

POLISHING CONCRETE



With
SATELLITE
DIAMOND
GRINDER/POLISHERS

POLISHING CONCRETE



- The following is a guide to the normal procedure involved in producing true Polished Concrete.
- True polished Concrete is extremely durable and requires little maintenance and has its own unique character and beauty.
- This is very different to Clear Coated Concrete floor surfaces where a coating such as clear epoxy or polyurethane is used to paint the surface and provide the 'polish' or 'sheen'.
- This coated system will require re-painting from time to time, and can mark or scratch.

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Firstly; an important word – no two slabs are the same, therefore it is impossible to accurately predict:

- ❖ How much topping you will need to grind off to expose the aggregate
- ❖ How hard the concrete surface will be to grind
- ❖ What the stone or aggregate effect will look like – or even if there will be areas where there is no stone showing at all – every floor will be unique and that is what makes polished concrete interesting.
- ❖ How readily the surface will take on the required sheen or polish, (or Stain, if you decide to give the floor a different colour effect)
- ❖ Fashions change. A 'salt and pepper' effect can be more interesting and desirable than a full exposed aggregate look, which can look very 'busy', for example. It is personal preference.

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Important word:

HOWEVER:

- One thing is for certain; no machine or operator can move the stone around in the slab to be “just how you want it”.
- Secondly: What you see, is what you get. It is not a failure on the part of the guy polishing your slab if it doesn't come out looking the same as you have seen on another slab.
- In fact the floor may look entirely different to what you saw on another slab, even the relative colour may be different.
- Stone comes from a quarry and there will be differences in the stone from a quarry today, compared to 6 months ago.

FACT: The great thing is that your slab will be unique; there won't be another slab anywhere in the world like yours!

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FIRST CUT GRIND

The 'FIRST CUT' is the grinding of the top surface layer to get down to the level of aggregate exposure required. The 'first cut' is actually several passes.

TIP:



Using a long (2-3m) straight edge, identify high areas and grind and remove these high areas first to achieve the best final result. Using chalk can be a great way to mark areas to grind down first.

The 'FIRST CUT' is done by using 'coarse' diamond tooling to maximize the rate of concrete removal, i.e. 30, 25 or 16mesh.

Note: Very coarse diamond doesn't necessarily mean fastest grinding speed; it can mean more work later to remove deep scratches.

With more grains of diamond scratching the surface, often you complete the First Cut sooner with 30# Diamond tooling.

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1st CUT INSTRUCTIONS

Use discs with 6 or more segments: This will make floors flatter than discs with just 3 segments.

If you can, grind when the concrete is 'Green'. The rate of removal will be faster. CAUTION: Do a test patch before you grind too much to ensure that the concrete is not so 'Green' that it is pulling stone out of the concrete.

- Always do the 1st cut grind in several passes. (Never grind down to the stone, square metre, by square metre! It will make the floor uneven.)
- Ensure that each pass with Satellite Generation 3, or Satellite "SP" Planetary is at a constant speed lapping at least half of the machine width each pass. (If using an old technology planetary driven disc machine it is best if you overlap 2/3rds of the machine width with every pass.)
- Grinding down to aggregate involves removing a lot of concrete; usually 2-3mm is removed, sometimes more.
- As a guide, if 3mm is removed, this should be done in at least 4 to 6 passes. *The more passes, the flatter the floor.*

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1st CUT INSTRUCTIONS (cont'd)

- Each pass is done at 90° to the previous pass; doing some passes at 45 degrees, also is a good idea.
- Multiple passes while moving at a constant speed is important to ensure that the grinder will level out high spots with each pass. Doing many passes ensures that you don't grind some areas deeper than other areas, and *create* an 'ocean wave' effect.
- When grinding hard concrete it is beneficial to have a fair bit of dust under the machine, and ensures that some dust is left on the surface; this helps to keep the diamond segments 'OPEN'. Turn the vacuum down to achieve this.

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1st CUT INSTRUCTIONS (cont'd)

- For soft, easily-ground concrete; turn vacuum up as much as possible to suck as much dust away as possible so that you don't wear diamond discs too fast.
- Using diamond **discs** will make floors flatter than using diamond **plugs**.

Floors won't be as flat, or polish up as evenly if diamond plugs are used instead of discs; it is more difficult to get an even final polish if plugs have been used as they cannot achieve the flatness that discs will.

Note: Don't apply concrete Densifier/Hardeners until you have finished grinding the concrete down to the level you want.

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SECOND CUT GRIND

This is the step before you begin to use phenolic (resin bond) diamond polishing pads.

