



IT'S NOT ALL ABOUT CONTENT...!

The Hamburg based mechanical engineering company KHS Corpoplast invented the PET bottle almost 30 years ago – and has been considered the innovative engine of the sector ever since. Intensive use of state-of-the-art tools for development, construction and manufacturing was and continues to be the foundation for this.

Five years ago, KHS Corpoplast already began the introduction of CATIA V5 – today, the system is used in every facet. And the integration with SAP R/3 into a "Product Lifecycle Management" solution is a part of it. The results are better performing machines at lower costs, complex bottle designs, shorter processing times and improved quality. "Our expectations of CATIA have been fully met, we are very satisfied," said CAD System Administrator Dipl.-Ing. Julian Choinski.

The rotary machine with the tool moulds spins at breathtaking speed, the moulds open imperceptibly fast and accept the blanks, the completed plastic bottles fly out of the stretch blow moulding machine "Blomax" like a drum flare onto the conveyor line. In less than two seconds, the machine blows out the pre-warmed PET "pre-moulds" at pressure of over 40 bar into finished bottles. With every turn of the high-end version of the rotary machine, Blomax 16D, that makes 32 bottles – which accounts for a production capacity of 42,000 bottles per hour.

► PLM AS A GOAL

These few indications already make it clear: "The stresses on the components are extreme," explains Choinski. And they are getting more and more extreme. The top priorities in machine development are the further improvement

of output while continuing to improve capability to produce even more complex bottle forms. The machines may naturally not become more expensive, and must also at least maintain the current quality level.

"That all stipulates advanced tools in construction and production and an integration of the entire engineering process towards PLM," said CAD/CAM expert Choinski. Choinski and his team already started looking for an alternative to Medusa, the CAD system introduced in the mid 1980s, five years ago. It had already become clear back then that Medusa was not up to the requirements of the future. In particular, the continuity of processes, such as all the way through to NC programming and production, or component

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behaviour or production process simulation, could not be realised using Medusa. Following an intensive selection process, the decision fell for CATIA V5 and a partnership with CENIT.

► CATIA V5 IS "PERFECT"

"At the time and the current release status, that was certainly placing a lot of faith in CATIA's potential," Choinski

remembers. But today, the decision proves itself to be "perfect." CATIA was implemented on over 36 Windows 2000 based workstations in two phases.

The initial installation ran smoothly and was already completed in 2001. It was exceptionally positive that CATIA requires a comparatively low level of training and allows intuitive operation: "CATIA works the way a designer thinks," says Choinski. The designers were then able to tap the entire CATIA V5 world at a relaxed pace, one function at a time. KHS Corpoplast did not plan the system migration as a "big bang," but as a process that continued over several years. As a result, KHS is one of the few users who exploit the full potential of CATIA V5.

► SIMULATION

Everything that can be simulated is checked virtually in advance in the CATIA modules GPS, GAS and EST. What kind of stress will there be on a component, how stable is the formed bottle, which bottle design can still be produced, can the parts be easily installed and removed, where are collisions in running operation of the machine lurking?

KHS CORPOPLAST: CATIA V5 IS "PERFECT"

"We can already exclude most error sources in development, so that there are no nasty surprises in machine production and the final product," Choinski emphasises.

► SIMULATION AND COSTS

A concrete example shows the resulting benefits. Before CATIA, simulation was limited to a few key components, such as the mould bearer, which is subjected to particular stress.

Based on a 2D dataset, a 3D model was built by an external service provider and a plethora of values were calculated. This took weeks and cost roughly EUR 15,000 per simulated component. If error sources or potential optimisations were then discovered, they could not be immediately adopted in the existing data.

Today, these simulations are part of the daily routine. They are performed directly at the CATIA workstations, are completed in a few hours and do not generate any extra costs. The prerequisite for raising output even more with new machine generations.

► PARAMETERISATION

Both machine components and the bottle moulds are complex and rife with variants. Yet no process runs without a number of changes – for example, because after bottle design and creation of the 3D model it becomes apparent that the volume is not 100 percent correct, e.g. 1.03 litres instead of 1.00. Parameterisation then allows for quick adjustments.

"The parametric approach is one of the main advantages of CATIA V5," says Choinski. In development and production of the machine, this leads to a significant

increase in productivity.

In the case of the design and construction of PET bottles, Choinski estimates the advantage as a factor of two: "Today, we complete twice as many projects with the same team."

► EXCEL LINKAGE

The engineering specialists at KHS Corpoplast carry parameterisation so far that they record certain geometric data – e.g. of master curves – in dynamic Excel tables. The selection and building of concrete moulds is then parameter-driven. Which allows employees, for example, who may not be experienced in setting up curves to create error-free designs.

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► DATA MANAGEMENT AND SAP

But the advantages of the new system are not limited to CATIA. The integration of further company-critical applications – especially SAP R/3 – also shows decisive improvement: "Now we can organise all our processes in a single system," says Choinski. The connection of CATIA with SAP is one of CENIT's specialities. As a certified SAP Partner, the German system integrator has developed its own software, SAP's PLM Integration for CATIA V5 (CDI).

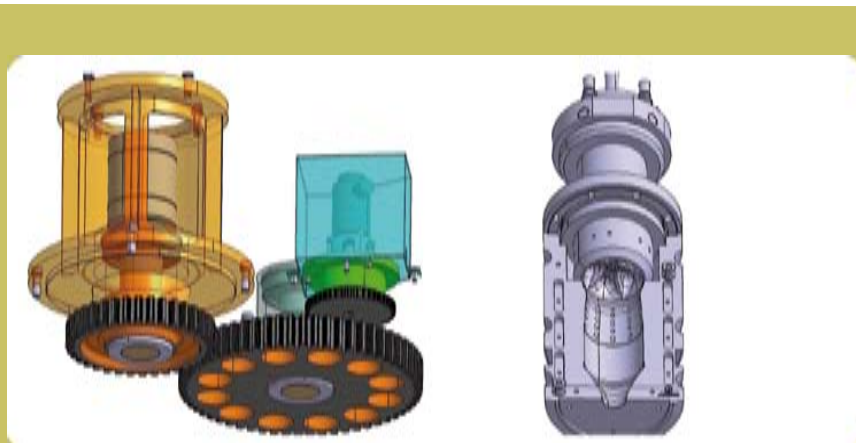
At KHS Corpoplast, linkage with SAP is important in two aspects: First, all CATIA data are managed in and with SAP. Gone are the days when different desi-

gners incidentally and unwillingly worked on the same component of component group. Gone also are the days when it was not clear what the status of the files was.

Designers now check out the necessary files so that they are inaccessible to other users. Additional status indications show the current status – while an additional function makes things yet easier. As soon as a component is released, the data management in SAP automatically creates a PDF of the geometry. All other employees who do not have access to a CATIA workstation – such as service technicians – can then access the designs. Independently, without having to bother the designers.

Secondly, designers can check directly in SAP which parts are available as bought-parts, how much they cost and whether they are in stock. At KHS Corpoplast, CATIA usage and the construction of PLM structures in many further applications has already been greatly advanced due to the integration. Yet the system is "still a long way from being exhausted," as Choinski stressed. Next, the kinematic module is to be more closely examined and likely also implemented. "We have to know more precisely what forces work on the components, blanks and bottles, in order to further accelerate production processes, says Choinski.

Every additional bottle that the machine ejects per minute counts: Ten additional bottles already add up in a year to several million.



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