This specification is drafted by Diagrind as general guidelines for preparing the appropriate project specification for a clear indication of proposed polished concrete flooring with consideration to the Green Building Council of Australia, Technical Manual – V1.1 IEQ-11(Office Interiors) and V2 IEQ-13 (Office Design).

Documentation has been compiled from the - Cement Concrete Aggregates Australia – ACI 300-R, ASCC and CPC handbook and specifications.

This document specifies the dry process of finishing and polishing concrete floor surfaces, including products.

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Specification Guide

TITLE- Diamond Polished Concrete Specification 2021
SPECIFICATION NO: DPC2021

PART 1-GENERAL

1.1 SUMMARY

This section includes the following: Applying liquid densifiers for dust proofing, semi curing, hardening and dry mechanical polishing concrete to a specified level.

A. Specification for project:

Project type: { insert }

Structural Slab: { insert type }

1.2 REFERANCES

A. Cement concrete aggregates Australia
B. Green star design specification
C. ACI 300 R
D. AS 3610.1

1.3 STANDARDS

General

Formed surfaces: AS 3610.1.

Polishing: ACI 300-R

1.4 INTERPRETATION

Definitions

General: For the purposes of this work section the following definition applies:

- Green concrete: Concrete which has recently set but has not achieved any design strength.
- FF: Floor flatness level
- Grouting:
- Densifying:
- S, for compressive strength grades also known as MPA

1.5 TOLERANCES

Formed surfaces

Quality of the surface finish: To AS 3610.1 and ACI300-R

Unformed surfaces

Flatness: As follows:

- Floors specified or scheduled to be exposed in the finished work: The maximum deviation under a 3metre straight edge shall be 3mm, when laid in any direction.

- Rectify non-conforming 'as laid' concrete by suitable procedures, such as levelling compounds or grinding.

- Min F_{F-} 25 – 70 depending on class of finish chosen. Class A FF 70 minimum to class D FF-25 minimum.

1.6 DESIGN

- As per ACI 300-R and available at https://www.diagrind.com.au/about/concrete-requirements-for-polished-concrete Please refer to appendix for specifics on each finish

Class 0: Burnished concrete zero aggregate or fine exposure (appendix A)

Class A: Cream polish, minimal fines and aggregate exposure (appendix B)

Class B: Salt n pepper exposure of all the small aggregates (appendix C)

Class C/D: Medium to full exposure of the larger aggregates (appendix D)

Gloss level 0: low to no gloss (appendix E)

Gloss level 1: low to satin gloss (appendix E)

Gloss level 2: medium gloss (appendix E)

Gloss level 3: high gloss (appendix E)

- Minimum of 32MPA concrete with minimal additives and water added.

1.7 SUBMITTALS

A. Comply with each product requirements according to the provision and specification sections as detailed in appendix.
    a. Provide submittal information within 7 days after the contractor has received the client's instruction to proceed.

B. Chemical Product Data:
    1. Submit special concrete treatment and finishes manufactures test data.
    2. Submit special concrete treatment and finishes describing products to be provided with product name for the specified material proposed under this section.
    3. Submit special concrete treatment and finishes manufactures recommended procedures, which when approved by the client/ Architect, will be the basis for accepting or rejecting procedures on the proposed work.
    4. Submit technical data sheet giving descriptive curing time and application requirements.
    5. Follow manufactures recommended installation instructions.

C. Hardener sealer, densifier specified in this document.
    1. Densifier; C2 Hard, C2 Hard Blend or C2 Superhard

D. Sealer/stain guard specified in this document.
    1. C2 Ultraseal and/or C2 protector

E. Construct On site samples as noted in section 1.8 - E 1 & E 1a to meet the agreed requirements of visual and reflectivity value prior to commencement.

F. Typical layout including dimensions and floor grinding schedule.

1.8 QUALITY ASSURANCE

A. Polishing contractor to be trade qualified, trade license, and show 3 examples of similar works. Engaging a Diagrind certified contractor, this project will be eligible for the 15-year system certified Warranty where all aspects here in are adhered to. Selecting non - trade qualified polishing contractor may result in lower quality and minimal support from contractor or product manufacture alike. Example of warranty certificate in appendix F.

