



Complete PE pipe solutions for hydro power applications



Durability and performance for hydro power schemes

As a leading UK manufacturer, GPS PE Pipe Systems is well placed to provide hydro power installers with reliable and cost effective PE pipe solutions.

GPS Excel is a high performance polyethylene (PE) pipe system with a potential 100-year maintenance-free life and an outstanding track record of serving the water, gas and offshore industries.

When compared to pipes made from other materials, it offers an overall system cost reduction based on lower maintenance and excellent hydraulic performance, as well as logistical and installation advantages.

Features

- Lightweight (75% less than ductile iron)
- Flexible (typical bend radius 25-35 x pipe OD)
- Fully end load bearing no need for thrust blocks
- Corrosion and tuberculation free with no lining to deteriorate
- High level of abrasion and crack resistance (at normal temperatures)
- Outstanding damage tolerance (tolerable of scores up to 10% of wall thickness)
- UV and freeze resistant (remains ductile even at -50°C)
- Fusion welded joints are as strong as the pipe
- Long life (typically over 100 years)

Benefits

- Smooth bore reduces friction loss and maximises flow
- Consistent pressure and flow characteristics throughout life
- Improved energy efficiency
- Faster installation
- More economic transport loads
- Reduced need for expensive pipe handling equipment and specialist machinery
- Fewer joints (with minimal number of mechanical joints) minimises the risk for potential leaks
- Minimal maintenance
- Lower whole-life costs than for other pipe materials (ductile iron and GRP)



The non-corrodible bore of Excel pipe remains exceptionally smooth over time, ensuring less friction loss and consistent flow rate throughout the life of the pipe system. This means maximum power output, as well as low maintenance and cleaning costs. In contrast, the hydraulic performance of metallic pipes can decline dramatically over time due to corrosion, tuberculation or biological build-up, resulting in significantly reduced hydraulic performance and consequent loss of power output. This can even occur on lined metallic pipes as the result of lining detachment at joints or damage during installation.

Lower Whole-Life Cost

As demonstrated in the Whole Life Costing Model (developed by Thames Water, Borealis, GPS and TRL in 1996), PE pipes not only tend to have lower initial costs than other pipe materials (ductile iron and GRP), they also have lower whole life costs. Taking into account the various project costs incurred from the outset for a large diameter scheme - from material choice and installation to on-going repair and maintenance - Excel piping offers better price competitiveness and real value for money over other pipe materials.

Lower Environmental Impact

As PE pipes are lighter in weight than conventional materials, they are consequently more efficient to transport and therefore have a lower impact on the environment. As confirmed in the independent study by the Flemish Institute for Technological Research (VITO), not only does the manufacture of plastic pipes require less energy, on average, they have an environmental footprint that is 1/3 of that of traditional materials.







Key Product Information

- Size range: up to 1200mm OD
- Pressure ratings: up to 16 bar (as standard at 20°C)
- Material: black PE100
- Pipe lengths: standard 50m/100m coil lengths (up to 180mm OD) and 6m/12m/18m straight lengths.
 Other lengths can be made to order
- Fittings: a comprehensive range available, custom fittings can be made to order
- Jointing methods: butt-fusion, electrofusion or mechanical (where necessary)
- Installation methods: open cut, slip-lining/pipe bursting, moleploughing, directional drilling



Quality & Approvals

- Meets the relevant national and international quality standards
- Manufactured to BS EN 12201-2
- Manufactured in premium PE100 grade materials, listed on the PE100+ Association Quality Material List (www.pe100plus.net)
- Quality management system accredited to ISO 9001:2008
- Environmental management system accredited to ISO 14001

Expertise in PE Pipe Systems

For many years GPS PE Pipe Systems has been leading innovation in the development of PE pipe and fittings and our wealth of experience ensures that we remain a market leader.

With a long company history and one of the broadest PE pipe product ranges on the market, GPS is more than a commodity supplier. We deliver security of supply, capitalising on our strong quality management system, the state-of-art manufacturing facilities and an unmatched product and technical support.









Tailor Made Solutions

The GPS broad product portfolio gives consultants and engineers freedom of choice with the ability to integrate different systems perfectly. However, every hydro power project is unique and when there is a need for more optimised designs, bespoke pipes and fittings can be custom-made to fit an exact specification.

Value from Optimum Pressure

Specifiers can achieve considerable savings by matching pipe diameters and wall thicknesses to realistic pressures expected, instead of opting for standard pressure ratings which incorporate generous safety margins.

Extensive Fittings Solutions

Not only does GPS offer a comprehensive range of fabricated PE fittings up to 1200mm OD, we also have the latest manufacturing equipment and processes to provide customers with custom fabrications to meet specific project needs.

Complex Designs

Challenging environments often dictate the need for complex designs. GPS technical expertise along with our leading-edge extrusion and fabrication facilities means that we are able to offer solutions for the most challenging pipeline projects.

Installation Service

GPS also offers a full installation service for our large diameter electrofusion fittings, removing the need for customers to organise specialist training or tooling and giving the assurance of the installation being carried out by fully accredited experts.

This service is particularly relevant to our large diameter couplers and vacuum clamped saddles (both available for mains sizes up to 1200mm), but is also available for electrofusion tees and elbows up to 400mm (dependent on style).

The vacuum clamped saddles are unique in that during the welding process, the fitting is fixed onto the mains pipe purely by a vacuum applied to the saddle itself. This negates the need for any additional external clamping equipment which usually requires extensive excavation below the pipe. It also enables welding onto far thinner walled pipes as no clamping force around the pipe is needed during welding.

Easier Logistics

Remote locations often bring logistical challenges. GPS can advise on the optimum delivery schedule possible and can manufacture custom lengths up to 18 metres to enable the most efficient delivery and installation.



Tried and Tested: Inver Hydro Scheme

Located in the remote Scotland's Western Isles and with the maximum output of 1970kW (7.6 gWh/year), the Inver Hydro is one of the most remote and largest private hydro schemes in the UK.

The remote location within a national scenic area meant that the pipeline installation had to respect the local ecology, landscape and environment and be robust enough to last for at least 100 years with minimum maintenance.

The Solution

The hard wearing strength and flexibility of Excel piping fulfilled this requirement, whilst ensuring that installation was as fast and simple as possible, with minimal requirement for specialist plant. GPS supplied 2.3km of black 1200mm Excel piping with pressure ratings closely matched the actual head along the penstock to achieve the most cost-effective solution (SDR21 and SDR26).

As well as ensuring that all deliveries to this remote location were completed within a demanding delivery schedule, GPS has also provided technical support and visited the site to ensure that handling and installation of the pipe was undertaken in line with best practice.

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