ETMM
EUROPEAN TOOL & MOULD MAKING
THE MAGAZINE

9
www.etmm-online.com
Volume XVIV | September 2017
ISSN 2194-7589
€ 11.50

SPECIAL

EMO Hanover 2017

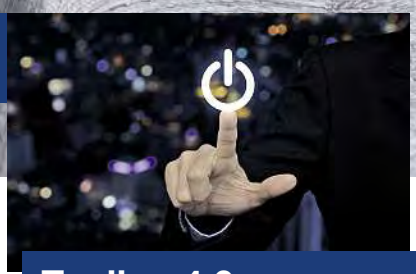
Trade fair preview and product highlights

Page 28

PRODUCT FOCUS

Tools for every application

Page 54



Tooling 4.0 – Hands on

How manufacturers can meet the challenges of Industry 4.0

Page 20

USA and Mexico

A seminar on the future development of the industry

Page 24

EDM Europe

Sodick EDM enhances accuracy and control

Page 74

Vogel Business Media

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See you at EMO 2017

Rosemarie Stahl
Editor
rosemarie.stahl@vogel.de

This September sees the biggest metal-working trade fair back in Germany. From 18 to 23 September 2017, the EMO trade fair will take place in Hanover once again. Did you know that the name stands for "Exposition Mondiale de la Machine Outil"? The name dates back to a time, when the trade fair was still held in Milan, Hanover and Paris. The last time EMO was held in Germany was in 2013. I am sure, many of our readers will take the chance to gather information face-to-face with suppliers and manufacturers of products and machines for metal-processing.

Together with my colleagues from the magazine MM MaschinenMarkt, I will be there to report about the trade fair. If you are visiting EMO Hannover 2017, you can stay informed with our daily newspaper that will be handed out all over the exhibition grounds. If you will not be able to visit the trade fair, you still don't need to miss anything. We will keep you updated online and via our social media channels. Be sure to follow us on Twitter and Facebook to know what is happening.

To while the time until EMO opens its gates, I recommend you to dig into our extensive trade fair preview. This issue covers around 50 products that will be on show – many of them for the first time ever. Additionally, I compiled an overview of all important events, seminars and conferences that are taking place at EMO Hannover 2017 (Page 28).

And now for something completely different. In June, ISTMA World, the International Special Tooling and Machining Association, elected a new President. Bob Williamson from the Toolmaking Association of South Africa will lead the Association for the next three years. I had the pleasure to meet him in Portugal in March. He is a genuinely nice person and agreed to answer my questions. In our interview, he told us about his plans for his presidency, about his role models and what European toolmakers can learn from their colleagues in South Africa (Page 80).

ETMM

TIP

Have a look at our product section to get an impression of what is on show at EMO Hannonver 2017.

Rosemarie Stahl
Editor

NEWS

SHOW REPORT

SPECIAL FEATURES

PRODUCT FOCUS – EMO PREVIEW

Source: LMT Group

The Copy Max copy milling cutters promise high process reliability in terms of quality and tool life.

At the end of September, the metal working industry meets in Hanover again.

Source: Deutsche Messe

TECH FOCUS

CASE STUDY

EDM EUROPE

REGULARS

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Ranking

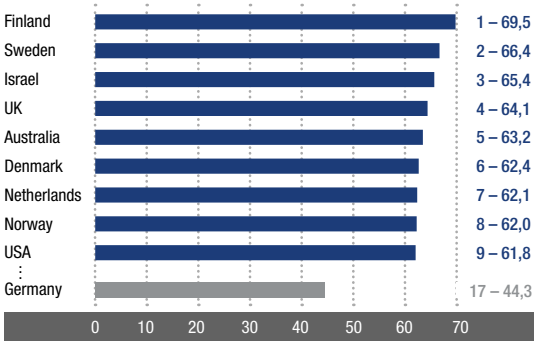
The month's best-clicked articles on etmm-online.com

1. **Innovation indicator 2017:** Germany only 17th in digitalisation
2. **Industry 4.0:** Industrial Revolution - Are machines taking over?
3. **Product gallery:** Annual Buyer's Guide photo gallery
4. **Machining Acc.:** Powerful micro motor system for tool & mould making
5. **Materials:** Pre-hardened plastic mould steel for optimum product quality

QUOTE OF THE MONTH

Source: Schulz

Digitalisation Indicator worldwide



The data is from the annually published Innovationsindikator (innovation indicator) published recently. Germany is 17th. (Source: Fraunhofer ISI and ZEW)

TRENDS

+0,6%

Seasonally adjusted GDP rose by 0.6% the euro area (EA19) and the EU28 in the second quarter of 2017, compared with the previous quarter, according to a flash estimate.

(Source: Eurostat)

+1,0%

European shares were on track for their best week since late April on Wednesday Aug 16, gaining almost 1% on forecast-beating growth data, rising metals prices and a weakening €.

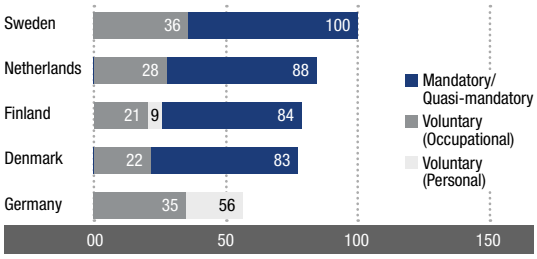
(Source: Reuters)

–15%

The 2016 survey forecast spending on metal-cutting to be $6.217 billion, a decrease of 15% compared to the latest estimate for 2015.

(Source: Gardner Media)

Pension Schemes – Europe



The coverage of private pension schemes by type of plan in selected EU member states, here based in 2013 on the working population 15-64 years.

(Source: IW Köln)

NUMBER GAMES

Stockmarket shares of the top 100 companies worldwide in 2008 in € b .. 13, 652
Stockmarket shares of the top 100 companies worldwide in 2017 in € b.... 17,438

The number of US companies in 2017 in the top 100..... 55
The number of European companies in 2017 in the top 100 22
The number of Chinese companies in 2017 in the top 100 11
The number of German companies in 2017 in the top 100..... 4

Stockmarket shares of World No.1- Apple in US$ b..... 754
Stockmarket shares of SAP (No.56) in US$ b 121
Stockmarket shares of Siemens (No.58) in US$ b..... 117

(Source: PWC)

NUMBER OF THE MONTH

364%

In 2015, almost 30% of the worldwide carbon dioxide emission was from China. This noted an emission increase of 364% compared to 1990, which was recorded at 7.7t per inhabitant in 2015. In Germany, the per-inhabitant emission was recorded at 9.6t in 2015, but compared to 1990, the emission from Germany had reduced by 24%. (Source: Destatis)

TICKER

US President **TRUMP** has till recently sent just about **35,600 TWEETS** and has around **36 MILLION FOLLOWERS**. (Source: Twitter) +++ In the **AUTOMOTIVE INDUSTRY** in Germany, all in all, there are1,327 local units of enterprises (with 20 or more persons employed) engaged in the manufacture of motor vehicles, trailers and semi-trailers in 2016. These employed amount to around **828,000 PEOPLE OR 14%** of the total staff working at local units in manufacturing. They achieved a turnover of **€407 BILLION**. (Source: VDW) +++ In 2015, the **EU 28** member states reported over **€258 BILLION** of government **EXPENDITURE** on **"PUBLIC ORDER AND SAFETY"**. This figure is equivalent to 1.8% of the EU's GDP. General government expenditure on "public order and safety" comprises mainly expenditure on police services, fire protection services, law courts and prisons. (Source: Eurostat)

DMG Mori reports growth in first half of 2017

Germany – DMG Mori has continued its growth trend. Following a strong first quarter of 2017, the company reached new record figures for the first half-year, DMG Mori says. For order intake, sales revenues and earnings, it recorded the best first half-year results in the company's history. Order intake rose by 22% in the second quarter to € 690.3 mn (previous year: € 566.6 mn). In the first half-year, order intake rose by 20% to € 1,384.2 mn (previous year: € 1,158.2 mn). Adjusted for structural effects, the company recorded a plus of 26%. Sales revenues in the second quarter rose by 4% to € 574.1 mn (previous year: € 551.1 mn). In the first half-year, the company achieved € 1,108.0 mn in sales revenues, which was slightly up on last year's figure (€ 1,092.5 mn), DMG Mori reports. Adjusted for structural effects from the realignment, sales revenues were up 7% compared to the previous year's figure. EBITDA rose by 14% to € 107.3 mn (previous year: € 94.2 mn). EBIT increased by 19% to € 77.6 mn (previous year: € 65.3 mn) and EBT even increased by 23% to € 75.2 mn (previous year: € 61.2 mn). As at 30 June 2017, the group recorded € 52.0 mn in earnings after taxes (previous year: € 42.8 mn). Apart from the good development of earnings, the financial position also developed positively. Free cash flow rose by € 161.9 mn (+87%) to € -23.7 mn (previous year: € -185.6 mn).

dmgmori.com

Mapal sales rising by 6%

Germany – Mapal reports a sales growth of 6% for the financial year of 2016. According to the company, consolidated group sales rose from € 540 mn in 2015 to € 575 mn in 2016. Additionally, the number of employees increased as well by 4%. Worldwide, the number of employees has risen from 4,800 to nearly 5,000.

Source: Mapal

Dr Dieter Kress (President) and Dr Jochen Kress (Member of the Executive Board).

"We are very happy with the result of the 2016 financial year," emphasises President Dr Dieter Kress. "The result shows that we are on the right path with our projects and the orientation of the company."

Dr Jochen Kress, Member of the Mapal Executive Board, adds: "We assume that the positive development will continue. This year, we will be able to offer our customers a comprehensive, digital tool management based on c-Com."

Together with investments in research and development, this year, Mapal is implementing several construction projects at international locations, for example, in the USA and China, the company says.

mapal.com

ETMM

NEWS IN BRIEF

Renishaw reaches out

Renishaw offers an extensive education outreach programme featuring 139 recognised science, technology engineering and maths (STEM) ambassadors who support a variety of STEM activities with local schools. This year, it will host over 65 events and workshops for young people, assisted by the STEM ambassadors.

renishaw.com

Source: © Arburg_Anja Symons

25 years in Belgium

End of June saw the Arburg subsidiary in Belgium celebrate its 25th anniversary with around 50 invited guests and a high-ranking delegation from the parent company.

arburg.com

New CEO

Kennametal Inc. has just announced that its board of directors has appointed Christopher (Chris) Rossi as president and chief executive officer and has also named him a director. He succeeds Ron De Feo, whom the board has appointed executive chairman of the board. Both appointments are effective 1 August 2017.

Source: Kennametal

kennametal.com

Metallurgy congress

EURO PM2017 CONGRESS & EXHIBITION
1 - 5 OCTOBER 2017 | MiCo, Milan, Italy

Source: EPMA

The Euro PM2017 Congress & Exhibition, Europe's annual powder metallurgy congress and exhibition organised by the European Powder Metallurgy Association, is set to return to Italy in October 2017.

europm2017.com

Source: Zeller+Gmelin

Dr. Karl Nowak (President Corporate Sector Purchasing and Logistics at Bosch), Siegfried Müller (Managing Director Zeller+Gmelin), Florian Kühnel (Key Account Manager Zeller+Gmelin) and Robert Huter (Vice President Corporate Sector Purchasing and Logistics, Machinery and Equipment at Bosch) are happy about the award for Zeller+Gmelin.

Supplier Award for lubricants

Germany – Lubricant manufacturer Zeller + Gmelin has won the Bosch Global Supplier Award in the category of "Indirect Purchasing". With the award, Bosch honours its suppliers for the 15th time this year. 18 of the 44 award winners of 2017 come from Germany.

According to Bosch, the company recognises above-average achievements in the manufacturing and supply of products and services. Quality, cost-consciousness, innovation and logistics are said to be main criteria for the selection of the award winners.

With this award, Bosch hopes to honour its business partners. As the company states, those companies do more than just supply parts. Instead, they are considered as development and innovation partners. Bosch wants to honour the winning companies for contributing to Bosch's success. According to the company, purchasing and logistics volume currently accounts for 60 percent of total sales, the majority of which comprises electronics and mechanical components.

Zeller + Gmelin feels honoured to be awarded the Suppliers Award: "We are extremely proud to be the only lubricant manufacturer named among the prize-winners," said Siegfried Müller, Marketing and Sales at Zeller + Gmelin. "Receiving the new award underlines once again that our concept of being an innovative partner and solutions supplier to our customers is a complete success," Siegfried Müller continues.

According to the company, Zeller + Gmelin develops individual and holistic solutions from one source, starting with research and development, and production. At its Eislingen site, twenty percent of its more than 500-strong workforce are employed in development and laboratories, the company states. The independent, medium-sized chemical company employs around 900 people worldwide and has more than 800 high-performance lubricants available, Zeller + Gmelin says.

> *"Bosch's success is based on competitiveness, innovation and agility, only to be realised with effective international partnerships."*
>
> *Dr. Karl Nowak, Chairman of the Bosch Management Board, Central Purchasing and Logistics*

The high performance of its supply partners is supported by Prof. Dr. Stefan Asenkerschbaumer, Deputy CEO Bosch Purchasing and Logistics: "Our aim is to achieve supply chain excellence. In the future, we will have to react even more flexibly, and faster to meet market and customer requirements. This can only work when all partners are networked intelligently, and work closely with the help of automated processes."

zeller-gmelin.de

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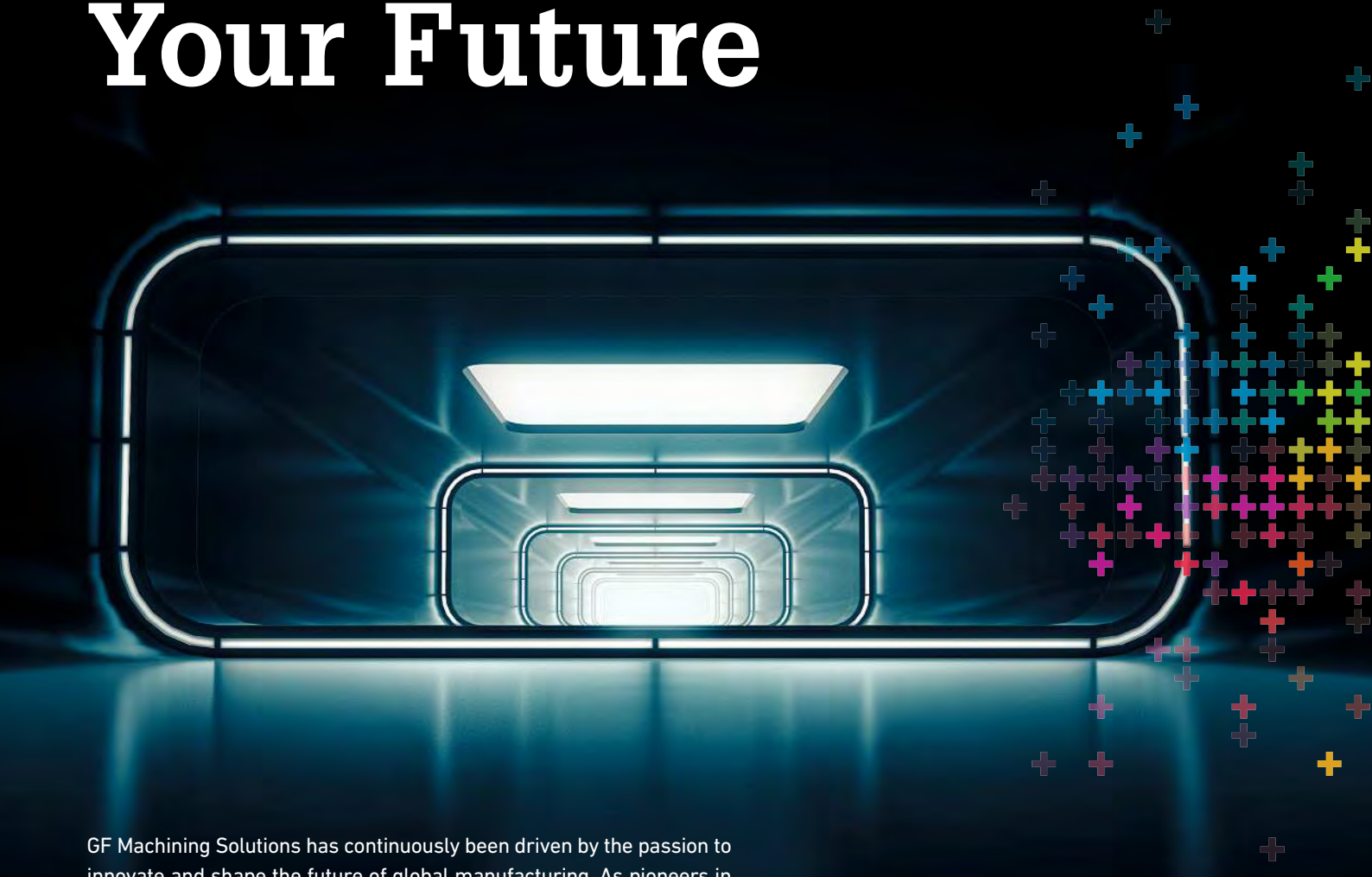

GF Machining Solutions has continuously been driven by the passion to innovate and shape the future of global manufacturing. As pioneers in electrical discharge machining (EDM), high-speed Milling, five-axis machining and Tooling, we have set the highest standards for precision, efficiency and quality around the world. We inspire you by offering a broad range of complete machining solutions as well as a comprehensive portfolio of cross-technologies and intelligent ecosystems (Industry 4.0) designed to take your manufacturing process to the next level.

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September 18–23, 2017
Hall 27 – Stand B24

www.gfms.com/emo2017

AgieCharmilles
Microlution
Mikron Mill
Liechti
Step-Tec
System 3R

Expansion of Poco Graphite

Source: Poco Graphite

Superior Graphite has been active in Russellville for 32 years.

USA – Entegris-owned Poco Graphite has announced that the company will take over facilities that were formerly used by Superior Graphite. The factory including its assets and its current workforce is located in Russelville, Arkansas, and was used as a small diameter graphite electrode factory. Poco Graphite is known for producing speciality chemicals as well as materials for microelectronics.

Entegris Senior Vice President of Specialty Chemicals and Engineered Materials, Stuart Tison, explained why this was a neccessary step: "We believe the facility in Russellville will help us to meet the growing demands of the high-performance materials market."

entegris.com

Trumpf announces sales increase of 11%

Germany – German machine tool manufacturer Trumpf has announced preliminary numbers that show a sales rise from 2.8 to 3.1 billion euros. At the same time, orders increased from 2.8 to 3.4 billion euros, the company says.

The 10.8 % upturn in sales was generated in the 2016/2017 fiscal year ending 30 June 2017. The biggest single market for Trumpf was Germany with sales of € 642 mn. The USA came second with € 416 mn and China third with € 398 mn. Trumpf reported that sales in South Korea, an important market for Trumpf, have risen by 57 %, reaching € 209 mn, making it the fourth biggest market for Trumpf.

Trumpf CEO Nicola Leibinger-Kammüller is cautiously optimistic: "In many markets, we exceeded our targets, with an equal contribution from all our products. But we know that the current investment climate has been influenced by external factors such as the euro exchange rate and raw materials prices."

She also stated that Trumpf invested a lot during the last year: The company drove forward its digital business platform and also expanded its locations in Germany and abroad, including the United States: "Clearly there are political differences between Germany and the U.S. at the moment, and that makes it all the more important that we give our American customers a clear signal that we see the U.S. as one of the main markets for digital production," stated Trumpf CEO Nicola Leibinger-Kammüller.

trumpf.com

Source: Trumpf

Dr. Nicola Leininger-Kammüller, CEO and President of the Managing Board at Trumpf.

Source: Emag ECM GmbH

Visitors can get information on latest developments, technology innovations and product releases at Deburring Expo 2017.

Deburring Expo – trade fair for deburring and surface finishing

Germany – In October, the second edition of Deburring Expo, trade fair for deburring technology and precision surface finishing, will take place in Karlsruhe, Germany.

According the the organisers Fair-X-perts, exhibitor bookings were already at 125 in the middle of June. Part of the event will be a three-day expert forum. The trade fair will take place from 10 to 12 October 2017. "As of the 15th of June, 125 companies from 14 countries had already booked booth floor space for Deburring Expo, including numerous market and technology leaders. We're expecting 150 exhibitors, many of whom will take advantage of the trade fair in order to unveil new solutions," says Hartmut Herdin, managing director of Fair-X-perts.

Depending on the requirements for the finished product or the material used, surface finishing can become a high-precision task. Tool and service life are also factors that can be enhanced with the correct surface treatment, preventing friction and wear. Additionally, surface treatment is an essential part of many manufacturing processes besides toolmaking.

The Deburring Expo, which only takes place for the second time, aims to be a platform for all related applications: from deburring and rounding to the production of precision surface finishes. Exhibitors will present their innovations and advanced products and services, enabling customers to fulfil growing requirements, the organisers say.

The trade fair will feature an overview of a number of applications, including equipment, and tooling as well as testing, measuring and analysis methods.

According to the organisers, visitors also have the chance to inform themselves about latest developments and technology. One example will be barrel finishing solutions for individual part processing, which can be easily integrated into automated production lines and permit highly accurate, reliable deburring, edge rounding, smoothing, grinding and polishing of high-quality, geometrically complex components, synchronised to manufacturing cycle time. Other highlights at the Deburring Expo will be, for example, from the field of ECM deburring and processing injection-moulded plastic parts.

The Deburring Expo will also feature a three-day expert forum. The presentations aim to provide information on fundamentals as well as expert knowledge for deburring and surface finishing, the organisers say.

deburring-expo.com.

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WALTER
KÖRBER SOLUTIONS

Look across the pond: Seminar on German tool making

Germany – In Novermber, Werkzeugbau Akademie (WBA) will offer an international three-day seminar about toolmaking in Germany. The seminar with the title "Toolmaking in Germany – the industrial approach" will be held from 27 to 29 November 2017 in Aachen, Germany.

WBA already organised an international seminar last year. Due to the huge success of this first edition, the academy decided to organise the event annually.

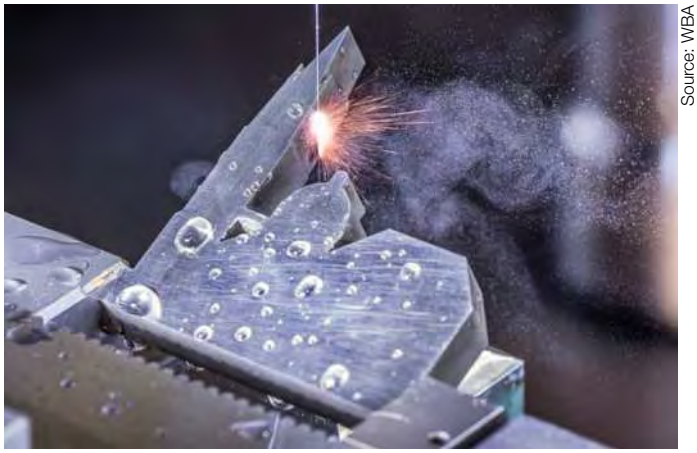
According to the organisers, this year's programme features even more technological insights to give further guidance on future tooling strategies and technologies.

The main topics of the international seminar will be process standardisation and flow production, production planning and control, additive manufacturing, and international tooling markets. WBA promises the participants to gain first-hand insights into a German best-practice tooling site. Additionally, attendees will be able to network and to profit from meeting with WBA's experts.

The seminar consists of several lectures and presentations. Furthermore, there will be demonstration sessions at a tool shop and factory, and a visit of a German company, WBA says.

Attendees will learn about new opportunities offered by 3D printing technologies and the integration of additive and conventional technologies into integrated process chains. The lectures will also focus on efficient planning and scheduling to ensure delivery reliability and value creation speed.

Furthermore, the lectures will focus on an outlook on the possibilities of Industry 4.0 for the tooling industry as well as best-practice examples. The seminar will be held in English and is open to a maximum of 25 participants. According to the attendees of last year's seminar, the event was well organised and an educational experience. The contents offered many possibilities for a transfer to real-life production.



Source: WBA

International tool makers are invited to Aachen in November to learn about the German industry and technology trends.

WBA owes its expertise to the close co-operation with various institutes in Aachen. The WZL, laboratory for machine tools and production engineering, at RWTH Aachen and the Fraunhofer Institute for Production Technology have been bundling their know-how and activities in the tool and die industries in the Werkzeugbau Akademie since 2010.

werkzeugbau-akademie.de

UK reports growing output among manufacturers

UK – In the last three months, production among UK manufacturers has grown at the fastest pace since 1995. According to the quarterly CBI Industrial Trend Survey, 43% of respondent firms said the volume of output over the past three months was up.

For the survey, 397 manufacturers responded to questions about their production, employment and expectations. Most of the results were positive: The employee headcount increased at the fastest rate in three years. Hiring intentions also improved. 32% of manufacturers stated that their employee number was up. Only 13% reported a downward trend.

According to the quarterly survey, 35% of businesses reported an increase in total orders, and 21% a decrease, returning a balance of +14%. These numbers are in line with expectations, but still robust. Domestic orders were reported to be expanding at a growth rate of 19%. Export orders continue to grow, even though growth is slowing down (+17%).

Source: Pixabay

397 manufacturing companies from the UK took part in the July 2017 CBI Quarterly Industrial Trends Survey.

18% of firms said they were more optimistic about the general business situation than three months ago while 13% were less optimistic, returning a balance of +5%. Optimism about export prospects for the year ahead grew (+13%) at a solid pace, the CBI survey reports.

"Output growth among UK manufacturers is the highest we've seen since the mid-1990s, prompting the strongest hiring spree we've seen in the last three years. Cost pressures are easing and firms are upbeat about the outlook for export orders," said Rain Newton-Smith, CBI Chief Economist.

"It's great to see the benefits from the decline in sterling for UK exporters feeding through. But the flipside is the broader hit to consumer spending power across the economy from stronger inflation, which is likely to have fuelled the slowdown in the economy in Q1 and is expected to pull down growth in Q2."

The expectations for the following period are very optimistic as well. With a plus of 16%, expectations for domestic order growth are the most upbeat since April 2015, the survey reports. Expectations in export orders are also remarkably high (+37%). Expectations for output growth are high as well at +28%. Additionally, the respondents also expect an increase in investment in training and retraining.

cbi.org.uk

Purmundus Challenge is looking for smart 3D printing technology

Germany – At the next Formnext powered by tct exhibition, the winners of the Purmundus Challenge will be announced. All entries will be on display at the trade fair in the Purmundus Challenge area. The winners will be announced at a ceremony scheduled for 16 November.

This year's Purmundus Challenge is themed "Fusion – 3D printing intelligently combined". The aim is to motivate innovative minds to share their ideas of 3D printed products, the organisers stated. According to Mesago, the challenge is geared toward designers, engineers and programmers, including those from universities, design agencies and studios, start-ups and SMEs.