B. New projects, prior to placement of the designated architectural concrete, construct a test sample for each finish to verify selections and design.

criteria under the sample submittals.

C. Existing concrete, test sample to be completed on site as per section 1.8.E mock-up.
D. Installer/applicator Qualifications: Engage an experienced trade certified contractor which has a minimum of 8 years proven track record of processing mechanical polished concrete like that indicated for this project with a record of successful service performance, applicable trade qualification and licensing.
E. Mock-ups
   1. Apply mock-ups of finish type to demonstrate surface finish, gloss sheen level, colour variation (if any) and workmanship.
      a. Build mock-ups approximately 25 square metres for areas exceeding 500 Sqm, 10 square metres for areas 300 - 500 Sqm in the location indicated or if not indicated, as directed by the Architect or representative. Residential samples sizes are on a case-by-case basis.
      b. Notify Architect or the owner's representative seven days in advance of the dates and times when mock-ups will be undertaken whenever practical.
      c. Obtain from the Architect, owner, or representative written approval of mock-ups before commencing slab preparation step 1 in appendix A-D.
      d. If it is determined the mock-ups do not meet requirements, alter, and construct others until mock-ups meet approval.
      e. Maintain mock-ups whenever possible during construction as a standard for the completed work.
      f. Mock-ups completed to structural slab may become part of the completed work if undisturbed before substantial completion.

F. No satisfactory chemical or cleaning procedure is available to remove petroleum-based stains from concrete surface. Prevention is therefore essential.

   a. Concrete to be adequately protected prior to grinding and polishing to prevent staining.
   b. All hydraulic operated equipment used with-in the areas to be treated and polished must be in good running condition with no oil leaks, remove from area at first sign of leaks.
   c. No trade shall park vehicles on slab to receive treatment. If necessary, to complete their scope of work, drop sheets shall be always placed under vehicles.
   d. Protect under and around pipe cutting and threading equipment.
   e. Steel and timber shall not be placed direct on to slab. Place impervious protection under if it to avoid rust and timber tannin staining.

G. Pre-installation Meetings: Conduct a pre-installation meeting to verify project requirements, manufacturer's installation instructions and warranty requirements.

Comply with Project Meetings. Review the following.

1. Environmental requirements.
2. Scheduling and phasing of work.
    - Works typically completed 14 days after concrete installation.
3. Coordinating with other work and personnel
4. Protection of adjacent surfaces.
5. Surface preparation.
6. Repair of defects and defective work prior to installation.
7. Installation of polished floor finishes.
8. Application of liquid hardener, densifier, sealers.
9. Protection of finished surfaces after installation.

1.9 DELIVERY, STORAGE AND HANDLING

Deliver products in original containers bearing manufactures labels indicating brand name and storage directions.

1.10 PROJECT CONDITIONS (NEW CONCRETE SLABS)

A. Environmental Limitations:

1. Comply with relevant manufactures instructions for substrate temperature, ambient temperature and humidity, moisture content, ventilation and any other conditions which affect application and performance.
2. Minimum concrete grade of S32 to AS1379, or a specified nominal mix.
3. Engage experienced concreter to place and finish to Australian Standards and exposed concreters specifications. Recommend features such as designated aggregate to be hand seeded.
4. Cement & Concrete Association of Australia, Honed & Polished: Section 3 clauses 3.3.1 to 3.4.11 shall be used to eliminate sub-standard finishes.
5. Concrete shall have a class A minimum flatness finish with no more than 3mm variation over 3 metre length in any given direction and no more than 1mm undulation over 300mm.
6. Concrete must be vibrated to disperse mix air, sufficiently vibrate without causing aggregate segregation, ensure adequate compaction.
7. Application of densifier for dust proofing and sealing tight steel trowel concrete after complete removal of curing agents.
8. Application of densifier to treat and aid the mechanical dry polishing process.

