

THE COMMERCIAL FLOORING REPORT

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FOR THE COMMERCIAL FLOOR COVERING INDUSTRY  TOTALLY GREEN PUBLICATION

The Commercial Flooring Report goes digital. We have a new look for the industry's only true independent, objective and unbiased source of commercial flooring information, issues and technology you won't find anywhere else. We appreciate you, our readers, and encourage you to share this publication freely as you see fit.

We will begin sending the CFR with the PDF attachment along with a link to the flipbook edition. This will begin with the May issue. Let us know what you think!

Remember, if you need help with a project, have questions or find yourself with a problem you can't solve, contact us. We're here to help you.

GYPSUM ?



Gypsum, in the past, has been the bane of the flooring industry as a flooring prep material. It was soft and chalky, didn't bond well, stuck to the back of flooring materials, was affected by water and otherwise not up to par with cementitious based patches, levelers and substrate prep materials as a result it gained a bad rap and likely rightfully so. But you must be fully aware that the gypsum products of today aren't anything like those of old and actually have better attributes and performance characteristics than cementitious products. In fact all cementitious products contain some gypsum so even though you may think you're avoiding gypsum entirely you aren't because it's in concrete as calcium sulfate. You're also brushing your teeth with it because it's in your toothpaste as well and many of the other products you use daily. The high early set up in cementitious floor prep materials, those being used instead of gypsum, is due to the gypsum it contains. The new gypsum floor prep products rival and exceed concrete and they are not affected by water and in several aspects are better than cementitious floor prep materials.

So let's take a look at gypsum floor prep products and their attributes so you can come to the same conclusion that I did that these products are amazing performers and why.

First, what is gypsum?

Gypsum is a naturally occurring mineral made up of calcium + sulfate with 2 molecules of chemically



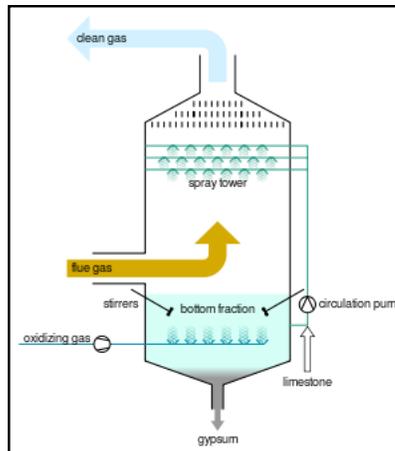
Old Gypsum Layer

bound water also known as calcium sulfate dihydrate. This is important because dihydrate means there are 2 molecules of chemically bound and locked in water which makes it a fire retardant or heat sink which is why it's used in multi-family. So if you do any multi-family work the attributes of gypsum products are without comparison. Natural gypsum sources for example that USG uses are very pure – well above 90% and some as high as 96%. Neither natural gypsum nor synthetic gypsum contain organics so they cannot support mold or mildew. This is another factor to consider when installing floating floors over damp slabs that have to be prepared first. Gypsum is non-toxic and is neutral pH making it much less alkaline than PC or CAC-based concrete.



<https://en.wikipedia.org/wiki/Gypsum>

Synthetic gypsum, more accurately called FGD gypsum (flue gas desulfurization) is a bi-product of the cleaning of coal-fired power plant exhaust. Here's how: Exhaust leaving the combustion chamber of a coal-fired power plant is first cleaned of ash. This is done using filters. The collected ash is called "fly ash." The hot exhaust then is forced through a limestone slurry. The slurry is made up of finely ground limestone and water. Limestone is chemically called "calcium carbonate." As the exhaust passes through the limestone slurry, sulfur dioxide (which is found in the exhaust) is then "absorbed" into the limestone slurry. It is at this point when the limestone slurry, aka calcium carbonate, converts into calcium sulfate – gypsum! Synthetic gypsum is then calcined (cooked) just like natural gypsum and as with natural gypsum USG can cook the gypsum in a number of ways based upon the end use. Just like natural gypsum, synthetic gypsum is free of organics which, like natural gypsum will not support mold and mildew growth.



https://en.wikipedia.org/wiki/Flue-as_desulfurization

Gypsum strength is directly related to the amount of water used during the rehydration process as well as whether fillers such as sand or gravel are used.



