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#### **OUTLINE**

GeoMITS, Rice House and Autogrill introduction
Geopolymer based coffee grounds and rice husk lightweight precast tables
Final Properties of the GP material Application on the market







#### **GeoMITS**

MATERIAL INNOVATION TECHNOLOGY SERVICE

**GeoMITS** is focalized on:

Consulting, R&D and supplying about Geopolymer binders (reactive powders and liquid

hardeners) for several applications

Customizing of automatic mixing plants (mobile and fixed central beton ) for production from

laboratory to industrial scale

360° Service about designing of final geopolymer recipes included choice of best partially

reactive aggregate curve and intermediation between clients and aggregates supplier







#### **Rice House**

Rice House is benefit company focalized on:

Since 2016 as startup the company was focused on creating synergies between companies to design and manufacturing products using sustainable raw materials from agricultural waste and rice processing waste, inside a circular economy approach.

The mission is changing the world of constructions to create the rice based house using the most possible recycled material thanks to more sustainable and not

Portland clinker based binders.







# **Autogrill**

Autogrill is company focalized on:

From an idea of the entrepneur Mario Pavesi by the late 1950s the first store created

by Pavesi had evolved into an established business, opening several gas stations

connected with shop/bar till having real restaurants along the highways.

The company become private and named Autogrill S.p.a. in 1993

Today the Autogrill brand is owned by the Benetton Group and it's spread

worldwide.

Ground coffee is organic-inorganic waste and it's considered as special waste







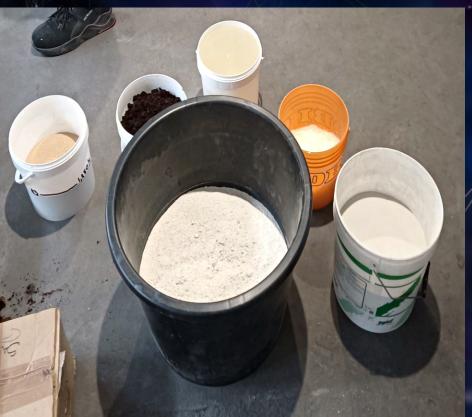
From a collaboration between Rice House and Autogrill, GeoMITS was commissioned to develop a Geopolymer based material that could be used to precast the tables and the tiles necessary to be used inside the new bar and restaurants through the italians highway roads, recycling the coffee grounds and ,at the same time, using the lightweight ground rice husk to obtain the perfect consistency and workability of the hardened pieces.

The project was called I was a coffee









#### INDUSTIAL TESTING AT RICE HOUSE

- MIX DESIGN: GP BINDER FIRST (METAKAOLIN BASED AND POTASSIUM SILICATE REAGENT)
- ADDICTION OF GROUNDS COFFEE (HUMID)
- ADDICTION OF PREMIXED GROUND RICE HUSK AND FUNCTIONAL AGGREGATES (REACTIVE MINERALS)
- ADDICTION OF FIBER AND IF NECESSARY 1-2% OF EXTRA WATER









GP BINDER MIXING

READY FRESH PRODUCT

PRECAST TABLE AFTER VIBRATION









DEMOLDING ROUND TABLE

DEMOLDING RECTANGULAR TABLE

**DEMOLDING TILES** 











ROOM TEMPERATURE CURING FIRST MIX OF 10-15 PER DAY

CURED AND ASSEMBLED WITH FEET









AT VILLORESI OVEST CLOSE TO MILANO ONE OF THE MOST OLD AUTOGRILL IN ITALY













3D EFFECT OBTAINED USING GP TILES









#### **MATERIAL PROPERTIES**

- DENSITY = 1,05 g/cm3 (LIGHTWEIGHT)
- FLEXURAL STRENGHT = 6 to 8 MPa
- COMPRESSIVE STRENGHT = 14 to 17 MPa
- FIREPROOF (PROPANE FLAME 1200°C)
- OIL / WATER PROOF (WITH NANO TREATMENT)



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# THANKS FOR YOUR KIND ATTENTION



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