TECKROCK

Concrete Polishing Specification Guide

TECHNOKOTES

ISO 9001-2008

Pune, INDIA

State of Art

Concrete is one of the most widely used construction materials. Because of its strength, durability, ease of manufacture, ease of installation and relatively low cost, it is frequently the material of choice for floors, walls, and the like. However, there are many instances where it is desirable to provide a floor or wall surface that has a pleasing high gloss finish or shine. In such cases, concrete may be over looked in favour of other more high cost materials such as marble, stone, terrazzo, etc.

This brings us to TECKROCK, Exposed Concrete Flooring Systems; TECKROCK is a complete set to retrofit old concrete and also has a number of hardening, densifying and or polishing additive under its banner which have been exclusively developed for Concrete Polishing.

Polished Concrete

Polished Concrete is mechanically treated concrete, treated with diamond grinding tools. Typically polished concrete is defined as concrete treated with 800 grit up to 3,000 grit levels of polishing pads. (Anything ground below 400 grit levels is not technically considered polishing.) Grinding tools are progressive pads building to the desired polish level. Polishing often includes using liquid hardeners and/or densifiers to add durability and serviceability to the surface. Colours and dyes can be used in conjunction with the polished system to further enhance the aesthetics.

There are other methods to meet client desires for a polished concrete look. These other methods depend on the existing concrete profile, the contractors experience and expertise, the equipment and the supplies used.

Polished concrete is not to be confused with “stained” concrete, “epoxy” concrete, “terrazzo” concrete or “sealed” concrete. Sealers or epoxies are applied over plain concrete or stained concrete.

These sealers/epoxies can produce a flat finish or a high gloss finish. Polished concrete is actually changing the surface of the concrete physically by using pads, grits and buffing materials to achieve the finish mechanically.

TECKROCK Benefits

- A sustainable design flooring option.
- Uses materials already present.
- Eliminates the energy and additional materials to apply other flooring options such as carpet, wood, tile, etc.
- Low maintenance.
- More durable and easier to clean than many other flooring options.
- Increased slip resistance (vinyl composite tile (VCT) standards typically are a minimum of 0.5 SCOF, polished concrete is typically 0.7 to 0.9 SCOF).
- Reduces the opportunity for dust and dust mites for asthma and allergy suffers.
- Improves natural lighting with the reflective surface bouncing light around the room.
- Potentially reduces the need for additional interior lighting.
- Hard wearing surface has less opportunity for chipping, denting and wear and tear.
- Cleaner, healthier atmosphere for restaurants, hospitals and medical clinics, etc.

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Aggregate Exposure

Class	Name	Surface Cut Depth	Appearance
A	Cream	Very little	Little aggregate exposure
B	Fine Aggregate (Salt & Pepper)	1.5 mm	Fine aggregate exposure with little or no medium aggregate exposure at random locations
C	Medium Aggregate	3 mm	Medium aggregate exposure with little or no large aggregate exposure at random locations
D	Large Aggregate	6 mm	Large aggregate exposure with little or no fine aggregate exposure at random locations
Note: FF #'s effect consistency of aggregate exposure			

Reflective Clarity and Reflective Sheen

Gloss can be measured with a Gloss Meter

Level	Name	Reflective Clarity	Reflective Sheen	Grit Range
1	Ground	Flat appearance with no to very slight diffused reflection	None to very low	Below 100
2	Honed	Matte appearance with or without slight diffused reflection	Low to medium	100 – 400
3	Semi-Polished	Objects being reflected are not quite sharp and crisp but can be easily identified	Medium to high	800- 1500
4	Highly- Polished	Objects being reflected are sharp and crisp as would be seen in a mirror- like reflection	High to highest	1500 - 3000
Reflective Clarity: When viewed 5 feet above and perpendicular to a surface, the degree of sharpness and crispness of the reflection of the overhead objects.				
Reflective Sheen: When viewed at 20 feet from and at an angle to a surface, the degree of gloss reflected from the surface.				

