

what's new in the

pipeline

Issue 26 August 2005

Electrically Conductive Pipes Reduce Static Risk

In certain situations the risk of static discharge from pipes can be potentially dangerous if volatile media or dry substances are being conveyed. To assist with the control and safe discharge of static electricity, special grades of electrically conductive Polyethylene and Polypropylene are available as piping systems.

Designed for use in the construction of piping systems and plant engineering, these specialist polymer products are an increasingly popular alternative choice for this application.

Electrically conductive systems are available in three materials: Polypropylene electro-conductive (PP-el); Polyethylene electro-conductive (PEHD-el); and Polypropylene flame retardant and electro-conductive (PPR-s-el). Each range includes pipes, fittings and semi-finished products. In all cases the addition of the electro-conductive or flame retardant properties results in the modification of some of the standard properties of the raw material. Therefore for applications involving chemical resistance, the suitability of the piping material should be checked for each specific case.

Typical applications for PPR-s-el, PP-el & PEHD-el include:

- Piping systems for aggressive media
- Suction and exhaust piping systems
- Piping systems for solids
- Piping and tanks in explosion-proof rooms
- Degassing piping systems in waste disposal facilities
- Lining tanks and containers
- Process plant construction
- Mining applications

Pipes are manufactured in diameters from 32mm to 1200mm - in standard lengths of 5m. A choice of pressure ratings from PN3.2 to PN10 is available. The range of fittings includes flanges, tees, bends and reducers - manufactured as injection moulded parts in sizes up to 315mm. Sheet materials can be supplied in thicknesses up to 20mm, and compatible welding rods are available to complete the range. In common with other product ranges from AGRU, strict control of incoming raw materials and sophisticated production systems ensure that complete material traceability can be demonstrated with the endorsement of works test certificates according to EN10204.

Electrically conductive piping is part of a wide range of plastic piping systems available from IPS. For details on this product or to discuss your particular application, contact us now on freephone 0800 975 79 71

Weld On 724 – A high strength solvent cement for chemically resistant joints

A well made PVC-U or PVC-C solvent welded connection produces a joint that is at least as strong as the parent pipe or fitting. Solvent cement welding is a very cost effective joining process, and over the years it has led to the increased popularity of these materials for a wide range of applications. This growth in use has in turn led to the use of these systems in ever more demanding applications, handling increasingly aggressive chemicals.

Recognising that a small number of these aggressive process fluids are known to attack standard solvent cements, IPS Corporation – manufacturers of the Weld-On solvent cement range – began development of a new solvent cement to deal with this problem. The new formulation – Weld-On 724 – was subjected to an extensive test programme involving actual process piping installations in the pulp & paper and chemical treatment industries, where the piping installation was monitored over the course of a year.

In addition to this field experience, IPS also undertook exhaustive laboratory testing of pipe joints made using Weld-On 724 cement. The tests involved a wide range of chemicals involving caustics – including hypochlorite – as well as mineral acids and other corrosive chemicals under a combination of both pressure (7 bar) and temperature (60°C) for a test duration of 2500 hours. At the end of the test period, no failure was recorded on any of the solvent cement welded joints made using Weld-On 724.

Used with Weld-On P70 primer, Weld-On 724 provides an ideal solution for solvent welded systems handling aggressive media. It is a medium bodied cement that is brush applied requiring no special application methods – greatly simplifying the jointing procedure.

Weld-On 724 is available from stock in 473ml or 946ml can sizes. It is WRAS approved for use in contact with cold potable water. Please contact us if you would like further details of the IPS Weld-On range of solvent cements, primers and jointing accessories, or to request a copy of the Weld-On 724 brochure. We would also be pleased to discuss with you details of our free training courses in solvent cement welding.



Plastics Protect Treehouse

One of the largest wooden treehouses in the world is open to visitors at the Alnwick Garden, Northumberland.



