

## *THIS IS COPPER*

**Studio *ThusThat*, composed of recent Royal College of Art graduates Kevin Rouff, Paco Böckelmann and Guillermo Whitembury, uses waste from the copper industry to design a series of objects that demonstrate its potential as an alternative to cement, with a much lower carbon footprint.**

Copper is ubiquitous to our modern world, yet it is largely invisible. It is the oldest metal mined by humankind, with ancient uses dating back 8000 years. The metal was historically used for its malleability and antimicrobial properties (indeed, even against [viruses](#)). Today, it is crucial for a renewable future: a wind turbine alone can contain up to five tonnes of copper, and ten tonnes of the metal are needed per kilometre of high-speed railway.

But we are running out of copper. “Well, not quite,” explains Kevin Rouff. “We are running out of accessible copper, despite the large amounts present in the Earth’s crust.” Mining companies are lucky if they can find ore with anything above 0.2% copper content. This means that over 2 billion tonnes of ore are dug up each year in order to facilitate the electrification of transportation, energy production and consumer products. The increasing demand for the metal combined with decreasing ore quality means more waste.

For their latest project *This is Copper*, Studio ThusThat focuses on one such waste called “slag”, the leftover impurities of the smelting process. During the pyrometallurgical purification process, slag is extracted and poured out in molten form, cooling into a black glassy stone — like man-made lava.

Slag is produced regardless of whether the copper is coming from mines or from recycling. While 80% of all copper ever mined is still being circulated, the reality is that demand is far outpacing our recycling abilities. And even recycling produces slag, often more contaminated than the slag coming from mines. The group sourced their slag from Metallo Group in Belgium, a copper recycler who has invested heavily in developing a system for ensuring a clean, standardised, and safe slag in the hope of finding new uses.

Working with scientists from KU Leuven, the designers used slag to create what is called a ‘geopolymer’. Geopolymerisation is an innovative technology that uses common inorganic compounds to create high-performance alternatives to standard cement. “Because the slag has already gone through the high-temperature smelting process, it is reactive and ready to be used as a binder. It replaces the need for cement entirely,” notes Guillermo Whitembury. Additionally, coarser forms of slag can be used as aggregate in the place of sand. The result is a very strong black concrete-like body made from slag, with about 77% less CO<sub>2</sub> than standard cement. Given that the cement industry is responsible for 8% of global emissions, low-carbon alternatives that simultaneously use an abundant waste material will be key to meeting future environmental goals.

Studio ThusThat designed a collection of interior objects including chairs, lamps and mirrors. During their research the designers experimented with various processes and

techniques in order to explore the different aspects and characteristics of the material. For instance, the individual parts of their *Molten* chair are joined together with molten copper, exploiting the materials unusually high resistance to heat and thermal shock. Another example is the *Sparkly Black* chair that was cast directly into a pile of coarse copper slag, using the raw material itself as formwork. The process is inspired by the sand casting process - the traditional technique for most metal castings.

*This is Copper* is part of an ongoing investigation into mining and metals through which the designers hope to tell a more complete story about both the primary metals as well as their material backstory. Studio ThusThat has previously worked with the waste of the aluminum industry – [red mud](#) – turning the problematic residue into a series of tableware objects. “We like to play with materials that are often overlooked and somewhat hidden,” says Paco Böckelmann, “to uncover their origins and to tell a new story.”

More information on copper [here](#).

Website: [www.thusthat.com](http://www.thusthat.com)

Email: [Studio@thusthat.com](mailto:Studio@thusthat.com)

Instagram: [@studiothusthat](#)