

Highly productive

complete machining



Reprint from the technical journal
NCFertigung
September 2006



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'TNX80/65' by Traub shortens times and reduces costs at Kieselmann

Normally, flexibility and productivity are mutually exclusive - but in this special case it is not true: The 'TNX80/65' turn-mill center by Traub is equipped with three 10-station turrets that can be used variably or simultaneously and thus reducing times and costs at Kieselmann GmbH from Swabia drastically - namely with complex CrNi parts in not very large lot sizes. This means: complete machining is worthwhile.

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"Our two 'TNS' production turning machines by Traub were getting old, and we needed replacement for them," was one of the reasons for the due follow-up investment according to Oliver Hecker. The plant manager of Kieselmann GmbH in Knittlingen continues: "We have more and more multifunctional parts, which require a more complex and thus more extensive machining: thus leading finally to machining in up to four clamping setups, which was time-consuming and not really the most economic method", and concludes: "We knew that complete machining would be the only real solution for us."

It was already clear that we would be machining using bars in the future (the same as until now) and that the following machine would need a counter spindle. Hecker points out: "The pieces should come completely finished - also deburred - from the machine." With only 20 per cent milling/drilling, not too many rotating tools would be needed, but due to the variety of parts and the desired small lot sizes, the offered tool capacity could not be too low. Dietmar Kappus of the Kieselmann production planning department outlines it as follows: "With regard to our aim of a really complete machining, our slogan was: 'Better a tool too much than one missing' - it would be inexcusable if we had to handle a piece twice just because of an insufficient tool capacity."

When evaluating the turning machine with counter spindle and milling/drilling capacity for complete machining to be purchased, the Kieselmann production engineers proceeded in a slightly unorthodox way, as reports Hecker: "We looked through our notes of technical availability, service frequency and service quality of our different turning machines of different manufacturers - and Traub certainly got the best score: it was clear that we would send our first inquiry to Reichenbach."

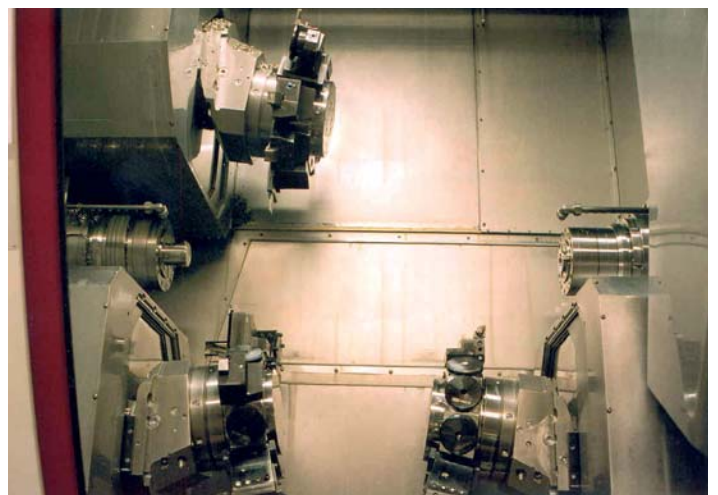
And it is also comprehensible that Traub recommended the TNX80/65 for the dedicated needs of Kieselmann - because its design as turn-mill center with counter spindle offers endless possibilities for high-tech machining depending on the version: The only question that remained was which configuration should be ordered. "Because...", says Helmut Brückner, sales manager for Southern Germany of Traub Drehmaschinen GmbH & Co. KG: "... our TNX80/65 can do anything - but it is too good



for simpler turned parts. It has just too many capacities, and it was not intended for simple parts: it is a high-tech turn-mill center that can be adapted exactly to individual requirements."

It operates in X and Z with up to four (identical) 10fold turrets (logically two above and two below), with every station being able to accommodate also driven tools. Optionally, an Y-axis travel can be provided for each tool carrier in addition. Werner Groß, regional sales director for Index/Traub points it out: "Like this it is possible to turn synchronously on main and counter spindle as well as mill synchronously, thus reducing the machining times in part drastically." Hecker, the Kieselmann plant manager, confirms this using a concrete example: "For the component that we have chosen for the acceptance, we only needed 6 minutes using the 'TNX' compared to previously 24 minutes, while the piece costs could be reduced by half in spite of higher investment costs and thus a higher hourly rate."