The treehouse is part of an ambitious plan by the Duchess of Northumberland to revitalise the gardens at Alnwick Castle, which already feature a magnificent water cascade. There are almost 6,000 square feet of buildings linked by suspended walkways, high in the trees. Visitors can wander through the tree-tops as well as eat in the restaurant, shop, or spend time in one of the educational rooms.

Such a large timber structure has an obvious fire risk. However this has been solved by the installation of a fire sprinkler system using CPVC plastic fire sprinkler piping. The system was designed and installed by Vipond Fire Protection, who are experts in this field having installed many other CPVC fire sprinkler systems.

CPVC plastic pipes are strong, lightweight and very easy to install using a cold solvent welded joint. Manufactured and tested to numerous international fire protection standards, the system has previously been successfully installed at many important buildings including several of great historic value.

For details on our fire protection programme, contact our sales team or visit our dedicated fire protection website at: www.ips-blazemaster.com. For information on visiting Alnwick Garden and its' magnificent treehouse, go to: www.alnwickgarden.com.

New electrofusion fitting design improves joint quality

Following a long period of research and development, AGRU has developed an improved electrofusion fitting design which features a resistance wire that is totally embedded in the fitting. The design philosophy of the new range of electrofusion fitting was very demanding – a working pressure of up to 16 bar and a life expectancy of 100 years were prerequisite. In addition the high reproducibility of welding quality was required, in conjunction with short welding times and fitting traceability by bar code scanning.

One common problem that is regularly encountered during installation of electrofusion couplings in PE100 material is contamination of the internal fitting surface with dirt or moisture during assembly. If care is not taken, this contamination can remain in the joint area during welding, leading in turn to a potential weakness in the joint itself.

This new fitting has a smooth internal surface on the coupling, making it almost impossible for contaminants to be undetected and making cleaning much easier. The encapsulated wire design also eliminates the possibility of aggressive media making contact with the heating wire. As a result this new coupling design creates more possibilities for the use of PE100 piping with electrofusion jointing in ever more demanding environments.

AGRU has made significant investment in robotic production systems in order to produce these new electrofusion fittings to the highest possible quality standards. During production, three separate tests are conducted to verify the integrity of the resistance wire to ensure fittings of a consistently high quality - offering excellent long term performance.

The new range of embedded wire electrofusion fittings from AGRU is available in diameters up to 400mm. It includes couplings, tees, elbows, reducers, caps and transition fittings. Full details can be found in the latest edition of the IPS handbook.



Pure piping for critical applications



The use of specialist high purity thermoplastic piping systems is well established in demanding applications such as those found in the semi-conductor and microelectronics industries. Pharmaceutical manufacturing also provides applications where high purity thermoplastics can be used.

Why choose high purity plastics? These specialist materials offer numerous advantages over conventional materials. They are corrosion and passivation free, they offer simplified welding techniques, and they have a superior surface finish which does not corrode or rouge - a common problem with metallic systems.

AGRU PVDF and Polypropylene high purity piping systems are produced from fully traceable raw materials in a meticulously controlled manufacturing environment. Documentation and evidence of traceability of raw materials is an essential part of the programme, and as a result material test certificates are available as part of a demanding quality assurance system.

High purity thermoplastic piping is simple to install using established welding techniques. PVDF and polypropylene are "melt processable polymers", which means that they can be joined by a choice of fusion welding methods. Non-contact Infrared (IR) Fusion is the preferred technique, using computer controlled welding equipment. IR welding avoids direct contact between the heat source and the parts to be joined – which could otherwise lead to a possible source of contamination. The latest generation of AGRU IR welding machines feature computer control and recording of welding parameters, as well as weld record labels to permanently fix to the joint area.

With the many benefits of cleanliness, purity of materials, ease of installation and traceable documentation, it is easy to see why high purity thermoplastic piping materials are steadily replacing metal systems for critical applications.

