

**Rapid series ramp-up and high flexibility in coil manufacturing**

**Successful coil project for an automotive Tier 2 supplier**



Within a few months, KUK Group has set up series production for solenoid valves in several variants. An automotive Tier 2 supplier benefits from the rapid ramp-up of series production as well as the flexibility of the self-developed line: two different products in a total of five variants can be manufactured on it. KUK also produces close to its customers, which keeps delivery distances short. In this article, you will learn more about the implementation of this project, in which KUK was able to contribute a great deal of development and production know-how.

## Background

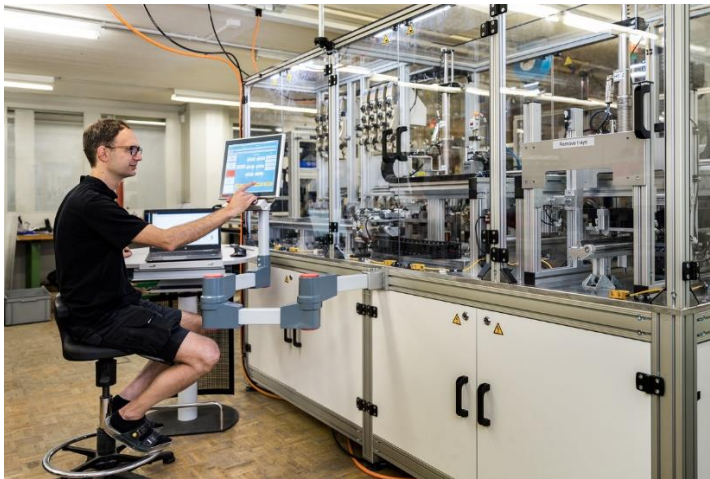
In the summer of 2020, a globally active automotive Tier 2 supplier with several thousand employees was looking for an alternative supplier for two solenoid valves, one for trucks and one for cars. The fact that KUK won the contract was primarily due to the speed of the series production. But the proximity of the Slovakian factory to the destination is also a weighty customer advantage. In addition, there is the high degree of automation: it was immediately clear to KUK that, given the quantities in the millions, only interlinked full automation would come into question.

## Project sequence

The specifications of the automotive Tier 2 supplier were limited to installation space, customer-specific interface and the required performance of the valves. On this basis, KUK developed the design of the pin and the connection between pin and coil, including the design of the coil body. For the coil former, a groove contour ensures the even layer structure for the first layer. The KUK development department was thus able to bring all its experience to bear and play a very active role in the design process. The advantage for the customer was that the design was already focussed on a feasible and efficient production process. The customer received the first samples only four months after signing the contract, and the first series samples were available after six months.

<b>5</b>	<b>6</b>	<b>x Mio.</b>	<b>1</b>
Variants (Solenoid valves)	Months to series production	Number of pieces per year	International supplier with proven automotive know-how

The production line created by KUK's own automation department is much more than a winding machine. Among other things, it also includes an injection moulding machine (1x horizontal, 2x vertical). The ENGEL Victory 180, ENGEL 330V/40 rotary and ENGEL Victory 200/90 tech units were chosen for this purpose, which use a rotary table to ensure optimum cycle times – aligned with the winding and test line.



*Chained full automation under construction*

For the tools, KUK was once again able to rely on a sound network of suppliers. These established contacts are a basic prerequisite for managing the project in a short time. An important feature of the entire system is the simple and flexible duplication, so that rapid scaling is guaranteed for the customer.

At the globally operating KUK Group, in addition to the headquarters in Switzerland, the plants in Slovakia and China were also involved in the successful course of the project. Product development, plant engineering and prototype production took place in Appenzell (Switzerland), while packaging was prepared in Shanghai (China). The production ramp-up finally took place in Trenčianska Teplá (Slovakia), a short transport distance from the automotive supplier's plant, where the solenoid valves are further processed.



*The production line created by KUK's own automation department is put into operation at the plant in Slovakia.*



## Challenges

What challenges was KUK able to solve together with the client in the shortest possible time?

- The design solution had to be co-engineered and made ready for series production.
- In terms of production technology, the solution with two different articles in five variants produced on one and the same line is particularly impressive. Highly efficient, but of course a sticking point in plant construction.
- The selection of the KUK suppliers, especially due to the particular coating requirements for the pin, was a major challenge.
- The selection of the KUK suppliers for the mould construction, especially because of the time pressure.
- The selection of injection moulding equipment: dimensions, energy requirements and capacity
- The special material situation in the automotive supply chain in 2021 had to be jointly addressed in close coordination with suppliers and the customer.

The KUK approach of reporting "problems" to the customer in good time and coming up with alternative proposals paid off once again in this project. In the end, an optimal solution for a successful coil project was found for all challenges during all project phases with the customer and the KUK suppliers.



