HOLMAN PLUMBING

BPIR Summary

Prepared November 2023

> Pressure U-PVC Fittings

HOLMAN

BPIR Summary

Pressure U-PVC Fittings manufactured to AS/NZS 1477

Name	Pressure U-PVC Fittings
Line	Unplasticized Polyvinyl Chloride U-PVC Fittings manufactured to AS/NZS 1477
Identifier	HOLMAN Industries Pressure AS/NZS 1477

Holman PVC-U Pressure Fittings are designed and suitable for use pressure applications. The Holman range of Pressure application fittings are suitable for sustainable pressure pipeline systems and do not contain any compounds based on Lead Cadmium or Mercury.

PVC-U pressure fittings are chemically inert avoiding corrosion, chemical and gas emissions while in normal service life as a public water main or sewer.

Unplasticized Polyvinyl Chloride is a leading material used in pressure pipe and fittings systems in Australia. The economic advantages are publicly documented well accepted by the industry. They are lightweight, resistant to a wide variety of chemicals and do not support combustion.

PVC-U pressure pipes and fittings are impervious to bacterial and fungal attacks and are not subject to electrolytic or galvanic corrosion.

Pressure pipes and fittings are designed with high impact strength, which prevents damage during handling and installation.

All parts assemble easily using either solvent cement or rubber seal rings to accommodate thermal expansion and contraction or ground movement.

Relevant building code clauses

B2 Durability — B2.3.1 (a)

F2 Hazardous building materials — F2.3.1

G13 Foul water — G13.3.1, G13.3.2

Compliance

All Holman Industries Certifications and Licences are available for download at the HOLMAN Website under the following link: Plumbing Supplier - Australian Made & Accredited - Holman Industries

- AS/NZS 1477 WaterMark - Licence No. 70010
- AS/NZS 1477 WaterMark - Licence No. 70008
- AS/NZS 1477 WaterMark - Licence No. 25603
- AS/NZS 1477 WaterMark - Licence No. 040128-I02-R01
- AS/NZS 4020:2018 – Licence No. SM-ST230149
- ISO 9001:2015 Licence No. QMS-21388

All Type Testing documents are strictly confidential, information is retained with our Certification Assessment Body (CAB) responsible for compliance and licencing and may only be released by application by formal written request. Holman Industries reserves the right to deny access at company discretion.

Contact Details

Manufacture location (Australia)	11 Walters Drive, Osborne Park, WA 6017 Australia U 1-2/68 Lisgar Street, Virginia, QLD 4014 Australia U4/90 Quinns Hill Road East, Stapylton, QLD 4207 Australia
Legal and trading name of manufacturer	BOOKLEAF as Trustee for the EDEN Unit Trust T/A Holman Industries
Manufacturer address for service	11 Walters Drive Osborne Park WA 6017 Australia
Manufacturer location (Overseas)	Shanghai Xinguanghua Plastic Industry Co. T/A Zhejiang Vicpic Plastic Industry Co. Ltd – No 3699 Yuanjiang Road, Minghuang, Shanghai, China Yonggao Co. Ltd – No. 2 Daixi Road, Huangyan Economic Development Zone, Taizhou, Zhejiang China TTC Industrial Corp. Ltd - 223 GP 12 Soi Wat Bangplee Yai Km 13 Bangna-Trad Road, Bangplee, Samutprakarn 10540, Thailand
Legal and trading name of importer	BOOKLEAF as Trustee for the EDEN Unit Trust T/A Holman Industries
Manufacturers website	**www.holmanindustries.com.au**

Applications

PVC-U pipes and fittings have been in use for pressure applications in Australia since the 1960s supported by a much longer service history elsewhere in the world.

Over this time, the industry has recognised the many benefits of PVC for pressure pipes and fittings.

