

## Geopolymer suspensions: A revolution in green construction and 3D printing

### Development status

#### Phase 3

#### Technology validation and implementing it in real environment.

Testing the technology outside of the laboratory and its adjustment to external conditions.

### IP protection status

Maturity level Validated / Ready for transfer (Technology verified, functional suspension exists)  
Intellectual property Patent CZ2021103A3 granted (Protected in the Czech Republic, potential for PCT)

### Challenge

Use waste materials as a basis for creating new building mixtures without the use of cement and sand and without the need for a thermal energy source (minimizing CO2 emissions and environmental impact).

### Description

This patent eliminates the use of cement and sand, does not require thermal energy sources, uses waste materials, and reduces CO2 emissions and environmental impact. The fitting is made from geopolymers, waste energy ash, metallurgical waste, binders, and water. The advantages of the fitting include good insulating properties, low thermal and electrical conductivity, excellent resistance to high temperatures, moisture, and chemical influences. The fittings can be manufactured using various technologies, namely: free or pressure casting into a mold, 3D printing, casting into fittings, mixing the mixture on site into shaped frames, etc. This patent has extraordinary commercial po

### Partnering strategy

Collaboration, licensing

### Institution

**Jan Evangelista Purkyně University in Ústí nad Labem**

### Vlastník

**Jan Evangelista Purkyně University in Ústí nad Labem**  
Štefan Michna

### Commercial opportunity

Opening up the 3D printing market: Pumpable slurry is an absolute necessity for additive manufacturing (3D printing of buildings), which is one of the fastest growing segments of the construction industry. Logistical simplicity: No mixing on site is required. The product is delivered ready-made, saving time and eliminating human error in dosing. High added value of waste: Enables waste producers (energy, steel mills) to monetize by-products (fly ash/slag) as a valuable raw material. New applications: Thanks to its fluidity, it enables the production of thin-walled facade panels, spray repairs of tunnels/sewers, and protective coatings. ESG and Sustainability: An ideal product for decarbonizing the construction industry and meeting circular economy goals.