



HEIDENHAIN

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Klartext *Automotive*

HEIDENHAIN Controls in the Automotive Industry

THE FAST AND RELIABLE WAY TO ACHIEVE PERFECT
CONTOURS AND SURFACES IN TOOLMAKING

**INTO THE FAST LANE
WITH THE iTNC 530**

Efficiency Takes Priority

HEIDENHAIN Controls Ensure Increased Accuracy in the Automotive Industry

Dear Klartext Reader,

Exciting new shapes and beautiful lines have become major characteristics in the increasing diversity of models in automotive engineering. Designers want to make the drivers' wishes come true. In translating these wishes into reality, they are faced with conflicting priorities between the increasingly complex technical implementation and the growing cost and time pressure. The search for optimization opportunities is as important as ever.

In our "Klartext Automotive" special issue, we'll show you innovative HEIDENHAIN solutions that make production processes, particularly in toolmaking, more efficient and convenient in terms of maximum speed, surface definition and time savings. The certainty of having a technology that you can always rely on is another important factor of economic success. The same quality and reliability standards that can be expected from a high-quality automobile must become a requirement in production.

We wish you an enjoyable "test drive" of our new Klartext issue!

Please read and enjoy, with best wishes from ...
The Klartext staff!



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Successful Application of HEIDENHAIN Controls in Automotive Toolmaking

More Design, Higher Accuracy and Increased Cost Efficiency

Sales in the German automotive industry have increased by a strong 20 percent to 317 billion euros in 2010 according to the German Association of the Automotive Industry (VDA). Similarly successful results for German car manufacturers are anticipated for the current year.

"We are already expecting to set new records again for passenger car exports and for domestic production in 2011. Capacity utilization is excellent again and the orders on hand are significantly above the long-term average," stresses VDA President Matthias Wissmann. Today almost every second new car in Western Europe has a German brand. In China's growth market, almost every fifth new car sold is from a German car manufacturer. And in the premium segment, the global market share is around 80 percent.



Quality as a key competitive differentiator

Quality and technology continue to be major selling points in the automotive sector. Manufacturing the exterior begins in toolmaking. In our first "Klartext Automotive" special issue we'll show you how leading car manufacturers increase the ratio of quality to machining time in toolmaking by using HEIDENHAIN controls.

We will start off with the topic of "beautiful lines." They can be a big challenge when putting designers' innovative, and often, unusual wishes into practice. This will be successful only if car manufacturers are able to provide the appropriate, large form tools. That's definitely no easy feat. It is complicated, time-intensive, and

expensive. We'll show you how HEIDENHAIN controls support in the manufacturing process and increase the contour accuracy, while minimizing process interruptions and delays.

Would you like to find out how to successfully master the challenges of large, sculptured surfaces? Our Klartext discussion will illustrate what requirements a control has to meet to achieve the desired surface quality and dimensional accuracy in the production process—without losing sight of efficiency considerations. The iTNC 530 fits the bill to a T: it features a powerful motion control and helps to avoid expensive follow-up work.





Big new world

Big cars are growing more and more popular with (potential) customers. As a result, the dimensions in toolmaking are increasing as well, which leads to the creation of tools that are both very expensive and one-of-a-kind. The required machining time on very large milling machines can be up to several hundred hours. The control of the machine tools has an important influence on efficiency. We'll show how controls from HEIDENHAIN can bring added process safety and reliability as well as dimensional accuracy to production.



Efficiency and performance in real-world environments

Our journey through the automotive world closes with trips to Munich and France. BMW profits from large new machine tools that have been equipped with the iTNC 530 for the first time. New functions that are tailored to the special needs of automotive toolmaking make work easier.

The Klartext correspondents also visited the second-largest car manufacturer in Europe: the PSA Group, to which Peugeot and Citroën belong. The controls previously used at Peugeot until then could not fulfill the more sophisticated demands in toolmaking.

Experience first-hand how the iTNC 530 helped to reduce the costs and time involved in manufacturing these huge tools, while simultaneously increasing the quality and even creating new possibilities for designing the body geometries.



iTNC 530 Allows Efficient Changes During the Machining Process

Designing Beautiful Lines: Customizations for Optimizing the Contour

Beautiful lines combined with dynamic surfaces define the style elements of cars. The freedom designers have in creating the exterior also depends on what is technically feasible in making the molded parts. Tool-making plays a key role and needs to prove its efficiency anew with every new car model.

Making the large form tools is very time-consuming. The automated roughing and finishing process can take far above 100 hours. As the majority of large tools are one-of-a-kind, highest levels of accuracy and surface definition are a must. After all they have a direct impact on the quality of the finished vehicle components of an entire series. The production costs are correspondingly high.

Machining these tools requires excellent expertise and experience from the machine operators. The intricate contours could not be manufactured with this high accuracy without frequent manual interventions in the automated machining process. To keep costs as low as possible, the interruptions to the machining process must be brief and deliver reliable results.