Technical Focus: Connections

1. Making Secure Threaded Connections

Threaded joints are frequently used to make connections to process control devices, gauges or instrumentation. The key advantages of threaded connections are that they provide a simple adaptation to demountable parts, or they provide a transition to dissimilar piping materials or components.

In our previous issue, we discussed the use of PTFE tape on plastic threaded pipe joints. To complete the picture, in this article we also cover the safe use of paste sealants on plastic systems.

What type of thread sealant should I use?

PTFE thread tape and PTFE based paste sealants are in common use. However only paste sealants that are specifically manufactured for use on plastic piping systems should be used. Some paste sealants contain chemicals which cause stress cracking in thermoplastic materials, and failures often occur as a direct result of incompatible thread sealants.



PTFE tape used correctly provides good sealing properties on thermoplastic threads. Applied to male threads, the tape should be carefully applied in a clockwise direction so that the threads are evenly covered. Generally 1½ – 2 turns is sufficient to provide coverage. Over application can cause a build up in the joint area, leading to additional stress from over tightening.

PTFE thread sealant pastes which are compatible with thermoplastic pipes may also be used. These sealing pastes are formulated for use as an alternative to PTFE tape, and should not be used in conjunction with any additional thread sealing products.

How do I make a good threaded connection?

Whenever possible use an injection moulded threaded component, as it will have been designed to adapt to the forces and stresses that are created from threaded connections. Special threaded connections that have stainless steel, brass or galvanised mild steel threads are widely available for transition to metallic piping systems. Additionally, there are also wide choices of reinforced threaded components with male or female threads which are

designed to produce safe and reliable joints between plastic systems.

Correctly apply the thread sealant to the male thread, making sure that good coverage of the threads is achieved. Assemble the joint until hand tight, and then tighten between 1 to 2 turns beyond hand tight using a strap wrench designed for use with thermoplastic pipe – do not over-tighten! Pipe wrenches designed for metallic piping should not be used on thermoplastic pipe.

Points to remember with threaded joints

- Whenever possible, always use an injection moulded threaded component
- If you must use pipe, make sure that the wall thickness is suitable for threading
- Do not use metallic pipe tools that can cause notches or gouges
- Do not subject threaded joints to vibration, stress or deflection
- Do not over-tighten the joint
- Take care when threading male metal threads into female plastic threads
- Make sure that the thread types are compatible
- Make sure you use a compatible thread sealant
- Do not combine thread sealants with other products such as hemp

2. Using Union Connections

Union connections are widely used in thermoplastic piping systems to produce a simple method of assembling valves, piping or other equipment. Although simple in concept and operation, an understanding of the function and installation can help ensure that the long term performance of union connections is not compromised.

Basic function of union connections

Union connections depend upon an internal “O” ring as the sealing mechanism. During installation, the “O” ring must be compressed sufficiently to provide a seal between the mating surfaces of the union parts – which is achieved by tightening of the union nut. As the pressure inside the pipeline increases, the “O” ring creates a tight seal, thereby preventing the pipeline fluid from escaping.



An effective seal is usually achieved without excessive tightening of the union nut – generally hand-tight plus a quarter of a turn with a strap wrench is adequate. Additional

tightening of the union nut is not recommended as this can cause damage to the components.

How do I prevent installation problems?

One of the common problems is misalignment of the components, which can prevent an effective seal of the "O" ring being made. Dirt, or debris on the sealing surfaces can also prevent sealing, and damage the "O" ring itself, whilst the use of lubricants or sealing compounds can lead to problems with stress cracking if incorrectly applied.

To prevent installation problems from occurring, a few simple steps need to be observed, beginning with the jointing process. Always disassemble unions (including unions on valve connections) before making solvent welded joints to ensure that no cement is accidentally pushed on to the sealing faces or the "O" rings. In heat fusion welding, make sure that the joining process has been correctly performed and that no distortion of the joining surfaces has occurred through excessive heating.

