NEWS

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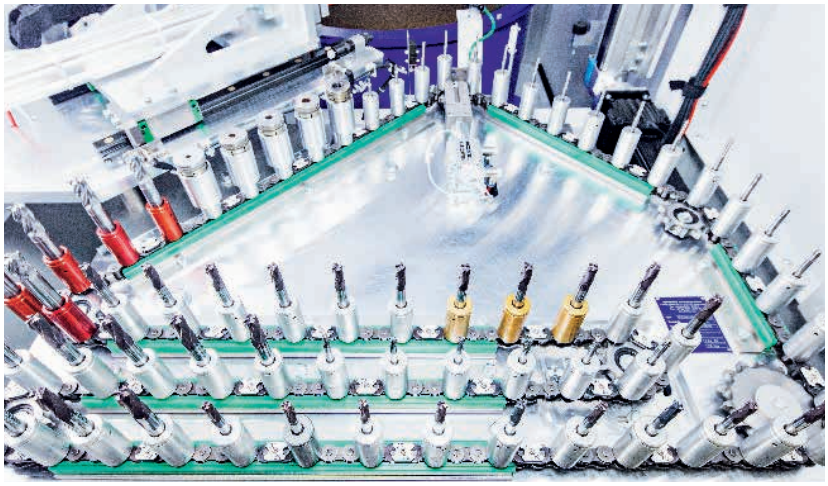
THE DIGITAL TWIN HAS ARRIVED AT OTEC

Discover the new technology that's set to benefit OTEC's customers

SF SERIES AUTOMATION: NOW WITH CHAIN LOADER

Efficient tool processing with automated loading

EDITORIAL



Dear Reader,

Big changes are afoot at the heart of our economy – the automotive industry. Future technologies are leading the way and have an enormous impact on us all. But they also give us fresh perspectives and opportunities to go on developing. Everything we do revolves around the contribution we can make through innovation – how we can use OTEC's progressive technologies to make end products that futureproof our customers and increase their bottom line.

They say a rolling stone gathers no moss. Well, there are lots of exciting, innovative topics keeping us – and especially you, our customers and business partners – rolling. Read on to find out which OTEC precision finishing process conquers ultra-hard PCD tools from UC Tools with flying colours. Or how our chain loader and SF1 combo became the SF1 ILS success story for an Italian surgical drill manufacturer.

In this, the second edition of 2019, we'll be spotlighting the 'digital twin' that lets you put a machine through its paces before it's even built. In practical terms, that means we can work on design and software development in parallel, so we'll soon be able to deliver custom machine solutions more quickly.

We aim to give you an ongoing insight into our day-to-day activities and share our passion for pioneering solutions. In this edition, the hot topic is predevelopment. Among other things, Daniel Stelzer explains how synergies from our cooperation with Pforzheim University create added value.

We hope you enjoy reading this newsletter.

Helmut Gegenheimer
Managing Director

OTEC NEWS
#02/2019

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THE DIGITAL TWIN HAS ARRIVED AT OTEC

Google 'digital twin' and you'll get thousands of hits – it seems no industry these days can manage without this digital all-rounder, whether in manufacturing, property, medicine, telecommunications or logistics. Why? That's exactly the question we answer in this article. Find out how OTEC's customers will benefit from this new technology.

Digital model + digital shadow = digital twin!

The digital twin has several components. First, the digital model – well-known in industrial environments – that emerges during development and design of a physical object. This digitally maps or simulates the geometry, kinematics or process flow of a real product. But ... there's no data exchange between model and product.

The digital shadow is all the relevant data about a real product collected over its lifecycle, such as process and machine data as well as status data for individual components. As you'd expect, the information flow between the physical product and its digital shadow is one-way.

The digital twin combines the model and shadow with a decision-making instance via defined communication channels. This 'decision-maker' optimises the system by using algorithms to analyse the digital model and make decisions based on the knowledge it acquires. Depending on its level of autonomy, the twin passes on the resulting commands to the real object and/or helpfully communicates them to relevant external interfaces (for example, a machine operator, HMI or ERP system).