Risks of manual intervention

Perfection in milling the outline is the key to ensuring ultra-accurate contours. The machining process is largely automated, but often requires specific follow-up work, e.g. milling edges and arcs in individual sections of the contour with a tool that has a smaller radius. This, in turn, frequently means trudging off to the CAD office, which leads to a time-consuming interruption of the machining process. The CAD office writes and tests a program for the contour section concerned. Then the program is transferred to the control and executed there. These are many steps for attending to a single detail.

To optimize the quality or the machining speed, specific parameters like feed rates need to be changed globally. In this case the running machining process has to be interrupted as well. Another common cause for delays is that the control cannot simply resume the machining program, but has to consider all the previously executed program sections from the very beginning.

Every manual intervention in the automated machining process involves a risk. The large machining programs make the display in the control's editor appear complicated and cluttered. This wastes valuable time. Some global settings require changing machine tool parameters in widely distributed places. The more steps you need for these adjustments and the more complex the changes are, the more error-prone they are. And errors are something these very expensive workpieces can tolerate the least.

Correcting axis movements—safe and easy with the HEIDENHAIN wireless handwheel



Easy contour rework

In contour milling, it often happens that a specific part of the contour has to be reworked with another tool. Typically, the corresponding program segment from the CAD/CAM system has to be adjusted and then a new, short program is created.

An easier way without the detour to a CAD/CAM system is to use the DXF converter that is integrated in the iTNC 530 from HEIDENHAIN. In a graphics view, users can interactively select tool paths that have been created in a CAD/CAM system. The selected parts of the contour can be quickly stored as a separate machining program in the control. This function saves users some of the time-consuming visits to the CAD office and allows them to carry out minor changes themselves. Also useful in this case are the functions for the safe approach and departure of the contour, which can be easily included in the newly created machining program via simple dialogs.

Conclusion: For example, if you need to rework parts of contours with a smaller tool, or even if you just want to rework some parts of a 3-D shape, the graphic, interactive selection in the DXF converter is very convenient and saves you a great deal of time.

Fast and safe adjustment of global settings

If a tool has to be taken from the running production process because it needs to be reworked—the toolmakers have to be quick. They won't always be able to use the same machine for which the NC program of the tool was written. The Global Settings option makes it possible to quickly adapt the NC program to the axis configuration of an available machine.

To change global settings, the current machining process has to be stopped. With an iTNC 530 from HEIDENHAIN, a safe stop is possible at any time and the operator can easily make the changes: without modifying the machining program, the operator can define coordinate transformations and settings that are effective for the current program. A clearly structured form further simplifies the process. This helps to avoid errors and ensure that interruptions are as short as possible.

The start of the machining program does not cause any delays, either. The iTNC 530 begins immediately and, if necessary, moves to a new position using the positioning logic that the operator previously defined.

Conclusion: Changes to the global settings are uncomplicated and safe. Interruptions are kept short.

Reliable handwheel superimposition

When machining undercuts in the large tools, the operator has to intervene directly in the automated machining process. With the handwheel—preferably with the wireless HR 550 FS from HEIDENHAIN—you can precisely correct tool movement in a defined axis by superimposed positioning. Before doing so, you define in the global settings for which axes and to what extent you want to allow the superimposition. Handwheel superimposition is also safe and easy to use in a tilted system, for example if you want to directly influence the movement of a virtual axis.

Conclusion: The functions for handwheel superimposition are conveniently defined in the global program settings. The HEIDENHAIN wireless handwheel allows performing superimposed movements precisely and without restricting cables—even in the virtual axis.

Strategies for safe and quick changes

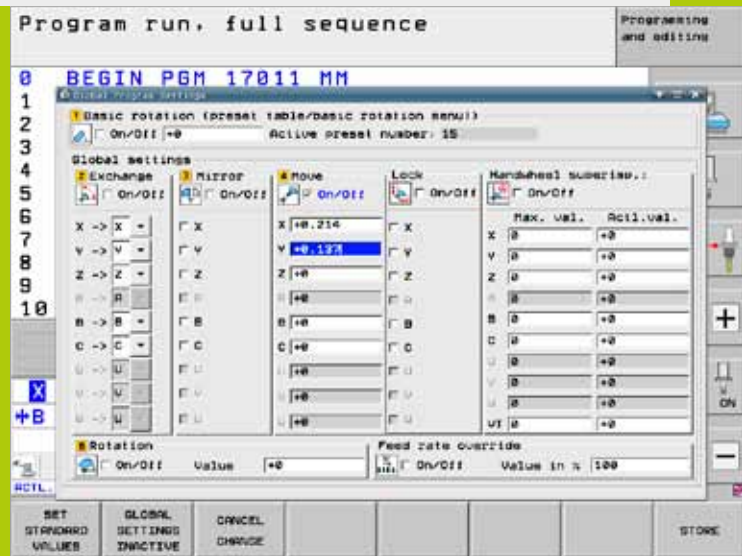
HEIDENHAIN controls are designed around the needs and requirements in the field. The iTNC 530 has many functions to make the complex adjustments during the machining process as easy as possible for the machinist. Whether it's the global settings, handwheel superimposition or the graphic selection of contour parts—the goal is always to deliver reliable results in minimum time. This reduces costs.

