

Presented by AQUAQUICK GLOBAL B.V

# AQUAQUICK 2000<sup>®</sup>

"We will clean the future"



**AQUAQUICK GLOBAL**

WE PROVIDE A **CLEANER** ENVIRONMENT

# Introduction

AQUAQUICK 2000



The producers of the AQUAQUICK products originated from a company called TKF (Twentsche Krijt Fabriek), which was founded in 1957. At that time the most important products were various kinds of chalk, like school board chalks and textile marking chalks. The well known yellow coating on school board chalk was an invention of TKF. Another invention was GARBOSOL, a patented textile marking chalk which was easily removable with water. GARBOSOL was sold worldwide.

Reacting on demands out of the market for environment- and user friendly cleaning products, the inventor Mr. Henri de Vries, developed AQUAQUICK 2000 in close cooperation with the University of Twente. In 1988 RIBARO bv was established especially to market and produce the AQUAQUICK products. Since then the AQUAQUICK products have been tested and examined on a regular basis in numerous independent international research institutes.

This wide range of approvals and certificates guarantees that the AQUAQUICK products are completely safe for environment and user. Since 1998 AQUAQUICK 2000 is market leader in the Netherlands for the Dutch Fire Brigades (Cleaning road surfaces after oil spills)..

The AQUAQUICK products have been developed by paying particular attention to the physical and biological processes that make it possible to form a micro-emulsion with and stimulate the biodegradation of hydrocarbon.



Safe for users

Safe for the  
Environment

Good cleaning result





In 2003, PT AQUAQUICK ASIA was established in Indonesia, to market the AQUAQUICK products in Asia, Australia and New Zealand. In 2004 PT AQUAQUICK ASIA opened a blending factory in Jakarta – Indonesia. Indonesia accomodates many oil companies and it is important to have a factory in Indonesia to be able to supply the oil companies fast. Nowadays the local blending in Indonesia is being done by PT Catur Inti Chemical, our distributor for Indonesia.

The AQUAQUICK products will realize considerable saving of costs because of their excellent cleaning and degreasing capabilities in combination with environment friendliness. AQUAQUICK always has to be diluted with water before use. Dilution rates vary from 1:50 up to 1:600 depending on water temperature and pressure/mechanical force.

AQUAQUICK 2000 is odorless and colorless and thanks to its special composition gives no specific health risks. Furthermore special protective clothing is not required and while using the products under high temperature (high pressure cleaners, degreasing baths, etc.) there are no harmful vapors.

# TECHNICAL DATA

No	Samples	Oil Content (mg/L)	Oil Content	Microbial Population
			% reduced	
		HEAVY OIL		
1	Day (0)	4385.33		4.300.000
2	Day (8)	2936.70	-33.03	138.000.000
3	Day (14)	2352.00	-46.37	160.000.000
4	Day (21)	2026.00	-53.80	130.000.000
5	Day (28)	1962.00	-55.26	62.000.000
		LIGHT OIL		
1	Day (0)	4200.00		12.700.000
2	Day (8)	2412.70	-42.55	150.000.000
3	Day (14)	1566.00	-62.71	80.000.000
4	Day (21)	1539.30	-63.35	16.000.000
5	Day (28)	1472.10	-64.95	12.000.000

AQUAQUICK 2000 is a revolutionary, water based cleaning product, that is composed out of ecological materials and plant extracts. The product is very suitable for the elimination of all animal, vegetable, synthetic and mineral oils and greases (hydrocarbons) in a 100% environment friendly way. AQUAQUICK 2000 contains special nutrients that create an explosive growth of the bacteria en microorganisms that are present in the environment. These bacteria require a carbon source for their metabolism process. Therefore these bacteria are capable in converting the AQUAQUICK / hydrocarbon emulsion in a biological way in to harmless components such as CO2 (carbon dioxide), H2O (water), Biomass and energy.

This is an aerobe (consumption of oxygen) process. Thanks to the special composition of AQUAQUICK 2000, it is harmless in use and does not cause any particular health risks. In the minimum dilution rate (2%), AQUAQUICK 2000 is to be considered as non-toxic to aquatic organisms (IMO regulations). Also AQUAQUICK 2000 does not affect or damage metals, plastics, paints, coatings, rubbers, etc. Before use, AQUAQUICK 2000 has to be diluted with water (both fresh and sea water can be used) in a dilution rate from 1:50(2%) up to 1:600 (0,17%).

