

REVIVING & INDIGENIZING TOY AND MOULD MANUFACTURING IN INDIA

How Sanco used State-of-the-Art Machinery and Simulation Tools
to Build a Competitive Edge in High-Precision Moulds & Toys, Made
in India

Finding an opportunity

Toys have been a part of Indian culture for ages and finely handcrafted toys have been a signature of Indian craft. But Indian toys witnessed a gradual decline in popularity with the influx of imported electronic toys from China, Japan, Taiwan etc. Compared to traditional handcrafted toys which would require a very long time, these imported substitutes can be manufactured in much less time thanks to advanced toy manufacturing technologies.

The story of Sanco starts here. **Nandkumar Salunke**, a passionate entrepreneur who wanted to start a manufacturing venture, was undecided on which industry to venture into. Along with his colleague **Manish Jawalgi**, he visited many trade fairs across the world such as EMO to assess the market potential of the different manufacturing sectors.

During their research, they found there were no electronic toy manufacturers in India. With a huge population to serve, India offers a large potential domestic market, yet it was highly dependent on imports from majorly China. The duo decided to venture into toy manufacturing, and then the next challenge surfaced!

As **Mr Nandkumar** points out, *“I realized that there is a huge potential in a large country like India where the toy manufacturing industry was still very underdeveloped. Thus, we decided to venture into this business segment. But we soon realized there was a lack of basic infrastructure available to build high precision moulds, which are needed to produce these products efficiently”*.

Since mould quality has a decisive impact on both quality and cost, it is essential for a competitive edge against foreign competition. So, it was crucial to master this capability domestically. Instead of depending on imported moulds, **Nandkumar**

Salunke decided to first invest in a high precision captive tool room based out of Pune, India, and the journey of **Sanco Dies & Moulds** started.

Bringing mould making home to India

“During our initial journey we realized most of the toy manufacturing units in India are capable of manufacturing simple plastic toys, using a very basic manufacturing process. But to produce more complex toys, the mould needed to be imported”, shared **Manish Jawalgi**, Executive Director of Sanco. He adds, *“We realized that we needed this skillset locally, to reduce our dependence on imports and cultivate a competitive advantage. So, along with our Managing Director Nandkumar Salunke we decided to first set up the necessary infrastructure required to develop high-precision moulds for complex parts in India.”*

India's own hi-tech tool room

While the whole world faced unprecedented challenges due to the pandemic, the young team led by **Nandkumar Salunke** at Sanco started investing and developing a high-quality precision tool room in Pune, with state-of-the-art technologies. Sanco also roped in many industry experts to run the organization professionally. Together, they created the first-of-its-kind-facility in India.

Seetharam Bhat, a veteran in mould making who heads the Technical Division of **Sanco**, played a major role in setting up the mould making process. Speaking about setting up the facility, **Seetharam** adds, *“We enhance the technology of any product that we reverse-engineer. We don't*



Figure 1: Nandkumar Salunke, Managing Director of Sanco Group, with Anubhab Hazra (CEO) and Vatsal Naik (Technical Director) of Indian SIMCON distributor ZW India, in the new tool room at Sanco.

just 'copy and paste', we improve on existing technologies to create a better product."

To enable this kind of innovation, **Sanco** makes a point of deploying the best software solutions available, such as Hexagon Scanner, SLA 3D Printer, Haimer Tool Holders and Cutting Tools, Siemens Mould Designer, **SIMCON's** sophisticated injection moulding simulation **CADMOULD**, and many others.

Jyoti Prakash, Technical Director of **Sanco** with more than 4 decades of experience, comments: *"Any software can only run at its full potential when paired with the best-configured machines that have high-precision spindles. This is why **Sanco** decided to invest not only into software, but also into some of the world's best machines, creating a cutting-edge combination of hardware and software."*

To guide the investments, Managing Director **Nandkumar Salunke** personally met with major manufacturers for acquiring

CNC Machines, Inspection Machines, Softwares etc. Mr. **Nandkumar Salunke** explains **Sanco's** ambition: *"We wish to create an ecosystem to serve the Indian manufacturers with the best quality moulds, using world-class infrastructure. Thus we spared no expense and invested significantly, to ensure our Tool Room is truly best in class."*

Sanco has allowed access to its tool room for other manufacturers who may require such high precision systems to develop moulds. Sanco today boasts of delivering high precision dies, moulds, components and services to customers around the globe.

Mr. **Jyoti Prakash** explains what it takes to achieve world-class quality: *"There is a common misconception that plastic will always behave exactly as it was designed to. But in practice, it really depends on many factors. A captive tool room with the latest technology becomes necessary to understand how the plastic will behave."*

You need to know this real-world behaviour already in the design stage, to avoid hiccups further down the development cycle.”

Physical trial and error is expensive – it’s better to virtualize!