A clear, straightforward entry form facilitates global settings for the programs.

Global Settings function overview

The functions are designed to meet the typical needs and requirements of toolmaking:

- Exchanging axes
- Additional, additive datum shift
- Superimposed mirroring
- Axis locking
- Handwheel superimposition, with axis-specific memory of paths covered per handwheel, also in virtual axis direction
- Superimposed basic rotation
- Superimposed rotation
- Globally valid feed-rate factor



Increasing the Surface Quality with TNC Controls

Perfection in Surface Design

It is fascinating to watch how automobile design is reinvented over and over again. Each different car design brings its own new style elements. From the elegant, sporty lines to aerodynamic shapes, the exterior design requires perfect surfaces. Manufacturing the body shell is a major challenge for all car manufacturers. Toolmaking plays an essential role in this process because the surface definition of the forming tools has to meet exacting quality standards.

The design also determines the requirements that the forming tools must fulfill. Highest surface quality is imperative because the tools that form the car body parts have to last the lifetime of the car type. Grooves, marks or unevenness in the surface must be avoided under any circumstances in order to ensure that the sheet-metal part can be properly drawn over the mold.

It is a tedious and time-consuming process until the desired surface finish is achieved. In most cases, roughing and finishing are followed by manual grinding, lapping and polishing. This manual work is expensive and can also lead to defects.

The demand to precisely produce smooth transitions and flowing forms needs to be met within increasingly short process cycles. This requires all the skills of the highly qualified operators at the large portal machining centers. But it also calls for a control that supports highest surface definition. Then the need for expensive reworking can be minimized or even eliminated.

The motion control of the TNC

In the machining program for the sculptured surfaces, which is created by the CAD/CAM system, the transitions between the many NC blocks present a particular challenge. At any rate, they are only an approximation of the actual contour, and inevitably lead to deviations. A powerful control like the iTNC 530 automatically smoothes the block transitions, leading the tool over the workpiece surface at a constant speed. The control ensures that high feed rates are in concert with the very precise tool guidance. The iTNC 530 gives users an easy possibility to directly influence the ratio of machining speed to tolerance: a cycle allows definition of the contour deviation values.

