



# BIOZONE<sup>®</sup>

Performance Cleaning Experts<sup>SM</sup>

## 美國百龍生化清潔液

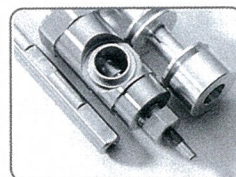


**RoHS**  
2011/65/EU

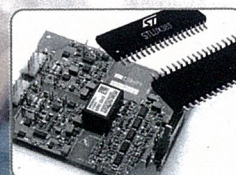
**SGS**



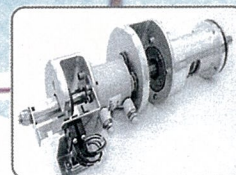
Healthcare



Pharmaceutical



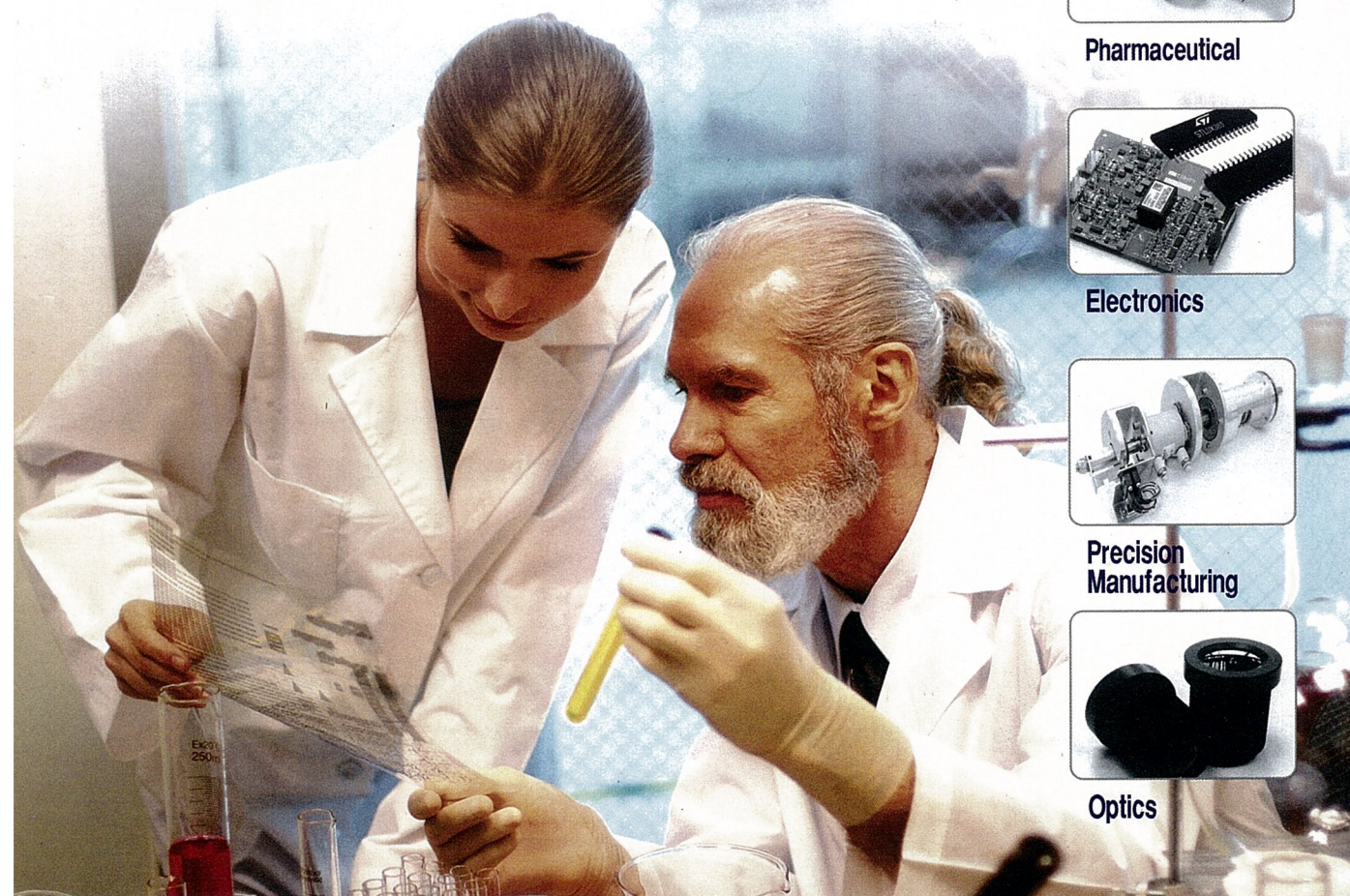
Electronics



Precision  
Manufacturing



Optics







## 公司歷史：

**BIOZONE**® 為美國生化清潔劑領導品牌之一，由美國哥倫比亞大學威廉·喬·生化博士 (Columbia University Joe William Dr.) 所主導研發全球最頂尖的生化清潔技術，**BIOZONE**® Inc. 在美國已有 50 多年清洗技術服務經驗，產品特色以「環保、無毒、零殘留」為最大訴求。

隨著 21 世紀科技不斷演進，在製程清洗操作安全的環境下，**BIOZONE**® 生化產品系列，已完全取代化學強酸、鹼及揮發性有機溶劑，能符合 100% 無殘留的清潔要求標準；西元 1962 年在美國首先推出 EnzymBio 醫療生化清潔劑，率先使用於醫療用手術器械、儀器及醫療器材製造使用的清洗清潔程序，使用後佳評如潮，因此贏得了客戶對 **BIOZONE**® 生化清潔產品的信任與口碑！

在政府對環保強力嚴格監督要求下，**BIOZONE**® 一直秉持著以產品技術服務為導向，目前已跨足於環保、工業實驗室、醫療、醫療器材、製藥、醫學美容、化妝品、印刷電路板、光電半導體、電子封測元件、精密金屬加工、光學玻璃...等高科技製造先進領域。

## 技術服務：

**BIOZONE**® 生化產品用途廣泛，百龍生化技術服務團隊，總能適時為客戶找出最佳解決方案 (Solution)，讓客戶產品能夠輕鬆通過清洗評估與查核驗證，且清洗後的廢液能完全被生物所分 (降) 解且零污染廢水易處理，能 100 % 符合環保廢水排放法規標準；在 **BIOZONE**® 美國百龍生化清潔液選用表中，我們會依據您的清洗材質與清潔度要求，來推薦適合的生化清潔劑及產品物質安全資料表或試用品來讓您使用。

## 質量保證：

在美國 **BIOZONE**® Inc. 嚴格監督質量技術保證，一定能讓您得到最滿意的產品使用效果；另外對於特殊要求的清潔需求，**BIOZONE**® Inc. 實驗室亦提供生化清潔標準書，可作為製程清洗監控查核規範；**BIOZONE**® 全系列產品在美國皆已獲得美國 (F.D.A) 食品暨藥物健康管理局品質認證，符合歐盟 RoHS (2011 / 65 / EU) 法規規範歐盟 REACH 機構授權評估及簽署許可，並依法通過取得國內行政院衛生署第一等級醫療器材許可證 (衛署醫器製壹字第 003828 號)。

## 客製化服務：

為滿足特殊製程清潔，美國 **BIOZONE**® Inc. 技術服務團隊，亦不斷研究開發新材料生化清洗技術，來符合客戶實際的需求，並提供客製化產品與技術諮詢服務。



## MEDICAL DEVICE MANUFACTURING 醫療器材(植體)

### Getting medical equipment critically clean for use in demanding human health and veterinary applications.

Whether the equipment is designed for human or veterinary health, manufacturing medical devices—such as the titanium prosthetic hip joint shown at right—often requires equipment cleaned to implantable standards. Whether the product is designed for in vitro or in vivo use, is biomechanical or electronic, you'll find an BIOZONE cleaner expressly formulated to get products scrupulously clean without leaving interfering residues.

