**Introduction to polished concrete.**

I hope that this fulfills all of your requirements.

I have noted below some constructed statements, as well as those already listed within both our brochure and within Lafarge website listings. Although it would have to be said that the new concrete application, Artevia polished as attached, basis its environmental approach as being sustainable as appose to its production being pure environmentally friendly, having researched this somewhat it is comparable to most other floor finish and floor constructed products, more over in most cases concrete is used anyway just hidden by an applied surface, so the grinding and polishing of such surfaces stands good grounds for consideration.

**Polishing existing concrete.**

The process itself consists of simply grinding the ~~paste coat~~ laitance from the surface of the concrete floor, to remove any undulations and expose the natural beauty and colours of the aggregate that until now has been hidden below the surface.

A densifier/cure is applied and left overnight to soak into your floor ready for the final stages.

Our polished concrete technicians will now commence with what we think is the truly sparkling phase of the process, with the use of HTC’s brochure attached, patented, diamond / resin bonded polishing segments which can give your floor a whole range of stunning and practical finishes.

Polished concrete designs brochure attached.

**Environmental**

Our system enjoys one of the lowest embodied carbon (CO2) footprints available for a finished floor and we are currently undergoing evaluation in our aim to further reduce our carbon rating.

Look at any traditional floor covering and something as small as a single kilo of self leveling epoxy uses 50 kWh/m2 of energy just to produce.

We also actively promote the use of alternative compounds to cement in concrete (PFA, Pulverised Fuel Ash, Fly Ash and GGBS) which can produce a reduction in CO2 by up to 48% and are happy to advise on alternative mixes.

**Research & Innovation**

Lafarge R&D teams work to develop environmentally friendly products in order to: decrease CO2 emissions in cement production conserve natural resources - for instance, by using a higher proportion of recycled ~~raw~~ materials in the production process create value-added products for sustainable construction, improve health and safety for employees and subcontractors, optimize the performance and uses of Lafarge products.

Artevia brochure attached.

I know that Lafarge circulate a lot of material in this area, but if you choose to get a direct opinion and associated information.

Final attachments. A group of images representing some examples of finished work.

Please call me if you think I can help with details to re-edit the above into something that the CFJ magazine can use.

Assuring you of our best attention at all time.

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Contact: John Barry I.Eng

M 07739 711445

Lafarge Research and Development.

Contact: Emma Hines

M 07803 953935,

When asked to give an opinion on the merits or otherwise of a polished concrete floor finish BrianSpecMan wrote:

Lots of greenwash and badly written marketing

Yes it needs a lot of work.

A lot of information about other stuff in the company’s or supplier’s ranges unrelated to this floor hardener.

If you expose the concrete and show it off:

* You need to consider cost, its made of concrete, but does not mean its cheap.
* You exposed its thermal mass, which is a bonus, only if it is exploited,
  + The Curve Arts Theatre in Leicester has a concrete polished floor but so much solar protection that no sun gets in nor heats it up at all, it gets heated by M&E plant or the presence of people.
* Could be beautiful
  + The Curve Arts Theatre in Leicester has a polished concrete floor that under the lighting it receives could be anything: resin, rubber, PVC or linoleum its difficult to tell
* It needs to be on top of water proof thermal insulation and damp proof membrane: high embodied energy and carbon;
* Having the floor at a different level to surrounding floors may lead to a thermal bridge that needs to be considered
* Polished Concrete Floor is unlikely to include under floor heating, other means need to be considered
* Polished Concrete Floor dematerialises the floor (removes other finished completely) but may be adding more below and definitely making the floor surface more expensive.
* You need to strengthen the concrete floor against foot traffic wear with some of the following:
  + Grinding the surface off to expose stronger materials below the surface
  + a coating of resinous stuff (synthetic ingredients, non-renewable, Off-gassing, VOCs, hazardous waste?),
  + add stronger aggregates e.g. granolithic chippings (where from?)
  + or impregnate the floor with stuff (synthetic ingredients, non-renewable, Off-gassing, VOCs, hazardous waste?)
* You need to have interesting aggregate/binding to be worth showing off
* A fair faced concrete will invite a high labour rates
  + to achieve highest quality consistent appearance concrete
  + And extra processes to make it look good.
* Recycled aggregates
  + may not be beautiful to the designer
  + may need to be selected
* Special aggregates may need to be brought to the site
  + marbles from italy?
  + Fancy aggregates from where?
* Insitu structural terrazzo floors are also available
  + Expensive
  + Imported marble aggregates and coloured matrix OPC cement
* They promote but do not require cement substitution
  + so may be made of OPC Ordinary Portland Cement
  + (1.8% of UK CO2 production or 8% of global CO2 production)
  + but will always have a proportion of OPC (20-70%)
* PFA Pulversied Fuel Ash
  + Residue from Coal fired Power Stations
  + CO2, other pollution,
  + spherical, glass like,
  + aggregate and cement replacement,
  + desulferisation gypsum by-product to avoid acid-rain from flue gases mixing with weather
* Fly Ash
  + Residue from furnaces
  + See below
* GGBS Ground Granulated Blastfurnace Slag Cement
  + (waste from UK steel making,
  + High embodied energy and potentially high embodied carbon,
  + cementitious,
  + slower set,
  + same ultimate strength,
  + Low carbon (only if you discount the steel making impacts),
  + suitable with recycled glass aggregates (no alkali-silica reaction);
  + warmer colour than OPC cement if its still visible
* Removes laitance (water diluted cement matrix on top surface) and flatten out surface tolerances
* Polished concrete surfaces will emphasis the swirls of the power-float/grinder left in the concrete surface
* Need to consider diamond grinders
  + if industrial diamond and made in laboratories in the UK or EU might be okay,
  + if obtained naturally need to consider the social and environmental issues and pollutions associated with diamond extraction
* Need to consider the electrical energy or fuel input to the grinding and polishing kit and the waste water and ground material dust removal and disposal
* The alternative is a second hand softwood scaffold board tamped across the surface by two men eating 3 shredded wheat for breakfast
* Polished Concrete Floors have an acoustic influence on the space and surroundings
  + no absorption,
  + high reflection,
  + longer reverberation time,
  + impact noise,
  + noise transfer through floor,
  + may need acoustic isolation joints
* Object falling on Polished Concrete Floors are vulnerable to breakage rather than bounce
* Concrete shrinkage needs to be controlled and large floors must be broken up with movement control joints,
* The layout of movement control joints need to be considered as a design issue and not left to chance
* Grinding floors with control joints is not simple, so often cut afterwards and then filled with:
  + load bearing sealants (synthetic ingredients, non-renewable, Offgassing, VOCs, hazardous waste?)
  + or strips of metal or plastic. (high embodied energy and carbon)

BrianSpecMan 26th January 2013

on the subject of fly ash I wrote the following last year:

"Coal Fly Ash Class C has worked well as an infill material for the Shaw EcoWorx carpet and carpet tile backing system.  This is a bi product of coal combustion at electrical generating plants and is derived from particles captured from the flu gasses in electrostatic precipitators.  Around 40% of recovered fly ash has been recycled to supplement Portland Cement in concrete production and has thus produced major savings in energy and CO2 emissions.  Fly Ash C is not considered or treated under regulation as a hazardous waste stream, although it contains trace concentrations of [heavy metals](http://en.wikipedia.org/wiki/Heavy_metals) and other substances that are known to be detrimental to health in sufficient quantities. Potentially toxic trace elements in coal include arsenic, beryllium, cadmium, barium, chromium, copper, lead, mercury molybdenum, nickel, radium, selenium, thorium, vanadium, and zinc.  Although no regulatory controls have been implemented there have been a number of concerns expressed by environmental groups regarding the potential for damage to human health and the environment from the processing, handling and storage of this material

In December 2008 the collapse of an embankment at an impoundment for wet storage of fly ash at the [Tennessee Valley Authority](http://en.wikipedia.org/wiki/Tennessee_Valley_Authority)'s [Kingston Fossil Plant](http://en.wikipedia.org/wiki/Kingston_Fossil_Plant) resulted in a [major release](http://en.wikipedia.org/wiki/Kingston_Fossil_Plant_coal_fly_ash_slurry_spill) of 5.4 millon cubic yards of coal fly ash, damaging 3 homes and flowing into the Emory River. Cleanup costs may exceed $1.2 billion. This spill was followed a few weeks later by a smaller TVA-plant spill in [Alabama](http://en.wikipedia.org/wiki/Alabama), which contaminated Widows Creek and the Tennessee River. These events caused Shaw to review its use of the Coal Fly Ash C material and to seek a suitable alternative."

Alan Best 2012

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