GFR Group Pty Ltd
PRODUCT APPRAISAL REPORT 11/09
Vent Master PX Air Valve
AS 4883:2008 – Air valves for sewerage
Publication: 11 September 2013
Document History

The following information indicates the changes made to this document.

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<tr>
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</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Name/Title</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
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<td>carl radford</td>
<td>11/9/2013</td>
</tr>
</tbody>
</table>

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Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak body of the Australian urban water industry. Its members and associate members provide water and wastewater services to approximately 16 million Australians and to many of our largest industrial and commercial enterprises.

Urban water service providers have a critical role in ensuring that Australians have access to adequate and high quality water services. As Australia’s population continues to grow, with most of this growth occurring in cities, that role becomes increasingly important.

WSAA’s vision is for Australian urban water utilities to be valued as leaders in the innovative, sustainable and cost effective delivery of water services. WSAA strives to achieve this vision by promoting knowledge sharing, networking and cooperation amongst members. WSAA identifies emerging issues and develops industry-wide responses. WSAA is the national voice of the urban water industry, speaking to government, the broader water sector and the Australian community.

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1 EXECUTIVE SUMMARY

The Vent Master PX air valve is Australian designed and manufactured by GFR Group in Western Australia. The GFR Group is a fabriortor, supply merchant, designer and installer of polyethylene pipe, fittings, pumps, tanks, and all other fluid handling infrastructure. The GFR Group manufacture pipeline valves, including the Vent Master PX double acting dual orifice air valve for use in sewerage networks that can vent air as well as vacuum break. The vent Master PX has also been employed in other non-sewerage applications.

The Vent Master PX is manufactured under a Quality Management System that is certified to ISO 9001:2008. GFR Vent Master PX is not fully compliant with the Standard AS 4883. The Vent Master PX falls outside the scope of this Standard as it has a polyethylene body and not the prescribed metal body. The Vent Master PX is provided with a flange connection. A polyethylene (PE) stub flange, with fitted backing ring flange, is butt fusion welded to the base of the Vent Master PX PE body.

The Vent Master PX is available in standard DN 80, 100 flange mount, stainless steel backing ring flanges with dimensions conforming to AS 2129 Table E or optional DN 150 & 200 Table E flange mounts to AS 2129.

GFR Group can supply backing ring flanges, conforming to other dimensional specifications such as AS/NZS 4331, AS/NZS 4087 Figure B1, B2, B5 and B7 or AS 2129 Table D or C. Alternative flange tables are available upon request.

The overall diameter of the polyethylene body is 200mm and the height of 520mm is shorter than other equivalent products, meaning it’s far easier to fit in pits and trench depth/excavation costs are reduced.

The Vent Master PX is corrosion resistant and has the ability to operate leak free in difficult media situations such as sewerage and tailings, slurries. Other applications include raw water, potable water and saline/hypersaline water. The Vent Master PX has bulk air release capacity up to 670 litres per second.

The Vent Master PX has been appraised with the Standard Insert. The Standard Insert combines an anti-hammer/surge mitigation feature and a second smaller orifice for auto venting of pressurised air in an active pipeline. It closes leak tight down to pressures of 20 kPa and has a maximum pressure rating of 1600 kPa.

Not included in this appraisal are the Vent Master High Response Insert (HRI) used where low pressure transients are an issue and the custom option of Super Duplex (SAF 2507) wetted internals for extreme corrosion applications. These inserts have not been subjected to testing to demonstrate performance compliance with AS 4883.

Vent Master PX of all sizes are available from the GFR Group Manufacturing Facility located in Perth, Western Australia.

The Vent Master PX air valve has been successfully tested against the performance requirements of AS 4883:2008 - Air valves for sewerage.

The Vent Master PX air valve body has also been successfully tested at a pressure equal to 0.6 x PN for 1000 hours at a temperature of 80°C in accordance with WSA 112 -2002.

GFR Group has also provided results of an independent FEA (Finite Element Analysis) to predict the performance of the PE material designation of the Vent Master PX air valve.

1.1 Recommendation

The Vent Master PX Air Valve is an ‘Appraised Product’, assessed, by means of Product Appraisal, as conforming to AS 4883 and WSAA Product Specification WSA PS 275 and

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1 Without the antislam disc fitted the maximum outflow through the primary orifice is 670 litres per second, otherwise 162 litres per second is the maximum outflow through the primary orifice just prior to the closure of the antislam disc.
the additional requirements of supplementary body strength tests and FEA stress modelling of the polyethylene body.

It is recommended that WSAA members and associates, subject to any specific requirements of the members or associates, accept or authorise the Vent Master PX as detailed in this report for use with relevant piping networks.

2 THE APPLICANT

Located at Unit 1, 12 Colin Jamieson Drive, Welshpool WA, 6106, GFR Group is an Australian fabricator, supplier, designer and installer of polyethylene pipe, fittings, pumps, tanks, and other fluid handling infrastructure, including pipeline valves.

Now into its third decade of operations, GFR Group supplies polyethylene products and services to the mining, municipal, energy and industrial sectors.

