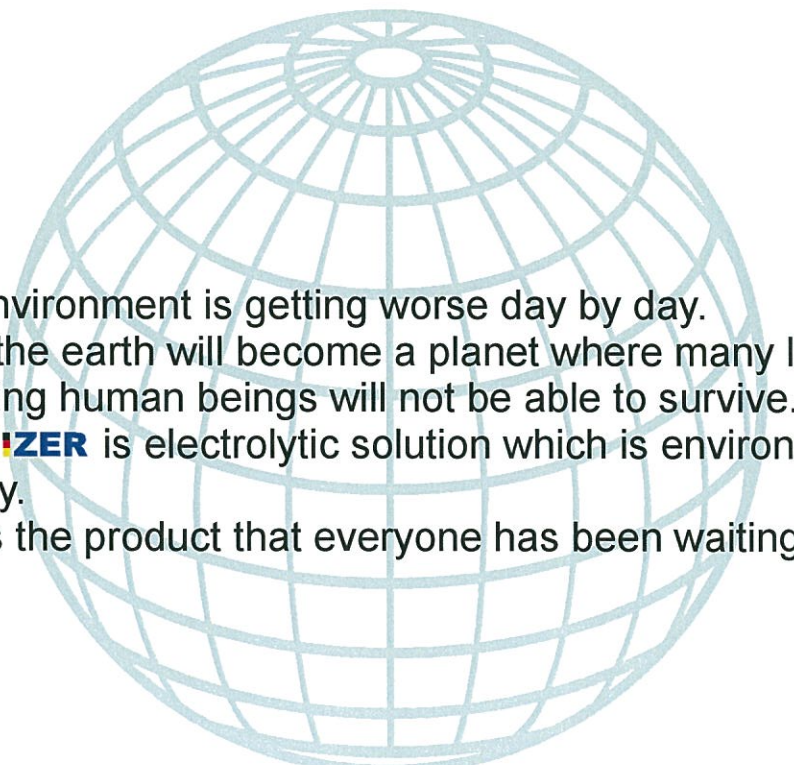


# **ECOMIZER**

## **TECHNICAL GUIDANCE**

### **ECOMIZER Technical Guidance**



Our environment is getting worse day by day.  
Soon the earth will become a planet where many life forms including human beings will not be able to survive.  
**ECOMIZER** is electrolytic solution which is environmentally friendly.  
This is the product that everyone has been waiting for.

This booklet is edited as technical guidance highlighting the features of **ECOMIZER**

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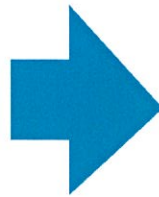


# 1. What is **ECOMIZER**?

● **ECOMIZER** is environmentally-friendly strong with high degreasing capability and it works as deproteinization agent.