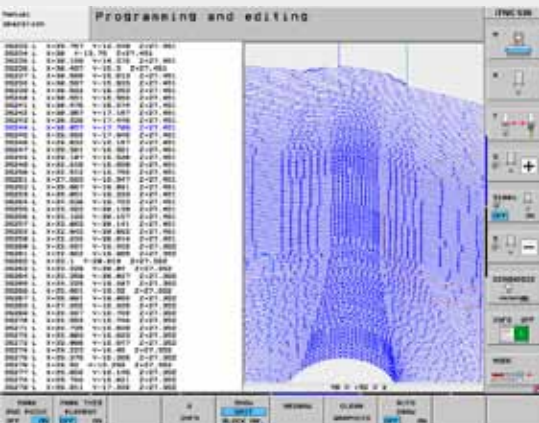
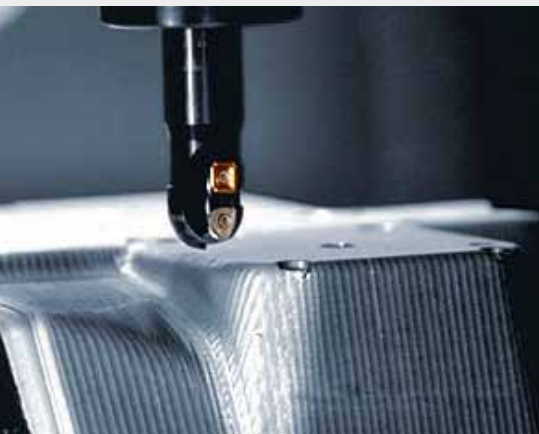
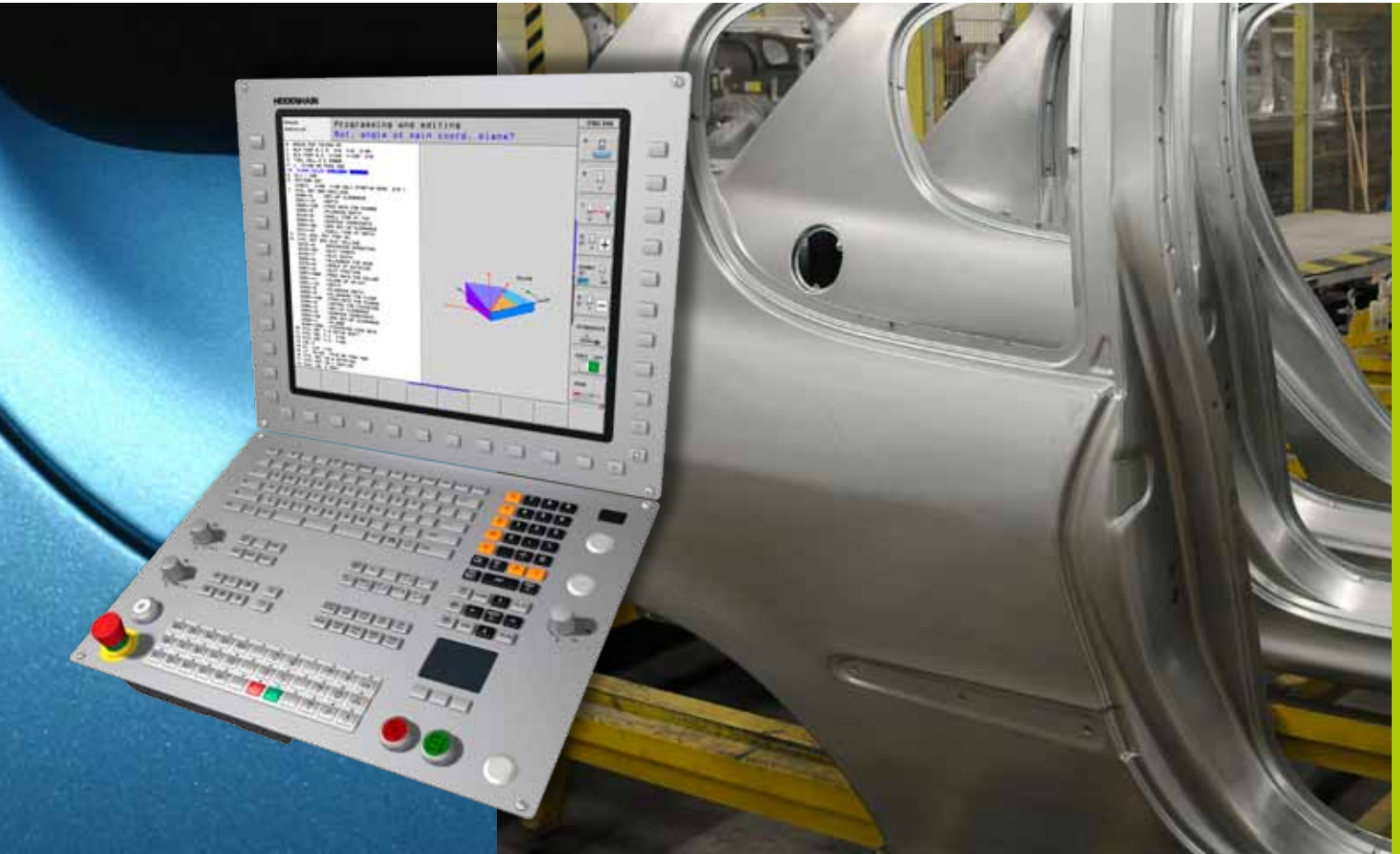
Conclusion: Through their block-smoothing capability, the TNC controls can ensure a high surface definition of the NC programs created in the CAD/CAM system.

Post processors calculate NC programs based on machine-specific data and theoretical tool data. Real tools usually differ from this data, however, and would re-

quire a recalculation of the NC program. One of the solutions for this is TCPM, the Tool Center Point Management function. When moving the tool along the contour, the iTNC 530 takes into account the deviations that have been defined for the real tool in terms of length and radius, even during 5-axis simultaneous machining. This eliminates the need for recalculation by the post processor, which comes in handy particularly when the CAM office is unstaffed during the night shift.

The rapid reversal motions of the tool are another problem. The resulting jerk causes significant oscillations of the machine, and deviations between the tool and the workpiece are the consequence. The iTNC 530's motion control acts preventively by smoothing the jerk. This ensures that the contour tolerances set are not exceeded, even if traversing speeds change abruptly. In this case as well, the operator can influence the machining time with the values he chooses for the tolerance.

Conclusion: The motion control of the TNC controls ensures high surface definition by guiding the tool tip and smoothing the jerk.



Avoiding surface marks with the iTNC 530

The contour of the sculptured surfaces designed in the CAD system is converted to points in the CAM system. These points can be unevenly distributed depending on curvature. A typical challenge for the control is to then interpolate a homogeneous contour from these points. The iTNC 530 features a powerful motion control that ensures precise contours, no matter from which CAD/CAM system they come and with which post processor the programs are generated. This is because the iTNC 530 tolerates a heterogeneous distribution of points. It can thus prevent, for example, that visible marks are left on the surface during multipass up-cut milling.

Conclusion: Expensive optimization and attempts to achieve the specified surface definition can be avoided thanks to the iTNC 530 and its tolerance towards an inhomogeneous point distribution.