This is why **Sanco** developed the ambition to analyze mould behavior virtually, before building a physical prototype. Once a physical prototype has been developed, it becomes difficult and expensive to make major changes to its design. Therefore, the more issues can be discovered and fixed upfront virtually, the better. **Mr. Seetharam Bhat** puts it this way: *“During mould development, we needed a software tool which could determine the feasibility of the mould design. This way, we could be sure upfront, whether the product was going to meet our quality requirements.”*

SIMCON’s injection moulding simulation software

After extensive research of the simulation tools on the market, Sanco decided to explore **CADMOULD** and **VARIMOS**, created by the German simulation software company **SIMCON**. Their software has been in market for more than 30 years, enabling years and years of optimisation, based on real-world deployment at many of the most quality-obsessed injection moulders in the world, such as German luxury car manufacturers. This wealth of real-world calibration is what gives a simulation engine its maturity and reliability.

The simulation software **CADMOULD** gives mould makers and part designers a preview of what will happen inside the mould, during plastic injection moulding. This

makes it possible to identify and fix many potential issues upfront, before a physical prototype is built. Sanco anticipated that this way, they could avoid part filling issues and reduce shrinkage and warpage to get more accurate part dimensions. Simulation-based optimization can also be used to reduce cycle times, resulting in better utilization of machinery, thus reducing cost per part.

Having formed this ambition, **Sanco** reached out to **Anubhab Hazra**, CEO of **ZW India**, the Indian distributor of the world’s most performant injection moulding software, to evaluate and deploy **CADMOULD** and **VARIMOS** in practice. **Anubhab** remarks that *“When they approached us for simulation solutions for their first-of-its-kind project in India, we were very excited to be part of this initiative, because we knew how much of a competitive edge they could gain from this technology.”*

Catch and fix issues early, using accurate simulation

The first thing that **Sanco** evaluated was, of course, simulation accuracy. They found that **CADMOULD’s** results were remarkably accurate. By comparing simulation results with the real-world results of parts already in production, **Sanco** found accuracy was >90%, which makes it industry-leading. **CADMOULD** offered the most precise warpage simulation, as well as superior fibre orientation results.

For example, one of the test parts was a part which displayed mechanical failures due to problematic fibre orientations. It turned out that **CADMOULD’s** fibre orientation simulation was spot-on, as validated through microscopic examination of the failed parts.

If the simulation had been used already during the design of this part, the issue