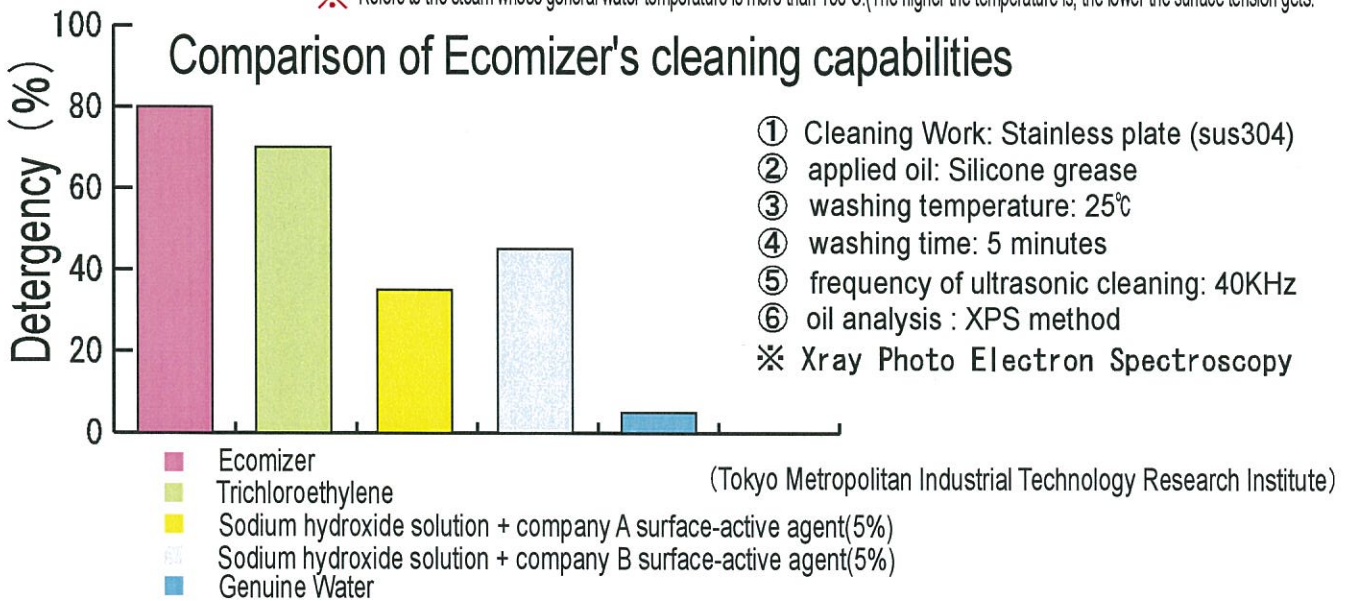
Grease is applied



3 minutes after washing with Ecomizer  
jet flow supersonic wave 45KHZ


● **ECOMIZER** is very effective when the temperature is more than 40°C used with supersonic wave between 40KHZ to 50KHZ with microbubble

※ Refers to the steam whose general water temperature is more than 100°C. (The higher the temperature is, the lower the surface tension gets.)




Ecomizer's superior cleaning is compared. Ecomizer is superior to the other detergents under the same circumstances.

## 2. Features of **ECOMIZER**

-  **ECOMIZER** is fundamentally made of "water" and "electricity." The generated **Ecomizer** does not contain any potassium carbonate even though a small amount of potassium carbonate is used as "electrolyte."

[The principle and formula are available by P.C.T(Patent Cooperation Treaty).]

-  When categorized, **ECOMIZER** is solution which contains a very small amount of potassium hydroxide. **ECOMIZER** is however different from sodium hydrate.

■ Please refer to the chart below for the differences between Ecomizer and sodium hydrate whose pH is the same.

Category	pH	O.R.P. at the time of generation	ion concentration	conductivity	consistency	Aluminum depletion	Cleaning rate (SUS304)	irritating odor	Contact with Water	Eye irritation test	cutaneous test
sodium hydrate (kalium)	13.0	-40mV	+30,000 ppm	1,260 $\mu$ S/cm	1.4 mpd/s	1.1 wt%	45%	Yes (Strong)	Generated heat	Burn	Burn
<b>ECOMIZER</b>	13.0	-960mV	2,300 ppm	2,700 $\mu$ S/cm	1.2 mpd/s	0.4 wt%	76%	None	None	None	None



※

Dissolved hydrogen	dissolved oxygen
0.002ppm	7.11ppm
1.048ppm	3.76ppm

※ Data is based on pH 11.7. (not pH 13.0)

(Incorporated foundation: KITASATO Research Center of Environmental Sciences)

(Aggregate Corporation: Kanagawa-ken Pharmaceutical Association Examination Center)

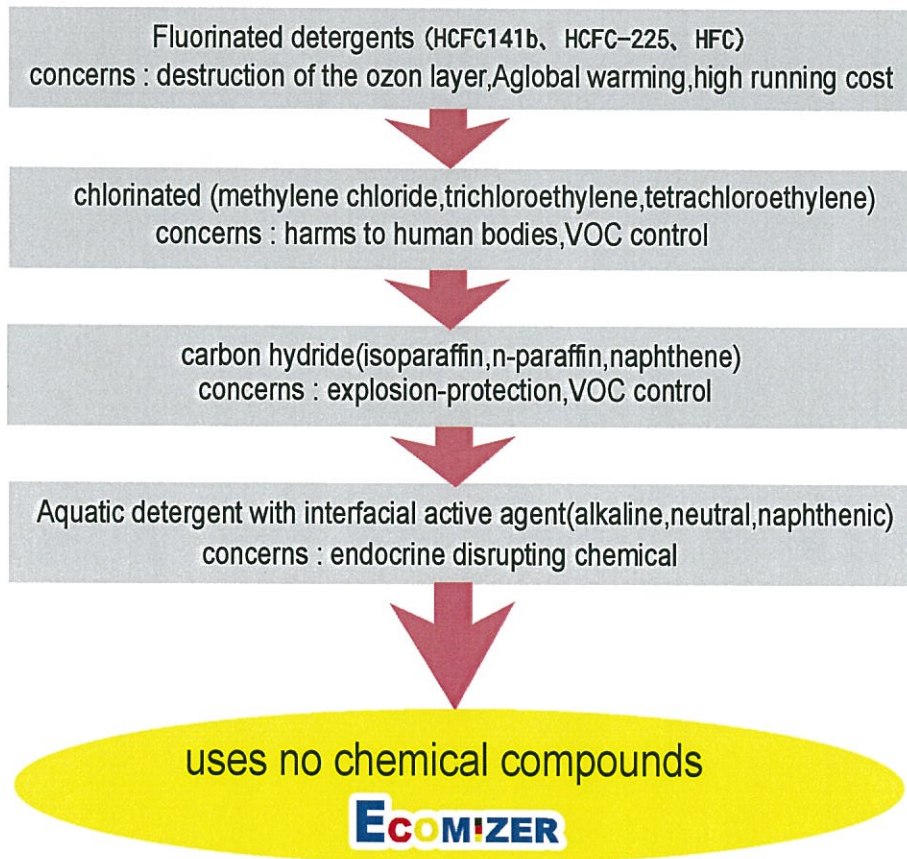
-  **ECOMIZER** does not use any chemicals Therefore, BOD(biochemical oxygen demand),COD(chemical oxygen demand), N-hexane and SS(suspended solids) do not exist.
-  Oily Water separation is easy for oil contents in Ecomizer. Oily content density can be lowered and recycled by floating oil collecting machine and core lesser filter.