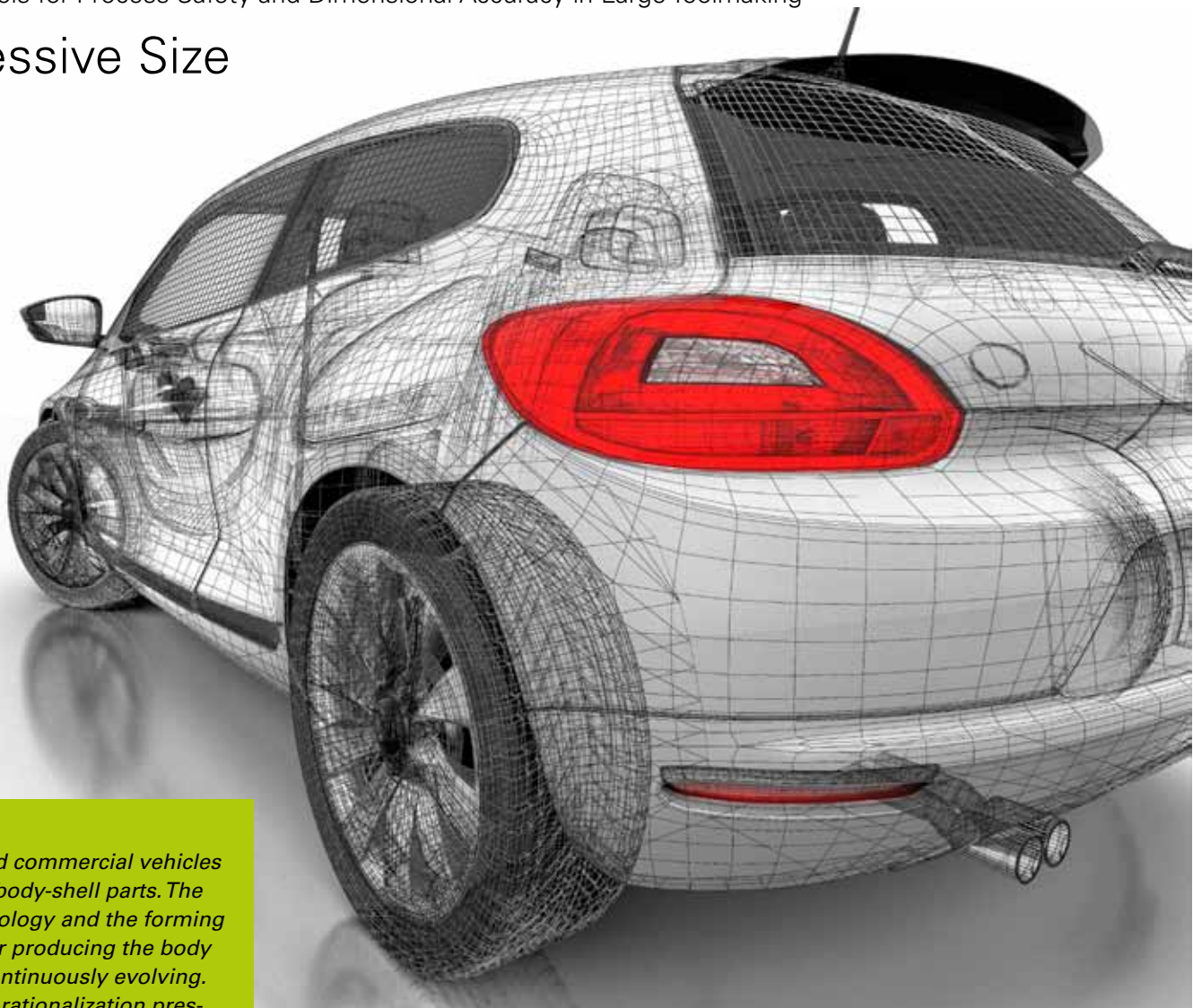
The iTNC 530 provides special functions for tool and mold making

High surface definition— at high speed

HEIDENHAIN helps to resolve the conflicting priorities between speed and surface definition by offering a special function: Adaptive Feed Control (AFC). With AFC you can optimize the machining time: the tool accelerates in workpiece regions with little material removal and, where more material is removed, the AFC automatically reduces the contouring feed rate in order to achieve an excellent surface finish. This all takes place within defined boundaries that you can easily enter in a table.

TNC Controls for Process Safety and Dimensional Accuracy in Large Toolmaking

Impressive Size



Big cars and commercial vehicles have large body-shell parts. The press technology and the forming methods for producing the body parts are continuously evolving. This places rationalization pressures on toolmaking. The reason is that machining the large tools costs time and thus money.



"Great latitude" in handwheel superimposed traverse with the new wireless handwheel.

Big and reliable

The forming tool that is manufactured from a cast blank is in for a long machining time. The overall machining time of about 300 hours is divided into roughing, finishing and final fine finishing. Finishing alone can take up to 17 hours. Interruptions to the process would cause a delay and, in the worst case, even postpone the start of production of the body-shell parts.