What does a digital twin actually do?

Basically, digital twins automate and optimise existing systems. Digital twins of physical objects are always created for specific tasks such as production planning or material flow planning. So there's no such thing as an 'overall' digital twin for a product, but different twins can be tailored for each of an object's tasks.

Flawless: the 'test authority' twin at OTEC Präzisionsfinish

OTEC is using digital twin technology to set up an internal system for virtual commissioning, by testing the control code of new systems on a digital image of the real thing before physical startup.

This will allow us to optimise process flow and make any corrections safely in advance, minimising disruption during actual commissioning and shortening lead times.

Information and training at OTEC Präzisionsfinish:
Parts of this article were taken from Luis Schumacher's research paper, The Digital Twin In Industrial Engineering. Luis is studying mechatronic system development under Professor Barth at Pforzheim University and is currently writing his master's thesis at OTEC Präzisionsfinish GmbH.

For information on training and education opportunities, visit www.otec.de

PREDEVELOPMENT

OTEC LEVERAGES THE SIGNS OF THE TIMES

Globalisation and digitalisation have well and truly arrived in traditional mechanical engineering, with the resulting challenges of shorter product life cycles and increased international competition. But companies that understand the signs of the times find profitable opportunities and new development possibilities. OTEC's core technology is mass finishing. We aspire to reinvent it again and again with innovations, and to go on developing our role as a technology leader. For example, continuous improvements in physicotechnical analysis are a source of innovative new product ideas. And by accelerating digitalisation, we're continually improving our internal (development) processes to create service offerings that actively support our customers' value chains.

Exploiting future potential

To advance and exploit this future potential we set up a Predevelopment department in late 2018. Its interdisciplinary team – spanning mechanical engineering, tribology, chemistry, programming, electrical engineering and automation – is working on projects around future technologies and new product development for OTEC Präzisionsfinish. By focusing on risky and completely new products, we're reducing the risk involved in series development while remaining technologically well-placed for the future.

Where research is concerned, our predevelopers work on a project basis with renowned universities like Karlsruhe Institute of Technology (especially the Institute of Production Science), Pforzheim University of Applied Sciences and the Fraunhofer Institute for Production Systems and Design Technology in Berlin. Certain students at these institutions also write their theses while working in the department.

Hands-on – everyone's involved!

Our innovation management policy allows any employee to take their process or product ideas to the Predevelopment team without having to jump over technical barriers. This interaction between Predevelopment and the rest of the workforce, coupled with creativity and commitment, spawns tangible product concepts. The opportunity to actively shape OTEC's future with ideas has been well received so far.

Thanks to the team's hands-on mentality, prototypes can be developed quickly and effectively, while ideas and theories are verified in practical experiments. With the first projects already under implementation, OTEC Präzisionsfinish's role as a technology leader is set to continue.

The Sozialpädagogischen Wohngemeinschaften Karlsruhe offers children and young people with complex disabilities a home-from-home. When we discovered this residential community and its impressive, committed team, we had no hesitation in lending our support to their work.

OTEC LENDS SUPPORT TO KARLSRUHE'S RESIDENTIAL COMMUNITY FOR DISABLED YOUNGSTERS

In early 2019, OTEC paid them a visit to hand over a donation in person and get to know the charity better. We were warmly welcomed, given a tour of the house and met some of the 28 children and young people who live there in four small residential groups. They receive 24-hour care in a family atmosphere where personal relationships, mindfulness and empathy play a central role. During our visit it was plain to see how the children and carers really do see each other as family.

Parents, too, are closely involved and can visit and pick up their children at any time. The community is homely, and therefore also a place where the individual interests and needs of the youngsters can develop. Because every child is different, with his or her own preferences, interests and perceptions.