Highly-polished concrete is when the concrete is polished to the degree where the reflective clarity should be good enough to see a near perfect reflection of the overhead lighting.

CONCRETE POLISHING FOR NEW FLOORS

Concrete Needing Additional Shine

SILKOTE S

SILKOTE S is applied to the concrete floor at a rate of 50 square feet per Kg. The SILKOTE S is allowed to soak into the concrete for 30 minutes. Any puddles formed is removed and allowed to dry. A second application of SILIKOTE S is applied at a rate of 150 square feet per Kg and allowed to dry for 24—48 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step can be repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete surface having a very high sheen finish.

Concrete with Poor Finish

PROTEX C

After the floor is smoothed using a rotary polishing machine with an abrasive polishing disk to remove the poor finish, PROTEX C is applied at a rate of 50 square feet per Kg. PROTEX C is allowed to soak into the concrete for 30 minutes. Any puddles formed is removed and allowed to dry. A second application of PROTEX C is applied at a rate of 150 square feet per Kg and allowed to dry for 24 hours. Subsequently, TECROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result will be a hardened concrete surface having a very high sheen finish.

Soft Concrete

SILIKOTE PS

After the soft concrete is removed and the surface is smoothed using a rotary polishing machine with an abrasive polishing disk, SILKOTE PS is applied at a rate of 15 square feet per Kg. SILKOTE PS is allowed to soak into the concrete for 30 minutes. SIKIKOTE PS penetrates the surface of the concrete such that it need not be removed. A second application SILIKOTE PS is made at a rate of 150 square feet per Kg. This second application is allowed to dry for 24 – 48 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete substrate having a very high sheen finish.

Porous Concrete

INSEAL FS

INSEAL FS is applied at a rate of 25 square feet per Kg. The INSEAL FS is allowed to soak into the concrete for 45 minutes. Any puddles formed is removed and allowed to dry. A second application of INSEAL FS is applied at a rate of 150 square feet per Kg and allowed to dry for 24 – 48 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete surface having a very high sheen finish.

Dusting Concrete

PROTEX

PROTEX is applied at the rate of 25 square feet per Kg PROTEX compound is allowed to soak into the concrete for 30 minutes. Any puddles formed is removed and allowed to dry completely. A second application of PROTEX is applied at a rate of 150 square feet per Kg and allowed to dry for 24 – 48 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete surface having a very high sheen finish.

SILKOTE PS

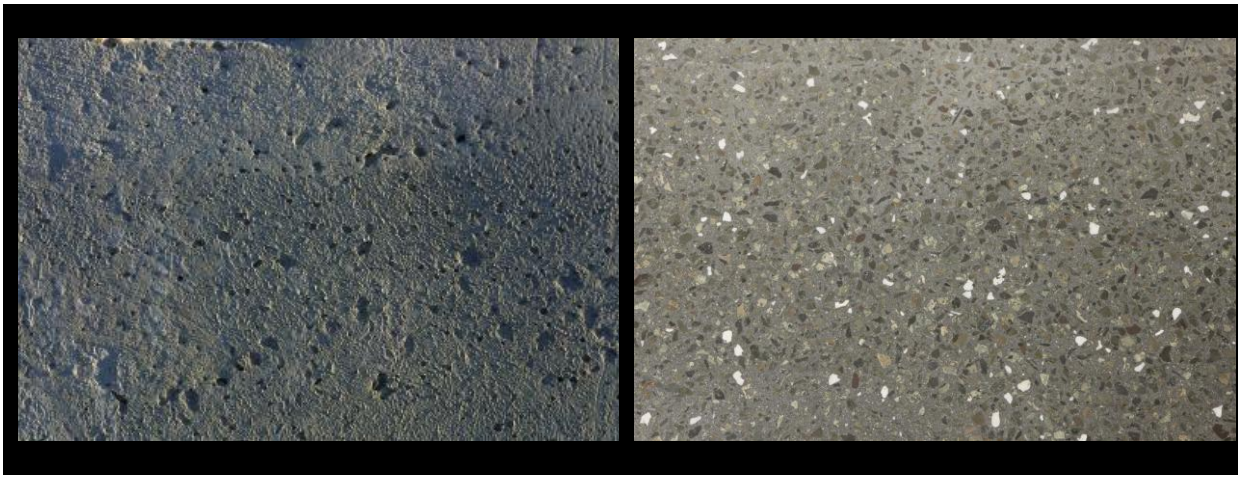
SILIKOTE PS is applied at a rate of 75 square feet per Kg. SILIKOTE PS is allowed to soak into the concrete for 45 minutes. Any puddles formed is removed and allowed to dry for 24 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete surface having a very high sheen finish.