#### An Biozone cleaner brand for every medical equipment manufacturing application

BIOZONE brand, for example, has been found to be especially well suited in cleaning implants prior to secondary cleaning operations and coating with aluminum plasma spray (TPS) with implants used in both dental applications and medical procedures such as knee, hip, and shoulder replacements.

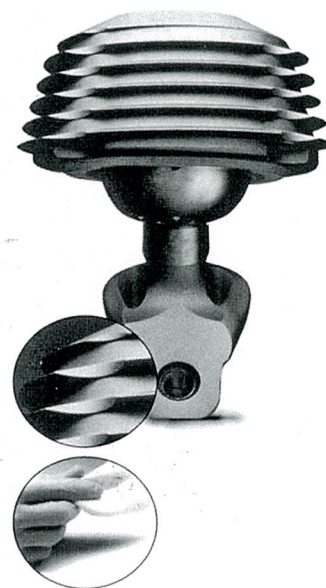
It not only removes all contaminating residues but it's aqueous-blend formulation is also biodegradable and non-volatile—without the disposal and safety problems associated With other metals cleaners.

BIOZONE is also well suited to removing interfering residues in high-fidelity, research-quality medical devices such as Doppler flow catheter transducers, eliminating the need for harsh chemicals and ultrasonic cleaning. In addition, it easily removes wax residues from rigid gas permeable (RGP) contact lenses during manufacturing.

And our AQUIBIO—which is especially well suited to removing oils from metal and elastomeric-polymer surfaces during manufacturing—has been used in cleaning plastic artificial joint materials prior to testing.

CITABIO cleaner has been successfully used to ultrasonically clean titanium implants and other medical devices in validated GMP cleaning in accordance with quality systems protocols.

Even sensitive aluminum Class I and Class II external medical devices can be cleaned manually or in ultrasonic tanks using AQUIBIO or using SOJUBIO in spray parts washers or washer/sterilizers.



Before : Medical devices—such as prosthetic hip joints—must be critically pre-cleaned prior to coating and packaging.

After : Swab tests validate successful cleaning with Biozone detergents.

## MEDICAL DEVICE 醫療器械

### Effective sterilization requires effective cleaning--and when it comes to cleaning reusable instruments or equipment, Biozone detergents meet the most demanding standard.

The ultimate goals of healthcare cleaning procedures are to keep instruments and equipment clean and sterile, prolong their working life, minimize cross-contamination, and reduce medical waste.

The ideal manual detergent for getting Reusable items clean has a neutral range pH, to Prevent corrosion or other surface degradation. When proteinaceous soils or blood must be cleaned, adding an enzyme to the detergent formula means instruments come clean via soaking and gentle cleaning, rather than abrasive scrubbing—thus prolonging their working life and decreasing the chance of bacterial contamination.

AQUIBIO and ENZYMBIO from Biozone meet these criteria easily economically. Thanks to its neutral range pH, AQUIBIO not only cleans stainless and chrome-plated surgical instruments effectively, but also those made from other materials—even gold-plated instruments. It cleans aluminum, brass, copper, plastics and rubber, titanium, and tungsten carbide drill tips. Sequestrants in AQUIBIO prevent water scale and calcium deposits

that can leave residues and promote corrosion. And because they are concentrated, these detergents are economical to use.

ARCOX and SOJUBIO are excellent for use in cartwashers or washer-sanitizers where efficient corrosion-inhibited alkaline cleaners are required. Use CITACOX for mild organic acid rinsing and neutralizing.

#### Loosen baked and dried-on soils without scrubbing

For removing scale, protein, and heavy soil loads, ENZYMBIO protease enzyme detergent is especially effective in instances where soiled instruments have dried or are heat sterilized prior to cleaning, a step taken in some facilities as a precaution against infection transmission. Soaking in ENZYMBIO assists in subsequent cleaning to ensure that corrosive dried-on blood is removed and abrasive cleaning is not required.

Biozone offers a broad range of detergents for hospital and healthcare cleaning, available in liquid or powder form, for manual, machine, ultrasonic, or soaking.



Before : Blood dried onto scalpel handles is tough to remove.

After : Soaking in ENZYMBIO followed by gentle cleaning prepares surgical instruments for effective sterilization and prolongs instrument life.



## ENVIRONMENTAL 環保檢測

In ground water, surface water, soil or sediment sampling, field-proven Biozone detergents get sampling equipment clean while preventing cross-contamination.

### Environmental testing requires taking water and soil samples

Recognizing the importance of critically clean sampling equipment, the Engineering Support Branch of the EAP's Environmental Services Division has set up standard procedures that require the use of "phosphate-free laboratory detergent such as AQUIBIO" in cleaning Teflon®, glass, and stainless steel equipment used for sampling trace organic compounds or metals.

Automatic wastewater sampling equipment is also subject to laboratory detergent cleaning guidelines, as are silastic rubber pump tubing, as well as sounders used to measure groundwater levels, submersible pumps and hoses for purging ground water wells, portable augers, and all miscellaneous sampling and flow-measuring equipment.

### The practical, safe choice in environmental testing

From bailers, split-spoon samplers, augers, dredges, flow-through cells, to delicate pH meter probes, Biozone aqueous detergents help maintain the level of testing accuracy you

need—without the risks and hazards associated with solvents—to comply with EPA guidelines.

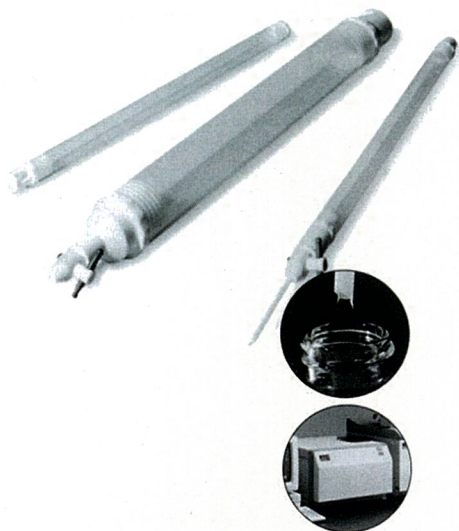
Our field-proven AQUIBIO brand contains a unique blend of free-rinsing ingredients, leaving no post-rinse contaminating residues and no opportunity for cleaner to interfere with phosphate-sensitive analytical equipment.

In addition, AQUIBIO liquid cleaner can be handled more conveniently. And because the cleaner is phosphate-free, small quantities can be safely disposed of after use without requiring special procedures or precautions.

