SURFACE SOLUTIONS

TYPE IL WHITE PAPER · FOR FLOORING CONTRACTORS

Type IL Cement: What Flooring Contractors Need to Know Before They Bid and Install

By Jack Aspenson, S3 Surface Solutions · October 2026 · Updated November 16, 2026

You are the last trade on the slab and the first one called when the floor fails, often a year or more after you leave. Type IL cement changed the slab under you, and the decisions that set the risk were made at the pour, by trades you never met. This paper covers what to ask before you bid, how to qualify the bid, what to test, how to prep, and when to say no.

The short version:

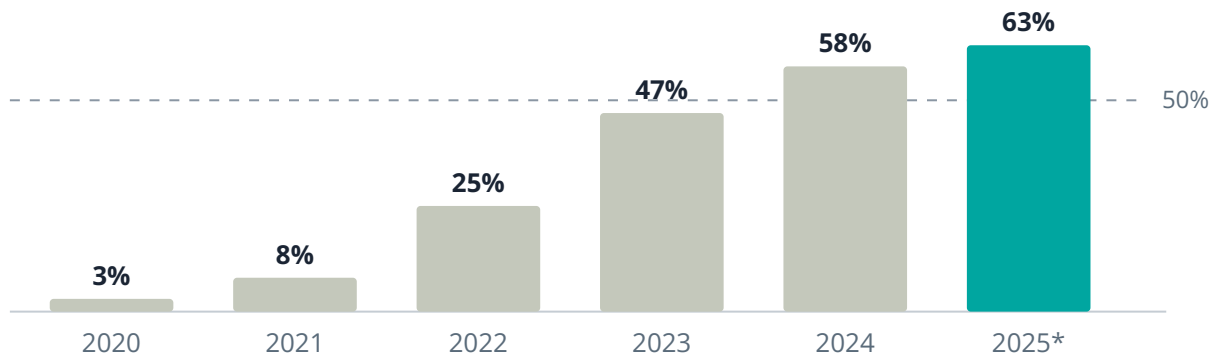
- Get the mill certificate, cure product and finish method before you price the job.
- Qualify the bid: the slab must meet the adhesive manufacturer's RH and pH limits, and mitigation and film removal are extra.
- Test RH, surface pH, hardness and absorption, document everything, and don't install over a slab that fails.

1. What changed in the cement

Type IL (portland-limestone cement, ASTM C595) replaces 5–15% of the clinker with raw limestone, ground finer than the cement around it. ASTM added it in 2012, and by June 2023 it outsold ordinary portland. It meets the same strength, set and soundness requirements as Type I/II (ASTM C150), and all 50 states and the District of Columbia approve it for DOT work. What the cement spec never evaluated is how the top few millimeters behave under a flooring adhesive, and most adhesive data sheets were still written for C150 concrete.

Blended cement went from 3% to 63% of U.S. shipments in five years

Share of U.S. cement shipments that is blended cement; about 95% of it is Type IL



2020: 3% · 2021: 8% · 2022: 25% · 2023: 47% · 2024: 58% · 2025*: 63%

* 2025 = January to September. Type IL passed ordinary portland in monthly shipments in June 2023.
Sources: USGS Mineral Commodity Summaries 2025 and 2026; PCA/ACA shipment data · 2020–2025

Research from the ACI Foundation (April 2026) found Type IL performs comparably to Type I/II **when it is properly finished and cured**. The rest of this paper is about meeting that condition.

2. What your crews will see on pour day

Type IL gives the finisher less margin. Expect these tendencies, not guarantees:

- **Bleed water:** less of it, and the sheen is hard to see. Don't wait for the old cue; the finishing window opens earlier.
- **Set time:** slower in cold (slag slows it further), faster in heat. Get set-time data and mock up in pour-season weather.
- **Surface:** crusts on top while still plastic below. Protect it from strike-off on, and never trowel a crust.
- **Wind and heat:** the top dries with little bleed water to replace it. Have retarder and windbreaks ready before the pour.
- **Drying and pH:** the slab holds water longer, and surface pH stays high longer because a wet surface can't carbonate. Test; don't use Type I/II dry-down schedules.

