The logo for SKOLD companies is centered on a white background. The word "SKOLD" is in a bold, sans-serif font. The letter "S" is blue, while "K", "O", "L", and "D" are dark grey. The "O" is stylized with horizontal lines through it. Below "SKOLD" is the word "companies" in a smaller, grey, lowercase sans-serif font. The entire logo is enclosed in a light grey border that has a blue triangular shape cut out from the bottom right corner.

SKOLD
companies



door



construction



commercial



specialty

Our Companies

Companies

- Skold Construction Services: 1992
- Skold Door Company: 1994
- Skold Commercial Contracting: 1997
- Skold Specialty Contracting: 2002

Offices

- Iowa, Minnesota & Sioux Falls, SD & Rapid City, SD

Additional Service Areas:

- Nebraska, North Dakota, Western
- Illinois, Western Wisconsin,
- Montana and Wyoming



Agenda

- Definition of Polished Concrete
 - Discuss the Process, Sequence of Polishing Concrete
 - Benefits of Polished Concrete
 - Specifications – Cast in Place 03 30 00 and Polished Concrete 03 35 43
 - Challenges of Polished Concrete – Pros and Cons
 - Pitfalls
 - Polished Concrete Maintenance
-

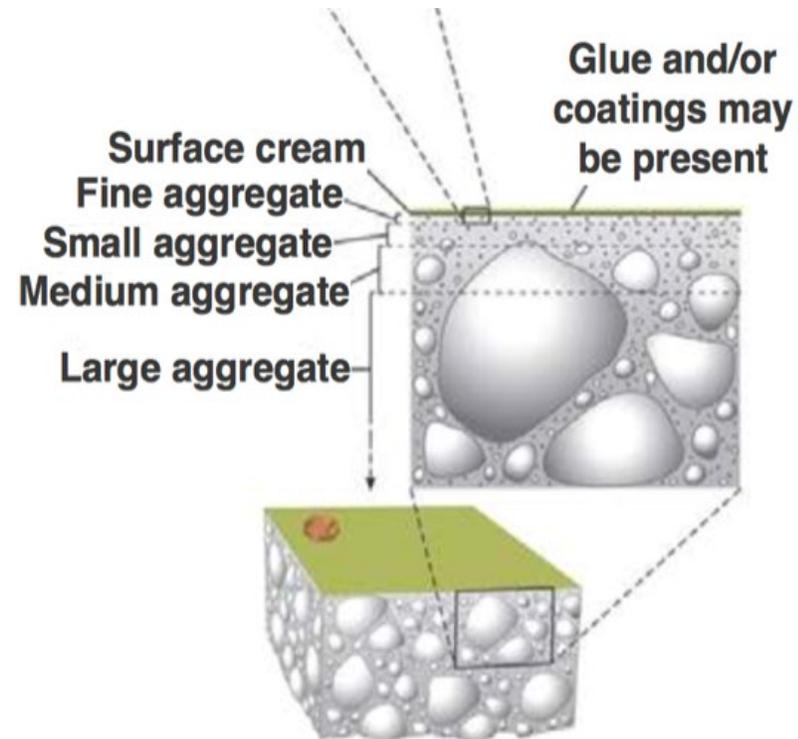
Definition of Polished Concrete

The act of [permanently changing](#) a concrete surface, with or without aggregate exposure to achieve a specified appearance level.