3 THE PRODUCT

The Vent Master PX is an Australian designed and manufactured double acting dual orifice air valve for use in sewerage networks that can vent air as well as vacuum break. The vent Master PX can also be used in other non-sewerage applications.

The Vent Master PX is highly corrosion resistant and has the ability to operate leak free in difficult media situations such as sewerage, and tailings, slurries. Other applications include raw water, potable water and saline/hypersaline water. The Vent Master PX has bulk air release capacity up to 670 litres per second.

The Vent Master PX – Technical Data Sheet is attached to Appendix F.

Figure 1 depicts the outside appearance of the Vent Master PX 100 mm unit.

![Vent Master PX 100 mm Unit](image)

**FIGURE 1 GFR VENT MASTER PX 100 mm UNIT**

The Vent Master PX is available in standard DN 80, 100, Table E flange mount or optional DN 150 & 200 Table E flange mount rated to PN 16 pressure class.
The Vent Master PX is appraised with the Standard Insert (See Figure 2). The Standard Insert combines an anti-hammer/surge mitigation feature and a second smaller orifice for auto venting pressurised air in an active pipeline. It closes leak tight down to pressures of 20 kPa and has a maximum pressure rating of 1600 kPa.

The valve combines corrosion resistant materials of construction with simplicity that makes it easy to service. Two bolts secure the clamp at the top of the valve that houses the entire working internals, so it is possible to service the valve with a fresh insert (full working internals) in less than 2 minutes. The Vent Master PX can also be easily serviced from outside a pit (no need for confined space permit).

Materials of construction include Polyethylene (PE) PE100 body that is not the prescribed metal body and is therefore not fully compliant with the material definition in AS 4883. Other materials include 316 Stainless Steel, Ertalon 6PLA (cast nylon), EDPM and Nitrile seals.

![FIGURE 2 VENT MASTER PXD 100mm STD](image)

<table>
<thead>
<tr>
<th>Country</th>
<th>Patent applications</th>
</tr>
</thead>
</table>

The Vent Master PX is a GFR patented design, made by GFR in Australia and covered by the following Patent applications:

The Vent Master PX is made under a Quality Management System that is certified to ISO 9001:2008.
4 SCOPE OF THE APPRAISAL

The scope of the appraisal covers the Vent Master PX in end configurations and options outlined in Table 1 below:

**TABLE 1 GFR VENT MASTER PX VALVE RANGE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Flange</th>
<th>Pressure rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV100077</td>
<td>Vent Master PXD 80mm STD</td>
<td>Table E</td>
<td>1600kPa @20 deg.</td>
</tr>
<tr>
<td>AV100078</td>
<td>Vent Master PXD 100mm STD</td>
<td>Table E</td>
<td>1600kPa @20 deg.</td>
</tr>
<tr>
<td>AV100079</td>
<td>Vent Master PXD 150mm STD</td>
<td>Table E</td>
<td>1600kPa @20 deg.</td>
</tr>
<tr>
<td>AV100090</td>
<td>Vent Master PXD 200mm STD</td>
<td>Table E</td>
<td>1600kPa @20 deg.</td>
</tr>
</tbody>
</table>

NOTE 1 The suffix ‘D’ on the Vent Master PX model number represents the current design iteration. The suffix ‘D’ doesn’t appear on GFR technical brochures or product literature.

NOTE 2 Other flange configurations are available upon request.

5 APPRAISAL CRITERIA

5.1 General

Appraisal criteria is determined by the WSAA Infrastructure Products and Materials Network and regularly reviewed to ensure that the criteria reflect the requirements of WSAA members.

5.2 Quality Assurance Requirements

The WSAA product appraisal network accepts Air Valves manufactured under cover of a third party certified management system complying with AS/NZS ISO 9001 and having ISO Type 5 product certification in accordance with AS 4883 by a JAS-ANZ accredited Conformity Assessment Body (CAB) or by a CAB accredited by an international accreditation system recognised by JAS-ANZ.

5.3 Performance Requirements

The Appraisal criteria is drawn from AS 4883 – Air valves for sewerage.

The following Product Specification is also relevant to this application:

WSA PS-275 – Air Valves for Pressure Applications – Sewerage.

Copies of the above Product Specification can be found in Appendix B or downloaded from the WSAA website.

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

GFR Group Pty Ltd is a quality endorsed Company and holds ISO 9001:2008 Certificate of Registration No. QEC28084, issued by SAI Global, for the design and manufacture of water and sewer commercial valves.

GFR Vent Master PX valves are manufactured under cover of a third party certified management system. GFR Vent Master PX valves have been satisfactory tested in accordance with performance requirements specified in AS 4883.

GFR are unable to fully satisfy the requirements of the ISO Type 5 Product Certification Scheme, as defined in ISO/IEC Guide 67, because the valve body of the GFR Vent Master PX is manufactured from a PE100 compound instead of metallic material, as prescribed in AS 4883.
6.2 Compliance with Performance Requirements

The Vent Master PX air valve (Standard Insert Model No. AP16XKAE100 or AV100078) has been subjected to the performance requirements of AS 4883:2008 - Air valves for sewerage.