● **ECOMIZER** is not sparkling and extremely good at rinse, so rinse (pure water, city water) can be greatly reduced.



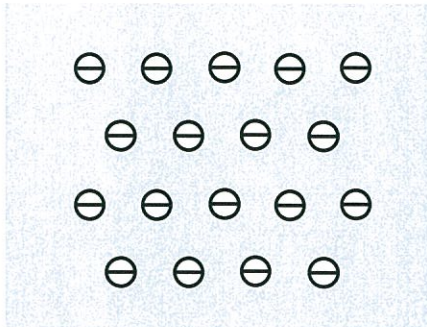
● **ECOMIZER** is safe for a human body. It is used for washing hands and tools in hospitals and food factories.

● **ECOMIZER** is now about to replace various detergents.

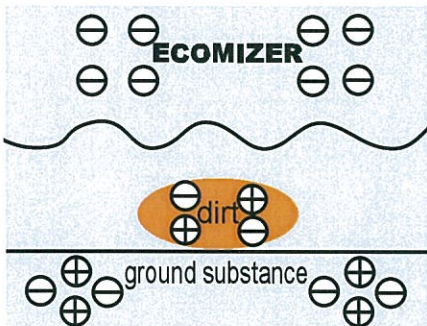


### 3. Cleaning (degreasing) capabilities of **ECOMIZER**

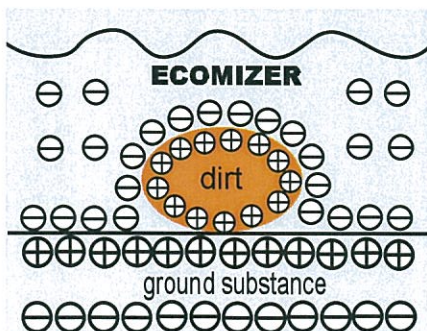
- The mechanism of grease cutting washing by **ECOMIZER** is based on electrical exfoliative function. Therefore, it doesn't cause any chemical changes and it doesn't damage surfaces of objects.



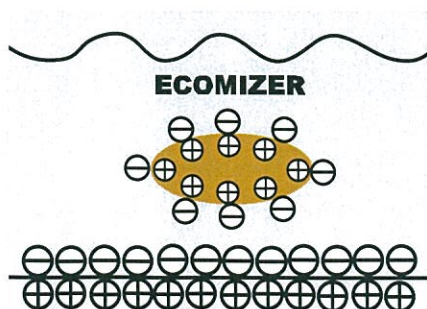
- **ECOMIZER** is solution which has a lot of electrons.



- **ECOMIZER** gets closer to "dirt" and "ground substance."



- When **ECOMIZER** touches "dirt" or "ground substance," power is generated between the molecules and the surfaces of "dirt" or "ground substance" gets ionized "plus."



- "Minus" and "minus" are working against each other on the surfaces of "dirt" or "ground substance."
- "Minus" ion covers the surfaces of "dirt" and "ground substance."
- Dirt gets pulled off the surfaces of "ground substance" not only due to the gravitation of minus ion of "dirty surface" and plus ion, but also the minus ion working against each other that covers "dirty surfaces."

# 4. Antirust effects of **ECOMIZER**

- For washing metal parts, antirust capabilities are required.