CONCRETE POLISHING FOR WEATHERED FLOORS

Rain Damaged Concrete

SILIKOTE S

SILKOTE S is applied at a rate of 50 square feet per Kg. SILKOTE S is allowed to soak into the concrete floor for 30 minutes. Any puddles formed is removed and allowed to dry. A second application of SILIKOTE S is applied at a rate of 150 square feet per Kg and allowed to dry for 24 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete surface having a very high sheen finish.



Carbonated Concrete

PROTEX

PROTEX is applied at the rate of 25 square feet per Kg PROTEX compound is allowed to soak into the concrete for 30 minutes. Any puddles formed is removed and allowed to dry completely. A second application of PROTEX is applied at a rate of 150 square feet per Kg and allowed to dry for 24 – 48 hours. Subsequently, TECKROCK ASSIST is applied to the concrete at a rate of about 100 square feet per Kg. While the concrete is still damp, a rotary polishing machine is used to polish the concrete. This polishing step is then repeated by using higher grit polishing discs on each occasion. The result is a hardened concrete surface having a very high sheen finish.

OVERLAYS FOR CONCRETE FLOORS

Polymer Concrete Overlay

TECROCK PM

TECROCK PM is supplied as a ready to use blend of dry powders which requires only the site addition of clean water to produce a free-flowing, shrinkage compensated micro-concrete suitable for large volume concrete repairs at nominal thicknesses in excess of 50 mm.

Uses

For the reinstatement of reinforced concrete where low permeability characteristics are required and where high compressive strength is a consideration.
TECROCK PM has been specifically developed for the repair of large areas of concrete where access is restricted or where reinforcement is congested.
It is suitable for use where excellent chloride and carbon dioxide resistance is required or for repairs to concrete affected by alkali-silica reaction (ASR). TECROCK PM is alkaline in nature and will protect embedded steel reinforcement.

Advantages

- Maximum compatibility with concrete of compressive strength 30 - 60 N/mm²
- Dual expansion system compensates for shrinkage in the plastic and hardened states
- Low alkali content minimises risk of alkali-silica reaction
- Exceptional bond to concrete substrates without independent primer
- Suitable for placement by pumping or pouring techniques into restricted locations
- Self-compacting nature eliminates honeycombing and displaces air without vibration
- High strength and low permeability provide maximum protection against carbon dioxide and chlorides
- Pre-bagged to overcome site-batched variations — only the site addition of clean water is required
- Contains no chloride admixtures

TECROCK TOPKOTE

TECROCK TOPKOTE is a high strength; self levelling concrete overlay topping that is easy to place. TECROCK TOPKOTE rapidly gains strength to allow pedestrian and vehicle traffic or mechanical polishing within 24 hours after placement. The time-proven benefits of positive bonding and durability assure precise decorative repair of worn and pitted concrete surfaces.

TECROCK TOPKOTE quickly develops strength and can be dyed with provided dyes and polished with concrete polishing systems, if desired. This attractive, fast curing, fibre reinforced, self-levelling material may be placed in various thicknesses from 10-50mm depth in a single pour. TECROCK TOPKOTE can be integrally coloured for additional decorative effect.

