2010 EDITION

GIRPI

INFOS

# Water quality in Europe

*Legionella and pseudomonas problems*

*Network diagnosis*

*Regulations and studies*

*The High Environmental Quality approach*

*Synthesis and solutions*

# CONTENTS



# Editorial

Water has now become an important factor in public health and sustainable development. It is essential to life but it also carries many diseases.

Political leaders and professionals in the water industry in France and all across Europe have become aware of the need to protect this resource. The French government has made the campaign to control legionella and other bacteria that develop in water a major objective. The "legionella" enactment dated 1st February 2010 is one specific example. New standards have also been set up for the different types of buildings open to the public.

The general public and professionals have the same essential need for information. Thus, practical guides have been published to improve knowledge and prevention. Everyone concerned in the water industry (tourism professionals, plumbers, material manufacturers, etc.) is now pulling in the same direction in an effort to solve this problem, including carrying out research and taking action to limit risks. New and safer materials are appearing to prevent risks of proliferation of these bacteria.
Therefore, a multi-facetted effort is the only way to achieve the defined objective of eliminating all pathogenic bacteria.

Enjoy your reading.

GIRPI
*safety for your pipeworks*


## *Contribution acknowledgements*

***Dr Colette GODARD***
Manager of the Besançon CHU (Universal Hospital Centre) water analysis laboratory associated with the Institut Pasteur National Reference Centre for the study of Pseudomonas aeruginosa

***Rachid AINOUCHE***
La Roche Posay Spa Manager
Secretary of the French Hydrothermal Techniques Association

***Julien LIRONCOURT***
HYDROTHERM Engineering design office – assistance treasurer at the French Hydromineral Techniques Association

***Patrick PARIS***
ANTAGUA expertise design office - President of the CAPRIS association

***Patrick LIZIN***
Vigotech AKATHERM

***Laurent FOUILLET***
SPIE centre-west climatic engineering development manager

***Christophe JADAUD***
Isateg Atlantique

***Alex ANDERSON***
ROTARY INTERNATIONAL Engineer

***Victor BORG***
Technomedical Engineer (Estates & Facilities)
Technical Services Department Gibraltar Health Authority

***Dominique BOURGOIN***
Holiday Inn Marseille Technical services manager



# Water quality in networks

***Proliferation of bacteria in water networks can become a major health risk, particularly for persons with poor health.***
***The European Union decided to give a boost to a more consistent water policy as early as 2000 through the Water Outline Directive that set the target for each Member State to achieve impeccable water quality thresholds by 2015.***
***63 parameters now control European water quality.***

## Legionella

### *Water bacteria, legionella and pseudomonas can cause serious infections.*

Several legionella outbreaks are identified every year in different buildings open to the public in France and across Europe.

Most cases occur in hospital centres, retirement homes, convalescence homes and spas, while others affect persons who have been travelling.

> About 6 000 cases of legionellosis are diagnosed in Europe every year.

About 6 000 victims are diagnosed in Europe every year, but the distribution is unequal in different European countries: **there is 1 case of legionellosis per 100,000 persons in France, while the value for Europe as a whole is only half this number.** Denmark has 1.7 cases, making it the most affected European country, although it has a very good diagnosing and monitoring system.
Monitoring of this fatal pathology has been reinforced in order to detect outbreaks and to be able to take appropriate measures.

Legionellosis is a serious pneumopathy that affects the most vulnerable persons in priority. **It is caught by inhalation and not by ingestion.**

It is caused by a bacteria, legionella, that has always existed in water. **It proliferates in water circuits in which the temperature oscillates between 25° and 45°C** (domestic hot water and air conditioning circuits).

The legionella bacteria develops and fixes in the presence **of high concentrations of lime, magnesium, metallic residues and sludge,** usually originating from **corrosion and scaling.**

Domestic hot water production and air conditioning networks may be the source of a problem when they are **obsolete, badly maintained, corroded and scaled. They can then become genuine sources of bacterial attachment and proliferation.**

## Pseudomonas

These bacteria live in fresh water, moist soils and plants. They develop at **between 4 and 43°C and easily colonise domestic cold water networks containing stagnant water.**

They act as cross infection germs in vulnerable patients. They are one of the most frequently isolated bacteria involved in nosocomial infections.