- material stability
- corrosion resistance
- high strength to weight ratio
- ease of handling and installation
- excellent flow characteristics

SWJ Pressure Fittings	RRJ Pressure Fittings
Pumped sewerage and effluent pipelines	Water supply services
Potable water	Above ground water supply
Irrigation and turf watering	Below ground drainage and sewer
Slurry transport	Watermains
Pressure sewerage	Irrigation
Water supply	
Recycled water	

Product Limitations

Pressure PVC-U pipes and fittings are suitable for system operating temperatures ranging from 0° C to 50° C

For operating temperatures above 20° C provisions must be made for the pressure re-rating in accordance with Table 1.1

Table 1.1 – Thermal re-rating factors

Maximum operational temperature (°C)	Multiplication factor for pressure re-rating
20	1.00
25	0.94
30	0.87
35	0.78
40	0.70
45	0.64
50	0.58

** Based on ISO 1452.3 - fittings in piping systems intended for the supply of water under pressure*

Effect of Low Temperature	The impact resistance of PVC-U pipe and fittings decreases with the reduction in ambient temperature; therefore, extra care should be exercised if installations are carried out at ambient temperature near 0° C.

Effect of Elevated Temperatures	PVC-U has a softening point of approximately 80° C. As the material has a low thermal conductivity, pipe and fittings can cope with elevated temperatures. The recommended maximum continuous operational temperature for PVC-U pipe and fittings systems is 50°C. The mechanical properties of PVC are referenced at 20°C. Thermoplastics generally decrease in strength and increase in ductility as the temperature rises and design stresses must be adjusted accordingly.

Product Advantages

Excellent internal and external corrosion resistance	The properties of PVC-U Holman Pressure fittings promote for a long service life
Electrical conductivity	Holman PVC-U are non-conductive and do not suffer from electrolytic corrosion
Light weight	The light weight of Holman PVC-U Pressure fittings can lead to significant handling advantages.
Low installation costs	The light weight of Holman PVC-U Pressure fittings integrate easily with commonly used PVC-U stormwater pipeline systems at various lengths to reduce installation costs.

Weathering and solar degradation

The effect of “weathering” or surface degradation by radiant energy, in conjunction with the elements, on plastics has been well researched and documented. Solar radiation causes changes in the molecular structure of polymeric materials, including PVC. Inhibitors and reflectants are normally incorporated in the material which limits the process to a surface effect. Loss of gloss and discolouration under severe weathering will be observed. The processes require input of energy and cannot proceed if the material is shielded, e.g., under-ground pipes and fittings.

From a practical point of view, the bulk material is unaffected and performance under primary tests will show no change, i.e., tensile strength and modulus. However, microscopic disruptions on a weathered surface can initiate fracture under conditions of extreme local stress, e.g., impact on the outside surface. Impact strength will therefore show a decrease under test.

Chemical resistance

The well documented optimal chemical resistance of PVC-U to acid alkalis, oxidising and reducing agents make it particularly suitable for a wide range of industrial and domestic applications. In general PVC-U is resistant to most oils, fats, alcohols, and aromatic-free petrol, but is unsuitable for use with aromatic and chlorinated hydrocarbons, esters and ketones which can ultimately lead to swelling and softening of the material/s.

Impact Resistance

The impact resistance of PVC is reduced at lower temperatures. Under impact loading, PVC exhibits a transition between ductile behaviour at room temperature and brittle behaviour as the temperature is reduced. The ductile to brittle transition temperature is dependent on formulation. For some grades, impact strength at -20°C is approximately half that at +20°C.

Provision for expansion and contraction

Consideration must be given to thermal expansion and contraction in situations where the installation temperature differs from the operation temperature, or where thermal variation is likely during operation and maintenance. The coefficient of thermal expansion is 7 x 10-5/ °C which means that for example, a pipe system which is installed at 20°C, and then cooled down to -10°C during operation, will contract by approximately 2.10mm for every metre in length. Pipe design systems shall ensure that thermal movement does not result in a significant "bending moment" at the rigid connections or to bends and tees. Refer to AS/NZS 2032 – Installation of PVC pipe systems, for guidance on provision for thermal movement.

Installation requirements

Installation practices are to be with reference to AS/NZS 3500 Plumbing and Drainage and AS/NZS 2032 Installation of PVC Pipe Systems.

The Holman Industries Stabilised Fittings range shall be installed as per AS 3500.2

Jointing Methods

PVC-U pipelines are designed to be easily assembled. While rubber ring jointed (RRJ) pipe systems can be fully assembled above the trench, care must be taken to ensure joints do not pull apart during lowering into the trench. All joints must be subsequentially be inspected. DWV Solvent Weld pipe systems may be jointed above the trench but not lowered into the trench until the solvent has completed its initial set stage.