The GFR Vent Master PX has demonstrated compliance with the relevant performance requirements in AS 4883. The PE body material is not a specified option of the standard.

The Vent Master PX has been tested by the Plumbing Testing Laboratory (PTL) to demonstrate compliance with the performance requirements of AS 4883.

AS 4883 static testing associated with body strength, seal seating performance, valve functionality etc. was carried out at PTL's Wangara Laboratory in WA.

AS 4883 dynamic testing (inflow and outflow) was carried out at GFR premises under the guidance and supervision of NATA certified PTL (Plumbing Testing Laboratories). A purpose built test rig was assembled at GFR (Midvale, WA) as there was no facility in Australia at the time that had sufficient capacity to carry out these tests.

For further information regarding performance testing of the GFR Vent Master PX refer to Appendix D.

6.2.1 Test 1 - Body Strength Test (Test Report TT2243)

Refer Clause 5.2.2 of AS 4883

The GFR Vent Master PX was tested in accordance with the requirements of Clause 5.2.2. A hydrostatic pressure of 2400 kPa was applied for 15 minutes. No leakage, or plastic deformation or distortion of the valve body or other components was observed. Results are summarised in Table D1 Appendix D.

The test regime specified in Clause 5.2.2 of AS 4883 is considered valid for metallic air valves only. The product design incorporating a PE80/PE100 material has very different properties, including PE strength, regression over time and cyclic fatigue resistance etc.

All valves are subjected to a proof test at ambient temperature and a pressure of 1.5 x PN before release.

GFR Group has provided results of an independent FEA (Finite Element Analysis) to validate and test their design against predictable forces, to determine whether a design will fail and, if so, when and how the material will deform, snap, or collapse. Refer to Section 6.2.3.

6.2.2 Supplementary PE Body Strength Test

6.2.2.1 PE Body strength test (Test Report TT2405)

Refer Clause 3.5.2. WSA 112 – 2002

AS 4883 is written solely for metallic bodied valves and has no listing for alternative materials of construction.

GFR Group provided supplementary body strength test report, performed by a NATA certified laboratory, using the following boundary conditions:

- 1000 hours
- 80°C
- 960 kPa (0.6 x PN rating)

The boundary conditions specified above and the method of testing used was in accordance with WSA 112 – 2002 Industry Standard for Sewerage Air Release and Vacuum Break Valves, Clause 3.5.2.
A hydrostatic pressure of 960 kPa was applied for 1000 hours and at 80 degrees. No leakage, or plastic deformation or distortion of the valve body or other components was observed. Test results are summarised in Table D2 Appendix D.

The GFR Vent Master PX was also subjected to additional testing to AS 4883-2008, clause 5.2.4 – Test 3: Seat sensitivity test.

6.2.2.2 Test 3: Seat sensitivity test (Test Report TT2405)

Refer Clause 5.2.4 of AS 4883

At the end of the above PE Body strength test, the hydrostatic pressure was lowered to 50 kPa and held for 1 minute. No leakage was observed.

This procedure was repeated at 40, 30, 20 and 10 kPa. It was observed that the seat started to leak at 15 kPa. The valve was subsequently drained and retested at 20 kPa. No visible signs of any leakage were observed.

The intention here was to validate that the Vent Master PX would still operate correctly after the above elevated temperature/extended duration testing, and seal (without leaking) at the manufacturer’s’ prescribed minimum low pressure sealing pressure value (20 kPa)

The supplied specimen was model number AV100078 and it complied with all aspects of the above referenced testing.

The report of testing can be found in Appendix D.

6.2.3 Finite Element Analysis of the Valve Body

Finite Element Analysis was also undertaken by GFR Group to assess the strength of the polyethylene body. Vent Master PX model number AV100078 was computer modelled in 3D and Strand7 (release 2.4.5) was used to carry out the FEA of the valve. Deacon Engineers in South Perth WA were selected by GFR to perform this analysis.

Two load scenarios were modelled:

- a. Long Term (50 years) internal pressure of 1600 kPa at 20°C
- b. Pressure surge raising internal pressure to 2000 kPa at 20°C

In both load scenarios the allowable stresses exhibited in the body did not exceed the maximum allowable limits. The GFR Vent Master valve body was structurally validated as a result and the valve body material determined to have a service life of 50 years.

A copy of the executive summary of the FEA report can be found in Appendix D

The full report can be obtained by contacting the manufacturer (GFR) directly. Refer to Appendix C for Supplier details.

6.2.4 Test 2 - Seat Test (Test Report TT2243)

Refer Clause 5.2.3 of AS 4883

In accordance with the requirement of clause 5.2.3 the hydrostatic pressure was lowered to 1.1 times the allowable operating pressure (i.e. to 1766 kPa) and applied for a period of 15 minutes. No leakage of any kind observed.

The GFR Vent Master PX therefore complies with the requirements of Clause 5.2.3.

6.2.5 Test 3 - Seat sensitivity Test (Test Report TT2243)

Refer Clause 5.2.4 of AS 4883

At the end of the seat test, the hydrostatic pressure was lowered to 50 kPa and held for 1 minute. No leakage was observed.
This procedure was repeated at 40, 30, 20 and 10 kPa. It was observed that the seat started to leak at 12 kPa. The valve was subsequently drained and retested at 20 kPa. No visible signs of any leakage were observed.