### *How do these bacteria enter a water network?*

- Through the meter
- By retro contamination
- Due to pollution (dirty tubes on site)
- Through contaminated equipment (e.g. during proof trials)

Propagation after water enters the network and before it is used depends on the **nature of the water,** the choice of materials, lack of treatment, **absence of water circulation and ambient temperature.**

**High quality water depends essentially on secure networks strictly satisfying health obligations.**

**Action at 3 levels is essential to limit contamination of water networks:**

- The design and construction of networks
- Operation and maintenance
- Surveillance and monitoring

# *Water quality in spas*
## objective: to eliminate all pathogenic bacteria

***Spas have joined the fight against bacteria and set themselves the objective of eliminating all pathogenic bacteria to reduce risks even more.***

## *The specific nature of hot springs*

In general, springs belong to municipalities and are monitored by public authorities. In France, no natural springs can be exploited without authorisation by the French Ministry of Health, after receiving the opinion of the academy of medicine, inspections of intake works and physical, chemical and bacteriological analyses.
Hot springs are controlled by the National Health Laboratory and are monitored regularly by the Ddass (Department Directorate for Health and Social Affairs). Their activity may be suspended if even small quantities of pathogenic bacteria are detected.
Most French spas now offer facilities and care that respect quality standards defined by the profession (AFNOR standards).

## *What the French law says*

The Ministry of Health and social protection reinforced measures to manage health risks related to legionella and pseudomonas in spas through the June 19th 2000 order and the November 29th 2001 circular. These texts define the organisation of control over the sanitary quality of natural mineral water used for therapeutic purposes in these spas and methods of managing nonconformity situations.
**A priority quality objective is that there should be no legionella (sp and pneumophila) at the outlet and at usage points.**

- Care in direct contact with the respiratory mucous membranes or that could cause contact with ocular or respiratory mucous membranes.
- Care in contact with other internal mucous membranes and ingestion of natural mineral water.
- Individual external care (baths, showers) or collective external care (corridors).

**Julien LIRONCOURT** – ***BE HYDROTHERM Engineering design office assistant treasurer to the French Hydromineral Techniques Association.***

« Stainless steel is our priviliged material when we design our installations; this is essentially due to the quality of available materials and the sanitary excellence of existing installation techniques. However we cannot use this material systematically, sometimes because it is too expensive considering the budget allocated to the operation, and sometimes because the nature of the spa water concerned makes it impossible to use a “stainless steel” alloy which can actually be very sensitive to corrosion.
**When the risk is considered to be too high, we need to adopt a different solution; in this case we use C-PVC,** an attractive alternative that resists high temperatures and chemical agents routinely used to clean our installations ».

# NEWS

**Rachid AINOUCHE**
***La Roche Posay Spas Manager***
***Secretary of the French Hydrothermal Techniques Association***

***GIRPI INFOS: You have a zero bacteria objective in spas ...***
Rachid AINOUCHE: Our first essential aim is to completely avoid treating our water, which is the major difference with other establishments, and drinking water and domestic water networks. Spa water is provided for therapeutic purposes and a basic criterion for the water that we use is that it must be bacteriologically innocuous and have a constant composition in the long term. We have to satisfy a specification in which we collect water (usually ground water) from an open, natural environment and bring it into our spas through kilometres of pipes while maintaining its specific qualities without treating it in any way. The only way of achieving this aim is to take preventive action on networks that we know and control, and be thoroughly familiar with the nature of our water and its advantages and disadvantages.

***GIRPI INFOS: materials have to resist violent treatments ...***
Rachid AINOUCHE: The treatment is aimed at the material, not the water. Water is used as a vector to carry either heat to sterilise the material, or chlorine, or acid, to decontaminate the pipe. It is essential that materials should resist effective treatments for eradication. Permanent or long term eradication is impossible, recolonisation takes place very quickly and preventive work to limit sedentary colonisation is done every 15 days. About a thousand analyses per year demonstrate the reliability of the system. We use the same methods for remedial treatments.

**Dr Colette GODARD**
***Manager of the Besançon University Hospital (CHU) Water Analysis Laboratory associated with the Institut Pasteur National Reference Centre for the study of Pseudomonas aeruginosa***

***GIRPI INFOS: Why a centre specially dedicated to this bacteria?***
**Dr Colette GODARD:** Besançon CHU Bacteriology Hygiene Water laboratories were approved by the InVS (Health Monitoring Institute) in 2007 to detect and characterise mechanisms of resistance of P. Aeruginosa to antibiotics. This nosocomial germ can become resistant to almost all anti-infection agents available in therapeutics. Another of the center's missions, after its expertise activity, is to make hospital biologists aware of epidemiological phenomena involving multi-resistant strains.