Mesago announced that the competition will look for models that use 3D printing to present new possibilities in our daily lives. The main hurdle, according to the organisers, will be to come up with sensible ways to combine seemingly averse material characteristics and methods. The jury will also take into account the level of innovation, economic and social potential and design. Last year, first prize was won by Firstep, a prosthetic foot for children.

The year's awards include up to € 6,000 of prize money. Additionally, there will be other attractive prizes, the organisers announced. Submission deadline for this year's challenge is 30 September 2017.

purmundus-challenge.com

New sales manager

Management – The hot runner and control system provider PSG Plastic Service has a new sales manager for the DACH region since the beginning of July. PSG announced that he will be responsible for Germany, Austria and Switzerland (DACH). According to the company, he has an outstanding knowledge of the subject and sector.

Source: PSG Plastic Service

Responsible for the DACH region: Klaus Dieter Kapp

"We are very glad that we were able to obtain Mr Klaus Dieter Kapp for our company. He is a very experienced specialist," stated Udo Fuchslocher, CEO of PSG Plastic Service.

"Having him at the top of our competent and excellent sales team will allow us to strengthen our market position continuously and sustainably as well," Fuchslocher noted further.

PSG Plastic Service is known as a provider of hot runner, control, cooling and temperature control systems. The Germany-based company in Viernheim looks back on more than 50 years of experience.

psg-online.de

Polyurethane industry meets in Munich for the first time

The first edition of PSE Europe, International Exhibition for Polyurethane Solutions, ended with thoroughly positive results. From 27 – 29 June 2017, an international audience of industry experts was introduced to innovative applications and new developments in the PU sector at the MOC in Munich, Germany.

The organiser, Mack Brooks Exhibitions, reports a total of 1,069 trade visitors from 51 countries and 75 exhibiting companies from 16 countries: "We are delighted that Europe's new marketplace for the PU industry was successfully received by exhibitors and visitors alike. PSE Europe was designed to market the versatile material to a wider audience and demonstrate the potential of polyurethane for innovative applications in different industry sectors," says Nicola Hamann, Managing Director of the organiser, Mack Brooks Exhibitions. "The feedback we received from the exhibitors was very positive. They praised the show for its international audience and the expertise of the visitors they had met at their stands. Our exhibitors particularly valued the fact that they were able to meet a large number of new faces from many different industry sectors," explains Hamann.

A total of 75 exhibitors from 16 countries showcased a wide range of innovative PU applications and solutions. Leading exhibitor countries were Germany (45% of all exhibitors) and Italy. Other exhibitor countries and regions represented at the show were Austria, the Benelux, China, Eastern Europe, France, Great Britain, Japan, Spain, Switzerland and the USA.

With their machinery, systems and products on display, the exhibitors highlighted how the polymer empowers innovation in different applications, for sectors such as automotive, construction/insulation, furniture/bedding, electronics, packaging, footwear and medical devices. Visitors were introduced to raw materials, materials and semi-finished products as well as PU systems and processing machinery, equipment and services.

A total of 1,069 visitors came to PSE Europe 2017.

Source: Mack Brooks Exhibitions

Already many booth requests for the next PSE Europe

PSE Europe 2017 attracted a total of 1,069 international trade visitors from 51 countries. The majority of visitors came from Germany. However, a total of 47% of visitors had travelled to Munich from abroad. The Top-10 visitor countries at the show were Germany, Italy, Austria, Spain, Switzerland, Great Britain, Turkey, the Netherlands, France and Poland.

The conference programme of the event proved to be very popular and was well attended throughout the three days of the show. The programme gave visitors insights into the latest trends, innovative applications and new developments within the polyurethane industry. Equally well received was the Feature Area at PSE Europe 2017, a dedicated space within the exhibition hall, which bridged the gap between theory and practice and showcased impressive PU product innovations.

"We would like to thank all exhibitors who participated at this launch event with their impressive stands, and all visitors who attended PSE Europe 2017 to find out about the latest industry trends, source products and network with other industry specialists. We are delighted that the success of the show has also been confirmed by the registered interest in the next edition of the event. On-site in Munich, we have already received many stand requests for PSE Europe 2019, from existing exhibitors as well as new companies," concludes Hamann.

The next International Exhibition for Polyurethane Solutions is scheduled to take place from 25 to 27 June 2019 at the MOC in Munich, Germany.

pse-europe.com

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Booth 143
Hall FW

EMO
Hannover
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Rising investment and employment in the German plastics industry

Rosemarie Stahl

Kunststoffinformation KI reports an outstanding first half of the year for the German plastics industry. Some 61% of companies reported business development better than in the six months before. What's more, this development was not expected by half of the respondents.

An outstanding first half of 2017 has reported by the German information service Kunststoffinformation KI in its survey on the German plastics economy. According to the survey, the high expectations for this period were even exceeded. Expectations are positive for the upcoming six month period thanks to the upward trend in the development of exports, investment and employment.

The information service KI has published this survey biannually since 2001. For the survey, executives of 445 companies answered questions on business, investment and employment.

Some 61% of the companies reported an improvement compared to the second half of 2016. Only 51% had expected this development at the beginning of 2017. Also, the share of companies that reported declining business development was lower than expected at 9%. On KI's own scale, the KI Development Index (KI Entwicklungsindex), the period reached 118 points – the highest score in six years. The positive mood in the German plastics industry is also reflected in the investment numbers: 28% of respondents corrected their plans during the first half-year. According to KI, this is a unusually high number. Only 6% of the companies cut their planned expenditures, KI reports.

Moreover, for the last five years, employment has been consistently positive. During the last six months, 44% of the companies increased their number of employees, increasing by 11% compared to the year prior.

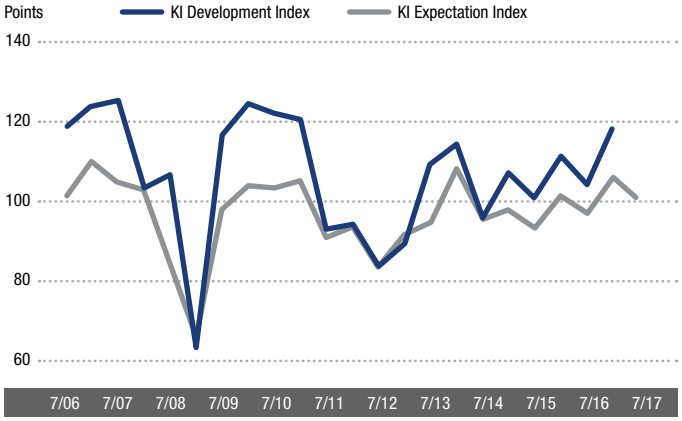
Optimism for the remaining year

According to the survey, positive development will continue for the next six months. One third of the companies are planning further recruitment. Only 7% plan to cut their number of employees. KI therefore expects the next year to break the records again.

Even though expectations were high, the development in the last half-year period showed that the German plastics industry is strong. If the economic situation continues at this rate of growth, the expectations for the end of the year will be exceeded as well, KI reports.

Plastics economy: Expectations and development

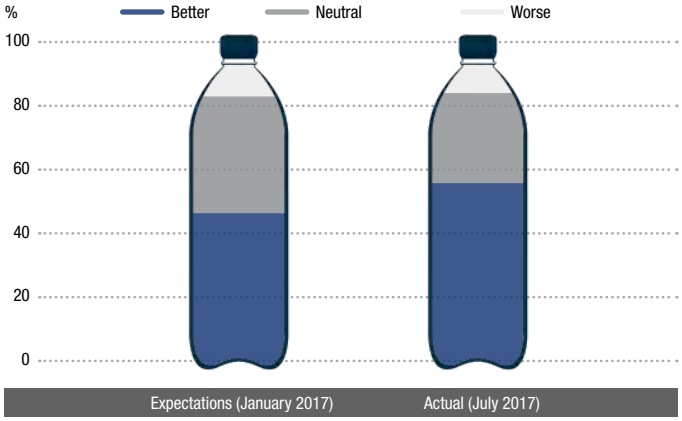
2006–2017, German-speaking sector (KI Dialog-Survey)



The prospects for the next periods are very good. The current expectations for the next six months may be exceeded again, KI reports. The Development Index indicates an ongoing positive trend for the German plastics industry. At 118 points, this is the highest score the index has reached in the last six years. (Source: KI Dialog)

Plastics industry: Business development

1st half-year period of 2017 vs. 2nd half-year period of 2016



The results of KI's survey show that the high expectations for the first half-year period have been exceeded. Only 51% of the correspondent companies had expected this at the beginning of 2017. Nine percent reported a negative business development for this period, a little bit less than expected. (Source: KI Dialog)

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Beautiful summer weather and a good atmosphere welcomed the visitors of Moulding Expo 2017 in May.

Source: Stahl

Exhibitors affirm the successful concept of Moulding Expo

Rosemarie Stahl

The second edition of the international trade fair for tool pattern and model-making in Stuttgart was a successful show. According to the organisers, 14,000 visitors found their way to the four exhibition halls in southern Germany. For the organisers, this means that they achieved their main goal: Tool, pattern and mould-makers have a home in Stuttgart.

Messe Stuttgart has published the final numbers of this year's MEX, as it is often called nowadays. The trade fair has not made a huge leap since the first Moulding Expo in 2015, but the results are still satisfying for the organisers: "I have never experienced a trade fair which has become established so quickly and at such a high level among exhibitors. I had the impression that the visitors wanted to really absorb the programme items. We have given the tool, pattern and mould-making industry a home," enthused Ulrich Kromer von Baerle, President of Messe Stuttgart.

With 763 exhibitors attracting more than 14,000 visitors from all over Germany, Europe and the rest of the world to Stuttgart, the trade fair has established itself as the most important European meeting point for the tool, pattern and mould-making industry, reports Messe Stuttgart. As every leading supplier in the industry presented their products and services, MEX underlined its status as a trade fair by the industry for the industry, Messe Stuttgart explained.

Thomas Seul, President of the Association of German Tool and Mould Makers (VDWF), was also very pleased with the trade fair: "Moulding Expo 2017 was a fantastic event. Here at the VDWF, we worked hard in the run-up to the trade fair. We discovered that it was precisely the right path we had taken three years ago when our members voted on whether the VDWF should become a promotional supporter of Moulding Expo. Moulding Expo will be the leading trade fair in future and will also continue to develop into an international platform for tool and mould-making. I am already looking for-

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Moulding Expo 2017 in numbers

An overview of the figures as stated by Messe Stuttgart:

Exhibitors:
- 763 companies, including 530 from Germany, 233 from abroad, occupying a net exhibition area of 21,620 m² (gross: 42,000 m²)

Exhibition areas:
- Tool, pattern and mould-making (39%)
- Contract manufacturing and services (25%)
- Machine tools, measuring technology and special machines (24%)
- Components and accessories (19%)
- Software (13%)
- Systems for additive manufacturing (3%)

Visitors:
- 14,015 visitors,
- 14% from abroad (Austria (15%), Switzerland (13%), Italy (10%), Turkey (7%), Czech Republic (6%))

Industries of visitors:
- Automotive and automotive component supply industry (41%)
- Tool construction and mould making (29%)
- Mechanical engineering and plant construction (23%)
- Plastics industry (15%)
- Pattern-making and prototyping (11%)
- Metalworking and processing industry, and metal production (11%)

ward to MEX 2019 and am certain that it will again be a total success."

His colleague, Managing Director of the Precision Tool Association of the German Engineering Federation (VDMA), Markus Heseding, is sure that Moulding Expo 2017 was even more attractive for visitors thanks to the increased internationality. "The slight increase in the number of visitors showed us that this toolmaking trade fair is also well received by the visitors as an individual event. The quality of the discussions was highlighted by the exhibitors. This is especially pleasing for us as a promotional supporter. Our members are hoping that the number of visitors will increase again in 2019."

Ulrich Kromer von Bearle has drawn a conclusion for the future: "The positive response from all participants and the visibly positive mood in the industry are reason enough for Messe Stuttgart to start looking forward to the third edition of Moulding Expo in May/June 2019."

After MEX 2017 is before MEX 2019

The sector can be sure that Messe Stuttgart will be working on the next edition as soon as possible. No sooner had MEX 2017 finished at Messe Stuttgart than the preparations for the third edition of the trade fair began. The trade fair organisers have resolved to continue establishing Moulding Expo as the leading European trade fair for the industry. "We are pleased that our still young trade fair is now already a permanent fixture in the calendar of European tool, pattern and mould makers," said Ulrich Kromer von Baerle. He also clearly defined the next steps: "MEX 2017 has strengthened our conviction that we are on the right path together with the industry. However, organising trade fairs also means that we must continually develop and learn. We will therefore meet with the advisory board in autumn and determine the key topics and date of Moulding Expo 2019."

messe-stuttgart.de

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A highlight event: For the celebration of their 25th anniversary, VDWF, the Association of German Tool and Mould Makers, was visited by the Premier of the State of Baden-Württemberg, Winfried Kretschmann. During his visit, Professor Steffen Ritter (left) had the chance to explain to him his idea of the Polyman.

Source: Stahl

Hands on Tooling 4.0

Dr. Wolfgang Boos,
Dr. Michael Salmen,
Advan Begovic,
Jens Helbig

Toolmaking has a special position in the production process because, in most cases, the toolmaker is not the one who sells the final product that is produced using his tools. The interconnection of the individual production steps is therefore an essential challenge.

Source: ©grapestock - stock.adobe.com / Fotolia.com

At the beginning of the digital transformation stands the task to interconnect toolmaking processes.

Time-to-market, quality, costs and innovation – these requirements determine the current challenges of the manufacturing industry. Both product development and series production are affected by these challenges. Due to the fact that the process chain of toolmaking is centrally located between product development and series production, its impact on the manufacturing industry is high. For this reason, the tool and die industry has the ability to support the manufacturing industry in addressing its challenges significantly. On the one hand, tool shops need to manufacture tools cost-efficiently, in the right quality and with short lead times to realise short times-to-market. Therefore, the tool and die industry can enable competitive series production. On the other hand, the tool and die industry has the ability to consult product development in developing product and process innovations. As a result, the challenges of the tool and die industry correspond to the challenges of the manufacturing industry in terms of time, quality, costs and innovation. The mega-trend of Industry 4.0 opens up numerous opportunities to meet these challenges, which are covered in the vision of Tooling 4.0.

Tooling 4.0 applications

The vision of Tooling 4.0 follows the approach of toolmaking, being highly interconnected. Therefore, four action fields need to be addressed. The Smart Shopfloor uses the possibilities of real-time data analysis, a visualisation of real objects in a virtual environment and human-machine-interactions to create a transparent and efficient manufacturing process. Smart Innovation is based on iterative development loops and the use of simulation, rapid prototyping, innovation networks and other platforms. The Smart Organization focuses on organisational learning, networking of employees and a creativity-supporting working culture. Smart Solutions include both Smart Tools and Smart Services. This action field has the main purpose of satisfying the customer requirements placed by the manufacturing industry.

A research study of WBA Aachener Werkzeugbau Akademie (Smart Tooling, 2016) illustrates that 83% of the interviewed tool shops highly value the potential of Tooling 4.0 applications in the tool and die industry. Even though many existing tool shops have recognised the potential and the improvements that can be realised by Tooling 4.0, practical experiences show that only a few tool shops have actively implemented innovative applications. However, initial Tooling 4.0 applications have been developed and built up as prototypes or demonstrators at WBA Aachener Werkzeugbau Akademie, which concentrates on the development of Tooling 4.0 applications. In the following, some innovative Tooling 4.0 applications are introduced.

Automatic data capture on the Smart Shopfloor

The processes on a tool shop's shopfloor are complex due to the one-off production of tools. By reason of manufacturing many components for the fabrication of a single tool, there is a big challenge to maintain the overview of the work in progress on the shopfloor. Therefore, many tool shops have implemented an ERP system to track data in terms of operating times, waiting times and idle times. In many tool shops, manual data capture is current practice. Employees document the actual machining times on a job card and every couple of days an employee of the work preparation department

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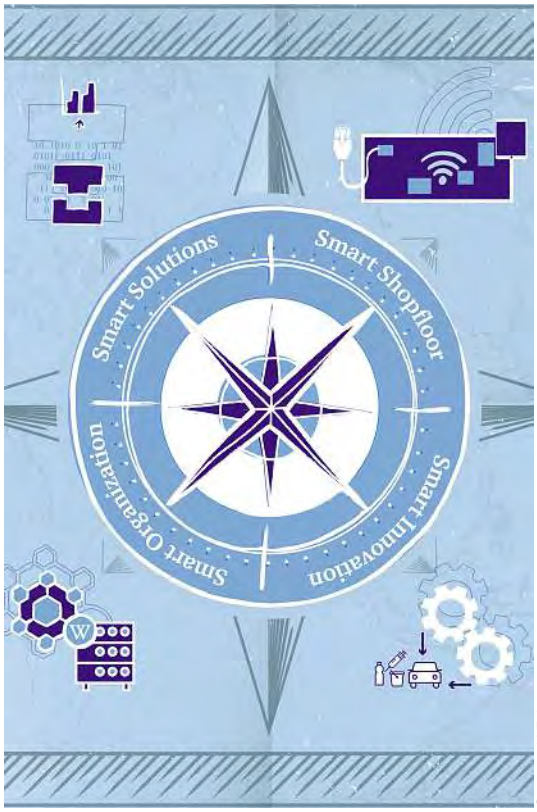
WBA Aachener Werkzeugbau Akademie

WBA Aachener Werkzeugbau Akademie is the leading partner of the tool and die industry in customer-oriented consulting. WBA offers professional development for junior and executive staff, applied research and business networking. As a platform for the tool and die industry, WBA operates at the interface between research and industry. Located in Aachen (Germany), WBA profits from the knowledge of the institutes of RWTH Aachen University, the Laboratory for Machine Tools and Production Engineering (WZL) and also from the Fraunhofer Institute for Production Technology IPT, both located in Aachen as well.

transfers this data to the ERP system. Even though systematic data tracking is used, the accuracy of the captured data cannot be guaranteed and the ERP system cannot be applied effectively. Furthermore, data capture itself requires a high effort.

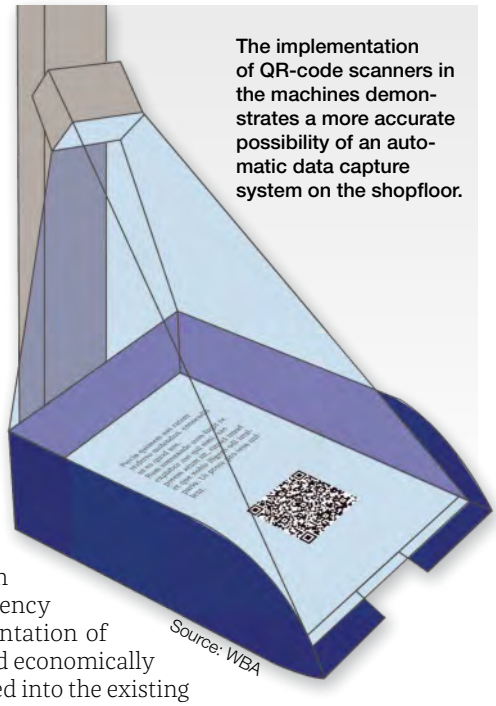
The implementation of QR-code scanners in the machines demonstrates a more accurate possibility of an automatic data capture system on the shopfloor. At the beginning of an operation at the machine, a job-related job card must be placed in the corresponding field of the QR-code scanner by



Source: WBA

The four action fields of Tooling 4.0: Smart Solutions, Smart Shopfloor, Smart Organization and Smart Innovation.

the responsible machinist. The measurement of the operation times starts simultaneously and is automatically connected to the ERP system in real time by a standardised interface. After the machining process is completed, the machinist stops the measurement of operation times by the use of the integrated touchscreen. By this means, operating times, idle times and waiting times can be analysed and databases optimised. Additionally, the captured data can be used as input for project planning and cost calculations. This real-time data capture improves the data's accuracy and makes it possible to track the current status of each component for higher transparency on the shopfloor. The implementation of QR-code scanners can be realised economically with simple means and integrated into the existing ERP or PPS system by corresponding system manufacturers.



Source: WBA

The implementation of QR-code scanners in the machines demonstrates a more accurate possibility of an automatic data capture system on the shopfloor.

Smart Innovation by similarity analysis

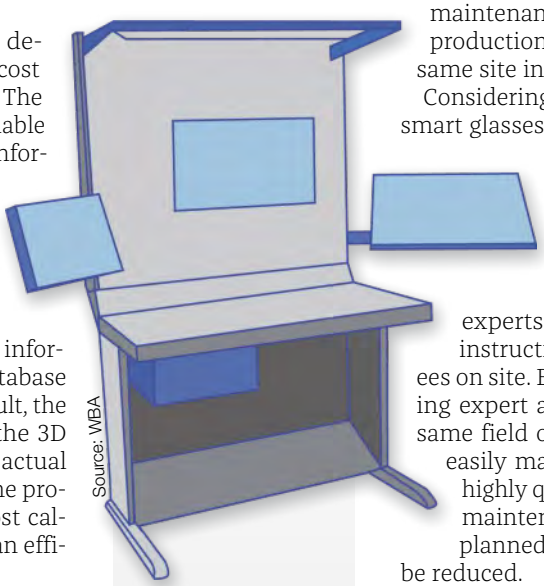
In the order fulfillment process, tool shops spend in average 3.5 hours for offer preparation. On average, tool shops prepare 443 offers a year, which result in 1,550 hours of offer preparation a year. Nevertheless, 21% of incoming orders overrun their budget. In many tool shops there is a moderate quality of planning and scheduling, which results in low due-date reliability. Furthermore, the effort for designing new tools is high.

A similarity analysis can minimise the described effort and increase the accuracy of cost calculations and planning and scheduling. The idea of a similarity analysis is to analyse available product information and synchronise this information with a tooling database based on a software. The input for the synchronisation is the product's CAD model. Additional product information like product material, planned production quantities and product tolerances are taken into account. Based on the CAD model and the provided information, the software screens the tooling database regarding the defined requirements. As a result, the software provides recommendations for the 3D model, a rough cost calculation as well as actual operating times of appropriate past tools. The provided data enables efficient and reliable cost calculations and capacity planning as well as an efficient design phase.

Digitalised assembly instruction for knowledge transfer

Every tool is unique. Consequently, tool assembly is a complex and knowledge-intensive procedure. Due to the tools' complexity, it is a challenge to find qualified toolmakers for the assembly and qualification of tools. Furthermore, 34% of the errors that occur during the order fulfilment process are identified in the assembly process.

The addressing of these challenges can be improved by implementing digital assembly benches. The digital assembly bench combines new technologies from the field of augmented reality (AR), such as smart glasses and CAD viewers, with the conventional assembly bench. Based on the tools' 3D model, the assembly process is simulated and can be downloaded by the employees. The simulation of the assembly process provides stepwise and visualised instructions of the tool assembly. Experienced toolmakers can also record and share their knowledge in a database. New employees or trainees can access the recommendations and can benefit from the digitalised knowledge of the experienced toolmakers. In case of illness or retirement, the assembly can be continued without a loss of knowledge and job rotation can be easily realised. Furthermore, the digital support enables the assembly to record detected mistakes and make them visible to everyone who is involved in the product development process. This form of feedback supports continuous improvement processes and facilitates the identification of key learnings. In addition, the visualisation of assembly instructions enables an accelerated assembly process and improves the error feedback between the involved departments.



Source: WBA

The digital assembly bench combines new technologies from the field of augmented reality (AR), such as smart glasses and CAD viewers, with the conventional assembly bench.

Augmented reality to enable Smart Solutions

The most important benefit that can be brought to the tool shop's customer is constantly running series production. For this reason, innovative tool shops do not only provide tools, they also offer an integrated tooling service that includes consulting, technical support as well as preventive repair and maintenance. However, the tool shop and the production plant are usually not located at the same site in a global production network.

Considering that, augmented reality in terms of smart glasses can be used for an improvement of downstream services. Smart glasses are wearable computers that add information to the user's field of view. In case of urgent repairs or maintenance, smart glasses enable remote servicing. The tool shops' experts get the opportunity to give repair instructions via the Internet to local employees on site. By using smart glasses, both the tooling expert and the employee on site share the same field of view and technical advice can be easily marked in both directions. As a result, highly qualified personnel for tool repairs and maintenance is not required on site. The unplanned downtime of series production can be reduced.

The tool and die industry can address its challenges regarding time, quality, costs and innovation by implementing the vision of Tooling 4.0. Although many tool shops have recognised the potential of Tooling 4.0, the practical implementation of innovative applications is moderate. The described applications illustrate selected possibilities for an implementation of the vision of Tooling 4.0.

werkzeugbau-akademie.de

The seminar topic at EMO will be the global economic and technological trends in the machine tool industry, with a focus on USA and Mexico.

Source: ©Onur - stock.adobe.com / Fotolia.com

USA and Mexico – The future of the industry

Since the election of Donald Trump as the President of the United States, insecurities regarding future trade and business opportunities with Mexico and USA have been on the rise. Many associations addressed these worries in their forecasts for 2017. How have the markets developed since then and how is business possible in the future? These questions will be answered in a seminar at EMO 2017 organised by the VDW.

Once, these American markets were big markets for European companies. But since the end of last year, optimism has dropped. The insecurity regarding the future of these two countries is worrying European investors. A seminar organised by the VDW at EMO 2017 will address these concerns.

USA and Mexico were major beacons of hope for international manufacturers of production technology: the USA with its re-industrialisation programme, and Mexico, which had evolved into one of the world's most important automaking locations. But since the beginning of this year at the latest, industry representatives all around the globe have been wondering where the U.S. economy is heading, and what is to become of its southern neighbour, Mexico. The VDW (German Machine Tool Builders' Association) will be investigating these questions as part of its Metalworking Growth seminar on 21 September 2017 at the EMO Hannover. After all, last year, the USA was the second-biggest market for machine tools worldwide, with Mexico ranking 7th. "For addressing our highly topical seminar theme, we're partnering with Gardner Business Media, a company possessing excellent knowledge of both these markets," reports Dr. Wilfried Schäfer, Executive Director of the EMO's organiser, VDW. Soundly based expert information, he continues, is indispensable to every corporate leader from the manufacturing sector doing business with these two countries. It's all the more valuable when the experts concerned are able to base their assessments and appraisals on how the situation is actually viewed from within these two markets.

Travis Egan, the publisher of the Modern Machine Shop trade periodical, takes an optimistic stance. He perceives a highly upbeat mood among the manufacturers in both these countries, and promises good business opportunities for every vendor able to utilise this optimistic atmosphere in his favour. The figures issued for the German machine tool industry's first quarter, for example, prove him right: German exports to the USA have increased by 16 percent, with exports to Mexico up by more than one third. "Needless to say, this trend has its roots in last year's order bookings," explains Dr. Schäfer. The many large-scale orders in project business with these two countries' automotive industries have ensured high growth rates. But in Mexico, at least, order activity slumped considerably during the year's first quarter, whereas order intake in the USA continues to be buoyant.