And for cleaning stubborn hydrocarbon residues, nothing beats the solvating and coupling action of TERABIO 9. It keeps contaminating soils suspended in the cleaning solution, preventing their redeposition on cleaned surfaces.

For automated cleaning of sampling equipment and containers in laboratory dishwashers, use phosphate-free SOJUBIO liquid or TIGACOX liquid for reliable results.

Biozone, Inc. offers a broad range of powders and liquids for manual, machine, clean-in-place, and ultrasonic critical cleaning—all free rinsing, corrosion-inhibiting and biodegradable.



Before : Environmental field tests subject equipment to chemically aggressive environments.

After : Mass-spec equipment blanks show AQUIBIO leaves no interfering trace levels of contaminants.

## LABORATORY 實驗室

Biozone detergents leave no interfering residues on reusable labware.

Residues that interfere with laboratory procedures are the invisible enemies of reliable results. Cleaners that can't remove residues without also etching, clouding, or otherwise damaging labware surfaces are enemies of your labware and instrumentation budget.

Biozone detergents not only remove interfering residues without accompanying deterioration of equipment, but also handle tough laboratory cleaning problems such as removing proteinaceous soils or radioisotope decontamination. And Biozone, Inc. can help you pass your inspections for lab accreditation.

### From pipets to animal cages

BIOZONE, AQUIBIO, CITABIO, ENZYMBIO, BIOTERG, TERABIO 9 and ARCOX all pass the inhibitory residue test for water analysis. Neutral pH AQUIBIO and LUBIO are ideal for cleaning phosphate-sensitive analytical ware—in fact an EPA unit lists AQUIBIO as a standard phosphate-free detergent for their guidelines for cleaning sampling equipment and containers. ARCOX liquid, DOTE-RCOX liquid, phosphate-free TIGACOX pow-

der, phosphate-free SOJUBIO liquid, and CITACOX acid rinse are specially formulated for machine labware washers. CITABIO excels at removing trace metals, CITACOX provides excellent acid rinsing and neutralization in laboratory washers. Use BIOTERG for pipets and tubes in automatic siphon pipet washers.

Use Biozone detergents all around the lab for cleaning beakers and all lab glassware, tissue cultureware, stainless steel instruments sampling apparatus, and tubing. Biozone sprays work effectively and economically, while avoiding the hazards of strong acids and solvents.

Biozone cleaners are supported with rinse water detection methods for passing accreditation with the College of American Pathologist (CAP) inspection questionnaire, as well as provided with lot-specific inhibitory test to meet NELAC and State water lab inspection requirements.

Whether manual or machine, power or liquid, phosphate or phosphate-free, Biozone has the right detergent for your application, all free-rinsing, corrosion-inhibiting, and biodegradable.



Before : Dirt, bacteria, reagents, reaction products, and residues can stick to lab glassware.

After : AQUIBIO gets out laboratory soils, leaving no interfering residue. Surfaces stay clear, clean, and readable.



### High-performance aqueous cleaners Biozone handle exacting electronic applications without employing hazardous chemicals or volatile solvents.

The bottom-line requirement for cleaning circuit boards or any other electronic part or assembly is that the cleaning method must not have the potential to leave conductive residues.

In circuit board fabrication, a typical check for impurities may employ an omega-meter or ionograph, which detect the presence of metal salts in the board rinse water. Board cleaned with TERABIO 9 and properly rinsed with deionized water meet the most exacting standards of cleanliness.

#### Leaves no conductive residues

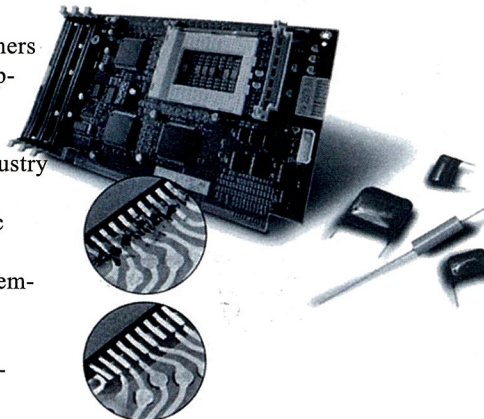
Biozone TERABIO 9 is an ideal cleaner for demanding applications in electronic cleaning. Because it contains no conductive metal cations, it cannot leave conductive residues. And, once a part or assembly has been cleaned with TERABIO 9, it stays clean. Its coupling ability keeps soils suspended in the cleaning solution, preventing redeposition on cleaned material. In addition, as used, the solution is non-flammable and corrosion-inhibited, and can be used for manual, ultrasonic, or spray machine cleaning.

While TERABIO 9 meet the most demanding critical cleaning requirements, there is another compelling reason for its use in electronics—it is an aqueous cleaner, with no ozone-depleting potential and low volatile organic content. And, like all Biozone cleaners TERABIO 9 is biodegradable and meets typical disposal requirements.

TERABIO 9 and other Biozone detergents are used in a variety of electronic industry cleaning applications including:

- Cleaning glass substrate before dichroic coating of electronic parts.
- Cleaning during manufacturing and assembly of infrared detectors.
- Cleaning electrical contacts and leads
- Cleaning ceramic insulators and components.

Whether cleaning through-hole or surface-mount board, TERABIO 9 does the job effectively, economically, and without CFC hazards. LUBIO can even be used with aluminum substrates.



Before : Oils resins, and rosins contaminate soldered connections on printed circuit boards.

After : TERABIO 9 du-fluxes and removes ionic contamination without the problems associated with CFCs or solvents.

## PRECISION MANUFACTURING 精密金屬加工

### From bright-dipping brass forgings to cleaning stampings and castings, Biozone detergents clean without the disposal and use hazards of solvents or strong acids.

In metalworking, a part's appearance often defines the quality of that part—and of the final end product itself. In precision manufacturing, surfaces free of interfering residues are critical. Biozone detergents provide manufactures with an easy-to-use, biodegradable medium for getting surfaces critically clean.

From bright-dipping brass forgings, stampings, and castings for a high-quality surface finish to cleaning medical devices, whether the job involves removing cutting oils or even trace impurities from precision parts, CITABIO brand detergent performs consistently, economically, and effectively—without the hazards associated with solvents or strong acids. SOJUBIO cleaner has a superior surfactant system for high-efficiency oil removal while still rinsing freely to an interfering residue-free surface.

#### From plasma lasers to lenses and optical parts

Take a look, for example, at the superior cleaning capabilities of CITABIO in just one extremely critical process.

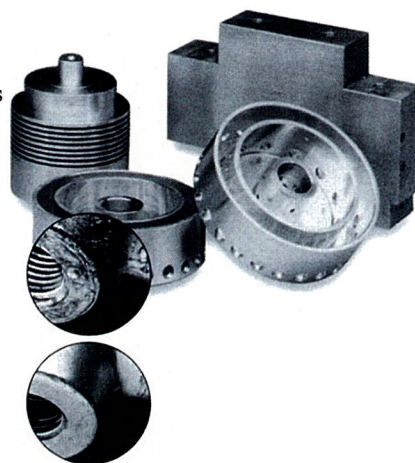
A gas plasma laser, which uses an aluminum chamber in which inert gases receive very large

electrical currents, must be absolutely free of surface debris and oxides. If not, the result may be poor performance at best and dangerous conditions at worst. CITABIO easily achieves the scrupulously clean interior surfaces these devices require.