***G. I.: This bacteria is responsible for many infectious problems ...***
**Dr C. G.:** Two national inquiries led by the InVS showed that P. Aeruginosa is the 3rd cause of infections related to care in France, after Escherichia coli and Staphylococcus aureus, and several thousand cases occur every year.

***G. I.: What is its preferred habitat?***
**Dr C. G.:** Pyocyanic bacilla is a bacteria that lives in wet environments and is found mainly in surface water (lakes, ponds, rivers, etc.) and in effluents containing organic materials (sewers, estuaries, etc.), where it proliferates. With the development of hospitalisation, it has become ubiquitous in hospitals and clinics, long and medium health care centres, etc.), and sometimes in retirement homes.

***G. I.: It is also found in taps ...***
**Dr C. G.:** The patient's environment is regularly contaminated by strains of P. Aeruginosa from outside or inside hospitals, carried on the hands of care personnel, medical equipment and in sinks and showers. Water traps can accommodate large populations of pyocyanic bacilla that could potentially travel backwards and contaminate taps and shower heads. Regular maintenance of taps and showers (descaling and disinfection) in the water distribution network is essential to reduce the risk of infection related to this bacteria.

**CNR Resistance to antibiotics: Pseudomonas Aeruginosa – Jean Minjoz CHU Bacteriology Laboratory**
**25030 Besançon cedex – France**
**Phone: 33 (0)3 81.66.82.86**

## *The opinion of an expert: Jacques Naitychia – ISAGUA CONSEIL*

Sources: Cahiers GIRPI Infos – Water quality – 2007 French edition

### How can we efficiently resist against the development of pseudomonas in cold water?

Factors helping the development of this bacteria are scale, corrosion and heating of pipes, and oxygen.
**Conventional chemical disinfection is not sufficient to kill this bacteria, but excellent results can be obtained by a heat treatment combined with a chemical treatment,** if they are applied very strictly.
**Cold water pipes must be capable of resisting temperatures of 60°C or more, to facilitate the fight against Pseudomonas.**

# Network *diagnosis*

**Patrick PARIS**
***ANTAGUA EXPERTISE Design Office***
***President of the CAPRIS association***
CAPRIS www.capris.asso.fr

***GIRPI INFOS: What is the Role of a diagnosis company?***

Patrick PARIS : Antagua aims at satisfying all needs related to solving risks incurred by to legionella and pseudomonas, which are the main bacteria currently responsible for bacteriological contamination of water.
This company was created to satisfy a very clearly identified need (design, construction and maintenance).
Although many guides and texts discuss the legionella problem, in practice difficulties remain in both new and existing buildings.

***GIRPI INFOS: What buildings are concerned by the diagnosis activity? Are they mainly new or old networks?***

Patrick PARIS : Hospitals and clinics are the primary target due to the higher risk and greater negligence in terms of patient protection. They are followed by hotels and dwellings. Most actions needed are in existing networks. However, there is a demand for increased quality in water networks carrying domestic hot and cold water, water for standard care, bacteriologically controlled water and osmosed water, for the construction of new hospitals.
Medical personnel are becoming increasingly demanding about the available water quality.

> “Medical personnel are becoming more and more demanding about the available water quality”

***GIRPI INFOS: When should a diagnosis company be called in?***

Patrick PARIS : These actions are initiated when the legionella and pseudomonas risk is not controlled, or when contamination remains after attempts to control it. A diagnosis is different from an expertise that gives more information about the work to be done. Remember than the cost of the work is not necessarily high.

***GIRPI INFOS: What would you recommend to reduce the risk of bacteria developing in water networks?***

Patrick PARIS : The first thing is to be thoroughly familiar with your installations, keep drawings up to date, provide well-monitored maintenance, long-lasting and quality materials. A network can be separated into 3 main parts, namely distribution, production of domestic hot water and usage points. These are inevitably the 3 points at which action is necessary. Users are only too frequently not sufficiently familiar with their installations.

***GIRPI INFOS: Who is responsible if contamination occurs?***

Patrick PARIS : The facts show that in existing facilities, the duty holder monitors contamination with the assistance of CLIN (Centre de Coordination de la Lutte contre les Infections Nosocomiales) - Committee against Nosocomial Infections and operational hygiene teams. In new facilities, the installer is almost always responsible for problems that arise during the first few months after commissioning and handover.

