

Press Release

Brussels, 26 September 2017



Plastic Pipes Shaken, But Not Stirred

-Major outcome of new report on behaviour of plastic pipes towards dynamic ground movements

A panel of engineers from the European Plastic Pipes and Fittings Association (TEPPFA) has reviewed and published the technical evidence that describes the behavior of plastic pipes in response to dynamic ground movements. Their findings are now contained in a detailed report that could prove invaluable for utility companies that deliver vital services such as water, gas, sewer and telecoms.

It has long been known that ductile performance of plastic pipes accommodate extreme dynamic movements such as earthquakes, tsunamis or landslides. The TEPPFA report entitled '*Behavior of Plastic Pipe Systems in response to Dynamic Ground Movements*', reviews a whole range of underground disturbances. These include not only acute seismic events but also adjacent deep excavation, traffic loading, frost heave, collapse of voids in ground and many other conditions.



Flexible plastic pipes favored

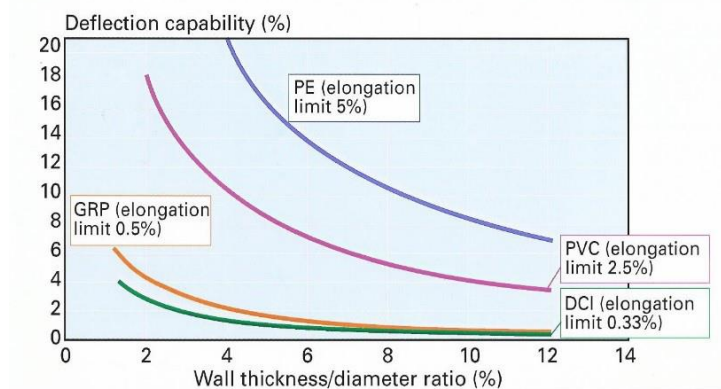
Ludo Debever, TEPPFA general manager comments: “Our team of experts have critically examined over one hundred independent sources that involve authoritative research, testing and experience from around the world. Their conclusion is that the performance of flexible plastic pipe systems to withstand the stresses and strains of dynamic ground movements far exceeds the same ability of rigid, non-plastic pipe materials.”

“Since plastic pipes were first commercially introduced over eighty years ago, their use has significantly improved public health and welfare throughout the world. As the report notes, the acceptance of plastic pipes has more to do with attitude than latitude. Utility companies rightly rely on the continuous performance of pipelines if and when the ground moves. Now they have a body of technical evidence and solid experience which favors flexible plastic pipes as their pipeline of choice.”



In the report, one prominent example of how utility companies have opted for plastic pipe technology comes from Dr. David Walton. Walton is a pipe engineer and scientist with over forty years of working with utility companies such as British Gas and Thames Water.

Deflection capability as function of wall thickness/diameter ratio



“When the earth moves, the pipe system has to move with it,” he explains. “Resistance is futile. Rigid pipelines are more vulnerable to dynamic ground movements especially if they are aged, corroded or both.”

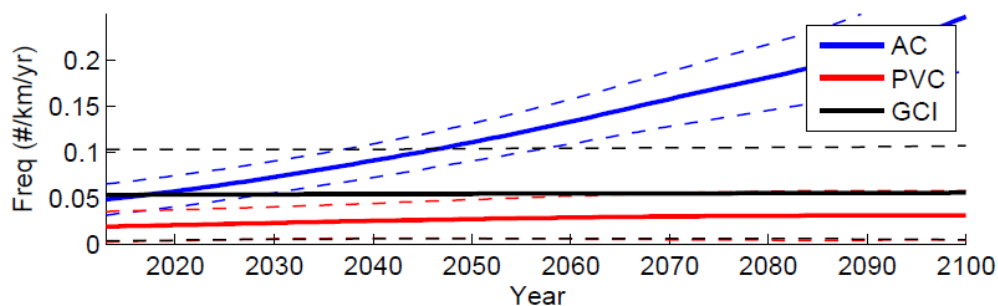
“The speed, scale and scope of replacement of cast iron gas and water mains by more flexible and durable plastic pipe systems was fundamental in the UK. For British Gas, the conversion to flexible, welded polyethylene systems overcame leakage and significantly reduced the danger of explosions. In addition to solving the obvious safety and regulatory issues, it virtually saved their business.”

The authors of the report insist that whatever the size or source of ground movement, the ductile and elongation properties of the pipe material must cushion blows from soil loads. “Only plastic pipes and their joints can do this by providing a functional safety buffer,” they state.

Their reflections are backed up by comparative testing of plastic and ductile iron (DCI) pipes for deflection capability as a function of SDR (Standard Dimension Ratio).

Less vulnerable to defects during earthquakes

By their very nature, acute seismic events represent actual situations by which various pipeline materials are physically tested. Many water, gas and sewer pipeline failure assessments have been carried out in the aftermath of major earthquakes. The report details and analyses many of these devastating instances such as Valencia (1994), Great Sichuan (2008), Canterbury, New Zealand (2010/2011), Kobe (1995) and Fukushima (1916).



Predicted PVC lifetime performance

To assist utility companies in their pipe material decision, the report also provides an earthquake prediction model that applies to various pipe materials. It also backs up actual





earthquake experience with physical testing work carried out by Cornell University in New York, Osaka Gas, Rensselaer Polytechnic Institute and the University of British Columbia.

“This combined evidence completely supports the preference for plastic pipes for water, gas and sewer delivery systems,” says Debever. “In such severe conditions, the need for continuous performance is vital for the emergency services as well for public welfare in the face of such challenging circumstances.”

“Our report clearly confirms that plastic pipes are less vulnerable for defects from ground movement than rigid pipes,” Debever concludes.

The full technical report: '*Behavior of Plastic Pipe Systems in response to Dynamic Ground Movements*' has been posted to the TEPPFA website: <http://www.teppfa.eu/industry-studies-2/>

End of Press Release

About TEPPFA

TEPPFA is The European Plastic Pipe and Fittings Association founded in 1991 with headquarters in Brussels. TEPPFA's 10 multinational company members and 14 national associations across Europe represent 350 companies that manufacture plastic pipes and fittings. TEPPFA's members have an annual production volume of 3 million tonnes directly employing 40,000 people with € 12 billion combined annual sales. TEPPFA positions itself as plastic material neutral.

Its final products are subdivided into 3 application groups: 1. Building & Construction (Hot & cold water supply, central heating, waste water discharge and rainwater drainage) 2. Civil Engineering (Below ground pipe systems for sewers, stormwater management, sub soil drainage and cable ducting) 3. Utilities (Pressure pipe systems for distribution of drinking water and gas)

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