Other examples of Biozone cleaners used in precision cleaning are:

- Cleaning oil from steel rolls used in plate glass production
- Removing mold-release agents from plastic parts
- Cleaning film processing machine rollers
- Ultrasonic cleaning of jet engine parts during overhaul procedures
- Ultrasonic cleaning of turbine fuel nozzles

In fact, almost any glass, plastic, metal, rubber, or porcelain surface can be safely, effectively, and economically cleaned with an Biozone detergent. There is even a low foaming neutral pH LUBIO detergent for use in aluminum cleaning in parts washers. There is also a low-foaming, organic acid CITACOX cleaner to cut through surface oils and brighten and remove oxides, scales and corrosion from brass, copper, and stainless steel.

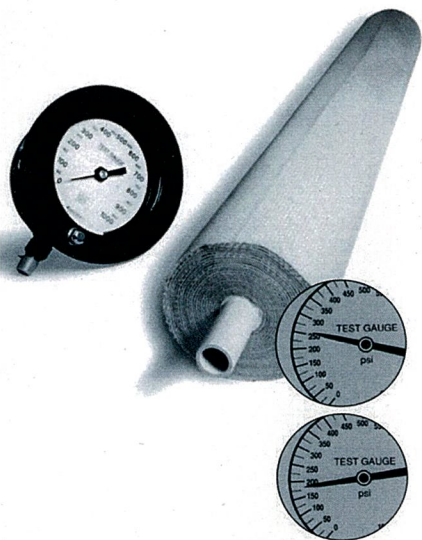


Before : Brass forgings corrode and lose their bright appearance unless they're bright-dipped.

After : CITABIO cleans, removes corrosion, and brightens metal surfaces without disposal problems associated with solvents.



### Biozone detergents prolong the life of food, beverage, and dairy-product processing equipment—including UF and RO filtration—without leaving interfering residues.



**Before :** Reverse osmosis membranes must be cleaned to yield required flowthrough rates—without contaminating food products.

**After :** After cleaning with ENZYMBIO, diaphragm shows required drop in pressure differential—with an increase in permeation flow.

Critical cleaning of food, beverage, and dairy processing equipment such as slicers, food extruders, mixers, grinders, wrappers, food tables, sight gauges, piping, glassware, and other food-contact equipment has a direct effect on the quality of food and beverage products requiring the maintenance of sanitary conditions in accordance with stringent guidelines.

Biozone detergents such as CITABIO, ENZYMBIO, AQUIBIO, and BIOZONE have long been used in food and beverage processing for their ability to remove even the most stubborn proteinaceous soils without leaving interfering residues.

#### Helping to yield higher filter membrane outputs with less waste

For example, through whey concentration with reverse osmosis (RO) systems, producers have reduced waste by creating a nutritive, marketable, high-protein concentrate.

In both ultrafiltration (UF) and (RO) filtration of whole and skimmed milk as well as cheese whey, ENZYMBIO unique protease enzyme detergent formula is effective in cleaning UF and RO membranes to maintain high

flow rates and desired rejection of dissolved solids—while rinsing away to leave no interfering residues which could contaminate food products.

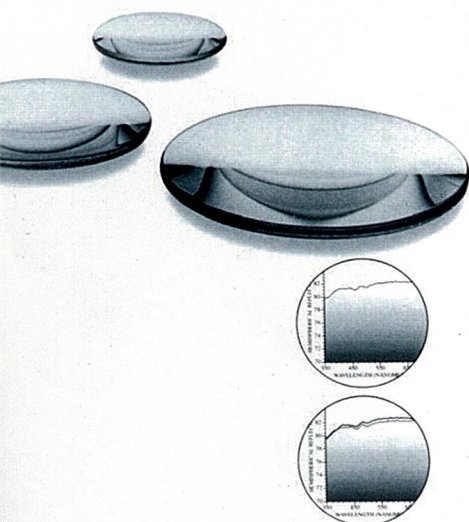
In cheese and milk processing, low-foaming CITACOX is highly effective at milkstone and calcium scale removal.

From test to pilot labs to full production in food, dairy, and beverage processing, packaging and bottling, Biozone manual, automatic, and clean-in-place detergents help processors preserve product purity—to agar-plate-proven standards—while improving output and profitability.

Biozone, Inc. has a full line of detergents that are authorized by the United States Department of Agriculture (USDA) for use in federally inspected meat and poultry plants.

## OPTICS 光學、鏡頭

### Ensuring the accuracy of acquired through microscopic, telescopic, spectrographic, intergerometric, and other optic devices starts with Biozone detergents.



**Before :** Reflectance of calibrating screen in the ultra-violet to the near-infrared region before cleaning with AQUIBIO.

**After :** After cleaning with AQUIBIO, the material shows no adverse change in hemispherical reflectance or change in wavelength readable.

Equipment used in such diverse fields as astronomy, remote sensing, machine vision, laser rangefinding as well as biomedical and other microscopic research requires critically clean, calibrated optics to ensure the accuracy of collected data.

Agents used in cleaning such optics must leave no data-corrupting residues that would adversely affect the efficiency of light transmission or spectral sensitivity. They should also contain no abrasive substances that could damage glass or quartz surfaces.

Free-rinsing AQUIBIO and BIOZONE-detergents help maintain the performance of sensitive optics without fear of leaving films, oils, or other data-contaminating residues. And since these brands contain no abrading compounds they help prolong the life of such costly equipment—even through repeated cleanings.

They have long been used for cleaning core glasses drawn down to micron ranges for fiber optics used in medical and industrial applications, image transmission devices such as endoscopes for nose and throat inspection as well as

remote review of aircraft engines and nuclear tanks.

They have also found application as the preferred cleaning agents for removing liquid monomers used by OEMs in lens manufacturing for both microscopes and telescopes. AQUIBIO has even been called on to clean calibration screens used in calibrating a wide range of light detection instruments—without affecting their UV performance.

What do you need to clean? We've been formulating and manufacturing aqueous cleaners for optics for more than fifty years.



## From tablet presses to mix tanks Biozone detergents handle tough performance cleaning jobs--like removing insoluble coatings residues.

Tablet presses don't come clean easily when sustained-release products are involved. Nor do any other processing devices used in the production of sustained-release or timed-release pharmaceuticals. But CITABIO does the job quickly and safely.

Cleaning protocols vary from manufacturer to manufacturer. But whether the good manufacturing practice test for cleanliness involves wipe or rinse sampling, TOC or HPLC analysis, all punches, dies, and other product-contact parts come critically with CITABIO.

If you need guidelines for your cleaning validation procedures, or you suspect residue interference, call on Biozone technical service for product recommendations and assistance.

### Clean virtually all processing surfaces

Infat, virtually any glass, metal, plastic, or porcelain surface in a pharmaceutical or biotechnology manufacturing facility that comes in contact with difficult-to-dissolve substances can be made critically clean with CITABIO, BIOZONE or AQUIBIO for manual, immersion and circulate CIP; or use alkaline SOJUBIO or acidic CITACOX for sprayball CIP or automatic washer use. And they're available in bulk sizes that meet your quality control and record.

keeping requirements.