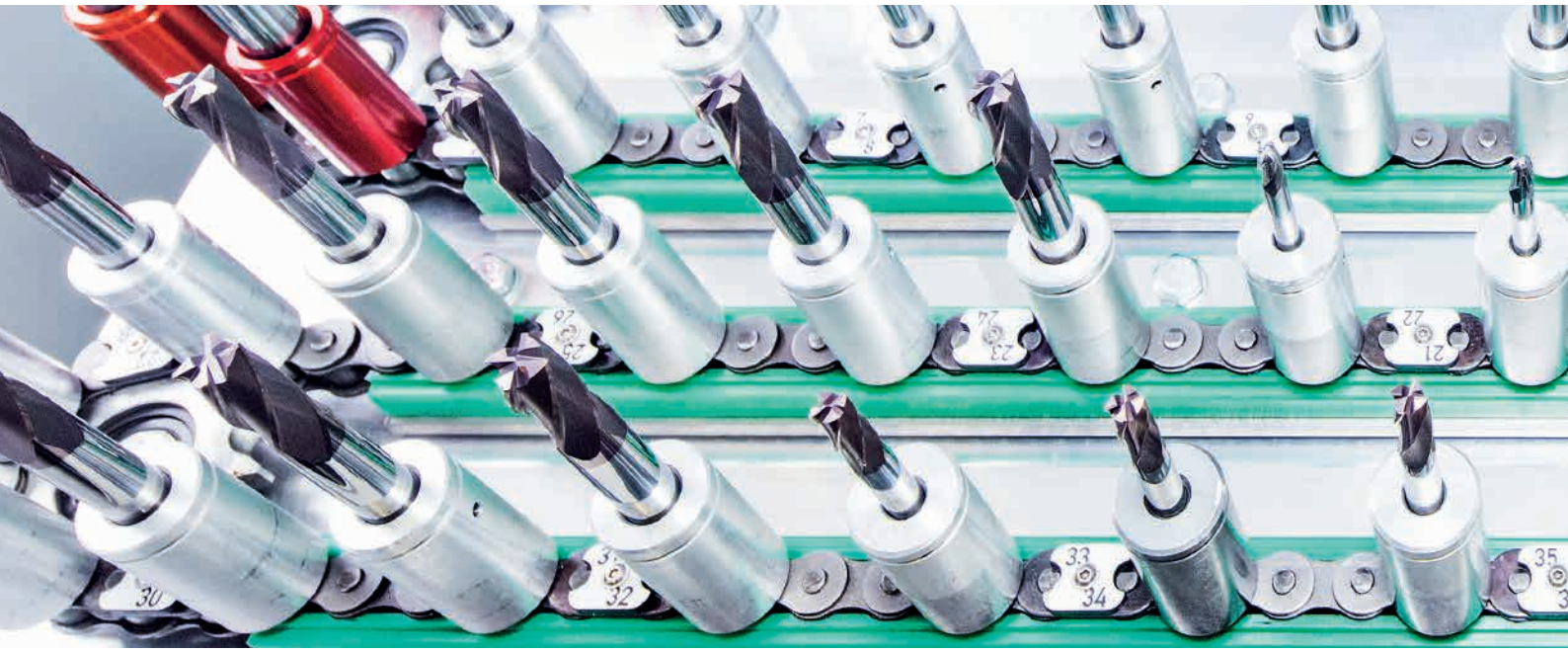
Music and light play a special role, with a special multisensory 'Snoezelraum' and music therapy, where the children and young people can relax and simply revel in their senses. Physiotherapy, occupational therapy and speech therapy are some of the other regular treatments on offer.

And of course there's lots of fun to be had with leisure activities like outings, holiday camps and joint events with similar facilities. We're delighted to be supporting this project! **To find out more, visit www.reha-suedwest.de/wg-karlsruhe/**

+++ ISSUE #01 OF OTEC NEWS WILL BE PUBLISHED IN FEBRUARY 2019 +++

IT RUNS LIKE CLOCKWORK:

SF SERIES AUTOMATION: NOW WITH CHAIN LOADER



When it comes to processing large volumes of workpieces, short process times, process reliability and consistent, reproducible results through fully coordinated process parameters and abrasives are all important. But so are loading and set-up times.