Uses

The rapid strength, self-levelling features of TECROCK TOPKOTE assure an attractive durable concrete repair surface for worn, uneven and pitted existing concrete floors. Its excellent workability and wear resistance make it ideal for patch repairs in large and small areas that require a very durable and polishable repair material. Use TECROCK TOPKOTE to renovate and correct irregularities in uneven and worn structural floors, including light manufacturing, malls, retail stores, warehouses and lobbies.

Advantages

- Long flow life
- Polishable topping within 24 hours
- High abrasion resistance
- Can be dyed or coloured
- Rapid strength gain
- Excellent bonding to sound concrete surface
- Single applications 10-50 mm
- Can add decorative aggregate

Micro Concrete Overlay

TECROCK MICRO TOPKOTE

TECROCK MICRO TOPKOTE is a single component unique blend of cements, polymers, colour and mineral aggregates to be used to resurface existing concrete surfaces. It combines the durability of concrete with colour and decorative aggregate to produce a high-performance floor with enduring beauty. TECROCK MICRO TOPKOTE floors are trowel applied 1.5 -3 mm thick, cured, then polished.

Uses

Use wherever you want an attractive, exposed coloured concrete floor such as commercial lobbies, institutional floors, shopping centres, schools, theatres, and restaurants.

TECROCK MICRO TOPKOTE may also be used as a concrete patch and repair material, fixing spalls, pop-outs, pitting, and spalling of various sizes. The repair material can then be dyed and polished to closely resemble existing concrete surfaces.

Advantages

- Creates a highly polished surface
- Perfect for concrete repair in small and wide patching areas
- Built-in permanent colour and texture
- Reduces surface wear and dusting
- Resembles concrete
- Breathable

POLISH ASSISTING CHEMICAL

TECKROCK ASSIST

Water clear polishing assisting product used in the final stages of concrete polishing to increase pad life and bring down the polishing time. Used instead of plain water as a grinding assistance. TECKROCK ASSIST is usually sprayed at a rate of 100 square feet per Kg.

Uses

Use for all concrete polishing projects especially for rain or carbonation damaged concrete for excellent results.

Advantages

- Increase polishing pad life
- Reduced dusting
- Higher gloss readings with same consumables
- Increased abrasion resistance
- Longer lifespan of the polished concrete floor

BOND COAT FOR OVERLAYS

EPIKOTE SF200

EPIKOTE SF200 is a two part solvent free bonding agent composed of liquid epoxy resin and hardener. It is used for bonding of structural concrete new to old concrete because it gives excellent bonding properties to freshly mixed concrete/mortars, and self levelling concrete etc.

Uses

- Bonding agent for bonding of old to new concrete / mortar.
- To extend or repair structural concrete
- Bonding agent for self levelling concrete

Advantages

- Water resistance - Excellent water resistance and sealing property prevents leakage.
- Toxicity - Non toxic.
- Moisture tolerant - It is moisture tolerant hence provides strong bond of new concrete to fresh concrete.
- Ease of application - Easily applicable by brush as a bonding agent for old to new concrete / mortar.
- Adhesion - Excellent adhesion to almost all building materials.
- Strength - Bond strength exceeds the tensile strength of concrete hence no failure of concrete due to high degree of movements.
- Open time - Comfortable open time to complete the work easily.
- Shrinkage - Very low shrinkage as compared to polymer modified cementitious bonding agents
- Durability - Very high durable bond.
- Chemical Resistance - Resistant to chemical attack

TECKCRYL 100 PLUS

TECKCRYL 100 PLUS is a structured nano-particle acrylic polymer for hard penetrative primer applications. This 100% acrylic polymer modified with organosilicate features excellent hardness and improved adhesion and is thoroughly tested in varied conditions. This technology uses the penetrative feature of the nano polymer size provides outstanding moisture block resistance and exceptional film adhesion at no or low VOC.

