High density gypsum
AMATEC

The gypsum produced by today's technology is not strong enough to be used as the main construction material, instead of concrete. The strength of the gypsum significantly depends on the water/gypsum (W/G) ratio.
We developed the new technology and created the high-density gypsum, which we get at W/G ratio of about 0.19-0.22. We have maintained a very high mobility of the mixture, the same as on standard technology with a W/G ratio of 0.3-0.7.

The material we obtained has the following characteristics

- density of 1.9 - 2.1 t/m³ (≈ 125 lb/ft³)
- compressive strength of 50 - 110 MPa (N/mm²) or 7.2 - 16.0 ksi and more
- bending strength of 13 - 17 MPa (N/mm²) or 1.9 - 2.5 ksi and more
- 50-60% strength gain in 1-3 hours, 60-80% in 24 hours and full strength in 1-3 weeks
- water saturation in 2 hours 0.0%
- full water saturation of 3-6% in 4-7 days (on elements with a cross-section of 40x40 mm)
- ratio of compressive strength in fully water-saturated state to dry samples 0.5-0.6

A material with such excellent characteristics can be a basic building material and replace structural concretes.
The gypsum has the following properties, which are superior to concrete:

- long shelf life and has no limit under standard operation
- possibility of complete recycling
- high labor productivity, as the curing rate is 10 times less than that of concretes
- no shrinkage deformations and does not require drying after manufacturing
- energy costs for production are 4-5 times less than of cement
- 7-10 times less CO2 footprint than on cement.

We've developed a technology for porising high-density gypsum and obtained a spectrum of materials with densities of 100-1500 kg/m3. The lightweight types are an excellent thermal and acoustic insulator. The porous material has a plastic form of deformational fracture. High-density gypsum is the basis for a huge class of composites by using any kind of fillers for any range of engineering solutions.

So we have strong structural gypsum, beautiful finishing gypsum and insulating gypsum, which together form more than 90% of the building. Gypsum is the cheapest material. According to our calculations, we can build 2 times cheaper, 10 times faster, reduce CO2 emissions by 3-5 times from each m2 of built building.
Gypsum raw material is quite common in many countries. Our technology is creating a Sustainable Construction Industry with Low Carbon and Cyclic Economy principles.

We will be glad to cooperate in implementing our technologies!
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