Seco's universal MDT system is innovative, ultra-productive and cost-efficient. By using single tool holders, specifically designed inserts and a unique clamping system a number of operations i.e. profiling, turning, grooving and parting-off etc., can be performed negating the need for several standard and special tools.

See the MDT system in action in the following machining demonstrations:

- **The DMG MORI CTX demonstration**
- **The MAZAK I400 demonstration**
- **The MAZAK NEXUS demonstration**
- **The WILLEMIN-MACODEL demonstration**

# SECO SHOWCASE:
# INDEXABLE MILLING SOLUTIONS FROM SECO TOOLS

Seco offers a comprehensive range of indexable milling cutters to manufacturers.

**INDEXABLE MILLING CUTTERS:** Seco's wide variety of indexable milling cutters covers an enormous application range that includes - face milling, square shoulder milling, copy milling, disc milling and much, much more.

The depth and breadth of the range allows manufacturers to achieve the balance between productivity, performance and cost efficiency.

## INSPIRATION THROUGH INNOVATION 2018: SOME FEATURED PRODUCTS

### DOUBLE OCTOMILL

Double Octomill milling cutters are versatile, economic, productive and can be used for both roughing and finishing operations.

Equipped with double-sided inserts, featuring a total of 16 cutting edges, the cutters combine high performance with unrivalled cost-effectiveness.

See Double Octomill in action in the following machining demonstrations:
- **The HERMLE No 1 demonstration**
- **The MAZAK NEXUS demonstration**

### HIGH FEED 2 WITH LP-09 INSERTS

Achieve improved productivity and process security with High Feed 2 (HF-2) cutters and our new rectangular-shaped LP-09 inserts.

The inserts' higher corner strength combined two cutting edges per insert and a larger number of inserts (teeth) per cutter body ensure faster removal rates during high feed machining operations.

See HF-2 and LP-09 inserts in action in the following machining demonstrations:
- **The DMG MORI SVD demonstration**
- **The HELLER demonstration**
- **The HERMLE No 1 demonstration**

### AEROMASTER

Designed to provide high metal removal rates when machining aluminum, Aeromaster combines a pre-balanced cutter with positive axial rake with high-rake polished inserts. This unique design enables metal removal rates of up to 3,000 $cm^3$/min to 4,000 $cm^3$/min.

See Aeromaster in action in th e following machining demonstrations:
- **The DOOSAN NHP 5000 demonstration**
- **The HERMLE No 3 demonstration**
- **The MATSUURA demonstration**

INSPIRATION THROUGH INNOVATION 2018

# SECO SHOWCASE:
# SOLID MILLING SOLUTIONS FROM SECO TOOLS

Seco's premium solid carbide milling cutters deliver unrivalled cutting performance, long tool life and high process security. As such they are widely used for demanding parts production in key industry segments such as aerospace, medical, mould tool and die, and power generation.

Our solid carbide cutters have many innovative and performance-enhancing features that include dedicated micro-grain carbide structures, optimised flute lengths, specialised edge honing and wear-resistant coatings.

## INSPIRATION THROUGH INNOVATION 2018: SOME FEATURED PRODUCTS

### JABRO®-SOLID² END MILLS

Our solid carbide square shoulder end mills, ball nose cutters and finish end mills deliver high productivity and extended tool life. The range includes our best-selling JS400, JS720 and JS522 series.

See these solid carbide end mills in action in the following demonstrations:

**JS400 SERIES**
- **The DMG MORI SVD demonstration**
- **The DOOSAN NHP 5000 demonstration**
- **The HERMLE No 3 demonstration**
- **The MATSUURA demonstration**

**JS522 SERIES**
**(TWO FLUTE FINISHING CUTTERS)**
- **The MATSUURA demonstration**

**JS720 SERIES**
**(HIGH-PERFORMANCE, 6-FLUTE CUTTERS)**
- **The DMG MORI CTX demonstration**
- **The HELLER demonstration**
- **The MAZAK I400 demonstration**
- **The MAZAK NEXUS demonstration**
- **The ROMI demonstration**

### JABRO®-COMPOSITE CUTTERS

Seco's Jabro®-Composite range of diamond coated solid carbide and PCD endmills is designed for the machining of glass and carbon fibre reinforced plastics.

See Jabro®-Composite cutters in action in the following demonstration:
- **The CNC ROBOTICS demonstration**

### JABRO® (CO-CR) RANGE OF SOLID CARBIDE CUTTERS

Jabro® Co-Cr range of solid carbide cutters are designed for the machining of medical and replacement parts. The tools deliver reduced cycle times, exceptional surface finishes and long tool life.