Whether you have to clean capsule fillers, centrifuges, comminutes, compactors, conveyors, dryers, filters, filling lines, granulators, kettles, mills, mixers, reactors, or any other pharmaceutical or biotechnology production machinery that must be free of interfering residues, Biozone has an acidic, neutral or alkaline biodegradable detergent.

that meets typical disposal requirements to do the job.

In fact, almost any glass, plastic, metal, rubber, or porcelain surface can be safely, effectively, and economically cleaned with an Biozone detergent. The superior surfactant systems of SOJUBIO or CITACOX are effective at low concentrations on a wide range of residues without having to use troublesome additives, even on titanium dioxide, petrolatums, lotions, polymeric thickeners, and acrylic coatings. Biozone detergents are available worldwide with consistent formulations, certificates of analysis online, cooperation with audits and vendor questionnaires, ingredient toxicity data, shelf life information, residue sampling techniques, ingredient disclosure, lot number tracking, and validation support.



Before : Some pharmaceutical ingredients resist going into solution, making tablet presses tough to clean.

After : punches and dies cleaned with CITABIO meet stringent pharmaceutical cleaning validation standards.

## COSMETICS 化粧品

## Biozone detegents make short work of silicon, titanium dioxide, and other hard-to-clean residues.

### performance cleaning doesn't have to take hours.

Whether you're scrubbing 1,500-gallon kettles or wrestling with plastic tubes and fillers, you need to ensure that the last batch of product you processed really is history. That's where Biozone cleansers come in. Proven detergents such as CITABIO, ENZYMBIO, and BIOZONE wash away your most tenacious cleaning problems—without leaving residues CITABIO, for example, excels in removing trace metals and oxides—including titanium dioxide. ENZYMBIO conquers protrinaceous residues. BIOZONE makes short work of silicon residues and even tackles waterproof mascara in heated immersion cleaning. Whatever the surface—galss, plastic, metal, or otherwise--Biozone gets it critically clean.

### Want to make your cleaning operations cheaper and more efficient? We can help.

Biozone stretches your cleaning budget in two key ways. First Biozone detergents make your cleaning jobs faster and easier. Scrubbing and rinsing big stainless-steel kettles can take hours.

Biozone can shorten—or even eliminate—manual scrubbing time. And that means saving money. Second, Biozone detergents are highly concentrated for economical use. A little bit of any one of them goes a very long way. We know cleaning. We have more than 50 years of experience in developing and manufacturing cleansers for the most demanding industrial applications.

Our experts can help you improve your cleaning procedures, install new procedures, eliminate cross-contamination and ensure compliance with FDA standards. Whatever your cleaning problem, Biozone can help you solve it.

Biozone offers a broad range of powders and liquids for manual, machine, clean-in-place, and ultrasonic critical cleaning—all free-rinsing, corrosion0inhibiting, and biodegradable.



Before : Titanium dioxide and other cometic ingredients can be tough to remove from stain-less-steel kettles.

After : CITABIO removes metal oxides completely, ensuring microscopically clean surfaces for your nest batch.



# PERFORMANCE CLEANING PROCEDURES

## DIRECTIONS FOR BIOZONE 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 (about 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	Form	Dilution (%)	Recommended Amount		Minimum Wash Temperature	Usual Wash Temperature	Manual Precautions	
				Oz/Gal	gram/l or ml/l			Protective Gloves	Eye Protection
BIOZONE	liquid	yes	50	1 1/4	10	Ambient	Warm	Desired	Desired
ENZYMBO	liquid	yes	50	1 1/4	10	Ambient	Max 130°F	Desired	Desired
AQUIBIO	liquid	yes	50	1 1/4	10	Ambient	Warm	Desired	Desired
CITABIO	liquid	yes	50-25	1-3	10-20	Ambient	Hot	Required	Required
TERABIO 9	liquid	no	25-10	2-6	20-50	Ambient	Hot	Required	Desired
ARCOX	liquid	no	50-25	1/2-1 1/4	5-10	Warm	Hot	Required	Desired
BIOTERG	liquid	no	50-25	1/2-1 1/4	5-10	Ambient	Hot	Required	Required
DOTEROX	liquid	yes	50-25	1/2-1 1/4	5-10	Ambient	Ambient	N.A.	N.A.
LUBIO	liquid	no	25-10	2-6	20-50	Ambient	Warm	Desired	Desired
CITACOX	liquid	no	50-25	1-3	10-20	Ambient	Hot	Required	Required
TIGACOX	liquid	no	50-25	1/2-1 1/4	5-10	Warm	Hot	Required	Desired
SOJUBIO	liquid	no	50-25	1/2-1 1/4	5-10	Ambient	Hot	Required	Required

## SOAKING

Recommended products :

BIOZONE, AQUIBIO, CITABIO, ENZYMBO, LUBIO, ARCOX, DOTEROX, CITACOX, TIGACOX, SOJUBIO, AND TERABIO 9

**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 pre-treatment method for loosening soils and preventing drying—especially for labware or medical instruments—prior

to further cleaning.

**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 (see Rinsing at right).

## MANUAL CLEANING

Recommended products:

BIOZONE, AQUIBIO, CITABIO, ENZYMBO, LUBIO, ARCOX, DOTEROX, CITACOX, TIGACOX, SOJUBIO, AND TERABIO 9

**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 pre-soak, ultrasonic, or machine cleaning.

**Directions :** Make up cleaning solution as below, or use undiluted detergent on a warm, wet cloth or sponge for non-abrasive scouring. Cleaning 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 surfaces soils without marring the surface.

- Rinse thoroughly (see Rinsing at right.)
- Wear gloves, eye protection, and other safety equipment if recommended.

## ULTRASONIC CLEANING

Recommended products:

BIOZONE, AQUIBIO, CITABIO, ENZYMBO, LUBIO, ARCOX, DOTEROX, CITACOX, TIGACOX, SOJUBIO, AND TERABIO 9

**Typical Use :** To clean large batches of articles or for fast, convenient cleaning.

**Advantages :** Fast, effective, penetrating cleaning.

**Concerns :** Capital cost, material tolerance for ultrasonic agitation.

**Directions :** Make up detergent solution in a separate

container.

- Add cleaning solution, run machine for several minutes, to degas solution and allow heater to come up to temperature.
- 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 (see Rinsing at right).

## CLEAN-IN-PLACE

Recommended products:

BIOZONE, AQUIBIO, CITABIO, ENZYMBO, LUBIO, ARCOX, DOTEROX, CITACOX, TIGACOX, SOJUBIO, AND TERABIO 9

**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 hours. 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 products: ARCOX, DOTEROX, LUBIO, TIGACOX, SOJUBIO, AND TERABIO 9

**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 towards 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.

- 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 CITACOX as an acid rinse and neutralizer where desired.
- Most machines have at least three rinse cycles (see Rinsing at right). Refer to machine manufacturer's directions.

## AUTOMATIC WASHING

Recommended products: BIOTERG

**Typical Use :** Washing pipets in laboratories.

**Advantages :** Effective batch pipet cleaning.

**Concerns :** Pre-soak pipets for best results.

**Directions :** Completely immerse pipets immediately after pre-soak solution. When ready to clean:

- \* Drop an BIOTERG 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 use in a
- Run water until BIOTERG 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.