## *Commissioning a domestic hot and cold water network:*

When a site is commissioned before handover, more and more clients of buildings open to the public impose a check on the sanitary quality and a bacteriological analysis at many points in the network. That is why contractors must limit and prevent water stagnation by carefully planning leak tests and pressure tests before handing over the installation.
contractors must take special care during **cleaning and disinfection procedures, and make sure that all elements in the network are compatible.**

# FRANCE

# 3 tools to enhance water quality, sustainable buildings & building products.

## The legionella enactment dated 1st February 2010

**1**

After years of non obligatory guidelines, this order now makes it legally compulsory to monitor installations based on an annual analysis of legionella and temperature measurements in buildings open to the public.

| Target objectives: concentration of legionella pneumophila in buildings open to the public | |
|---|---|
| <1000 UFC/L | at all usage points at risk |
| Absence (<250 UFC/L) | at points indicated by CLIN |

### Application dates

| Hospitals and clinics and EHPAD (extra care houses)* | Hotels, camp sites and prisons* | Other buildings open to the public* |
|---|---|---|
| July 1st 2010 | January 1st 2011 | January 1st 2012 |

This order can be downloaded from the following address:
**www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000021795143**

** : In French law, the term building open to the public (ERP) refers to public or private buildings that are open to customers or users other than employees (private or public)*

**2**

## THE HQE APPROACH & BUILDING CERTIFICATION SCHEME HIGH ENVIRONMENTAL QUALITY

An environmental approach applied to the construction or rehabilitation of more comfortable buildings, with better respect of the environment.

Various **"NF – HQE® Approach"** certifications have been made official since 2005: commercial buildings, new build and renovated collective and individual housing, and even operations in commercial buildings.

*14 targets to help main contractors structure the technical response to their clients' objectives*

| EXTERNAL ENVIRONMENT | INTERNAL ENVIRONMENT |
|---|---|
| **SUSTAINABLE CONSTRUCTION** | **COMFORT** |
| 1/ Relations of buildings with their immediate environment | 8/ Hygrothermal comfort |
| 2/ Integrated choice of construction processes and products | 9/ Acoustic comfort |
| 3/ Low nuisance sites | 10/ Visual comfort |
| **SUSTAINABLE MANAGEMENT** | 11/ Olfactory comfort |
| 4/ Management of energy | **HEALTH** |
| 5/ Management of water | 12/ Health quality of spaces |
| 6/ Management of activity waste | 13/ Health quality of air |
| 7/ Management of servicing and maintenance | 14/ Health quality of water |

**For further information: www.assohqe.org**

**3**

## FDES: ENVIRONMENTAL AND SANITARY DECLARATION SHEETS

Environmental and Sanitary Declaration Sheets (FDES) are used to produce an environmental report on building products that can be used in a project, through a detailed study respecting AFNOR standard NFP 01-010. This can minimise impacts on environment and health.

Declared environmental data are based on the inventory of the product life cycle "from the cradle to the grave" and can be used at each stage of a building project.

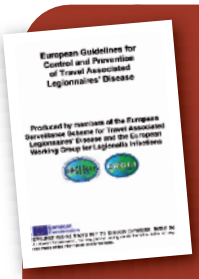
All conforming FDESs are listed on the site: **www.inies.fr**

# EWGLI

European Working Group for Legionella Infections

***The EWGLI network is a European scientific program for monitoring legionella infections. In 1997, it launched the European Legionellosis monitoring program related to travel (EWGLINET).***

The EWGLI network comprises 35 member countries (24 European countries and 11 countries outside the European Union). Its priority objective is to identify grouped or isolated cases of legionellosis in order to quickly alert travel professionals (agencies, tour operator federations) and develop a European database. EWGLI checks that corrective actions are implemented in the countries concerned if legionellosis occurs. EWGLINET thus provides regular information about cases of legionellosis (number of cases in different countries by year, the age and sex of victims, various monthly reports) and answers many questions that travellers and travel professionals might ask about the disease.




**EWGLI published a guide in 2002 that was updated in 2005,**
***"The European Guidelines for Control and Prevention of Travel Associated Legionnaires' Disease".***
**It gives a series of procedures to handle cases of legionellosis. The European Parliament has approved this document and adopted it as an official document.**

For further information:
**www.ewgli.org**

Download the guide:
**www.ewgli.org/data/european_guidelines/european_guidelines_jan05.pdf**

# *New constraints* for hotels

***Legionella in domestic hot water networks must now be monitored in all buildings open to the public and particularly hotels, guest houses and camping sites.***

### *What about French regulations?*

The February 1st 2010 order fixes new technical requirements applicable to collective domestic hot water production, storage and distribution installations that supply these tourism facilities, and have potentially risky usage points.