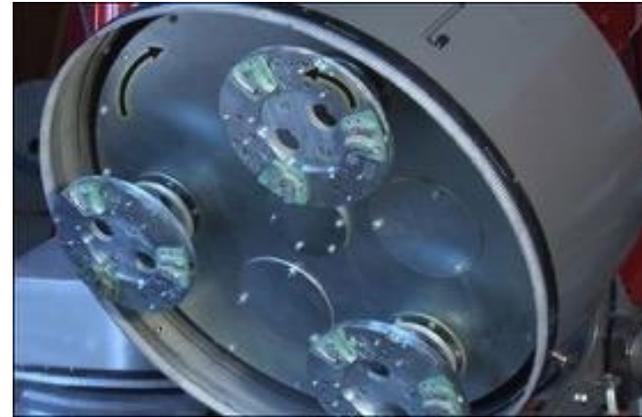
Concrete – A Microscopic View

Unprocessed Concrete

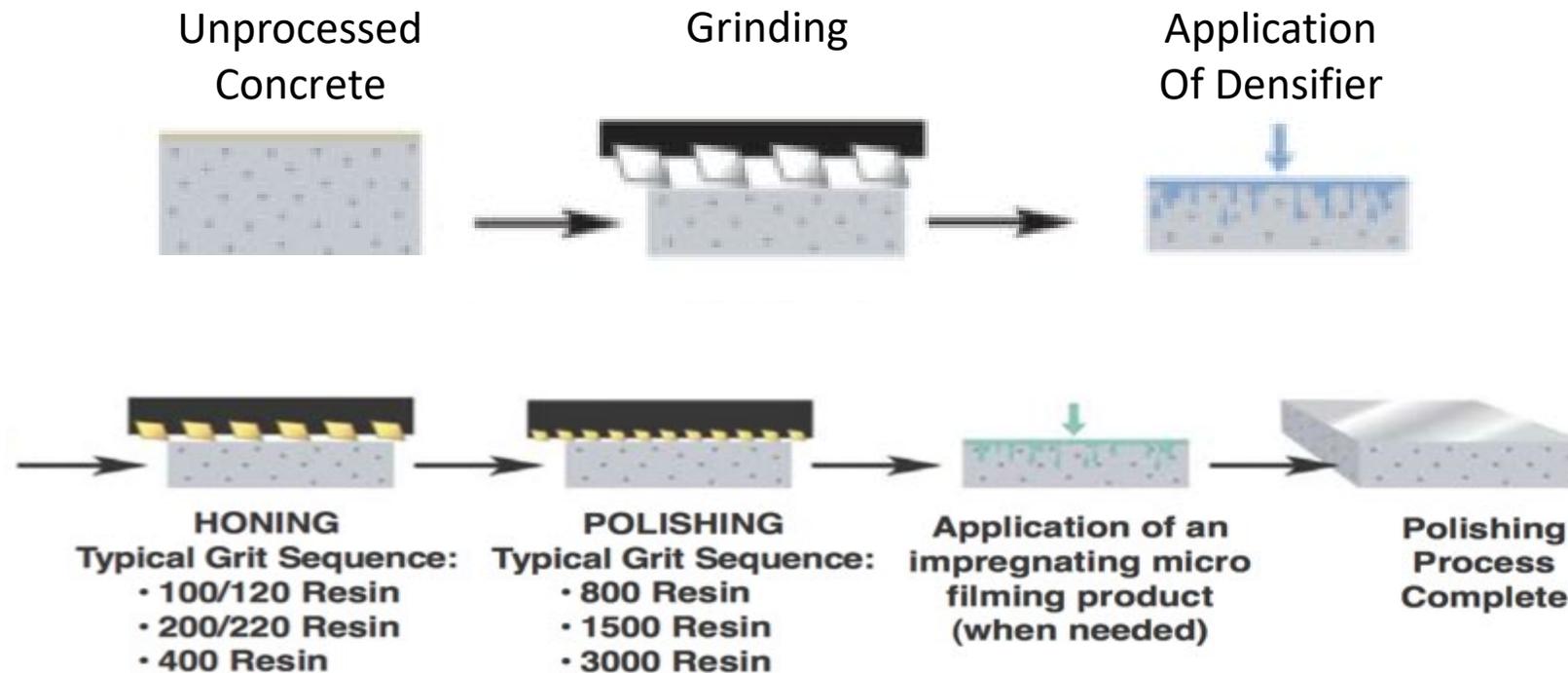


Polished Concrete Equipment and Diamond Tooling

Triple Planetary Head Grinder



Polished Concrete Process



Polished Concrete Process

Unprocessed
Concrete



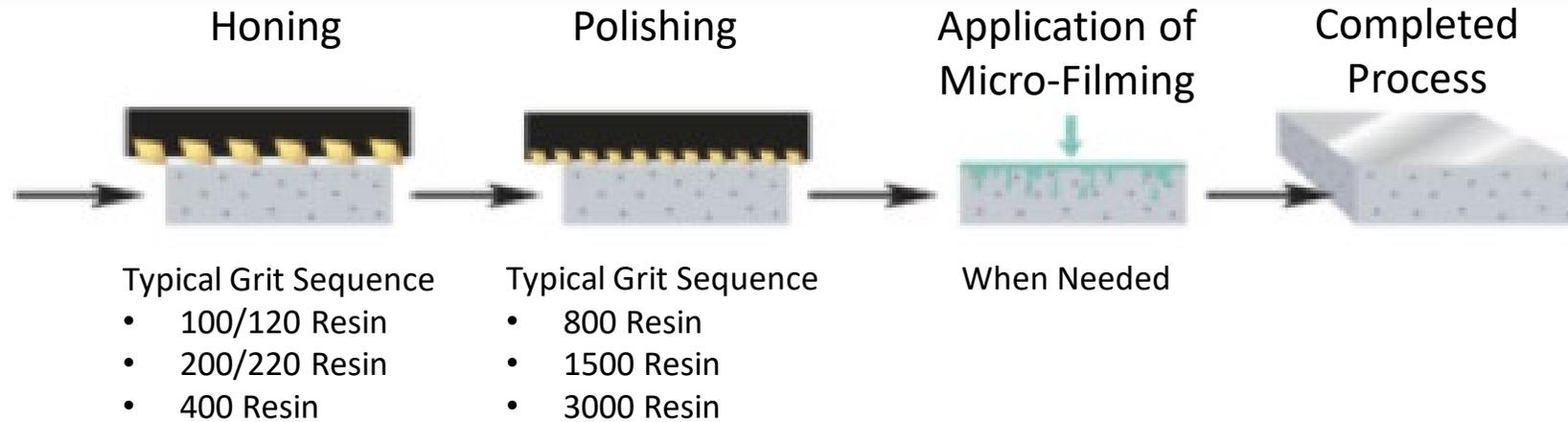
Grinding



Application
