

TEPPFA: Legionella, Key to Prevention is Correct System Design and Operation

KWD-globalpipe, 2005-165. **Correct design and operation of the system is the key to prevention of Legionella in tap water piping installations.** Whatever the pipe material, long stagnation times and inappropriate temperatures can cause Legionella to proliferate.

Under typical practical conditions, the **choice between plastics and copper has no significant influence on the risk of Legionella outbreaks.**

Legionnaires' disease is an unusual and serious form of pneumonia caused by inhalation of water droplets containing the bacteria Legionella pneumophila. These bacteria, which occur naturally in low concentrations in surface water, are **difficult to remove completely through disinfection** because the bacteria nest in other organisms.

Accordingly, the **presence of Legionella pneumophila in hot and cold water systems** inside any building is to be expected, although it usually occurs only in small quantities. People become infected by legionnaires' disease when **two circumstances coincide**: first, when the **concentration** of the bacteria in the water is relatively high; and, second, the **water becomes vaporised** so that water droplets can be inhaled. This can occur, for example, in cooling towers, humidifiers and showers. The most vulnerable individuals are normally the elderly, or those already weakened by sickness or disease.

The **most important factor** for the possible development of Legionella bacteria in tap water systems is the **design and operation of the system**. It is well known that Legionella thrives in water that is insufficiently flushed, and is allowed to remain stagnant for too long between the **critical temperatures** (20°C to 45°C). Regular, thorough flushing at 60°C or above permanently reduces the Legionella growth.

These criteria are consistently reflected in guidelines and regulations developed in many individual countries for the design, operation and maintenance for tap water systems to avoid the growth of Legionella. An overview has recently been **published by the European Working Group for Legionella Infections [EWGLI]**.

It has been **wrongly claimed by the Copper Industry that copper pipework helps reduce the risk of the spread of Legionnaires' disease**. To support this assertion, it cited a research project in 2003 by the Dutch water quality research institute, **KIWA**. From tests simulating a Dutch domestic hot water system, initial results were said to show that water conveyed by copper pipe could reduce the concentration of Legionella bacteria when compared with water in cross-linked polyethylene pipes. **This was interpreted** as having implications for the relative risk of spreading the disease itself.

In fact, this claim from the Copper Industry is seriously misleading and was based on its own premature conclusion from the study's findings. It had also overlooked the detailed methodology of the research.

It is well known that Legionella occurs in all types of piping materials. The cited Dutch research project was set up with new pipes under laboratory conditions – and, crucially, with water at 37°C, the ideal temperature for Legionella. This provided conditions where some initial biocidal influence from the copper was to be expected. However, that effect is only temporary and, as the **continuing KIWA study proved, disappears after some months**. The full study clearly indicated that the likelihood of Legionella forming in pipes in long-term service is no different whether the pipes are copper or plastic. It is the design of the system and the conditions under which it is operated that are the real influential factors.

Technical Guidelines for the Control and Prevention of Legionella in Water Systems, including References for National Guidelines (Jan 2005).

The European Guidelines for Control and Prevention of Travel Associated Legionnaires' Disease :

On 1 July 2002 **EWGLI** introduced a new set of procedures for responding to cases of travel associated legionnaires' disease in all the participant countries. On 2 June 2003 an amended and updated edition of the guidelines was approved and endorsed as an official document by the **EU Committee for the Epidemiological Surveillance and Control of Communicable Diseases in the Community**, instituted by Decision No 2119/98/EC of the European Parliament and the Council.

A **new document dated January 2005** has now been **posted on the website**. It contains revisions to Part 2, the most important of which is the addition of an extra paragraph (no.24) which outlines procedures for dealing with requests for information from legal representatives and others involved in litigation or compensation claims. The technical parts of the guidelines will be revised later this year.

The guidelines outline a standard approach to control and prevention of travel associated Legionnaires' Disease across all European countries. **Parts 1-2 explain** how the reporting and response procedures for clusters of cases should now operate within Europe. **Parts 3-4 of the guidelines** are very technical and are written for engineers and people involved with maintenance of water systems in hotels and other buildings.

The **guidelines are available** for downloading in PDF format
www.ewgli.org/pdf_files/GuidelinesJanuary2005.pdf , (1,190 kb)