The machine control plays an important role in ensuring that unattended manufacturing runs safely and reliably. On the one hand, it controls and monitors the contact of the milling cutter with the workpiece, and on the other hand no failure is allowed to occur in the control itself. HEIDENHAIN controls feature high availability

because they are very stable in terms of both hardware and software. The control components are connected through the HSCI (HEIDENHAIN Serial Controller Interface), the new HEIDENHAIN real-time protocol for fast Ethernet. The encoders communicate via EnDat 2.2, the bidirectional interface from HEIDENHAIN. This ensures high availability of the overall system, making it diagnostic-capable and immune to noise—from host computer to the encoder.

If a tool change is impending, replacement tools can be automatically inserted after defined tool lives and at uncritical positions. The milling cutter can also be changed because of wear, which is measured automatically.

Should the machine ever come to a standstill, a quick and reliable reaction is necessary. To this extent the iTNC 530 can immediately inform the machine operator via a text message, in order to minimize any delays. The lift-off function permits the iTNC 530 to retract the tool from the workpiece upon an NC stop fully automatically, even with tilted axes, without damaging the tool or workpiece. This safety function is even available when the power supply fails.

In addition to allowing the machining of large forming tools, the iTNC 530 features a practical function to avoid machining interruptions: the Dynamic Collision Monitoring (DCM) function very effectively reduces the risk of collisions between the tool and fixtures or permanent machine components in the machine's work envelope.

Big and true to size

Intelligent module concepts also help to counteract the rationalization pressure on the large forming tools. Tools are assembled like building blocks to suit different car body variants. While this saves tool costs, the demands on the dimensional accuracy of the individual tool components are high.

TNC controls have powerful features to ensure that even the tightest tolerances can be met: KinematicsOpt allows the operator to recalibrate the machine when necessary. This takes just a few minutes and is very simple to do thanks to a touch probe cycle that measures the rotary axes fully automatically. It does not matter whether the axis is a rotary table, a tilting table or a swivel head. The compensation directly affects the accuracy of the machine itself, and therefore of the workpiece as well.

Another useful feature is KinematicsComp. It enables the machine manufacturer to save a comprehensive error description of the machine in the control. An attractive variant of this feature is available for large-tool making in the automotive

industry. In this case all that needs to be done is load the error model of the cutter head into the control. This has far-reaching consequences: KinematicsComp can compensate a tilting of the cutter head caused by the size and weight of the milling units. The volumetric accuracy of the machine is effectively and significantly increased.

It is in fact the interaction of all HEIDENHAIN components that ensures highest accuracy. All modules and assemblies in the purely digital control concept are interconnected via digital interfaces. If the position is then captured by high-precision HEIDENHAIN linear and angle encoders, an exacting positioning accuracy and optimum repeatability are achieved.

Big and free to move

Another aspect of large dimensions is that the paths of traverse on the machine tools can be very long. It can be quite tricky to hurry after the tool with your hard-wired handwheel over a distance of 20 m in the X direction, which is common with large, state-of-the-art gantry milling machines. During handwheel superimposed traverse or tool setup you end up trailing the cable along, which can cause damage to the cable. The new wireless handwheel now gives operators great freedom of motion, allowing them to fully concentrate on what is happening in the machine's work envelope.



Reproducible tilting accuracy over long periods with KinematicsOpt.

Report from the Field: BMW

Big Tools— Big Challenges

The Chinese philosopher Lü Buwei once said, "The difficulty in a matter is not based on its size, but on recognizing the proper time." On this note, the iTNC was faced with new challenges in a pilot project for toolmaking at the BMW Group's factory in Munich. The HEIDENHAIN solution demonstrated that the time for a change in large toolmaking has come.

The iTNC 530 has reached the next level in large tool making.

Automobiles move—and they move us emotionally. Impressive dynamics and fascinating style elements are meant to get our hearts beating. And the prerequisite for this effect is a powerful toolmaking capability. This capability profits—like the product itself—from its efficiency. The imperative is to increase quality while lowering production times and cost. This is a big challenge for toolmakers because they are expected to make innovative and often unusual designer wishes come true—and at an affordable price at that.

Mission: Increasing efficiency in large toolmaking

It takes tools with impressive dimensions to manufacture car body parts, and they are both expensive and one-of-a-kind. Lavish material removal and large, sculptured surfaces require correspondingly long machining times. This job is made even more difficult by the fact that these complex

tool sets have a modular design: everything has to fit together perfectly.

These complex factors all have to be calculated into the effort to increase efficiency. Process reliability has top priority. It can secure the gains in machining speed, surface definition, and the optimized features associated with them. The tandem of a large machine and an NC control must provide excellent performance. In addition, the complex tool sets require sophisticated new control functions for machining.

In the course of a market research, the toolmakers of the BMW Group discovered an attractive combination to achieve these goals: new large machines from Droop + Rein could meet their demands perfectly. And they wanted to marry the machine to the HEIDENHAIN iTNC 530 NC control.

A toolmaking game with other rules

Direct interventions by the machine operator in the machining process require considerable skill. They need to deal with traverse in virtual axes, the machine movements are superimposed with the handwheel—and all this while the part program is running. Also, inaccuracies are compensated with superimposed datum shifts. The machine operators want to directly influence the course of the part program through global functions and superimpositioning, such as coordinate transformations, without having to change the program itself.