- Samples and analyses for legionella must be made at least once every year by a COFRAC[1] accredited laboratory.
- The temperature is systematically checked at key point in installations.
- A sanitary installation log-book must be kept and made available to the health authorities. It traces the monitoring procedures applied including a description of the installation, the methods used and results of monitoring, and all elements related to maintenance.
- The results of the legionella pneumophila count must be less than 1000 Colony Forming Units per litre. If these thresholds are exceeded, the installation manager must immediately take the corrective measures required to restore water quality and to provide user protection.

### *"Tourism facilities. Elements for management of the risk of proliferation of legionella in water networks" 2008 Guide*


The DGS (General Directorate for Health) published a guide aimed at tourism facilities. It is a means of making hotelkeepers aware of the risks of bacterial proliferation while giving them advice about how to manage their installations correctly.
It also describes their responsibilities in terms of water quality, particularly when the degradation of quality is related to network servicing and maintenance conditions, and also liabilities if a case of legionella occurs.

[1] *COFRAC: Association responsible for accreditation of certifying and inspection laboratories and organisations.*

### *Responsability of the Hotelier in UK*

Under the European communities (Drinking Waters) Regulations, 2007, a hotelier becomes responsible for the safety aspects of water from its delivery point at the hotel onward, i.e. within its "domestic distribution system".

Download the "Tourism facilities guide"
**www.sante-sports.gouv.fr/guide-etablissements-touristiques.html**

# STUDIES

## Regulations and guides in Europe

**Guides are available to advise you about the design of networks, monitoring and inspection, and also maintenance and servicing.**

### GUIDES IN FRANCE

- **2005 technical guide for water in health establishments France**

The French Ministry of Health wrote this guide to help hospitals and clinics implement a global procedure for management of water quality. The guide identifies the main dangers and health risks related to water use, it offers organisation methods to face these risks and it gives recommendations. Finally, it defines rules for the design and servicing of water production and distribution installations.


Download the "technical guide for water in hospitals and clinics"
**www.sante-sports.gouv.fr/IMG/pdf/Guide_technique_de_l_eau_dans_les_etablissements_de_sante_-_edition_2005.pdf**

- **CSTB (Scientifical centre for Building Techniques) Technical Guides**

***"Water networks for human consumption inside buildings"*** This guide provides technical solutions to minimise risks of degradation of the water quality inside distribution networks and discusses steps for the design, production and implementation of domestic hot and cold water installations.

### LEGISLATION IN EUROPE

Regulations and guides about legionella in domestic water are continuously envolving. They vary from one country to the other, and even between regions within the same country (Belgium and Italy). For example, the following is a list of some official documents on the subject outside France:

**In UK:** the country is less affected by legionellosis than France with between 200 and 250 cases per year compared with 1000 to 1500.

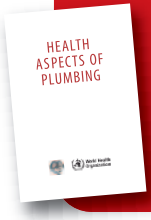
Nevertheless, the HSE (Health & Safety Executive) has published HSC L8 (2000) Control of legionella bacteria in waters, the approved Code of Practice and Guidance for the control of legionella bacteria in water systems, setting out the statutory requirement for dealing with that risk. This applies to all premises with a water system. This document has "special legal status" and is considered as being law.
Around this essential document, we can also mention:
Health and Safety at work Act 1974, the statutory instrument that underwrites and legally enforces HSC L8 (2000) regulations.
The COSHH (Control Of Substances Hazardous to Health) regulations (1999).
The RIDDOR regulations (1995), the legal reporting mechanism by which outbreaks of legionnaire's disease are notified to the HSE.
The drinking water inspectorate – drinking water quality is regulated by the government through DWI, which monitors and checks the safety of drinking water and provides regulations for suppliers.
**www.hse.gov.uk**

**In Belgium:** the Flemish government took a series of initiatives to reduce the risk of legionellosis in 2007, including testing and prevention measures in risk establishments. They are compiled in the document entitled *"Beste Beschikbare Technieken (BBT) voor de Legionella-beheersing in nieuwe sanitaire systemen"*
**www.vito.be**
For the Wallon community, the Public Health Institute associated with the General Health Directorate issued an order in 2003 dealing with showers in swimming pools. **www.iph.fgov.be**

**In Italy:** the Department of Health has published legal texts on the subject of water quality and legionella. Italian regions have published their own application decrees and guidelines.

**In Spain:** Spanish – Real Decreto 865/2003 and Catalonia -decret 352/2004 constitute the legal basis (Royal Decrees). They are completed by the Technical Guide of the R.D. 865/2003.

