

Plastics Pipes – A Look into the Future

**S.H.Beech SHB Consulting**

**Abstract**

The use of plastics pipeline systems for utility applications has been a major success, providing an asset without the corrosion issues associated with metals. Plastics pipes were first used for water supply in the 1950's, but in the 1960s Du Pont USA developed a polyethylene system for gas distribution. This was introduced in the UK and subjected to major development by British Gas, pioneers of the use of plastics pipes for gas networks in Europe. This technology has been adopted by gas companies globally, and as a result plastics systems are the prime choice for low and medium pressure gas distribution. Development and associated standardisation has been an ongoing activity resulting in assurance of more robust products for installation by 'no-dig' technology and service in more severe environments.

Today polyethylene is the most commonly used thermoplastic for gas systems in pressures up to 10 bar in Europe and globally. Buttfusion and electrofusion jointing techniques are well developed for this thermoplastic giving a reliable fully end load resistant system. Other polymers are used for gas pipes but tend to be restricted to certain niche applications. These include high impact PVC, crosslinked polyethene PE-X, and polyamide PA commonly referred to as nylon. In recognition of these systems ISO/TC 138/SC4 Plastics pipes and fitting systems for gas has developed product standards based on these these polymers. Potentially PE-X can be used for gas applications up to 16 bar pressures and PA up to 20 bar. However there may be limitations in diameter and available jointing techniques for these polymers for use at these pressures.

The plastics pipes industry has developed thermoplastics materials and monolayer pipes near to their potential limit in terms of pressure capability. However multilayer and composite pipes are creating interest and the opportunity to extend operating envelopes and applications. Multilayer pipes manufactured from PE with an aluminium core layer have gained popularity for installation within buildings as they can be handled like copper pipes. Peelable layer products have been introduced to facilitate jointing and offer further protection to the outer surface of the pipe. The development of composite plastics based pipes offers the potential of much higher pressures. Reinforcement of polyethylene pipe by continuous filaments, wound tape, and even by using steel mesh have all resulted in the successful commercialisation of products for both oil and gas applications.

This paper reviews the development of plastics pipes products with a pointer towards the future and the potential for plastics based products with a 50 bar or higher pressure rating. The progress of plastics fusion technology and the part played by standardisation are discussed also.

Contact: [beeche@blueyonder.co.uk](mailto:beeche@blueyonder.co.uk)  
Tel: +44 1506 207232