> **Field evidence:** in a 2024 ACI-ASCC survey of 173 contractors, 77% saw higher water demand and 43% more plastic-shrinkage cracking. In 2023 mockups, six of seven Type IL slabs crusted or tore at evaporation rates as low as 0.03–0.09 lb/ft^2/h. In ASCC side-by-side mockups, water-based adhesives bonded weaker over Type IL than over Type I/II.

3. Why it matters at the floor

A Type IL slab can look ready to bond before it is. Fresh portland concrete is placed at pH 12.5–13.5. In S3's field testing, Type IL slabs have held high surface pH for up to 24 months after the pour:

1. Fine limestone packs the paste, so the top few millimeters densify and dry slowly.
2. Wet pores keep out the CO_2 that would normally carbonate and neutralize the surface.
3. High surface pH persists, and returns after the surface is sealed and re-wetted.
4. Low-VOC, water-based adhesives tolerate less alkalinity than the solvent products they replaced, so the bond fails, often a year or more after installation.

A hard-troweled or burnished finish, a densifier, or a film-forming cure closes those same pores further. That is why finishing and curing decide the outcome more than the mix does.

Moisture tests can miss it. ASTM F2170 (RH) and F1869 (MVER) measure moisture, not how long surface alkalinity persists, and their usual limits were set on Type I/II concrete. In the ASCC mockups, Type IL passed moisture tests nearly as well as Type I/II and still bonded weaker. Test surface pH, hardness and absorption too.

4. Before you bid: get the slab's history

Ask the GC for these in writing. Each one changes what the slab will need.

- **Cement type:** the mill certificate, C150 or C595/Type IL.
- **Mix:** w/cm, SCM type and percentage, and coarse aggregate source.
- **Finish:** hard-troweled or burnished? Densifier or hardener applied?
- **Cure:** product name and data sheet. Does it leave a film, and will it be removed?
- **Vapor retarder:** is there one, and is it directly under the slab?
- **Schedule:** pour date, and when permanent HVAC will run.

If the GC can't answer, price the risk (testing, prep and possible mitigation) or exclude it in writing.

5. Qualify your bid

Sample qualifications. Have your own attorney review them before use.

- "Bid assumes the slab meets the adhesive manufacturer's published RH, MVER and pH limits at the time of installation."
- "Moisture or pH mitigation; removal of curing compounds, sealers or densifiers; and grinding of dusty or delaminated surfaces are excluded unless listed."
- "Substrate testing per ASTM F2170 and F710 will be performed after HVAC has run at service conditions for 48 hours. Installation proceeds only on acceptable results."
- "Delays caused by slab conditions are excluded from the flooring schedule."

Many specifications state that starting installation means accepting the substrate. Test before you start, not after.

6. Test and document before you install

- Run HVAC at service conditions for 48 hours.
- Test RH per ASTM F2170: 3 tests in the first 1,000 sf, plus 1 per additional 1,000 sf.
- Map surface pH (F710) at the same density; spot checks miss the variation Type IL slabs show.
- Check hardness (Mohs 5 or above), absorption (F3191 water drop) and a rub test for dusting; chain drag for hollow spots.
- Record dates, ambient conditions, test locations and photos, and send the results to the GC in writing before you install.
- Judge every reading against the adhesive manufacturer's limits, not a generic 75% RH.

7. Prep and system selection

- **Open the surface:** remove curing films, sealers and densifier residue mechanically, to the profile the adhesive manufacturer requires.
- **Get to sound concrete:** grind dusty or delaminated areas and repair cracks before priming.
- **Match the adhesive to the slab:** choose one whose pH limit is above the measured surface pH, not just its RH limit.
- **Readings over limits:** use a moisture and pH barrier rated for high alkalinity, or a pH-neutralizing, salt-sequestering treatment accepted by the flooring manufacturer.
- **Warranty:** get the flooring and adhesive manufacturers' written approval of the complete system.