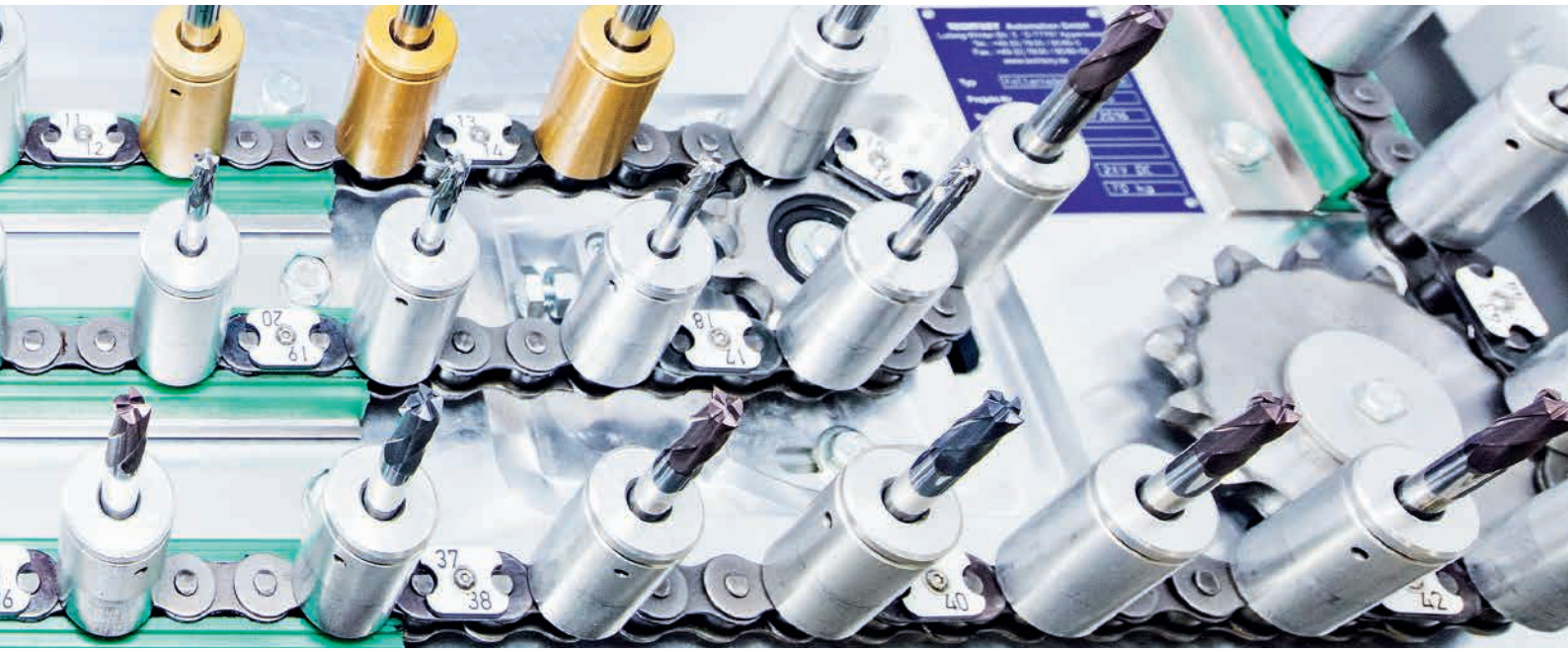
Efficient tool processing with automated loading

OTEC SF Series machines run for up to five hours unmanned. Courtesy of automatic chain loading. The OTEC SF1 ILS with chain loader not only raises the bar in automated precision finishing but also offers significant cost advantages. It features a chain loader with 64 or 160 positions in tool diameter-dependent loader sleeves, and can process mixed workpieces of 2–18 mm diameters in a single batch. Workpieces and collet adapters can be exchanged automatically as required. Once the tools have been processed they are fed back into their loading sleeve. The exchange takes around 14.5 seconds.