The GFR Vent Master PX therefore complies with the requirements of Clause

6.2.6 Test 4 - Endurance Test (Test Report TT2243)

Refer Clause 5.2.5 of AS 4883

In accordance with Clause 5.2.5 the GFR Vent Master PX was filled with water, and pressurised to 1600 kPa. The Test pressure of 1600 kPa was held for ten seconds before being depressurised to atmospheric pressure. This procedure was repeated for 200 cycles.

Upon completion of Test 4 - Endurance Test, the test procedures specified in Clauses 5.2.3 and 5.2.4 were repeated. No leakage was observed during either test.

The GFR Vent Master PX therefore complies with the requirements of Clause 5.2.5.

6.2.7 Unseating Test (Test Report TT2243)

Refer Clause 5.2.6 of AS 4883

In accordance with Clause 5.2.6 the GFR Vent Master PX was submerged in a test tank at a controlled temperature of 60 degree C and pressurised to 1600kPa for a duration of 72 hours. The test procedures in Clauses 5.2.3 and 5.2.4 were repeated. No leakage of any kind was observed during either test.

The GFR Vent Master PX therefore complies with the requirements of Clause 5.2.6.

6.2.8 Test 6B - Air Discharge Test (Test Report TT2243)

Refer Clause 5.3.3 of AS 4883

The Air Discharge Test (Test 6B- for anti-slam valves only) was carried out on the clients premises under PTL supervision by Mr Tim, McLennan from Inspired Systems and NATA certified PTL (Plumbing Testing Laboratory), results are summarised in Table D1 Appendix D.

6.2.9 Test 7 - Air Intake Test (Test Report TT2243)

Refer Clause 5.3.4 of AS 4883

The Air Intake Test (Test 7- for large orifices and anti-slam valves only) was carried out on the client’s premises under PTL supervision by Mr Tim, McLennan from Inspired Systems and NATA certified PTL (Plumbing Testing Laboratory), results are summarised in Table D1 Appendix D.

6.3 Compliance with Material Requirements

6.3.1 General

Refer Clause 2.1 of AS 4883

AS 4883 Clause 2.1 lists the basic material requirements for the manufacturer of valve components.

The GFR Vent Master PX complies with some not all of the material requirements of Table 2.1 in AS 4883.
TABLE 2 GFR VENT MASTER PX COMPONENT MATERIAL LIST

<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
<th>Standard</th>
<th>Grade</th>
<th>GFR Vent Master PX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Ductile Iron</td>
<td>AS 1831</td>
<td>BS500/7 or 400-15</td>
<td>PE100 to AS/NZS 4129</td>
</tr>
<tr>
<td>Cover</td>
<td>Ductile Iron</td>
<td>AS 1831</td>
<td>BS500/7 or 400-15</td>
<td>Stainless Steel ASTM B16.5.316</td>
</tr>
<tr>
<td>Float</td>
<td>Stainless Steel</td>
<td>ASTM A276</td>
<td>316</td>
<td>HDPE AS4130/3 PE100</td>
</tr>
<tr>
<td>Resilient seal</td>
<td>Synthetic elastomer</td>
<td>AS 1646</td>
<td>EPDM or NBR</td>
<td>EPDM, ASTM D2000-01 E300-70</td>
</tr>
<tr>
<td>Seat</td>
<td>Stainless Steel</td>
<td>ASTM A743M</td>
<td>CF-8M</td>
<td>Stainless Steel ASTM B16.5.316</td>
</tr>
<tr>
<td>Levers, Linkages and Pins</td>
<td>Stainless Steel</td>
<td>ASTM A276</td>
<td>316</td>
<td>N/a</td>
</tr>
<tr>
<td>Springs</td>
<td>Stainless Steel</td>
<td>ASTM A313M</td>
<td>316</td>
<td>N/a</td>
</tr>
<tr>
<td>Sealing O-rings</td>
<td>Synthetic Rubber</td>
<td>AS 1646</td>
<td>EPDM or NBR</td>
<td>Nitrile / NBR ASTM D2000-99, N100-70</td>
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<tr>
<td>Fasteners</td>
<td>Stainless Steel</td>
<td>ASTM A276</td>
<td>316</td>
<td>Stainless Steel ASTM A276 316</td>
</tr>
<tr>
<td>Drain Valve</td>
<td>Stainless Steel</td>
<td>ASTM A276</td>
<td>431</td>
<td>Stainless Steel ASTM A240M 316</td>
</tr>
<tr>
<td>External insert Screen</td>
<td>Stainless Steel</td>
<td>ASTM A240M</td>
<td>304</td>
<td></td>
</tr>
</tbody>
</table>

Alternative material requirements are also referenced in Appendix D of AS 4883.

6.3.2 Vent Master PX body

Refer Clause 2.1 of AS 4883

AS 4883 Table 2.1 requires ductile iron body castings to conform to minimum grade BS500/7 or 400-15.