Subject	TECHNICAL DATA AQUAQUICK 2000.
Form	Liquid
Color	Transparent (slightly yellowish)
Odor	Odorless
Viscosity	25 sec. (Din cup 4-20 °C
Specific mass	1.018
Ph. Value	4,3 to 5,0
Solidification point	<0°C
Vapor tension	2300 pa
Explosion limit	n.A
Rel. evaporation temp.:	127°C
Flash point	n.A
Spont. Comb. Temp.	n.A
Mac value	n.A
Toxicity	LD50 >5g/kg (oral rat)
Biodegradability	96-100% <21 days



# TECHNICAL DATA



AQUAQUICK 2000 SP is an user and environment friendly cleaning product which is very suitable for the removing and cleaning of all mineral, vegetable, animal and synthetic, oils and greases (hydrocarbon). Opposite to AQUAQUICK 2000, AQUAQUICK 2000 SP does not accelerate the biodegradation of hydrocarbon pollutions.

AQUAQUICK 2000 SP is a fast splitting surfactant/degreaser that has been developed for situations where the wastewater is being drained in to the sewage system or environment while using a grease/oil separator. The product has been tested and is approved by TUV in Germany, who concluded that AQUAQUICK 2000 SP meets the guidelines regarding the German regulations and requirements for fast splitting cleansers and measures for biodegradability and bioaccumulation.

Subject	TECHNICAL DATA AQUAQUICK 2000.SP
Form	Liquid
Color	Transparent (slightly yellowish)
Odor	Odorless
Viscosity	20 sec. (Din cup 4-20 °C
Specific mass	1.016
Ph. Value	8.0 to 8.5
Solidification point	<0°C
Vapor tension	2300 mbar/2300 pa
Explosion limit	n.A
Rel. evaporation temp.:	>127°C
Flash point	n.A
Spont. Comb. Temp.	n.A
Mac value	n.A
Toxicity	LD50 > 12g/kg (oral rat) LC50: >1000mb/1 (LC50, diluted product
Biodegradability	96-100% <21 days