Of Densifier

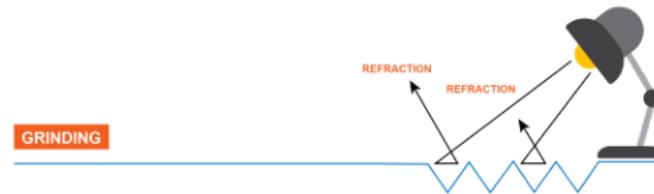


Polished Concrete Process

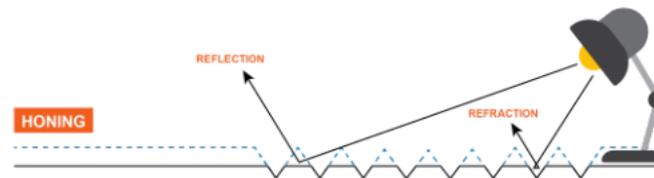


How does Concrete Shine

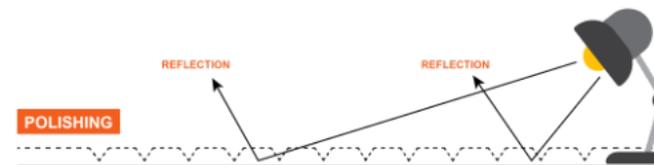
Grinding – Deeper depth scratch pattern. Includes abrasives up to 100 grit (metals, hybrids or resins)



Honing – Medium depth scratch pattern. Includes abrasives 100, 200 grit.