B. Close all areas to be dust proofed, hardened, and polished during and after application for a period recommended by applicator.

PART 2- PRODUCTS

2.1 MATERIALS

1. C2 Hard / C2 Super Hard/ C2 Hard blend.
2. C2 Protector/C2 Ultraseal
3. Related materials
    - C2 Pin Fix or similar
    - Potable water
    - C2 Clean
    - C2 Maintain

2.2 Densifying and Sealing Treatments

1. C2 Hard / C2 Super Hard/ C2 Hard blend.
    - Please refer to TDS

2.3 Finishes

A. As per the design specified by architect; Class A/B/C/D detailed in appendix.

2.4 CONCRETE SEALER

A. Concrete sealer for internal Polished Concrete flooring is an impregnating stain guard which closes of the capillaries to protect against possible stains from foods and liquids. It is impossible for the sealer to chip, crack, fade or discolour as they are not a topical coating.

B. Sealer type: Solvent based impregnator / C2 Protector or C2 Ultraseal
    - C2 Protector; is a penetrating, reactive treatment that provides water, oil and stain repellency for every kind of finished concrete floor.
    - C2 Ultraseal; is a durable, protective coating that dramatically increases the stain resistance of interior and exterior concrete floors.

PART 3- WORK EXECUTION

3.1 SURFACE CONDITIONS

A. Plastic shrinkage cracking from inappropriate measures may be visible on the completion of the proposed mechanical polishing process.

B. CONCRETE CURING: Water dissipating curing agent only. Hydrocarbon resin agent not to be used.

C. Examine substrate with installer, for conditions which may affect the performance of finish.

D. Verify the slab meets surface and finish requirements for "Cast-In-Place Concrete" Class A surface finish and flatness.

E. Prior to commencement, verify the floors surfaces are suitable for the intended level of finish, are free of laitance, stains, and construction materials.

F. Preparation: Remove any surface contaminants such as adhesives, curing agents, paint, or sealers

3.2 PROCESSING OF FLOORS

A. Concrete Floor surface preparation shall be processed by a planetary floor machine with a minimum width of 650mm to remove surface contamination and expose appropriate level of aggregate as per design specifications and approved mock-up.
    1. Note: Existing surfaces may require altered preparation process to originally desired but will be addressed during the mock-up approval stage.
B. Concrete Floor surface polishing shall be processed by a planetary floor machine with minimum honing and dry polishing pressure of 300 kg.
C. Strict adherence to ensure that each step of the grinding and polishing process has received full refinement before moving on to each subsequent step. Failure in full refinement will provide a lower quality finish in performance and gloss retention.
D. Floor surface to be polished to desired gloss level and as per approve mock-up.
E. Edges shall be processed to match floor area with-in 2-5mm of walls and fixtures (floors preferably polished prior to installation of walls and fixtures)
F. Grinding, Hardening, Honing Polishing and Sealing of Concrete Floor Surface as per specifications.
G. Refer to appendix A for burnish concrete, appendix B for cream polish, appendix C for salt n pepper exposure, appendix D for medium to full exposure.

3.3 WORKMANSHIP AND CLEANING

A. The area to be treated shall be always kept clean and free of debris from other trades.
B. Protect adjoining surfaces as required, remove spatter if necessary.
C. Adjoining surfaces which have had protection applied does not guarantee marking will not occur. Always best practice to schedule polishing to occur immediately after installation of concrete and prior to any walls in new builds and prior to any wall finishes or fixtures in existing builds.
D. Remove collected debris such as bagged concrete dust and used containers, place in site skip or at designated site waste pile.

3.4 PROGRAMMING WORK STAGES

A. Concrete polishing is not to be considered as a traditional floor finishing trade. Construction programming may need to be altered to fulfil the design criteria and architectural specifications. Recommend a prestart up meeting for all parties to complete their requirements successfully.
B. For new builds it is best practice to schedule polishing damage occurring to the concrete throughout the build which may not be repairable at a later stage. The process is faster, more efficient and cost effective to be completed at this stage.

