DIRECTIONS FOR USING ALCONOX CLEANERS

DIRECTIONS FOR ALCONOX DETERGENTS

Directions: Dilute detergent (see chart) using warm (about 120°F or 50°C) or hot (about 140°F or 60°C) water. Ambient temperature water may be acceptable, especially for pre-soak. For difficult soils, use very hot water (above 150°F or 65°C) and double the recommended amount of detergent. When cleaning solution may be reused, make up fresh solutions frequently as needed.

Product	Form	Foam	Dilution (%)	Recommended Amount Oz/Gal	Recommended Amount gm/l or ml/l	Minimum Wash Temperature	Usual Wash Temperature	Maximum Wash Temperature
ALCONOX	Powder	Yes	1	1 1/4	10	Ambient	Warm	Boiling
TERGAZYME	Powder	Yes	1	1 1/4	10	Ambient	110–120˚ F	130˚ F
LIQUINOX	Liquid	Yes	1	1 1/4	10	Ambient	Warm	Boiling
CITRANOX	Liquid	Yes	1–2	1–3	10–20	Ambient	Hot	Boiling
DETERGENT 8	Liquid	No	2–5	2–6	20–50	Ambient	Hot	Boiling
ALCOJET	Powder	No	1/2–1	1/2–1 1/4	5–10	Warm	Hot	Boiling
DETOJET	Liquid	No	1/2–1	1/2–1 1/4	5–10	Ambient	Hot	Boiling
ALCOTABS	Tablet	Yes		(1 tablet per use)		Ambient	Ambient	Boiling
LUMINOX	Liquid	No	2–5	2–6	20–50	Ambient	Warm	Boiling
CITRAJET	Liquid	No	1–2	1–3	10–20	Ambient	Hot	Boiling
TERGAJET	Powder	No	1/2–1	1/2–1 1/4	5–10	Warm	Hot	Boiling
SOLUJET	Liquid	No	1/2–1	1/2–1 1/4	5–10	Ambient	Hot	Boiling
DETONOX	Liquid	Yes	1–3	1–4	10–30	Ambient	Warm	Boiling

SOAKING

Recommended: ALCONOX · LIQUINOX · DETONOX · CITRANOX · TERGAZYME · LUMINOX · ALCOJET · DETOJET · CITRAJET · TERGAJET · SOLUJET · DETERGENT 8

Typical Use: To clean small items—hospital catheters and tubes, small metal parts—and large tank interiors, including pharmaceutical and other blending tanks. An excellent pretreatment method for loosening soils and preventing drying prior to further cleaning—especially for labware or medical instruments.

Advantages: Very little physical effort or expense.

Concerns: Extremely dirty articles or difficult soils may require further cleaning.

Directions: Soak, completely submerged in solution, until clean. This may take several hours, depending on the type of soil. Remove and rinse thoroughly.

MANUAL CLEANING

Recommended: ALCONOX · LIQUINOX · DETONOX · CITRANOX · TERGAZYME · LUMINOX · ALCOJET · DETOJET · CITRAJET · TERGAJET · SOLUJET · DETERGENT 8

Typical Use: For cleaning small articles such as medical examination instruments, labware or circuit boards, and large articles such as process equipment.

Advantages: Versatile, inexpensive, effective.

Concerns: Time consuming and labor-intensive. May not be effective on difficult-to-reach areas requiring presoak, ultrasonic, or machine cleaning.

Directions: Make up cleaning solution as below, or use undiluted detergent on a warm, wet cloth or sponge for nonabrasive scouring. Clean as follows:

- Wet the article with solution by dunking or using a soaked cloth or sponge.
- Clean with a cloth, sponge, cotton swab, brush, or pad that agitates surface soils without marring the surface.
- Rinse thoroughly. Wear gloves, eye protection, and other safety equipment if recommended.