The body is fabricated from a section of polyethylene (PE) pipe, machined PE billets, and a PE stub flange. The material designation for Vent Master PX body comprises the following:

(a) DN 200 PE 100 (PN 20) SDR 9 pipe produced under a product certification scheme certified by a JAS-ANZ accredited Conformity Assessment Body (CAB) to AS/NZS4130 and extruded from a fully compounded PE100 complying with AS/NZS4131;

(b) PE 80B¹ body ends – machined to match the pipe thickness of DN 200 PE 100 (PN 20) SDR 9 pipe and

(c) PE 100 Stub Flange (PN 16) SDR 9.

NOTE 1 The PE body ends are now machined from a solid billet of PE 100, instead of PE80B.

Using the material designation specified above, the Vent Master PX body was successfully tested in accordance with AS 4883. GFR Group has since modified the design of the Vent Master PX PE body.

The different components of the Vent Master PX body are joined by buttwelding. The buttwelding process is carried out by GFR Group certified welding technicians in accordance with the single low-pressure procedure of ISO21307: 2011 – Butt fusion jointing procedures for PE pipes and fittings used in the construction of gas and water distribution systems.

Inspection and testing of PE Buttwelds, in particular tensile destructive testing, is carried out in accordance with ISO21307: 2011.

GFR Group has provided a Rochling Engineering Plastics, Material Safety Data Sheet (91/155/EWG) dated 21/06/2006 for the PE100 Body material.

The following data was also provided in the Material Safety Data Sheet:
- Rochling Material – Polystone G-Black (PE-HD)
- Hazards – None known
- Melting point – 130 – 140°C
- Ignition temperature - >360°C
- Solubility – Insoluble in water
- Transportation – Non dangerous goods
- The Body HDPE material is UV stabilised and benchmarked as 50 year life expectancy.

6.3.3 Stainless steel components

Refer Clause 2.1 of AS 4883

Alloytech (WA) currently supply all Stainless Steel items to GFR Group other than the backing plate or backing flange. The items that Alloytech supply are machined from Sandvick supplied Grade 316 stainless steel as specified in the submission from GFR Group.

The backing plate or backing flange, bolts, nuts and washers are manufactured from Grade 316 stainless steel. The backing plates, bolts, nuts and washers are supplied by Stirlings (WA). Flange dimensions conform to AS 2129 Table E, but as stated elsewhere in this appraisal, alternative flange configurations are available to suit end users specific requirements.

6.3.4 O-ring seals

Refer Clause 2.1 of AS 4883.

The assembly drawings nominate o-rings seal materials as Nitrile\(^1\). AS 4883 specifies EPDM or NBR in compliance with AS 1646.

NOTE 1 (NBR is an alternative name for Nitrile)

GFR Group has provided a ‘Spec Seals’ Technical Report on N100-70 Nitrile compound. The product is also known as BUNA-N which is nominated in AS 4883 Table 2.1 as a synthetic elastomer suitable for ‘O’ ring seals. The N100-70 material is compliant with ASTM D2000-99 Grade M2BG714B14 EA14 EF14 EF11 EF21 EO14 EO34 F17.

Since the first design iteration fifteen years ago GFR Group has yet to supply an O-ring seal replacement kit.

6.3.5 Automatic orifice seal – Secondary Orifice Seal

Refer Clause 2.1 of AS 4883.

GFR Group has also provided ‘Spec Seals’ Technical Report on E300-70 EDPM compound which is vulcanised to the Secondary Orifice Seal as shown in Figure 3. The EDPM compound is nominated in AS 4883 Table 2.1 as a synthetic elastomer suitable for secondary orifice seal. The E300-70 material is compliant with ASTM D2000-01 Grade M5CA714 A25 B35 C32 EA14 F17 G21, ASTM D2000-75 Grade 5CA720 A25 B35 C32 L14 F17 G21.

Since the first design iteration fifteen years ago GFR Group has yet to supply a vulcanised EDPM secondary orifice seal as a replacement.
6.3.6 Cap and baffle

Refer Clause 2.1 of AS 4883.

GFR Group has provided a material specification for ‘Ertalon® 6 PLA’ used for the Cap & Baffle components. The Baffle is an internal component and the Cap is the top section of the assembly and exposed to atmosphere/sunlight. GFR was questioned about the exposure of Ertalon® 6 PLA exposure to sunlight and they contacted their supplier, Dotmar who purchase the material from Quadrant Plastics in Europe. Dotmar’s Technical Manager verified that the Ertalon® 6 PLA material was completely acceptable for use as a cap.

Dotmar has provided photos and statements demonstrating the use of Ertalon® 6 PLA on crane pulleys in safety sensitive applications exposed to full sunlight. GFR has further explained that Ertalon® 6 PLA has been in other GFR products exposed to the elements for over 20 years without an issue.

6.3.7 Weld in adaptor

GFR Group has provided an Agruair Inspection Certificate 3.1 ACC to EN 10204:2004 for the weld in adaptor for connection of the ball valve to the PE Vent Master body and used as a drain valve. The adaptor is manufactured by injection moulding from PE 100 (blue) to a nickel plated bronze ½” BSP male R thread connection for the F/F ball valve. This adaptor is welded into the PE 100 Vent Master Body.