3.5 SPECIFIC QUALIFICATIONS/ EXCLUSIONS.

This section will greatly improve the understanding of necessary procedures for performing concrete treatment, honing, and polishing properly.

A. Lifting of floor polishing equipment into difficult sites to be provided by Builder/ Client where access cannot be achieved manually.
B. Assumption there is or will be 415-volt 32 Amp minimum, site power or where site power cannot be provided, an inclusive supply of suitable diesel generator on a time cost plus basis can be included as part of scope of works. Adequate lighting and water to be available.
C. It is the responsibility of the Builder / Client to arrange and provide waste disposal.
D. The floor surface should not have been exposed to adverse weather conditions during placement. If weather damage has occurred, additional preparatory grinding will be time, equipment, tooling, and materials cost-plus basis.
E. Removal of contaminants such as slab soiling, oils, diesel or petrol, hydraulic fluids, drag marks depression, hand and power trowel marks or any other outside form of contamination will be at time, equipment and materials basis and performed at the best of knowledge and ability, but without guarantee of removal.
F. Any underlying or unforeseen conditions which require repair shall be brought to builder / Clients' attention and will be billed at time, equipment and materials cost plus basis.
G. PLEASE NOTE: At time to time and part of cleaning and sealing of concrete floor surface is a wet process and could possibly affect adjacent surfaces on or around the immediate area or even the floor level below. Applicators will endeavour to tape and protect areas adjoining their work areas in a diligent manner best of their abilities, however in no case will be held liable for any damage that may occur due to lack of or undisclosed information from Builder / Client knowing the extent of this work to be undertaken.
H. Areas to be treated, honed, polished, and sealed to be free of building materials and other trades due to possible safety and floor contamination issues.
I. The areas to receive treatment shall be delivered to the applicator in swept clean condition. All equipment and supplies to be removed before turning the area over to the applicator. If the applicator or crew members are required to clean the area, and / or move other's supplies, materials, and equipment, it will be done at time per man cost plus basis.
J. PROTECTION OF THE FINISDHED FLOOR IS THE RESPONSIBILTY OF THE BUILDER/ CLIENT.

3.6 PROTECTION

A. Protect finished work until all materials applied to densify seal or protect the work in accordance with the manufacture's recommendations.
B. Protect finished areas for 7 days from excessive free-standing water.
C. Cover with breathable material. If plastic is to be used do not cover finished floor for a minimum of 7 days after completion, products applied are still curing and covering early with plastic may cause discolouration through sweating.
D. Ply and Geotech fabric or ram board are good alternatives and safer then traversing over plastic covering.

3.7 FINAL CLEAN

Apply polished concrete cleaner C2 Clean and/or C2 Maintenance applied by auto scrubber. Machine buff with white nylon pads as required when areas or building is ready for hand over.

(FINAL CLEAN is optional and is to be excluded/ included)

Concrete installation

1. The surface should be power floated. (To achieve a surface as pore-free and level as possible, thorough power floating is required).
2. The surface should be heavily trowelled to obtain as smooth, dense, and a hard surface. - Burnished to black
3. The floor surface needs to be flat. If the surface is not flat polishing without aggregate exposure may not be possible. You want a floor greater than FF 70.
4. the concrete surface should be water hardened under plastic sheeting for 5-10 days after casting, before it is time to start grinding and polishing.
5. The surface needs to be free of water and not waterlogged when it becomes time for polishing.

