

New research results: Legionella grows just as well on copper as on plastics (VVS Forum)



KWD-globalpipe, 2005-165. VVS Forum, 2004-12-15, The whole article: There is **no evidence that copper pipes prevent Legionella growth better than plastic pipes**. These new results appeared during a Legionella congress in Amsterdam in the Netherlands. The atmosphere at the congress was open-minded and cordial. The purpose was to promote the management of Legionella by co-operation. A Dutch database that can be used to trace infection sources was also interesting.

The **international congress, Legionella in Europe**, was hosted by the Netherlands Ministry of Housing, Spatial Planning and the Environment. **Görel Allestam from the Swedish Institute for Infectious Disease Control (SMI)**, Bertil Jönsson from the Swedish National Board of Housing, Building and Planning and Rolf Kling from the Sanitary Equipment Installers Association participated for Sweden. The congress was not part of the series of international Legionella congresses that are planned to take place in Chicago next year (www.legionellaconf.org).



Picture: "It is not unexpected that the curves for Legionella growth, after some time, end up at about the same levels for copper and for PEX pipes, **says Görel Allestam**, referring to Dick van der Kooijs extended investigation."

Requirement for hotter water in the Netherlands.

The reason why the Netherlands took the initiative to hold the congress was due partly to their chairmanship of the EU and also because the Netherlands have been hit by a large outbreak of Legionella, says **Görel Allestam**. The outbreak occurred at a flower exhibition and was found to have emanated from an indoor fountain.

That earlier interest was lower in the Netherlands than in Sweden is due to the fact that the Dutch approached the Legionella problem in a completely different way. In the Netherlands, the temperature for hot water installations is higher and therefore there is less risk for Legionella growth. The regulations in the Netherlands for hot water installations require temperatures over 60°C which is higher than in Sweden.

Database Fingerprints.

In the Netherlands a programme was initiated to take a lot of samples of hot water in buildings. An identification was then made based on the molecular biology of the Legionella bacteria, resulting in the production of genetic fingerprints for the different variants. The results were then placed in a database used for comparison with actual Legionella cases. To some extent they have been able to use the database to trace the infection source.

Görel Allestam finds this very exciting. She says that there are similar plans in Sweden to establish a database in order to detect some of the existing Legionella variants.

The next step is to try to find a test showing whether the Legionella variant is a dangerous one or not. At present, there is no method or marker which can be used for this purpose.

Legionella in copper and plastic pipes.

Dick van der Kooij of KIWA Research (www.kiwa.nl) gave an interesting and appreciated presentation at the conference. In an earlier presentation he had shown results from an investigation of Legionella growth on different piping materials. The earlier study lasted just over 500 days and seemed to show that Legionella grew better in PEX pipes than in copper pipes. However, his prolonged study, presented at this congress, continued for approximately another 300 days and showed the differences in Legionella growth to have more or less equalised. The difference that now existed was that the bacteria seemed to grow better on copper than on PEX, a result that pointed in a completely different direction from the earlier studies.

The growth curves are not smooth, showing rises and falls.

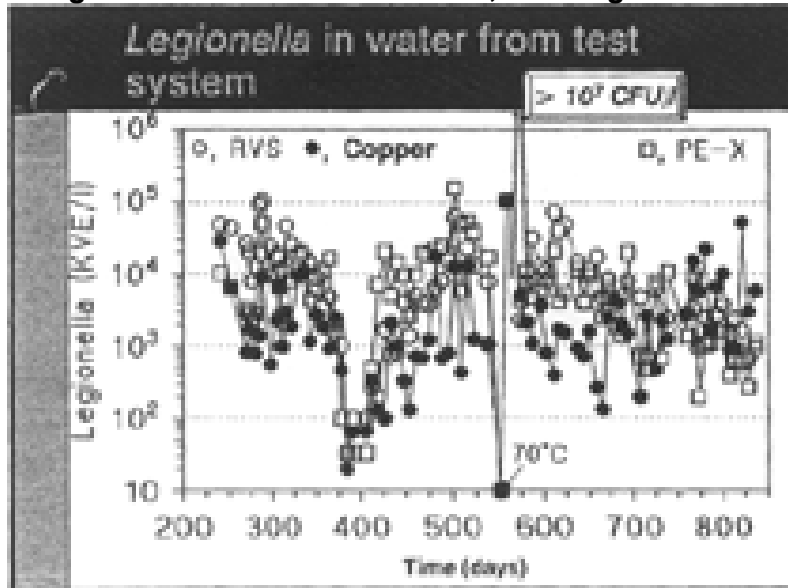


Diagram: “Dick van der Kooij showed this diagram on an overhead projector at the Legionella conference in the Netherlands. The **diagram shows** Legionella growth in stainless steel (RVS), copper and PEX pipes. The first part (approx. 500 days) was already known and has been interpreted as showing copper is better than PEX at preventing Legionella growth. However, the prolonged study shows something completely different. “

What is causing the growth of Legionella to vary in this way?

One possibility is that the Legionella bacteria can use organic substances from the plastic for their growth. At first the pipe surface is clean. After some

time a biofilm develops on the surface resulting in a stable system between the Legionella bacteria and other micro-organisms in the biofilm. On copper the amount of Legionella is low in the beginning due to the release of copper ions which have a toxic effect on the Legionella bacteria. However, after time a biofilm is also created on the copper. The biofilm inhibits the release of copper ions, reducing the toxic effect on the Legionella. It is not unexpected that the curves for Legionella growth end up at about the same level for copper and PEX pipes, says Görel Allestam.

No specific regulations for Legionella in Sweden.

The EU has compiled the different european regulations regarding Legionella. The current EU directives and the legislation and guidelines in the different countries to fight against Legionella were presented at the congress.

Sweden has a more general legislation than many other countries, says **Görel Allestam**. This general legislation includes the law for infectious disease control, the environmental law and the building regulations. Other countries have specific regulations regarding the prevention of the spread of Legionella. For example, the UK has come very far in competence regarding how to deal with Legionella depending on some large outbreaks and they are very generous to share their knowledge.

Doctor Heleen Nieuwenhuis, from the company **Nalco**, talked at the congress about the importance of co-operation around the subject of Legionella and would like to see the harmonisation of EU legislation.

Different approaches in different countries.

When it comes to industrial cooling towers, the interpretation of the results of analysis differs between countries. One country refers to action values when it is time to take action. In the US it is required to clean and treat with biocide if the concentration of Legionella bacteria is above 106/l. In the Netherlands there is only indirect advice and no action value. In the UK it is required to clean and disinfect at higher than 130/l. In France the facility is closed at 105/l and in Spain they close at 194/l.

Sweden has no fixed action values for cooling tower water, but follows a policy that the European Working Group for Legionella Infections (EWGLI) (www.ewgli.org) has developed. This network was established in 1986 on the initiative of Ingegerd Kallings at SMI. One of the tasks of the network is to warn for possible exposure to Legionella during travel. They have a database that registers reported cases of Legionella at hotels and other tourist residences. Currently Birgitta de Jong reports to EWGLI if a person from Sweden has been infected while travelling.

Birgitta Johansson

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