Refer to Section 12 Question 9 and the response provided by for more details about the method of connection of the drain valve to the PE body of the Vent Master PX air valve.

6.3.8 Drain valve

Refer Clause 5.4.6 of AS 4883

GFR Group has provided a brochure from YZNG TRONG International Co. Ltd. This Brochure lists the ½” BSP Stainless Steel 316 Ball Valve and material specification. The body and metal components are generally SS 316 and 304 and PTFE washers and seals.

AS 4883 specifies Grade 316 stainless steel and the ball valve has no stated compliance with any particular standard. GFR is reviewing the use of this brand of ball valve and advised that in the meantime the valve is low use and easily replaced if necessary by the Water Agency with a valve of their choice.

6.3.9 Backing Rings Stainless Steel and flange gaskets

Refer to Clause 3.2.2 of 4883

The Vent Master PX is provided with a flange connection. A polyethylene (PE) stub flange, with fitted backing ring flange, is fusion joined to the base of the Vent Master PX PE body.

The Vent Master PX is available in standard DN 80, 100 flange mount, backing ring flange dimensions conform to AS 2129 Table E or optional DN 150 & 200 Table E flange mount to AS 2129.
GFR Group can also supply stainless steel backing ring flanges, conforming to other dimensions specifications such as AS/NZS 4087 Figures B1, B2, B5 and B7 or AS 2129 Table D.

The flange gasket materials are not supplied by GFR Group.

The flange gasket materials shall comply with industry standard WSA-109:2011.

6.3.10 Other Vent Master components

Refer Clause 2.1 and of AS 4883

Clamp – The GFR supplied drawing nominates the material as DI epoxy coated and fitted with 316 SS nuts, bolts and washers. The Clamp material is Ductile iron Grade 500-7. It is hot dipped galvanised to AS 4680 prior to the application of black powder coating (280µm) in compliance with AS 4158. GFR has advised that the black powder coating is purely for aesthetics.

Screen – 1mm x 1mm x 0.56mm Grade 316 stainless steel woven screen mesh, 42% open area, 16 apertures per inch². The mesh is sourced from Europe.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

The GFR Vent Master PX Installation and Maintenance Manual for the Standard Insert can be found in Appendix G and the Assembly Drawing GFR-PXD-000 can be found in Appendix E.

8 PRODUCT MARKING

The Vent Master PX body has a 316 stainless steel identity plate screwed to the upper section to carry the AS 4883:2008 marking requirements:

- Manufacturer's name or mark
- Serial number
- Nominated valve size DN
- Year of manufacturer
- Pressure Class PN

• Serial Number (may be a permanent stick on label)

![FIGURE 4 REVISED NAMEPLATE ARTWORK](image)

Attached is the revised nameplate artwork to address the requirements of AS 4883 – section 6.1.2
The nameplate is 316 stainless steel, the printed lettering is 3mm or greater and secured to the top cap plate (item 1) of the valve with 4x5mm 316 stainless steel screws (item 16) that also serve to secure the insect screen assembly to the outlet orifice cap (item 15). (The aforementioned item #’s are in reference to Drawing GFR-PXD-000 Rev 2).

9 PACKAGING AND TRANSPORTATION
Standard packaging: - 9 units strapped and wrapped to a pallet base.

![Figure 5 Packaging – GFR Vent Master](image)

10 PRODUCT WARRANTY
This product is covered by the normal commercial and legal requirements of the Competition and Consumer Act 2010, which covers manufacture to relevant standards. Additional warranties may be negotiated on a project specific basis.

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD TESTING REPORT
The Vent Master PX has been in service in various locations and at the time of Report preparation WSAA members and associates that have the Vent Master PX in service have been requested to provide some details of operation and performance.

GFR Group has supplied an order of Vent Master PX air valves to Wide Bay Water Corporation. This order was for four (4) GFR Vent Master PX 80 mm Standard Insert: Model AV100077. The air valves were installed on a DN 450 trunk water main as part of an air vale replacement program. A field trial report has been provided for this installation in Appendix H.

The Vent Master PX has been in service in its current design specification for over 12 months and nearly 15 years since its first design release. Many mining sites both here and overseas have employed the Vent Master valve and report product satisfaction and reliable service. Mine site referees can be provided upon request.

Additionally, those end users nominated in Appendix H “Usage References” have provided referees for in service validation/testing of the Vent Master PX HRI model.

12 IPAM NETWORK DISCUSSION
GFR Group has provided the following answers to questions raised by the IPAM Network:

**Question1.** What is the purpose of the ball valve on the side of the Vent Master PX?

**Answer1.** The stainless steel ball valve has two main functions:

1. To provide a sampling point for water quality testing etc
2. To release pressure within the valve prior to servicing in situ or removing the valve from the line (this is an OHS requirement – ie: de-energise)

**Question 2.** The note and corresponding material detail on the General Arrangement Drawing GFR-PXD-000 Rev 2 refers to a clamp (item 3) that secures the working internals of the valve body as Ductile Iron and Hot Dipped Galvanised to AS4680. It is also powder coated. Why is it necessary to include this powder coating (fusion bonded epoxy) given it has a galvanised protective coating?

