



# GO

THE CUSTOMER MAGAZINE

no. 15 | 2024

## THE TOOL: CONSTANT SOURCE FOR BETTER MANUFACTURING PROCESSES

Utilising the value of individual solutions:  
For more productivity, precision, and process  
reliability. Implemented with standard and  
special tools.

### **Reunification gives users a triple advantage**

HC90 mills faster, smoother, and with double the tool life

### **Top-quality finish in cast iron and steel materials**

SK90/EK90 with unique cassette system

### **Long-term planning – tooling solutions for rails and switches**

The bar is set significantly higher

### **Side milling cutter duo enables long distances and shorter processes**

TB18 roughs and finishes twice as productive



**AVANTEC** 

# SIDE MILLING CUTTER DUO ENABLES LONG DISTANCES AND SHORTER PROCESS

SIDE MILLING CUTTER TB18 ROUGHS AND FINISHES 1200 MM LONG GROOVE IN PRESSURE ARM 2.6-TIMES SO PRODUCTIVE AND EXTENDS THE TOOL LIFE BY TWO OR FIVE TIMES



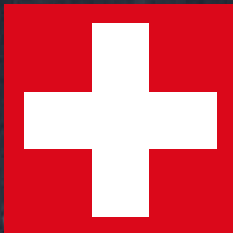
Raphael Nobs – at Dihawag  
Avantec solution finder on-site  
for Switzerland

Pressure arms are the force generators in bending machines on which profiles of various types and shapes are bent. They are used in architecture, the automotive industry, and many other sectors. For example, for the frames of TV monitors, for stair profiles, flashings and yes, even for a simple gutter with a bead. The machining process for such pressure arms includes, among other things, milling a groove with  $L/W/D = 1200 \times 24 \times 5$  mm. This groove later incorporates the measurements for determining the exact position of



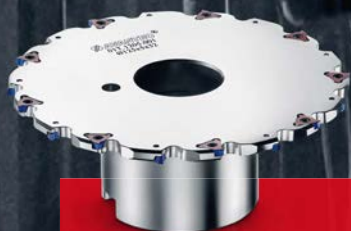
Emanuel Sturm – for the past 11  
years solution finder for Switzerland  
and Baden-Württemberg

the pressure arm. A very precise milling operation, but one that requires a 250 mm cantilever of the tool. The current solution with a side milling cutter (8 teeth,  $\varnothing 80$  mm,  $a_p = 3$  mm and  $a_e = 5$  mm) roughs and finishes the groove in a mere 25 minutes. Basically, the customer is very satisfied with the current situation. However: A bending machine always requires two of these pressure arms with groove. The running time for all operations is two hours, so you can produce exactly four components in an 8-hour shift ... but too often you only manage three parts. The process must therefore be quicker. And Swiss colleague Raphael Nobs at Dihawag literally had his ear in the right place. The customer cutting edge. However, increasing the cut-impossible to realise. Excessive vibrations unstable for these compressive forces. The stent, and the sound during machining did was stable and secure. This did not increase able to make the most of the advantages of edges. For operations with long tool cantilever, vibration-free milling is simply the key to a safe process. It was agreed: Together with the right and left hand insert system of a TB18 side milling cutter, the groove can be produced more productively on this soft-cutting basis. Two weeks later, the TB18s milled in tandem. One roughs first, then the other finishes with the same type of indexable insert. The operations are split between two tools



had tried to gain time by using a wider  
ting width from 3 to 5 mm proved to be  
due to workpiece behaviour that is too  
workpiece quality was no longer consi-  
not convey the feeling that the process  
productivity. Now Nobs and Sturm were  
the polished, highly positive Avantec tool

due to the very different stresses (roughing- $a_e = 6$  mm, finishing- $a_e = 0.4$  mm) so that both operations run optimally with their fixed parameters. The tool life for roughing has increased from 5 to 11, and for finishing, from 5 to 25 workpieces. The Avantec solution with the TB18-Duo is a good 30 minutes faster, so that the four pressure arms come off the machine in one shift ... every time. It's worth listening, and listening carefully!



**TB18 with cross-toothing**  
Double cutting depth and  
smooth running

## TB18-DUO

ROUGHS AND FINISHES

**Constructional steel**

**+ 300 parts/y.**

- | Tool life x 2/x 5 ☒
- | Productivity x 2,63 ☒
- | Vibration-free ☒
- | Only one type of indexable insert ☒



# FOCUS ON THE STRENGTHS

Dear Readers,

It hasn't been easy for all of us for quite some time now; hardly any encouraging news from the political world, little effective action on the social and labour market issues that are important for our SMEs, extreme cost pressure at all levels, and the outlook cannot be described as optimistic in view of the economic forecasts, even if what is predicted rarely comes true. All the more reason to keep going! Seeing the big picture, showing initiative, focusing on our strengths, having good ideas and creating new opportunities; 2023 will be a successful year for Avantec, not in every respect, but in many.

