

# Recycling quartz from mining waste

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An EPFL engineer has discovered a way to extract value from mining waste by recycling the quartz it contains to make composite surfaces for kitchen and bathroom countertops. Brazil-based Vale, the world's largest producer of iron ore, will try out his idea.

When [iron ore](#) is mined, only the most valuable portion is sold; the rest is discharged as [waste](#), or "tailings." In 2013, Emile Scheepers, a metallurgical engineer who was then enrolled in EPFL's Executive Master's of Business Administration (EMBA) program, analyzed this situation. "We found that mining byproducts containing high levels of [quartz](#) can be used to make synthetic quartz, a material commonly used in kitchen and bathroom countertops," he says. He presented his idea to Vale, and the company quickly came on board with the idea. Yesterday the Brazil-based mining giant presented its Vale Quartz initiative at a press conference.

Synthetic quartz surfaces are an increasingly popular alternative to marble and granite for home interiors. They are made by pulverizing quartz, mixing it with plastic resins and pigments, compressing the mixture, and baking it an

industrial oven. The resulting material is non-porous and highly robust, making it easier to maintain than natural stone surfaces. "The market for synthetic quartz surfaces is huge – it's worth some 3 billion dollars in the US alone. The natural quartz used to make those surfaces costs over 100 dollars a metric ton, which is a lot. Our recycled version is a lot cheaper," says Scheepers, who now works in Vale's Swiss division.

## Turning waste into a resource

"On top of the obvious benefit of reducing waste, our method lets miners turn a valueless byproduct into something that could be highly useful," he adds. Vale plans to build a synthetic quartz production plant in a mining-intensive region of its home country, which will create 80 jobs directly and diversify the local economy.

For now, the Vale Quartz initiative is still in the planning stages. The company is also looking into other uses for its quartz-rich tailings. "Tailings are like sand—and sand is one of the most used natural resources on the planet. But it's not as abundant as you might think," says Scheepers. Vale therefore hopes its tailings could replace natural sand, and that its initiative will spur further efforts by the mining industry to turn waste into sustainable products.

Provided by Ecole Polytechnique Federale de Lausanne

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