***WHO guides show the relation between health and networks.***




***The World Health Organisation believes that sustainable health is impossible without access to good quality drinking water served by healthy networks. It emphasises the importance of their design and use to reduce health risks, it has created an inventory of microbiological risks and emphasises the need to take strict measures to provide healthy water for consumers.***
***This guide can be downloaded on the WHO site:***
**www.who.int/water_sanitation_health/publications/plumbinghealthasp/en**
***"Legionella and the prevention of legionellosis" 2007: this guide provides a complete overview of the "legionella" problem. It provides advice about risk evaluation and management, particularly in sensitive environments such as cooling towers, swimming pools, whirlpool baths, and it identifies necessary measures to prevent or control this risk.***
**www.who.int/water_sanitation_health/emerging/legionella_rel/en**

# HTA/SYSTEM'O®

**For sustainable domestic hot water and cold water networks satisfying strict sanitary requirements.**

## Network safety involves good design and a sensible choice of materials.

**Experts recommend the following to efficiently limit the development of bacteria:**

- Do not allow water to stagnate and enable good water circulation.
- Resist scaling and corrosion by design and maintenance adapted to the water quality and installation characteristics.
- Keep water in the installations at a high temperature or be able to increase the temperature occasionally when required.

**Therefore, an adequate system must be resistant, have a low corrosion potential, limit scaling and biofilm promotion, and be compatible with chemical and thermal treatments, for hot and also for cold water.**

## HTA/SYSTEM'O® satisfies all these requirements:

**HTA PIPE: HOT AND COLD WATER**

**HTA-F PIPE: COLD WATER ONLY**

**A UNIQUE RANGE OF FITTINGS**

**A SINGLE WELDING POLYMER**

No corrosion, no scale

Bs1d0

Fire safety (Euroclasses)

Fit for anti-bacterial treatments

SIMPLE TOOLS

Installation time under control

Recyclability

### *Main applications:*

- Domestic hot and cold water distribution
- Main risers
- Main rings

### SAFETY CHOICE

- ATEC 14/08-1316 - WRAS n°0904539.
- Bureau Veritas – RINA – Germanischer Lloyd.
- Fire classification: Bs1d0 (Euroclasses).
- ACS (Sanitary Conformity Certification) holder
- FDES (Environmental and Sanitary Declaration Sheets).
- ♻ Recyclability

# Some examples of SYSTEM'O® applications

***SYSTEM'O® has now become a reference system on many sites in France and internationally.***
***According to site managers, its advantages are the robustness and reliability of the material, but also ease of installation and preservation of water quality. These requirements are now essential among decision makers' selection criteria.***
***Some reports...***

## CPAS* in Ixelles Brussels - Belgium

**Patrick LIZIN**
*VigotecAkatherm - Product Specialist*

VIGOTEC AKATHERM

**FOCUS**

***Context***
- **Construction of a 186-bed convalescence home**
- **Installation of SYSTEM'O® for the domestic hot water and cold water**

***SYSTEM'O® advantages***
- **not very conducive to biofilm**
- **Possibility of treating the entire hot water and cold water network**

***GIRPI INFOS: What can you tell about this site?***
Patrick LIZIN: The Ixelles CPAS has built a 186-bed convalescence home. SYSTEM'O® has been used throughout the network for both hot water (HTA) and cold water (HTA-F).

***GIRPI INFOS: Why choose SYSTEM'O® system for this new building?***
Patrick LIZIN: Legionella bacteria had developed in the galvanised steel network in the old convalescence home. It was very difficult to eradicate them. This is why SYSTEM'O® was chosen because it is not very conducive to the formation of biofilms and it offers the possibility of treating the entire network, including hot water and cold water if water is contaminated. This is a large advantage.

***GIRPI INFOS: How did the installation work proceed?***
Patrick LIZIN: Everything happened very smoothly, particularly because GIRPI assisted us during all steps including the production of drawings by their design office, supply of the equipment list, training of fitters on site and technical assistance during the construction work.

**CPAS: Public Social Action Centre*

**The contractor must avoid the risk of pollution (projections of dirt, dust, etc.) during storage on site and during installation of pipes, to control effects on health.**

**SYSTEM'O® pipes and fittings must be stored in a clean and identified zone.**

**HTA and HTA-F pipes are wrapped in plastic foils and plugged to limit pollution before assembly.**

# Saint Bernard's Hospital - Gibraltar

**Alex ANDERSON**
*Rotary International Engineer*

***GIRPI INFOS: Could you remind us of the project's specific parameters and constraints?***
Alex ANDERSON: The works have consisted of the complete removal of copper pipework from the incoming mains to the point of draw off. The hospital is the largest in Gibraltar with circa 200 beds and was kept completely operational through out our works. Girpi was used throughout the range of services HWS, HWSR, CWS.

