

How Acids Dissolve Concrete — Simple Scientific Breakdown

Concrete is mostly:

- Sand + rock (does NOT dissolve)
- Cement paste (this *does* dissolve)

The cement paste is the “glue” holding everything together. It’s made of **calcium-based compounds**, and acids react with calcium.

When an acid dissolves calcium, the concrete loses structure → **it softens, breaks apart, and rinses off.**

The way this happens depends on **which acid** is used.



1. Glycolic Acid — Breaks the Glue → Creates Mud

What happens chemically

Glycolic acid reacts with the calcium in cement and forms **calcium glycolate**, which is **highly soluble in water**.

That means calcium (the glue) dissolves and washes away.

What drivers see

- Concrete **softens**
- Sand starts falling out
- It becomes **muddy**
- Brushes and rinses off easily

Why it matters

Glycolic doesn’t damage aluminum or paint, and it dissolves *deep into* the buildup



2. Phosphoric Acid — Hardens the Surface → No Mudding

What happens chemically

Phosphoric acid reacts with calcium to form **calcium phosphate**, which is:

- **Hard**
- **Insoluble**
- **Crust-forming**

So instead of dissolving the cement glue, it creates a new hard layer.

What drivers see

- No mudding
- Concrete stays crusty
- Builds a shell on top
- Doesn't break down heavy buildup

Why it matters

Good for **light haze** or **cement film**, but NOT for thick buildup on trucks or equipment.



3. Muriatic (Hydrochloric) Acid — Very Aggressive → Fast Dissolve but Dangerous

What happens chemically

Hydrochloric acid reacts with calcium to form **calcium chloride**, which *is* soluble — so it will dissolve cement.

BUT:

- Reaction is **extremely aggressive**
- Releases sharp fumes
- Corrodes aluminum and steel
- Eats through paint, wiring, hoses, chrome, etc.

What drivers see

- Heavy fizzing
- Fast breakdown
- Severe metal damage
- Rapid corrosion

Why it matters

It works fast — **but destroys trucks**.
Not suitable for fleet use.



Why Acid Strength (Concentration) Matters

Different acids + different concentrations = very different behaviors.

Low Concentration

- Slower reaction
- Safer on surfaces
- Better for daily maintenance
- More dwell time needed

Medium Concentration

- Balanced performance
- Good for moderate buildup
- More controlled chemical action

High Concentration

- Faster reaction
- Heavier dissolving power
- Higher risk of:
 - Etching aluminum
 - Damaging decals
 - Creating excessive fumes
 - Burning skin or eyes