Kieselmann GmbH, however, ordered 'TNX80/65' with 'only' three instead of four turrets: The turret on the bottom left is only used for the main spindle, the one on the bottom right only for the counter spindle, whereas the turret above can be used for both spindles as required. "Like this, we have 30 tools available in total, and this should be



Thanks to main and counter spindle and up to four 10fold turrets (optionally with Y axis), the 'TNX80/65' by Traub guarantees really powerful complete machining.

sufficient even with our most complex parts - but two turrets with each ten tools would frequently not have been sufficient," explains Kappus. However, there is the possibility to use double tool carriers? Hecker replies: "We machine almost only stainless and thus long-chip steels - the more space between the tools, the better. Besides, we are more flexible with three turrets, and in addition, all three have an Y axis," and continues: "Due to this largely free selection of the tool carrier to be used, we achieve the desired high productivity."

The 'TNX80/65' system offers an (upper) vertical tool carrier with B axis as alternative for a turret - could this have been taken into account for the requirements by Kieselmann? "It is predestined for users with a large proportion of milling and drilling processes," replies Brückner, and Hecker says: "Four fifths of the processes used for our workpieces are mere turning processes, and the cutting volume when milling and drilling is also limited - the decisive factor for us was the ability to use a real complete machining. If the workpieces have been machined in the 'TNX', we want them to be finished. And we have achieved this target", Kappus continues: "Complete machining on just one machine reduces the cycle times drastically, makes it easier to meet part and position tolerances and finally makes the entire production planning easier."

In the 'TNX80/65' brochure, Traub points out explicitly the high repetitive accuracy in tool changing of the tool carriers in case of turrets - but it seems that this feature impresses the Kieselmann production engineers probably less than the machine-internal tool measurement. Hecker says: "Yes - the accuracy in tool changing of the tool carries is really good, but the integrated tool measurement system is of particular use for us: This allows determining and applying the coordinates of the cutting edges quickly, accurately and safely", and adds: "We would like to have this for other turning machines as well." However, this is not the only wish: After Kieselmann ordered the WinFlex IPS programming software (subsequently...!) from Traub and now generates the NC programs for the 'TNX80/65' using this software, Hecker and Kappus would like to use this practice-oriented programming system also for other turning machines. Hecker admits: "At first, we thought that we could generate the programs for the 'TNX' with its three turrets as for all other NC turning machines - but when we saw in the training how easy and safe it is to use WinFlex even for synchronization and optimization of the axes movements for the three turrets, there was no doubt about it - we ordered the software." And Kappus says: "It is only an optional feature but WinFlex should belong to the standard scope of delivery - at least if the 'TNX' is equipped with more than two turrets."

As programming with WinFlex is so easy and safe, only NC programs that are actually executable are given to the workshop - and this is also a benefit for the machine operators: The operators need not



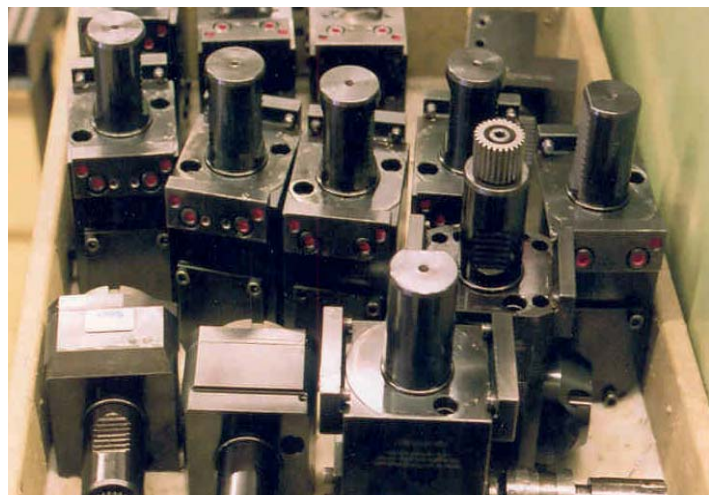
At Kieselmann GmbH, the 'TNX80/65' is programmed run-capable via WinFlex ITS software and checked for collision in the work planning - however, the powerful program for the fine optimization is also available on the CNC panel.

to be afraid of pushing the start button, and thanks to WinFlex, setup for order changes or run-in of new programs is also speeded up - a decisive factor for Kieselmann GmbH. The target is to reduce lot size to such an extent that changeovers are required twice a day - and this is only paying off if the chips are falling again soon.