***GIRPI INFOS: What were your reasons for selecting HTA?***
Alex ANDERSON: The system was chosen through past experience, and its ease of use and adaptability. Especially in Gibraltar where the water is quite aggressive GIRPI had been found to have excellent resistance to corrosion. As well as this due to it being used in a public building the fire rating of the material compared to similar products was very good and an important consideration.

***GIRPI INFOS: Was it your first experience with our product?***
Alex ANDERSON: The first time I used Girpi was just over 3 years ago when my company used it on another hospital for the MOD "Princess Royal Medical Center" based in Gibraltar. The installation on a whole went extremely well.

***GIRPI INFOS: After having used our product, what is your feedback on Gibraltar Hospital?***
Alex ANDERSON: All concerned including the management, down to the technical services department have been very happy with the installation.

**Victor BORG**
**Technomedical Engineer (Estates & Facilities)**
**Technical Services Department Gibraltar Health Authority**

In June 2006 we started to encounter pinholing of the copper pipework installation in the hospital. It was decided to completely replace the installation and Girpi was the product chosen for the job.

**The reasons Girpi was chosen for the replacement of the installation were:**

- **High resistance to corrosion**
- **Durability**
- **Robust construction of both pipes and fittings**
- **Ease of installation**
- **Resistance to scale.**
- **Product met Fire Codes**

It was quite a challenge to carry out the complete pipe replacement from incoming mains (150 mm diameter) to point of draw off, and still meet the day to day demands of a working hospital. At no time was the running of the hospital compromised, but as you can imagine this took a lot of planning behind the scenes. We established a very good relationship with the contractor, but we also had to be confident that the product being used for replacement was accommodating to our needs. The ease of installation of Girpi made our job easier.
We filter our incoming water supply, using sand and manganese dioxide to remove iron from the incoming supply. We also have several systems of reverse osmosis, for dialysis and for the supply of water to washer disinfectors and autoclaves.

# GIRPI has equipped some of the most prestigious hospitals in the United Kingdom

**The Norfolk and Norwich University Hospital (NNUH)**
800 beds, construction started in January 1998, opened in November 2001.

**Hairmyres Hospital, East Kilbride, Glasgow**
450 beds, construction started in 1998, opened in September 2001.

**Bishop Auckland General Hospital (BAGH)**
County Durham and Darlington, 280 beds, construction started in 2000, opened in 2002.

**Harplands Psychiatric Hospital**
Stoke on Trent, construction started in 2001, opened in 2002.

**Dumfries and Galloway Royal Infirmary**
390 beds, built in 1975, renovated between 2001 & 2003.

**University Hospital Coventry Walsgrave**
1,250 beds, construction started in July 2002, opened in July 2006.

**Royal Derby Hospital**
1,160 beds, construction started in October 2003, opened in July 2009.

**Princess Royal MOD Medical Centre**
Gibraltar, construction started in 2007, opened in March 2009.

**Knottingley GPI Medical Centre**
West Yorkshire, opened in July 2009.

**Cygnet Mental Health Hospital**
Derby, opened in 2010. Cygnet operates 17 centres with more than 730 beds in the UK.

# University hospital center of Nantes

**Laurent FOUILLET**
***SPIE West Centre climatic engineering development manager***

***GIRPI INFOS: Can you tell us why this site is special, in a few words?***
Laurent FOUILLET: The pediatrics building in Nantes Hospital Centre will be rehabilitated on 6 levels over about 4 years. Care personnel and hospitalised children will remain in the premises during this period. The main constraint is to maintain service continuity while guaranteeing safety and tranquillity of the children and care personnel. We will achieve this by replacing the old networks as we proceed, and we needed to choose a technical solution that satisfies these constraints.

University Hospital Center of Nantes

ISATEG ATLANTIQUE

**Christophe JADAUD**
***ISATEG ATLANTIQUE DESIGN OFFICE***

***GIRPI INFOS: What technical criteria encouraged you to choose a synthetic material (C-PVC) rather than a traditional material?***
Christophe JADAUD: As the contractor mentioned, the choice of a synthetic material helped us to overcome major technical constraints that quickly become problematic on an occupied site (no flames, handling, etc.).