The Process

1. Preparatory grind the concrete with 200grit Fenix (or similar) to remove minor surface blemishes and debris (aggregates must not be revealed).
2. Apply a saturated application of a Lithium silicate, (C2 hard, C2 hard blend or C2 superhard) by airless spray/ pump spray, even out with a microfibre flat mop. Do not allow pooling on the floor and continue until floor has reached maximum densification.
    a. Once the silicate treatment has dried, a second coat may be required **if** the concrete is still absorbent.
3. We then remove excess cured / dry silicate with Fenix 100 grit resin bonded diamond tools by honing with the grinder.
    a. 2 thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 0.
    b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
4. Continue the honing process with Fenix 200 grit resin bonded diamond floor polishing pads.
    a. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 1.
    b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
5. Commencing Fenix 400 grit resin bonded stage is what we categorize as polish step1.
    a. An increase in light reflectivity has developed at this stage. This low gloss satin level is the minimum recommended finish point to achieve a long-lasting floor with good light reflection.
    b. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a satin gloss level 2.
    c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
6. Commencing Fenix 800 grit resin bonded stage is what we categorize as polish step2.
    a. An increase in light reflectivity has developed at this stage providing a medium gloss level gloss level 3
    b. A thin coat of C2 Ultraseal or C2 Protect can be applied with a microfibre.

applicator and low pressure spryer if trying to achieve a medium gloss level 3
   c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
7. Commencing 1500-3500 grit resin bonded stage is what we categorize as polish step 3 & 4 and is the final step.
   a. An increase in light reflectivity has developed at this stage providing a high gloss level gloss level 4.
   b. Some floors can achieve this finish using only 1500 grit diamonds whereas others require furth polishing up to 3500 grit.
   c. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   d. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
8. Two sealers can be used for sealing the floor C2 Ultraseal and C2 protector.
   a. C2 Ultraseal is best for high gloss floors however this sealer is not suited to floors which require high non-slip factors as this sealer can affect non-slip ratings and it is important to test prior to installing.
   b. C2 protector is a water, oil and stain repellent. This sealer does not add any further gloss to the finish and is designed for all types of gloss level. This sealer does not affect the non-slip rating once applied. This sealer has excellent resistance to acid attack and can be used in addition to C2 Ultraseal to help protect the polished surface further.

Protection of Honed/Polished Concrete Floor.

Following completion of final polishing and sealing, the surface must be covered to protect it from other trades as is done with other high quality floor finishes.

Cover with breathable material. If plastic is to be used do not cover finished floor for a minimum of 7 days after completion, products applied are still curing and covering early with plastic may cause discolouration through sweating.

Ply and Geotech fabric or ram board are good alternatives and safer then traversing over plastic covering.

Concrete installation

1. The surface should be power floated. (To achieve a surface as pore-free and level as possible, thorough power floating is required).
2. The surface should be heavily trowelled to obtain as smooth, dense, and a hard surface. - Burnished to black
3. The floor surface needs to be flat. If the surface is not flat polishing without aggregate exposure may not be possible. You want a floor greater than FF 70.
4. the concrete surface should be water hardened under plastic sheeting for 5-10 days after casting, before it is time to start grinding and polishing.
5. The surface needs to be free of water and not waterlogged when it becomes time for polishing.

The Process

1. Preparatory grind the concrete with 50grit transitional (or similar) to remove minor surface blemishes and debris (small fines and small aggregate maybe partially exposed).
2. Apply a saturated application of a Lithium silicate, (C2 hard, C2 hard blend or C2 superhard) by airless spray/ pump spray, even out with a microfibre flat mop. Do not allow pooling on the floor and continue until floor has reached maximum densification.
    a. Once the silicate treatment has dried, a second coat may be required **if** the concrete is still absorbent.
3. We then remove excess cured / dry silicate with Fenix 100 grit or NATO 100grit resin bonded diamond tools by honing with the grinder.
    a. 2 thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 0.
    b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
4. Continue the honing process with Fenix 200 or NATO 200 grit resin bonded diamond floor polishing pads.
    a. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 1
    b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
5. Commencing Fenix 400 grit or NATO 400 grit resin bonded stage is what we categorize as polish step1.
    a. An increase in light reflectivity has developed at this stage. This low gloss satin level is the minimum recommended finish point to achieve a long-lasting floor with good light reflection.
    b. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a satin gloss level 2
    c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
6. Commencing Fenix 800 grit or Vharr 800 grit resin bonded stage is what we categorize as polish step2.
    a. An increase in light reflectivity has developed at this stage providing a medium gloss level gloss level 3