See the Jabro® Co-Cr tools in action in the following demonstration:
- **The HERMLE No 4 demonstration**

# SECO SHOWCASE:
# HOLEMAKING SOLUTIONS FROM SECO TOOLS

Everything from drills, reamers and boring bars are available from Seco and all can be relied upon to deliver high-performance, high-productivity and cost-efficient holemaking solutions.

The depth and breadth of our holemaking product range is second to none, and means that we can supply customers with the optimum holemaking solution irrespective of the material being machined, or the different machining strategies being employed.

- **DRILLING:** With optimised coatings, tip geometries and insert designs, Seco drills are the first choice for manufacturers.
- **REAMING:** Our high quality, easy-to-use reamers are ideal for high-performance and high-precision machining, and large batch production.
- **BORING:** We supply rough and fine boring heads, as well as Bridge Bars and Jumbo Bridge Bars for large oversize boring, overturning and grooving.

Our extensive knowledge of the holemaking process and the different variables that impact on its success means that we are at the forefront of developing new and innovative products - all designed to help our customers improve their productivity and optimise their processes.

## INSPIRATION THROUGH INNOVATION 2018: FEATURED PRODUCTS

### PERFOMAX®

Perfomax® indexable insert drills are versatile and economic, and feature strong, square inserts with four cutting edges for unrivalled productivity and cost efficiency. The drills can be used with our latest insert grades (including Duratomic®) to ensure high performance.

See Perfomax® drills in action in the following machining demonstrations:
- **The GROB demonstration**
- **The HERMLE No 2 demonstration**

### FEEDMAX™-P

Seco's new range of Feedmax™-P solid carbide drills provide component manufacturers with increased productivity (up to 35% higher) and improved tool life when machining ISO P (Steel) and cast iron. Featuring a new geometry and an advanced TiAlN coating, the new range delivers improved chip management and control, and helps manufacturers increase process reliability.

See Feedmax™ drills in action in the following machining demonstrations:
- **The DMG MORI CTX demonstration**
- **The DMG MORI SVD demonstration**
- **The DOOSAN NHP 5000 demonstration**
- **The GROB demonstration**
- **The WILLEMIN-MACODEL demonstration**

INSPIRATION THROUGH INNOVATION 2018

# SECO SHOWCASE:
# THREADING SOLUTIONS FROM SECO TOOLS

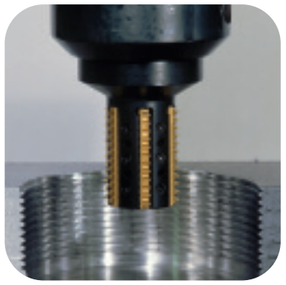
The depth and breadth of our threading product range is second to none, and means that we can supply customers with the optimum threading solution irrespective of the material being machined or the different threading strategy employed.

Our knowledge of the threading process and the different variables that impact on its success mean that we are at the forefront of developing new and innovative threading products - all designed to help customers improve their productivity and optimise their processes.

Our threading solutions can be accessed via our innovative Threading Wizard facility on our website.

This online resource helps you not only select the optimum tool holder, insert and machining parameters, based on application data you provide, but also creates and downloads the resulting CNC code direct to your machine tool. The Threading Wizard feature is quick, easy-to-use and ensures process reliability and optimisation.

## INSPIRATION THROUGH INNOVATION 2018: FEATURED PRODUCT



### THREADMASTER™ THREAD MILLS

Threadmaster™ thread mills provide manufacturers with an effective and efficient machining solution.

Threadmaster™ thread mills are designed to reduce cutting forces and eliminate chatter. They feature a carbide substrate and TiCN-coating that makes them tough and wear resistant.

See Threadmaster™ thread mills in action in the following machining demonstration:
- **The DMG MORI CTX demonstration**

# SECO SHOWCASE:
# CUSTOMISED PRODUCTS & SOLUTIONS FROM SECO TOOLS

In some instances standard tooling solutions often cannot deliver the productivity, performance, flexibility or reliability and performance required.

In these situations a modified or bespoke solution is required.

Seco Tools UK's unique Custom Products facility, located at the company's Technology Centre in Alcester, is an advanced high-technology resource that designs, manufactures and supplies such bespoke solutions.

Employing 14 highly-experienced members of staff and using the latest machine tool and ancillary technologies, the Custom Products operation can make a real difference to manufacturers' productivity, performance and profitability.

You can find out more about the scale, capabilities and work undertaken at Seco's Custom Products operation at Inspiration through Innovation 2018.