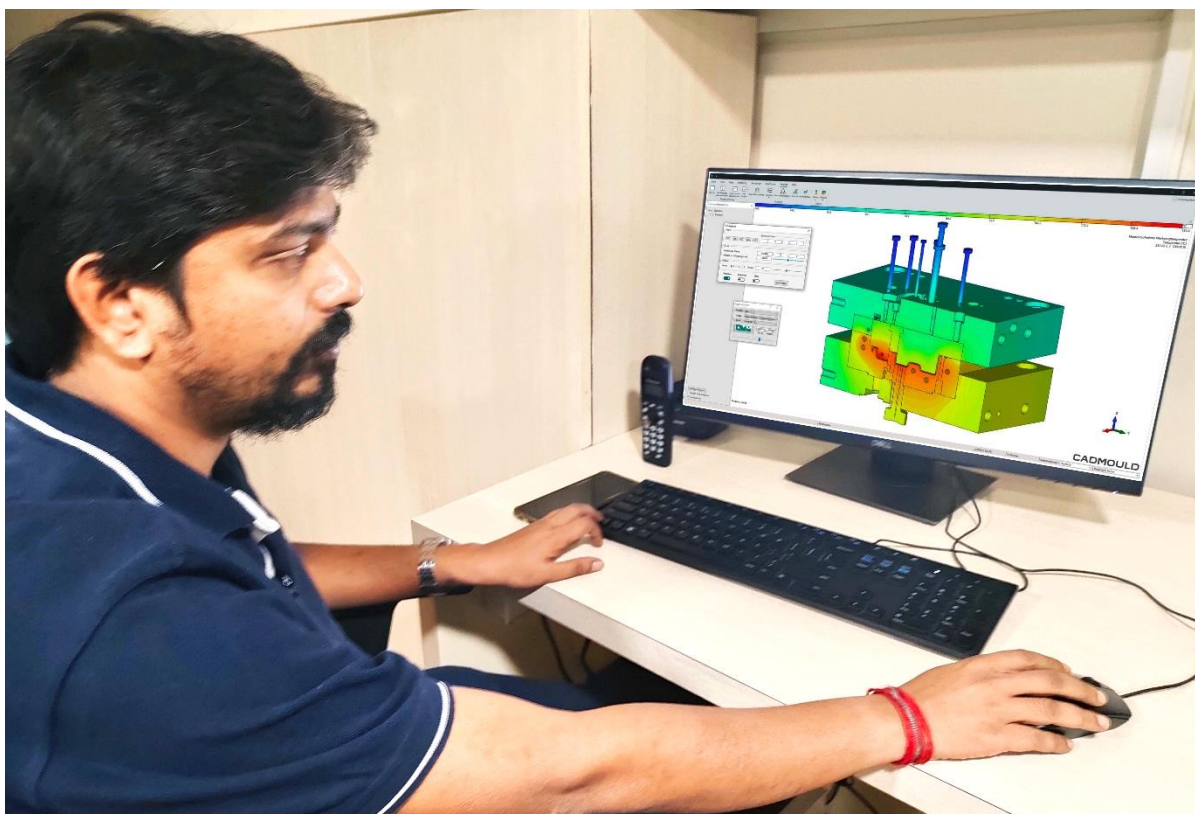


Figure 2: Seetharam Bhat, who heads the Technical Division of Sanco, using SIMCON's advanced injection moulding simulation software CADMOULD to analyze the thermal behavior of a mould.

would have been discovered and fixed early on, before the prototype was built. This example, and others like it, convincingly demonstrated the ability of the software to spot issues upfront.

In the same way, the simulation can be used to test alternative solutions. For example, in one part **Sanco** discovered an issue where the plastic would create unwanted marks on the product. Using **CAD-MOULD** simulation, Sanco was able not only able to identify the root cause of the problem, but also to test ways of fixing the issue virtually, without building new prototypes. The solution was to change the locations of the gates where material enters the mould, thus changing the flow path of the material, and avoiding the surface marks. This fixed the issue, enabling **Sanco** to skip many manual product design iterations, avoiding significant cost and delay. Sanco was able to move towards the final product launch without any more unexpected hurdles.

Automating Repetitive Steps

Sanco discovered that on top of **CAD-MOULD's** industry-leading level of simulation accuracy, one special feature that really makes it stand out is its automated variant analysis add-on **VARIMOS**.

VARIMOS is used to quickly test many alternative solutions, when you have found an issue you want to fix. "When you identify issues during simulation and you want to fix them, you're going to want to test multiple potential solutions," said **Seetharam**. "With other simulation software, it can be tedious and repetitive work to set up all of those design variants one by one, simulate them, look at results, change something, and repeat. It's tedious trial and error. With **VARIMOS**, you just give it a list of variables to play around with, and it will set up multiple simulations by itself to explore your options. It will then run the

simulations, and summarize the results for you. All you need to do is look at the interactive summary, and discuss pros and cons of different solutions with your stakeholders. It automates many of the painful repetitive steps, so you can focus on decision-making and alignment with colleagues and customers. It's less trial and error and a much quicker path to a better solution."

Fewer mold corrections, faster time to market

The result is not only fewer mould corrections and reduced cost, but also much faster product development times than with a conventional way of working.

*"I have been working in injection moulding for more than 20 years, using different simulation software packages. And after we saw the superior performance of **CAD-MOULD** and **VARIMOS**, we knew that this was the right solution for us. It's just better!",* shared **Seetharam**.

Enabling Engineers to Multitask

Compared with other simulation software, **SIMCON's CADMOULD** uses very little computing power, due to the remarkable efficiency of its custom-developed simulation algorithm. **Vatsal Naik**, Technical Director of **ZWIndia**, adds, *"It's really surprisingly good at parallelization. With a single workstation, we can simultaneously run several simulations, and yet we still have free capacity to work with other software, on the same computer, at the same time!"*

The result of this multi-tasking strength is a better use of valuable engineering capacity, and a significant acceleration of product development.

Simulation has become the new normal way of working at Sanco

Sanco has deployed **SIMCON's CAD-MOULD** and **VARIMOS** as their standard way of working when they create new products and is very pleased with the outcome. **Sanco** was able to significantly reduce filling issues, as well as the shrinkage and warpage challenges that are common in plastic-based items, while simultaneously speeding up product launch times, thanks to this virtualized way of working. **Mr. Nandkumar** adds, *"SIMCON's products have allowed us to reduce time and overall cost of developing moulds, and to better satisfy our customers. I'd like to thank the entire team of ZWIndia and SIMCON for developing this wonderful software, and also for their spirit of partnership and their world-class trainings and support for our team."*

SIMCON is happy to share the best practices in simulation and be a sparring partner during the transition of its partners. For more than 30 years, **SIMCON** have been closely working with their customers to optimize their plastic injection moulding projects. **SIMCON** has service engineers who have run thousands of challenging projects, and can support their partners with advice or full simulation services if required to do so. **SIMCON** also offers software, services and tailored training to get you started and deepen your team's skill-set. **SIMCON** helps its customers to tackle their injection moulding challenges and reach their potential in various sectors.

A boost for Make in India

Before the trailblazing innovations by **Sanco**, Indian toy manufacturers had to look towards other countries, to import the kinds of complex moulds which are

required for sophisticated parts. With its investments into a cutting-edge tool room and its simulation capabilities, **Sanco** has contributed significantly to fostering a domestic Indian capacity to produce high-precision moulds, with complex design specifications. This constitutes a major boost to Make in India!

About the authors

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