


American Concrete Institute®
Advancing concrete knowledge

The Art of Concrete


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ACI
WEB SESSIONS




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Amerete, Inc. started in 2004 as American Concrete Technologies


The owner, Tim Taylor, was first exposed to polished concrete in November 2003. He traveled to Sweden to meet with a European machinery manufacturer to determine if polished concrete was as impressive as what he first saw. He knew immediately the potential and possibilities that this innovation would bring to American Architects, Designers, Builders, and Facility Managers. The economics and ease of long term care were perfect for not only the industrial market but for commercial and residential as well. Upon his return to the states he placed his order for equipment and tooling from Sweden and in 2004 the company was launched.

With the introduction of polished terrazzo in late 2010 the name was changed from American Concrete Technologies to Amerete. The name is a contraction of American (Amer) and Concrete (ete) thus Amerete.



The Green Advantage of Polished Concrete

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Basics of Polished Concrete


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Basics of Polished Concrete

Polished concrete is the mechanical grinding and polishing of concrete. It utilizes industrial diamonds to level, grind and polish the floor.



Grinder / Polisher



Planetary Rotation with 3 Heads

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Diamond Tooling is Used

The tooling uses diamonds. For grinding a metal matrix is used and for polishing a resin matrix is used. There are different tools for soft, normal and hard concrete. The grinding machine uses planetary rotation and three or four heads.



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Multiple Steps are Required

There can be up to 9 steps to a beautiful polished concrete floor. Often the process starts with 40 grit tooling and removes between 1/32" to 1/16" of the top layer. Next is the 80 grit step and then densification with a lithium or sodium silicate that is used to harden and dust proof. The next steps are to remove the scratches of the previous grit. Each step is independent therefore can stop at 800, 1500 or go to 3,000 grit depending on the required sheen.



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Vacuums are Used to Collect the Dust

Dust is controlled with the use of vacuums. Often Hepa filters are used to collect the air borne dust. Some dust may remain on the floor and be vacuumed up.




Vacuum Pre Separator Smaller Vacuum


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Edges are Done by Hand

The grinder cannot get up to an edge or a wall so it must be hand ground with a small grinder following the same grits as the machine.



Hand Grinder with dust collector




Another option is to paint the edges with a decorative border.

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Polished Concrete Does not Require Chemicals

No chemicals are necessary to polish concrete. Mechanical polishing offers a deep, rich, luster finish, a flattened surface and a glossy appearance. It is glossy because it is very smooth. The wear surface becomes the hard aggregates in the concrete matrix.

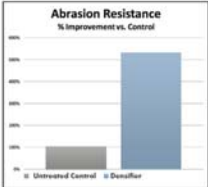


The Green Advantage of Polished Concrete

A Densifier is Used

A densifier is used to harden and dust proof the concrete. A sodium or lithium silicate densifier is used with no VOC's.

Hardened & polished vs. Untreated Control	
TEST	RESULT
Tabor Abrasion Testing, M22 Wheel, 1000 gram load	% Improvement vs. Control
Control	100%
Hardened & Polished	521%



Abrasion Resistance
% Improvement vs. Control

Notes
This received one coat of Densifier, less than was polished to 3,000 grit.
Graph shows more than 500 percent improvement in abrasion resistance over untreated, unpolished control.

The Green Advantage of Polished Concrete

Least Expensive Flooring Options when Maintenance is Considered

Over the life of the building polished concrete is among the least expensive options.

