



# ZIM Success Story

## An Automated Way to Refinish Marble

*Until now, removing unsightly flaws from marble surfaces always took a great deal of time and manual effort. Enter a new machine from Zella-Mehlis (Thuringia, Germany), which fully automates the refinishing of marble in a fraction of the usual time. Besides being efficient, this system represents a milestone in terms of sustainability and resource conservation, as well.*

When it comes to quality, not many building materials can contend with marble. The august appearance this carbonate mineral is known for has made it a popular choice in designing both interiors and façades. However, just 10-15 per cent of the marble quarried around the world can be brought to market in premium quality. This is why the natural stone industry has spent years searching for new ways to refine marble that takes a considerable effort to obtain, yet often still exhibits imperfections.

The mechanical engineering company Böhm Fertigungstechnik Suhl GmbH and its Ukrainian partner, Smart Industry Group

(S.I.G.), have now come up with an automated method of removing flaws from marble surfaces. The demonstration unit that has already been brought online at Böhm's headquarters in Zella-Mehlis, Thuringia, is capable of improving up to a thousand square metres of marble every day and making it usable at the next-higher level of quality.

### **The product and its innovation**

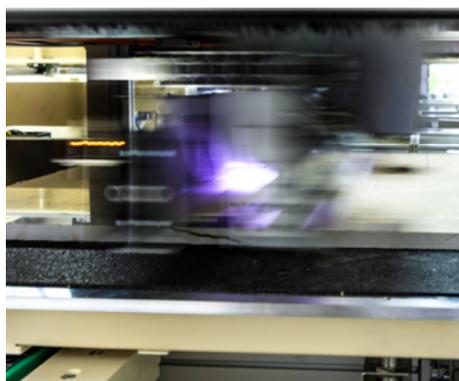
The 35-metre-long machine detects flaws, eliminates them, and refinishes the areas in question in six automated steps. In the first, a slab of marble up to 1.2 square metres in size is transported into the machine via a portal system and conveyor belt

to have its dimensions measured. An array of cameras then captures the initial condition of the marble.

In the third step, this pixel-precise information is analysed by software that was developed in-house at S.I.G., which identifies the slab's flaws and impurities. Those operating the machine can intervene at this point to determine (either themselves or based on the customer's preferences) how intensive the surface treatment should be in the subsequent steps. The resulting information can then be converted into laser vectors. The fourth step involves a laser that removes as much as .04 millimetres of material from the surface of the marble. After that, brushes



A slab of marble enters the machine



Scanning the material's surface



A laser burns away flaws in the marble

and pressurised air clean the slab and prepare it for the fifth step – refinishing. Once they have been primed, the lasered sections of the surface are refilled with UV-resistant material by a printer that was created by an Austrian company

for this specific purpose. In doing so, it creates an appearance that matches the rest of the marble.

Finally, the slab's refinished surface is polished and sealed with a coat of resin. When all six steps are complete, the retouched areas are almost impossible to see with the naked eye. The refined marble then corresponds to the next-higher level of quality.

200 people in Germany and a further 45 in Trenčin (Slovakia). The company's areas of focus range from the production of entire assemblies and special-purpose machines to the manufacturing of electrical cabinets and control systems. It also produces individual components on a make-to-order basis.

#### Project information

**Project duration:** 04/2019 to 07/2020

**Project form:** Cooperation Projects

**Technology field:** Materials technology

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#### Market and customers

Those interested in this machine primarily include quarries and companies that work with marble. As it starts the process of bringing it to market, Böhm is initially focusing on the natural stone industries of Italy and Spain.

Smart Industry Group (S.I.G.) is a Ukrainian company based in Kharkiv. It provides solutions and services related to the automation of technological systems and processes. In particular, S.I.G. creates specifications for automated process control systems and develops software applications for desktop and web environments.

#### The partners

Böhm Fertigungstechnik Suhl GmbH (now known as Boehm Group GmbH) was founded in Zella-Mehlis in 1991. It now employs

#### Information about the program

The Central Innovation Programme for SMEs (ZIM) of the Federal Ministry for Economic Affairs and Energy provides funding to all technologies and sectors:

- Individual projects
- Cooperation projects
- Innovation networks and feasibility studies prior to R&D projects.

#### Information and advice on cooperation projects

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