   b. A thin coat of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
7. Commencing 1500-3500 grit resin bonded stage is what we categorize as polish step 3 & 4 and is the final step.
   a. An increase in light reflectivity has developed at this stage providing a high gloss level gloss level 4.
   b. Some floors can achieve this finish using only 1500 grit diamonds whereas others require furth polishing up to 3500 grit.
   c. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   d. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
8. Two sealers can be used for sealing the floor C2 Ultraseal and C2 protector.
   a. C2 Ultraseal is best for high gloss floors however this sealer is not suited to floors which require high non-slip factors as this sealer can affect non-slip ratings and it is important to test prior to installing.
   b. C2 protector is a water, oil and stain repellent. This sealer does not add any further gloss to the finish and is designed for all types of gloss level. This sealer does not affect the non-slip rating once applied. This sealer has excellent resistance to acid attack and can be used in addition to C2 Ultraseal to help protect the polished surface further.

Protection of Honed/Polished Concrete Floor.

Following completion of final polishing and sealing, the surface must be covered to protect it from other trades as is done with other high quality floor finishes.

Cover with breathable material. If plastic is to be used do not cover finished floor for a minimum of 7 days after completion, products applied are still curing and covering early with plastic may cause discolouration through sweating.

Ply and Geotech fabric or ram board are good alternatives and safer then traversing over plastic covering.

It is critical that the concrete slab is protected prior to works commencing and after works have been completed. Any staining present in the concrete at the time of polishing may not be able to be removed.

Concrete installation

1. The surface should be power floated. (To achieve a surface as pore-free and level as possible, thorough power floating is required).
2. The surface should be trowelled to obtain as smooth and flat surface. Do not over trowel this type of floor like a class A & B floor, this will create a thick hard crust and create additional grinding works.
3. The floor surface needs to be flat. If the surface is not flat there will be significant aggregate exposure to achieve a flat floor. The floor needs to be greater than a FF 25 finish.
4. Ideally the class B finish has 80%-90% large aggregate with 10%-20% cement fines and fine aggregate.
5. the concrete surface should be water hardened under plastic sheeting for 5-10 days after casting, before it is time to start grinding and polishing.
6. The surface needs to be free of water and not waterlogged when it becomes time for polishing.
7. All boot holes must be filled with fresh concrete and not just filled in with slurry as this will leave footprints in the surface which cannot be ground out.
8. The screed should also never rest or be excessively pushed into the surface as this will also cause the aggregate to be pushed down and this cannot be fixed later.

The Process

1. Preparatory grind the concrete with #25-#35 grit metal bonded diamonds to achieve a flat even surface. The spread of aggregate exposure 100% depends on the installation of the concrete. Continue grinding until all the surface paste has been removed in the low spots.
2. Second pass grind with #50-#60 grit metal bonded diamonds to remove step 1 scratches.
    a. Floor can be densified and sealed at this step if trying to achieve an exterior finish with a non-slip rating of P5 or above.
3. Vacuum floor to remove all traces of debris, especially from hairline cracks and airholes.
4. Grouting step: Saturate the floor with water and whilst still moist apply C2pin fix to the surface of the concrete. Work in small square sections to ensure the pin fix does not fry out. Mechanically grind the grout into the floor using #100-#180 grit metal bond diamonds (depending on the floor quality grouting maybe achieved with #100-#120 grit diamonds or #140-#180 diamonds). Continue grinding until grout fully dry and no smears appear.
5. Use #50 grit transitional diamonds to clean surface and remove any remaining grout.
6. Vacuum floor to remove any grit or dust.
7. Apply a saturated application of a Lithium silicate, (C2 hard, C2 hard blend or C2 superhard) by airless spray/ pump spray, even out with a microfibre flat mop. Do not allow pooling on the floor and continue until floor has reached maximum densification.
    a. Once the silicate treatment has dried, a second coat may be required if the concrete is still absorbent.
8. Then remove excess cured / dry silicate with NATO 100grit resin bonded diamond tools by honing with the grinder (if densifier has been left to cure overnight, you may need to use #50grit NATO diamonds to remove the excess densifier).
    a. 2 thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 0.