What will be addressed in the EMO's seminar is the ongoing global economic and technological trends in the machine tool industry, with a particular focus on the USA and Mexico. Steve Kline Jr., Director of Market Intelligence at Gardner Business Media (GBM), will provide information on the investment plans of U.S. companies, right through to certain technologies which have been identified as primary targets for purchasers. For almost ten years now, Steve Kline has been drawing up market studies in the capital-goods industry, and heading the Capital Spending Survey and the Gardner Business Index, to name just two benchmark indicators he's in charge of.

Source: Gardner Business Media

"Much of the boost is coming primarily from the relatively small companies that are seeing major opportunities in the application of new technologies like additive manufacturing."

Pete Zelinski, Senior Editor of the Modern Machine Shop trade periodical

AT A GLANCE

Seminar Programme

Metalworking Growth Seminar – An overview of the trends in metalworking in the USA and Mexico

When: Thursday, 21 September 2017, 9:00 to 11:00 am
Where: Hanover Exhibition Grounds, Convention Centre
Seminar language: English
Attendance fee: EUR 85.00 plus VAT
Programme:
10:00 am Welcome
(Dr. Wilfried Schäfer, VDW)
10:05 am Trends in the international machine tool market, with a particular focus on the USA and Mexico (Steve Kline Jr., Gardner Business Media)
10:40 am Technical trends in the US machine tool industry (Pete Zelinsky, Modern Machine Shop)
11:10 am The machine tool industry in Mexico: opportunities and challenges (Claude Mas, Modern Machine Shop Mexico)
11:40 am Discussion
12:00 pm Ending with a snack

Theodora Laser, VDW, Phone +49 69 756081-21, t.laser@vdw.de
emo-hannover.de/conferences

Pete Zelinski, the Senior Editor of the Modern Machine Shop trade periodical, is devoting a lot of attention to technical developments, and quickly goes into downright raptures: "Ever since I started working, this is the most exciting time I've experienced for the USA's industrial sector. Much of the boost is coming primarily from the relatively small companies that are seeing major opportunities in the application of new technologies like additive manufacturing."

Major opportunities for selling production technology in Mexico

In Mexico, by contrast, what's needed are some long-term strategies. That's the verdict of Claude Mas, the publisher of the Modern Machine Shop Mexico trade periodical. He sees major sales potential here, because a Mexican middle class with ample purchasing power is in the process of emerging. "Given an annual economic growth of between four and five percent, Mexico's baby boomers will over the next 20 years be in the market for high-quality consumer goods, which could also be produced in the country itself," is his firm conviction. So far, only 20 percent of Mexican production output is being sold at home. So a higher level of domestic demand, he continues, offers major opportunities for selling production technology.

"In the times we're living through at the moment, highly eventful and turbulent as they are, where politicians on the other side of the Atlantic are questioning the retention of free trade, it's all the more important to analyse the real conditions on the spot, time and again," says Dr. Schäfer of the VDW. "For this, there is no forum better suited than the EMO Hannover, because it's there that many top-flight international production experts meet up for exchanging news and views and for discussing trends and challenges."

emo-hannover.de

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The VDW (the German Tool Builders' Association) was founded in 1891. Today, it has around 120 member companies. The association offers advice and knowledge transfer. It represents the German industry's interests to legislators, authorities, clients and the public.

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South Africa _ Spain _ Sweden _ Taiwan _ Thailand _ Turkey _ Ukraine _ United Arab Emirates _ United Kingdom _ U.S.A. _ Vietnam

Time for EMO

In September, the EMO Hanover, trade fair for the metalworking industry, will be held again after a four-year break. The trade fair is already heading towards another huge growth this year.

Rosemarie Stahl

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Highlights of EMO Hanover 2017

Facts 2013

Source: emo-hannover.de / Graphic design Vogel Design Werkstatt

Source: Deutsche Messe

EMO is one of the big ones, the world's largest trade fair for metal-working. The last time it was held in Hanover was 2013, due to its unique location plan. The last EMO was held in Milan, Italy, in 2015. This year, it is back in Germany and offers a huge variety of seminars, conferences and events to attend.

The programme is clearly oriented at trends in manufacturing. Besides a conference on additive manufacturing, the topics of digitalisation and Industry 4.0 are the main focusses of the trade fair. While many exhibitors have examples of these trends on show at their booths, associations also pick up these topics for their forums and symposiums. Additionally, visitors can take part in guided tours to learn more on modern manufacturing technologies.

Translating the Industry 4.0 concept into reality

Industry 4.0 is progressively emerging as the crucial factor in the race for leading-edge technology and market shares in the future. And time is running out for German machinery and plant manufacturers. On one side of the world is the USA, with its exceptional software competence and, not least, its digital entrepreneurship in terms of new business models. On the other side of the globe is China, which with its "Made in China 2025" and "Internet Plus" programmes is channelling substantial resources into digital transformation. So despite the good starting position that German companies have created for themselves, they would be well advised not to rest on their laurels.

The German Mechanical Engineering Industry Association's (VDMA) Metrological and Testing Technology and High-Precision Tools section will accordingly be spotlighting ideas and products from the Industry 4.0 environment. At the VDMA's stand (Hall 4 / D44), member companies and partners from the research community will from 19 to 21 September be contributing 30 brief presentations, focusing primarily on high-precision tools, metrological and testing technology, research, and tool data interchange.

"At the VDMA forum, we shall be aiming to show what solutions our sectors are offering in order to translate the concept of Industry 4.0 into shop-floor reality," explains Markus Heseding, Executive Director of the two associations. "We already have a good track record with a forum of this kind, and are looking forward to a high attendance."

Specifically, the "Innovative Solutions for Industry 4.0" event will be informing its participants on issues like intelligent clamping systems and how production processes can be simulated by networking tools and software, and how to monitor tool life-cycles and reduce costs.

Another event will also deal with the concept of Industry 4.0: For the first time, EMO Hanover will see a research symposium. The VDW (German Machine Tool Builder's Association) teams up with the WGP (German Academic Society for Production Engineering) to inform on and discuss the topics of Industry 4.0 and digitalisation under the heading "Production of Tomorrow". On 21 September 2017 at the EMO Hannover, the Production for Tomorrow symposium will be taking a look at the future of production. "With this symposium, we are aiming quite deliberately to draw attention to precisely those innovations that will guarantee the high-end quality of machine tools for the years ahead as well, irrespective of network thinking," emphasises Prof. Eberhard Abele, President of the WGP – a grouping of leading German mechanical engineering professors. Professor Abele will hold the keynote speech themed "Production Technology in 2025 – Challenges and Opportunities".

Source: PTW

The future of production is a connected one. The fair aims to close the gap between science and practice, for example, with the research symposium on the production of tomorrow.

Entrepeneurship has its own place at EMO

The rapid technological change is accompanied by the founding of new companies. Young entrepreneurs are, for example, developing software for networking machines and processes, building 3D printers for metal parts, or making existing systems and components ready for Industry 4.0. They start companies from research projects at universities or open up a company on their own.

EMO Hannover 2017 wants to give companies with revenue of up to 10 million euro a platform entitled Start-ups for Intelligent Production. The objective is to support young companies in marketing their innovations. With fresh ideas and new products or services, they are also sought-after business partners for many established providers.

The shared booth is supported by the Federal Ministry for Economic Affairs and Energy (BMWi).

Nowadays, metal-working does not only mean machine tool processes. Additive manufacturing is still a growing sector. While these alternative processes offer

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UPSHOT

EMO Hanover 2017 offers a programme that includes topics relevant to every trade fair visitor.

Rosemarie Stahl
Editor

ETMM

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Are machine tools safe?

The safety of machine tools is a major issue. Complex machinery, high speeds and high power levels can be a dangerous mixture for the operator. Nevertheless, machine tools are very safe products. At the Safety Day for Machine Tools at EMO Hannover 2017, top experts will present their insights on the requirements and challenges entailed by the current state of the art, mapping out how practical solutions ensure high levels of safety and elucidating what remains to be done in the future.

It is a remarkable story: "For many decades, our companies have proven that they can handle the risks that come with the operation of machine tools," explains Heinrich Mödden, a machinery safety expert at the EMO organiser, VDW (German Machine Tool Builders' Association). Certainly, there is a lot of work still needed, but, as Mr. Mödden continues, "it pays off, as the number of accidents is continuously declining." This shows that a high level of safety has already been achieved with traditional design practices.

Safety Day for Machine Tools: Tuesday, 19 September 2017, 10:00 am to 2:00 pm, Hanover Exhibition Grounds, Convention Centre

a variety of new possibilities starting from individualisation to small-batch production, traditional production technology is not yet outdated. Most of EMO's exhibitions still involve the classic machine tool. Nevertheless, additive manufacturing plays a growing role at this trade fair as well.

Additive Manufacturing is the icing on the cake

In the meantime, many manufacturers struggle to adapt to the new technology. As Carl Fruth, Managing Board Chairman of FIT, explains: "There are a large number of delicate seedlings. Many of our customers would like to use additive technologies to manufacture replacements for existing components. But this is possible only in a very few cases. Usually, a new component has to be developed and very often the adjoining components of the system as well. Firstly, many companies are deterred by the outlay involved, and secondly, of course, you need specialised development competence for this new production technology."

At EMO Hanover, visitors have the chance to get information on additive technologies at two events. The first will be held on 20 September: The Additive Manufacturing Working Group of VDMA organises a conference themed "Opportunities and perspectives for additive manufacturing". The second one will be the "International Conference on Additive Manufacturing", hosted by Cecimo, the European Association of Machine Tool Industries. The conference will be held on 21 September at the Hanover Convention Centre.

Source: Uwe Noelke

"At the VDMA forum, we shall be aiming to show what solutions our sectors are offering in order to translate the concept of Industry 4.0 into shop-floor reality," explains Markus Heseding, Executive Director of the German Mechanical Engineering Industry Association's Metrological and Testing Technology and High-Precision Tools section.

A clear overview of selected topics on guided tours

A trade fair as huge as EMO Hanover can easily overwhelm visitors. The 2,100 exhibitors cannot be visited even in six days. To make it easier for visitors to find those highlights of special interest to them, there are guided tours. According to the organiser, EMO Guided Tours guarantee that visitors see the highlights of their special area of interest.

The tours will last around two hours. Part of the tours are presentations by exhibitors. These demonstrations at the exhibitors' booths are planned to take roughly 15 minutes. During these presentations, exhibitors will present their innovations and solutions.

The tours will be oriented at main topics of the metal-working sector. One tour will focus on connecting systems for intelligent production. According to the organiser, machine tools and systems for the metal-working sector are of great importance for Industry 4.0 roadmaps. For visitors interested in the opportunities of the digital production, this tour also offers a stop at the special exhibit on "Industry 4.0".

For visitors who are mainly interested in high-efficiency manufacturing, the guided tour on high performance and high efficiency might be the right starting point for their trade fair visit. As key topics for serial production, these topics are the main focus of a tour about process design, dynamic automation and intelligent quality control.

The future of manufacturing will be the subject of a third guided tour at EMO. It deals particularly with modern trends in manufacturing, from additive manufacturing and hybrid manufacturing systems to new cutting technologies, CAD/CAM solutions for generative processes and scanners for reverse engineering.

Apart from these guided tours, Deutsche Messe also offers personalised tours.

Opening ceremony with big names of politics

Germany President Frank-Walter Steinmeier will be ceremonially opening EMO Hannover 2017. The opening ceremony on 18 September is scheduled to last about an hour.

Besides Frank-Walter Steinmeier, Lower Saxony Prime Minister Stephan Weil and CECIMO President Luigi Galdabini will also be speaking at the ceremony. After this, the President will be taking an

Source: Deutsche Messe

"The paramount tasks for manufacturers and users of machine tools are entailed by digitalisation."

Carl Martin Welcker, EMO's General Commissioner and VDMA President

Source: Manfred Weis

Professor Eberhard Abele, President of WGP, will hold the keynote of the Production for Tomorrow symposium, titled "Production Technology in 2025 – Challenges and Opportunities".

Source: FIT AG

For Carl Fruth, Managing Board Chairman of FIT AG, the days of traditional machine tool manufacturing are not over.

extensive tour of the fair. "We shall be demonstrating to the President the performative and innovative capabilities of our sector, and the range of solutions we offer in the environment of digitisation," stated Carl Martin Welcker, General Commissioner of EMO Hannover.

The upcoming EMO Hanover 2019 will be held from 16 to 21 September.

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EMO 2017 at a glance

EMO Hannover is the leading trade fair for the metalworking sector. It brings together users and manufacturers from all continents.

At the last EMO Hannover in 2013, around 60% of the exhibitors came from abroad, adding up to a total of 43 home countries. The 145,000 visitors came from over 100 different nations, making the EMO Hannover the premier trade fair for the international metalworking industry.

The topics presented in Hanover cover all important production areas:

- Machine tools
- Additive Manufacturing
- Other machines
- Precision tools
- Parts, components, accessories
- Software, manufacturing and process automation
- Metrology and quality assurance
- Services

The EMO Hannover is organised by the German Machine Tool Builders' Association (VDW), located in Frankfurt am Main, on behalf of the European Association of Machine Tool Industries, Cecimo.

Opening hours: 18 - 23 September 2017 (Monday - Saturday), daily from 9 a.m. to 6 p.m.
Place: Messe Hannover
Ticket Prices: Day Ticket: €35 (advance sale)/€52 (on site)
Reduced Admission: €12 (on site)
Full-Event Ticket: €65 (advance sale)/€89 (on site)

emo-hannover.de

Digital challenges at the EMO Hannover

Nikolaus Fecht

Despite fantastic digital opportunities, Prof. Dr.-Ing. Frank Barthelmä is certain of one thing: Without more openness in the machine tool industry, the digital Industry 4.0 concept is not going to pay off for small and mid-tier enterprises.

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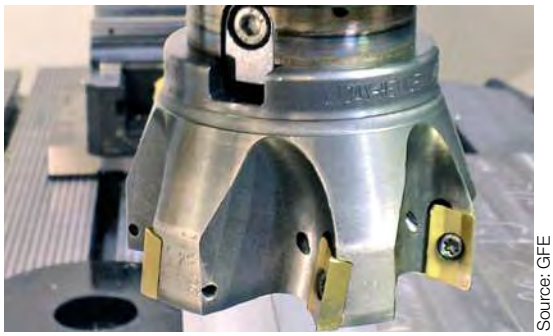
The German Society for Production Technology and Development GFE develops, improves and implements processes, products and systems, from initial conception all the way to small-series production. The focus here is always on the tool and its machining technology.

His belief is reason enough for the Thuringian-born tool expert and Executive Director and Institute Manager of the German Society for Production Technology and Development (GFE – Gesellschaft für Fertigungstechnik und Entwicklung Schmalkalden e.V.) to use the EMO Hannover 2017 not only for acquiring information, but also for recruiting co-campaigners for digital networking.

Professor Barthelmä, how is the trend towards Industry 4.0 influencing metal-cutting applications?

Industry 4.0 is influencing the process chain in two ways, firstly in terms of technology and engineering, and secondly in terms of the data flowing along it. When both of these interact to optimum effect, we obtain a textbook example for Industry 4.0. This applies in regard to quality and disturbance variables, but also and increasingly to predictable parameters such as tool paths and tool lifetimes, achievable surface qualities, and for maintenance intervals for machines and lines. Ideally, users receive all important information on the entire spectrum of process-related factors. What's more, all data available can now be recorded and evaluated in real time, and control loops created, so as to upgrade the efficiency of the processes and the quality of the products involved thanks to more transparent metal-cutting.



Source: GFE

Looking into the future: At the EMO Hannover, the GFE will be showcasing the current status of digital matters as exemplified by the EU project entitled "Dyna-Tool – Enhanced Efficiency in Meta-Cutting Applications".

How far are intelligent tools already the state of the art?

If you remember: A bit more than ten years ago, there was an ongoing debate on whether or when a tool can be classed as intelligent. Nowadays, within the context of Industry 4.0, we are talking about intelligent holistic solutions, in which, of course, tool sensors and actuators play an important role. So when you say "state of the art", you're absolutely correct. Not only in terms of using increasingly miniaturised and more energy-efficient sensors or actuators in the tool itself, but also with a view to their utilisation in the overall system comprising the tool, the machine and its control system, and the application concerned.

But how can the multiplicity of data now being acquired be evaluated to optimum effect?

The answer to this is still in its infancy with many of our typical customers, the small and mid-tier companies. Many potential users of intelligent solutions of this kind, especially in these SMEs, are sometimes unable to assess what data they actu-

Source: GFE

"I would like to see even more shared projects with partners from the academic community and the industrial sector representing a highly disparate range of scientific disciplines, which elucidate questions not least with the aid of live demonstrators, for example."

Frank Barthelmä, Executive Director and Institute Manager of the German Society for Production Technology and Development (GFE – Gesellschaft für Fertigungstechnik und Entwicklung Schmalkalden e.V.):

ally need in order to render their technology/IT fit for purpose, and to generate from these new production lines when needed. This extends to new business models that may prove necessary. Universities and large corporations are already well advanced in this respect, whereas many of the small and mid-tier companies are still in the exploratory phase. For meaningful analysis, moreover, a comprehensive data history is required in order to correlate it with new key statistics. But what do we actually know about the technical wisdoms of our predecessors? So what we need here is even more collaboration between the academic and business communities when it comes to generating new ideas, models and, above all, new solutions. What I would like to see here, for instance, is more joint projects involving partners from the academic community and the industrial sector representing a highly disparate range of scientific disciplines, which elucidate these questions not least with the aid of live demonstrators, for example.

Doesn't that also mean that new network alliances have to be formed across the boundaries of sectoral and scientific specialisms – meaning collaboration between software analysts who understand nothing about metal-cutting, and metal-cutting experts who usually aren't all that familiar with big-data analytics?
Yes, but this is only going to work if the SMEs get involved at an early stage. The networks supported by the Federal Ministry of Economic Affairs, for instance, have proved well worthwhile in this context. For example, the GFE is currently a partner in the SME 4.0 Competence Centre of the Ilmenau University of Applied Science, and in a model factory is addressing problems encountered with data generation and data transfer in connection with metal-cutting – for transfer especially in SMEs. The question involved here is this: How can I utilise a control loop in the machine so as to ensure that quality, efficiency and productivity can serve as controlling target variables?

How does analysing the metal-cutting parameters make metal-cutting easier – in terms of new materials, for instance?
In the case of new materials, especially, it's becoming progressively more important to close the loop in the control circuits with the aid of analytics. There is still quite a bit of work to be done on the path to purposeful evaluation. There is room for improvement, too, in the transparency of the results. Here I would propose a pre-competition platform, accessible to manufacturers and users alike. I would like to see a data pool, so that everyone doesn't have to keep on re-inventing the wheel. As a role model, I would cite a front-ranking tool manufacturer who at the "Schmalkalden Tool Conference" in November of last year promised to be more proactive than previously in terms of data disclosure. It should be noted that it's worthwhile for a manufacturer if users learn which of his tools are best suited for efficiently machining new materials. Here, too, the GFE is making its own contribution with the SME 4.0 Competence Centre.

Is there a current highlight from your work?
Yes. The EU's "Dyna-Tool – Enhanced Efficiency in Metal-Cutting Applications" project, supported by the German Engineering Federation's Precision Tool Association and the research institute Forschungskuratorium Maschinenbau e.V., is tasked with investigating how vibration-stable metal-cutting processes can be designed using sensor technology in the tools and the tool holders. For this purpose, the GFE has within the framework of the project developed a sensor-integrated tool for hard machining, which thanks to direct integration in the machine's control enables the process to be controlled well-nigh in real-time. The Dyna-Tool consortium has succeeded in putting more transparency into the metal-cutting process, so that it can be kept within defined limits for low vibrations, but at the same time is able to exploit its performative potential to the full. What's more, we are currently examining the integration of high-resolution metrological devices in the tool, including an interface with the control system, so as to use this to create a real-time control loop. Anyone interested can learn more about this and other projects at the EMO Hannover and its forum entitled "Innovative Solutions for Industry 4.0", hosted by the German Engineering Federation's Precision Tool Association.

And what does the EMO Hannover 2017 mean for you in general; where is your informational focus?
I'm primarily interested in examples of best practice, not least in order to see where we still need to take action. In addition, I want to talk to other advocates of these ideas on more transparency, so as to already encourage them to practise mutual feedback or to give a presentation at a separate forum. I shall thus be attempting at the EMO Hannover, within the context of my networking activities, to gain additional co-campaigners for more openness and transparency in the sector.
gfe-net.de

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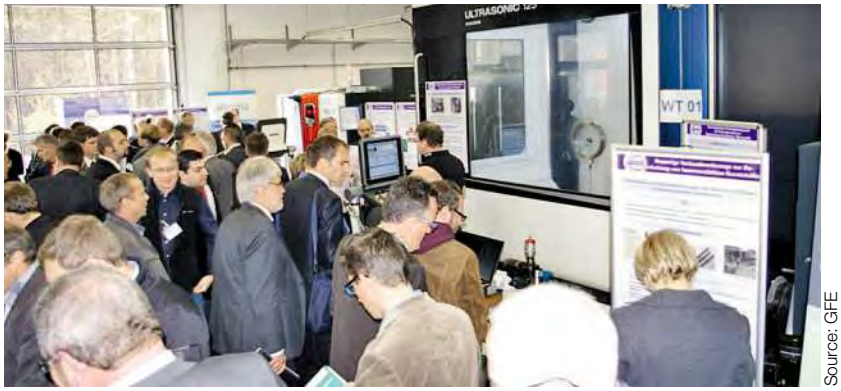
Innovative Solutions for Industry 4.0 Forum

When: 18–23 September 2017, EMO Hannover
Where: Hall 4
Organisation: German Engineering Federation's Precision Tool Association, http://pwz.vdma.org

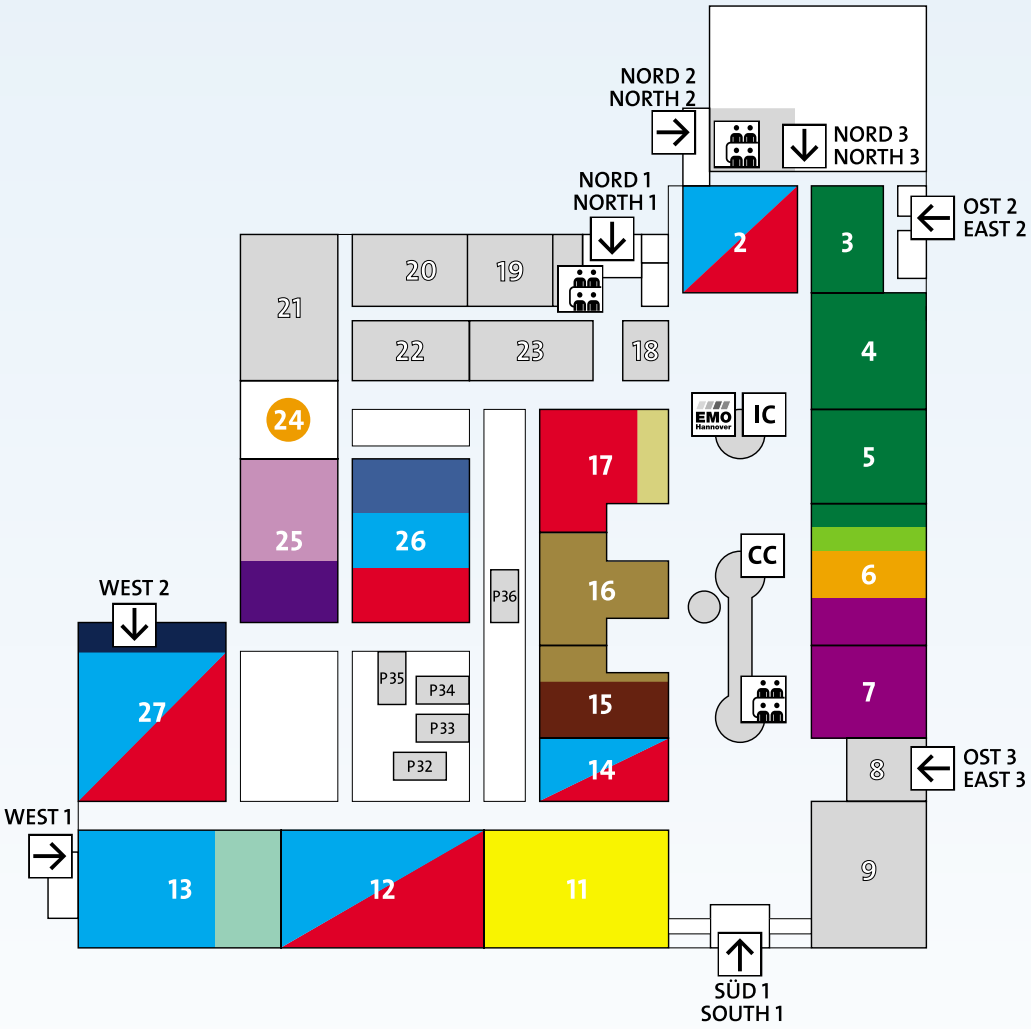
Alfred Graf Zedtwitz, Tel. +49 69 6603-1269, alfred.zedtwitz@vdma.org;
Bernt Ritz, Tel. +49 69 6603-1980, bernt.ritz@vdma.org



Source: GFE

Transferring ideas: Digital transformation is a difficult undertaking, especially for small and mid-tier companies. It may prove helpful for them to tackle the issue jointly in networks, as is the case here at the GFE in Schmalkalden.

