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	pressurized <i>in-situ</i> curing (4.5 bar – 95 °C)	Pressure-less bath curing (95 °C)
pipe failure time @ 6.1 MPa / 95 °C	1100 hours	1000 hours

Crosslinkable POLIDAN® TUX 100 together with *in-situ self-curing* technology constitute an eligible and attractive alternative to insulated steel in piping systems for hot water transport applications under pressure, like District Heating and Geothermy. They offer outstanding long-term performances and provide a set of very cost-effective, time-sparing and fit-to-purpose advantages.

Contact: Solvay Padanaplast, e-mail: info.padanaplast@solvay.com , visit: www.padanaplast.com , www.solvayplumbing.com , www.solvayplastics.com

APSwissTech SA versus THE Thomas Machines SA (20.5.2005)

- By order of the 21 April 2005, the Judge in charge of the Civil Cantonal Tribunal of Vaud (Switzerland) accepted a petition for interlocutory relief filed by APSwissTech against THE Thomas Machines.
- In support of its petition, APSwissTech put forward the infringement of two of its patents and the copy of technical designs.
- In concrete terms, the judge forbade THE, by means of provisional measures, to put on the market production lines of irrigation tubes similar to the equipment delivered to Italy, crosswelders of the make SLT-060 or SLT-300 and production lines LPE 702 for composite pipes resembling the line delivered by THE to Germany.
- The judge also forbade THE to spread allegations giving the impression of a collaboration between Swisscab and THE.
- While it is immediately binding, the verdict is however still not final. Firstly, it can still be the object of an appeal. Secondly, APSwissTech needs to validate the verdict by means of an in-depth trial.

Contact: www.apswisstech.ch

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

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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](http://www.ewgli.org/pdf_files/GuidelinesJanuary2005.pdf), (1,190 kb)

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

KWD-globalpipe, 2005-165. 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 was also interesting.

From VVS Forum, 2004-12-15, Sweden

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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.

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

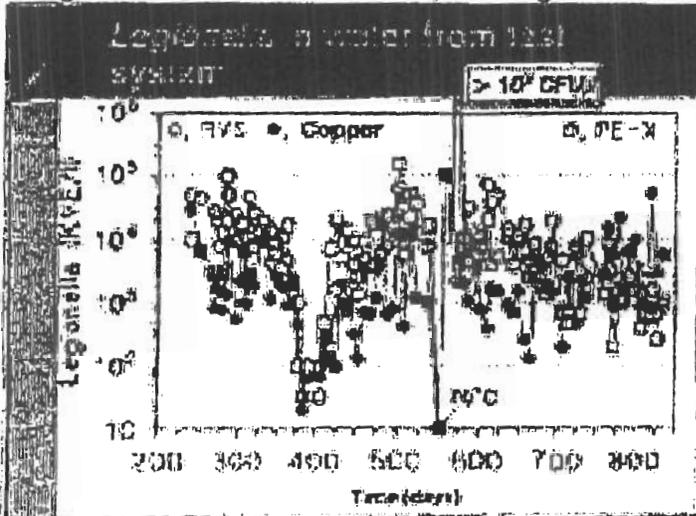


Diagram: "Dick van der Koolj showed this diagram on an overhead projector at the Legionella conference in the Netherlands. The diagram shows Legionella growth in stainless steel (RVS), copper and PEX pipes. The first part (approx. 500 days) was already known and has been interpreted as showing copper 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

The journal **VVS-FORUM** have the largest circulation among consulting engineers, plumbers, wholesalers, manufacturers. It is the specialized journal in Scandinavia for the Heating, Ventilating, Plumbing, Sanitary and Refrigeration trades, including Insulation, Energysaving and Environmental and allied subjects. **Subscription:** Skr 290 per year.

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