When preparing to install unions into the system, make sure that the joining faces are aligned squarely to each other flush with the "O" ring. Tighten the union nut fully by hand - do not use metal pipe work tools that can scratch or gouge thermoplastic materials - and then tighten a further 1/4 of a turn using a strap wrench.

Union connections must never be used to draw pipes together, to close up gaps, or to correct misalignment in the system.

Adjustments after testing the system

If any leaks are detected from union connections following the pressure test, then the system should be drained, the pressure released, and the assembly checked for any of the installation problems previously mentioned. Once the problem has been rectified, follow the installation steps once more, and avoid over tightening.

3. Making Secure Flange Connections

All plastic piping systems feature flange joints in a variety of styles. They are particularly useful for a number of applications, including:-

- temporary or de-mountable installations
- for connections between dissimilar materials
- for connection to flanged equipment such as tanks or pumps and valves
- when installation conditions will not allow other jointing methods

Installing flanges correctly

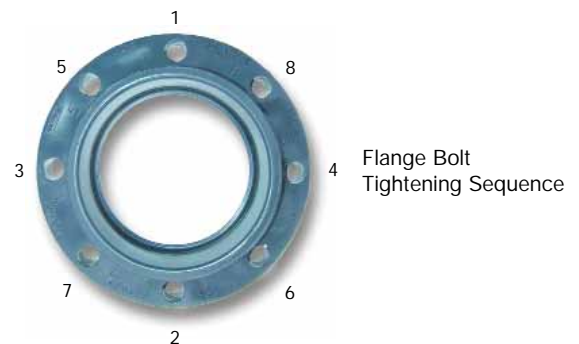
When installing flanges, care should be taken to ensure that the alignment and fit of the pipe spool is accurate so as to eliminate stress. Flange connections must never be used to

adjust or correct misalignment in any piping system. In addition, checks should be made to ensure that there is dimensional compatibility between mating flanges, particularly if dissimilar materials are being joined.

Before the bolts are tightened, the flange faces to be assembled should be aligned parallel to each other. There should be a sufficient gap to allow the gasket to be inserted, but the gap should not be excessive as the forces created by tightening the bolts could cause undue stress in the flange.

Take care to choose the correct bolt length, ensuring that the screw thread will finish flush with the nut after tightening. Washers should be used on both the nut and the bolt to prevent damage to the flange, and the threads should be lubricated to permit easy running during assembly.

All bolts should initially be hand tightened before being fully tightened. The preferred method for tightening the flange bolts is to use a torque wrench set to the correct value for the flange type that is being used. Bolts are then tightened gradually and diametrically, until the joining force is uniform across the entire sealing area. The following diagram shows the correct sequence for tightening flange bolts.



Select the correct flange gasket material to suit the fluid being conveyed, as well as the operating temperature and pressure. Common materials include EPDM and FPM elastomers. These are available as both stub flange and full face type gaskets. Special versions of expanded PTFE gaskets are also available for use with thermoplastic flanges. Ideally suited to aggressive chemicals, high temperatures and especially high purity applications, these new gaskets have helped in providing effective sealing solutions in highly demanding applications.

Full face gaskets are designed to match the bolt pattern of the flange, and are available in all flange patterns and types. The bolt holes in the gasket can be an aid to installation, as they help locate the gasket securely and accurately in the sealing area. Stub flange gaskets are intended to fit across the "inner bolt circle diameter" of the flange, and care should be exercised to ensure that the gasket is correctly dimensioned to suit the flange pattern being used.



Thermoplastic pipe and fittings for use with drinking water

Thermoplastic pipes are ideally suited for use in drinking water applications, but there is often some confusion about the types of materials that can be used, and what kind of approvals are required for satisfactory use. Here we try to address two of the most common questions that arise:

1. Are IPS products tested and approved by:

- The "Water Board"?
- The "National Water Council"?
- The "Water Research Centre" (WRc)?
- The "Water Bylaws Scheme"?
- "WRAS"?



