Concrete Drum Cleaning: Acid Selection and Concentration Guide

1. When to Use Each Acid — With Effective Concentrations

This guide outlines the appropriate use of Glycolic, Phosphoric, and Muriatic acids for cleaning concrete residue from mixer drums. Using the correct acid at the right concentration is crucial for effective cleaning while maximizing the lifespan of the equipment.

Glycolic Acid — For Preventative & Light Cleaning

Use this acid when:

- Residue is fresh (e.g., slurry, paste, or a thin film).
- Cleaning is performed frequently (e.g., two to three times per week).
- The primary goal is the prevention of buildup, not the removal of heavy, hardened concrete.

Effective Concentration:

- 5–10% glycolic acid.
- *Note: This is often achieved by diluting commercial products at a ratio of 1:3 to 1:5 (one part product to 3-5 parts water).*

Why This Works:

- Sufficient acidity to dissolve fine cement particles and prevent film formation.
- Exhibits very low corrosion rates on carbon steel, making it safe for repeated use.

Typical Application:

1. Spray or circulate the solution inside the drum.
2. Rotate the drum slowly.
3. Allow for a dwell time of 10–20 minutes.
4. Rinse the drum thoroughly with water.

Limitation: This acid is not effective on thick, fully cured concrete.

Phosphoric Acid — For Routine Removal

Use this acid when:

- Buildup is light to medium.
- Concrete has already begun to set or harden.
- You require stronger action than glycolic acid but still want to protect the steel.

Effective Concentration:

- 10–20% phosphoric acid.
- *Note: While some operations may briefly use up to 25%, staying within the 10–20% range is safer for the equipment.*

Why This Works:

- Efficiently breaks down the calcium compounds in hardened cement.
- Leaves behind a phosphate passivation layer, which provides temporary corrosion resistance.
- Offers a good balance between cleaning speed and corrosion risk.

Typical Application:

1. Spray or circulate the solution.
2. Rotate the drum.
3. Allow for a dwell time of 5–15 minutes.
4. Agitate with a brush or mechanical cleaner if needed.
5. Rinse thoroughly.

Warning: Do not allow the solution to dry on steel surfaces, as this can lead to staining or corrosion.

Muriatic Acid (Hydrochloric) — For Reset & Emergency Use Only

Use this acid when:

- Concrete is thick, hard, and fully cured.
- A drum has been significantly neglected.
- Mechanical removal (chipping) is impractical or unavailable.

Effective Concentration:

- 5–10% hydrochloric acid.
- *Note: Commercial muriatic acid is typically around 31% and must always be diluted significantly before use.*

Why This Works:

- Extremely aggressive dissolution of cement for the fastest possible action.

Typical Application:

1. Ensure very short contact time only.
2. Allow for a maximum dwell time of 2–5 minutes.
3. The drum must be in constant rotation.
4. Follow immediately with a heavy, thorough rinse.
5. Neutralize the surface afterward if possible.

CRITICAL: Muriatic acid should never be used for routine cleaning on carbon steel due to its highly corrosive nature.

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2. Quick Selection Guide

Drum Condition	Recommended Acid	Effective Concentration
Fresh Slurry / Thin Film	Glycolic Acid	5–10%
Light Cured Buildup	Phosphoric Acid	10–15%
Medium Cured Buildup	Phosphoric Acid	15–20%
Heavy, Neglected Concrete	Muriatic Acid (Emergency)	5–10%
Frequent Maintenance	Glycolic or Phosphoric	≤15%

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3. Practical Rule for Maximizing Drum Life

Always try to increase dwell time before you increase acid concentration.

Recommended Protocol for Your Operation:

1. Start with Glycolic Acid at 5–10% for all preventative and daily cleaning.
2. Move to Phosphoric Acid at 10–15% only if buildup begins to harden.
3. Reserve Muriatic Acid at 5–10% for rare, emergency corrections on neglected drums.