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Why Does Gypsum Have Bad Reputation?

In the past there was a lack of product/market stewardship by some gypsum concrete manufacturers and market conditions created by GC's to "value engineer" projects with gypsum products that frankly weren't that great. Value-engineering resulted in compromised quality (low cost = over-sanded/over-watered underlayment). In other words the stuff you think gypsum still is. Another reason is that in the past, most multi-family projects used carpet and pad which "covered" a multitude of sins in the substrate. Recent trends towards using resilient products "uncovered" sub-standard underlayments. USG in particular has "raised the bar" by increasing base-line compressive strength from 1500 – 1800 to 2500 psi minimum and created user-friendly state-of-the-art formulations that require less water of convenience yet increased flow creating a self-leveling product with high strength. They have developed close contact with contractors and instituted educational and quality programs for "hand-picked" contractors.



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Flooring manufacturers are not up to speed on gypsum concrete innovations and technologies and as a result are skeptical to recognize or endorse these products even though they are in the ASTM F 710 and F 492 standards. Flooring manufacturers need to recognize and open lines of communication to address issues. The resilient flooring industry must recognize that they are not requiring 3,000 psi underlayment under their resilient products because they call out "commercial" applications for 3,000 psi ONLY. Multi-family is NOT commercial. They are two separate architectural divisions. If all resilient flooring manufacturers simply required a 3,000 psi under all resilient products, regardless of architectural division, this would force GC's, architects and gypsum concrete manufacturers to play on an "even field."

The Attributes of "New" Gypsum:

Gypsum flooring products today are nothing like the gypsum products of the past that have spurred so many to question their validity, quality and performance characteristics. As with so many things today that create change, skepticism is hard to over-come.

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Gypsum develops about 1/2 of its ultimate strength very quickly – usually within a few hours of being mixed and set. The other 1/2 of the strength comes when all the water of convenience has evaporated from the hardened mass (i.e. floor).

The above is important because unlike Portland cement that may take up to 28 days to develop ultimate strength, gypsum strength happens very quickly. Improving the evaporation of the free water via fans or HVAC systems will hasten the drying time and ultimate strength. Because gypsum contains two molecules of chemically bound water, gypsum is a great heat sink which makes it a desirable building material when used to slow the progress of heat due to fire. For this reason poured gypsum underlayment is the preferred material used in wood-frame multi-family structures due the above

Multi-family structures include apartments, condos, townhomes, dormitories, barracks, low-rise hotels/motels etc. All building code bodies in the US require a minimum 1 hour fire protection between units. UL (Underwriters Lab) is the recognized authority in managing the design of walls, ceiling and floors.

Gypsum Concrete for the Building Contractor:

Gypsum concrete used in the US for multi-family installations (INCLUDING REPAIR) must be recognized by UL. Manufacturers must show the UL label on all UL-approved products. 3/4" of gypsum concrete provides the same heat protection as 2 1/2" of light-weight concrete.

Gypsum concrete formulations can range in density from 115 to 130 lbs/cu ft. with compressive strengths beyond 12,000 psi and gypsum concrete can be formulated to be "vinyl ready" with virtually no surface corrections needed at compressive strengths that meet and exceed resilient flooring manufacturers' requirements. Gypsum concrete EXPANDS when it sets. This unique characteristic results in crack-free installations.