The run-in of new programs could be even faster according to Hecker and Kappus - in spite of all the compliments, Hecker has a proposal for improvement: "The WinFlex software is available also on the 'TNX' - in particular for the fine adjustment of the programs...", and Kappus gives reasons: "... when programming in the office, the complete real situation cannot be seen on the screen in spite of all graphics simulations - only when being next to the machine it can be seen where one or the other synchronization mark could be better positioned", and criticizes (probably justified): "We would like a slightly increased dynamics in the simulation." Werner Groß emphasizes: "We take such criticism very seriously because it is constructive - however, it should also be clear that only the simulation runs on the PC, which is not so fast, but the actual NC program is not affected by it - the adapted

CNC is absolutely fast enough for any complex contour."

A decisive factor in the technical data for a turn-mill center using bars is (also) the bar diameter - having 80 mm on the main spindle and 65 mm on the counter spindle, it is different on the left and right on the 'TNX80/65': There are certainly comprehensible reasons but probably also arguments for the same bar diameter and the same performance (as all four tool carriers that are possible are also identical). But Hecker corrects us: "Most of the cutting is done on the side of the main spindle, at least



Together with the NC program, a tool setup sheet is given to the workshop - and as this example demonstrates, two 10fold turrets would (often) not be enough for the complete machining of the parts at Kieselmann GmbH.



(left) Plant manager Oliver Hecker, Kieselmann GmbH, Knittlingen: "...a decisive factor for us is the capacity for a real complete machining."

Helmut Brückner, sales manager for Southern Germany, Traub Drehmaschinen GmbH & Co. KG, Reichenbach: "... it is a high-tech turn-mill center for individual..."



(left) NC programmer Dietmar Kappus, Kieselmann GmbH: "The complete machining on only one machine reduces drastically..."

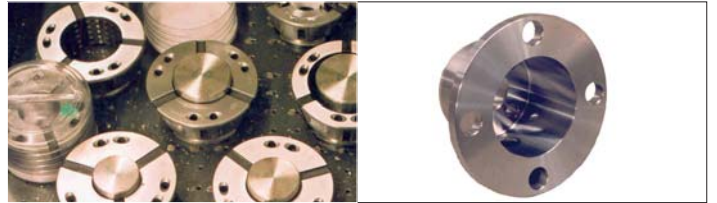
Werner Groß, regional sales director for Index and Traub: "Like this it is possible to turn synchronously on main and counter spindle as well as..."

with our workpieces, the counter spindle works only in about 40 per cent of the total machining time because the discharge of the parts is also done on the right side - and this task is inevitably done at the expense of the machining on the counter spindle." Well, probably he is right.

Could all the expectations set in 'TNX80/65' with regard to production engineering be fulfilled with Kieselmann GmbH? Hecker insists: "The main factor for us was to decrease the machining and cycle times using a powerful complete machining and in addition to decrease the piece cost - both targets have been met even better than calculated," and Kappus adds: "And the technical availability is also well above average (as we are used to with Traub machines) - we are very satisfied." As machine manufacturer, could you imagine to get an even better reference? Probably not.



Kieselmann GmbH machines virtually exclusively stainless steel parts - the plastic worm is an exotic part (which, by the way, could not be machined by the fittings manufacturer from Knittlingen before installing the 'TNX80/65' by Traub).



In case of machining with bars (also on the counter spindle), the use of draw-in collect chucks is required - and some must be adapted to the work-piece (for example this piece with shoulder for being clamped in the counter spindle): but all are coming from Hainbuch (at least at Kieselmann GmbH).

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