The tests referred to are now covered by the Water Supply (Water Fittings) Regulations 1999.

These regulations are used to check for performance and fitness for purpose, as well as for the effect upon water quality. The "Water Boards" and the "National Water Council" no longer exist. The "Water Bylaws Scheme" also ceased to exist after 1999.

WRAS approval covers products in use on the consumers' premises. The regulations are administered by the Water Undertaker, guided by the "Water Regulations Advisory Scheme", also known as "WRAS". Approved products are listed in the Water Fittings and Materials Directory, published annually by WRAS.

Most of our systems and raw materials in PVC-U, PVC-C, ABS and Polyethylene have been tested for effect on water quality and are listed in the directory.

2. Are IPS products tested and approved by the "Drinking Water Inspectorate (DWI)"?

DWI Regulation 31 (Regulation 29 in Scotland) approval covers products in use in the public water system from the water source to the point at which it enters the consumer's premises.

The approval relates to the Water Supply (Water Quality) Regulations 2000, and is administered by the "Drinking Water Inspectorate", also known as "DWI". These regulations require that products in contact with public water supplies must "have been tested and approved by the Secretary of State; or be considered by the water undertaker to be unlikely to adversely affect the quality of water."



Secretary of State approval is only granted to products that have high surface area contact with the water supply, such as pipes or reservoir linings. IPS has PVC-U and ABS piping that has been tested and is fully approved.

Products that have low surface area contact with the water supply are not deemed to require approval, but should have been tested for effect on water quality and listed in the WRAS Water Fittings and Materials Directory. Examples of these products are:

- Valves
- Pipe fittings, including gaskets and jointing compounds

For complete information on our approved products, contact our technical team.

Expansion Underway

Work has started on a much needed extension to our building that will more than double the size of our warehouse. When completed, we will occupy a facility with over 50,000 square feet of warehouse space.

The new warehouse will involve considerable re-organisation and investment in state-of-the-art pipe storage systems to take maximum advantage of the available space. When all of the phased work is completed early in 2006, we believe that we will occupy the largest and best equipped plastic piping stockholding and distribution facility in the U.K.

We will keep readers updated on our progress in the coming issues of What's New in the Pipeline?



Who's my contact?

At IPS we have a team of industry specialists covering the UK and Ireland, backed up by the resources at our County Durham head office. To reach any of our business development team, you can call our telephone Freephone at 0800 975 79 71 or you can contact any of the team directly on the following phone numbers or e-mail addresses:



Fire Protection:
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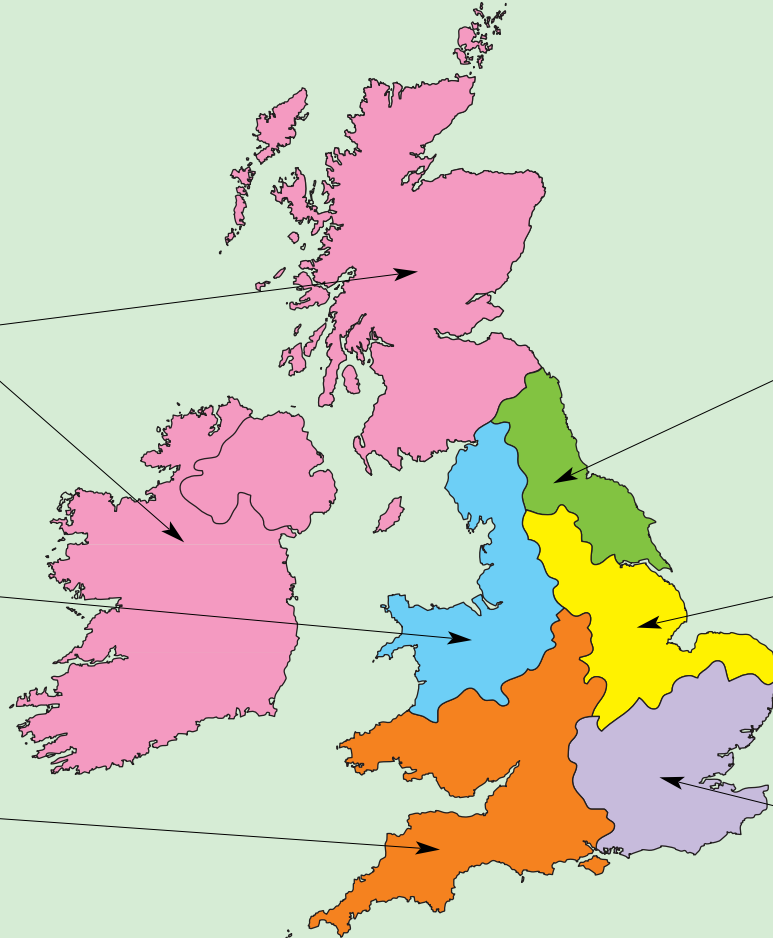
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CNC Technology Improves Welding Controls