	Vinyl Sheet	Carpet	Vinyl Tile	Porcelain Tile	Quarry Tile	Epoxy Terrazzo	Polished Concrete
Cost/sq ft installed	\$ 3.88	\$ 2.76	\$ 1.76	\$ 9.69	\$ 8.26	\$ 12.50	\$ 3.25
Annual Cost of Maintenance/sq ft	\$ 1.39	\$ 1.53	\$ 1.47	\$ 1.22	\$ 1.22	\$ 0.46	\$ 0.38
Initial Cost Plus 10 Years Maintenance	\$ 17.78	\$ 18.06	\$ 16.46	\$ 21.89	\$ 20.46	\$ 17.10	\$ 7.55
Replacement Cost/sq ft	\$ 3.43	\$ 2.24	\$ 1.60	\$ -	\$ -	\$ -	\$ -
Frequency of Replacement	9 years	10 years	15 years	40 years	40 years	40+ years	40+ years
Forty Year Cost*	\$ 74.72	\$ 72.92	\$ 64.83	\$ 58.49	\$ 57.06	\$ 30.90	\$ 12.60
Annual Cost/ sq ft	\$ 1.87	\$ 1.82	\$ 1.62	\$ 1.46	\$ 1.43	\$ 0.77	\$ 0.32

- Includes initial cost, replacement & maintenance cost
- The National Terrazzo & Mosaic Tile Association conducted an extensive study, compiling statistics and updated based on market experiences and customer input (03/04)
- Diamond Polished Concrete should retain its sheen for 5-7 years and then may require a touch up re-polish based on \$.50 per square foot.
- Diamond Polished Concrete price based on 10,000 sf, salt & pepper finish with no edges @ 3,000 gmt

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Construction Process Using Polishing Concrete in New and Existing Concrete

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Concrete can be Polished at Any Time



Any concrete can be polished at any time. For best results it is best to polish before any walls are up. The earliest a slab can be polished is 5 days after placement.



It is a good idea to protect the floor from the other trades during the construction process. Often it is not protected with excellent results.

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Holes are Polished and Blended

Holes can be patched using a cementitious material. When blended with the polishing dust the color can match the floor allowing it to blend. It may still be noticeable.



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No Special Mix Design is Required

No special concrete mix is necessary. Any 3000 psi or over will work. Fly ash and other pozzolans can be used. A good finish results in the best polished concrete. The best cure is a wet cure or a dissipating curing compound.



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Floor Flatness is Important



Laser Screed

The flatter the floor the better. A floor flatness (FF) number of 50 is preferred. A laser screed works well. A bump cutter and two passes with a pan on the power trowel can flatten the floor for superior results.



Bump Cutter



Float pan for power trowel

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All Cracks can be Filled

The larger cracks can be filled by hand before grinding and polishing. The smaller cracks can be filled using a special grouting material during the grinding process. The dust from the concrete is blended with the grouting material to fill the cracks. The cracks disappear or look like veins.

Before Grouting System After Grouting System

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Sheen can be Varied

The sheen of the polish can be varied. Satin is equal to 800 grit. Semi gloss is equal to 1500 grit and the shiniest is 3000 grit which is full gloss.

800 Grit / Satin 1500 Grit / Semi Gloss 3000 Grit / Full Gloss

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Aggregate Exposure can be Varied

The amount of aggregate exposure can be varied. A cream finish is just the polish of the cement on top. A salt and pepper finish is the exposure of the sand or fine aggregates. A heavy aggregate exposure is possible often exposing 90% of the large aggregates. To get even heavier exposure you might request and "over rocky" mix with more aggregate than sand.

Cream Finish Salt & Pepper Heavy Aggregate

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Integral Color is the Best Way to Add Color

Color can be added to the concrete mix called integral color. The color is throughout the entire concrete slab. Integral color can be only added to wet concrete

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Dyes can Be Added at Any Time

The dyes are added during the polishing process. The concrete is polished to 400 grit, then the dye is applied. The polishing process is completed followed by a polish guard to lock in the color

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Decorative Aggregates Can be Added



Recycled products can be broadcast to the top of wet concrete. Included are recycled concrete, glass, metals and stone aggregates

Stone Glass Metal

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Honed Concrete is Perfect for Exteriors

Honed Concrete is the rustic grind of the concrete. It can be used on interior as well as exterior concrete, new or existing. The honed finish is perfect for exterior applications.

