Control of microbiological water quality in drinking water distribution networks
(*biofilm, planktonic bacteria*)

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Assessment of microbiological risks and water safety management using a new tool of ATP-metry
INTRODUCTION

The **microbiological quality of drinking water** may significantly deteriorate during transport in the distribution networks, in particular because of **bacteria present within biofilms** that inevitably **develop on the internal** surface of pipes and other equipment.

The aqua-tools company specializes in sales of kits dedicated for a true **quantification of total biomass**, in training programs for **Risk Assessment from potable water up to reuse water** to prevent health risks, and control **audits** of biological activity in all facilities.

This new diagnostic tool allows the quantification of active biomass by a **new generation of ATP measurement** in any type of water providing results in 6 minutes in the field.

OVERVIEW

The drinking water **distribution networks** are constantly seeded with a population of microorganisms (bacteria, fungi, protozoa...) coming from both:

- Source water (surface water contains an average of $10^7$ to $10^8$ cells)
- Tanks, ruptures and repairs on the network.

Some of these microorganisms find systematically, inside networks, conditions allowing their proliferation, **despite the presence of chlorine disinfectants**, which cannot under their conditions of use **inactivate all microorganisms** within the distribution system.

In most drinking water, the frequency of isolation of bacteria indicator of fecal contamination (Escherichia coli, Streptococcus faecalis) is extremely low because one of the aims of the treatment is to eliminate them.

Also **dominant and indigenous flora of networks** is represented by a population of **heterotrophic microorganisms** (Pseudomonas, Flavobacterium, Aeromonas, Acinetobacter...) mainly associated to the wall of the **network (biofilm)**.
**AQUA-TOOLS’ SOLUTION:** The Quench Gone Aqueous™ kit, (QGA™)

The development of rapid measurement (less than 6 minutes) and the effectiveness of water disinfection is important where traditional methods require both time (24 to 72 hours) and also have a low response rate (cultivable bacteria only).

A self-monitoring with QGA kits based on a new generation of ATP quantification - Adenosine triphosphate (results expressed in equivalent bacteria) will cover all microorganisms in the entire distribution system, including:

- ground and surface water sources,
- treatment stations,
- reservoirs,
- and distribution networks.

These field measures will help you to establish a microbiological mapping of the distribution network, and a selection of critical points (Area polluted, presence of biofilm, stagnant water, corrosion…) to be monitored, in a regular way, as a part of preventive measures.

**BENEFITS**

This tool is the first line of defense in a HACCP-type program strategy for water security and maintenance of your networks. It is an excellent complement to your regulatory analysis.

Assessment of a monitoring plan with preventive measures are on line with:

- The management of water resources, control of production & distribution of drinking water, maintaining networks Standards ISO 24510, 24511.24512
- The control of biofilm formation with materials in contact with water

**CONCLUSIONS**

Today, all professionals involved are aware that the distribution network of drinking water should be understood as an equal to a biological reactor, controlled and monitored, in order to limit as much as possible the alteration of water and water/materials interactions.
The risk assessment of the microbiological quality of a network, reducing the risk of incidents related to sanitary water consumption, reducing concentrations of oxidizing products, are as many key elements that run through the use of the QGA kit of fast control allowing preventive actions.

**THE 1st MONITORING TECHNOLOGY FOR CONTROL OF ACTIVE BIOMASS IN REAL TIME**
Second generation of ATP metry technology

**Cooling tower, sanitary network, process water, biofilm, drinking water, recreational water, natural water, recycling water**
- Improve treatment efficiency on viable culturable or not culturable microorganisms
- Optimize concentration, frequency and injection points for biocides
- Identify polluted zones and risk areas
- Verify discernment of cleaning actions on fixed biofilm
- Control of disinfection processes
- Monitor and stabilize quality of water networks

**Biological treatment of waste water**
- Quantify active biomass and measure the biomass health
- Detect toxicity of any influent
- Improve process stability
- Reduce operational costs

Our way to manage sanitary risks and improve environmental conformity.