Name: Nicki Adams
Position: Marketing Co-ordinator
Team: Seco Tools UK

## TECHNICAL PARTNERS

# THE DREAM TEAM!

Over 40 of our Technical Partners, including machine tool builders, CAD/CAM providers and workholding, metalworking fluid and metrology suppliers are attending Inspiration through Innovation 2018.

A majority of these Partners are involved in at least one of our 16 machining demonstrations, and all will be showcasing their specific technology solutions in the new Exhibitor Zone - an area specifically created for the event.

You can find out which Technical Partners are exhibiting at Inspiration through Innovation in this section of the brochure.

INSPIRATION THROUGH INNOVATION 2018

# A WINNING FORMATION!


1. CAD/CAM
2. MACHINE TOOLS: MACHINING CENTRES (INC. 5-AXIS)
3. MACHINE TOOLS: MILL-TURN MACHINES
4. AUTOMATION
5. METROLOGY
6. 3D PRINTING
7. WORKHOLDING
8. METALWORKING FLUIDS
9. CUTTING TOOLS
10. BUSINESS SERVICES
11. ADDITIONAL PARTNERS

INSPIRATION THROUGH INNOVATION 2018


## CAD/CAM

| | |
|---|---|
| AUTODESK | www.autodesk.co.uk |
| CG TECH VERICUT | www.cgtech.co.uk |
| MAJENTA PLM | www.majentaplm.com |
| OPEN MIND | www.openmind-tech.com/en.html |
| SOLIDCAM | www.solidcam.com |
| TEBIS | www.tebis.com |
| VERO SOFTWARE - EDGECAM, WORKNC, VISI | www.edgecam.com/www.worknc.com/ www.visicadcam.com |


## MACHINE TOOLS - MACHINING CENTRES (INC 5-AXIS)

| | |
|---|---|
| HELLER | uk.heller.biz |
| KINGSBURY | www.kingsburyuk.com |
| MATSUURA | www.matsuura.co.uk |
| MAZAK | www.mazakeu.co.uk |
| MILLS CNC | www.millscnc.co.uk |
| ROMI | www.romiuk.com |


## MACHINE TOOLS - MILL-TURN MACHINES

| | |
|---|---|
| DMG MORI | uk.dmgmori.com |
| GROB | www.grobgroup.com |
| WILLEMIN-MACODEL | www.willemin-macodel.com |


## AUTOMATION

| | |
|---|---|
| CNC ROBOTICS | www.cncrobotics.co.uk |
| FANUC | www.fanuc.eu |
| REM SYSTEMS (EROWA) | www.remsystems.co.uk |


## METROLOGY

| | |
|---|---|
| ALICONA | www.alicona.com |
| THE BOWERS GROUP | www.bowersgroup.co.uk |
| HEXAGON | www.hexagonmi.com |
| KISTLER | www.kistler.com |
| OGP & VICI | www.ogpuk.com/www.vicivision.com |
| RENISHAW | www.renishaw.com |
| ZOLLER | www.zoller-uk.com |

INSPIRATION THROUGH INNOVATION 2018

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## 3D PRINTING

| | |
|---|---|
| LASER LINES | www.3dprinting.co.uk |

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## WORKHOLDING

| | |
|---|---|
| BROWN & HOLMES | www.brownandholmes.co.uk |
| CRAFTSMAN | www.craftsmantools.com |
| HAINBUCH | www.hainbuch.com |
| LEADER CHUCK | www.leaderchuck.com |
| NIKKEN | www.nikken-world.com |
| ROEMHELD | www.roemheld.co.uk |
| SCHUNK | www.schunk.com |
| THAME WORKHOLDING | www.thameworkholding.com |

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## METALWORKING FLUIDS

| | |
|---|---|
| HOUGHTON | www.houghton-csc.co.uk |
| JEMTECH | www.jemtech.co.uk |
| WOGAARD | www.wogaard.com |

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## CUTTING TOOLS

| | |
|---|---|
| SECO TOOLS COMPONENT ENGINEERING TEAM | www.secotools.com |
| SECO TOOLS CUSTOM PRODUCTS | www.secotools.com |

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## BUSINESS SERVICES

| | |
|---|---|
| SECO TOOLS CONSULTANCY, EDUCATION & SERVICES | www.secotools.com |

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## ADDITIONAL PARTNERS

| | |
|---|---|
| EVOSET | www.evoset.com |
| HEIDENHAIN (GB) LTD | www.heidenhaingb.com |
| JAIVEL AEROSPACE | www.jaivel.aero |
| MACHINEMETRICS | www.machinemetrics.com |
| TDM SYSTEMS | www.tdmsystems.com |

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