# PRODUCT BENEFITS

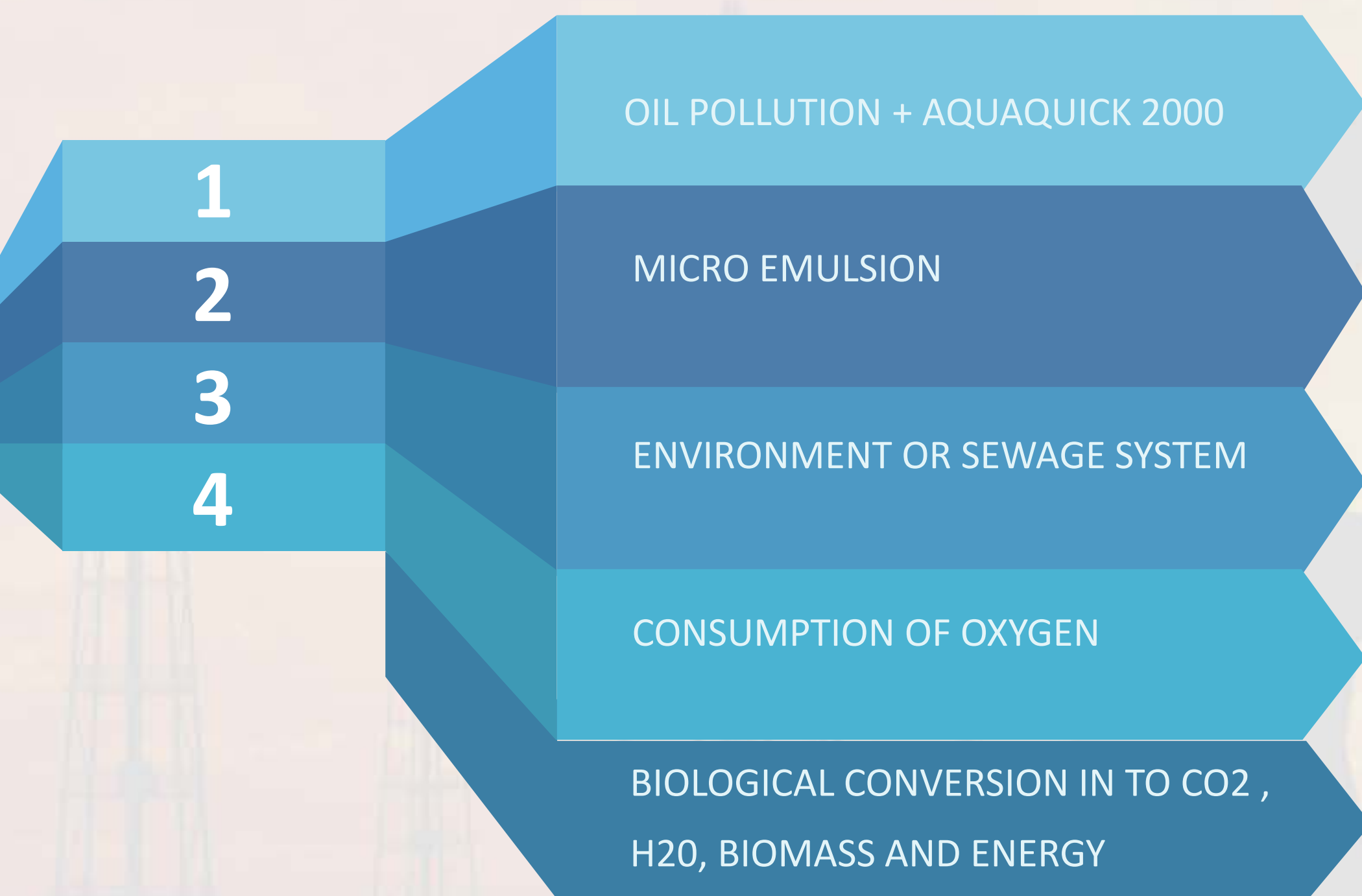


## BENEFITS OF AQUAQUICK 2000

- ✓ Multi functional degreaser.
- ✓ Suitable for all hydrocarbon combinations.
- ✓ No affection or damage of metals, plastics, coatings, rubbers, etc.
- ✓ Totally ecological.
- ✓ 100% biodegradable (remains: CO<sub>2</sub> and H<sub>2</sub>O).
- ✓ User friendly.
- ✓ No special safety precautions required.
- ✓ Decrease of explosion danger of fuels (AQUAQUICK 2000 only).
- ✓ Reduction of chemical waste.
- ✓ Accelerated biodegradation of pollution (AQUAQUICK 2000 only).
- ✓ Energy and cost saving.
- ✓ Non-flammable.

## POTENTIAL CUSTOMERS

- ✓ Oil refineries
- ✓ Oil rigs
- ✓ Oil spill dispersant (both on land and sea)
- ✓ Cleaning of storage tanks
- ✓ Metal industry
- ✓ Garages/workshops
- ✓ Shipyards
- ✓ Mining
- ✓ Food industry
- ✓ Hotels and restaurants
- ✓ Fire brigades
- ✓ Public works department
- ✓ Water purification plants
- ✓ Railways
- ✓ Defense
- ✓ Soil cleaning
- ✓ Soil remediation
- ✓ Landfarming,



**When AQUAQUICK** is used in controlled systems like degreasing baths, rinsing systems, industrial washing machines, etc., the oil remains can be skimmed of the surface after a certain rest period. The remaining water can be drained away in to the environment or sewage system as long as this complies with the local governmental regulations. This method will reduce the chemical waste easily by 90%. While diluting AQUAQUICK, water should be added first before adding AQUAQUICK to prevent the building of foam.

**Saturation point:** Because AQUAQUICK 2000 is waterbased its saturation point lies much higher than the saturation point from conventional solvents.

**Vapors:** If AQUAQUICK 2000 is being heated or added to degreasing baths with hot water, no toxic fumes will occur.

**At request** AQUAQUICK EUROPE, can supply practical dosage pumps, that guarantee that the right dilution rate is always being used, and that prevents over-dosage. This KIWA certified systems are suitable for both cold and hot water. The AQUAQUICK products, may never be mixed with other cleaning products, because of the possibility of reactions between AQUAQUICK and certain active, aggressive ingredients and base substances of other products. Also it is possible that AQUAQUICK will lose its cleaning capabilities after it has been mixed with other products.