EMO Hannover
18-23·9·2017



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	Company	Hall	Booth	Page
B	Berkenhoff GmbH	13	A96	25
C	CGTech Ltd.	25	D07	3, 62
	Cheto Corporation, S.A.	16	B12	15
	CNC Software Inc.	25	B04	7
D	DMG Mori Global Marketing GmbH	2	A21	7
	Dormer Pramet	3	A64	66
	DP Technology Europe	25	D25	37, 65
E	Exeron GmbH	27	F33	39
F	Fastems Systems GmbH	25	B60	36
	FMB Maschinenbau GmbH & Co. KG	17	A44	64
G	Gewefa UK Ltd.	5	B93	66
	GF Machining Solutions GmbH	27	B24	9, 42, 76
	GOM GmbH	6	B86	63
H	Haimer GmbH	4	E18	46
	Heun Werkzeugmaschinen & Industriebedarf GmbH	13	A102	35, 79
	HIG Handel mit Industriegütern Gesellschaft m.b.H.	13	D91	77
I	InovaTools Eckerle & Ertel GmbH	5	B54	55
	Iscar Ltd	4	E36	17, 59
J	Jakob Lach GmbH & Co. KG – Lach Diamant	4	D41	58
	Jones & Shipman Hardinge Ltd	11	C78	36
	Jongen Werkzeugtechnik GmbH	4	D18	67
K	Kaeser Kompressoren SE	12	A36	62
	Kern Microtechnik GmbH	12	D60	65
	Kennametal Inc.	3	E29	8
L	Licon MT GmbH & Co. KG	12	D04	39
	Liebherr-International Deutschland GmbH	26	A72	58
	LMT Tools	4	E70	1, 54
M	MachineWorks Ltd.	27	B73	67
	Mapal Dr. Kress KG Präzisionswerkzeuge	4	A18	7, 50
	Mazak Machine Tools	27	B56	38
	Meusburger Georg GmbH & Co. KG	5	E24	63
	Mikromat GmbH	11	B19	50
	Mikron Tool SA Agno	4	A74	66
	Mitsubishi Materials	5	D06	51
O	Oemeta Chemische Werke GmbH	6	F21	64
	Open Mind Technologies AG	25	A08	66
	OPS – Ingersoll Funkenerosion GmbH	12	D59	59
R	Reiden Technik AG	13	B53	37
	Renishaw plc	6 27	B46 A72	8, 53, 67
S	Samputensili	26	A56	36, 38
	Sarix SA	13	B90	79

Lathes (Halls 2, 12, 14, 16, 17, 26, 27)
Lathes and automatic lathes

Milling machines · Machining centres · Flexible manufacturing (Halls 2, 12, 13, 14, 26, 27)
Milling machines / Machining centres / Flexible manufacturing cells and systems

Transfer and special production machines · Unit heads (Hall 17)
Transfer and special production machines / Unit heads

Precision tools (Halls 3, 4, 5, 6)
Cutting tools / Clamping devices

Measuring technology and quality assurance (Hall 6)
Measuring and testing technology / Quality assurance

Tool grinding machines (Hall 6)
Tool grinding machines / Abrasive tools and products

Components · Coolants and lubricants · Waste disposal · Accessories (Halls 6, 7)
Mechanical, hydraulic and pneumatic components / Waste disposal / Cooling and lubrication / Workshop equipment / Accessories / Materials

EDM (Hall 13)
Electroerosive and abrasive machines

Grinding machines · Surface technology · Honing, lapping, polishing machines · Heat treatment (Hall 11)
Grinding machines / Abrasive tools and products / Machines and systems for use in surface technology / Honing, lapping, polishing and deburring machines / Industrial ovens and heat treatment systems / Machines for marking and engraving

Sawing machines · Drilling machines · Associations (Halls 15, 16)
Sawing and cutting-off machines / Welding, cutting and gas cutting machines / Sawing blades / Drilling and boring machines / Safety and environment / Associations

Sheet metal working machines · Forming machines (Hall 15)
Sheet metal working machines / Shearing, nibbling, blanking and punching machines, laser / Presses / Metal forming (massive) machines / Bar, section and tube working machines / Welding, cutting and gas cutting machines

Industrial electronics · Robotics (Hall 25)
Control and drive systems / Electrical and electronic equipment for machine tools / Industrial robots, assembly and handling / industrie 4.0 area

Software (Hall 25)
Software for product development, machines and manufacturing

Gear cutting and finishing machines (Hall 26)
Gear cutting and finishing machines / Planing, shaping, slotting and broaching machines

Additive Manufacturing (Hall 27)
Machines for additive manufacturing, materials for additive processes

Special Youth Show (Hall 24)

	Company	Hall	Booth	Page
	Sandvik Coromant	5	B18	58
	Schiess GmbH	13 25	A14 B60	64
	Schunk GmbH & Co. KG Spann- und Greiftechnik	3	E55	46
	Sodick Europe Ltd.	13	A86	74
	SolidCAM Ltd.	25	A11	**43**
	Sorma spa	5	A84	58
T	TDM Systems GmbH	5	B18	50
	Trumpf GmbH + Co. KG	27	D46	10
U	**Union Tool Europe SA**	3	C13	**47**
V	VDWF – Verband Deutscher Werkzeug- und Formenbauer e.V.	16	D64	18
	Verein Deutscher Werkzeugmaschinenfabriken e. V. (VDW)	4	D44	24, 28, 32, 44
	Vero Software Limited	25	B20	31
	Vomat GmbH	7	E01	47
W	**Walter Maschinenbau GmbH**	11	B24	**11**, 39
	Walter AG	3	B34	63
Y	Yamawa Europe SPA	5	B83	59
Z	Zeller + Gmelin GmbH & Co. KG	6	G08	8
	Zimmer & Kreim GmbH & Co KG	13	B86	**37**

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Source: Matti Nenonen

Access and flexibility are key factors for an automated production.

Automation assistant for the metalworking industry

Pallet handling – The Finnish provider for automation systems, Fastems, is releasing the latest version of its software for automated pallet handling for the metalworking industry at EMO Hanover 2017.

According to Fastems, the Manufacturing Management Software (MMS) is a progressive solution for automatic production processing. It enables users to plan, control. visualiase and monitor capabilities. The upcoming version is the MMS Version 6. According to the company, Fastems has more than 30 years of experience in developing automation concepts.

The latest software version was developed taking user requirements and suggestions into account, Fastems says. The company's engineers worked with this feedback to develop a number of improvements. These include utilities for advance production order planning long before they are in queue for machining. Another feature is the simulation of the anticipated capacity usage level in an automatic production process. According to Fastems, Version 6 enables users to plan future manufacturing runs much more precisely.

This is possible thanks to an additional set of software tools that allows users to verify the future production of resource requirements. A number of key factors can be assessed before the order is executed, for example, the availability of materials and tools as well as the upcoming capacity requirements of the machines.

fastems.com;
Hall 25, Booth B60

Source: Hardinge Grinding Group

Hardinge added features from existing machines to the Kellenberger 100 grinding machines.

A machine completely overhauled for the future

Grinding – Kellenberger, a member of the Hardinge Grinding Group, announced that at EMO a new machine concept will have its debut. The Kellenberger 100 is said to overhaul the Group's portfolio of high-performance grinders completely and make the segment fit for the future.

The machine is based on a modular design and incorporates key elements of a number of machines: Kellenberger's Vista and Vita model ranges, Jones & Shipman Ultramat CNC and Ultragrind 100, and the Tschudin T25. The integration of all these elements makes the latest addition to the portfolio a combination of the expertise and experience of the member companies of Hardinge Grinding Group.

Kellenberger explains that the challenge presented to Kellenberger engineers was to develop a platform on which diverse machine concepts could be realised in line with customer budgets and performance expectations. The result far exceeds the capabilities of many existing grinding machines, Kellenberger says. Because of its modular configuration, manufacturing costs can be optimised and the purchaser receives an excellent price-performance ratio. The operator guidance system comes with an intuitive touchscreen panel. Cycle programming or workpiece-related graphic programming is an option.

The machine shown at EMO will be the variant with 1,000 mm between centres, Kellenberger says.

jonesshipman.com;
Hall 11, Booth C78

High-precision grinding and gear manufacturing tools

Grinding – Italy-based Samputensili, which also has a Chemnitz-based company in Germany, will present several machines and gear manufacturing tools at EMO.

Among the many to be showcased is the company's Samputensili G 375 H profile grinding machine. According to the company, this machine has been designed for the efficient and high-precision grinding of external and internal spur and helical gears of up to 375 mm, worms, rotors and screw threads of up to 1,000 mm. Based on its best-selling S 375 G, which was further enhanced and improved, the G 375 H can be equipped with a wide range of options to suit customer requirements and applications, being based on a modular design concept. The machine is ideal for both small batches and series production.

The booth will feature a selection of gear cutting tools, round tools, carbide preforms and blanks manufactured by Samputensili and the company's American partner, Star SU.

samputensili.com;
Hall 26, Booth A56

Source: Samputensili

The G 375 H machine for profile grinding can be equipped with a wide range of options to suit customer requirements and applications.

Source: Walter Ewag

A premiere at EMO 2017: the high-precision six-axis Ewag Compact Line.

New standards in compact and flexible insert grinding

Grinding– At EMO 2017, Walter Ewag will present its latest innovations for tool machining.

At the trade fair, the six-axis Ewag Compact Line will be making its public debut, as the company announced. Visitors of EMO can inform themselves on this high-precision, compact and flexible machine for the grinding - including peripheral grinding - of inserts in tungsten carbide, cermet, ceramic, PCBN and PCD.

Applying protective chamfers on the inserts' main cutting edges is ensured by the machine's optimised kinematics as well as by the new C axis, Ewag says. According to the company, machine downtime is minimised by the machine's short travel distances and by the integrated six-axis Fanuc robot that offers agile handling and a high degree of flexibility for loading complex inserts.

The Ewag Compact Line's 'three-in-one' dressing unit ensures grinding wheel concentricity and high process reproducibility, plus offers wheel dressing, regeneration and 'crushing' in a single package, Ewag says. Usability and effectiveness is said to be guaranteed by the integrated ProGrind software.

walter-machines.com;
Hall 11, Booth B24

Reiden's milling and turning machining centres

Machining centre – Reiden Technik's RX-Series will be showing a new addition at EMO Hanover. The RX12 incorporates Reiden's double-drive spindle technology with the new machine developed around Hydropol, a specialised concrete and steel composite for the bed and column that can be completely recycled.

According to the company, the machine is demonstrated in cell form with a two-pallet system. It is said to have an axis travel of 1,300 mm in X, 450 mm in Y, and 1,000 mm in Z with rapid traverse rates of 50m/min. Additionally, the A-axis for the spindle is 0 to 90 degree to enable horizontal and vertical cutter positions with the 1,200 mm diameter rotary table, which has a swing of 1,200 mm and rotates through a programmable gearless drive up to 400 rev/min, the company says.

Source: Reiden

The Reiden RX12 combines turning with milling and drilling.

The construction of the Reiden RX12 around its Hydropol composite provides high orders of inherent stability. It absorbs vibration and has significant levels of dynamic stiffness. In producing the composite against a normal cast iron frame, 30 percent less primary energy is used and CO2 levels are 66 percent lower, the company says.

As a result, both 5-axis milling and turning operations can be integrated into a single machine setting and benefit from Reiden's spindle DDT development. According to the company, the spindle is able to swivel between horizontal and vertical planes within one second and the slim head design has pneumatic clamping to hold position.

reiden.com; Hall 13,Booth B53

Source: Samputensili

The SG 160 Skygrind, claimed to be the first gear-dry grinding machine in the world.

Source: Mazak

The Integrex i-800V/8 combines 5-axis milling, turning operations and pallet-changing capabilities to process large, highly complex parts.

Gear-dry grinding machine with two spindles

Grinding – Among the machines and tools to be presented by Samputensili at EMO is the company's SG 160 Skygrind, the first gear-dry grinding machine in the world, the company claims. Samputensili says the machine totally eliminates the need for cooling oil during the hard finishing grinding of the toothed gear after heat treatment. It features two spindles: one for skive hobbing and the other for generating grinding. The grinding process is split into two main passes, namely roughing and finishing. For the roughing process, skive hobbing is used, while worm grinding is used for the finishing process.

According to the company, the machine removes about 90% of the stock allowance with the first pass using a hobbing tool, which has the advantage of not heating the workpiece excessively. Subsequently, with the second finishing pass, a grinding wheel removes the remaining stock without causing problems of overheating the workpiece, resulting in a completely dry process.

Furthermore, the machine's structure with two spindles actuated by linear motors and the use of more channels simultaneously ensure a time of chip-to-chip of less than two seconds.

The SG 160 Skygrind is said to be faster than traditional dual-table grinding machines, has a small footprint and a lower cost of investment for auxiliary equipment. It is environment-friendly as well.

Also on display is a European premiere that the company is very proud to launch in Germany – the Samputensili G 160. According to Samputensili, this machine has been designed and manufactured to fit the requests of the automotive market, which focuses on high performance and excellent quality.

Samputensili G 160 features a new concept for the high-productive grinding of gears of up to 160 mm in diameter with double work spindles, where separate X1 and X2 axes, driven by linear motors, replace the typical rotary turret. This, the company says, is to enable a faster workpiece change and a record-breaking chip-to-chip time of less than two seconds including meshing, synchronisation and simultaneous repositioning of the tool.

This unique, patented machine concept ensures good production time among the machines that are currently on the market, Samputensili adds.

sampspa.com;
samputensili.com;
Hall 26, Booth A56

Full Industry 4.0 solution on live demonstration

Smart Factory, Industry 4.0, Machining – At EMO, Industry 4.0 will take centre stage at Yamazaki Mazak's booth with the unveiling of the company's iSmart factory concept along with 25 new machines, including 15 machines making their world debuts.

Mazak's iSmart Factory is centred on three key pillars, namely Smooth Technology, the new Smart-Box, which provides faster data analysis with increased security, and the MT Connect standard communication protocol, the company says. All elements combine to facilitate the real-time sharing of manufacturing data between the production floor and offices, resulting in shorter lead times, reduced in-process inventory and lower indirect labour expenses.

According to the company, Smooth Technology, incorporating very fast CNC and Smooth Process Support factory management software, sits at the heart of Mazak's Industry 4.0 infrastructure, due to its ability to reduce machining by 30%, connect entire machine shops and provide real-time monitoring and analysis capability. In addition to the Smooth Process Support modules, such as Smooth Scheduler and Smooth PMC, the CNC has now a number of new programmes that will be launched at EMO.

At the show, each of the 25 machines, configured into six different machining zones, will be connected using the company's Industry 4.0 infrastructure to display real-time production information.

Taking centre stage in the Multi-Tasking zone is the latest extension to the company's flagship Integrex range. The Integrex i-500 extends the capacity of the successful i-series and features a modular design concept, enabling customers to match the required machine specification to their application. The Integrex i-500 will be joined by another machine shown for the first time, the Integrex i-800V/8, which combines full 5-axis milling, powerful turning operations and pallet-changing capabilities to quickly process large, highly complex parts, such as jet engine components on a vertical platform. Both machines are making their world debuts at the show and will be operating on Mazak's SmoothX CNC, enabling booth visitors to witness the level of productivity that can stem from full integration into the iSmart Factory concept.

Another debut at the fair will be a first European showing of its latest additive manufacturing machine tool, the Variaxis J-600AM.

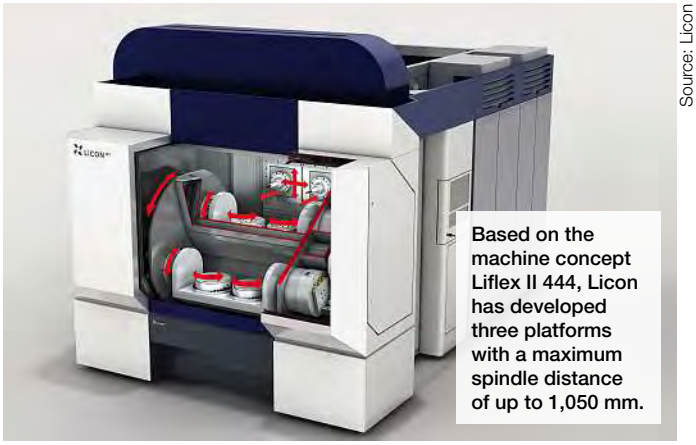
mazak.co.uk;
Hall 27, Booth B56

i³-technology for flexibility in manufacturing saves time and costs

Manufacturing – Machine manufacturer Licon will present the company's latest products and demonstrate a wide range of configuration options for different applications. The main focus will be on its i³-technology, which allows for the correction of working spindles independent of each other.

Generally, flexibility in manufacturing and savings f space are key decision parameters for twin-spindle machining centres. While both spindles for twin-spindle machining centres are often not adjustable, Licon provides independence – even for the basic configuration – in the Z-axis as well as in all three linear axes, provided by its i³-technology, the company says.

As an example, an application case is noted here: To increase the manufacturing output of housings for passenger car steering systems, a concept was realised to enable the machining of two workpieces per spindle simultaneously. The advantage thus for the two-piece clamping is the corresponding machining of two workpieces with one tool change.



Source: Licon

Based on the machine concept Liflex II 444, Licon has developed three platforms with a maximum spindle distance of up to 1,050 mm.

Non-productive time is divided between two workpieces, as such, resulting in a 15-20% increase in output. In addition, the housings are machined, for quality reasons, mostly completely in one clamping and thus with five axes. Workpieces have features that are on opposite sides and have to be machined – thus the need for the A and B-axes to be able to rotate 180°. Influences by temperature fluctuations, for example, by the coolant, can lead to displacement of the spindle distances.

Thermal shifts of 20 micrometers or less could lead to quality issues in cases of tight component tolerances. Mathematical algorithms can compensate the machining centres automatically by the individual adjustment of all linear axes. Therefore, operators in a three-shift operation environment don't need to intervene in the process in order to correct, for example, a temperature test.

licon.com;
Hall 12, Booth D04

Quick Sourcing Grid: Machining Equipment

Source: Samputensili

Company | Contact	Ad on page	Boring Machines	Drilling Machines	
Exeron GmbH, Oberndorf am Neckar, DE | www.exeron.de	39			
GF Machining Solutions Management S, Meyrin 1, Winterthur, CH | www.gfac.com	9		●	
OPS – Ingersoll Funkenerosion GmbH, Burbach, DE | www.ops-ingersoll.de	59			
Sarix SA, S. Antonino, CH | www.sarix.com	79		●	
Anca Europe GmbH, Weinheim, DE | www.anca.com				
Breton, SpA, Castello di Godego, IT | www.breton.it				
Colchester Lathe Co., Heckmondwike, W Yorks, UK | www.colchester.co.uk				
DMG Mori AG, Winterthur; CH | www.dmgmori.com				
Emco Maier Ges.m.b.H., Hallein, AT | www.emco.at				
Ewag AG, Etziken, CH | www.ewag.com				
F. Zimmermann GmbH, Neuhausen auf den Fildern, DE | f-zimmermann.com				
Fehlmann Maschinenfabrik AG, Seon, CH | www.fehlmann.com			●	
Fidia, SpA, San Mauro Torinese (TO), IT | www.fidia.it				
Fritz Studer AG, Steffisburg, CH | www.studerag.ch				
Gruppo Parpas | www.gruppoparpas.com		●		
Haas Automation Europe, Zaventem, BE | www.haascnc.com				
Hardinge GmbH, Krefeld, DE | www.hardinge.com				
Heller Machine Tools Ltd., Redditch, Worcs, UK | www.heller.co.uk				
Heto Corporation, SA Z.I. Santiago de Riba Ul, Oliveira de Azeméis, PT | www.iheto.com				
Hurco Europe Ltd., High Wycombe, Bucks, UK | www.hurco.co.uk				
imes-icore GmbH, Eiterfeld, DE | www.imes-icore.de				
Jobs, SpA, Piacenza, IT | www.jobs.it				
Kitamura Machinery GmbH, Düsseldorf, DE | www.kitamura-machinery.de				
Körber Schleifring GmbH, Hamburg, DE | www.schleifring.koerber.de				
Mac Tec e.K., Emmelshausen, DE | www.mac-tec.de			●	
MAG Systems S.r.l., Abbiategrasso (MI), IT | www.magsystems.it		●	●	
Makino Europe, Kirchheim unter Teck, DE | www.makino.eu				
Maschinenfabrik Berthold Hermle AG, Gosheim, DE | www.hermle.de				
Matsuura Europe GmbH, Wiesbaden, DE | www.matsuura.de				
Mersen France Gennevilliers SAS S.A.S., Gennevilliers, FR | www.mersen.com				
Rainford Precision Machines Ltd., Rainford, St Helens, UK | www.rainfordprecision.com				
SHW Werkzeugmaschinen GmbH, Aalen Wasseralfingen; DE | shw-werkzeugmaschinen.de				
Suhner France S.A., Alfortville, FR | www.suhner.com			●	
Toyoda Mitsui Europe GmbH, Krefeld, DE | www.toyoda-mitsui.com				
Unisig GmbH, Bad Urach, DE | www.unisig.de		●		
Yamazaki Machinery UK LTD, Worcester, UK | www.mazak.com				
YMT Technologies Ltd., Yeovil, UK | www.ymtltd.co.uk				

	Machining Centres, Graphite-Electrode	Grinding Machines	Gun Drilling Systems	Machining Centres, High-Speed	Machining Centres, Horizontal	Lathes	Machining Centres, 5-Axis	Milling/Turning Machines	Turning Machines	Machining Centres, Vertical
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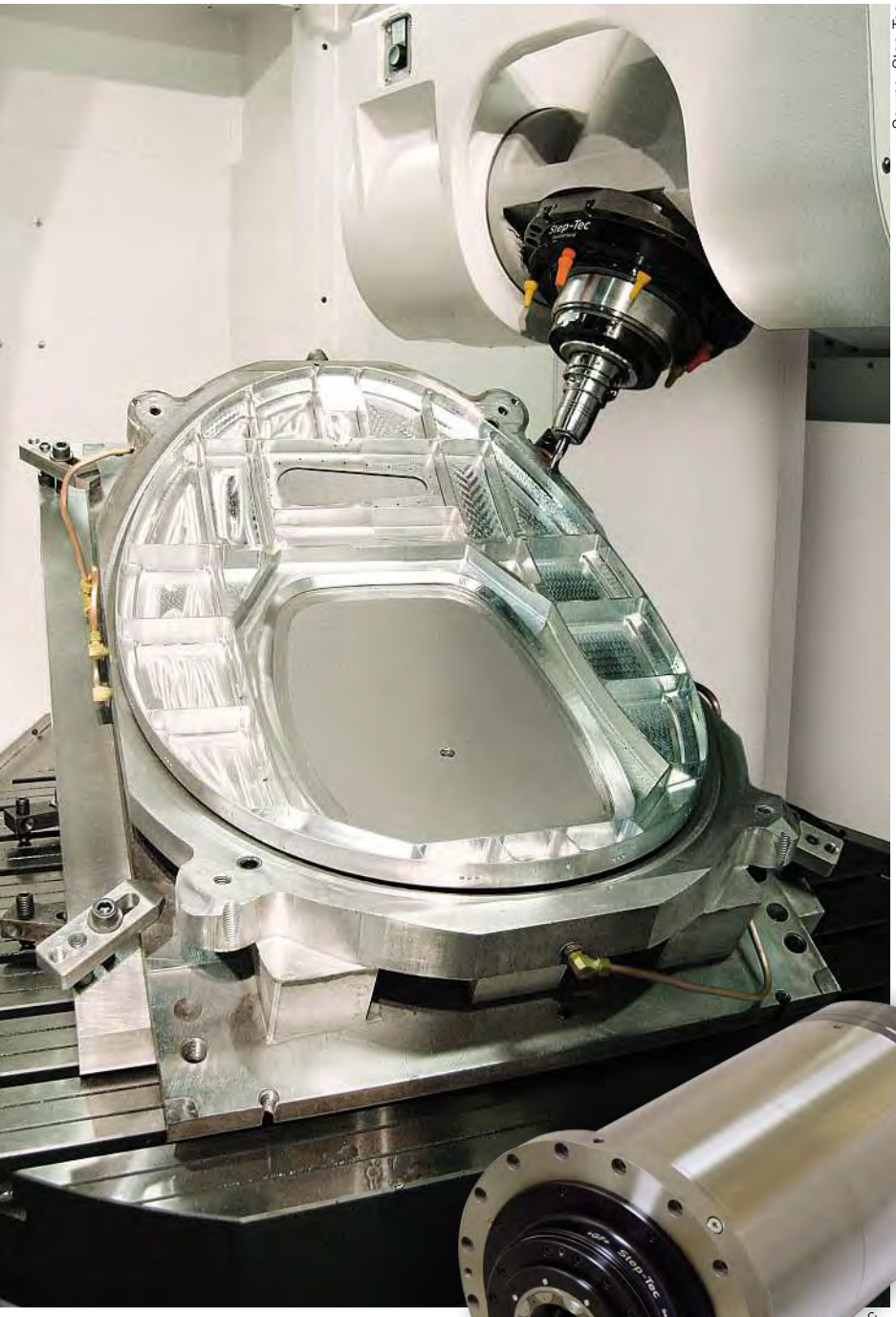
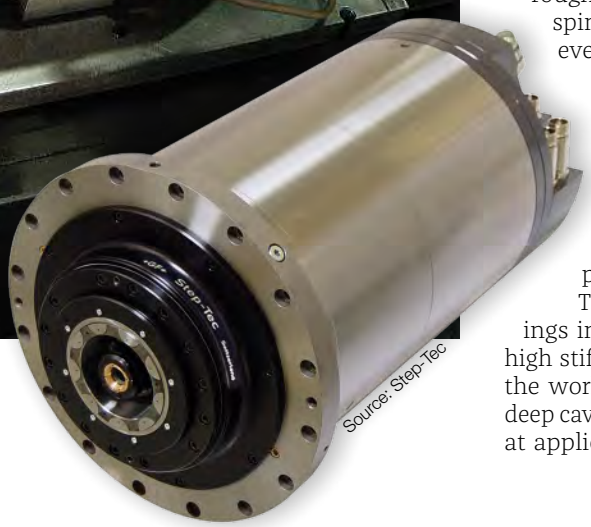
Making the tool spin: Swiss motor spindles for energy milling

Al Breitenberger

Motor spindles are an essential part of machining centres. The correct spindle enables users to master a wide range of applications, from delicate finishing operations to heavy-duty roughing. Swiss spindle-manufacturer Step-Tec will present its product portfolio at EMO 2017 in Hanover.



Source: Step-Tec



Source: Step-Tec

Step-Tec's motor spindles enable high-precision machining of large mould structures in one go.

Step-Tec has been developing and building high-speed and high-performance motor spindles for mould-making, production, energy and aerospace applications since 1995. The spindle portfolio of more than 100 different types of spindles ranges from 90 mm to 320 mm in diameter, covering a performance range of 1 to 130 kW, with torque of up to 1,200 Nm on its most most powerful spindle.

Step-Tec offers a comprehensive range of standard platform spindles as well as tailored products, which – thanks to its intense investment in the latest technologies such as data management, electronics and high precision mechanics – ensure customers a leading position in competitive environments where precision machining on the highest performance level is a must.

In 2011, Step-Tec launched its HPC190, which set a new benchmark in terms of performance milling. It soon became a bestseller thanks to its compactness, energy efficiency and, most of all, its versatility in holding any optional equipment or feature a customer could ask for. Step-Tec followed it up with the XL successor, a heavy-duty spindle for roughing and milling large mould structures and tough materials, such as aluminium and titanium for aerospace components.

Even though the successful 190 series was the inspiration for the HPC290, it is nevertheless an all-new spindle, developed from scratch. The prototype of this new platform spindle in the 15,000 min-1 version with 46 kW and HSK-T100 will be on display at Step-Tec's booth at EMO Hannover.

With a torque of 366 Nm, this spindle is capable of milling large mould structures in one go. The motor performance characteristics are ideal for roughing with face mills with inserts. Excess spindle power guarantees great chip volume even when machining tough materials.