We have broadened our horizons through existing and new collaborations with machine tool manufacturers and partners from the clamping device and measurement technology sectors, as well as technical colleges, universities, and institutes. In the best case scenario, this results in valuable advanced knowledge as well as product innovations on all sides. A look at over 30 years of user experience confirms to us that Avantec tools are time and again the impetus for



our customers' own innovations. This is also the case with the "New Generation", with which we were able to secure challenging projects. In 2024, we will place greater emphasis on the subject of finishing. Our EK90 finishing tool and its somewhat more recent SK90 modification repeatedly demonstrate significant advantages in „finishing“ ... the results are simply outstanding! We also remain focused on titanium machining and the machining of rails and switches. So that we know how to set the latter correctly.

Best regards  
Your Uli Werthwein

## YOUR PROBLEM SOLVERS ... ON-SITE

17 x IN EUROPE, 7 x IN ASIA, 1 x CENTRAL AMERICA, AND 4 x AVANTEC IN D/A/CH AND THE USA



Our man from Monterey in Mexico, Armando Gomez, in Hanover for the EMO together with Michael van Well, Michael Maier, Cata Moroiu, Bruno Chaton – Viva Mexico!

»In the thick of it instead of just there«. That was the slogan of German sports television in the 90s. This is a good image for our global dealer network, which by being „in the thick of it“, means in the shop floor, at the machine. This is the only way we can identify how we can overcome your challenges with a targeted approach: Vibrations, maintain precision, manufacture more productively. Regardless of where in the world, our Avantec dealers work together with milling experts on-site and in-house and construction ... in order to find the best solution, the key to mutual success in the manufacturer-dealer-customer triangle are good ideas, direct contact, and trusting communication. And we will maintain these principles.

**GO**

no. 15 | 2024

**AVANTEC**



# RAILED FOR THE LONG-TERM – TOOLING-SOLUTIONS FOR RAIL AND SWITCH

STANDARD TOOLS AND CUSTOMISED FORM CUTTERS ARE RAISING THE BAR FOR TOOL LIFE AND METAL REMOVING RATE Q SIGNIFICANTLY

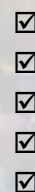
To begin with, a few facts and figures: Passenger transport in Germany accounts for 1,238 billion passenger kilometers per year. Of this, 8% is traveled by rail, 6.5% by the public transport mix of underground and suburban trains, bus, and by plane 5.6%. The lion's share (79.9%) is accounted for by private transportation, i.e. motorcycles and cars including taxi and rental cars. Incidentally, these figures can also be used to calculate the risk of injury: The train is 133 times safer than the car. The network length in Germany is around 40,000 km with over 66,000 switches and crossings. The tram network is 3,000 km long. The 16 S-Bahn networks, with those in major cities such as Berlin, Stuttgart, Hamburg, and Munich being among the largest in Germany, cover a good 5,000 km. Every year, the federal government provides the federal states with around 8.8 billion euros in funding for local passenger services (rail). With an annual increase of 1.8% until 2030. In 2023, DB AG modernised and renewed around 2000 km of track (i.e. 4000 km of rails) and 1800 switches. One kilometer of track extension for local and long-distance transport costs around 12 million euros and each kilometer of electrification 2 million euros. Avantec became deeply involved in the topic of rail and switch processing three years ago. We presented our solutions in various production facilities and were given the opportunity to test our tools. In manganese steel, as in the case of rails for local and long-distance transport, or in Hardox, which is used for underground railway, city railway, and trams



because it is more resilient due to the tight curvature, we have applied our milling tools in both materials for the special milling operations for the various rail shapes (vignole, crane, groove). We didn't always achieve a better solution than the status quo, but the learning effect has finally set in; today we are successfully working on the grooved rail, (switch) frog, fishplate chamber, and rail ends. The results achieved by our tooling packages clearly raise the bar in terms of process reliability, tool life, and productivity. Here are the key data for one of the realised projects: V-groove grooved rail, Xtra contour cutter, WKZ-Ø 300 mm,  $z_{eff} = 7$ , radius indexable inserts with 3 cutting edges, tangential indexable inserts with 4 cutting edges, cycle time with 2 tracks per 3 m rail = 24 min, tool life = 72 m,  $Q = 290 \text{ cm}^3/\text{min}$ , reliable process. The targets were all met and in some cases exceeded. In short: Our long-term commitment to rails and switches has proven to be effective. For new, innovative Avantec solutions and for success with users.