*The KUK winding module developed by KUK is the heart of the production line. It is also used as a modular system for other projects.*

## KUK CEO Manuel Inauen on the advantages for the automotive Tier 2 supplier:



«**The buyer** appreciates the flexible and quickly realisable, customer-specific solution. Through our internal plant construction, we can draw a very attractive offer regarding the required investments on the customer side. Thanks to the flexible implementation with one line for five product variants, only two tools are necessary, which saves time and costs.»

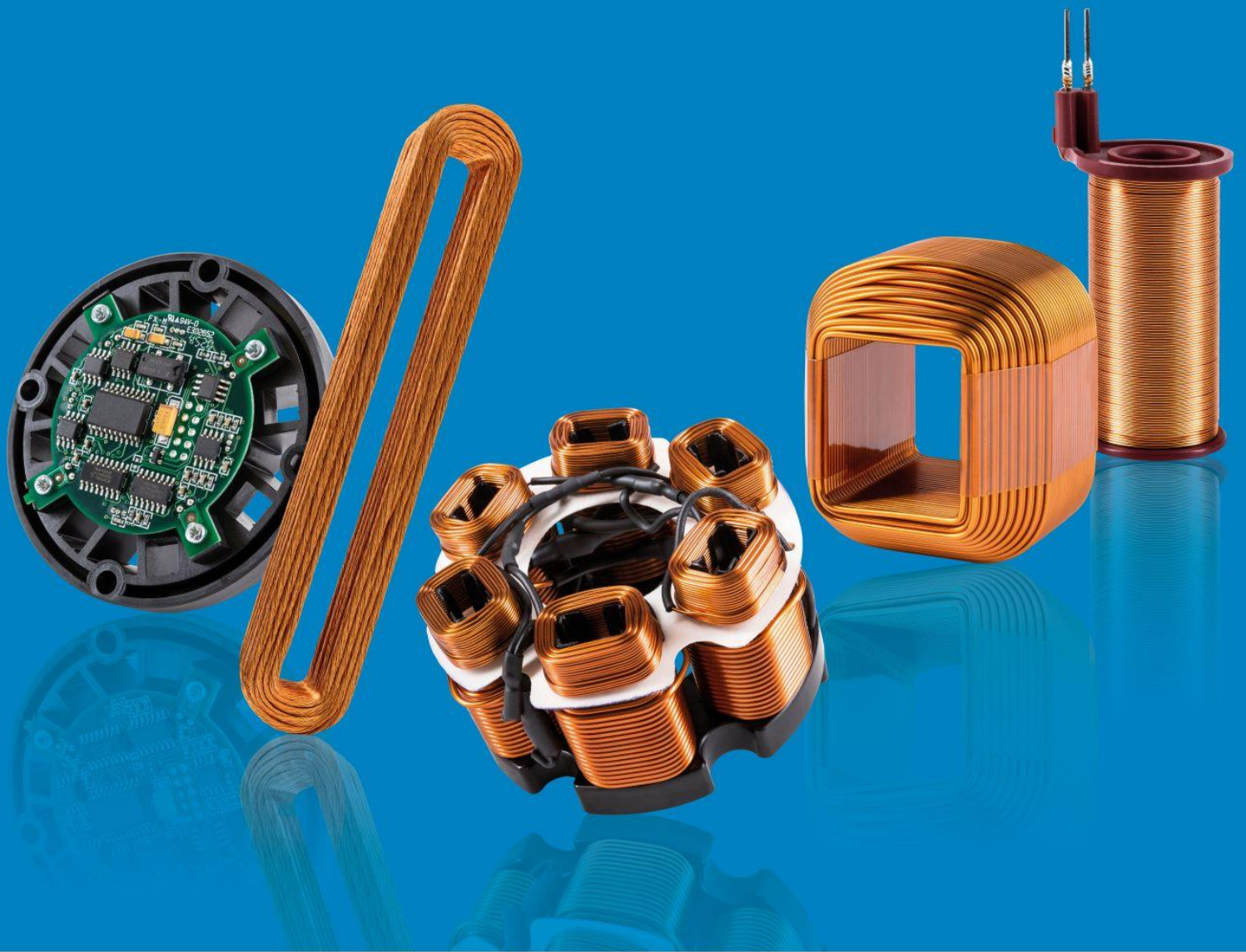
«**For the development department**, KUK determined the optimal design in the trade-off between component requirements/quality/realisation time/costs. The customer gave KUK a black box with defined interfaces. In the black box, KUK finally created a product design that enables two articles to be produced in five variants on the same winding line.»

## Why was it a successful coil project for the automotive Tier 2 supplier?

### Jan Mönlich, Product Manager Automotive at KUK Group:

«We were always striving to achieve joint solutions. With KUK Group, the automotive supplier gained a partner that has repeatedly proven its customer-oriented approach. The fact that KUK had the opportunity to create an overall concept meant that, on the one hand, many technical suggestions could be made based on our know-how, and on the other hand, KUK served all interfaces for the customer. Instead of having to deal with different suppliers solely for the pin, coilformer or wire, the automotive Tier 2 supplier now has only one contact partner: KUK Group.»





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