If you have scratches left after you have completed the second cut, it will be difficult to remove them during polishing.

The "Second Cut" is actually done with two grades of diamond disc; 80# and 150#, to ensure scratches are totally removed.

Be absolutely certain to vacuum between every stage to remove loose diamond grit from the floor before proceeding with the next stage. If you don't, diamond grit on the floor from the previous stage will create more scratches

So, to do the Second Cut Grind

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SECOND CUT GRIND

The purpose is to totally remove any score marks from the first cut grind, as the phenolic (resin bond) polishing pads are not designed to effectively remove deep score marks.

- Using a suitable Dust Extractor, vacuum the surface well.
- First, use fine **80 mesh** diamond discs, grind thoroughly to ensure the surface does not have deep scratches from the first grind. Then vacuum thoroughly.
- Then, use **150 mesh** (very fine) metal bond diamond discs to ensure a thorough removal of finer scratch marks from the 80# grind. Then vacuum thoroughly.

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OVERVIEW OF THE FULL POLISHING PROCESS

Here is an overview of the process from this point on:

1. Using a suitable Dust Extractor, vacuum the surface well now. And, ensure you vacuum between each of the following processes.
2. Next apply a Hardener/Densifier. Slide 12
3. Most floors need to be Grouted to fill porosity or bug-holes. Slide 13
4. Begin the Polishing process with 100# Resin Bond (Phenolic) diamond polishing pads. Slide 17
5. Continue the Process with 200# and 400# pads. Slides 19 - 21
6. Apply Lithium Sealer after 400#. Allow to cure 4 hours min. "
7. Continue with 800# and 1500# polishing pads. "
8. Apply Sup'r Sheen 'DS50' sealer. "
9. Buff using 1500#. Finish with 3000# if you wish. "

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HARDENING/DENSIFYING

- Apply ULTRA SURFACE Hardener/Densifier solution (USS-20) Lithium Colloidal Silicate. This product has the effect of Hardening and Densifying the surface. It is easier to polish a hardened surface than a soft surface.
- USS-20 is applied by pump-up pressure spray, sufficient to give a 'wet' look to the surface, and generally should soak into the surface, and within about eight to 15 minutes be sucked in. Don't allow USS-20 to remain wet on the surface for longer than 15 minutes.
- Apply in cool weather conditions to help with keeping a "wet edge".
- Always leave to penetrate and ingress the floor, at *least* overnight, before beginning the polishing stage. This will allow the concrete hardening/curing process to take place.
- Clean up the slab with 150# Diamond discs the next day

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GROUTING THE SURFACE

OFTEN YOU NEED TO 'GROUT' THE SURFACE IF IT IS 'OPEN', (POROUS) OR IF IT HAS 'BUG-HOLES'.

- Vacuum surface very thoroughly, then dampen the slab.
- Use a pump-up spray bottle with 1:1 ratio of Water and Super Sheen 'LX' Grout Solution (SSGS-5), spray sparingly over a small area, then run over this with the grinder straight away while wet. (Use either 150# discs or 100# polishing pads).
- You may need to sprinkle some grouting compound (or grinding dust from the last stage) over the surface, as you get further into the process you should be creating enough dust by grinding.
- Make the compound into a stiff paste until you can see that the grouting is very closed and tight. You may need to use plain water too while rubbing the paste into the surface, to just keep damp enough to do the job.
- Don't work the surface until it is dry, just grind enough until it is even.
- Be certain that you leave no surplus grout on the top of the slab as you go, as it can be difficult to grind off. The trick is to learn just how minimum powder and solution you need to do the job. Leave to cure and harden, minimum 6 hours.
- Clean up with the same tooling and inspect the surface closely.
- Bug holes over 5mm will need to hand filled.

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GROUTING THE SURFACE – Cont'd

- Once dry and hardened, (allow about 24 hours, or at least overnight), use 150# Diamond disc or 100# Resin Bond Diamond Polishing Pads to remove excess, (hopefully there is very little) and get surface to 'white concrete' before moving onto the polishing stage.
- If there is still some porosity, using the same 1:1 solution, apply sparingly to surface, and create a stiff paste before grinding off the excess slurry. This can help to close the surface a little more; this step can be necessary if the concrete is particularly porous.

NOTE: If you are only grinding lightly into the concrete topping, without exposing the aggregate, you may not need to grout at all if there is little or no porosity.



Just grouted concrete ready to start with resin bond discs when completely dry.

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NOW YOU ARE READY TO BEGIN POLISHING

Satellite grinders (in fact, most grinders!) do not have to be variable speed to successfully polish. Reducing speed with Variable speed machines is intended to reduce heat and 'burning'.