## STABLE, SAFE, VERSATILE IN USE

- | Grooved rails, switch frogs, fishplate chambers, rail ends
- | Standard high-feed milling cutters and extra tools
- | Optimized indexable inserts for Hardox and manganese steel
- | Significant increase in productivity (Q) and tool life
- | High process reliability and precision





# REUNIFICATION BRINGS TRIPLE ADVANTAGE TO USER

IN SERIES PRODUCTION OF HOUSINGS, THE HC90 SHOULDER MILLING CUTTER MACHINES AT EXTREME CANTILEVER CAVITIES – FASTER, SMOOTHER, AND WITH DOUBLE THE TOOL LIFE



All over the world, there are workpieces that are sometimes insourced and sometimes outsourced, where motivation and objectives often vary. In this case, we are talking about transmission housings for tractors that have migrated from OEM to TIER. Andrea Faravelli, who has been in charge of this project since 2019, has followed the outsource route, this being the nature of a good sales engineer, because he knows: In practice, not all tools are necessarily adopted 1:1 from the predecessor process. It was the same here. At the first meeting, it turned out that for the two machining operations on the housing base – namely the helical milling of a hole with Ø 34 mm and a depth of 6 mm as well as the machining of two further holes with Ø 57 and Ø 54.5 mm plus a 45° chamfer – the Avantec tool is no longer used, but another one instead. The milling quality is satisfactory, but there was still a desire for optimisation. On the one hand, the high noise level was a negative factor, and on the other – as is so often the case – one would like to reduce the unit costs. Faravelli was basically able to resolve this very easily by implementing the OEM solution in the new horizontal machining center, a Mazak. Instead of, like the competition, using a standard tool with Ø 32 mm, his solution was to use an individual tool with the same hole diameter, namely 34 mm. The 20% extra cost for the „special tool“ is virtually irrelevant because the benefits clearly outweigh the disadvantages in practice. Of the total machining time of the housing in the 2nd clamping position, the solution with screw-on version of the HC90 shoulder milling cutter saved a good 300 seconds, which significantly reduced the unit costs. Calculated on the annual batch size of 1200 components, that's a good 100 hours of machine capacity that can be saved or freed up. Sometimes it is the case that you mill faster, but this is at the expense of other factors, such as tool life or even quality. For Riccardo Lamera's Mazak, „neither-nor!“ applies. The HC90 shoulder milling cutter mills the operations on the horizontal three-axis centre with outstanding smooth, silent running, even with a cantilever of 354 mm. The quality is as required, which is also reflected in the tool life: it is twice as long as before. The reunification of workpiece and tool is successful for both sides. And that's how it should be.

Successful together. CEO  
Riccardo Lamera, M.E.A SRL with  
Andrea Faravelli, Avantec Italia.



## HC90 THE QUIET TYP

**GGG40 | 1200 parts/year**

- | + 50% tool life ☒
- | Twice as productive ☒
- | Vibration-free ☒
- | Process reliability ☒



# SUCCESSFUL COOPERATIONS

DEVELOPING, TESTING AND PRESENTING TOGETHER – FOR THE BENEFIT OF USERS

A big thank you to all our partners for their collaboration on test cuts, showroom equipment, and trade fair presentations! This is also deliberately expressed here in our customer magazine to emphasise how much we appreciate these cooperations. Working together to find manufacturing solutions for our customers' "tough nuts to crack" is our task, and it is Avantec's strength. This makes it all the more important to have partners when it comes to trying things out, helping each other, and bringing new ideas to fruition, which we then present together at trade fairs and in-house exhibitions. The entire Avantec team will continue to nurture these collaborations with energy and drive in 2024 so that all involved can pass on this experience to their users in the form of quality, unit cost benefits, and process reliability.

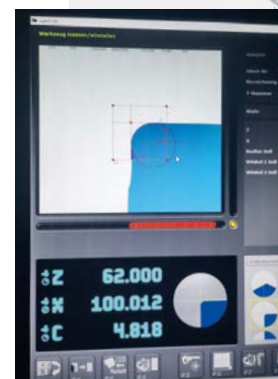


Test cut passed and ready for EMO 2023. Karsten Feil and Moritz Gai (Kunzmann), Tim Zöllner (Avantec) and Rainer Veith (SK-Schüssler)

## IN CAST IRON AND STEEL MATERIALS FOR TOP-QUALITY IN FINISHING

FINISHING CUTTERS SK90 AND EK90 WITH UNIQUE CASSETTE SYSTEM FOR EASY MICRO-PRECISION PRESETTING – FAST AND WITH HIGH PRECISION FOR PERFECT FLATNESS AND SURFACE FINISH

