PRESS RELEASE – FOR IMMEDIATE RELEASE

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PVC-O PIPES – THE MOST SUSTAINABLE WAY TO DELIVER WATER

The plastic pipe industry has long claimed that bi-oriented PVC-O pipe systems offer the most efficient and sustainable delivery of water. Developed over forty years ago, these high pressure pipes are used increasingly as a replacement for ductile iron pipes. Recent scientific evidence not only confirms the suitability of these plastic pipe systems but also underscores their sustainability and long term performance. PVC4Pipes have reviewed these latest findings and what they could mean for water companies throughout the world.

The main body of recent evidence has been drawn from work carried out by the independent Flemish Institute for Technological Research (VITO) to establish a European Product Declaration. Commissioned by the European Plastic Pipes and Fittings Association (TEPPFA), VITO carried out life cycle assessment (LCA) from cradle to grave of PVC-O pipes manufactured in two separate wall thicknesses (1.8 mm and 2.7 mm).

Their analysis confirms that these two pipe examples have a very low environmental impact over a lifespan of 100 years. Furthermore, their carbon footprint calculated on an annual basis for the purposes of global warming is similarly low and comparable to the driving of a car over a mere distance of 34 and 39 kilometers respectively.

Low environmental impacts

Steve Tan, spokesman for PVC4Pipes is convinced that these findings will encourage more water companies to favor PVC-O pipe systems: "We live in a world driven by economics and powered by choice. For any water pipeline installation, the price of pipe is only about ten percent of the full cost of installation. Water companies are well aware that PVC-O pipes outlive and outperform their heavy rivals and thus enhance the value of pipeline assets. The expression 'paying the piper' is about exercising responsibility and this new evidence underlines the sustainable credentials of PVC-O systems."

These credentials have been identified and quantified by VITO throughout the various main stages in their LCA assessment of PVC-O pipes. They include energy consumption and the CO2 emissions generated throughout the pipe's life cycle such as extraction and raw material processing, production, transportation, installation and use. Common characteristics are low environmental impacts throughout the entire cradle to grave life cycle (see chart below for main environmental impacts).

A comparative LCA study carried out by Edge Environment in 2009 and commissioned by the Plastics Industry Pipe Association (PIPA) of Australia reached equally interesting conclusions. PVC-O water pipe systems have been successfully used in Australia for over 20 years. Using LCA methodology compliant to ISO 14044, Edge Environment examined and compared identical functional units of PVC-O pipes with cement-lined ductile iron pipes. They concluded that PVC-O pipe was 'substantially the best performer.'

800 mm diameter pipe

Manufacturers of the machines that make PVC-O pipes agree. Rob Spekreijse is CEO of the Rollepaal Group, an international company that has pioneered the design and manufacture of complete PVC-O production lines. He recently told the Plastic Pipes Moscow 2013 conference that "PVC-O pipe systems are the most sustainable way to deliver water. Compared to ductile iron, their manufacture requires less material and energy to produce and their carbon footprint is almost eight times smaller. And they can be recycled repeatedly and efficiently to recreate new pipes from old for half a millennium."

Given the recent evidence for sustainability, plastic pipe experts expect world demand for PVC-O pipes to accelerate. But other factors could promote their popularity. The pipe is currently made in fifteen countries and a new host of national standards around the world is widening acceptance. The current range comprises 90 – 630 mm diameter and is specified within ISO 16422. The added prospect of a large diameter (800 mm) within this standard would enhance appeal.

Lowest failure rate

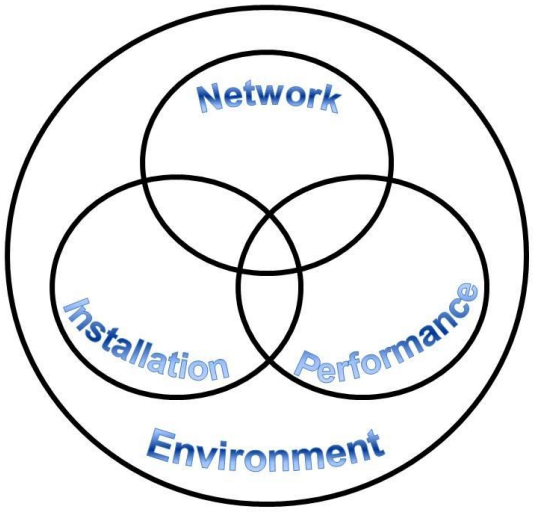
Further comparative evidence of the suitability of PVC pipe technology in the field of water delivery has been provided by Dr. Steven Folkman, associate professor at Utah State University.