However, there are two factors that cause pads to get hot;

1. How **fast** the pads are moving over the surface. Reduce the speed, and you reduce the heat generated.
2. How much **weight** per pad. Example; Rub your hands together lightly, not much heat. Now, rub while pressing together hard. See the difference?

So! You can either:

Vary the speed of rotation, OR,

Vary the weight per pad;

To get the result we need.

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NOW YOU ARE READY TO BEGIN POLISHING

Install the 3 x 175mm Velcro Discs, (or the 480mm diameter Velcro plate)

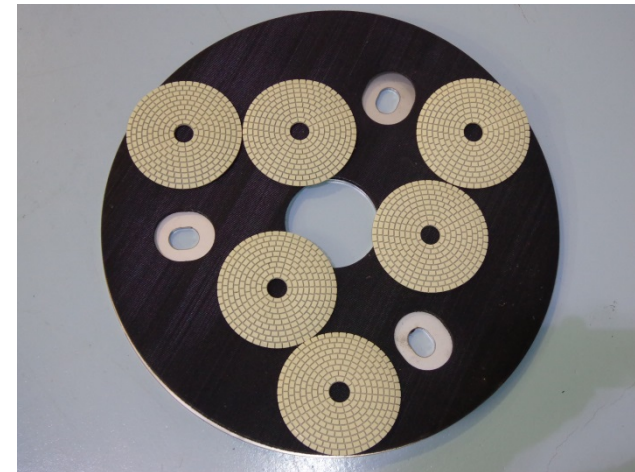
With a Satellite grinder, there are 2 methods of controlling the weight per pad.

- a. Use the machine weights. Move the weights so they counterbalance the head of the grinder to reduce weight on the diamond polishing pads.
- b. Use large area of polishing pads to spread the weight.
- c. Using our Skina Resin Bond Segments is the best polishing set-up and makes it easy to get consistent polishing. Use 3 or more to vary the pressure.

FLOOREX RECOMMENDS that *if* you are using our 480mm diameter "Velcro" plate (see the lower picture opposite), that the pads be in 3 groups of 2 125mm diameter (6 pads total), or batches of 3 x 100mm diameter pads (9 pads).



175mm Velcro Discs and Resin Pads



125mm Pads in 3 groups of 2

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POLISHING the FLOOR

1. Start by using 100# Resin Bond Diamond Polishing pads with a thorough coverage of the floor lapping each pass with half machine width.
2. Vacuum thoroughly.
3. Now use 200# pads,
4. Vacuum thoroughly again, then
5. Then use 400# pads,
6. Vacuuming between each pass.

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POLISHING the FLOOR – Hardener/Sealer

NOTE: USS-20 Lithium is preferable on any floor; but particularly recommended if the surface is porous.

1. Apply USS-20 Ultra Surface Sealer (Lithium) with a pump-up spray and spread evenly and thinly with a lambswool or microfibre pad. Allow to cure and dry for 3-5 hours at least before moving to step 2. It must be applied sparingly.
2. Polish with 800# Resin Bond pads. The floor will have quite a high level of sheen. Use low machine weight &/or low speed.
3. Now continue to 1500# resin pads and deliver a high level of sheen. Use low weight &/or low speed. Optional: If you want to, continue on to 3000# pads.
4. If a final guard is required, apply UDS50 DeepSeal solvent borne Sealer, spreading as thinly and evenly as possible with a lambswool pad, allow to dry overnight.
5. For the final polish, and to deliver the ultimate sheen on the finished product, use #3 x 175mm (or 500mm) Sup'r Sheen Buffing pads P/No. DDSS-175-4 .

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FINAL POLISHING

NO TWO CONCRETE SLABS ARE THE SAME; FOR THAT REASON THERE IS NO ONE 'RIGHT WAY', OR 'FIXED' METHOD FOR POLISHING.

SO SUCCESSFUL POLISHED CONCRETE CONTRACTORS ARE ALWAYS PREPARED TO EXPERIMENT.

HOWEVER, IF THERE IS ONE ATTRIBUTE THAT THE PROFESSIONAL NEEDS ABOVE ALL OTHER, IT IS PATIENCE. WITHOUT PATIENCE, YOU WILL FIND IT A CHALLENGE.

A final buff with 'SUPR SHEEN' buffing pads on the SATELLITE (or on a commercial polisher) will bring up the floor to its final level of sheen and is great for maintenance buffing on any polished slab in years to come.

ENJOY THE RESULT!