# AQUAQUICK DETAILS



The AQUAQUICK products always have to be stored FROST-FREE.

Once frozen ( $< -3^{\circ}\text{C}$ ), AQUAQUICK can lose specific properties that are vital to the unique AQUAQUICK cleaning and biodegrading process.

To remove hydrocarbons with a melting point (i.e. frying fat, butter, paraffin, etc), AQUAQUICK should always be used in combination with water with a temperature above the melting point of the hydrocarbons.

The hydrocarbons should be softened or liquefied using this temperature.

Because AQUAQUICK 2000 breaks the molecule structure of the hydrocarbons, the dissolved hydrocarbons will not coagulate in the wastewater.

## CHEMISTRY

There are numerous cleaning and purifying products on the market, (popularly) called chemistry, Almost every cleaning product contains surface-active agents, also called detergents, reducing the surface tension of the water.

The working method of these products is based on the polar and a-polar actions of these substances. Water is a dipole and can make a solid compound with other substances. This is called hydration. The molecules of these compounds contain a short piece that is water soluble (hydro file), and a long tail which is not very soluble in water (hydrophobic), but very good soluble in oil-like substances. The hydrophobic part has a tendency to dissolve or to combine with hydrophobic parts like oils, greases, waxes, solvents and some synthetics/plastics.

The hydrophilic part connects with water molecules, and the hydrophobic part connects with the oil molecules. This results in the removal (solving) of the hydrocarbon pollutions. This is called a short-term emulsion. The hydrocarbon separates from the emulsion (mostly in less than 5 minutes) and comes back in its original form.

The problem is being replaced, but not solved,





## Project name

The **Composition** of most of the cleaning products are based on strong alkali components, like sodium hydroxide, sodium carbonate, sodium meta silicate (ph 10—14). These substances are blended with water and surface-active substances which we can divide in four groups:

1	Ariiogene anionics (alcohol sulphates,alkyl benzene sulphates alkane sulphates, alcohol ether sulphates_
2	Kationogene cationics (alkyl ammomium composites, quats() imidazolinederivates).
3	Nonionegene 110thOtliCS (alkylfenoletoxylates alcoholetoxylates).
4	AM fotere amphoteric (betaines, sulfobetaines, amineoxides).

Anionic substances are the most used. The hydrophilic parts gets a negative electrical charge regarding the hydrophobic part Soap belongs to this group of substances.

Cationic substances have the opposite charge. Here the hydrophilic part is positive charged regarding the hydrophobic part. For cleaning products this group is less important They are mostly used for disinfectants (quats) and in fabric softeners for the textile cleaning.





**Non-ionic** substances are very important in cleaning products, especially in combination with anionic substances. Amfotere substances can act like anionics or cationics, depending on the circumstances (such as the degree of acidity of the solution). Because a number of these substances are skin-friendly, you can find these in baby shampoos and other products. Some types have disinfecting properties.

In the last decades, the use of cleaning products in industrialized countries has increased considerably, resulting in huge water stress Non-biodegradable products caused this. The biodegradability of the current surface-active substances has improved significantly, but this does not necessarily mean that they are less poisonous/toxic, or that for example no harmful residual substances can be formed.

The legal standard to call a product (cleaning product) biodegradable is that it has to be biodegradable for minimum 80% in maximum 28 days.

Biological degradation of AQUAQUICK 2000 and AQUAQUICK 2000 SP:	
Water purification plant:	100% <60 minutes
Environment (surface water fresh or salt)	96 – 100% <21 days

Some surface-active substances, like alkylfenoletoxylates, have an oestrogenic effect on fish and shellfish and are more and more being replaced by alternatives that don't have this harmful effect.





Theoretical aspects of the AQUAQUICK products:

The AQUAQUICK products have been developed, by paying particular attention to the biological and physiological processes and bioaccumulation (the accumulation in body tissue) in the environment.

The two main products have been developed for various applications:

AQUAQUICK 2000 biological dispersant / surfactant / degreaser.
AQUAQUICK 2000 SP multifunctional degreaser / surfactant.

Both products have the following properties:

Completely biodegradable
Not affecting / damaging metals, plastics, coatings, paints, rubber, etc
Safe for skin and eyes (dermatological tested)
Suitable for all cleaning systems (maximum water temperature 140 ‘Q
No harmful fumes when heated
Unlimited shelf life
Energy and cost saving
Non-flammable
Multi functional degreasers
Suitable for all hydrocarbon pollutions (animal, vegetable, mineral, synthetic

AQUAQUICK 2000 (biological process).

