



Uniformity of Aggregate exposure

Aggregate exposed when grinding a slab will be random in size and location, varying with placement techniques, curling and flatness. Random exposure is beyond the control of your contractor and it is inherent and unique to the concrete. Attempts to achieve uniformity by grinding deep, where aggregates are ground below their equators can cause slab damage due to aggregate pop outs. Acceptable aggregate exposure is up to 0.5 times the diameter of the mid-size aggregate in the mixture. (ref ACI 310R-13)

New Build Concrete Design

New slabs should take into consideration of these before grinding and polishing is performed:

- Concrete mixture design
- Vapour retarders
- Jointing and joint filler material
- Aggregate selection
- F_F and F_L numbers
- Finishing practices
- Curing method
- Quality control
- Post-placement slab protection

Concrete mixture designs

When specifying a concrete mixture, consider the design for ground and polished floors to ensure the design meets all of the intended requirements for floor use. Most mixture designs are sufficient for polished concrete if they meet these basic requirements;

- Compressive strength- 32MPa or greater 28 day strength is ideal for polishing. Low strength mixtures are not good for polished finishes as the concrete will not be durable enough to hand the stresses involved. If concrete is too weak aggregate can rip and tear from the surface. Also you may not achieve the desired gloss level.
- Cement replacements - limit the use of pozzolans such as fly ash and slag cement. These materials limit the amount of $Ca(OH)_2$ available for the chemical reactions needed for densification.
- Aggregates - Smooth or tumbled aggregates have a nice look and feel but may not bond properly with the cement paste (such as river pebble). Smooth aggregates can be used provided not too much of the stone is exposed when grinding. Irregular shaped aggregates tend to interlock better in the mixture.
- Air content-air-entrained concrete should not be used for polished concrete. All concrete will also need to be well vibrated.
- Fibre- floor reinforced with synthetic or steel fibres can be polished. However When fibers are included in the mixture they can be noticeable in the floor. (ref ACI310R-13)