# PERFORMANCE CLEANING PROCEDURES

## RINSING

Don't neglect the rinse! Use ambient, warm, or hot water. A running water rinse directly contacting all surfaces for at least 10 seconds on each surface is desirable. If not practical, use a series of three or more agitated soak rinse tanks or at least two counter-flow cascade rinse tanks. For large surfaces, several passes with a clean cloth or sponge soaked with rinse water followed by a clean, dry, absorbent wipe can work. In machine cleaning, after washing there should be at least three rinse cycles.

Any quality of rinse water can be used to successfully remove the detergent and soil. The quality of the rinse water determines what rinse water residues can be left behind on the surface being cleaned. The rinse water is the last liquid to touch the surface you are cleaning, whatever is in the rinse water can potentially wind up on the surface. Tap

water typically contains varying degrees of organic microbes, particulates, and hardness (calcium and magnesium) salts. If you evaporate tap water onto a surface you can deposit these contaminants—often in the form of water spots. Higher purity water contains less potential contaminants to deposit. In general, distilled water is particularly low in organic contaminants. Deionized water is particularly low in ionic or inorganic contaminants. Reverse osmosis or RO water can be very low in both organic and inorganic contaminants. Tap water is suitable for many rinsing applications.

Give **medical and surgical instruments** a final rinse in distilled or deionized water.

In laboratories, rinse **tissue culture and analytical ware** with deionized or distilled water. **Rinse trace organic ana-**

**lytical ware** in distilled or organic-free water. **Give trace metal or inorganic analytical ware** a final rinse with deionized water.

Rinse **pharmaceutical equipment** according to good manufacturing practice—with whichever is required: potable, deionized, distilled, sterile, pyrogen-free, or injectable water.

Rinse **electronic circuit boards** and non-conducting electronic devices with deionized water.

**Sensitive optical or precision manufactured parts** may require final rinses in deionized or distilled water.

**Food processing equipment** must be rinsed with potable water.

## DRYING

Drying can affect residues and corrosion. Impurities from rinse water can be deposited during evaporation. To minimize this, dry with techniques that physically remove rinse water from the substrate such as absorbent wiping, forced air or air knives, azeotropic solvent drying such as

isopropyl alcohol final rinse and dry, or vacuum drying that may also evaporate residues. Water, and particularly high purity rinse water can be corrosive to metal substrates during heated and air drying. The use of physical removal drying techniques or the addition of corrosion inhibitors (with

the tolerance of corrosion inhibitor residues) to the rinse water can help minimize corrosion.

## BATH LIFE EXTENSION AND CONTROL

For the highest levels of critical cleaning only freshly made up solutions should be used for cleaning to avoid any potential for cross contamination. For industrial critical cleaning applications high levels of cleaning can still be achieved with extended bath life. In general, a pH change of 1 pH unit towards neutral indicates an exhausted cleaning solution. Bath life can also be extended by physical filtration of particulates and cooling and settling of sludge and skimming of oils. Bath life can also be extended by adding one

use, detergent solutions can rarely be used more than a week even with these bath life extension techniques. Conductivity, pH and, % solids by refractometer can be used to control bath detergent concentration. Free alkalinity titration can also be used to control bath life of alkaline cleaners where the soil being cleaned depletes free alkalinity—as is often the case with oily soils. Titrate a fresh solution to determine new solution free alkalinity. Add more detergent to the bath to

ity. For example if your initial solutions is made up with 100 ml of cleaner concentrate and you observe a 25% drop in free alkalinity, you should try adding 25ml of cleaner concentrate to recharge your solution.

You should perform a new free alkalinity titration to confirm your recharge the first few times you use this recharging nested to be sure that the detergent you are using is liner with respect to free alkalinity depletion. This form of tually form. Fresh solutions must be periodically made up.

## CORROSION INHIBITION

Corrosion during cleaning is accelerated by the same things that accelerate cleaning: heat, aggressive chemicals, time, and agitation. In approximate order of importance, to reduce metal corrosion concerns, use less heat, lower pH detergents, shorter cleaning time, and less agitation.

In general use the mildest pH detergent to limit metal corrosion. Higher pH detergents such as SOJUBIO or DOT-ERCOX have special corrosion inhibitors that allow their use with aluminum. SOJUBIO and CITACOX have inhibitors that allow their use on a broad range of sensitive metals without leaving filming amine residues. In approximate order of importance, in general to reduce plastic corrosion,

use less aggressive cleaners that have less solvent or surfactant character or use lower concentrations of those cleaners, use lower cleaning temperatures, use less contact time, and finally use less agitation. With aqueous cleaning metal corrosion can occur during rinsing and drying. Corrosion inhibitors can be added to rinse water provided that any associated inhibitor residue does not interfere with the surface being cleaned. Keeping the surfaces cleaned hot with hot rinse water and using rapid heat or vacuum drying can accelerate drying and minimize metal corrosion. Forced air drying and air knives that physically remove rinse water can minimize drying corrosion. Drying with hot oxygen-free

gas such as nitrogen can also control corrosion during drying.

With mild steel you can have "flash rusting" when you rinse with hot water and dry with hot air. In some instances, by lowering the water temperature or drying temperature, corrosion can be avoided on mild steel. For instance in a case where flash rusting on mild steel had been occurring using 150°F rinse water and ambient air drying, rust was avoided by using 120°F in place of the 150°F rinse water. For the most sensitive steel, you can clean with an inhibited cleaner followed by an isopropyl alcohol rinse or using a corrosion inhibitor added to the rinse water.

## FOR ADDITIONAL CRITICAL CLEANING INFORMATION



PHONE

■ Call Biozone Technical Service at  
886-7-6229677



FAX

■ Call 886-7-6245968  
Follow the directions to enter your  
fax number



INTERNET

■ e-mail : [wetco.max@gmail.com](mailto:wetco.max@gmail.com)  
[http : www.biozonmac.com](http://www.biozonmac.com)  
■ Technical bulletins and MSDS  
Certificates of analysis  
Cleaning validation references  
US and international dealers  
Inhibitory residue test and CAP accreditation info.