With greater emphasis being placed on the long term safety and performance of plastic piping systems, the control, monitoring and recording of fusion welded joints is becoming crucial. To satisfy these requirements, WIDOS has developed and introduced the latest generation "CNC 3.0" process control for use with their contact butt fusion welding equipment

Designed to satisfy the requirements of the DVS guidelines 2207, 2208 and 2212, all welding functions are controlled by the CNC 3.0 control unit which forms an integral part of the equipment. The control unit has options for the input of the welding parameters to be made manually, by magnetic card scanning or with bar code scanning. Welding is only possible if all nominal values and parameters according to the DVS guidelines are fulfilled. In the event that any parameter is not fulfilled, the welding process is interrupted but still recorded.

During operation, the current state of the welding process, as well as the command for the next process step are visible on the display. At the completion of the welding, all welding data including nominal and actual values are recorded in the RAM memory with a continuous serial number. As a result all of the critical parameters concerning the fusion welding process are recorded.

The CNC 3.0 control unit has a welding memory capacity sufficient to record the details for 750 weld joints. The removable memory card is used to transfer the welding data between the control unit and a computer where the WIDOS welding programme WICON is used to produce weld record reports.

WIDOS welding machines with CNC 3.0 control are available for rent or purchase from IPS. Free of charge training in the operation of the WIDOS equipment can also be provided – please contact us for further details.



what's new in the

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Welcome To The Sales Team

Tom Tate and Chris McKeown have both recently joined our internal sales team, bringing with them a great deal of engineering knowledge.



Tom had previously spent 19 years involved in the production and fabrication of industrial plastic products, including site installation. He has extensive knowledge of plastic materials combined with hands-on experience. Outside of work, Tom is a keen DIY enthusiast, and he also enjoys electronics as well as computer construction and programming.



Chris spent 8 years working in the quality assurance programme for a leading process piping contractor, before working in the technical team for a manufacturer of hydraulic tubes. Chris enjoys sport, music and socialising, and has only recently dried out after his trip to the Glastonbury Festival!

Request for information

Please send me the following:-

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- Information on these product(s):.....
- A copy of the IPS Handbook
- A copy of the IPS Handbook on CD

Name:.....

Job Title:.....

Company Name:.....

Address:.....

Postcode:.....

Telephone:.....

Main Business Activity:.....

Please also send information to my colleagues:-

Name:..... Job Title:.....

Name:..... Job Title:.....

Name:..... Job Title:.....



PVC-U Systems



PVC-C Systems



ABS Systems



Polypropylene Systems



Polyethylene Systems



PVDF Systems



PURAD High Purity Systems



Compressed Air Piping



Pumps



Double Containment Systems



Process Measurement



Fixings & Supports



Tools & Installation Equipment



Sheet & Rod

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