These dynamics over the entire speed range enable users to roughen the workpiece followed by grinding to finish in one and the same fixture. By using small tools at higher speed, users get get the type of excellent surface finish that one tends to expect when milling small workpieces.

The bearing layout with three and four bearings in another version respectively results in high stiffness of the rotating axis. This allows for the working of long and heavy tools for milling deep cavities in one go. This spindle model is aimed at application in the aerospace industry, where

ETMM

INFO

The Swiss company Step-Tec has been an expert in the spindle business since 1995. In 2002, the company was taken over by GF Machining Solutions. Today, Step-Tec has around 100 employees and turnover of close to 35 million Swiss francs.

structural components such as housings and cross members made of aluminium or titanium are machined. A new bearingless rotary union suitable for all media makes it possible to bring coolants and lubricants into the rotating spindle shaft for cooling tool and workpiece. High-pressure cooling or low-dosed minimum quantity lubrication is just as possible as air-in-rotation. At the same time, the service life of these wear parts has been increased significantly thanks to an enhanced sealing technology within the rotary union.

Building such a short spindle with an extremely powerful induction motor with high-power density speaks well for Step-Tec's innovative power. The moderate spindle mass of less than 200 kg makes it possible to have a compact and highly dynamic swivelling head with a great mass-to-power ratio.

The power to machine hard materials

For machining titanium, where a lower speed but high torque is needed, Step-Tec offers the 8,000 min-1 model with 55 kW of power at a torque of 440 Nm. The spindle easily handles the increased lateral forces induced from milling titanium because of the static stiffness of the massive shaft on one hand, and the highly robust bearing layout with three preloaded front bearings (four in total) on the other. A Cool Core variant with 120 kW of power at a speed of 20,000 min-1 will soon complete the 290 platform.

The unique character of the motor spindle, to be fitted with a Spindle Shaft Interlock (SSL) that locks forces of up to 1,300 Nm, makes it very versatile, especially for turning operations in mill-turn applications. With its 290 platform, Step-Tec offers power spindles for complete machining in large milling centres, where structural components can be milled efficiently and economically. The platform combines surface quality with durability. In addition, the spindle is Industry-4.0-ready, enabling direct access to the spindle's status and even its condition with regard to planning preventive maintenance.

At the heart of many machining centres around the globe is a high-performance Step-Tec spindle. As an essential core component stemming up to 7,000 hours a year, the spindles ensure that machines can handle everything from heavy-duty roughing to fine-finishing operations. To ensure reliability, Step-Tec also offers a Spindle Exchange Program (SEP) as well as preventive services. To prevent downtime and unproductiveness, which generate unwanted costs, the Spindle Diagnosis Module (SDM) is able to analyse operating parameters to propose preventive services and thus optimise production.

gfms.com; Hall 27, Booth B24

AMF's all-inclusive solution is centred around the field-proven zero-point clamping systems.

Source: AMF

EMO spotlights the role of clamping technology

Walter Frick

The potentials of clamping technology in a process-optimised manufacturing operation will be spotlighted from all viewpoints at the EMO Hannover 2017. Here, too, additive processes open up entirely new options. For digitally networked manufacturing processes, intelligent clamping devices will play a crucial role.

He is thoroughly familiar with the sector, its needs and concerns: Bernt Ritz, Consultant for Technology, Standardisation and Clamping Tools in the German Engineering Federation's Precision Tools Association, outlines the trends that manufacturers of clamping technology are currently having to address:

- progressively increased machining of composites, lightweight components, thin-walled and miniaturised components,
- individualisation of workpieces, and concomitantly smaller batch sizes,
- higher concentricity accuracies and balance qualities for tool holders,
- fully automatable manufacturing processes and reliable process monitoring,
- automated workpiece placement,
- networking and unambiguous identification of clamping technology components,
- implementation of sensor technology for data acquisition and transmission,
- online configurators for clamping components

This maps out the framework within which the sector's innovative efforts are proceeding in the run-up to the EMO Hannover 2017 – and the innovative bandwidth of the exhibitors concerned extends even beyond this.

To quote Jürgen Förster, Authorised Signatory and Sales Manager at AMF Andreas Maier, Fellbach, for example: "Most customers have meanwhile comprehended and taken on board the importance and the potential of clamping technology in a process-optimised manufacturing operation. Whereas, for instance, the primary focus used to be on faster machine tools or longer useful lifetimes of the cutting materials, nowadays, clamping technology has at least the same perceived importance."

Automatability, of course, plays a major role in this context. Different retrieval options and concomitantly seamless communication with the machine tool are nowadays considered standard features. As a complete-system vendor of different clamping media, says Jürgen Förster, "we see a very definite trend towards a combination of different clamping methods. Zero-point clamping technology often constitutes the basis, and is supplemented by hydraulic, magnetic or pneumatic systems to form a flexible modularised whole." Seamless

networking and communication between the clamping devices and the machine tool are crucial factors for an optimised manufacturing solution in regard to Industry 4.0 and the associated components. The sales manager sees his firm's remit in its role of a clamping device manufacturer as "using the existing as-is status in the customer's manufacturing operation as the basis for planning and for optimising the production processes concerned."

Experience here has shown "that, given early involvement of the staff, there are almost no limits to the creativity and willingness to optimise of each individual." Together with a manufacturer of medical technology, for example, a solution has been developed "in which the result exceeded even our own expectations." For instance, AMF has fitted the zero-point clamping modules with position sensors, thus assuring automated manufacturing with robot loading in a dependable process.

"We're looking forward to this year's EMO in Hanover," says Jürgen Förster, "where we shall be showcasing our corporate capabilities and our expertise in all the different facets of clamping technology. In addition, the topic of 'affordable automation solutions for existing machine tools' is a keynote issue. Low-cost automation, including loading, gripping, storing, clamping and identification, is the guiding principle here."

Depending on the metal-cutting tools being used, explains Rolf Ehrler, Product Manager Clamping Devices and Milling Tools at Gühring, Albstadt, "the tool-clamping devices are becoming progressively more specific, meaning that in parallel to the development of high-precision tools we are also seeing a reciprocally entailed diversification of the clamping devices." He is rather sceptical when it comes to the role of "smart" clamping devices in networked manufacturing operations: "Smart holders (sensory and intelligent) are being researched, but due to the lack of networking are not yet suitable for full-coverage use." Instead, he advocates "optimally dimensioned and selected clamping devices," with which metal-cutting tools "can be used to significantly better effect and pushed towards enhanced machining performance and longer useful lifetimes." At the EMO Hannover 2017, there will be "a Future Display on show, devoted entirely to the smart factory concept, exemplified by exhibits like clamping devices produced using additive manufacturing."

Source: Mapal

The functional area is built up on the conventionally manufactured base using selective laser melting.

Extremely slim chucks thanks to additive manufacturing

In a digitally networked manufacturing operation, clamping technology will play a crucial role, since for an optimal process the blade often has to be brought closer to the working point on the component than had hitherto been possible. For this purpose, chucks are required that are extremely slim in construction without any loss in performance. This stipulation is being met by Mapal Dr. Kress, Aalen, not least with its slim-contour hydraulic expanding chucks, which enable hydraulic expansion clamping technology to be employed precisely where shrink-fit chucks used to be the only option. This is made possible by additive manufacturing: The functional area is deposited on the conventionally manufactured main body using selective laser melting.

Since dry machining is accounting for a progressively larger share of the manufacturing processes involved (not least out of environmental considerations), the thermal stability of the chucks is crucial. Thanks to additive manufacturing, the temperature-critical solder joint between the clamping sleeve and the main body can be dispensed with. This means the chucks can be used in a reliable process at operating temperatures of up to 170°C. Additive manufacturing, to quote Jochen Schmidt, Product Manager Clamping Technology at Mapal, "creates entirely new concepts for clamping technology, offering an added value for the customer in terms of process reliability and costs. We are already using this technology for series production. This has enabled the limits of the possible to be continually redefined in the past, present and future."

Jochen Schmidt concurs that mass production operations will increasingly demand chucks that can be integrated into intelligent manufacturing structures featuring a high degree of automation: "All system components here have to be amenable to digital networking." Tool chucks are normally used only in direct clamping applications – for small diameters as well. "With the aid of additive manufacturing," he says, "we have succeeded in offering precisely this kind of chuck: hydraulic expanding chucks with a slim contour for direct clamping of tools with diameters of 3 mm or more." At the EMO Hannover 2017, Mapal will be focusing not least on application-driven chucks: direct clamping of small diameters using hydraulic expansion clamping, but also vibration-damped tool systems.

amf.de; Hall 4, Booth C54;
mapal.com; Hall 4, Booth A18

Group offers entire process chain from a single source

Connected – The Haimer Group has become a complete system provider for tool management. At EMO, the company will exhibit its entire product portfolio, ranging from solid carbide tools to tool holders, shrinking and balancing technology and presetting devices. All products complement each other and offer the ideal conditions for network integration as well as continuous data flow, Haimer notes.

Focusing on a complete tool management solution for machine tools at the show, one of the highlights will be its Microset tool presetting technology, with which the family-owned company expanded its product portfolio at the beginning of the year.

Managing Director Andreas Haimer explains: "With our broad system range, we want to make the entire work process as easy as possible for the machine operator. From tools and tool holders to shrinking, balancing and highly-precise presetting technology, we are now able to offer our customers the entire process chain from a single source."

Microset devices cover a broad range of applications for entry-level machines that are very profitable for the low-volume users. The semi-automated machines with autofocus are suitable for average-volume users and the product range also includes fully automated presetting devices with linear drive, designed for regular to high-volume use.

Haimer says the presetting devices have high-quality hardware, good ergonomics and are user-friendly. An advantage is its thermostated cast iron construction, which ensures that all operations are simple, easily repeatable and do not require recalibration.

While the Microset devices already have a network interface and can communicate with the machine tool, Haimer will exhibit shrinking and balancing machines that are equally equipped – a premiere at EMO. A new Power Clamp series with a completely new design and software will be introduced to the market. This machine has gone through further development and now has a touchscreen control panel, which connects the Power Clamp machine to the network.

Also, the company is developing a simplified tool management system, designed for the combined use of its products. The company says that now many small and medium-sized companies are offered a solution that is easy to use, and are given a simple way to organise and digitise their tool presetting system.

haimer.de;
Hall 4, Booth E18

Source: Haimer

MD Andreas Haimer says: "We are now a system provider for tool management."

Source: Schunk

Smart Gripping: Autonomous handling scenarios, process monitoring and flexible processes are possible with the Schunk EGL Profinet.

Schunk equipment for smart production

Clamping – Dr Markus Klaiber is certain: "Industrial production is undergoing a fundamental change." Schunk's CTO is convinced that digitalisation will play a major role at EMO 2017 and the company, therefore, will present its own smart production solutions.

In the coming years, as he says, mechatronisation, digitisation and automation, as well as human-robot collaboration and the intelligent networking of all process-relevant components, will unveil a new thinking in industrial manufacturing. He names three aspects that are important for this change: communication between all involved components, a maximum transparency on all levels of business, and a flexible reaction to internal and external events.

According to Klaiber, clamping devices and gripping systems are of great importance in all three fields. Schunk's plan, he says, is to expand its role as a leading supplier for both product categories: "Our goal is to expand the position of our modules closest-to-the-part." As Klaiber says, Schunk wants to enable detailed monitoring of every individual process step and to permanently supply the higher-level ERP system control and cloud solutions with process data and to be able to react flexibly to any respective event.

Highlight at EMO will be a functional manufacturing cell in which an intelligent Schunk EGL Profinet gripper with variable power and positioning enables autonomous handling and ensures automated quality assurance. The gripper is able to decide on its own whether a part is defective and has to be removed from the process.

According to Schunk, all steps are monitored in real time and superordinate levels such as ERP systems or cloud-based monitoring platforms are provided.

Schunk plans to bring to the stage new products for mechanical clamping systems that reduce idle times, increase productivity of machine tools and enable flexible processes, the company says. Therefore, Schunk is going to expand its modular system for workpiece-direct clamping modules, extend its portfolio of lightweight chucks, and to present the slim, vibration damping Tendo Slim 4ax hydraulic expansion toolholder. The underlying message: "Easy to use, easy to integrate, easy to maintain," says Dr. Markus Klaiber. "Because modern gripping systems and clamping devices are the key to efficient and flexible production processes."

schunk.com;
Hall 3, Booth E 55

Tailor-made systems with ultrafine filtration technology

Filtration – Vomat will present ideas for individually tailored filtration systems, good for cleaning and maintaining accurate temperature of metal coolants at the show. The company says it offers concepts for the filtration and chilling of cooling lubricants for the grinding process as well as special solutions for materials other than metal.

Many metal processors require high purity coolants that conform to NAS 7 or 3-5 µm particle size. Vomat's systems are ideal for filtering ultrafine particles from oil used in processes such as grinding, honing, lapping, erosion and other types of processing. The controlled, full-flow filtration keeps the dirty and clean oil 100% separate and features an automatic back-wash cycle that is initiated by the degree of dirt in the filter elements.

The company's filtration systems are compact, requiring low maintenance, and are available in numerous configurations, from stand-alone units to plant-wide central systems.

vomat.de;
Hall 7, Booth E01

Source: Vomat

The systems are compact and require low maintenance.

EMO debut for 4-axis system

Flexible machining – Midaco Corporation, one of the partners of Hyfore Workholding, will debut at EMO and introduce its new fourth-axis trunnion system, developed to allow for removable fourth-axis capability to VMCs or horizontal machining centres.

According to the company, the unit is ideal for sub-contract or low-volume manufacturing environments where easy and rapid access to a fourth axis for three-sided machining of the workpiece is necessary but not permanent. To facilitate "all-around" machining, the trunnion rotates through 360°. A "parked" fourth axis can impair access to the total machining envelope, whereas with the Midaco unit, it is completely removed, along with its docking unit.

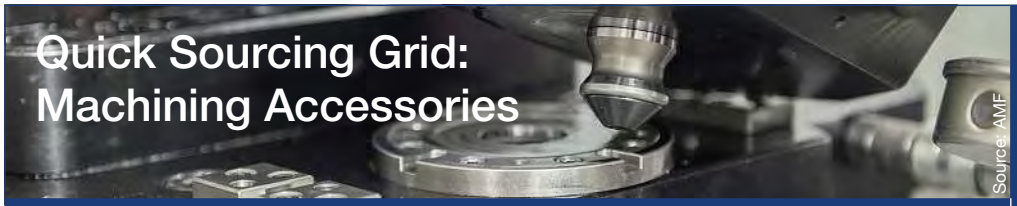
Source: Midaco

Midaco's new system has removable fourth-axis capability.

The new trunnion system is supplied complete with a permanently wired universal fourth-axis receiver that automatically engages with the chosen fourth-axis unit (not supplied).

hyfore.com;
Hall 27, Booth F09

Quick Sourcing Grid: Machining Accessories


Source: AMF

Company | Contact	Ad on page	Chucks	Chucks, Magnetic Holding	Clamping Tools	
Sarix SA, S. Antonino, CH | www.sarix.com	79				
Alphatech, Montluel, FR | www.alphatech.fr					
Angelo Ghezzi & C S.p.A., Paderno Dugnano (MI), IT | www.angeloghezzi.it					
AR Motif Makina Dis Ticaret Ltd. Sti. Topcular, Kisla Caddesi, Istanbul, TR | www.armotif.com		●	●	●	
ASM Automation Sensorik Messtechnik GmbH, Moosinning, DE | www.asm-sensor.de					
ATI Stellram Ltd., Melksham, Wilts, UK | www.stellram.com					
Big Kaiser Präzisionswerkzeuge AG, Rümlang, CH | www.kaisertooling.com					
CeramTec UK Ltd., Towcester, Northants, UK | www.ceramtec.de					
EDM-Tec OHG, Kaisersesch, DE | www.edm-tec.de		●	●	●	
Emco Mecof, Belforte Monferrato (AL), IT | www.mecof.it					
Erowa AG, Büron, CH | www.erowa.com		●	●	●	
Ewag AG, Etziken, CH | www.ewag.com					
Fenn Tool Ltd., Braintree, Essex, UK | www.fenntool.com					
Fidia, SpA, San Mauro Torinese (TO), IT | www.fidia.it					
Fischer AG, Herzogenbuchsee, CH | www.fischerag.com					
Fluid Conditioning Systems Ltd. Innovation Centre,, Warwick, UK | www.fluidcs.com					
Fraisa S.A., Bellach, CH | www.fraisa.com					
Gewefa UK Ltd., Corsham, Wilts, UK | www.gewefa.co.uk		●			
Gressel AG Spanntechnik, Aadorf, CH | www.gressel.ch		●		●	
Gurkan Makina Ltd. Ikitelli Org. San. Bol., Istanbul, TR | www.gurkan.com		●			
Haas Automation Inc., Oxnard, CA, USA | www.haascnc.com					
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Hardinge Inc., Workholding Division, Elmira, NY, USA | www.shophardinge.com		●			
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imes-icore GmbH, Eiterfeld, DE | www.imes-icore.de					
ITC Industrial Tooling Corp. Ltd., Tamworth, Staffs, UK | www.itc-ltd.co.uk					
Kitagawa Europe Ltd., Salisbury, Wilts, UK | www.kitagawaeurope.com		●			
Leader Chuck Systems Ltd., Tamworth, UK | www.leaderchuck.co.uk		●	●	●	
Mac Tec e.K., Emmelshausen, DE | www.mac-tec.de		●	●	●	
MAG Systems S.r.l., Abbiategrasso (MI), IT | www.magsystems.it			●		
Mitee-Bite Products Inc., Center Ossipee, USA | www.miteebite.com				●	
NCMT Ltd., Thames Ditton, Surrey, UK | www.ncmt.co.uk					
Okamoto Machine Tool Europe GmbH, Langen (Hessen), DE | www.okamoto-europe.de					
Otto Suhner AG, Brugg, CH | www.suhner.com		●		●	
Parpas Spa, Cadoneghe, IT | www.gruppoparpas.com					
Rego-Fix AG Präzisionswerkzeugfabrik, Tenniken, CH | www.rego-fix.ch		●		●	
Röhm GmbH, Sontheim, DE | www.roehm.biz		●	●	●	
Rollomatic SA, Le Landeron, CH | www.rollomatic.ch					
Schaublin S.A. Fabrique d'outillages, Delemont, CH | www.schaublin.ch				●	
Schunk GmbH & Co. KG Spann- und Greiftechnik, Lauffen am Neckar, CH | www.schunk.de		●	●	●	
Steelfluid S.r.l., Genoa, IT | www.steelfluid.it					
Streuli technologies AG, Birmensdorf, CH | www.streuli-techno.ch		●	●	●	
Suhner France S.A., Alfortville, France | www.suhner.com					
System 3R (UK) Ltd., Princes Risborough, Bucks, UK | www.system3r.com			●	●	
Tecnomagnete, SpA, Lainate (MI), IT | www.tecnomagnete.com			●		

	Cutting Fluids	Cutting-Tool Coatings	Filters	Fixturing, Quick-Change	Fixturing Components	Grinding Wheels	Lathe Tooling and Accessories	Lifting Equipment	Rotary Tables	Spindles	Toolholders	Tool Management Systems	Vises
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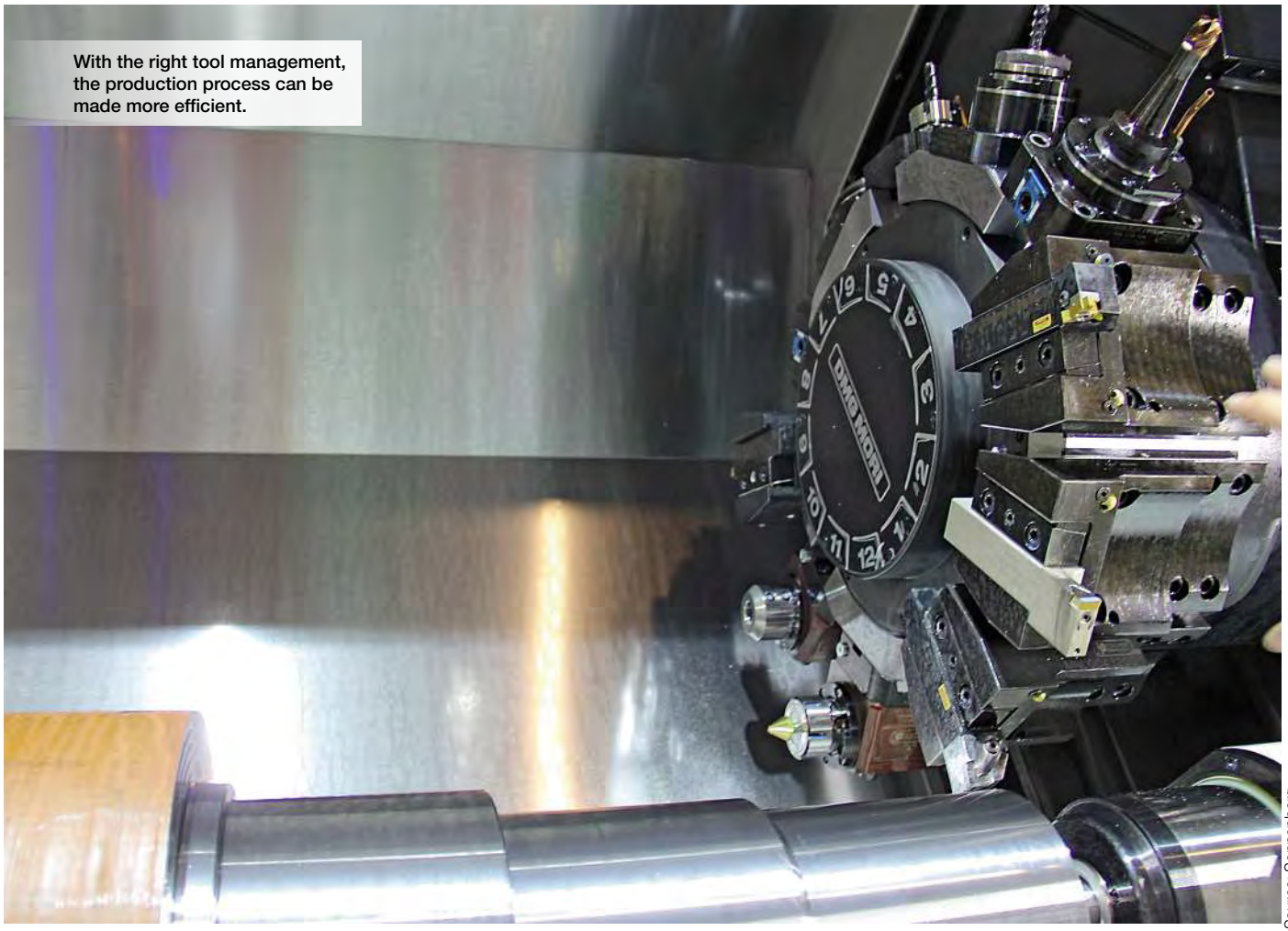

With the right tool management, the production process can be made more efficient.

Source: Sonnenberg

Tool management as a factor of success

Andrea Gillhuber

To produce a workpiece correctly, information exchange across process boundaries is necessary. Tool management plays an important role here, for if a tool is missing, production comes to a standstill.

ETMM

INFO

Software in cutting technology: In the course of digitalisation, software is becoming of ever-increasing importance in production. CNC-operated cutting processes need tool management to ensure error-free production.

Technological products are becoming increasingly more complex, and often supposedly minor details decide their acceptance on the market. Decisive factors for product acceptance include price, compatibility, design and product characteristics. To meet these specifications, a holistic approach is necessary. Value engineering is one of the keywords to be mentioned here. Value engineering covers the entire technological development of products – from product development to prototype production, and from quality assurance to series production.

Mikromat, a manufacturer of precision processing machines, is offering customers support with precisely this issue with the operator model Mikromat 4.0. The firm is convinced that only an interplay of human and technological competences can lead to success.

To ensure that a component is of high quality, the mechanical processing must be right. The cutting technology specialist also emphasises in this connection the importance of tool management.

According to the firm, various strategies are conceivable in tool management. The firm's practical experience in one-off and short-series production shows that it is advantageous to return the entire toolset from the processing machine to the tool service after every completed order. This guarantees the availability of the optimum tool for the process in question. At the same time, only the tool service is qualified to make a decision on whether to put the tool in storage or dismantle it. The combination

of optimum tool, optimum tool setting and optimum application in the precision portal is decisive for accuracy. Here, one must also remember to compensate for wear during processing while at the same time conducting cut management (cutters failing).

To retain an overview here, numerous firms offer tool management solutions that constantly look at the tool during product development and processing cycles.

Tool management is decisive

Many noted tool manufacturers, such as Walter, make their 3D models and the important parameters of their tools available so that they can already be planned into the design engineering for the later processing of the workpiece. This is also the time when one should check that the desired tool is in stock, whether in a magazine on the machine tool or in the store. In NC programming, the tools for the working material in question and the process itself are simulated. Afterwards, production starts. During production, the actual condition of the tool should be monitored, Mikromat emphasises.

In this context, various firms offer different softwares for tool management. Here is an overview:

Software for tool management is available from different manufacturers. One of these is TDM Systems, a subsidiary of the Sandvik Group and provider of Tool Data Management (TDM) in the cutting technology field. The system collects data from tools and production and transfers it to other systems.

With the TLM strategy (Tool Lifecycle Management), TDM Systems concentrates primarily on optimising processes by optimum tool planning and tool presentation. The software covers the organisation of tools in all phases of planning and production. One of its functions here is as a connecting link between ERP, PLM and MES, for which it collects tool data and graphics and makes them available in CAM and simulation sequences, at the same time taking over organisation of tool circulation. In other words, it delivers information about the availability and condition of all tools in machines and store. This way, the number of tools in circulation and in the store is kept low, and orders are made as needed and in response to the production situation. The software compiles a list of all tools used in workpiece construction and in simulation; on the basis of this list, tool requirements for the order are calculated, with tool service lifetimes and actual stocks taken into account.

Tool Lifecycle Management

The next step is to select the processing machine on which all, or the majority, of the tools are already available. Missing tools are ordered from the store or from the manufacturer and booked to the relevant cost centre.

The tool measurement system is incorporated into the TLM. For this purpose, TDM Systems cooperates with manufacturers of presetting systems. During measuring, these systems call up the design parameters for each complete tool stored in the TDM and send back the actual values measured. As a result, practical values taken from real pro-

Source:c-Com GmbH

Setting up c-Com, the lifecycle management for c-parts. The firm plans to launch the platform at the EMO Hannover 2017.

duction are available for planning processes. The measured data is also transferred to the machine.

This transparency regarding tool stocks can reduce tooling times and idle times on the machine.

The advantage of such management software is obvious. It helps in managing tools that are in constant use and must therefore be made available regularly and also re-ordered. To support their customers in this, toolmakers collaborate with software specialists. TDM Systems have set up a collaboration of this kind with Mapal. In the course of their collaboration, the software firm enables the manufacturer's tool supply and pre-setting systems to be incorporated into the tool lifecycle management.