**Ecomiser** is the solution which has very high antirust capabilities. The photos below show the development of rust gathering on the test bars SPCC (steel) kept in beakers: the first with tap water, the second with ionized alkaline water and the third with **Ecomizer**. We have observed the development of rust in the beakers left in the room temperature for 8 days.



▲ Tap Water



▲ Ionized alkaline water



▲ **ECOMIZER**

- The next chart shows the corruption state we have examined, based on the test results by JIS(JISK0100)

(Temperature 25°C, for two weeks, immersion, mdd=mg/dm<sup>2</sup> · day)

Target Metal	<b>ECOMIZER</b>	Pure water	Average level
Spcc(steel)	0.26	0.65	<1.0
SUS(stainless)	<0.01	<0.1	<0.1
Aluminum	<0.1	0.19	<0.1
Copper	<0.01	0.19	<0.1

(Tokyo Metropolitan Industrial Technology Research Institute)

- Antirust effects depend on the amount of pH and dissolved oxygen.

The dissolved oxygen in **Ecomizer** is 3.76mg/kg (ppm) which is less than one tenth of pure water. Furthermore, when pH becomes bigger than 10.0, passive state membranes formed on metal surfaces will prevent corruption. These two powers will work at the same time and they are thought to prevent steels from rust.

# 5. Safety of ECOMIZER

- Based on OECD Guidelines for the Testing of Chemicals(1987), we have conducted safety confirmation tests for ECOMIZER

All the results from the tests confirm that Ecomizer is "non irritant." "Safety" is a very important factor. Nothing has been as safe as Ecomizer that has high cleaning and antirust capabilities.

- Evaluations of a variety of safety tests

N0.	Names of tests	animals
1	eye irritation test	3 rabbits
2	primary skin irritation test(Intact)	3 rabbits
3	primary skin irritation test(injured)	3 rabbits

(Japan Food Research Laboratory)

- Evaluation, results

Evaluation of Eye Irritation Test(longitudinal transition)

Test on animals	Evaluation per each observation hour			
	1 hour	24 hours	48 hours	72hours
①	0 (0)	0 (0)	0 (0)	0 (0)
②	0 (0)	0 (0)	0 (0)	0 (0)
③	0 (0)	0 (0)	0 (0)	0 (0)
Average Total	0 (0)	0 (0)	0 (0)	0 (0)
Eye Irritation Test Results	Non irritant (Test results in brackets)			

(Japan Food Research Laboratory)

Cutaneous test results

observation hour	Test on animal ①		Test on animal ②		Test on animal ③	
	Intact	injured	Intact	injured	Intact	injured
1 hour	0/0	0/0	0/0	0/0	0/0	0/0
24 hours	0/0	0/0	0/0	0/0	0/0	0/0
48 hours	0/0	0/0	0/0	0/0	0/0	0/0
72 hours	0/0	0/0	0/0	0/0	0/0	0/0

(Japan Food Research Laboratory)



# 6. Bactericidal effect of **ECOMIZER**

- ◆ The control of bacteria promotes the sanitary environment in a factory(or a facility) and prevents the bad smell.
- ◆ **ECOMIZER** instantly kills gram negative bacteria and mold. **ECOMIZER** has no effect for Bacillus. But it is effective for gram positive bacteria like MRSA. (3 hours <10)
- ◆ Bactericidal effect of **ECOMIZER** is considered to be in the level of low level disinfectant.

aerobic viable count results

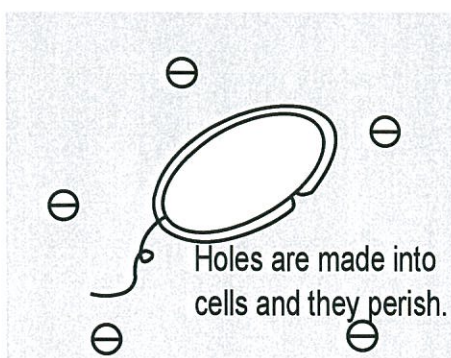
Test cells	Test liquid	viable cell count (/ml)			
		starting time	15 seconds later	3minutes later	
bacillus subtills	specimen control	$1.5 \times 10^8$ $1.5 \times 10^8$	$1.7 \times 10^8$ ***	$1.2 \times 10^8$ $1.8 \times 10^8$	bacillus subtills,subsptillis(NBRC3134)
Escherichia coli	specimen control	$4.3 \times 10^8$ $4.3 \times 10^8$	<10 ***	<10 $4.8 \times 10^8$	Escherichia coli(NBRC3972)
Pseudonas alruginosa	specimen control	$5.5 \times 10^8$ $5.5 \times 10^8$	<10 ***	<10 $4.9 \times 10^8$	P seudonas alruginosa(NBRC13275)
Salmonela enteritidas	specimen control	$6.0 \times 10^8$ $6.0 \times 10^8$	<10 ***	<10 $4.6 \times 10^8$	Salmonela enteritidas(NBRC3313)
Staphylocus auyeus	specimen control	$7.5 \times 10^8$ $7.5 \times 10^8$	$4.6 \times 10^8$ ***	$4.3 \times 10^4$ $6.0 \times 10^8$	(gram positive bacteria) Staphylocus auyeus(Ild1677)
Candida albicans	specimen control	$4.4 \times 10^8$ $4.4 \times 10^8$	$9.5 \times 10^8$ ***	<10 $4.1 \times 10^8$	Candida albicans(IFO1954)