**Answer 2.** The powder coating of the galvanised clamp is merely for aesthetics to help co-ordinate with the black finish of the polyethylene valve body. It provides no function in terms of surface protection.

**Question 3.** The Vent Master PX has a pressure rating of 1600 kPa at 20 degrees. Do you have a solution for pressures greater than 1600 kPa?

**Answer 3.** The Vent Master PX is available in a full metal body version (316 Stainless steel) and is rated to 49 bar.

**Question 4.** Have you got a solution for low pressure applications below say 20 kPa?

**Answer 4.** Yes. The Vent Master PX is available with an alternative insert called a HRI (High Response Insert. This insert is a single orifice unit that will seal drop tight down to 0 (zero) kPa line pressure.

**Question 5.** Table 1 details a Table E flanged connection for the Vent Master PX. Are other flange options available?

**Answer 5.** Vent Master PX valves can be supplied in any flange configuration desired in sizes 80, 100, 150 and 200mm. Table E is the standard off-the-shelf configuration.

**Question 6.** Can the Vent Master PX be serviced in the field or must it be taken back to a workshop?

**Answer 6.** The Vent Master PX was specifically designed with simple servicing in mind. It can easily be serviced in situ on the pipeline. The entire working internals can be changed out with a new operating insert in less than 2 minutes. Alternatively the existing insert can easily be extracted, inspected/cleaned etc., and then replaced. The main body of the valve does not need to be removed from the pipeline. Every seal and O-ring can be serviced in the field without the need to return the unit to the workshop.

**Question 7.** Are specialised tools required to service the valve?

**Answer 7.** No. Standard fitting tools are all that is necessary (Spanner, socket, screwdriver)

**Question 8.** Can you provide a solution when 316 stainless steel is not acceptable from a corrosion standpoint – eg: concentrated brine waste lines in a Desalination Plant?

**Answer 8.** Yes. The Vent Master PX is available with optional SAF 2507 Super Duplex wetted internals. As the body is polyethylene, it already has excellent corrosion resistance performance and does not need to be changed, resulting in significant cost savings.

**Question 9.** Can you please explain how the 316 stainless steel ball valve on the side wall of the Vent Master PX is attached to the main body?

**Answer 9.** The 316 stainless steel ball valve is screwed to a threaded insertion socket that is plastic fusion socket welded into the valve body. A factory jig is used to guarantee alignment and clamping while the socket weld cools. Socket welding is common in HDPE pipelines to provide simple, strong and cost effective offtakes. The strength of the joint is equal to the parent/base material.

**Question 10.** What governs the operating pressure limitation of the valve?
Answer 10. The polyethylene body governs the limit of pressure handling. The polyethylene bodied Vent Master is conservatively rated to 1600 kPa. The main body of the valve is formed by butt fusion welding top and bottom end caps to a section of PN20 pipe. The plastic weld beads are removed by machining in a lathe. As a result a small amount of material is skated off the pipe section, reducing its wall thickness by about 0.5mm.

Question 11. The Vent Master PX is manufactured in Australia. Is it an overseas design simply assembled in Australia?

Answer 11. All Vent Master valve products are GFR’s (The Manufacturer’s) own design/intellectual property. The products carry an Australian patent and are manufactured in Perth WA under a quality system certified to ISO 9001.

Question 12. Please explain how this valve offers anti-hammer and surge protection?

Answer 12. A disc mechanism that includes an anti-shock orifice at the top of the valve operates automatically when the valve is subject high velocity exiting air. The anti-shock/anti-hammer disc closes and attenuates the outflow of air, allowing columns of water to re-join or enter the valve body in a more controlled manner, thereby avoiding the introduction of high pressure rises/transients. In addition, the Vent Master PX is designed to maintain an upper pocket of air at all times during pressurised operation. This air pocket acts as a shock absorber to pressure surges that may occur within the system.

Question 13. Can the Vent Master PX be adapted for a hard plumbed offtake to a deodoriser/activated carbon canister?

Answer 13. Yes. A 50NB FBSP threaded outlet is available as an option.

Question 14. The Vent Master PX as shown is a double acting valve ie: it vents as well as vacuum breaks. Can you provide a one way solution for venting only?


Question 15. Can the Vent Master PX air valve be used in potable water applications?

Answer 15. Yes. The Vent Master PX is already employed in potable water systems with:

- Various Mine sites in WA, SA and NT
- Wide Bay Water NSW
- Barrow Island - Chevron

The Vent Master PX has been tested to and meets the criteria of AS4020 – “Testing of products for use in contact with drinking water” which will serve to formalise its already current application in potable water systems.

Question 16. Does “Standard insert Model No AP16XKAE100”, as tested by PTL, correspond with the standard drawings provided.

Answer 16. Categorically Yes. This product code was cumbersome and confusing and has been changed to a simpler alpha numeric code in accordance with Table 1 in this report (e.g.AV100078).