Mapal supports its customers with new logistics and services and here, too, benefits from the competences of TDM Systems. Together, the two firms enable customers to get started in professional tool management. Thanks to this co-operation, Mapal's adjustment and presentation systems can be linked to both new and already existing TDM applications. An interface enables the exchange of tool design data and the return of information with the actual measured tool characteristics. Alongside this co-operation with software firms, Mapal joined with SAP and other partners to develop their own lifecycle management for c-parts. Starting with SAP's Hana Cloud platform, the precision toolmaker developed its own solution, c-Com, for efficient handling of tools and tool-related data. On this open platform, customers and suppliers can input and share all their relevant tool data on the basis of clearly defined rules and access rights. This way, data for the collaboration are always absolutely up-to-date. They are uploaded to the platform once by the owner of the data, irrespective of how many people use them. Thus, the necessary information is available to all entitled persons at any time and from any place.

Tool data is made available to set-up equipment as well with the help of various tool management solutions. The picture shows Mapal's Uniset-C.

Source:Mapal

Collaboration with toolmakers

The platform also allows firms to compare applied technological solutions within their own environment, for example, tools and processing parameters for the same workpieces being produced at different locations. This supports standardisation and benchmarking strategies. Stocks as well as purchasing strategies can be optimised, and the interaction between purchasing and supply is simplified. Furthermore, c-Com gives suppliers a way of making new and more precisely tailored services available.

The tool specialist is convinced of its solution and is pushing ahead with it. Halfway through the year, the company spun off c-Com GmbH as a firm of its own within the Mapal Group. Meanwhile, other tool manufacturers are represented on the platform beside the firm from Aalen. These include the Swiss toolmaker Schnyder and the Italian firm Vergnano; further projects with the firms Bass and Emuge-Franken are in preparation, and by the EMO Hannover 2017 other tool manufacturers will also be part of the platform. In addition, further co-operations and pilot projects are currently underway, including one with the firm Lübbering, which concerns exchange and handling of data between the newly developed L.ADU electronics and c-Com, as well as with the Siemens IoT Cloud solution Mindsphere for the exchange of machine and tool data.

Product launch at the EMO Hannover

Four web-based modules will be presented at the platform launch at the EMO Hannover 2017: Tool Dashboard, Dynamic Order Optimizer, Reconditioning Management and Machine Run-Off. Parallel to this, various native iOS applications that will enable mobile handling of data and documents in real time will also be presented. Among them are applications such as Tool Manager, Tool Trial and Data Care.

mikromat-wzm.de; Hall 11, Booth B19
tdmsystems.com; Hall 5, Booth B18
mapal.com; Hall 4, Booth A18

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Exactly the right tool for every application

Dr. Diethard Thomas

At the EMO trade fair in Hanover, LMT Tools is expanding its product portfolio with a number of innovations for milling, threading and gear cutting. Users from the automotive, aerospace, energy technology, mechanical engineering, medical technology and mould and die-making industries receive new solutions to increase productivity in their individual machining applications.

Whether copy milling a single cutting edge (like the Copy Max 1 milling cutter) or 12 usable cutting edges per insert (like the Acu-Jet Double 6 Premium) the result is the same: The right tool for every application is always available. New precision tools are also being presented for machining high-strength or hardened materials, for example, the high positive face-milling cutter Multi Face H45 PRO4 or the Multi Edge 2-Feed mini. These are characterised by low cutting forces and a large material removal rate.

The new top performer for gear cutting is the robust Unify hob with indexable inserts. It covers the module range from 6 to 12. Its low diameter from 150 mm offers the advantage of very short process times, even on smaller machines.

The modular thread forming tap HPF Max is an efficient partner for serial production in the automotive industry and in mechanical engineering. A new carbide substrate, new coating and the optimised former geometry are decisive factors for its long tool life.

The Copy Max copy milling cutters promise high process reliability in terms of quality and tool life.

Source: LMT Group

Source: LMT Group

The roughing inserts of the Acu-Jet Double 6 Premium can be used up to 12 times.

The Copy Max product family has grown. After the double-sided Copy Max 2 insert has proved its worth in mould and die-making, LMT Kieninger has now developed the one-sided Copy Max 1 plate. New tool holders have also been added. Cylindrical steel shaft versions, available in two different lengths, and the cylindrical bolt-on milling cutter are new to the product range. The extra tools are available with internal coolant supply.

Their particular strength is demonstrated by the Copy Max family when it comes to roughing and semi-finishing larger moulds and in the removal of rest material. Depending on the nature of the component, the customer can use either the one-sided or double-sided version of the Copy Max indexable inserts.

The long tool life of these tool designs – which has been increased by a factor of 4 when using both cutting edges on the Copy Max 2 – is based on both the high-performance Nanomould Gold coating and on the HQS (High Quality Sintering) manufacturing process. With this process, even more stable cutting edges can be achieved thanks to the increased mould pressure and a special design.

Many tool systems quickly reach their limits when roughing tool steel, stainless steel or even superalloys. LMT Kieninger has redesigned the Acu-Jet Double 6 Premium especially for this purpose and added the 12mm diameter indexable insert.

The result is a tool which offers maximum stability and process reliability and which provides improved economy thanks to the double-sided use of the cutting inserts. The indexable inserts can be used up to 12 times.

Cost-effective roughing depends on one thing: the maximum possible material removal rate. For modern machining centres, this doesn't just presume innovative milling tools; rather, it also requires a selection of cutting materials for modern materials. However, the requirements are not a problem for the milling cutters Multi Face H45 PRO4 and Multi Face P45 PRO 8 from LMT Fette. The first

The modular thread forming tap HPF Max is characterised by a long tool life.

Source: LMT Group

tool has high, positively adjusted inserts with four cutting edges each. The second version has positively adjusted inserts with eight cutting edges each. The load on the spindle is significantly reduced by this positive cutting edge geometry. Even on low-power machines, it is possible to achieve large material removal rates. This saves production time and machine costs and conserves resources.

In practical application, machining has been taken to the next level. In the face-milling of a copper block with the new Multi Face H45 PRO4, different requirements were exceeded: Thanks to the low power consumption, it was possible to increase the diameter of the tool used from 100 mm to 160 mm in order to increase the radial infeed ae to 102 mm – previously it was 48 mm. Using optimised cutting values, it was possible to more than double the material removal rate to 676 cm^3/min. The tool life per cutting edge also increased from 18 hours to 24 hours, meaning that wear doesn't stand a chance.

The efficient machining of hardened and high-strength materials is a particular challenge for cutting tools. Both the demand for long tool life and the maximisation of removal rates are rapidly rising. The Multi Edge 2-Feed mini high-feed cutter from LMT Fette is meant to meet these requirements. New indexable inserts complement the range of already established milling tools.

A special carbide substrate combined with a TiAlN-based high-performance coating easily overcomes material hardness and material strength. The high-feed geometry of the 9 mm small inserts for cutting depths up to a maximum of 1 mm with an insert thickness of 3 mm allow for a veritable flood of chips during the roughing process. The slightly positive angle of the indexable inserts also makes a decisive contribution.

In practice, this leads to a considerable reduction in machining times. During the high-feed machining of highly tempered steel 1.2343, it was possible to halve the machining time compared to a competitor's tool. The long tool life of 165 minutes also contributes to reducing costs. The Multi Edge 2-Feed mini works very reliably and economically, even with large tool lengths.

ETMM

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The LMT Group is a familly-ownd business group that consists of LMT Fette, LMT Kieninger, LMT Onsrud and LMT Belin.

LMT Fette uses its experience for the latest innovations

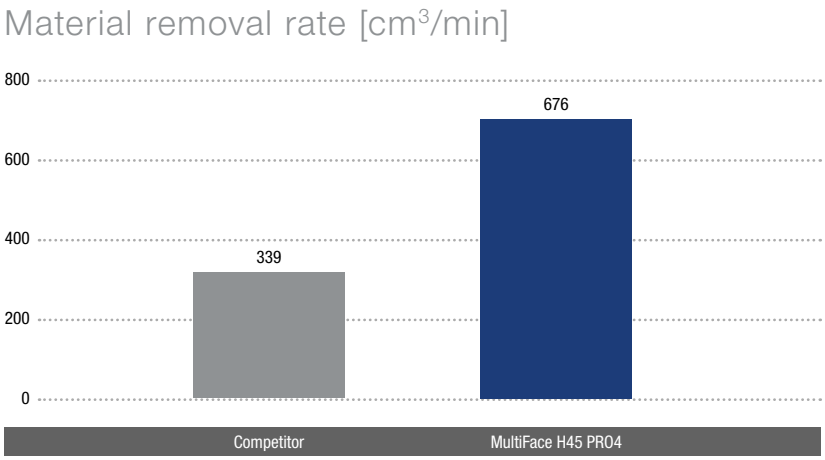
The experts at LMT Fette have created a comprehensive product portfolio for the various performance and quality requirements of gear cutting, from vehicle transmissions through to drives in wind turbines. One hundred years of experience combined with current research and development results help to generate innovative solutions to further reduce costs per part.

This is how the Unify indexable insert hob came to be. It strengthens the area of application of the proven gear hob family Carbide Line-I (I= Indexable) in the module range from 6 -12 and is the sensible choice when high performance and high quality are a requirement for the machining of gears. The design of Unify has created a single-part, compact, very robust base plate which works with high precision thanks to the small number of interfaces. The compact design enables the use of indexable inserts for gear cutting from a diameter of 150 mm which brings several benefits: It can be used on smaller machines, has fewer limitations due to collisions and offers advantages with regard to processing time.

Efficient internal thread production is the result of intensive tool research and repeatedly challenges the creativity of engineering experts anew. LMT Fette presented the first generation of HPF thread formers many years ago and in the meantime has made a name for itself in the area of chipless internal thread production with its unique selling point of modular design. HPF stands for High Performance Forming and combines the advantages of the wear resistance of a carbide thread head with the toughness of a steel shank.

Now, with the further developed thread forming tap HPF Max, a higher performance dimension has been opened up. In addition to the modular design, further significant design features are now making decisive contributions, especially the micro-grain carbide, the TiCN coating and the optimised former geometry. This makes the HPF Max a cost-effective partner for serial production in the automotive industry and in mechanical engineering.

lmt-tools.com



The high positive face-milling cutter Multi Face H45 PRO4 boasts impressively high material removal rates at low cutting forces. The graph shows a rate almost double of that of a competitor's product. (Source: LMT Group)

UNDERCUTS

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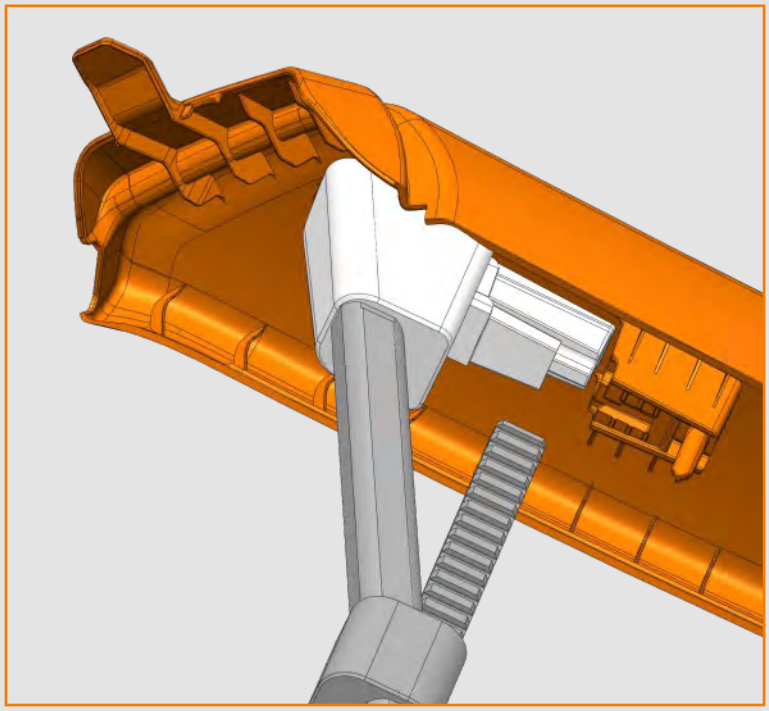

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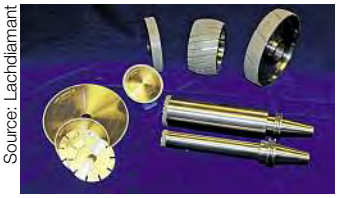
Electro-plated diamond and CBN tools

Grinding – Depending on the grain size of diamond or CBN (cubic boron nitride) grits, the coating is layered onto the grinding or deburring body with up to 1.5 times the original particle size. According to Lach Diamant, protruding diamond or CBN tips prove to hold a special advantage over other bond types, for example, plastics, or metals. The tips are immediately available and provide a high cutting ability for grinding, deburring and separating of fibre composites, graphite, and hard metals, the company says. Lach Diamant also recommends them for tool and mould-making.

lach-diamant.de;
Hall 4, Booth D41

Source: Lachdiamant



Examples of electro-plated diamond and CBN tools.

Introduction of new Osawa and Nikko tools

Cutting tools – Italy-based Sorma will present some new products at the forthcoming EMO. According to the company, the tools will be from the Osawa and Nikko Tools range. They are said to be designed to provide the flexible and versatile performances that are required in production today.

In drilling, one new solution and a focus of Sorma's presentation at EMO are the HPU drills. According to Sorma, these are carbide-coated drills, meant for both mass production and for producing small batches and different materials. The "S"-geometry and the wide chip pockets allow for excellent chip evacuation, Sorma says. Additionally, the straight-edge profile and the 45° corner chamfer edge offer increased toughness and a higher feed rate. The drills are intended for machining steel, stainless steel, cast iron, aluminium and superalloys, the company says. For milling, Sorma will introduce new end mills to the HF EVO-lution product family, including the variable helix and unequal pitch end mills for universal use. New lines are being introduced including the enhancement of the ALU range for machining aluminium and extra-short corner radii, long end mills for trochoidal milling.

According to Sorma, the most significant introduction at the trade fair will be the Osawa Catalogue 2018. The catalogue features all solid drilling and milling product families, including the new products showcased at the exhibition.

sorma.net; Hall 5, Booth A84

Source: Sorma

One of the products at show: the indexable Nikko Tools DRS Drilling System.

Focus on turning concepts and digitalisation

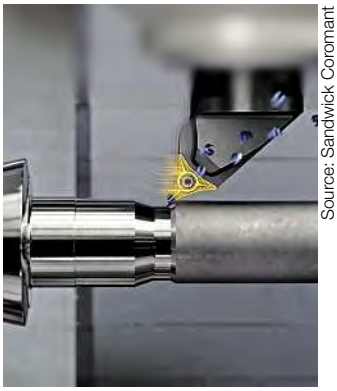
Cutting tools – Tool manufacturer Sandvik Coromant has announced it will focus on automation at their presence at EMO Hanover 2017. According to the company, "the future of machining and production" will be at the centre of their presentation on a 528 m² booth.

The motto that the company chose for its presentation is "Together we shape the future of manufacturing – Let's connect!" In line with this concept, Sandvik Coromant wants to offer new digital solutions and enable the connection of processes with the aim of increasing profitability. For achieving this goal, the company wants to bring 40 specialists to its booth to answer questions on the trends in machining.

One highlight will be the company's Prime Tuning method and its corresponding Coro Turn Prime turning tools. The latter are the industry's first solution for turning in all directions, improving flexibility and tool life, the company claims.

sandvik.coromant.com;
Hall 5, Booth B18

Source: Sandwick Coromant



The capability of Coro Turn Prime of turning in all directions offers improved machining flexibility, productivity and tool life, Sandvik Coromant says.

Improved productivity with new generation hobbing machine

Gear Cutting – Liebherr's LC280 gear-hobbing machine has been developed to offer maximum flexibility and productivity and is available at short notice. The company says it can machine gears and shafts with a workpiece diameter of up to 280 mm and a shaft length of up to 500 mm. The machine base has a steep bed to prevent chips from depositing. Additionally, an optional stainless steel housing can reduce thermal influence of hot dry chips on the machine bed to a minimum.

Compared to the previous model, the hob head has been redesigned to allow for the machining of workpieces of up to a module of five mm. Its spindle speed is now up to 2250 revolutions per minute, while the shifting length is 200 mm with a maximum tool diameter of 150 mm. Through the use of indexable carbide insert cutters, the process time for certain applications can be reduced by up to 30%, according to Liebherr. Also, workpieces of up to 15 kg can be automatically loaded and unloaded quickly with the optimised ringloader system.

liebherr.com;
Hall 26, Booth A72

Source: Liebherr

The gear-cutting machine featuring Liebherr quality significantly reduces costs.

Taps to improve productivity

Taps – Yamawa, manufacturer of threading solutions, has extended its product range and will introduce at EMO its new MHSP taps, which have been designed for improving productivity in medium hardness carbon steel blind holes tapping. The MHSP family provides high finish quality of the internal thread and cutting speed ranging from 5 to 30m/min depending on the steel type to be machined. The company says MHSP taps feature specific coating and geometry to enable long tool life, marking a further step forward for the range of SP (spiral) solutions for steel. The SP range already includes the ISP for hand tapping, SP for general purpose use, AU+SP for high performance and universal use, F-SP for high-speed tapping and HFISP with internal coolant for ultra-high-speed tapping.

Designed for the automotive industry, this new type of tap is said to improve productivity in manufacturing of workpieces such as hub bearings, connecting rods, crank shafts, tie rod ends, differential ring gears and swing bearings, Yamawa notes. The MHSP taps will be initially available in the range from M8 to M16.

yamawa.eu;
Hall 5, Booth B83

Source: Yamawa

The MHSP tap – designed for the automotive industry.

Cutting intelligently

Cutting Tools – At EMO Hanover 2017, Israel-based Iscar will emphasise on the theme of 'Machining Intelligently' and display leading-edge tools at the company booth. Its Industry 4.0-standard tools are said to help customers adapt to high-speed and high-feed machining as well as minimum quantity lubrication with modern machining strategies that comply with the user/machine connectivity demands of the "Internet of things".

Iscar says its wide range of new tools focuses on increased productivity with smart insert locking mechanisms to create a more stable machining process and that it has responded to today's market demands of high-speed machining and mill-turn machining centres with a range of upgrades in both tools and insert geometries, leading to less machine downtime and less labour.

Among the tool lines to be presented are its Dove-IQ Turn, Dove-IQ-Mill, Dove-IQ Grip, Penta-IQ Grip, Heli-IQ-Mill 390, Whisperline, Mill-4-Feed, Flashturn, Deca-IQ Thread, Do-Grip Jet Line, Cham-IQ-Drill 700, Sumocham IQ, Sumogun, Tang-Grip IQ, Swisscut Innoval, Millshred P290, Helido 690 Line and Spin Jet.

iscar.co.il; Hall 4, Booth E36

Source: Iscar

Iscar's tools from the latest ranges to be on display.

Quick Sourcing Grid: Cutting Tools

Source: Kennametal

Company | Contact	Ad on page	Company profile at etmm-online.com	Boring Bars	Boring Tools	Deburring Tools	Drills (indexable)	
InovaTools Eckerle & Ertel GmbH, Kinding, DE | www.inovatools.eu	55			●	●	●	
Iscar Ltd, Tefen, IL | www.iscar.com	17		●	●	●	●	
Jongen Werkzeugtechnik GmbH, Willich, DE | www.jongen.de	67			●	●	●	
LMT Fette Werkzeugtechnik GmbH & Co. KG, DE | www.lmt-fette.com	1		●	●	●	●	
Meusburger Georg GmbH & Co. KG, Wolfurt, AT | www.meusburger.com	63			●		●	
Mitsubishi Materials, Meerbusch, DE | www.mitsubishicarbide.com	51		●	●	●	●	
TaeguTec Ltd., Daegu, KR | www.taegutec.com	27		●	●		●	
Union Tool Europe SA, Marin-Epagnier, CH | www.uniontool.com	47						
Allied Maxcut Engineering Co. Ltd., Kingswinford, UK | www.alliedmaxcut.com						●	
Boehlerit GmbH & Co. KG, Kapfenberg, AT | www.boehlerit.com				●			
Ceratizit Austria GmbH, Reutte, AT | www.ceratizit.com				●		●	
Cole Carbide Industries Inc., Orion Twp., MI, USA | www.colecarbide.com			●				
Dormer Pramet, Chesterfield, UK | www.dormerpramet.com			●	●	●	●	
Emco Maier Ges.m.b.H., Hallein, AT | www.emco.at							
Greenleaf Corp., Saegertown, PA, USA | www.greenleafcorporation.com				●			
Gühring KG, Albstadt, DE | www.guehring.de				●	●	●	
Ingersoll Werkzeuge GmbH, Haiger, DE | www.ingersoll-imc.de				●	●	●	
ITC Industrial Tooling Corp.Ltd., Tamworth, Staffs, UK | www.itc-ltd.co.uk					●		
Kennametal Inc., Latrobe, PA, USA | www.kennametal.com			●	●	●	●	
Korloy Europe GmbH, Oberursel, DE | www.korloyeurope.com			●	●	●	●	
Kyocera Unimerco Tooling GmbH, Neuss, DE | www.kyocera-unimerco.de						●	
Mapal Präzisionswerkzeuge Dr. Kress KG, Aalen, DE | www.mapal.de						●	
MMC Hitachi Tool Engineering Europe GmbH, Hilden, DE | mmc-hitachitool-eu.com							
Otto Suhner AG, Lupfig, CH | www.suhner.com							
Paul Horn GmbH Hartmetall-Werkzeugfabrik, Tübingen, DE | www.phorn.de			●	●	●	●	
Rainford Precision Machines Ltd., Rainford, St Helens, UK | www.rainfordprecision.com							
RobbJack Corporation, Lincoln CA, USA | www.robbjack.com							
Sandvik Coromant, Zaventem, BE | www.sandvik.coromant.com			●	●		●	
Seco Tools AB, Fagersta, SE | www.secotools.com			●	●	●	●	
Tool-Flo Mfg. Inc., Houston, TX, USA | www.toolflo.com				●			
Tribo Hartstoff GmbH, Barchfeld-Immelborn, DE | www.tribo.de							
Tungaloy Germany GmbH, Monheim am Rhein, DE | www.tungaloy.de			●	●		●	
Walter AG, Tübingen, DE | www.walter-ag.com			●	●		●	
WNT Deutschland GmbH, Kempten (Allgäu), DE | www.wnt.de				●	●		
Zecha Hartmetall- Werkzeugfabrikation GmbH, Königsbach-Stein, DE | www.zecha.de							

	Drills (Solid-Carbide)	End Mills	Inserts (Drilling)	Inserts (Milling)	Inserts (Parting & Grooving)	Inserts (Threading)	Inserts (Turning)	Milling Tools (indexable)	Multifunctional Tools	Parting & Grooving Tools	Reamers	Solid Countersinks	Threading & Tapping Tools	Turning Tools
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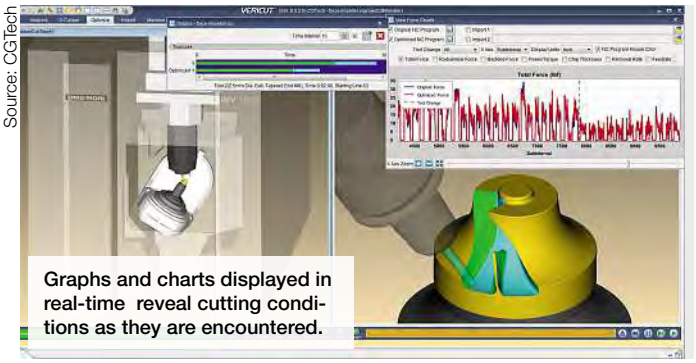
Source: CGTech



Graphs and charts displayed in real-time reveal cutting conditions as they are encountered.

Demonstration of latest software version at show

Software – CGTech will exhibit its latest version of Vericut 8.1, CNC machine simulation, verification and optimisation software.

This version features enhanced support for Force optimisation, a new AM module, Workpiece sectioning, an X-Caliper measurement tool, a report template and grinding and dressing operations.

According to the company, Force optimises NC programs by analysing cutting conditions such as force, chip thickness and feed rate. It displays graphs and charts in real time, revealing cutting conditions and forces as they are encountered by cutting tools. Thus, the NC programmer can identify undesirable cutting conditions such as excessive forces, chip loads, tool deflections or material removal rates represented as spikes in the graphs. Force Charts are linked with Vericut's NC Program Review, making it easy to review problem cutting conditions. With one click on the chart, the user is taken to the location in the CNC program and shown the actual cut in the graphics window.

Vericut's Additive module simulates additive and traditional machining capabilities used in any order on hybrid CNC machines. Simulating both operations can identify potential problems that can occur when integrating additive methods. Access to detailed 'history' stored with the program's droplet technology saves programmers time by quickly identifying the source of errors.

Source: Kaeser

The new screw compressors have the most efficiency with IE4 motors.

Compressed air solutions for Industry 4.0

Air Compressors – Kaeser Kompressoren will present its comprehensive compressed air products and services. The company offers single units as well as complete system solutions that cover the entire compressed air system lifecycle. Its product portfolio ranges from highly efficient rotary screw compressors for compressed air production, together with compatible treatment options, intelligent controllers and management systems, through to individually tailored service solutions, including maintenance and contracting solutions.

According to Kaeser, efficient compressed air supply begins with efficient components, which is why the company equips all of its rotary screw compressors from 30 kW with Super Premium Efficiency IE4 motors as standard, which is said to cut compressor power consumption. Also, further refinement and optimisation of the company's Sigma Profile airends (key components actually responsible for producing the compressed air) have helped boost specific power in rotary screw compressors from 75 kW, for example, by as much as 12%, Kaeser claims. The new DSD and FSD-series rotary screw compressors therefore offer enhanced efficiency and higher flow rates, which translate into energy cost savings.

Kaeser's compressed air management system now features improved 3D Advanced Control that harmonises the operation of all components in a compressed air system.

Industry 4.0 smart manufacturing solutions and a premiere

Source: DP Technology

The DP Technology booth at EMO in Hall 25, where Esprit's Additive Suite will be premiered.

CAM Systems – DP Technology will promote the benefits of its Esprit CAM for Industry 4.0 smart manufacturing as well as premiere Esprit's Additive Suite, a comprehensive 3D printing solution that simplifies the AM process, at EMO. The company notes that its Esprit CAM system is a full-spectrum system that provides factory-certified post-processors that generate machine-optimised G-code, offers good technical support and allows for automation solutions and apps built using the software's API.

According to the company, Esprit's built-in solutions enable manufacturers to create a digital twin of their machining environment and trace a digital thread throughout the manufacturing process, from CAD design to the finished part. With its exacting simulations, virtual machining is nearly identical to what occurs on the shop floor. The program integrates into the existing workflow, while data can be passed from CAD program to Esprit and then onward to shop floor management, tool data management, job management, resource planning and other software, the company says.