   b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
9. Continue the honing process with NATO 200 grit resin bonded diamond floor polishing pads.
   a. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 1
   b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
10. Commencing NATO 400 grit resin bonded stage is what we categorize as polish step1.
   a. An increase in light reflectivity has developed at this stage. This low gloss satin level is the minimum recommended finish point to achieve a long-lasting floor with good light reflection.
   b. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a satin gloss level 2
   c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
11. Commencing Vharr 800 grit resin bonded stage is what we categorize as polish step2.
   a. An increase in light reflectivity has developed at this stage providing a medium gloss level gloss level 3
   b. A thin coat of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
12. Commencing Vharr 1500-3500 grit resin bonded stage is what we categorize as polish step 3 & 4 and is the final step.
   a. An increase in light reflectivity has developed at this stage providing a high gloss level gloss level 4.
   b. Some floors can achieve this finish using only 1500 grit diamonds whereas others require furth polishing up to 3500 grit.
   c. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   d. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
13. Two sealers can be used for sealing the floor C2 Ultraseal and C2 protector.
   a. C2 Ultraseal is best for high gloss floors however this sealer is not suited to floors which require high non-slip factors as this sealer can affect non-slip ratings and it is important to test prior to installing.
   b. C2 protector is a water, oil and stain repellent. This sealer does not add any further gloss to the finish and is designed for all types of gloss level. This sealer does not affect the non-slip rating once applied. This sealer has excellent resistance to acid attack and can be used in addition to C2 Ultraseal to help protect the polished surface further.

Protection of Honed/Polished Concrete Floor.

Following completion of final polishing and sealing, the surface must be covered to protect it from other trades as is done with other high quality floor finishes.

Cover with breathable material. If plastic is to be used do not cover finished floor for a minimum of 7 days after completion, products applied are still curing and covering early with plastic may cause discolouration through sweating.

Ply and Geotech fabric or ram board are good alternatives and safer then traversing over plastic covering.

Concrete installation

1. The surface should be power floated. (To achieve a surface as pore-free and level as possible, thorough power floating is required).
2. The surface should be trowelled to obtain as smooth and flat surface. Do not over trowel this type of floor like a class A & B floor, this will create a thick hard crust and create additional grinding works.
3. The floor surface needs to be flat. If the surface is not flat there will be significant aggregate exposure to achieve a flat floor. The floor needs to be greater than a FF 25 finish.
4. Ideally the class C finish has 80 – 90 % Coarse Aggregate and 10 – 20 % Blend of Cement Fines and Fine Aggregate
5. The concrete surface should be water hardened under plastic sheeting for 5-10 days after casting, before it is time to start grinding and polishing.
6. The surface needs to be free of water and not waterlogged when it becomes time for polishing.
7. All boot holes must be filled with fresh concrete and not just filled in with slurry as this will leave footprints in the surface which cannot be ground out.
8. The screed should also never rest or be excessively pushed into the surface as this will also cause the aggregate to be pushed down and this cannot be fixed later.

The Process

1. Preparatory grind the concrete with #25-#35 grit metal bonded diamonds to achieve a flat even surface. The spread of aggregate exposure 100% depends on the installation of the concrete. Continue grinding until even exposure of aggregate and floor is flat.
2. Second pass grind with #50-#60 grit metal bonded diamonds to remove step 1 scratches.
    a. Floor can be densified and sealed at this step if trying to achieve an exterior finish with a non-slip rating of P5 or above.
3. Vacuum floor to remove all traces of debris, especially from hairline cracks and airholes.
4. Grouting step: Saturate the floor with water and whilst still moist apply C2pin fix to the surface of the concrete. Work in small square sections to ensure the pin fix does not fry out. Mechanically grind the grout into the floor using #100-#180 grit metal bond diamonds (depending on the floor quality grouting maybe achieved with #100-#120 grit diamonds or #140-#180 diamonds). Continue grinding until grout fully dry and no smears appear.
5. Use #50 grit transitional diamonds to clean surface and remove any remaining grout.
6. Vacuum floor to remove any grit or dust.
7. Apply a saturated application of a Lithium silicate, (C2 hard, C2 hard blend or C2 superhard) by airless spray/ pump spray, even out with a microfibre flat mop. Do not allow pooling on the floor and continue until floor has reached maximum densification.
    a. Once the silicate treatment has dried, a second coat may be required if the concrete is still absorbent.
8. Then remove excess cured / dry silicate with NATO 100grit resin bonded diamond tools by honing with the grinder (if densifier has been left to cure overnight, you may need to use #50grit NATO diamonds to remove the excess densifier).
    a. 2 thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level