AQUAQUICK 2000 is a biological surfactant/dispersant/degreaser that creates a micro emulsion by breaking the molecule structure of the hydrocarbon molecules.

AQUAQUICK 2000 makes a dispersion of all animal-, vegetable-, mineral- and synthetic hydrocarbons, like oils, greases, fats, fuels, etc. The product also contains a blend of special nutrients which makes sure that the microorganisms and bacteria, present in sewage system and environment, grow explosively and completely biodegrade the emulsion of AQUAQUICK and hydrocarbon pollution in to harmless substances like CO2, H2O, Biomass and energy,





In other words, AQUAQUICK 2000 accelerates the biodegradation of hydrocarbons.

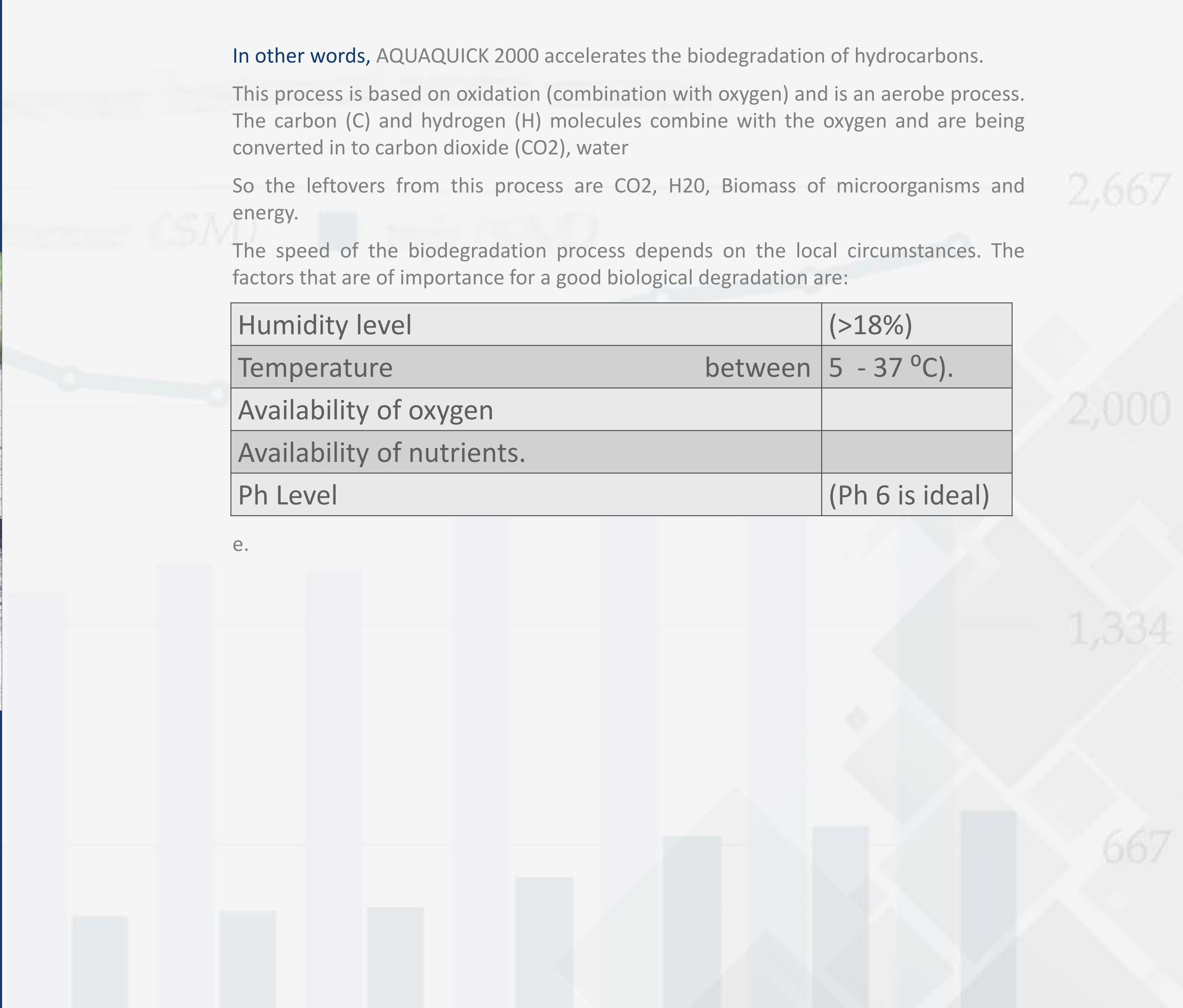
This process is based on oxidation (combination with oxygen) and is an aerobic process. The carbon (C) and hydrogen (H) molecules combine with the oxygen and are being converted into carbon dioxide (CO<sub>2</sub>), water