DP Technology's new additive manufacturing solution is designed to simplify the additive process from 3D-CAD model to printed part. It features programming, optimisation and simulation for direct metal deposition, 3D powder bed and subtractive manufacturing, with general end-user availability being expected in mid-2018, according to the company.

dptechnology.com;
Hall 25, Booth D25

Digital solutions take centre stage for tooling expert

Tooling – Tooling company Walter GB will be using digital solutions to demonstrate to EMO visitors how an integrated approach to production makes the company the partner of choice for complete tooling solutions.

With Industry 4.0 and the Smart Factory at the core of the display, the company booth will showcase a range of apps and digital tools to be witnessed and tested, all designed to save time and money – on every production application and all material types – via intuitive touchscreens and tool displays as well as a large central screen, the company explains.

According to Walter, using Walter's Tool-ID, it is possible to identify and monitor all the tools used in a production process. The tool life is also checked and tools are replaced at exactly the right time. Tool data can be transferred directly from the presetting device to the machine and the machine parameters can also be evaluated.

"For Walter, Engineering Competence stands for expertise in digital solutions," says Mirko Merlo, President of Walter AG. At the show, the company's display will provide visitors with a glimpse into the future of the company as a creator of digital transformations, using the latest joint developments in digitalisation to provide solutions for its customers.

walter-tools.com;
Hall 3, Booth B34

Metrology for Industry 4.0

Quality Control – An important measure to optimise manufacturing processes in tool, pattern and mould-making is quality assurance, involving measurement, control and correction processes. With its full-field and non-contact 3D measuring technology, GOM says it provides a good basis for Industry 4.0 and will showcase its optical 3D measuring machine Atos Scan-Box, an automated quality control machine, at EMO.

Source: GOM

The Atos Compact Scan for field measurement.

Another exhibit focuses on its mobile measuring systems for shortening production and development times, which are portable and can be operated close to production, Germany-based GOM notes. Among the systems that the company will present are its Pontos Live for online measurement and part positioning, Atos Compact Scan for full-field measurement on the shop floor and Tritop, a mobile coordinate measuring machine for large-volume objects and tools.

gom.com;
Hall 6, Booth B86

Solutions with automated cells for complex production

Robotics– At EMO, FMB Maschinenbaugesellschaft will present solutions to automate complex production steps, including separation of bulk materials and quality control of workpieces with a lot of properties that must be captured and measured. As such, FMB has designed a compact robot cell. Workpieces that are provided as bulk material are separated, orientated, gripped by a robot, measured on various stations and finally graded by the robot according to the measuring data, the company says.

FMB's modular and flexible robot cells are reliable, close to the machining process and fast and have integrated stations to separate, orientate, measure and grade workpieces to achieve100% quality assurance in series production, the company adds.

The robot conducts numerous step-by-step processes in production. An integrated control system analyses the measuring data and shows it on a display.

The robot cell is flexible and can be configured according to customer demands.

fmb-machinery.de;
Hall 17, Booth A44

Source: FMB

Compact robot cells reliably automate ancilliary jobs done previously by employees.

XXL machines and more, spread over three booths

Machining – Manufacturer of large machining centres, Schiess, will present numerous machines and solutions at EMO on three booths.

ts well-known "Vertimaster" multitasking-machine (for turning, milling, grinding, boring etc.), available in several sizes and configurations, falls into the XXL machines segment. The table width and face plate diameter vary from three up to 12,000 m with machining heights of up to 10 m. Schiess offers options on travels and load individually adapted to customer requirements, the company explains.

The company's implementation of its Masterhead principle allows the customer to choose from a portfolio of potential machining heads.

XXL machines are available as Vertical Lathe with two axes (VT), Vertical Lathe with three axes and boring and milling drive (VM) and a third linear axis (VMG) as well as Portal Milling Machine in Gantry Design, available also with face plate (VMG-PS).

schiess.de;
Hall 13, Booth A14 (Machine Innovation Network);
Hall 27, Booth B80 (Aerospace);
Hall 25, Booth B60 (Indus.4.0)

Source: Schiess

The multitasking-machine "Vertimaster" is available in several sizes and configurations.

A premiere to crown 25th anniversary celebration

Metalworking Fluids – Oemeta Chemische Werke, a metalworking fluid manufacturer, will present at EMO for the first time on the eve of its 25th anniversary and will showcase the company's latest product, Additiv CX. As part of its Hycut two-component metalworking fluid, the new additive is a high-performance emulsion suitable for all types of metalworking operations, the company says. The biocide-free additive stabilises the pH value and offers good corrosion protection.

"Our two-component Hycut system has undergone continuous development since its introduction nearly 25 years ago in order to keep up with advances in machine technology and legislation," explains Malte Krone, marketing head and product management at Oemeta.

Additiv CX is free of boron and biocides such as formaldehyde donors or iodopropynyl butylcarbamate (IPBC). It is suited for processing steel, stainless steel, grey cast iron and aluminium, where it not only ensures physical stability, but also stabilises the pH value. The manufacturer also promises effective corrosion protection. When mixed with water at a concentration of just 2%, the additive yields excellent anti-corrosive properties, the company explains.

At the recommended concentration of between 2.5% and 3% and in combination with Hycut ET 46, which contains oil, the emulsion has an initial pH value of 9.8. This high alkalinity is maintained over a long period of time, thereby ensuring the stability of the emulsion. Foaming behaviour and material compatibility have also been improved. The advantages are also clear when working with aluminium, Oemeta adds. The embodiment of advanced technology, Additiv CX is exempt from labelling and complies with legal requirements.

Oemeta introduced its two-component Hycut system on the market nearly 25 years ago. Since then, it has been regularly redeveloped. According to the company, despite its higher initial purchase price, when total costs are taken into account, the system is generally more cost-efficient than its competition. This is because it allows for longer cleaning and maintenance cycles, decreasing machine downtime to enable increased productivity. Depending on the processing tasks, cutting speeds can also be increased.

oemeta.com;
Hall 6, Booth F21

Source: Oemeta

Additiv CX is suited for processing steel, stainless steel, grey cast iron and aluminium as it ensures physical stability.

Machines for serial production

Source: Kern

Two machining centres on presentation.

Machining equipment – Kern Microtechnik is putting two machining centres based on Kern Micro at the centre of its presentation at EMO 2017. One of them is the fully automated Kern Micro combined with an Erowa Robot Compact, and the other is the compact Kern Micro Pro concept machine. The latter is designed particularly for serial production.

With the 5-axis Kern Micro concept machine, Kern aims to demonstrate a compact model for industrial serial production for application in nano machining. The new processing centre will also be flexibly expandable, Kern Mikrotechnik says.

Another product on show will be the compact Kern Micro, which has already proven itself in many areas, as the company also adds.

According to Kern Mikrotechnik, complex parts can be milled in only one pass thanks to the five simultaneously controllable axes. The machine centre shown at EMO Hanover 2017 will additionally be equipped with an Erowa Robot Compact 80. With this combination, the machine manufacturer hopes to prove that the most delicate products can be produced in serial production.

kern-microtechnik.com;
Hall 12, Booth D 60

Horizontal boring mill to be launched in Hanover

Source: Fermat

A WFT 13R is said to combine power and absorb high axial forces.

Milling – Fermat Machine Tool will launch its WFT 13R CNC horizontal boring mill at EMO. Marketed and supported in the UK by 2D CNC Machinery, Fermat says this universal horizontal mill represents the latest technology in table-type horizontal borers. The machine is said to combine power, absorb high axial forces and have precise table configuration in its category.

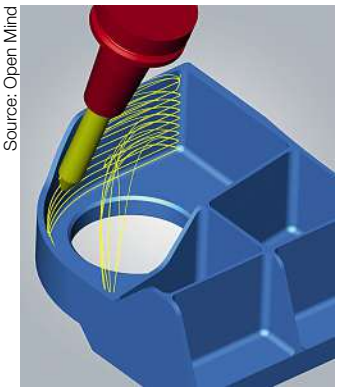
The WFT 13R has five linear axes and a rotary B-axis. Travels in X, Y and Z are 4×3×2 m with its W and ram travel V-axis having travels of 730 and 700 mm, respectively.

The 1,800 × 2,600 mm table has a 20-t load capacity and a zero-point work clamping system, two planetary gearboxes, two servo-motors and two pinions that operate in a master that prevents backlash and limits issues such as the effects of stiction. A fully servo-controlled rotary table option enables continuous B-axis rotation for simultaneous contouring in synchronisation with X, Y, Z, V or W-axes. The headstock has a 130 mm-diameter spindle with a 41 kW drive, the company explains.

2DCNC.co.uk;
Hall 11, Booth D07

Open Mind to present virtual machining software

Source: Open Mind



Open Mind promises a simulation that matches the real machining movements.

CAD/CAM – Open Mind will present its software for machining simulation at EMO 2017 in Hanover. According to the company, this is the first presentation of its NC-based Hypermill Virtual Machining Center. Open Mind claims that this software is able to simulate the exact machine movements that the machine will carry out in real. The software provider explains that milling tasks get more and more complex on machining centres with 5-axis technology. That is why the simulation of machining tasks becomes more important.

At Open Mind's booth in Hall 25, visitors have the chance to observe live machining with Hyper Mill Maxx Machining. The company promises immense saving potential, for example, in roughing, finishing and drilling. Moreover, the developers will give first insights into the upcoming version, Hyper Mill 2018.1, Open Mind says. This version is said to simplify programming of vertical surfaces. The milling contour is automatically generated by selecting the vertical surfaces.

openmind-tech.com;
Hall 25, Booth A08

Drilling in one-feed stroke for optimum machining

Drilling – Also presenting at EMO is Mikron Tool, showcasing the company's drilling and milling tools in small dimensions to efficiently machine stainless and heat-resistant materials.

Among the numerous tool ranges is Crazy-Drill Cool SST-Inox, a small drill available in diameters of 1 to 6 mm, which is suitable to drill without pecking.

Source: Mikron Tool

Only a one-feed stroke is needed to reach the full depth of 20 x d with Crazy-Drill Cool SST-Inox.

According to Mikron, only a one-feed stroke is necessary to reach the full depth of 20 x d. This is made possible by the tool-integrated, helicoidally, drop-shaped coolant ducts that deliver a massive and constant coolant flow during the entire drilling operation. These ducts provide up to four times the coolant flow. The advantage of this cooling method is the prevention of overheating the cutting edges right from the beginning. Combined with the right geometry, this cooling method facilitates an easier breaking of chips, which in turn helps to flush them out of the flutes. These factors also enable machining with higher cutting speed and feed.

mikron.com;
Hall 4, Booth A74

A computer generated image of the Dormer Pramet booth at EMO 2017.

Source: Dormer Pramet

Cutting tools, a new logo and a different experience

An Experience – Visitors of EMO can experience one of the widest assortments of cutting tools at the Dormer Pramet booth. The company provides high-quality cutting tools for hole-making, milling, turning and threading applications.

Covering solid to indexable, high-speed steel to solid carbide and general purpose to application-specific tooling, Dormer Pramet's "Product Zone" at EMO will feature tools for a variety of industry sectors, including general engineering, heavy industry, automotive and railway.

Each product assortment will be displayed in one of six ISO material-themed showcases, enabling visitors to find tools for stainless steel, steel, cast iron, heat-resistant super alloys and non-ferrous metals easily.

The booth will feature a "Community Zone" – an area where visitors can interact and share their experiences through a range of digital and social activities. This includes live streaming, product videos and a slot car racing challenge, where participants can win tickets to the final DTM championships race in Hockenheim.

Lastly, in the "Relax Zone", visitors can meet up with the company team. This area includes a historical display showcasing the evolution of the Dormer logo, the brand identifying the company's round tools assortment. Featuring products and publications from the past 100 years, the display at EMO will mark the official launch of a new Dormer logo.

dormerpramet.com;
Hall 3, Booth A64

Shrink collet system

Accessories – Toolholding innovator Gewefa will have a new taper toolholder on show. Other presented innovations are the Hydropin hydraulic chuck with a fixed stop pin, the Easy Fix boring bar toolholder and a new shrink collet system called Induterm M96. The latter is based on the heat-shrink clamping technique, popular for securing milling cutters into tool holders, Gewefa says. The company states that the Induterm M96 offers exceptional grip with short clamping length. According to Gewefa, this provides high flexibility, accuracy, and tool run-out of less than 3 microns. Visitors can convince themselves of the cost-effectivness of this solution at EMO 2017.

gewefa.com; Hall 5, Booth B93

Source: Gewefa

Gewefa's shrink collet system, Induterm M96.

What is in store in Version 8.0 from Machine-Works?

CAD – At EMO, UK-based Machine-Works will display new features of the company's CNC simulation and verification component software, Machine-Works, as well as those of Polygonia, its solid modelling software toolkit for processing polygon mesh.

The company says its Machine-Works' new surface and feature detection allows users to analyse cut surfaces and detect their features, which saves time when creating CAD data from polygonal data or generating a toolpath. Users can find generic geometrical features like cylinders or spheres or look for machined features such as drilled holes.

Also new is the sheet-bending functionality that allows for the optimisation of collision-checking results and performance, the company notes.

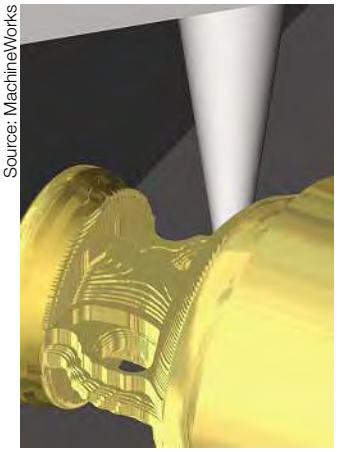
The collision detection feature now has more automation, enabling significant performance improvements on the collision inference. A simulation restore feature allows for 'snapshots' of a solid, for example, the stock, during simulation and quickly reverts to them at will.

The new version offers customers APIs to perform a cloud-based simulation, supporting both client and server-side renderings of simulation in real time as standard. A new client-side library introduces an API to handle the client side of the communications as well.

Furthermore, the new release allows for users to generate a 3D recording of a simulation that can be used to create movie files.

machineworks.com;
Hall 27 Booth B73

Source: MachineWorks



Users can analyse cut surfaces and detect their features with 8.0.

Integrated measurement in manufacturing and more

QC and AM – Renishaw, a precision -engineering technologies company, will exhibit its range of metrology and AM systems on two stands at EMO. In Hall 6, it will demonstrate the integration of its latest measurement technologies within a manufacturing process.

Renishaw will exhibit in the new AM zone and demonstrate software and systems for metal part manufacture in Hall 27. This includes its latest version of its build file preparation software, Quant-AM 2017, which has been designed specifically for the company's metal AM systems, Ren-AM 500M and AM 400.

Products on show in Hall 6 will include a new contact scanning system for CNC machine tools, new software for the Equator flexible gauge, which allows users to fully integrate the system with CNC machine tools, new on-machine and mobile apps that simplify the use of machine tool probing, an enhanced non-contact tool setter for machining centres, a new multi-probe optical interface system, a new surface finish probe for co-ordinate measuring machines and new software that enhances the functionality of its XM-60 multi-axis calibration system.

Show visitors will also see Renishaw's new machining cell concept, which will demonstrate how the ability to monitor key process input, analyse data and improve manufacturing processes facilitates increased productivity and higher accuracy.

renishaw.com;
Hall 6, Booth B46;
Hall 27, Booth A72

Source: Renishaw

Equator IPC with its new software will be exhibited in Hall 6.

From cellulose to moulding – New technology for fibre-reinforced plastics

Cellulose is an attractive material used in fibre-reinforced plastics, for example, in lightweight construction or as a material for transport containers and pallets. However, until now, it has not been possible to use standard forms of supplied cellulose for this purpose efficiently. The Fraunhofer Pilot Plant Center for Polymer Synthesis and Processing PAZ now wants to change this situation with a new project.

A first sample of the filter-stuffing unit developed at the Fraunhofer PAZ.

Source: Fraunhofer PAZ

Together with Fraunhofer PAZ partners, a technology platform will be developed for the production of high-quality cellulose compounds and their further processing to produce moulded parts (mouldings).

Fibre-reinforced plastics are used, for example, to make instrument panels or side paneling in cars, in the housings of electrical equipment and for garden furniture. Thermoplastics such as polypropylene (PP), polyethylene (PE) and polyamide (PA) are reinforced with fibres to achieve very specific material properties. The fibre content in the material can be up to 40 percent.

Industrial processing of fibrous cellulose

Cellulose fibres would be very suitable for this use: They are a renewable raw material and are less expensive than other materials such as glass. In addition, investigations at the Fraunhofer PAZ have shown that, compared to other natural fibres, they have very good mechanical characteristics that make them a possible candidate for plastic reinforcement: If very good, isolated cellulose fibres with long fibre length are used in the injection moulding compounding, the resulting materials are just as load-bearing as short glass fibre compounds – but with substantial material and cost advantages.

However, using cellulose fibres in this way poses large challenges for the process sequence: Individual fibres with sufficient length must be acquired from standard supply formats such as cartonboard, which can also be measured in exact doses and are flowable, to enable the fibre distribution to be precisely determined when added to the plastic melt. Such a process is not yet available.

The Fraunhofer PAZ wants to develop precisely this technology and, to achieve this, is working in a new project together with Kurt Seume Spezialmaschinenbau, Ematik, Exipnos and Dornburger Kunststoff-Technik. The objective of the project, which will be funded for two years within the »growth core potential« programme of the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschnung - BMBF), is to develop a technology platform for the efficient production of high-quality cellulose compounds based on commercially available cellulose supply

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INFO

Fraunhofer Pilot Plant Center for Polymer Synthesis and Processing PAZ

For ten years, the Fraunhofer Pilot Plant Center for Polymer Synthesis and Processing PAZ has been operating in the Value-Park Schkopau, performing polymer synthesis and processing procedures on an industrial-orientated scale. It is a joint initiative of the Fraunhofer Institute for Applied Polymer Research IAP in Potsdam-Golm and Microstructures of Materials and Systems IMWS in Halle.

The technical capabilities and the bundling of competencies in both fields constitute the Pilot Plant Center's unique selling proposition on the R&D market. At the Fraunhofer PAZ, new products and innovative technologies are developed along the entire value chain – from monomers, polymer synthesis and polymer processing to testing made-to-measure components.

Profile

- polymer synthesis and processing
- scale-up semi-industrial standards
- the biggest non-industrial polymer synthesis facility in Europe
- flexible synthesis plants
- complete development chain: from material design to tested prototypical components
- pre-serial production of components
- improvement of efficiency with industrial-scale processes
- replacement of oil-based by nature-based polymers

According to Fraunhofer PAZ, the research already finds application in several areas, for example, in low-resistance tires made from recycled materials.

iap.fraunhofer.de

forms and their processing into mouldings by means of conventional injection moulding and injection moulding compounding.

"Through the know-how of the participating partners, we are able to combine cellulose and plastic technology in a unique, continuous solution. In this way, we will make fibrous cellulose industrially usable for plastic reinforcement. Because inline processing, starting from cartonboard and without any other intermediate products that would worsen the properties and increase the price, is the most efficient processing option," says Dr. Michael Busch, head of the project at the Fraunhofer PAZ.

Simplifying sophisticated design solutions

The key is a filter-stuffing unit developed by Fraunhofer PAZ and for which a patent has been filed: The cartonboard, as the raw material, is first ground so that individual cellulose fibres with sufficient length are produced. These are transported away in a fibre air stream. The filter-stuffing unit then separates the fibres from the air and conveys them into the compounder-extruder, where further processing takes place.

Project Manager Busch foresees diverse possible applications for high-quality fibrous cellulose compounds and mouldings: "On the one hand, it will be possible to simplify sophisticated design solutions significantly. On the other hand, glass fibre-reinforced plastics could be partly replaced by cellular fibre-reinforced plastics, which are less expensive and more ecological," he said. The consortium is also aiming to produce master batches, in which fibre content is more than 50 percent.

polymer-pilotanlagen.de

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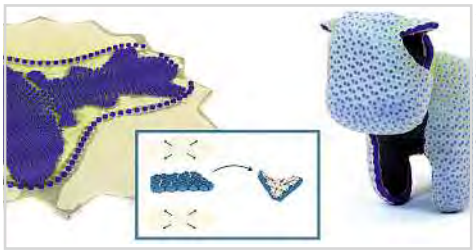
R&D IN BRIEF

Reducing costs for AM

Additive manufacturing processes such as Laser Metal Deposition or printing with metal powders often require vast investments. A new low-cost system from Aachen was presented at the Laser fair in Munich. With this, the Faculty of Mechanical Engineering at RWTH Aachen University wants to bring AM to SMEs.

ilt.fraunhofer.de

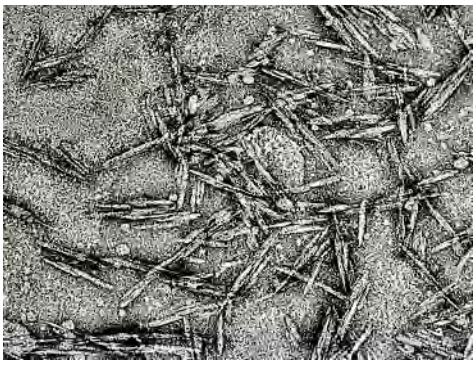


Source: IST Austria

Shaping objects from flat

IST Austria computer scientists design flat sheets that transform themselves into smooth-surfaced, free-form objects. Self-actuating objects that can transform themselves into 3D objects are an active area of research but until now options were limited to objects with sharp edges and little curvature. Now, for the first time, computer scientists have made it possible to create smooth, free-form objects by developing an ingenious material design and a new method of self-transformation. The original form of these object is flat. Because of the tension between the used materials, a variety of round forms can be achieved.

visualcomputing.ist.ac.at



Source: Empa

Plant-based 3D printing

Empa researchers have succeeded in developing an environmentally-friendly ink for 3D printing based on cellulose nanocrystals. This technology can be used to fabricate microstructures with outstanding mechanical properties, which have promising potential uses in implants and other biomedical applications. The cellulose for the nanocrystals can be recovered from the cellulose existing in trees, for example.

empa.ch

Source: Hasco

Henrik Jørgensen, managing director of Formteknik DK (left) and Johnny Quist, Hasco sales engineer Denmark East.

Diamond-like Carbon hard at work to raise mould productivity

Dr Michael Thielen,
freelance journalist

Companies with high outputs need smooth and reliable mould action. When manufacturing billions of parts during long production runs, reducing wear and increasing lifespan of moulds is key. This makes Diamond-like Carbon an interesting proposition for the coating of moving parts.

Mould making company Formteknik Denmark was founded by Henrik Jørgensen in 2007 and merged with Formteknik Sweden in 2015. While the Swedish branch does most of the manufacturing, Formteknik Denmark focus on R&D support, mould-design, engineering and testing of injection moulding cells for the production of high precision medical parts, thin wall packaging and caps/closures, with DLC coated standard components sourced from Hasco.

In Roskilde, west of Copenhagen, nine designers are concentrating on the engineering and development of injection moulds for the high-volume production of precision medical parts such as catheter devices, insulin pens, thin-wall packaging and caps and closures. The remaining staff of 22 are busy with FEA, MoldFlow, ESI, DFM, mould assembly, project management, sales and mould development in the injection moulding test centre. Another 34 employees work at Formteknik in Unnaryd, Sweden, which was founded in 1979. Formteknik delivers complete production cells, consisting of the mould, the injection moulding machine and all necessary peripheral equipment. Everything is assembled and tested in the test centre in Roskilde. Only after everything is successfully validated with the customer's product, the whole cell is transferred to the final manufacturing site.

All production cells are single purpose units which produce medical components, thin wall packaging or caps and closures in very high volumes from 10 million to over a billion parts per year, lasting several years without any product change. This requires high uptime availability, sometimes also referred to as Overall Equipment Effectiveness (OEE). Long maintenance intervals and maximum lifetime before a mould has to be replaced are key: "We guarantee two million shots for each mould," Jørgensen says.

Here, Diamond-Like Carbon (DLC) coatings are said to show their advantage. All moving parts of moulds made by Formteknik are coated with DLC

to reduce wear and increase lifetime. The coating combines the lubricating effect of carbon with the hardness of diamond particles to form a lubricating coat with high micro-hardness and low friction.

No additional lubrication is said to be needed. “In some areas it's quite difficult to grease, and many of our customers from the medical or food packaging sectors don’t want any grease at all,” Jørgensen says. Hence DLC-coating is an important prerequisite for clean room, controlled environment production.

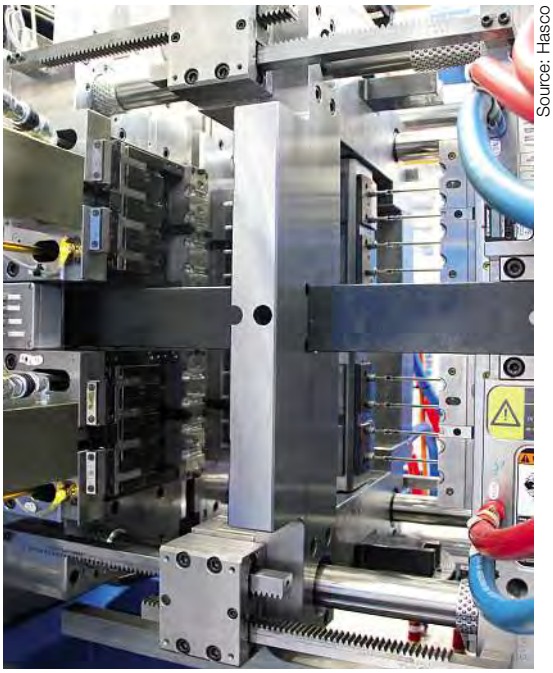
Diamond-like Carbon used for demoulding

While all moving parts such as slides, guide pins, ejectors in Formteknik’s moulds are DLC coated, the cavity surface itself is not. Here alternative coatings such as chrome nitride are used. With one exemption, as Jørgensen explains. “For one application, a small but long tube, we use DLC-coating to achieve the opposite effect. Due to the DLC surface structure and parts shrinkage behaviour, the part used to stick in the outer mould part, not on the core, which made demoulding easier. Here, DLC showed a relatively good adhesion to the polymer, so that the core of the mould was coated to make the injection moulded part stay on the core.”

High production volumes of 500 million units per year means multi-cavity moulds - single or twin component moulds of 48, 64, 72 and 96 cavities for caps and closures, or from typically 16 up to 64 cavities for more complex medical parts. In addition, moulds and production cells need to be integrated. Formteknik’s customers are often end-users who don’t produce themselves, but the majority of parts are sourced simultaneously from more than one external contract manufacturer, running the exact same equipment setup supplied by Formteknik.