Astonishingly fast mass finishing

Italian manufacturer Montemurro Utensili uses a pulse finish process on

Chain loader loaded with tools



the OTEC SF1 ILS (Integrated Loading System) to guarantee the quality of its high-grade bone and dental drills. During process development, our pulse finish produced outstanding results in just 60 seconds. Perfectly coordinated parameters and abrasives provide our customer with consistent, reproducible results. The machine's high processing forces and flow rates cut processing times, making it extremely cost-efficient.

Automatic loading for maximum output

The SF1 ILS outputs 40 units per hour. The automated loading system on the SF Series is ideal for increasing throughput.

Automatic tool change

SF1 ILS AUTOMATION APPLICATION: DENTAL DRILLS

The manufacturing process for stainless steel surgical drills used in minor or major procedures produces burrs. Manual deburring is not just time-consuming but also produces a lot of rejects, not to mention the fact that every drill ends up slightly different because of low process reliability. OTEC SF Series machines are designed for reliability, reproducibility and lower unit costs. No manual work required!

UC TOOLS & OTEC

Precision surface processing for PCD tools

OTEC has developed a custom surface polishing process for UC Tools' PCD range (PCD is an ultra-hard synthetic cutting material made from sintered diamond particles). The result: tools polished to perfection.

UC Tools uses the OTEC SF Series stream finishing machine exclusively for surface processing of these tools. OTEC is a partner it can trust – always ready to deal with queries or concerns – with efficient communication channels that the tooling specialist considers a big plus.

Superior surface quality is essential in tool carrier production, because it guarantees factors like better chip removal – especially in dry processing.

OTEC SF Series stream finishing machines are designed for highly effective mass finishing.

Since PCD tools are special-purpose, they are produced and processed in small volumes by clamping them in the holder and immersing them in a rotating container filled with a polishing medium. The machines produce frictional movement between the flow of polishing medium and the rotating PCD tool.

OTEC stream finishing machines produce smooth surfaces even in the smallest flutes, with roughness depths of Ra 0.02 µm. The SF's controlled movement sequences only process specific points on the tool, which makes the OTEC process faster and more targeted than other surface finishing methods, as well as producing superbly smooth PCD blades. It also has a pneumatic lifting door for rapid workpiece changeover.

Alongside PCD tools, OTEC stream finishing machines are used to prepare the cutting edges of carbide tools, and to polish chip spaces.

Since PCD tool blades are made from ultra-hard material, they have to be polished in a dry process (with a hard shell granulate containing a certain amount of abrasive). The SF machine comes to the fore here by preventing fractures in the cutting edges.

Processing takes between 10 and 30 minutes depending on the initial quality of the tools and the polishing level required.

UC Tools opted for OTEC's stream finishing machines not just because they are reliable but also on account of their efficient processing times, which means that several tools can be finished in a single run. The machines' high processing forces and flow rates also make them more cost-effective. OTEC's precision finish makes the service life of the tools more predictable as well as improving their cutting speed courtesy of better chip flow. Thanks to OTEC, the look and quality of UC Tools' products are a cut above the rest!

Watch video

UC Tools:

Established in 1988, UC Tools GmbH is an owner-managed company with over 30 years of expertise in special PCD tools for drilling, milling and turning. It also produces special solid carbide and soldered tools, for which demand is growing rapidly, as well as indexable inserts, cermet and CBN tools.