# DETERGENT SELECTION GUIDE

Application Key Concerns	Articles Cleaned/ Soil Removed	Cleaning Method	Recommended	Cleaner
Healthcare / Veterinary Effective preparation for sterilization. Longer instrument life. Reduce waste	Surgical, anaesthetic, and examining instruments and equipment. Catheters and tubes.	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO
		Machine washer, sani-sterilizer	ARCOX	DETERCOX
	Blood, body fluids, tissue on instruments.	Manual, Ultrasonic, Soak	ENZYMBO	
Pharmaceutical/Medical Device/Biotechnology Passing cleaning validation for FDA good manufacturing practices. For stainless steel, glass, plastic, elastomer cleaning	Titanium dioxide, petrolatum, oils emulsions, ointments, carbopols, lacquers, zinc oxides, proteins, steroids, alcohols, sugars, and Eudragit* (L/S/L30/D55/NE30D) polymers.	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO
		Machine washer, power wash, CIP	ARCOX	SOJUBIO
			TIGACOX (p-free)	
	Inorganic residues, salts, metallics, pigments. Eudegit* (E/RL/RS/E100) polymers, amphoteric, coatings, amines, ethers, starches, alkaloids.	Manual, Ultrasonic, Soak		CITABIO
		Machine washer, power wash, CIP		CITACOX
	Protein/ferment residues. R/O, U/F membranes.	Manual, Ultrasonic, Soak	CITABIO	SOJUBIO
Laboratory/Environmental Reproducible results, no interfering residues, extending equipment life. Keep laboratory accreditation Laboratory safety.	Glass, metal, plastic labware, ceramics, tissue culture, porcelain, clean, rooms, animal cages, bioreactors, tubing, benches, safety equipment.	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO(p-free)
		Machine washer, power spray, labware washer, washer-sterilizer, chge-washers	ARCOX	DETERCOX
			TIGACOX (p-free)	SOJUBIO(p-free)
	Tubes, reusable pipets.	Siphon-type washer-rinsers	BIOTERG (tablet)	BIOTERG (tablet)
	Microbiology, water lab, and environmental sampling. Phosphate-sensitive labware. EPA procedures. (Acid for water rinse cycle).	Field, Manual, Ultrasonic, Soak	TIGACOX	AQUIBIO
		Machine washer, labware washer	TIGACOX	SOJUBIO-base CITACOX-acid
	Radioactive equipment/contaminants.	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO
	Stopcock grease.	Machine washer, warewasher	ARCOX	SOJUBIO
	Trace metals, metal oxides, scale, salts, starches, amines.	Manual, Ultrasonic, Soak		CITABIO
		Machine washer, warewasher		CITACOX
	Proteinaceous soils, bio-wastes, tissue, blood and other body fluids, fermentation residues.	Manual, Ultrasonic, Soak	ENZYMBO	
		Glassware washer	ARCOX	SOJUBIO
	Glass, ceramic, porcelain, stainless steel, plastic, rubber. Oils, chemicals, particulates.	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO
		Machine washer, power wash	BIOZONE	DETERCOX
Metalworking, Precision Manufacturing, and Optics Clean parts, avoid volatile solvents, strong acids, and other hazardous chemicals.			TIGACOX (p-free)	SOJUBIO(p-free)
	Aluminum, brass, copper, and other soft metal parts. Oils, chemicals, particulates(acid for oxides, salts, buffing compound)	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO-base
			TIGACOX (p-free)	CITABIO-acid
		Parts washer, power wash	ARCOX	SOJUBIO-base
			TIGACOX (p-free)	CITACOX-acid
	Inorganics, metallic complexes, trace metals and oxides, scale, salts, metal brightening.	Manual, Ultrasonic, Soak		CITABIO
		Parts washer, power wash		CITACOX
	Silicone oils, mold-release agents, buffing compounds.	Manual, Ultrasonic, Soak	BIOZONE	CITABIO
		Parts washer, pressure spray	ARCOX	SOJUBIO
	Delicate substrates/neutral for waste.	Manual, Ultrasonic, Soak		LUBIO
Electronics Avoid conductive residues, avoid CFCs, pass cleaning criteria.		Machine wash, pressure spray		(Neutral pH)
	Circuit boards, assemblies, screens, parts, conductive residues, resins, rosins, fluxes, particulates, salts.	Manual, Ultrasonic, Soak		TERABIO 9
		Machine washer, power spray board and screed washers		
	Ceramic insulators and components.	Manual, Ultrasonic, Soak	BIOZONE	LUBIO
Food and Dairy Avoid interfering residues on food-contact equipment.		Parts washers	ARCOX	SOJUBIO
	Stainless steel, food-contact equipment.	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO
		Machine washer, power wash, CIP	ARCOX	DETERCOX
	Oxides, scale, trace metals, salts, milkstone.	Manual, Ultrasonic, Soak		CITABIO
		Machine washer, power wash, CIP		CITACOX
	Filter membranes. Proteins/biofouling.	Manual, Ultrasonic, Soak	ENZYMBO	
Cosmetics Avoid cross-contamination.	Product contact surfaces (acid for pigments and salts).	Manual, Ultrasonic, Soak	BIOZONE	AQUIBIO-base CITABIO-acid
		Parts washers, power spray		SOJUBIO-base
			ARCOX	CITACOX-acid
Nuclear Avoid waste interference	Reactor cavities, pipes, tools, protective equipment	Manual, Soak, Spray		TERABIO 9

p-free = phosphate-free

\*Eudragit is a ® registered trademark of Roehm GmbH & Co.