So the leftovers from this process are CO<sub>2</sub>, H<sub>2</sub>O, Biomass of microorganisms and energy.

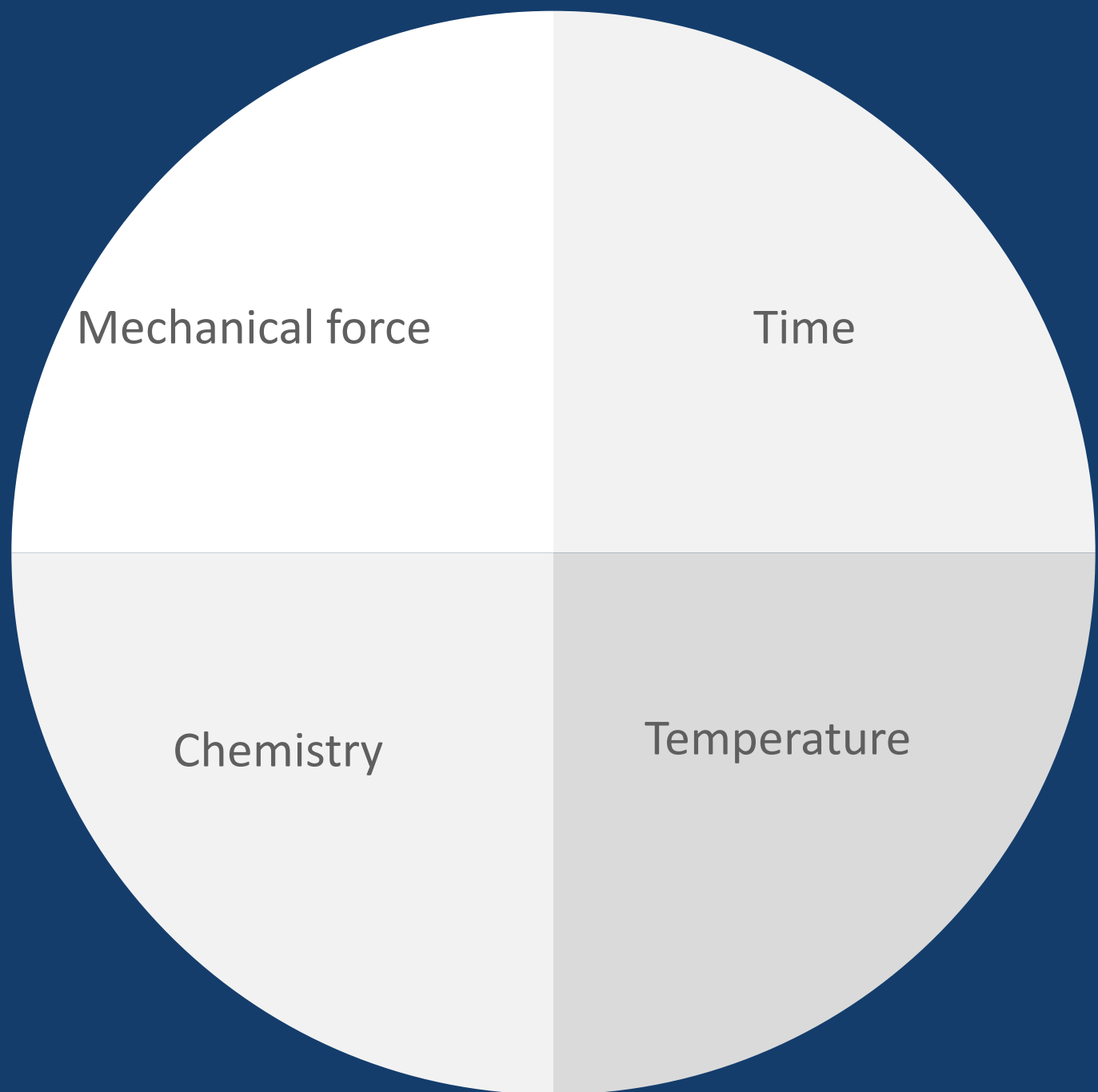
The speed of the biodegradation process depends on the local circumstances. The factors that are of importance for a good biological degradation are:

Humidity level	(>18%)
Temperature	between 5 - 37 °C).
Availability of oxygen	
Availability of nutrients.	
Ph Level	(Ph 6 is ideal)

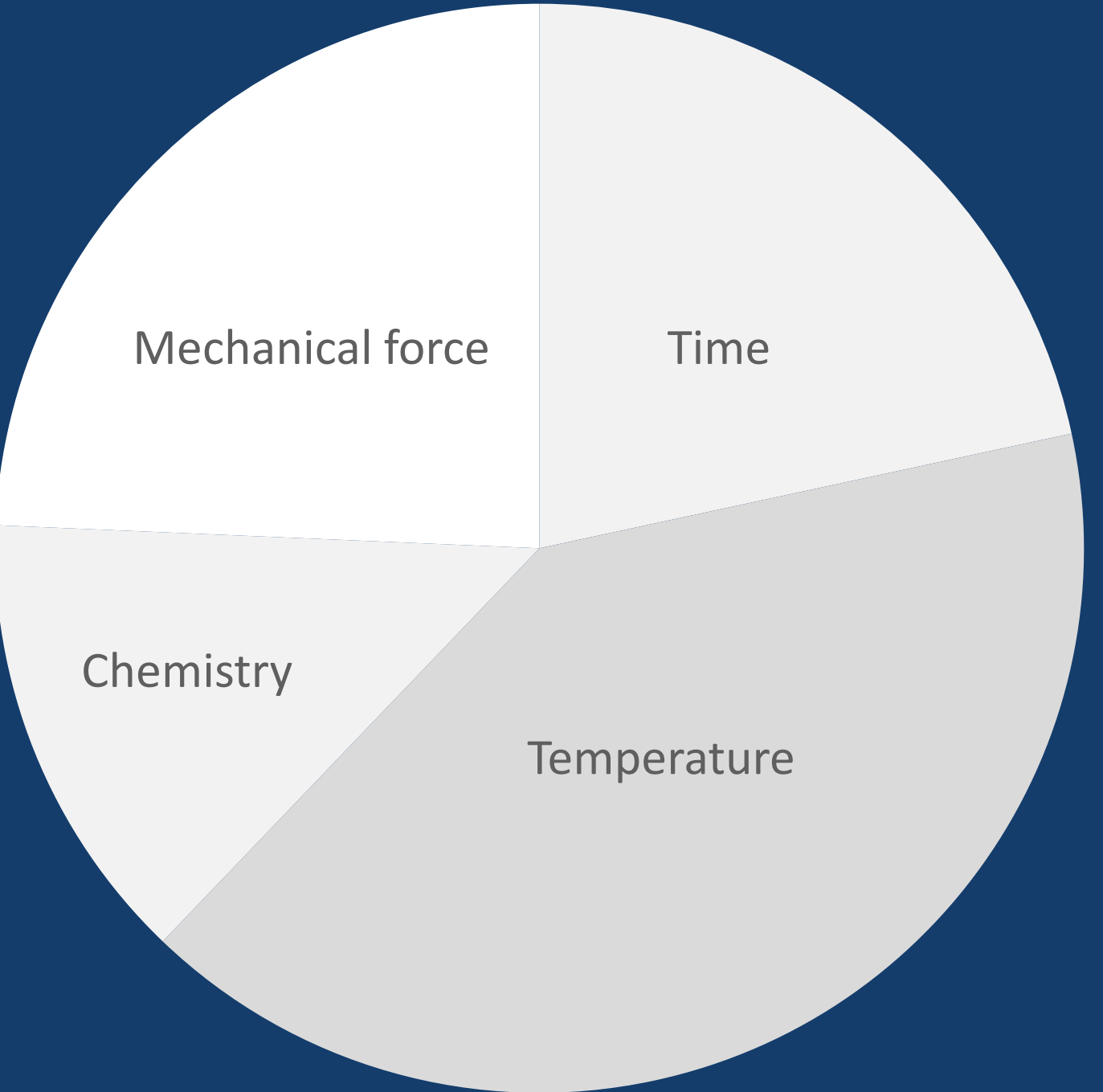
e.