control:purified water  
storage temperature:20°C  
<10 : not detected

(Japan Food Research Laboratory)

\* The starting time is based on the viable cell count following the addition of bacteria.

## ◆ Bactericidal mechanism

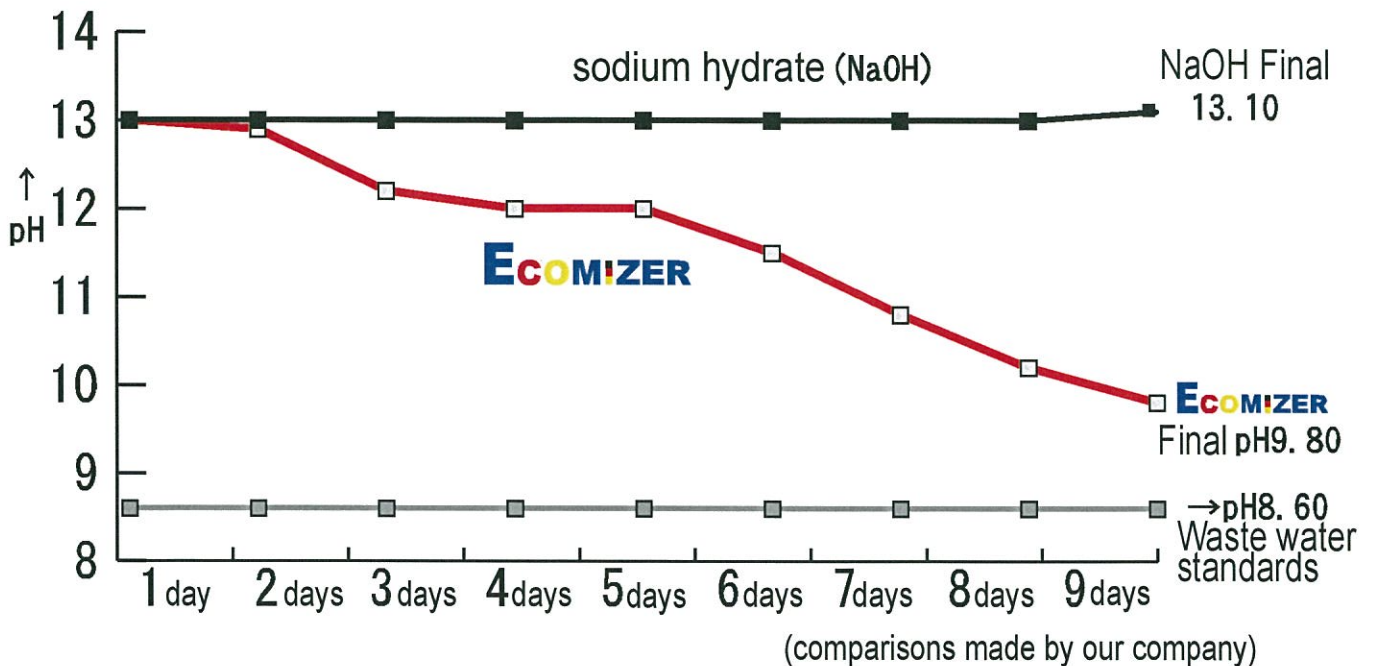


- The bactericidal mechanism of **ECOMIZER** is the same as the one of cleaning done by the powerful intermolecular gravity. **(electrical exfoliative effect)**  
In general, the mechanism is not based on OH radical or pH.

# 7. Recycle of **ECOMIZER**

**ECOMIZER** is solution that can be recycled.

**ECOMIZER** can be used without losing its capabilities for a few days when maintained properly in an oily water separator.



**ECOMIZER** is used for nine days (at 90°C).

When the detergency is compared with sodium hydrate, there is hardly any difference, however pH is greatly different.