In 2011, Folkman and colleagues conducted a survey amongst 188 water companies in the US and Canada to obtain data on water main failures of municipal and private water supply systems. Results were significant. A major finding of the study was that PVC pipe has the lowest overall failure rate when compared to steel, cast iron, ductile iron, concrete and asbestos cement pipes. Plastic pipe failure rate amounted to approximately one half that of ductile iron and one tenth that of cast iron.

The survey also confirmed that corrosion was a major cause of water main breaks. 75 percent of all utilities reported corrosive soil conditions with a high portion of old cast iron and ductile steel pipes. This combination ranked corrosion as the second highest reason for water main pipe failure.

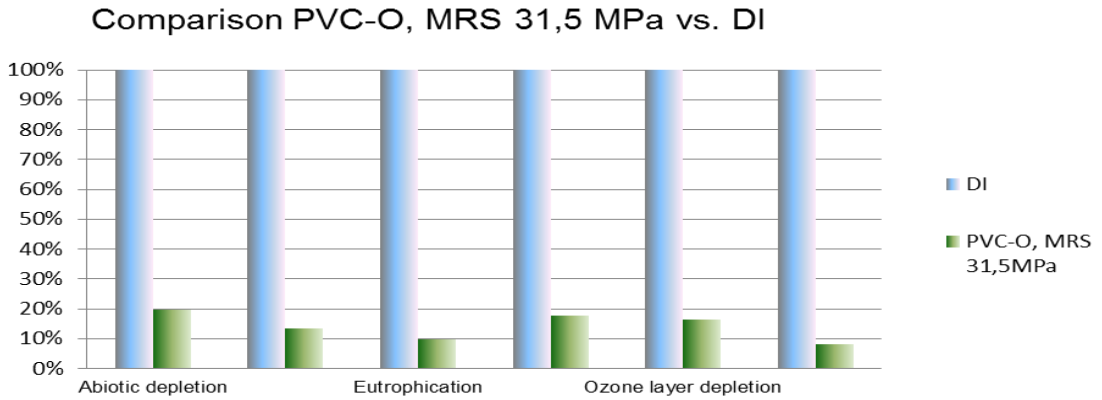
However, the burden of corrosion-prone pipe materials is not just limited to the enormous cost of repairing or replacing failed pipes. Steve Tan points to other economical and environmental factors. "Water is a scarce resource and water companies are aware of the cost of treated water leaking from the system as a result of corrosion. PVC-O pipes will not rust or corrode over time. Their ultra smooth surface means that less energy is needed to pump water through the delivery system. Technical estimates range from fifteen to twenty five percent. In a world where cheap energy no longer exists, this has to be factored into network maintenance equations."

"Energy can never be discounted," Tan explains. "Made from scrap iron, ductile iron pipes require more than twice the energy to produce than PVC-O pipes. The force of gravity is also a major environmental challenge - they are not easily moved. From truck to trench, their transportation and handling leaves deep carbon footprints."



Network benefits

Versatility is equally one of the major network benefits promoted by PVC4Pipes. "PVC-O networks are easy to design, install and expand. Their light weight, flexibility and toughness ensure reduced installation and maintenance costs. And when underground site conditions differ from the original master plan, solutions can easily be found. No above-ground recasting or remedial work is required. Such versatility is greatly appreciated by water and municipal engineers, contractors, specifiers and thus users."



PVC-O pipe (diameter 2.7 mm wall thickness) compared to ductile iron pipe

MAIN ENVIROMENTAL IMPACTS	Minimum Required Strength MRS 45: diameter 1.8mm	Minimum Required Strength MRS 31.5: diameter 2.7mm
Production raw materials	0.1 – 8%	0.1 – 6.6%
Transportation raw materials	<2.5%	<2.5%
Pipe extrusion	Ozone Layer 3.7% to Eutrophication 15% max.	Ozone Layer 5% to Eutrophication 17% max.
Pipe transportation	2 – 8%	3 – 4%
End of Life transportation	<0.5%	<0.5%
End of Life treatment	<0.6%	<0.6%

Major environmental impacts for PVC-O pipes: Source TEPPFA/VITO

Note to editors: Based in Brussels, PVC4Pipes is the trade association set up in 2003 with the mission of developing and promoting sustainable PVC piping systems in the global market. Members are drawn from all sections of the industry, from raw materials supply to pipe systems manufacture, testing institutes and promotional organizations.

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