Formteknik uses a number of individual components treated with different coating systems including DLC coating. “But to be able to buy different DLC-coated standardised parts from Hasco is helpful,” says Jørgensen. Otherwise, the company would have to send these parts to a coating company first, posing the additional problem that a coating has a certain thickness that has to be considered in the size of the uncoated part. This doesn’t seem to be the case for Hasco parts. Jørgensen claims cost savings of more than 50% when using DLC-coated standard parts compared to designing them in house with a certain undersize, manufacturing them and having them coated elsewhere. “This reduces the lead time and the size of our spare parts warehouses as well as the tied-up capital,” he says.

hasco.com



Source: Hasco

The photo shows a stack mould with a spinstack inside.

Stable form for 80 years

When it comes to our modern lifestyle, there are numerous inventions from the last millennium that helped to achieve the level of comfort we are used to today. A prominent example is the car. But sometimes, it's the small things that no one notices that actually make our lives easier. Think of the office chair, for example: How many hours do workers all over the world spend everyday on this seat? After work, people get into their cars and sit – hopefully comfortably – again on a padded chair. Whether the end of the day is spend at home on the sofa or perhaps with friends at a bar: We sit comfortably on upholstery. This comfort is due to the air that can circulate freely in the upholstery – thanks to the foam. And that, even though researchers doubted at the beginning whether it would be possible to produce this material at all.

Today, it is estimated that the material adds up to 5% of all plastics produced. Around 500,000 people are working in the production and processing of it. This year, it is 80 years old: Polyurethane. In the form of polyurethane foam (PUR foam), we use the material on an everyday basis. The foam is not only used for upholstering chairs but also for cleaning sponges, medical dressings and filters, making it indispensable for daily tasks. That puts PUR on a par with other essential plastic materials, for example, vulcanised rubber.

The popularity of polyurethane foam is due to its versatility and durability. Additionally, the pores of the foam are huge enough that air is able to circulate freely, preventing the storage of warmth and moisture. The foam is also famous for its form stability. Cushions remain in their original form for a long time.

In many cases, PUR foam is sold and used in the form of flexible blocks. Some flexible versions can also be moulded, which is often applied for car seats. For applications for building isolations, rigid foams are used.

A famous invention at only 31 years of age

The inventor of one of the world's most important plastics was the German chemist, Otto Bayer. Even though he shares his name with the famous global enterprise Bayer, he is not related to the founding family of the producer of chemicals and pharmaceuticals. Still, he worked for the company from the age of 31.

Otto Bayer was born in Frankfurt, Germany, on 4 November 1902. This was where he also studied chemistry and completed his doctorate. His supervisor was the equally famous chemist, Julius von Braun.

Bayer begins his first job at Casella Farbwerke thanks to the mediation of von Braun in 1927. Only six years later, Bayer is head of the central research. His main research interest at that time is the investigation of vat and sulfur dyes and the light fastness of dyes.

Source: Bayer AG

During a presentation, Otto Bayer demonstrates an experiment with polyurethane foam (1952).

ETMM

TIMELINE

1902

Otto Bayer is born in Frankfurt, Germany.

1933

At only 31 years, Otto Bayer becomes head of central research at IG Farbenindusrtrie AG (later Bayer AG).

1937

Patent application for polyurethane PUR.

1941

Invention of PUR foam.

1943

First products made from PUR foam with a shell made of resin-impregnated paper.

Casella Farbwerke belongs to I.G. Farbenindustrie, a merger of companies of the German colour industry. Among them are also BASF, Bayer and Agfa. The group exists until 1951, until companies like Bayer are re-established. Here, too, Otto Bayer works as head of research.

In 1937, at the age of 35, Otto Bayer makes the discovery he is famous for today: Together with his team, he discovers the polyaddition of isocyanates and polyols to polyurethane. The possibility of forming a hard foam by mixing small quantities of chemical substances does not seem to be feasible. Otto Bayer has to face several difficulties after achieving a usable result. Even after the chemist and his team are able to produce polyurethane foam, it takes several years for the material to be custom-produced.

In the following years, this invention, too, is not spared from the current political development in Germany. Like many other German inventions of that time, it is discovered for its usability for war purposes. Consequently, PUR foam is soon also tested for military use. In particular, parts with a resin-impregnated paper skin are tried out for the construction of, for example, aircraft. Here, too, its lightweight properties and form stability seem to offer advantages for aviation and transport.

In specialist circles, people call such cases dual-use: Civilian inventions are frequently recognised as useful by the military (or the other way round), and are subsequently exploited or further explored. Other prominent examples of this practice are thiodiglycol, better known as mustard gas, which also finds application in the cosmetics industry and microscropy, or the Internet.

The rise of PUR begins after the Second World War

In the 1950s, after the end of the Second World War, the material finds application in areas where it is used even today. Manufacturers start to use soft polyurethane foams for cushioning and mattresses. Harder foams find applications for insulation purposes. The automotive industry also discovers the material and starts using it for impact protection.

Nowadays, PUR foam is everywhere. There is no sign of its triumphal march ending. Still, efforts are being taken today to reduce the use of isocyanates for the synthesisation of polyurethanes. They are said to not so raise severe toxicity issues. Isocyanates are suspected of causing cancer and can trigger allergies. Polyurethanes do not contain harmful substances when fully reacted, but efforts have been taken to reduce harmful ingredients.

Bayer, not alone thanks to Otto Bayer, is still one of the key players on the polyurethane market in Europe today. Other important companies are BASF (Baden Aniline and Soda Factory), and the Swedish company, Chematur Engineering. According to a report by Markets & Markets, the polyurethane market will be worth $ 90 bn by 2021.

bayer.de

EDM Europe

The trade magazine for electrical discharge machining

Volume XVI | Issue 3 | 9-2017 www.edm-europe.com

Special Supplement

Vogel Business Media

Sodick EDM enhances accuracy and control at toolmaker

Dartford-based Synergy has invested in the latest Sodick AD35L from Sodi-Tech EDM, a move that has seen both precision and ease-of-control improve in comparison with the company's existing die-sink machine. The AD35L has been set to work producing punches for the compaction industry that feature intricate and precise forms.

EDM Europe

INFO

Impressive: Founded in 1976, Sodick today looks back on more than 55,000 manufactured EDM machines and 30,000 linear, motor-driven EDMs.

Now in its 11th year of trading, Synergy has carved out a strong niche fulfilling a range of toolmaking requirements. These include top and bottom punches for the compaction industry, which essentially compress metal powders into products such as magnets. The process relies on the compacting of metal powder in a die through the application of high pressure. Typically, the tools are held in the vertical orientation with the punch tool forming the bottom of the cavity. The powder is then compacted into shape and ejected from the die cavity. The parts tend to need very little additional work for their intended use, making for very cost-efficient manufacturing. Importantly, tooling must be designed so that it will withstand extreme pressure without deforming or bending. Furthermore, tools should feature a polished finish and prove wear-resistant.

Beyond compaction tools, Synergy is also highly successful in the provision of transfer press tools, as well as the supply of spares and repairs to all types of general press tooling.

Synergy Director Ian Chambers with Sodick technology installed in his production.

Source: Sodick

"Such has been our growing order book that it was clear we needed to increase our EDM capacity," explains one of the company's owners, Ian Chambers. "For this reason, we decided to assess the market for an additional die-sink EDM."

A boost in precision and minimised machining times

Despite having never used a Sodick machine before, the company's research identified the AD35L as the ideal solution. Following a full demonstration by Sodi-Tech EDM and the manufacture of sample parts, Synergy placed the order.

Installed in September 2016, the machine has been dedicated to a single repetitive job; special compaction punches made from Vanadis 30 tool steel and carbide with the requirement for a tight form sparked in the top face. The AD35L completes three punches every day.

"The tight form includes a maximum corner radius of 0.1mm," explains Mr Chambers. "We have to hold a tolerance on concentricity of 5µm, and 10µm on size, depth and profile shape, as well as a high level of surface finish. However, our new AD35L meets the specification day-in, day-out."

Featuring linear drives, glass scale feedback and a 10-year positioning accuracy guarantee, the Sodick has provided a clear boost to precision levels at Synergy. This is supported by optimised rib arrangements that increase rigidity by approximately 70%. Additionally, they help minimise machine deformation.

With regard to surface finish, Sodick's arc-less electrical discharge system features further improvements in machining performance and ensures that machining time is minimised. Equipped with Sodick's SVC high-quality surface finishing circuit, satin and mirror surfaces can be achieved.

Even a beginner can operate the machine

Ease-of-use and high levels of control are additional features of the AD35L to have impressed Mr Chambers. Here, Sodick's latest LN controller is equipped with LN Professional automatic programming functions, while LN Assist (supplied as standard) enables even a beginner to operate the machine.

"Considering I have been a user of another EDM brand for the past 30 years, the learning curve on the Sodick machine was really short," he says. "In fact, we were running capable in just 2-3 days. It was far easier than I anticipated and we are virtually experts now. For example, if we are 10µm under on a particular dimension, such is the level of control that we can get rid of that immediately."

Offering travels of 350 × 250 × 270mm in the X, Y and Z axes, respectively, and the capacity to accommodate workpieces weighing up to 550kg, the arrival of the Sodick AD35L at Synergy has spurred the company on to new levels of business performance.

"It's fair to say that the market is a little variable at present, but we managed to achieve our best month ever in February 2017, which is encouraging to say the least," concludes Mr Chambers.

sodi-techedm.co.uk

Source: GF Machining Solutions

Braunform GmbH's Timo Steinebrunner, Sales Manager (left), and Martin Kohl, Head of Eroding (right), at Braunform.

Precision for that perfect look

Braunform GmbH specialises in high-precision injection moulds and since 1977 the company's production process has relied on GF Machining Solutions' electrical discharge machining (EDM) technology. At the same time, this medium-sized business is not afraid of trying out prototypes and getting them ready for the market. Consequently, Braunform is a step ahead of many competitors.

Cool and casual—three-day stubble is all the rage. But whether the fashion-conscious male chooses to go with the trend or prefers a clean-cut alternative, he should always look well-groomed. A good razor that delivers chiselled contours or perfectly smooth skin is an essential part of this.

Braunform is a toolmaking business based in Bahlingen am Kaiserstuhl, a small town in south-west Germany. It creates the injection moulds that are used by various manufacturers, including the market leaders in cosmetic care products, for the highly sophisticated plastic components in their razors. These intricate structures, accurate to a thousandth of a millimetre, carry up to five extremely sharp blades, individually sprung for a smooth finish. This represents a real challenge for all designers and manufacturing experts at Braunform, especially if you bear in mind that these injection moulds are used for mass products and therefore have to deliver perfect results a million times over. "We supply renowned razor manufacturers throughout the world," revealed Timo Steinebrunner, Sales Manager, but without mentioning any names; discretion is paramount. Hidden champions like Braunform are usually secretive and avoid high-profile publicity. Instead, they rely more on their achievements to make a name for themselves in their particular industries.

Braunform certainly has no reason to hide away: Its customers come from the cosmetic care industry as well as from the automotive and pharma-

EDM Europe

INFO

GF Machining Solutions at a glance

Swiss-based GF Machining Solutions is a leading provider of machines, automation solutions and services, well known in the tool and mould-making industry.

The product portfolio of GF Machining Solutions includes electric discharge machines as well as high-speed and high-performance milling machines. The company also produces 3D Laser surface texturing machinges.

Based in Switzerland and maintaining a presence at 50 sites worldwide, GF Machining Solutions is a globally active group and source of strength to its customers.

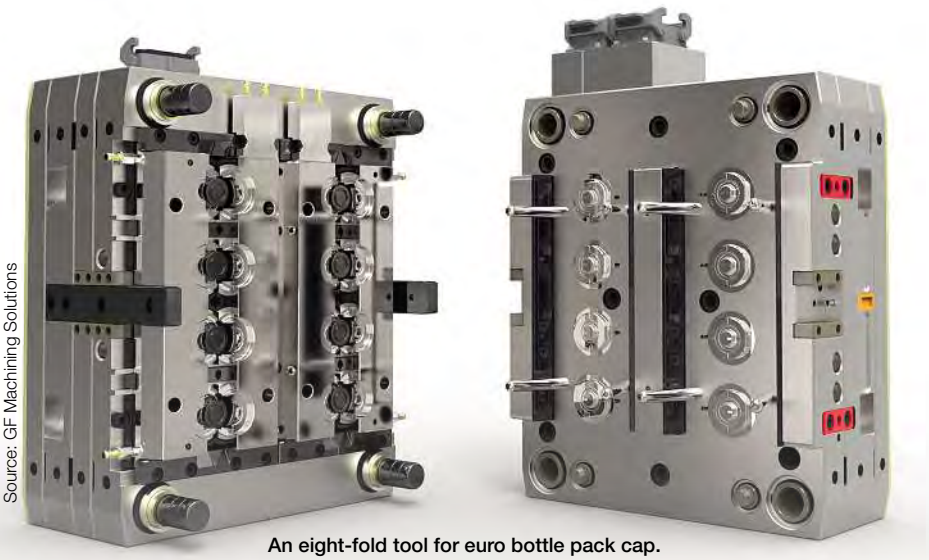
A company belonging to Georg Fischer Group (Switzerland), GF Machining Solutions has 3,102 employees and generated sales of CHF 916 million in 2016.

GF Machining Solutions at the EMO Hanover 2017

The company will focus on current trends for production at their presence at EMO 2017, including Industry 4.0, energy efficiency and additive manufacturing. Among others, GF Machining Solutions will be showing a premiere in milling technology. The highly efficient Mill P 500 U offers precision and surface finishing on a new level.

ceutical sectors and all of them are truly global players. Braunform produces an impressive range of tools for the manufacture of plastic components—from parking brake actuators to inhaler parts—and this is predominantly due to the fact that the company has opted for GF Machining Solutions' high-end EDM solutions. Since mid-2015, the family business has operated two Agie-Charmilles CUT 3000 wire EDM machines, one Agiecut Excellence, five Agie-Charmilles FORM 3000 ED die-sinking machines and two Agietron Hypersparks, all equipped with modular automation systems for loading and unloading workpieces and electrodes. These are the best that GF Machining Solutions has to offer and represent top-of-the-range EDM technology.

The machines are highly efficient in eroding multi-component moulds that allow various parts made from different materials to be manufactured in a single operation, as well as multi-cavity moulds that are especially economical for the mass pro-



Source: GF Machining Solutions

An eight-fold tool for euro bottle pack cap.

Source: GF Machining Solutions

Insert for coffee pad.

Mold insert.

duction of high-quality parts. By using GF machines, among others, Braunform has succeeded in developing a groundbreaking product—MED moulds, injection moulds that are optimised for cleanroom applications. The high level of process accuracy ensures maximum safety for customers in the medical industry, including companies that produce contamination-free insulin and infusion accessories.

Thanks to its extraordinary expertise, Braunform now has around 320 employees and an annual turnover of 35 million euros. This is a success story that began in 1977 when Erich Braun set up the business. The Agie erosion technology captured the pioneering entrepreneur's attention in the early days when he attended a trade fair. There has been a close partnership ever since: "Braunform has been a very loyal customer of ours since 1977. In those 37 years, the company has purchased 35 EDM machines, always the latest and best model," recalled Frieder Nothacker, Sales Engineer at GF Machining Solutions, who has looked after Braunform for over 20 years. The statement may seem surprising at first. After all, the acquisition of very sophisticated machines is associated with high investment costs that have to make economic sense in the long term. So why does it always have to be the latest machine?

A business relationship that started at a trade fair

"Since the very beginning we set out to be an innovation leader, as that is the only way we can survive in the face of competition," explained Sales Manager Timo Steinebrunner. "We simply do not offer off-the-shelf tools. Every injection mould is an individual design that is the result of intensive communication with our customers. And our customers have very stringent requirements. So it's not just a question of keeping pace with the times; we always want to be one step ahead."

A strategic partnership has developed between Braunform and GF Machining Solutions, built on decades of close co-operation and trust. Martin Kohl, Head of Die-sinking and Wire Erosion, took a look back: "At one time we perfected the EDM technique with graphite in collaboration with GF Machining Solutions and then we were involved in the technological development over the years as cooperation partner. So every new generation of machines has undergone its final trials with us. And that is still the case today: We also helped with the development of the latest machines last year." All customers of GF Machining Solutions benefit from this—as do all the men who want to be perfectly groomed.

gfms.com; braunform.com

Source: Heun

The camera system by Heun is easy to integrate into Heun's APos series of high-speed EDM drilling machines.

Real-time monitoring of EDM drilling machines

Quality inspection – At the EMO, Heun will present an additional option for the high-speed EDM drilling machines of Heun's Apos series – the integration of a camera system. It can be used for position recognition and quality inspection, Heun says.

The automated visual inspection records the test object and processes the data on an image-processing controller to which commercially available monitors can be connected. On Heun's own Apos machines, it is displayed on the machine monitor via remote desktop setting.

According to the company, real-time monitoring is possible with this system. Additionally, operation is very easy, Heun says. The device has automatic calibration as well as high-capacity position detection. One of its main advantages, according to Heun, is that it is a universal camera system for users without programming skills.

The "pattern search" function identifies certain features on the measuring object and transfers the positioning data. This requires an interface for communication with an SPC, which is developed on project basis.

The system consists of camera, lenses and lighting. It performs preprocessing and measurement processing and outputs evaluation results. According to Heun, retrofitting is possible on the machines of the Apos series.

The user interface with icons is easy understandable and allows for intuitive operation with the mouse, Heun states. Additionally, while settings are made, the area can be edited directly with the mouse on the display.

Minor adjustments are possible via the user-friendly operator interface. The correct preset surface can be selected from a variety of options. Numerous communication methods as well as various monitoring functions are available. The connection to SPC of different manufacturers is supported. This allows for easy integration into existing systems.

The fast and powerful image-processing system can be used to check the drilling process. The aim of Heun is to develop a program to recognize drill holes that have not been machined or reclosed within specific drilling patterns. The system then determines the first and the last correct drilling position, calculates the positions of the intermediate drill holes from the already known values and automatically creates these missing or closed drill holes.

heun-gmbh.de;
Hall 3, Booth A102

Toolmakers need to embrace digital technology

Rosemarie Stahl

At the recently held ISTMA General Assembly in Brazil, Bob Williamson was elected President for the next three-year period. Williamson is the representative of TASA (Toolmaking Association of South Africa) at the International Special Tooling and Machining Association.

Bob Williamson was elected as the successor of Dave Tilstone, who had been President since 2014. In our interview, Bob Williamson speaks about his goals for the next three years and he reveals what European toolmakers should do to remain successful in future.

Congratulations on your election as President of ISTMA World! How does it feel to take over this position?
Being elected as the President of ISTMA World is not only an honour and privilege but an acknowledgement by the International Tooling Industry of the pioneering work done by the South African Tooling Initiative and the team that pulled it together.

What are your plans for the next three years? Is there something you want to achieve by 2020?
It's important that we extend our position as the centre of expertise of the worldwide tooling industry and drive the application of Industry 4.0. During the next three years, we have planned a clearly defined schedule of networking reunions, the maintenance of our source of statistical and technical information for the worldwide industry, the promotion of regional grouping, increased membership, to develop an innovative approach to providing members with an attractive and sustainable value proposition, to establish a strong and vibrant corporate image to support and promote the ISTMA World brand, and the further development of strong and financially viable 'Global Partnerships'.

Where do you see the main task of a world association like ISTMA?
Our mission to help national industry associations and their members' companies achieve business success in the global economy through advocacy, networking, information, programmes and services is as valid today as it was 44 years ago when ISTMA was established.

You come from South Africa, a country that is mainly member of ISTMA Europe because of the shared time zone. What can European tool makers learn from Southern African toolmakers?
The recognition by our government and all key industry sectors of the strategic importance of a strong and vibrant tooling Industry towards the development and maintenance of a manufacturing economy along with the need for talent driven innovation is without doubt the building block that has led to the success of the internationally recognised South African National Tooling Initiative.

Where do you see the future of toolmaking? Are there any trends that will have an influence on toolmakers all over the world?
It is of paramount importance that tooling systems manufacturers fully embrace digital technology from an ownership perspective, whether it be for design, advanced machining or additive manufacture. It would be a fatal mistake to allow dependency on the information technology industry for know-how.

Source: Stahl

"Tooling systems must never be regarded as a commodity but rather as a highly subjective and critically important part of the manufacturing process."

Bob Williamson, President of ISTMA World

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ISTMA at a glance

ISTMA is the International Special Tooling and Machining Association. The international association is representing 20 special tooling and machining associations all over the globe. According to the association, its members represent more than 8,000 companies. The association is in charge of the central coordination and organisation of international events.

ISTMA's mission is to help industry associations and members "to achieve business success in the global economy through advocacy, networking, information, programmes and services."

Where do you see problems? Can toolmakers keep up with rising demands and growing competition?
The challenge comes from the customer base or the manufacturing industry; tooling systems must never be regarded as a commodity but rather as a highly subjective and critically important part of the manufacturing process. More than fifty percent of the cost of any product produced is directly linked to the selection of the tooling used in the manufacturing process. The secret is the close relationship between the manufacturing and the tooling Industries, with a focus on the total cost of manufacture.

Toolmakers are said to be very conservative. Is there any prejudice that you learned to be untrue in your work with toolmakers all over the world? Can you give an example?
Traditionally, the tooling Industry has always been socially close and independent when it comes to business dealings. This has proved to be a mistake. Today the world-wide tooling industry promotes networks, clusters and co-opposition. The best example of this positive trend is without doubt the Portuguese mould industry.

Do you have a personal role model?
There are several people who have had an influence on my career in the tooling industry; Derek Salt from Metalite in the UK for his passion for the design and manufacture of high-tolerance fixtures and gauging, Joaquim Menezes from Portugal for his leadership of the Marinha Grande Mould Cluster, Colin Muller, founder of the Aims Group, for the entrepreneurial spirit that enabled South Africa to become a recognised international supplier of automotive tooling, and John Mulgrew, owner of Design International, for the business sense and wisdom which has allowed him to build the largest South African manufacturer of automotive body-in-white assembly systems, exporting to all major continents. When I asked him, "How did you do it?", he replied, "I have three principles: One, customers have the right to quality; two, customers have the time to on time delivery; and three, my company has the right to make a reasonable profit."

One last question: What advice would you like to share with European toolmakers?
Stay in the lead with innovative technology.
istma.org

Source: Max Schwoelk Fotografia

The 15th ISTMA World Conference was was held from 28 to 30 June in the city of Joinville (Brazil).

ISTMA World News & Events

The International Special Tooling & Machining Association (ISTMA) is an international association representing 19 special tooling and machining associations throughout the world. Collectively, ISTMA member associations represent over 8,000 companies and over $40bn in annual sales. ISTMA World is in charge of the central coordination and organisation of all international activities

NEWS

ISTMA World Conference a success

Source: Max Schwoelk Fotografia

Organised by ABINFER (Brazilian Tooling Association), the XV ISTMA World Conference was held on June 28 to 30, in the city of Joinville (Brazil). Over 250 delegates from 13 countries attended the event and took advantage of world class presentations and speakers who shared with the audience their vision on the industry and its market and technological developments.

This 15th edition of the Conference took place at the Expoville exhibition fairground and convention centre. Attendees had a unique opportunity to learn about key topics like "World class toolmakers" or the introduction of "Industry 4.0" within the sector.

Forum held during Moulding Expo

Source: ISTMA

Organised by ISTMA Europe, with the support of the European Tooling Platform, the VI European Tooling Forum was held on May 30, 31 and June 1 at the "Moulding Expo" show in the city of Stuttgart (Germany).

This sixth edition of the Forum took place at the ISTMA Lounge on the exhibition fairground, with technical sessions organised on different schedules and days. Having speakers and attendees from several countries and regions, this initiative was a milestone for promotion, visibility and recognition of ISTMA and the Tooling Industry.

China, the newest member

China was formally recognised as ISTMA member in May 2017. The Chinese Die & Mould Industry Association – CDMIA, based in the city of Beijing, has been acknowledge as newest ISTMA member at the Moulding Expo show. CDMIA was formed in October 1984 and is the sole nationwide organisation in die and mould industry in China aiming to promote the sector's technological and commercial development. It is a non-profit organisation with 1,200 member companies from different regions in the country.

cdmia.com

Source: ISTMA

EVENTS

EMO Hannover

- The metalworking trade fair will take place from 18 to 23 September 2017.
- The EMO Hannover is organised by the German Machine Tool Builders' Association (VDW), located in Frankfurt am Main, on behalf of the European European Association of the Machine Tool Industries, Cecimo.

TCT Show

- The TCT Show will be held from 26 to 28 September 2017 in Birmingham, UK.
- It covers a broad variety of 3D technologies, for example, software, inspection and metrology or innovative takes on conventional manufacturing.

MEMBERS

Tool Factories Association
www.svaz-nastrojaren.eu

Estonian Special Tooling Association
www.estatools.ee

The Federation of Finnish Technology Industries
www.techind.fi

Association Française des Industries du Moule, Modèle et Maquette (AFIM)
www.afim-france.com

VDMA
www.vdma.org

The Gauge & Tool Maker's Association (GTMA)
www.gtma.co.uk

Szerszámgyártók Magyarorsazági Szövetsége (SZMSZ)
www.szmsz.hu

Unione Costruttori Italiani Stampi e Attrezzature di Precisione (UCISAP)
www.ucisap.it

Stowarzyszenie Techniczne – Tworzywa Sztuczne
www.stts.com.pl

Associação Nacional da Indústria de Moldes (CEFAMOL)
www.cefamol.pt

Slovenian Tool and Die Development Center
www.tecos.si

Toolmaking Association of South Africa (TASA)
www.tasaweb.co.za

Swedish Moulding and Press Tools Association
www.sinf.se

Swissmem
www.swissmem.ch

International Mould Manufacturers Union
www.ukub.org.tr

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Subscriptions: European Tool & Mould Making is published 9 times per year.
Annual subscription fee: € 101, plus €24 postage
Subscription inquiries, back issues, address changes: send your request to DataM-Services GmbH by email to mgrimm@datam-services.de or by fax to +49 931 4170-494

Circulation Audit: Member of the Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e.V. (IVW), Berlin

Editorial Contributions: Product/service information bulletins and press releases should be submitted in English and should be accompanied by a colour photograph or transparency. Please send to the address in Würzburg or email to: etmm.editorial@vogel.de

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ISSN 2194-7589

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Official Media Partner of ISTMA World

MEDIA GROUP

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Max-Planck-Straße 7/9
97082 Würzburg, Germany
Ph.: +49 931 418-0
www.vogel.de

Ownership:
Personally liable associates:
Vogel Business Media Verwaltungs GmbH, Max-Planck-Straße 7/9 in 97082 Würzburg,
Kommanditistin: Vogel Medien Holding GmbH & Co. KG, Max-Planck-Straße 7/9, 97082 Würzburg

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Printed at:
Vogel Druck und Medienservice GmbH, www.vogel-druck.de

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