With so much complexity in machining, the operation of the NC control has to stay as easy as possible. HEIDENHAIN controls are well known in the industry for convenience in operation and that was a positive factor in the decision to buy.

In this special environment, everything's a bit larger, though. CAM systems generate huge NC programs in which sculptured surfaces are approximated using many small line segments. This is a home game for the **iTNC 530**, whose powerful and highly dynamic, jerk-free motion control produces an optimum surface from the line segments. Functions for multi-axis machining, such as Tool Center Point Management (TCPM) or three-dimensional tool compensation have also proven to be indispensable.

To enable the user to navigate quickly through the large machining programs, the **iTNC 530's** programming editor was adapted. Changes in the NC program can now be made quickly and easily.

Perfect teamwork

During the project, two large machines from Droop + Rein were integrated with the HEIDENHAIN **iTNC 530**. One machine was a FOGS 2550 PT M40 C machining center, the other a T2550 PT R50 C portal machining center.

From the manufacturer's point of view, other criteria also influence the chances of success: the control has to fully support the machine's complexity without blowing the budget. The guarantee is also a topic: the control needs to run safely, reliably and with process stability. Worldwide support is also indispensable. During initial tests, HEIDENHAIN immediately demonstrated these qualities in its **iTNC 530**.

The integration of the new control model required a good deal of work by the machine tool builder: the R&D and production departments had to become familiar with the technology from HEIDENHAIN and integrate it in the features of their own product. Dr. Hanrath, Plant Technical Manager at Droop + Rein, admitted to "a considerable investment" that would turn out to be well justified. The task was quickly completed by intensive cooperation with the HEIDENHAIN team. As Dr. Hanrath says, "Of course the first machine cost us a certain amount of effort for familiarization—but right with the second machine everything was running smoothly."

HEIDENHAIN had to make adjustments in its NC control software: Besides new user functions, various technical adjustments were necessary for application on large machine tools, for example in order to be able to perform a complex, fully automatic cutter-head change without a control restart.

Being where the rubber meets the road: Even in automated operation, the operator has to be able to make manual changes and superimpose traverse with the handwheel.



Success across the board

The machined parts show that, right from the beginning, the friction-free cooperation yielded outstanding results. The machine manufacturer confirms this: "Immediately after putting the NC machine in operation we had excellent surface finish and high machining speed." Small adaptations that became necessary during testing were rapidly completed by both Droop + Rein and HEIDENHAIN.

The project initiators also expressed their satisfaction with the implementation of the new control functions, which functioned stably and reliably from the very beginning and met the stringent requirements for process safety and reliability. They spoke of the "unusually smooth and problem-free progress" of the project.

A further advantage of the HEIDENHAIN controls is their flexibility: they are now represented on machine tools of all sizes, and users who work with large machines for the first time do not have to relearn.

The results of the pilot project speak for themselves because the car manufacturer's large toolmaking activities profit from a step forward in efficiency: process safety, machining speed and workpiece accuracy have reached the highest level ever. No small potatoes to a company like BMW. After all, the car manufacturer is well-known above all for one thing: SHEER DRIVING PLEASURE.

The iTNC 530 in Operation for Peugeot and Citroën

HEIDENHAIN on Board and Voilà

HEIDENHAIN's control technology assists BMW, Audi and Volkswagen in the efficient and economic production of high-quality forming tools. We wanted to find out whether other European car manufacturers have also noticed the advantages of controls from HEIDENHAIN. As KLARTEXT correspondents we set off for France—all the way across the country from east to west.

The PSA Group, to which Peugeot and Citroën belong, is the second-largest car manufacturer in Europe, behind only Volkswagen. PSA has two toolmaking departments: one is in the city of Rennes, in the Brittany region of northwestern France, and the other in Sochaux, near the Swiss border. They both have the same tasks, namely supplying all PSA assembly sites with deep-drawing tools for car body parts.

And of course this means that they have the same goals: reduction of the costs and time involved in manufacturing these tools, with a simultaneous increase in the quality, and if possible, the creation of new possibilities for producing the body geometry. Rennes and Sochaux need to work hand in hand to achieve these goals.

New control needed, reliability and performance found

The hitch previously was that the controls used until then could no longer fulfill the more sophisticated demands in large-scale mold making. The functions and performance data of the controls lagged behind the capabilities of the machines. A new generation of numerical controls and feedback control accessories was urgently needed.

This was also a strategic decision with long-term effects for Peugeot and Citroën: to find a control system for large-scale mold making that could be used on all machines, whether new or retrofitted, at both sites.

After a thorough screening of the market, the search led to HEIDENHAIN. Since the German NC control specialist is present in over 50 countries, including a branch office in France, it was just a short way to go. The decision makers were instantly enthusiastic about the iTNC 530.

PSA immediately detected functions that had been lacking from other companies' controls, and was impressed by the precision of the pattern machining cycles. The control also succeeded in terms of performance and reliability. This was followed by a visit to the toolmaking colleagues at the BMW factory in Munich (see page 12), where the impression was reinforced: controls from HEIDENHAIN are also well-suited for large-scale mold making.