The company's innovative culture and in-house tool manufacturing processes are geared towards each customer's requirements, specifications and processing solutions to provide superior quality and flexibility. Its customer base includes both suppliers and manufacturers in the automotive and aerospace industries.

www.uc-tools.de

THE CF SERIES

The OTEC Disc Finishing Machine – Redesigned and Even More Remarkable

The new design of the OTEC CF Series disc finishing machine is sure to impress. Modular, compact and very sturdy, it has an optimised welded structure that guarantees trouble-free operation and a long service life. It also features storage space for the compound container and pumping station. The waste water drain has been optimised and the machine can be disassembled and reassembled easily and quickly for transport purposes. The new 7.5-inch colour touch display is another highlight. It's both highly efficient and user friendly, with fast, straightforward creation and storage for up to 1,000 programmes. What's more, it now has optimised backup functionality as well as integrated options for remote machine maintenance and control.

The CF Series disc finishing machine is suitable for any rapid surface processing requirement involving fine blanked, turned, milled and punched parts as well as jewellery. Years of technical experience and cutting-edge technology have gone into OTEC disc finishing machines. That's why they're the best on the market, and why our technology leads the market. Thanks to perfect container design, OTEC CF machines are characterised by reliability and short processing times, to name just two of their key advantages.

The new design of the CF Series

Watch video

TRADE FAIR REVIEW: EMO 2019

A big thank you from the whole OTEC team!

After weeks of preparation and a two-day build, OTEC Präzisionsfinish opened its stand at the EMO trade fair in Hanover.
Our technology-leading headline theme this year was 'µ precisionfinish', with a focus on the ultra-precise roughness values required by customers – specifically, up to Ra 0.01 µm! The new and above all user-friendly design of the CF Series was much admired and sparked a great deal of curiosity.
One of our Industry 4.0 highlights was data glasses that allow our service technicians to virtually look over the customer's shoulder and therefore offer the best possible assistance.
Finally, our wine bar gave visitors the chance to try OTEC wine produced by the family – the very embodiment of the company's lively combination of innovation and tradition!

Thanks to everyone who visited us on the stand and made EMO such a great experience for us. We look forward to seeing you again at EMO 2021 in Milan. For details of all our trade fairs worldwide, visit:

https://www.otec.de/en/news/trade-fairs-and-events/

OUTLOOK

GrindTec: the International Trade Fair for Grinding Technology

Grinding technology suppliers are drawn to it like a magnet. More like a supermagnet in fact! According to a press release from the organisers, over 500 exhibitors from 28 countries have so far registered for the event, including the leading machine manufacturers. Remarkably, almost all of the top grinding technology companies have upped the size of their stands. The word from inside sources is that more innovations than ever will be on show at GrindTec 2020 in Augsburg. One thing's for sure – with 53,000 m² of exhibition space, the next GrindTec will be the biggest ever! For details, visit www.grindtec.de

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IGJME	**IGJME** **10–13/2/2020**	**Mumbai** **India**
WIN EURASIA	**WIN EURASIA** **12–15/3/2020**	**Istanbul** **Turkey**
	GrindTec 2020 **18–21/3/2020**	**Augsburg** **Germany**
ISTANBUL JEWELRY SHOW	**Istanbul Jewelry Show** **19–22/3/2020**	**Istanbul** **Turkey**
MECSPE	**MECSPE 2020** **17–22/1/2020**	**Parma** **Italy**
	Global Industrie Paris **31/3–3/4/2020**	**Paris** **France**
SIMTOS	**SIMTOS** **31/3–4/4/2020**	**Korea**
MACH 2020	**MACH 2020** **20–24/4/2020**	**Birmingham** **England**
SIAMS	**SIAMS** **21–24/4/2020**	**Moutier** **Switzerland**

For details of all our trade fair dates, visit:
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IMPRINT

PUBLISHER / EDITORIAL TEAM:
OTEC Präzisionsfinish GmbH
Heinrich-Hertz-Straße 24
75334 Straubenhardt-Conweiler
Germany
Tel: + 49 (0) 70 82 / 49 11 20
Fax:+ 49 (0) 70 82 / 49 11 29
E-Mail: info@otec.de
www.otec.de

DESIGN:
Werbeagentur Regelmann
Pforzheim · Germany
www.regelmann.de

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