Some look for flatness when finishing, e.g. large castings such as cylinder heads and housings, the others require high surface quality as with printing units with rz values below 5 µm. In order for both users to master their challenges, the basis must be right: The micro-precise presetting of the cutting edges. The EK90 and SK90 finishing tools have a unique cassette system that quickly and easily brings all cutting edges to size and thus achieves an axial run-out of 3 µm. This high-precision presetting allows the EK90 and SK90 to finish at a feed rate of 5 mm per revolution ... Finishing professionals know that's fast! In addition, in combination with today's presetting devices, non-productive time for presetting is drastically reduced. The focus on the requirements is crucial for the right choice of indexable inserts and optimum results. Our wiper edge insert compacts the surface to the required rz even without too much pressure, a sharp-edged indexable insert achieves top flatness especially in steel materials, and for workpieces prone to vibration it is better to use narrow face cutters to reduce the axial pressure. As standard, the SK90 and EK90 are available from Ø 63 to 160 mm, and up to 300 mm diameter if only one finishing milling path is required.



Simply preset with high precision. The SK90 on Zoller presetting device

# ... DO WE NEED MORE AND MORE? WHAT ABOUT »LESS IS MORE«?

ASTUTE NONSENSE IS THE MEANING OF THE OXYMORON, JUST AS »LESS IS MORE« IS ONE.  
A SHORT EXCURSION WITH A GUY IN A BARREL, AN AUTHOR, DESIGNERS, AND TOOLS.

Let's go back to 400 BC with the oldest and best-known „lesser type“, Diogenes. Coming from a rich family himself, homeless so to speak, and living in a barrel from time to time, Diogenes is said to have told Alexander the Great, who promised to fulfill his every wish, that he should just move a little as he was blocking his sun. Diogenes believed that happiness could not be achieved through possessions and wealth, and that they even stood in the way of it. An excellent starting point for a philosophical discourse on whether doing without makes you happy. More than 2300 years later, the American Henry David Thoreau is convinced that simplification is the key to finding oneself and the nature that surrounds us. In a self-experiment in 1845, in a log cabin on a secluded forest lake, he went without his usual luxury for two years and learnt to adapt to more modest circumstances in a self-sufficient way. So just „simplify“? A good hundred years later, in an even more materialistic world, the now popular oxymoron of „less is more“ has evolved, which we see realised above all in the creative sector. Ludwig Mies van der Rohe formulated „Less is more“ to sum up his view of architecture: Clear, plain, and simple stylistic idiom. For him, perfection was not achieved when nothing more could be added, but when nothing more could be left out. Another one of the representatives of „less“ was Dieter Rams, probably the world's most famous German designer. He explained his idea of „responsible design“ in a groundbreaking speech in New York in 1976. Even back then, he pointed out the „increasing and irreversible scarcity of natural resources“ and demanded that all designers – and ultimately all of us – act responsibly with regard to the environment. Waste was a horror to him, and he repeatedly asked the question of how you can survive with finite resources if you just throw everything away. He was aware that he, the



LESS

product designer, was making a significant contribution to shaping this world. So he asked himself when design is good design, and formulated these 10 theses for this purpose.

Good design

1. is innovative
2. makes a product usable
3. is aesthetic
4. makes a product comprehensible
5. is unobtrusive
6. is honest
7. is durable
8. is consistent down to the last detail
9. is environmentally friendly
10. has as little design as possible



IS

If you take a closer look, do you see these theses implemented in everyday products in the industrial and consumer goods world? Is there one thesis that would be more

important to you than others? If so, which one? Just think about it. We have done the same, and used the



MORE

10 theses as a benchmark for our Avantec tools. You will not be surprised to find our products represented in all 10 points. Even the aesthetic aspect is perfectly acceptable for technology enthusiasts and form-follows-function fans. Environmentally friendly? We implement this with a high metal removal rate. Consistent in detail? We demonstrate this with a high level of process reliability. Durable? We prove this with long life distance. Innovative? We have been setting benchmarks with our high-positive milling cutters for over 30 years. For us, „less is more“ is the right basic attitude. Knowing which solution and which tool we can use to implement this 1:1 for you is the trick.

# IT'S ALL ABOUT Q – ALWAYS MILL WITH A FOCUS

TRUE TO OUR SLOGAN: FIRST COMES THE SOLUTION.  
THEN OUR TOOL. AND THEN YOUR SUCCESS.



AVANTEC Zerspantechnik GmbH | Wilhelmstraße 123 | 75428 Illingen | Germany  
T +49 7042 8222-0 | [info@avantec.de](mailto:info@avantec.de) | [avantec.de](http://avantec.de)

Indexable Inserts | Broaching tools | Shell End Mills | Face Milling Cutters | Side Milling Cutters | Copy Milling Cutters | High Feed Cutters  
Shoulder Milling Cutters | Shank End Mills | T-Slot Milling Cutters | Circular Milling Cutters | Programs Avant Easy Change and Triloc

**AVANTEC** 