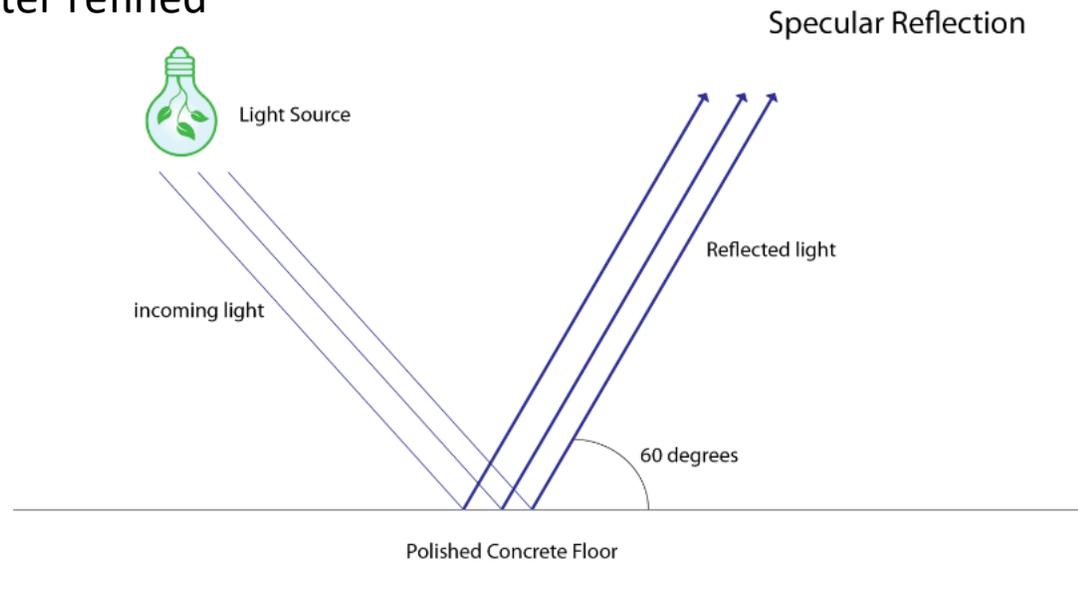


Polishing – Finer depth scratch pattern. Includes abrasives 400, 800 grit and above.



How Polished Concrete Shines

More light bounces off the concrete when the concrete is better refined





Polished Concrete Benefits

- Accommodates creative design
 - **Ease of Maintenance**
 - Retains luster and shine
 - Nearly limitless color range and design options
 - Does not show wear patterns
 - MVER – Moisture is not an issue
 - **LOW LIFE CYCLE COST**
 - Eliminates dusting from efflorescence
 - Increase abrasion resistance
 - May increase ambient lighting
 - Temperature regulating high thermal mass
 - “Green” Product / May contribute to LEED
 - VOC friendly
 - Environmentally friendly
-

Specifying The Concrete

03 30 00 – Cast-in-Place Concrete



Mix design and Finishing Suggestions

- Good Placement weather
- 3,500 psi minimum strength
- 20% maximum fly ash
- No slag cement
- Minimal admixtures
- Imported Sand or Grout
- Use pans prior to finishing blades
- Hard troweled without burn
- Combo, Plastic or Teflon blades



Floor Flatness (Ff)

- Ff specify based on the use and aesthetics of the floor required.
- Specification of Ff shall be greater than the intended use of the floor due to timing of testing.





Floor Flatness (Ff) Benefits

- Initial cut – The foundation of the polishing process, will assist in uniform aggregate exposure.
 - **Allows for 100% of the floor to be scratched by the diamonds.**
 - Uniform grinding and refining that will produce greater reflectivity and durability.
 - Floors will wear evenly, increased durability.
 - Less damage by forklift, pallet jacks, and carts
-



Cutting/Curing

- Soft cut saw
 - Joint layout is critical
 - Square pattern
 - Outside masonry corners
 - E-Cure, No Cure or Wet Cure
-

Specifying Polished Concrete



POLISHED CONCRETE AGGREGATE EXPOSURE CHART REPLACES CPAA AGGREGATE EXPOSURE CHART

CLASS	NAME	SURFACE EXPOSURE, %
A	Cement Fines	85-95% Cement Fines 5-15% Sand Aggregate
B	Sand Aggregate	85-95% Sand Aggregate 5-15% blend of Cement Fines and Coarse Aggregate
C	Coarse Aggregate	80-90% Coarse Aggregate 10-20% blend of Cement Fines and Sand Aggregate

Illustrations of Differences in Class



CPC Aggregate Exposure Categories

Class A – Cement Fines

Minimal exposure of the fine aggregate. The high F_f requirement of the initial concrete placement is critical to maintain a uniform appearance while minimizing exposure of aggregates.