ULTRASONIC CLEANING

Recommended: ALCONOX, LIQUINOX, DETONOX, CITRANOX, TERGAZYME, LUMINOX, ALCOJET, DETOJET, CITRAJET, TERGAJET, SOLUJET, DETERGENT 8

Typical Use: To clean multiple batches of articles or for fast, convenient cleaning.
Advantages: Fast, effective, reproducible, penetrating cleaning.
Concerns: Capital cost, material tolerance for ultrasonic agitation.

Directions: Make up detergent solution in a separate container.
- Add detergent, run machine 10 minutes to degas, allow heater to heat.
- Place groups of small articles in racks or baskets.
- Align irregularly shaped articles so the long axis of any part faces the ultrasonic transducer (usually the bottom).
- Immerse articles to be cleaned for 2–10 minutes, or longer, as needed. Remove and rinse thoroughly.
- Orient or rotate parts to release air from blind holes.

CLEAN-IN-PLACE

Recommended: ALCONOX, LIQUINOX, DETONOX, CITRANOX, TERGAZYME, LUMINOX, ALCOJET, DETOJET, CITRAJET, TERGAJET, SOLUJET, DETERGENT 8

Typical Use: For pipe, tank, and filtration systems.
Advantages: Assures clean systems without disassembly.
Concerns: Good circulation in system.

Directions: Make up cleaning solution as above.
- Circulate solution slowly for at least 1/2 hour. Allow several hours for large systems (thousands of gallons), especially with ambient temperature water.
- Drain by pumping in one full system capacity of water.
- Rinse by circulating and draining at least two times the system's water capacity. Some filtration units may require more rinsing.
- For spray clean-in-place use a low foaming detergent to clean. Rinse and flush thoroughly.

MACHINE WASHERS

Recommended: ALCOJET, DETOJET, CITRAJET, TERGAJET, SOLUJET, DETERGENT 8

Typical Use: For high-volume cleaning using washer-sanitizers, warewashers, conveyor-washers, or spray and pressure washers.
Advantages: Fast, effective, high volume cleaning.
Concerns: Capital cost; article's ability to withstand machine washing conditions.

Directions: Load articles into racks so that open ends face toward spray nozzles. Place difficult-to-clean articles with narrow necks and openings near the center of the rack, open-side down, preferably on special racks with spray nozzles pointing directly into them. Minimize touching between articles. Minimize fluid trapping orientation of parts—optimize drainage.
- Group small articles in baskets to prevent dislodging by spray action.
- Use only low foaming detergent as per machine manufacturer dose instructions. If no instructions, use a 1% solution or 1 1/4 oz. per gallon of wash water. Use more or less as needed.
- Use hot water (above 140°F or 60°C).
- Use CITRAJET as an acid rinse and neutralizer where desired.

Most machines have at least three rinse cycles. Refer to machine manufacturer's directions.

AUTOMATIC SIPHON PIPET WASHING

Recommended: ALCOTABS

Typical Use: Washing pipets in laboratories.
Advantages: Effective batch pipet cleaning.
Concerns: Pre-soak pipets for best results.

Directions: Completely immerse pipets immediately after use in a presoak solution of ALCOTABS, ALCONOX, or LIQUINOX solution. When ready to clean:
- Drop an ALCOTAB into bottom of washer.
- Place pipets in holder into the washer.
- Turn on cold or warm water at a rate that will fill the washer and completely cover all pipets, then drain to the bottom during each cycle.
- Run water until ALCOTAB has completely dissolved, continue running water to rinse thoroughly (may take an hour to complete washing and rinsing).

For analytical or tissue culture work use distilled or deionized water for final rinse.

BATH-O-CARD:

This acronym is formed from the first letter in each of the nine critical variables in cleaning. And each offers opportunities for cleaning process optimization.

Before cleaning — Presoak, prevent residues from drying and hardening, or stop any pre-cleaning procedures that make cleaning more difficult

Agitation — The more agitation, the better. Add or increase scrubbing, ultrasonic, spraying or flowing.

Time — The longer the cleaning, the more available cleaning capacity is used. Until you run out.

Heat — Every 10 degree C increase in cleaning temperature, doubles the cleaning speed. Clean as hot as practical, without damaging your substrate.