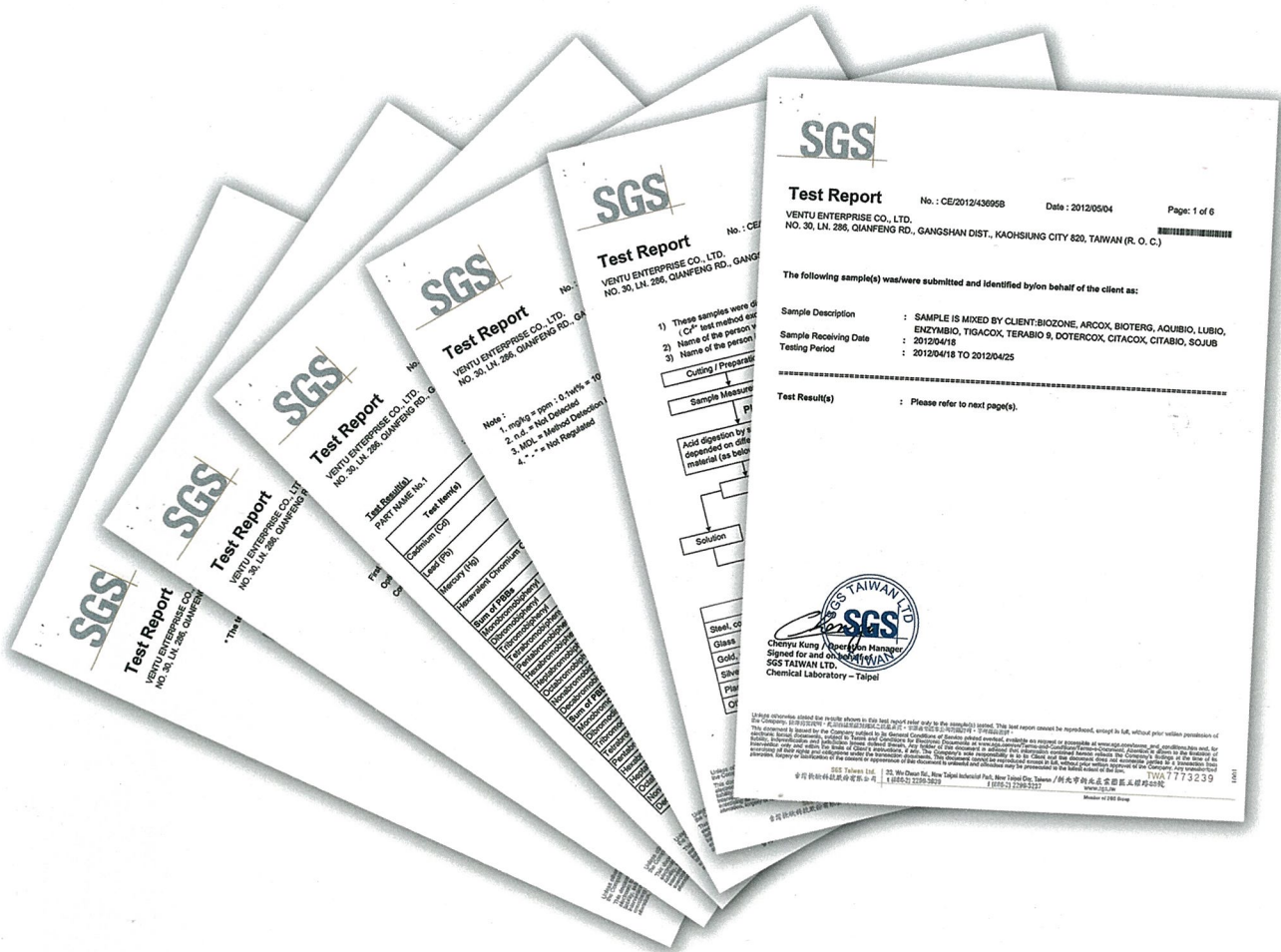


用途/優點	清洗物品/去除污垢	清洗方法	推薦清潔液
<b>實驗室</b>  實驗結果正確無殘餘物干擾、延長設備使用的壽命、使檢驗合格維持實驗室安全	玻璃、金屬、塑膠、實驗器具、	手洗、超音波清洗、浸泡、C-IP*	Biozone
	陶瓷器、清洗室的儀器、動物籠		AquiBio
	、生物的反應器、管子、實驗室	機器噴灑	ArCox
	工作台、安全防護設備	實驗室洗滌機	TigaCox
		滅菌洗滌機	SojuBio
		箱型洗滌機	DoterCox
	試管、吸量管、燒杯、滴管	吸管型洗滌機	BioTerg
	水和環境的取樣、環保試驗程序	手洗、超音波清洗、浸泡、C-IP*	AquiBio
	對磷酸鹽敏感的實驗器具	機器的清洗、實驗室洗滌機	SojuBio
	放射性設備／污染物油垢	手洗、超音波清洗、浸泡、C-IP*	Biozone
		機器的清洗、洗滌機	ArCox
	金屬殘留的氧化物	手洗、超音波清洗、浸泡、C-IP*	CitaBio
<b>醫院、診所</b>  滅菌前有效的清洗和延長醫療器械的使用壽命、清潔兼保養	蛋白質污垢、生化殘渣、薄絹、	手洗、超音波清洗、浸泡、C-IP*	EnzymBio
	血液和其他流體、發酵流質殘渣	機器噴灑機、實驗室洗滌機、滅菌	ArCox
		洗滌機、手推車噴灑機	SojuBio
	內外科用檢驗設備、手術室設備	手洗、超音波清洗、浸泡	Biozone
	、導管和水管、麻醉用設備		AquiBio
		機器清洗、動力清洗、實驗室洗滌	ArCox
		機、滅菌洗滌機	DoterCox
	蛋白質的污垢、血液和其它身體的流質、組織蛋白質/發酵殘餘物、R/O、U/F逆滲透薄膜、生化廢棄物、組織、血液及其他體液	手洗、超音波清洗、浸泡	EnzymBio
		動力清洗、滅菌洗滌機、手推車噴灑機	SojuBio
	產品接觸的表面材質、包裝容器	手洗、超音波清洗、浸泡、C-IP*	Biozone
	、裝填充傳送設備		AquiBio
	無機離子的殘餘物、鹽類、金屬合成物、顏料	手洗、超音波清洗、浸泡、C-IP*	CitaBio
<b>製藥、化粧品</b>  符合F. D. A. 優良藥品製造規範清洗評估標準查核程序	過濾設備、UF、MF過濾系統	手洗、超音波清洗、浸泡、C-IP*	EnzymBio
			SojuBio



用途/優點	清洗物品/去除汙垢	清洗方法	推薦清潔液
光學、液晶板  取代揮發性的有機溶劑和其它危險性化學物質	玻璃、陶瓷器、鋼製品、鋁、黃銅、銅、塑膠、玻璃纖維、個人安全設備、油垢、藥物、溶劑	手洗、超音波清洗、浸泡、C-IP*  機器清洗、動力清洗機	Biozone AquiBio ArCox DoterCox
	無機物、金屬合成物、金屬追蹤器、氧化物、鹽類、皮革合成物	手洗、超音波清洗、浸泡、C-IP* 機器清洗、動力噴灑	CitaBio CitaCox
	矽利康油、模具潤滑劑、皮革合成物	手洗、超音波清洗、浸泡、C-IP* 機器清洗、動力清洗機	Biozone SojuBio
	電子、半導體  避免有傳導性的殘餘物及四氟化碳能通過清潔測試與查核	手洗、超音波清洗、浸泡、C-IP* 機器的清洗、實驗室洗滌機	TeraBio 9
	陶製的絕緣器和合成半成品、導體零(組)件。	手洗、超音波清洗、浸泡、C-IP* 機器清洗、動力清洗機	Biozone ArCox SojuBio
	精密金屬加工  取代揮發性的有機溶劑、強酸，及其它危險性表面處理作業程序	不鏽鋼、鋁、黃銅、銅、其它金屬的零件及其表面污垢、Cutting Fluids、藥物、溶劑	Biozone AquiBio ArCox SojuBio
	金屬合成物、金屬氧化物、金屬追蹤器、金屬的發光器	手洗、超音波清洗、浸泡、C-IP*	CitaBio
食品、肉品加工  能避免有害的化學物質殘留在食物的容器及製程加工設備	不鏽鋼、食物的接觸器具、容器、傳輸送設備	手洗、超音波清洗、浸泡、C-IP*	Biozone AquiBio
	金屬氧化物、金屬追蹤器、鹽、牛奶塊	機器清洗、高壓清洗 手洗、超音波清洗、浸泡、C-IP*	CitaCox CitaBio
	蛋白質的污垢，逆滲透膜	手洗、超音波清洗、浸泡、C-IP*	EnzymBio
	航太、核子放射  避免Chelant磷酸鹽、氯化物、氟化物、磺黃成分殘留附著	反應器的凹處、設備、零件和工具、記錄污染反應器、個人安全放射防護設備	手洗、超音波清洗、浸泡、C-IP* 機器清洗、高壓清洗  TeraBio 9





符合歐盟RoHS (2011/65/EU) 法規規範及通過REACH規範評估、授權









## Put us to the test

Biozone brings more than half a century of experience in developing cleaners for getting metals, glass, plastics, rubber, and ceramic critically clean. Biozone anionic and nonionic cleaners come in liquid, for manual, machine, ultrasonic, soaking, or clean-in-place methods, with and without phosphates, in high and low pH, and with high or low foaming characteristics.

### Free sample packet of Biozone detergents

When requesting samples, please use the detergent selection guide on page eight, our detergent selection system and sample request on our e-mail at [wetco.max@gmail.com](mailto:wetco.max@gmail.com), or contact the Biozone technical service department for help in selecting the best detergent samples for your application. Contact us at the address below for your free samples and information packet.

Or, for fastest service, call 886-7-6229677

To place an order for detergent, mail [wetco.max@gmail.com](mailto:wetco.max@gmail.com), or call your laboratory, healthcare, or industrial supply company.







**潔葳企業有限公司 總代理**  
**美國百龍生化清潔液**

The Leader in Performance Cleaning Detergents<sup>SM</sup>

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