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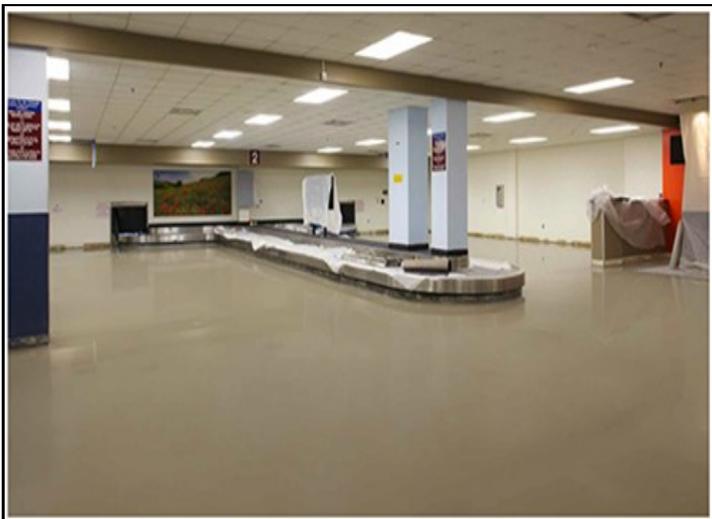
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Episode 1

Harlan Stone,
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Gypsum concrete can be processed at the jobsite using mixing and pumping machines up to 30,000 sq. ft. per 8-hour shift. Concrete contractors add fine aggregate (sand) at the jobsite and use controlled measuring techniques for both the sand and water. This results in predictable high quality poured underlayments. These contractors use equipment that can pump product almost 1,000 feet from the mixer/pump to the jobsite and the same equipment can pump vertically about 30 stories high. Gypsum concrete can be formulated to be “self-drying” where there is virtually no “free water aka water of convenience” resulting in a high strength mass that can be covered by non-breathable flooring products in a matter of hours. Combined with sound attenuation products, gypsum concrete results in installations that achieve and exceed current building code requirements. Gypsum concrete can also be used to flatten, smooth or otherwise correct concrete surfaces and it follows the same requirements/restrictions as PC or CAC SLU’s with respect to RH content in the host concrete. Think Shonox Worst Subfloor Contest.

Generally speaking, gypsum concrete is installed at a significantly lower cost than PC/CAC-based SLU’s at the same or higher physical properties such as compressive strength, tensile strength etc. and have unique characteristics such as slight expansion upon set (eliminates shrink cracks) as well as provides safety characteristics due to the chemically bound water. Properly formulated gypsum concrete can be used as a wear surface and can be polished.



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A Big Opportunity!

There are significant cost savings in new construction concrete substrates by using gypsum substrate products. Instead of finish troweling the concrete it can be Bull floated, left open to cure, and kept that way during construction and given the opportunity to exhaust as much moisture as possible. Then gypsum floor underlayment can be poured over the rough concrete surface to achieve a hard level surface to install flooring over. The open concrete will allow moisture to migrate an inch per month under the right conditions and if need be a top coat of moisture mitigation product can be applied. The installation of the flooring would be at least months away or a top coat of moisture mitigation material can be applied. The application then of a gypsum underlayment product will be incredibly smooth, self-leveling and ready for installation of flooring products quickly or even used as decorative finished floor such as Schonox Deco. The compressive strengths of concrete can be matched or increased to as high as 10,000 psi or even higher.

Now that you know here's more:

The most significant difference between gypsum and cementitious coatings is that it goes further, is less expensive, it has a controllable setting for time, it's much more precise to control and when it sets it expands slightly and does not shrink so there is no cracking, unless the building moves of course, and it will find all the nooks and crannies it is poured on which is why it can go over very rough or smooth substrates and once it sets it no longer needs moisture to cure. That means a cost savings from shot blasting and no surface profiling. All you need is a clean floor with a primer and pour the gypsum.

Hopefully this is enough information for you to make the decision to at least try these products. If I didn't believe in them they wouldn't be in this publication I've done the skepticism thing for you already. As always, if you have questions, concerns or need help with this or any other flooring material or substrate situation, contact us. We have the answers.

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