Circle of Sinner.



Cleaning methods.

Temperature and mechanical force have a huge influence on the cleaning efficiency and dilution rates.

Cleaning Circle of Sinner.

According to the physicist Sinner, four factors are qualifying for the cleaning result, namely: Chemistry, Mechanical Force, Time and Temperature.

By adjusting these factors for each different cleaning job, the best combination is being used to obtain the best possible cleaning job.

Once the Mechanical Force and Temperature are being increased, the Chemistry and Time will become less.

The dosage of AQUAQUICK (cleaning products) is also determining the cleaning result. An advise-dosage is given on the label and the matching product information. With the wrong dosage an insufficient result will be obtained. Using a too high dosage can cause foam building and will not improve the cleaning quality.

Practice will show that some waiting time after application before the product becomes active is only required when AQUAQUICK is used on old pollutions, that already have been absorbed by the surface (Floors, paving, etc.). With high water temperatures (>60° C) the dilution rate should be at least doubled. The use of mechanical force like high pressure or brushing also has a positive effect on the dilution rate. Using mechanical agitation will increase the dilution rate considerably. The combination of temperature and mechanical force is the most ideal. This will give the highest dilution rates.

Example:	Temperature Cold	>60 ° C:	>100° C
Manual:	1:50	1: 80	1: 100
Mechanical force	1:100	150:250	1:300/800



## Biodegradation

### Biodegradable hydrocarbons

This subject is particularly intended for AQUAQUICK 2000 applications, because only this product is capable of accelerating the biodegradation of hydrocarbon pollutions.

Microorganisms are the smallest single-celled living organisms, also called microbes. Bacteria, funguses, yeasts, and algae belong to this group\_ But also the lowest form of animal life, the protozoa.

The formed dispersion (micro emulsion) of AQUAQUICK 2000 and hydrocarbon pollutions will be completely biodegraded in the environment and sewage systems bacteria and microorganisms like:

**Micrococcus, Pseudomonas, Cornyebacterium, Nocardia, Flavobacterium, Alcaligenes, Arthrobacter, Achromobacter, Vibrio, Acinetobacter, and Bre vibacteri um.**

These bacteria are capable of full biodegradation of hydrocarbons and convert them into harmless substances like CO<sub>2</sub>, and H<sub>2</sub>O. Saturated hydrocarbons and unsaturated hydrocarbons are relatively easy biodegradable in comparison with strongly branched and cyclical compounds. Hydrocarbons with a chain length between 6 and 16 will be most quickly biodegraded in comparison with longer chains.

The speed of the biodegradation (in this case oxidation) will be influenced by the local conditions like accessibility of oxygen, acidity level (ph 6 is ideal), humidity level, temperature and nutrients.

AQUAQUICK 2000 contains a blend of nutrients like plant extracts, which create an explosive growth of bacteria. The micro emulsion parts are sized about 3 microns ( 1 millimeter — 1000 microns). The bacteria are sized between 2 — 10 microns and can oxidize and convert ("eat") the formed emulsion. Because of this effect, the natural biodegradation process will be accelerated considerably.

AQUAQUICK 2000 has a shelf life of minimum 3 years. After these 3 years the performance of the AQUAQUICK products will decrease.

Citric acid is a medium level organic acid that is being used more and more for cleaners and degreasers because of its outstanding biological degradation and ecological properties. The Citric Acid that we are using in our AQUAQUICK products is the same Citric Acid that Coca Cola is using in its Coca Cola.





## Conclusion

After-word.

It is impossible to discuss all aspects on cleaning and purifying in detail.

Not all technical data and research results are listed in this manual.

We assume that the reports and statements are known by the people who sell or market the AQUAQUICK products.

Finally, the most important issue for economizing in the cleaning branch is working hours. This is where the largest saving can be found. As you can see in the small table below, purifying cost exist of working hours for almost 90%.

Use of cleaning products	3-6%
Working hours	87-90%
Bureau and overhead	3-6%
Investment	2%