Solvent Weld joint

Only Solvent Cement and Priming Fluids that are manufactured to AS/NZS 3879 "Solvent Cements and Priming Fluids for PVC (PVC-U and PVC-M) and ABS pipe and fittings" are recommended.
To achieve a strong and leak free joint Installers shall:

1. Select the correct solvent cement for the intended application/s
2. Select the correct pipe for the application and the correct fitting/s using the relevant Holman Product Catalogue
3. Follow jointing steps 1 to 8 carefully in jointing instructions. Shortcuts will result in poor joints that are likely to leak or cause system failures.

Solvent Weld Jointing Instructions – Step 1 to 8

*** Do not work with hot pipes and fittings or on hot windy days without providing adequate protection to the pipes and fittings from the wind. When not in use always keep lid on solvent cement to minimise evaporation. DO NOT use solvent if over 12 months old.*

Step 1 – Cut spigot square and deburr

Cut the spigot as square as possible using a mitre box and hacksaw or power saw where applicable. Remove all swarf and burrs from both inside and outside edges with a sharp knife, file, or using sandpaper. Swarf and burrs which are left behind will wipe or remove the solvent cement and prevent proper joining. Also, swarf left behind may dislodge and jam taps and valves.

Step 2 – Check alignment

Check and ensure the pipe and spigot or fittings are properly aligned. Adjustments or alterations must be made prior to applying the solvent cement so the joint is not compromised at the welding stage.

Step 3 – Mark Clearly

Mark the spigot by using a pencil or marker only, at a distance equivalent to the internal depth of the socket. Do not score or damage the surface of the pipe or fitting.

Step 4 – Clean and soften the surface

Thoroughly clean the inside of the socket and area between the pencil (witness) mark and the spigot end with a clean, lint free cotton cloth dipped in priming fluid (defer from using any synthetic material). This removes dirt and grease and will soften the PVC surface. Attention: Do not brush or pour the priming fluid onto the jointing surface.

** Holman Industries recommends the use of protective gloves. If contact with skin occurs, wash affected area with soap and water immediately.*

Step 5 – Coat socket first – then spigot

Apply a thin and uniform coat of solvent cement onto the internal surface of the socket. Ensure that solvent build up does not occur in the root area of the socket. A pool of solvent cement in the root area of the socket will severely weaken the pipe or fitting. Next apply a uniform coat of solvent cement to the external surface of the spigot up to the pencil mark (witness) mark.

Step 6 – Assemble and hold for 30 seconds

Quickly assemble the joint before the solvent cement starts to set, by pushing the spigot squarely and firmly as far as the pencil (witness) mark, ending with a quarter turn to ensure the cements spreads evenly in the joint. Hold the joint in position for a minimum of thirty (30) seconds without any movement.

Step 7 – The welding stage

Wipe of any excess solvent cement from outside of the joint and where possible, from the inside of the joint. Do not disturb the joint for at least a further five (5) minutes, movement may break the initial welding bond.

Step 8 – Curing and testing

The “cure time” ensures the joint will achieve sufficient strength to allow for testing by internal pressure or vacuum. The minimum cure time for solvent weld joints in DWV pipes and fittings is twenty-four (24 hours)

Handling and Storage

While PVC-U pipes and fittings are light and easy to handle, careless handling may result in unnecessary damage. Pipes and fittings should not be dropped or thrown onto hard surfaces or allowed to come into contact with sharp objects that could inflict deep scratches.

Bowing or distortion

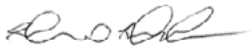
- Pipes and fittings can distort under high applied loads due. This may be caused by not being properly supported or stacking incorrectly. This can be aggravated at high ambient temperature and long-term storage.
- Heat sources should be avoided to reduce the risk of distortion.
- If pipes are stored outdoors for more than 12 months, they should be protected by for example, hessian or white shade cloth in a manner that allows ventilation and avoids heat build-up. Fittings are to be stored indoors only, up to the installation stage.

Responsible person

As the responsible person as set out in Regulation 3, I confirm that the information supplied in this declaration is based on information supplied to the company as well as the company’s own processes and is therefore to the best of my knowledge, correct.

I can also confirm that Holman Industries manufactured Drain, Waste and Vent (DWV) U-PVC Fittings are not subject to a warning on ban under s26 of the Building Act.

Signed for and on behalf of :



Mauro Meloni
National QA and Technical Compliance Manager
November 2023