0.
   b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
9. Continue the honing process with NATO 200 grit resin bonded diamond floor polishing pads.
   a. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a low sheen gloss level 1
   b. Buff floor with a red and white pad using a polivac to remove any excess sealer after each coat.
10. Commencing NATO 400 grit resin bonded stage is what we categorize as polish step1.
   a. An increase in light reflectivity has developed at this stage. This low gloss satin level is the minimum recommended finish point to achieve a long-lasting floor with good light reflection.
   b. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a satin gloss level 2
   c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
11. Commencing Vharr 800 grit resin bonded stage is what we categorize as polish step2.
   a. An increase in light reflectivity has developed at this stage providing a medium gloss level gloss level 3
   b. A thin coat of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   c. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
12. Commencing Vharr 1500-3500 grit resin bonded stage is what we categorize as polish step 3 & 4 and is the final step.
   a. An increase in light reflectivity has developed at this stage providing a high gloss level gloss level 4.
   b. Some floors can achieve this finish using only 1500 grit diamonds whereas others require furth polishing up to 3500 grit.
   c. Two thin coats of C2 Ultraseal or C2 Protect can be applied with a microfibre applicator and low pressure spryer if trying to achieve a medium gloss level 3
   d. Buff floor with a red and white pad using a high speed burnisher to remove any excess sealer after each coat.
13. Two sealers can be used for sealing the floor C2 Ultraseal and C2 protector.
   a. C2 Ultraseal is best for high gloss floors however this sealer is not suited to floors which require high non-slip factors as this sealer can affect non-slip ratings and it is important to test prior to installing.
   b. C2 protector is a water, oil and stain repellent. This sealer does not add any further gloss to the finish and is designed for all types of gloss level. This sealer does not affect the non-slip rating once applied. This sealer has excellent resistance to acid attack and can be used in addition to C2 Ultraseal to help protect the polished surface further.

Protection of Honed/Polished Concrete Floor.

Following completion of final polishing and sealing, the surface must be covered to protect it from other trades as is done with other high quality floor finishes.

Cover with breathable material. If plastic is to be used do not cover finished floor for a minimum of 7 days after completion, products applied are still curing and covering early with plastic may cause discolouration through sweating.

Ply and Geotech fabric or ram board are good alternatives and safer then traversing over plastic covering.

Level of Gloss, the term "level" is relative to the gloss attained after polishing is completed. Level indicates the gloss on the uncoated polished surface. Using a specific grit does not guarantee achieving the desired level of gloss; grit is only a descriptor of the tooling commonly used to attain that gloss. The grit numbers cited in the following level descriptions are only a general guide to the grit required to achieve the gloss of that level. Porous or weak concrete, carbonated concrete or concrete with soft, porous aggregate may never be able to achieve high gloss values with simple polishing. Similarly, very hard concrete and aggregate may achieve a higher gloss level using lower grits of diamonds.

Level 0: Low to no gloss. This has a flat matte appearance and is typically achieved using less than #200 grit

Level 1: Low gloss, satin appearance. This is typically achieved using less than

#400 grit Level 2: Medium gloss. This is achieve typically using #400-#800 grit

Level 3: High gloss, this clearly reflections objects with a sharp mirror finish. Typically achieved with #1500-#3500 grit

END OF SPECIFICATION

Specification Guide *DPC 2021* Created by Jessica Ausburn

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