Renovation: existing floors

- **Old adhesive:** remove it to clean, sound concrete. Cutback and some older adhesives can contain asbestos: test before you grind or scrape, and follow abatement rules.
- **Removers and abatement chemicals:** some leave residue or raise surface pH. Use a pH-neutralizing remover that rinses clean without residue, and test pH after prep.
- **Re-wetting:** a wet-applied remover that is rinsed off and dries within hours is not the concern. Standing water, prolonged wet scraping and the new adhesive's own water can bring high pH back to a surface that tested fine when dry. Test after prep, once the surface is dry.
- **Old patch and leveler:** remove it. Patch that is bonded today can let go once it is covered and the conditions under the floor change. Price the removal into the bid.

Disclosure: *S3 Surface Solutions makes products in the salt-sequestering cure and pH-neutralizing remover categories; data sheets are available on request.*

8. When to say no-go

Stop and put it in writing if readings exceed the adhesive limits, HVAC is not running, the surface is delaminated or dusty, or remediation has been put off "until later."

- [ ] State the findings, with test results and locations.
- [ ] List the options: mitigation, prep, or waiting for dry-down, with cost and time.
- [ ] Ask the GC or owner for written direction before you proceed.

A written direction to install anyway records who made the decision. Without it, the failure is yours.

Sources

- Klinger, Neuber, Ondo and Suprenant, "Minimizing the Risk for PLC Concrete Slabs," *Concrete International*, January 2024 (Joint ACI-ASCC survey and Neuber mockups)
- ASCC Type IL vs. C150 side-by-side mockups, 2023–24
- ACI Foundation / Temple University PLC industrial floors study, April 2026
- USGS Mineral Commodity Summaries 2025 and 2026: Cement
- PCA, Roadmap to Carbon Neutrality (2021); ASTM C150 and C595

Education only. The project specifications and the flooring manufacturer's written requirements govern.

Frequently asked questions

What should a flooring contractor get before bidding over a Type IL slab?

In writing from the GC: the cement mill certificate (C150 or C595/Type IL), the mix (w/cm, SCM type and percentage, aggregate source), the finish method and any densifier, the cure product and whether its film will be removed, the vapor retarder, the pour date and when permanent HVAC will run.

Why can a Type IL slab pass moisture tests and still fail?

ASTM F2170 and F1869 measure moisture, not how long surface alkalinity persists. Type IL holds high surface pH longer, and low-VOC water-based adhesives tolerate less alkalinity, so the bond can fail a year or more after installation even when RH readings looked acceptable.

What tests should be run before installing flooring?

After 48 hours of HVAC at service conditions: RH per ASTM F2170 (3 tests in the first 1,000 sf plus 1 per additional 1,000 sf), mapped surface pH per F710 at the same density, hardness (Mohs 5 or above), absorption (F3191 water drop), a rub test for dusting and a chain drag for hollow spots. Judge readings against the adhesive manufacturer's limits, not a generic 75% RH.

How should a flooring bid be qualified for Type IL slabs?

State that the bid assumes the slab meets the adhesive manufacturer's RH, MVER and pH limits; exclude mitigation, film removal and grinding unless listed; make installation conditional on acceptable F2170 and F710 results; and exclude delays caused by slab conditions. Have your own attorney review any qualification language.

What if the surface pH is above the adhesive's limit?

Choose an adhesive whose pH limit is above the measured surface pH, or use a moisture and pH barrier rated for high alkalinity, or a pH-neutralizing, salt-sequestering treatment accepted by the flooring manufacturer, and get the flooring and adhesive manufacturers' written approval of the complete system.

When should a flooring contractor say no-go?

When readings exceed the adhesive limits, HVAC is not running, the surface is delaminated or dusty, or remediation has been put off. State the findings with results and locations, list the options with cost and time, and get written direction from the GC or owner before proceeding.

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About the author

Jack Aspenson founded S3 Surface Solutions in 2015 and has spent more than 35 years in business development, technical sales and materials engineering. His work centers on concrete moisture mitigation, flooring failure forensics and substrate chemistry, and he consults on concrete and installation problems. More about Jack · jack@s3surfaces.com