**Ecomizer** is recyclable solution that is easy to drain. (The fact that the detergency does not change in spite of the pH being different indicates that the detergency is not entirely dependant on pH.)

For your reference, the dilution rates for **Ecomizer** and sodium hydrate required for waste water standards are shown below.

Regarding the conditions for adapting the waste water standards (pH8.6)

Diluted objects	<b>ECOMIZER</b>		sodium hydrate (pH13.0)
	pH9.8	pH13.0	
Tab Water (pH7.58)	About 3fold	About 1250fold	About 4500fold
<b>Biomizer</b> (pH2.0)	Less than 1/100fold	About 3fold	About 3fold

Biomizer is strongly acidic electrolytic solution developed by our company's technology.

## 8. Compatibilities of **ECOMIZER** with various materials

- These are the results based on the chemical corrosion resistance test. (JISK7114)

Please refer to this chart for the storage of **Ecomizer** and for washing with **Ecomizer**.

Categories	Symbols	Names	※Results
thermoplastic resin	PE	polyethylene	remains the same
	PP	polypropylene	remains the same
	PVC	polyvinyl chloride	remains the same
	POU	polyacetal	remains the same
	PC	polycarbonate	remains the same
	PET	polyethylene terephthalate	remains the same
	ABS	acrylonitrile-butadiene-styrene resin	remains the same
	※ acrylic		remains the same
	※ plastic		remains the same
rubber	※ silicone rubber		remains the same

※ The transformations after 7 days are measured by visual observation and the mass change.

(Aggregate Corporation: Kanagawa-ken Pharmaceutical Association Examination Center)

※ (comparisons made by our company)

### Compatibilities of **ECOMIZER** with metals

Metal category	conditions	Possibilities for uses (pH13.0 <b>ECOMIZER</b> )	Service condition
Aluminum	Corrosion	can be used for etching only	under pH8.5
Zinc	Corrosion	cannot be used	under pH11.0
Nickel	Corrosion	cannot be used	under pH11.0
Tin	Corrosion	cannot be used	under pH11.0
Lead	Corrosion	cannot be used	under pH11.0
Copper	protective covering	can be used	oxidized black in a long time (more than 6 hours)
Stainless	passive state	can be used	Not specified
Chromium	passive state	can be used	Not specified
Titanium	passive state	can be used	Not specified
Metal	passive state	can be used	Not specified

Please do not use **Ecomizer** for the above-mentioned metals, mixed metal and metal-coated objects.

## ◆ Compatibilities of **ECOMIZER** with other materials

Categories	Possibilities for uses	Service condition
Varnished items	cannot be used	Not specified
Items with clear coating	cannot be used	Not specified
Plated ware	cannot be used	Not specified
Genuine leather products	cannot be used	Not specified
Products made of silk or wool	cannot be used	Not specified
Lacquer craft	cannot be used	Not specified
Glass	cannot be used	usable by dilution (under pH11.5)
Car Wax	cannot be used	usable by dilution (under pH11.5)

There are items that can be washed with diluted **ECOMIZER**. Please read the User's manual.

## 9. Specific uses of **ECOMIZER**

◆ The comparison is made between **ECOMIZER** and other detergents.

As shown below, **ECOMIZER** is superior in many aspects.

Detergent	Item	Cleaning capabilities					Safety		economical efficiency	
	Categories	Cleaning capabilities	Antirust effects	Rinse	residual dross	Dry	Human body	environmental control	Running cost	waste fluid
<b>ECOMIZER</b>		◎	◎	◎	◎	△	◎	None	◎	◎
Strong Alkali Electrolytic water of other companies		△	◎	◎	◎	△	◎	None	○	◎
NaOH(sodium hydrate)		△	△	△	○	△	△	effective	○	△
trichloroethylene		○	△	△	○	◎	×	effective	△	△
hydrocarbon solvent		○	○	△	○	◎	×	effective	△	△
Water		×	×	◎	◎	△	◎	None	◎	○
interfacial active agent		○	○	△	○	△	△	effective	○	△