CPC Aggregate Exposure Categories

Class B – Fine Aggregate (Salt & Pepper)

Class B yields a beautiful sand reveal finish, and a uniform appearance while minimizing the exposure of larger aggregates.

Typically, this level of cut can be achieved within 1.5 mm (1/16 in.) of the surface.



CPC Aggregate Exposure Categories

Class C – Coarse Aggregate

Surface paste and fine aggregate is removed with grinding revealing the coarse aggregate.

Typically, this level of exposure can be achieved within 3.2 mm (1/8-1/4 in.) of the surface.



Specifying – Appearance



CONCRETE POLISHING COUNCIL
POLISHED CONCRETE
APPEARANCE CHART
REPLACES CPAA FINISHED GLOSS CHART

LEVEL	NAME	DISTINCTNESS-OF-IMAGE (DOI) GLOSS	IMAGE CLARITY VALUE, %	HAZE INDEX
1	Flat (Ground)	Images of objects being reflected have a flat appearance.	0 – 9	<10
2	Satin (Honed)	Images of objects being reflected have a matte appearance.	10 – 39	
3	Polished	Images of objects being reflected do not have a sharp and crisp appearance but can be easily identified.	40 – 69	
4	Highly Polished	Images of objects being reflected have a sharp and crisp appearance as would be seen in a near-mirror like reflection. May require grouting.	70 – 100	

Specifying – Appearance metrics

Light Reflectivity/ Shine and Clarity: DOI and Haze

1500

800

400



CPC Appearance Categories

Appearance Level 1 – Flat Ground

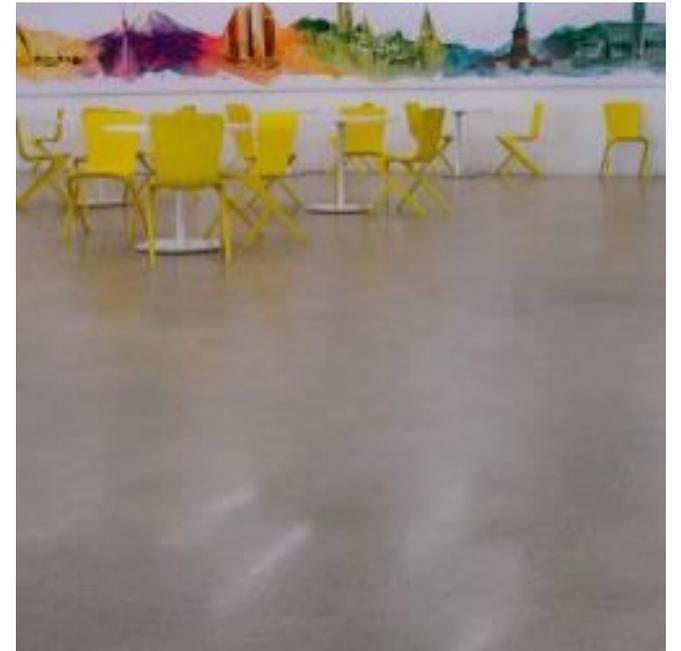
- Images of objects being reflected have a flat appearance.



CPC Appearance Categories

Appearance Level 2 – Satin (Honed)