Uses

Due to its ammonia-free composition, TECKCRYL 100 PLUS is an excellent choice for primer systems where odour of the product is a concern and penetrative feature into concrete with improved polymer adhesion is a must.

Advantages

- Superior moisture block and film adhesion compared to standard acrylic systems
- Excellent concrete penetrative feature
- Low VOC capable from 0-50 g/L
- Excellent adhesion to cementitious overlays
- Excellent wet adhesion
- Low odour

SUSTAINABILITY AND GREEN BUILDING

Polished concrete for LEED®NC credits

Many current green building certification programs and construction guidelines for achieving green points or credits can be attained by using polished concrete. The reasons are listed above in the benefits section, i.e., less energy use, more natural light, less construction materials needed, low maintenance, etc. Some examples of the programs are:

- LEED® by the U.S. Green Building System, USGBC
- Green Building Standards, National Association of Home Builders, NAHB
- National Green Building Standard, International Code Council, ICC
- Green Globes, ECD Energy and Environment Canada

Polished concrete can achieve LEED®NC credits:

- Materials & Resources (MR) Credit 1.1- Building Reuse, Maintain 75% of Existing Walls, Floors and Roof. The intent is to extend the lifecycle of materials to prevent waste and reduce the environmental impact that is caused by harvesting and manufacturing new material. Reusing the concrete slab as part of the building helps to achieve this point if the total amount of reused materials in the project meets or exceeds 75% as calculated by square footage.
- Materials & Resources (MR) Credit 1.2- Building Reuse, Maintain 95% of Existing Walls, Floors and Roof. The intent is the same as above in MR Credit 1.1 except it must meet the criteria of 95% reuse of building materials on the project.
- Materials & Resources (MR) Credit 3.1- Materials Reuse, 5% reused items. Polishing the slab instead of harvesting additional materials to cover the slab prevents waste and reduces the impact on the earth's finite resources. Reusing the slab as a finished floor, instead of covering it up with carpet, tile or other materials helps to meet this objective.
- Material & Resources (MR) Credit 3.2- Material Reuse, 10% of reused items. If the amount of materials reused exceeds 5% and meets or exceeds 10% then this point can be attained in addition to MR 3.1.
- Indoor Environmental Air Quality 4.2- Low Emitting Materials, Paints and Coatings. Indoor air quality effects the quality of life and well being of the occupants of a building considering the amount of time spent indoors at work, home or school. Materials that emit odours or VOCs (volatile organic compounds) should be eliminated. By using a low VOC or no VOC sealer on the polished floor or by eliminating the sealer altogether, polished concrete can meet this requirement.
- Energy & Atmosphere (EA) P2 – Minimum Energy Performance (Mandatory Prerequisite). All buildings must comply to a minimum energy efficiency level overall as established by the local building codes, the Dept. of Energy Standards or by complying with ASHRAE/IESNA 90.1-2004 regulations. The reflective nature of polished concrete reduces the amount of artificial light needed. This helps to maximize the natural and artificial lighting already in use, improving energy efficiency of the lighting system as a whole. The insulation gained from the thermal mass of constructing with concrete, including walls and exposed slabs, used with passive solar design principals, helps retain the internal temperature of the building. Using thermal mass as a design element will moderate the daily temperature fluctuations and reduce the HVAC load.
- Energy & Atmosphere (EA) 1- Optimize Energy Performance 1-10 points.
  If the energy efficiency exceeds the energy savings required in the baseline in prerequisite EA P2, an additional ten points can be achieved through EA1. Polished concrete can assist through increased ambient lighting and thermal mass for these items.

For all enquiries please contact

TECHNOKOTES
26-B, Goodwill Sanskruthi, Bhairavnagar,
Dhanori Road , Pune - 411015, INDIA.
Phone: +91 20 27171412 /
Mail: info@technokotes.co.in
Web: www.technokotes.com