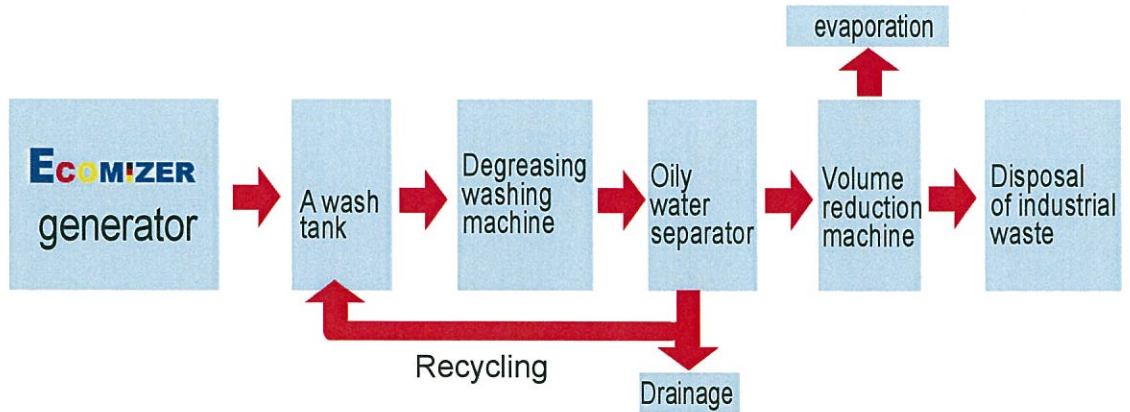
◎ Very good functions or capabilities ○ Good △ Inferior Functions or capabilities × cannot be used

(Tokyo Metropolitan Industrial Technology Research Institute)  
(Incorporated foundation: KITASATO Research Center of Environmental Sciences)

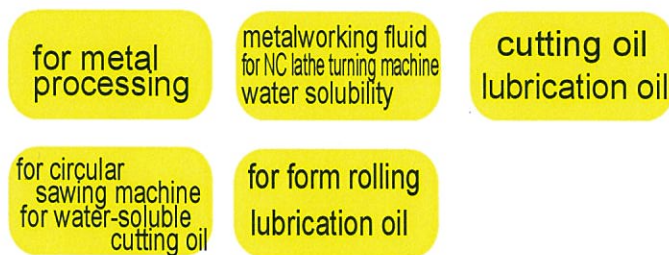
**ECOMIZER** can realize the **total cost reduction.**  
**environmentally-friendly society.**  
**improvement of your work environment.**

# 1. The Application of **ECOMIZER** in the industrial field.

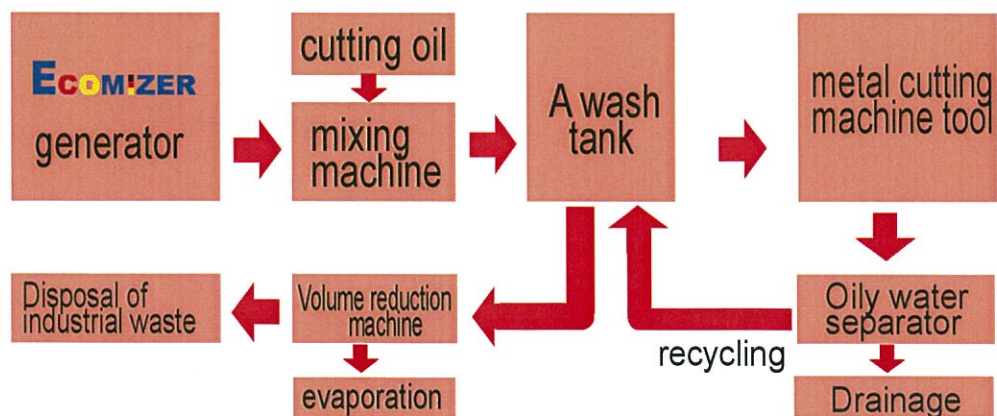
**A** **ECOMIZER** can be used as detergent (solution).



**ECOMIZER** (pH13.0) can be used as a substitute for processed oil.



**ECOMIZER** can be used as dilution water for water-soluble cutting oil.



※ For dilution, please use the concentrate solution of pH13.0 or tenfold-diluted **ECOMIZER** with water.

## D The introduction of **ECOMIZER** will give you a big cost reduction.

The chart below shows the comparisons of degreasing process for galvanization in an overseas factory. **Ecomizer** is introduced to be in accordance with the environmental quality standard. However **Ecomizer** can also realize a big cost reduction.

Items	<b>ECOMIZER</b>		Improvement
	※ Before Introduction	After Introduction	
Amount of degreasing agent	8,160kg	0	100%
Amount of antirust	2,400kg	0	100%
Amount of rinse	600tons	120 tons	80%
Amount of waste fluid disposal	<sup>(7.0 tons)</sup> 7,000 liters	<sup>(2.6 tons)</sup> 2,600 liters	62%
a number of times for cleaning the detergent tank	12 times	4 times	66%
Amount of drainage	4,800 tons	720 tons	70%

(1 line/year)

※ Before the introduction of **Ecomizer**, sodium hydrate and surface-active agent were used for washing process.