30 year old concrete
New Concrete

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Advantages of Polished Concrete

The Green Advantage of Polished Concrete

Advantages of Polished Concrete:

Ease of Maintenance
Most floor systems requires scrubbing to maintain a clean and beautiful appearance. Polished concrete surfaces are tightly compacted, reducing stains. They also do not require waxing or stripping to maintain their luster.

Improved Reflectivity and Ambient Lighting
Because polished concrete is highly reflective, less lighting is necessary and energy costs are lowered.

Cost Effective
Polished concrete is a very affordable flooring option and has an extended life which makes it one of the least expensive options available.

Improved Condition for Old Floors
As concrete ages it gets surface stress cracks, delaminating, curled joints, and ugly due to use and abuse. Concrete polishing removes the top layer of the concrete exposing new and virgin concrete. The polishing process will harden and strengthen old concrete increasing the impact and abrasion resistance. Old aggregates can be very beautiful because often they are river rocks.

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Advantages of Polished Concrete: *Cont...*

Elimination of Dusting and Efflorescence
In ordinary unpolished concrete crystalline deposits of salts, which leach from the concrete as soluble calcium hydroxides, will combine with the atmospheric carbon dioxide to form insoluble calcium carbonates which are usually white in color. This coloring can be eliminated with the use of a densifier in the polishing process.

Reduced Tire Wear
Rough, uneven natural concrete will abrade tires increasing their wear. A smooth polished concrete floor will level the joints and make the surface smooth. This will eliminate the abrasion on tires and reducing the black dust that results from tire wear.

No Downtime / No Interruption of Other Trades
Dry mechanically polished concrete does not interrupt production of manufacturing plants. Since the process is dry it can be walked on during the polishing process. During the new construction process the floor can be polished in the presence of other trades.

Extended Life Cycle of Floor
Polished concrete is an affordable flooring option. The extended life cycle can be at least 40 years or longer. Return on investment is usually better than other flooring options.

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The Green Advantage of Polished Concrete

Advantages of Polished Concrete: *Cont...*

Less Maintenance
Most floor systems, including tile, linoleum and VCT, require extensive maintenance programs to maintain a clean environment and nice appearance. Polished concrete requires no waxing or stripping to maintain the sheen. Regular cleaning with a neutral pH cleaner makes sure all the soap or detergents are removed.

Beautiful
Polishing takes an ordinary concrete floor and makes it very beautiful. Whether you choose a cream finish, salt & pepper or a heavy exposed aggregate the concrete will appeal to its owners.

Decorative
Polished concrete can be very decorative. On new concrete you can choose between normal aggregate or pea gravel. You can also add color by using integral colors or dyes. Decorative aggregates can also be broadcast and exposed during the grinding process.

Honesty of Materials
Unlike other decorative concrete processes, polished concrete is not trying to make concrete look like something else, but is true to the material. It is only making the concrete look as good as it can.

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Sustainability Points of Polished Concrete

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Sustainability

Polished concrete is intrinsically green. Many LEED projects use polished concrete to add to the sustainability contributing to LEED points for the project.



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What Makes Polished Concrete Green?

Dematerializing the project:
Concrete is a fundamental part of every construction project. Adding extra material to the project results in greater expenditures and environmental concerns such as harvesting, manufacturing, refining and transporting of products to the job site. Finishing the floor by polishing the existing concrete substantially decreases the environmental footprint of the project. It saves on natural resources and costs associated.



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Reducing Airborne Contaminants & VOCs

Up to 30% of people are sensitive to chemicals. Indoor air quality is of major concern. Polished concrete gives off no VOC's. The chemicals that are used in the polished concrete process are VOC compliant and safe.




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Optimize Energy Performance

Polished Concrete can utilize the thermal mass of the concrete thereby reducing the energy use. Polished Concrete can reduce the lighting requirements by reflecting available light.




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Old Slabs Reused

Raised aggregate concrete can be ground flat and polished. Therefore it can be reused instead of being replaced or re-covered.




Before



After


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This concludes the continuing education program.

Thank You For Your Time!

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