Retrofitting—almost as good as new

NS3E, an authorized HEIDENHAIN retrofitter, retrofitted the first machine in Rennes in 2008: a MODUMILL from the French machine-tool manufacturer Forest-Liné. The machine is only a few years old, but the original control was not reliable, there were problems with the workpiece quality and functions for 2-D machining were missing, so retrofitting seemed like a good idea. Regional authorized HEIDENHAIN agencies were responsible for these tasks. This ensured that not just the material goods, but also their installation, met the high quality demands placed by PSA and HEIDENHAIN.

"The MODUMILL is absolutely reliable. If we start a complicated machining sequence on Friday evening, then we can be sure that Monday morning we'll find a smoothly running machine center, and not one at standstill with an error message on its screen," reassured us Philippe Galison, head of Production in Rennes.

Patrick Menier, from the Service department in Rennes, becomes quite excited when comparing it to the predecessor controls. Whereas they would sometimes need up to 15 minutes to resume an interrupted machining process, the iTNC is

“back in” after just several seconds. Also, since the old controls could always only load sections of a program, they constantly wasted time with the loading of subsequent data, causing the machine to come to a standstill. The new controls also require much less post processing of the machining data after the transition from the CAD system to the iTNC.

The quality of the finished workpieces also earns praise: the higher surface quality, especially along edges and contours, means that less follow-up work is necessary.

Three more HSC machines from Forest-Liné have been retrofitted in Rennes since the MODUMILL. Interfacing the robot with the machine control for tool changing was also not a problem.

Premiere in France: The new wireless handwheel

PSA was the first customer in France to receive the new wireless handwheels for the iTNC 530. The advantages of this cable-free technology were recognized quickly. Since the workpieces are so large, the cables often became damaged when they were dragged over the workpieces. The cables were also often in the way and were tripping hazards. With wireless handwheels, on the other hand, the machine operator can move around freely, and fully concentrate on orienting the tool with respect to the workpiece. “The wireless handwheel has made many operators happy,” said Philippe Galisson. In fact, the wireless handwheel really was one of the reasons for the decision in favor of controls from HEIDENHAIN.

A good combination: A new gantry milling machine with iTNC

Along with the retrofits, a new machine was also equipped with the iTNC 530 in Sochaux. This EASYMILL, a gantry milling machine from Forest-Liné, is configured like no other machine on the planet.

It is suited for high-precision finish milling, and its enormous speed is impressive. Helder Raimundo, head of service, hopes that the milling tools will be improved, so that he can drive his own costs even lower.

The specified target of cutting the costs for a deep-drawing tool in half has actually already been achieved. The iTNC 530 played an important role in this: on the one hand with its quick and reliable milling capabilities, and on the other by reducing the amount of follow-up work necessary, since the workpiece geometries and surfaces are of such high quality. This also relieves the machinist: he is now free to operate two machines at the same time.

Good training leads to fast learning

Most machinists at PSA in Rennes and Sochaux had used a certain type of control for 15 to 20 years. But all machinists quickly managed the transition without any larger problems.

The good training program was not the only factor in this, but also the fact that the machinists had been included in the decision-making process. Everyone was enthusiastic about the user-friendly operating interface.

Good support means rapid help

“Rather than languishing in a call center, you immediately get a real person—one who is highly motivated to help you,” said Patrick Menier from Rennes. “No matter who you reach, the problem always gets solved.” The cooperation between PSA and HEIDENHAIN has earned the highest scores across the board. Problems are solved immediately, and questions are answered quickly and with dedication. Rapid assistance is also provided when a replacement part is needed.

Conclusion

Both sites consider the transition to HEIDENHAIN to be a success. The effects of this transition to new controls can be clearly felt. The automobile designers today have completely new capabilities when developing the car body.

All eleven large milling machines at Rennes are to enjoy the benefits of HEIDENHAIN controls in the future. Further retrofitting is planned in Sochaux in 2011, 2012 and 2013.

Free to focus on the center of the action—with the new wireless handwheel without any annoying cables.





HEIDENHAIN

Getting ahead of the crowd by exploiting tolerances?

People who make use of permissible tolerances when taking a path move decidedly faster than those who stay in the middle of the road. This is just as true in metal cutting as it is in Formula 1 racing. And that's why the micrometer accuracy of a HEIDENHAIN control wins you enormous time advantages. Depending on the machine and the requirements for surface quality and dimensional accuracy, it deliberately cuts curves to make you faster. The result: your TNC achieves optimal results and puts you far ahead in the race for productivity and profitability. DR. JOHANNES HEIDENHAIN GmbH, 83301 Traunreut, Germany, phone: +49 8669 31-0, fax: +49 8669 5061, www.heidenhain.de, e-mail: info@heidenhain.de

angle encoders + linear encoders + **contouring controls** + position displays + length gauges + rotary encoders