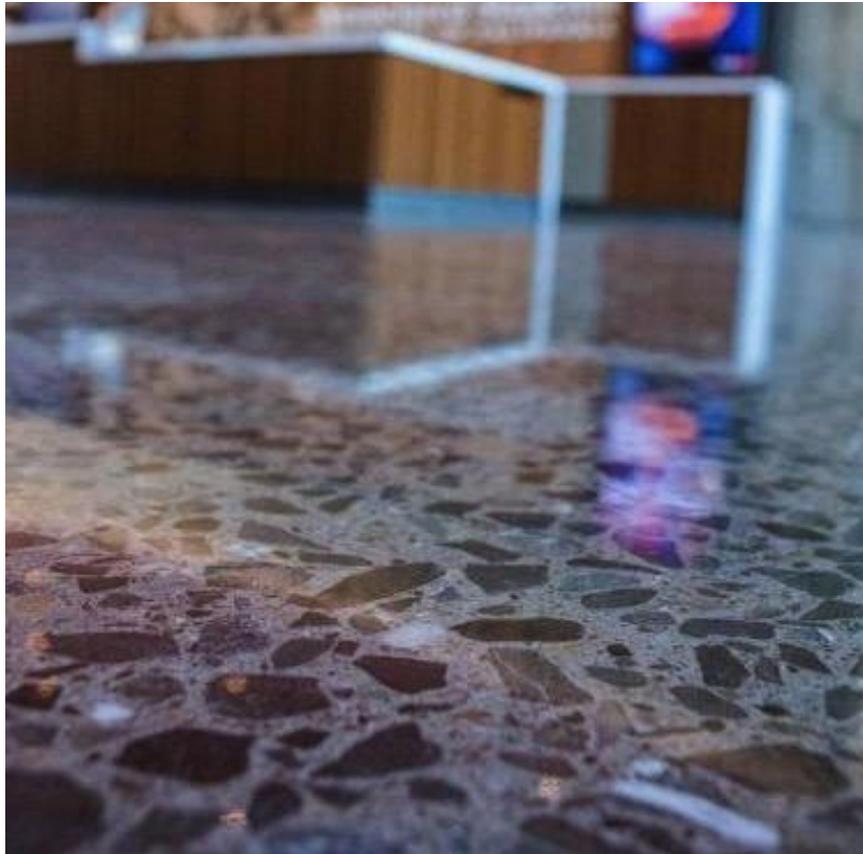
- Images of objects being reflected have a matte appearance.



CPC Appearance Categories

Appearance Level 3 - Polished

- Images of objects being reflected do not have a sharp or crisp appearance but can be easily identified.



CPC Appearance Categories

Appearance Level 4 - Highly Polished

- Images of objects being reflected have a sharp and crisp appearance as would be seen in a near-mirror like reflection. May require grouting.





Polished Concrete Challenges

- Unrealistic Expectations
 - Mockups are critical
 - No sole responsibility
 - Concrete Sub / Polishing Sub and General
 - Slab protection before & after
 - Schedule Challenges
 - Character of concrete comes out with polishing
 - Cracks are free & a patch is a patch
 - Unqualified contractors
-





Coloring – Designs - Aggregates

- Dyes
 - Acetone or Colorsolve based most common
 - Water based are also available
 - Not UV stable
 - Vibrant colors
 - Integral Colored Concrete
 - Not as vibrant of coloring
 - Color evenly through slab
 - Colored aggregate
-



1953

CHANGING THE FIELD

JOHN DEERE

JOHN DEERE FACTORY

JOHN DEERE

JOHN DEERE 4550

JOHN DEERE'S 2-CYLINDER DILEMMA:
How do you balance power and efficiency?

INDUSTRIAL DESIGN RESHAPES AN ERA:
How do you balance form and function?

WORLD WAR II IMPACTS WORKFORCE:
How do you balance production and innovation?

FOR THE CENTURY OF TECHNOLOGY

JOHN DEERE









Pitfalls – Qualified Polishers

- List the approved contractors in specification
 - Credentials past projects should be reviewed prior to adding them to the specification
 - Workmanship of field crews is key to success
-



Pitfalls – Protection

- Good Superintendent
 - Keep floor clean - Daily
 - Concrete is finished floor
 - Every progress meeting
 - Tyvek and Masonite
 - No food or liquid
 - No screws in lift tires
 - No pipe cutters / wire pulling / leaky lifts
-



Polished Concrete Maintenance

- Minimal maintenance
 - Some auto-scrub daily, special cleaners are recommended
 - High speed burnisher with diamond pad, bi-monthly
 - Concrete Enhancers or Stain Resistors-recommended
 - Reapply as needed – 6 – 24 months
 - Dust mop will generally clean most areas
 - Clean up spills and liquids quickly – Stain Slayer!
 - Important to incorporate floor coverings in entrance areas... capture sand / salt
-



Thank
You!