## 2、 Applications of **ECOMIZER** in the field of medicine

Because of **Ecomizer**'s high "degreasing capabilities" "Antirust" "bactericidal effect" and "safety" **Ecomizer** is used in many hospitals and clinics. (in more than 100 locations in Kanto Area) **Ecomizer** is mainly used for cleaning and sterilizing endoscopes.

**We now need strong detergent and bactericide that are "safe" and "environmentally-friendly."**



▲ Full automatic endoscope washing machine



▲ Mini endoscope washing machine

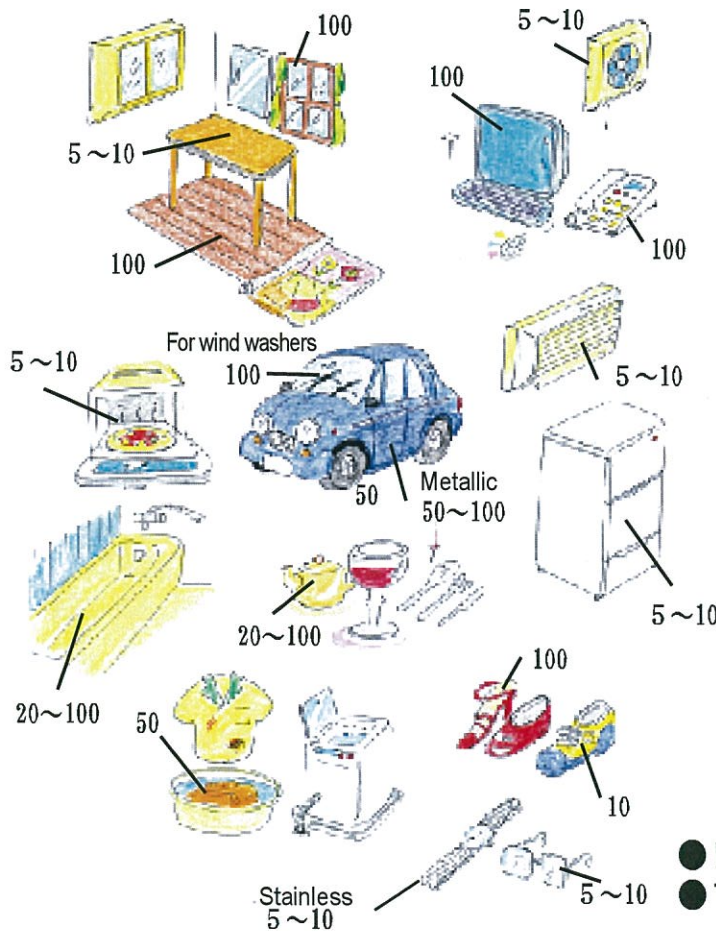
### 3、 The application of **ECOMIZER** in the field of foods.

**Ecomizer** can replace washing by sodium hydrate(kalium) and surface-active agent.(especially effective for getting rid of oil, protein and fat)

Where <b>Ecomizer</b> was used	How <b>Ecomizer</b> was used
Wash the interiors of a machine	concentrate solution or twofold
Pipe cleaning	idem
Washing appliances and tools	50-100 fold
Cleaning floors or grease traps	concentrate solution or twofold for grease traps, 50-100 fold for others
Cleaning clothes	50 fold
Cleaning fryers or greasy places	concentrate solution or twofold

### 4、 Other uses

**Ecomizer** should be diluted when it is used for the followings:(in general)



#### pH and dilution rates

When there is one-point difference in pH, dilution rate is 10 times bigger.  
 When there is two-point difference in pH, dilution rate is 100 times bigger.  
 When there is three-point difference in pH, dilution rate is 1000 times bigger.

pH	actual rates
0.1 difference	about 1.2 times bigger
0.2 "	about 1.6 times bigger
0.3 "	about 2.0 times bigger
0.4 "	about 2.5 times bigger
0.5 "	about 3 times bigger
0.6 "	about 4 times bigger
0.7 "	about 5 times bigger
0.8 "	about 6.3 times bigger
0.9 "	about 8 times bigger
1.0 "	about 10 times bigger

- **Ecomizer's** average density is pH13.0.
- The numbers indicate the dilution rates.

## ■ Penetration power test with tea leaves



Oolong Tea leaves kept for 5 minutes in **Ecomizer**  
(pH13.0 strong alkaline electrolytic solution) and tab water.

Left: **Ecomizer** Right: Tab water

**ECOMIZER** is considered to possess high electrolytic power and be extremely active.

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¥1,000 (tax included)

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