Orientation — Surfaces must be oriented to contact cleaning solution and rinse water. Also, rotate parts to release air in blind holes, and rack to prevent holding liquid between surfaces.

Chemistry — Use detergent suitable for the type of residue (acid or alkaline) and cleaning method (low foam for high agitation; high foam for immersion and ultrasonic).

After cleaning — Avoid recontamination and corrosion-causing humidity and heat.

Rinse — Use suitably pure rinse water to avoid rinse-water residues. Hot rinse avoids breaking emulsion and redepositing. Cold rinse reduces corrosion.

Dry — Removing water by alcohol dip, wiping, blowing or centrifuge reduces rinse-water residues and corrosion. (See following section for more information.)

Corrosion inhibition

Corrosion during cleaning is accelerated by the same things that accelerate cleaning: heat, aggressive chemicals, time, and agitation. To reduce metal corrosion, in approximate order of effect, use less heat, corrosion inhibited detergents, lower pH or pH appropriate detergents, shorter cleaning time, and less agitation. Avoid mixed metals in the same bath that form batteries and deposit galvanic oxides. The following techniques may work to limit corrosion, based on the material and/or process involved:

- **Metal:** Use the mildest pH detergent and avoid mixed metals in the same bath.
- **Aluminum:** After abrasion exposes pure metal surface, allow air passivation time prior to cleaning. Use mild acid cleaners such as CITRANOX or CITRAJET to avoid alkaline attack.
- **Plastic:** Use less aggressive cleaners, containing less solvent or surfactant character. Or use lower concentrations of those cleaners, lower cleaning temperatures, less contact time, and less agitation. For stressed polycarbonate and acrylic use surfactant-free DETOJET for cleaning. Unstressed material is not a concern. Avoid alkaline cleaners on polyurethane.
- **Mild sensitive steel:** Avoid “flash rusting” by rinsing with cold water and using rapid water-removing drying techniques such as dipping in isopropyl alcohol to form an evaporating azeotrope that removes water safely, centrifuge dry, wipe dry, air knives, and drying with oxygen-free gas such as dry nitrogen. Or add a suitable corrosion inhibitor to the rinse water, as long as you can tolerate corrosion-inhibitor residues. Do not use evaporative drying such as air drying or oven drying.
- **Sensitive steel:** Clean with an inhibited cleaner and isopropyl alcohol rinse (or add a corrosion inhibitor to the rinse water).
- **Galvanic corrosion:** Avoid mixed metals in the same bath that can form a battery and deposit oxides on one of the metals. For example, many metals will plate out their oxides on aluminum if the two metals are cleaned in the same bath. Intact stainless steel is generally OK as a mixed metal, but iron, steel, brass, aluminum, bronze and other metals can be a problem mixed with other metals.

Bath life extension and control

For the highest levels of critical cleaning, especially to avoid cross contamination, only freshly prepared solutions should be used. For industrial cleaning applications, however, bath life can be extended while still achieving high levels of cleaning.

Bath life extension techniques:

- Filtering particulates
- Cooling and settling of sludge
- Cooling and skimming oils
- Adding half again as much detergent as the initial load after partially depleting the cleaning life of a bath

Conductivity, pH and % solids by refractometer can be used to measure bath detergent concentration. In general, a pH change of 1 unit toward neutral indicates an exhausted cleaning solution. Under frequent daily use, detergent solutions can rarely be used more than a week, even when being extended.

Free-alkalinity titration can be used to extend bath life where the soils deplete free alkalinity, as follows:

- Titrate a fresh solution to determine free alkalinity
- Titrate the used solution to determine the percent drop in free alkalinity
- Add detergent to the used bath to bring the free alkalinity back to the new-solution level

For example if your initial solution contains 100 ml of cleaner concentrate and there is a 25% drop in free alkalinity, try adding 25 ml of cleaner concentrate to recharge the solution. Perform a new free-alkalinity titration the first few times to confirm that the detergent is linear with respect to free free-alkalinity depletion. This bath-life extension cannot be repeated indefinitely: sludge will eventually form, requiring a fresh solution.