Making Connections To Polyethylene Water Pipes

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TODAY'S UNDERGROUND PLASTIC PIPES HAVE A LIFE EXPECTANCY OF OVER 100 YEARS



Publications

- Technical Guidance
- Specification Guidance
- News Articles



Plastic Pipes Group | PPG - Support & Downloads - Overview (bpfpipesgroup.com)



Learning objectives

- Practical issues which if addressed promote right first time outcomes
- Solutions for making connections to different types of polyethylene pipe
- Specifications and options to promote quality, traceability and reliability





Viscoelastic

- Pipe has a dynamic response to an applied load (mechanical or thermal)
- The rate of response (time) is a function of temperature





Chain Principles



Chains are loosely entangled



Taking the strain



Viscoelastic

- Pipe has a dynamic response to an applied load (mechanical or thermal)
- The rate of response (time) is a function of temperature





Pipe Stretch & Contraction

- Pipe is anchored to a steel frame at each end to create end load
- Pipe is subject to internal pressure
- Diameter is measured as a function of time & temperature





Pipe Stretch & Contraction

- Supplied 125.0 125.8mm
- 10bar, 20°C, 30 days
- In service uti 128.5mm





Pipe Stretch & Contraction

- Supplied 250.0 251.5mm
- 10bar, 20°C, 30 days
- In service uti 257.9mm





Effect is reversible

- Removal of the load changes the applied stress
- Rate of dimensional change will be function of time & temperature
- Think about interaction in water networks with active pressure controls





Reversion in practice

- We want to cut into a pipeline to fit a flange stub or fit a tee fitting
- We use a tooling solution to correct the diameter of the pipe
- Slow rate adjustment will be easier and it is better for the pipe material





Tips for making connections

- We can fix water leaking into the weld with basic foresight
- A tapping tee commonly used for house connections
- Insert inflatable stopper if valves are passing during isolation works





Forming branch connections

- Small scale self tapping tee, electrofusion or bolted fittings
- Branch saddles, electrofusion is recommended





Long term thinking needed

- Works on the day it was installed, we are all happy?
- The pipe is viscoelastic and has a thermal coefficient of 'contraction'
- Sometime later, dissimilar materials and simple seals part, it leaks





Electrofusion is the long-term solution





Sizes for all assets

- PE pipes to 3m diameter exist, branch reducing outlet available all diameters
- Fittings with equal branch size exist, this range is growing today
- Certain fitting sizes and outlet types are range rated over several pipe sizes





Liner or new build, air valves





Equal as well as unequal, ranged

- Saddles are available with branch size matching main pipe, e.g. 250x250x250
- Saddles commonly available with reduced outlet, optimal valve sizing
- Range rating capability is normal, e.g. 250-400x90, 200-213x180





Contaminated land options

- Barrier gasket system for flange connection
- Field applied wrapping method provides protection
- Fully approved to BS8588, more on specifications to come





Core hole techniques

- No requirement to dig behind or beneath the pipe
- Vacuum loading techniques, tools or in saddle design
- Self holding while welding operation takes place





Live launch usage

- Making connections for new network extension is a core purpose
- Making connections for air valves, hydrants and washouts
- Making connections for live launch maintenance & inspection systems





Contract Specifications

- Electrofusion & mechanical
 - EN12201-3; fitting design
 - EN12201-5; fitness for purpose testing
- Barrier specific fittings
 - BS8588
- Installation code of practice
 - WIS 4-32-08; (specific to welding)

EUROPEAN STANDARD NORME EUROPÉENNE	EN 12201-5
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Quality approach

- Risk assessed method statements, access to commissioned asset
- Pressure testing is a given before drilling, integrity proof
- Full onsite data capture is now routine across quality installers

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Specifying tips

- Ask to see the fitness for purpose testing plan for the fittings
- Are installers GIRS/WIRS accredited for competency and quality control
- Think about the fittings but also the integrity test and the drilling machine





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Any questions?



About Us



The British Plastics Federation (BPF) Pipes Group is the leading trade federation of the UK plastic piping systems industry and a member of the European Plastic Pipes and Fittings Association (TEPPFA).

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Under the directive of the BPF Pipes Group Council the group is split into Application Groups encompassing the wide range of applications covered by plastic piping systems.

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- Designing Drains And Sewers 24th November

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