***GIRPI INFOS: And does the SYSTEM'O® satisfy it?***
Laurent FOUILLET: We are working on an occupied site in an ultra-sensitive environment, therefore we need to prefer a clean and quiet, easy-to-implement solution. SYSTEM'O® was a natural choice, and the lack of any flame on site was another important advantage.

FOCUS ***The main site constraints***

**Renovation of domestic cold water and hot water networks on an occupied site in an ultra-sensitive environment**

***Reasons for the choice of SYSTEM'O®***

- **Ease of installation even on an occupied site**
- **A clean and silent system**
- **No corrosion, no scale**
- **Preservation of water quality**

***GIRPI INFOS: In your opinion, what are the advantages of SYSTEM'O® on this special site?***
Christophe JADAUD: Apart from the advantages of using this type of material on an occupied site, we were also interested in its physicochemical properties for use in a hospital environment. Firstly, this material is compatible with chemical and heat treatments (the preferred preventive and remedial methods if the domestic cold water or hot water network is contaminated) and secondly, it is one of the materials that is least conducive to microbial growth.

# Holiday Inn Marseille

**Dominique BOURGOIN**
*Technical Services Manager*

**FOCUS** *The main site constraints*
- Renovation of the domestic hot and cold water network in a hotel

*Reasons for the choice*
- No corrosion
- C-PVC material not conducive to biofilm
- Ease and safety of installation
- Bs1d0 fire classification

***GIRPI INFOS: Mr. Bourgoin, you are responsible for maintenance at the Holiday Inn hotel, how did renovation of the domestic cold and hot water network take place?***

Dominique BOURGOIN: The galvanised steel water network dated from 1993, and after we had a few problems we decided to replace it with SYSTEM'O® C-PVC.
Pipes were replaced up to the 8th floor, thus including 119 rooms, and we worked floor by floor so that the hotel could remain open during the work. Therefore there was no particular nuisance, and in any case our customers never complained. It was a clean site.

***GIRPI INFOS: How does SYSTEM'O® solve the problems encountered in hotels?***

Dominique BOURGOIN: We take great care against the development of bacteria in hotels, and particularly legionella. SYSTEM'O® is non-corrodable and is not conducive to biofilm, which we considered to be an essential factor in our selection of the material.
The Bs1d0 fire classification also helps ensure safety in buildings open to the public.

***GIRPI INFOS: Are you satisfied with your SYSTEM'O® network?***

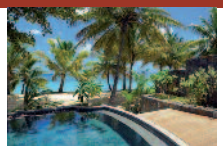
Dominique BOURGOIN: Perfectly, I no longer have any problem with my network, it offers more peace of mind and less maintenance.

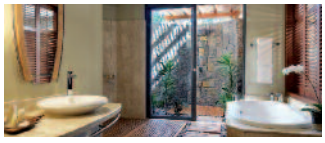
# Beach Comber - Mauritius

**Construction of a new hotel in the Beach Comber chain in Trou aux Biches - Mauritius**
**5-star hotel with 425 rooms**

**HTA was used for the entire hot water network**

**Reasons for this choice:**
- **Protection against formation of the biofilm**
- **Protection of water quality**
- **Reassuring fire classification: Bs1d0**
- **Ease of installation**
- **Product long-term durability**





## ENVIRONMENTAL SAFETY

- **Satisfies High Environmental Quality targets:**
  - Water quality
  - Energy savings
  - Low nuisance site
  - acoustic comfort
  - ease of maintenance
- **More than 98% recyclable**
- **Existence of a recovery system**
- **FDES:** Environmental and Sanitary Declaration Sheets

# A.C.S.

**SANITARY CONFORMITY CERTIFICATION**

## WATER SAFETY

- **Water quality protected**
- **Bacteria:**
  - limits factors conductive to their development (scale and corrosion)
  - eliminates legionella and pseudomonas

# Bs1d0

## FIRE SAFETY

- **Non flammable**
- **No smoke**
- **No flaming drops**
- **Performances certified by the LNE**

## NETWORK SAFETY

- **Mechanical strength**
- **Non-corrodable**
- **Hydraulic properties maintained (full flow coupling)**
- **Designed for 50 years**
- ***ATEC et CSTBat***

## DOMESTIC COLD WATER
## DOMESTIC HOT WATER

# SYSTEM'O®

**Adapted for chemical and heat treatments**
***including for cold water***

GIRPI
*safety for your pipeworks*

Rue Robert Ancel | BP 36 | 76700 Harfleur | Tél : 02 32 79 60 00 | Fax : 02 32 79 60 27
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