For information purposes the terms of the designation AP16XKAE100 are defined as follows:

- A=Air Release Valve
- P=Poly Body (High Density Polyethylene)
- 16=16 bar pressure rating
- X=Sewerage Media
Question 17: Please confirm that flanged connectors can be provided which are compatible with the Australian water industry standard sizes to AS 4087, Figure B5.

Answer 17: Yes GFR can supply flanges that meet customers specifications, including dimensions of flanges given in figures AS 4087 Figures B1, B2, B5 and B7.

Question 18: Can GFR Group supply backing rings manufactured from Grade 316 stainless steel (PN16) in accordance with AS 4087 Figure B7 and does bolting compatibility exist with AS 2129 Table D flanges.

Answer 18: Yes, GFR Group can supply grade 316 stainless steel (PN16) backing rings in accordance with AS 4087 Figure B7. Bolting compatibility exists except for the 225mm (9").

Question 19: Do the backing rings manufactured from Grade 316 stainless steel with an AS 2129 Table E flange have bolting compatibility with flanges to AS 4087 Figure B5.

Answer 19: AS 2129 Table E does not have the same bolting compatibility. Although in a lot of cases the (PCD) and number of holes are the same, the hole diameters are larger in AS2129. The Vent Master PX can be fitted with whatever flange configuration the end user specifies.

13 DISCUSSION

The GFR Group has provided considerable data on the Vent Master PX and responded in detail to all questions asked. The Vent Master PX design is innovative and demonstrates compliance with most requirements specified in AS 4883.

The GFR Group has claimed the significant costs associated with product testing to demonstrate compliance with the performance requirements of AS 4883 and has not included the Vent Master High Response Insert (HRI) and the custom option of Super Duplex (SAF 2507) wetted internals being included in this appraisal.

GFR recommend servicing every 12 months subject to individual system requirements.

The Vent Master PX design allows quick and easy access to perform preventative maintenance activities. The clamping ring has only 2 bolts to remove to provide access all internals. All work can be done in situ without the need to remove the valve.

14 LIFE EXPECTANCY

The Vent Master PX PE body has been tested and rated at PN 16. PE has a long history of pressure pipeline use in Australia and worldwide. The PE material is UV stabilised and benchmarked as 50 year life expectancy. This has been validated by FEA testing. The internals are subject to regular maintenance and refurbishment and that would suggest the life expectancy should be based on the life expectancy of the PE body i.e. in excess of 50 years.

15 FUTURE WORKS

There are no future work items.

16 REPORT RECOMMENDATION

The Vent Master PX Air Valve is an ‘Appraised Product’, assessed, by means of Product Appraisal, as conforming to AS 4883 and WSAA Product Specification WSA PS 275.
It is recommended that WSAA members and associates, subject to any specific requirements of the members or associates, accept or authorise the Vent Master PX as detailed in this report for use with relevant pipeline networks.

17 DISCLAIMER

This Product Appraisal Report (Report) is issued by the Water Services Association of Australia Limited on the understanding that:

This Report applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this Report.

To maintain the recommendations of this Report any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Report and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products.

WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

The following information explains a number of very important limits on your ability to rely on the information in this Report. Please read it carefully and take it into account when considering the contents of this Report.

Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 9805 7601 email carl.radford@wsaa.asn.au.

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The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

By accepting this Report, the Recipient acknowledges and represents to the Publisher(s) and each person involved in the preparation of the Report that the Recipient has understood and accepted the terms of this Disclaimer.

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Recipients should also independently verify and assess the appropriateness of any recommendation in the Report, especially given that any recommendation will not take into account a Recipient’s particular needs or circumstances.

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**APPENDIX A - QUALITY CERTIFICATIONS**

Copies of the following Quality Certification Certificates are available for downloading from the WSAA ‘Members Only’ IPAM Portal Website.

**TABLE A1 GFR GROUP PTY LTD – MANAGEMENT SYSTEMS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Certification licence no.</td>
<td>QEC28084</td>
</tr>
<tr>
<td>Certifying agency</td>
<td>SAI Global</td>
</tr>
<tr>
<td>First date of certification</td>
<td>23 December 2010</td>
</tr>
<tr>
<td>Current date of certification</td>
<td>5 October 2012</td>
</tr>
<tr>
<td>Expiry date of certification</td>
<td>22 December 2013</td>
</tr>
</tbody>
</table>
This is to certify that:

**BWANOLAR PTY LTD**
ABN 53 008 960 036
Trading as
**GFR Group Pty Ltd**
Valves Strategic Business Unit
5 Artello Bay Road Midvale WA 6056 AUSTRALIA
Level 1 580 Hay Street Perth WA 6000 AUSTRALIA
operates a
**QUALITY MANAGEMENT SYSTEM**
which complies with the requirements of
**ISO 9001:2008**
for the following scope
The design and manufacture of water and sewer commercial valves.

**Certificate No: QEC28084**

Issued: 11 October 2012
Expires: 22 December 2013

Originally Certified: 23 December 2010
Current Certification: 5 October 2012

Samer Chaouk
Policy, Risk and Certification Manager

Tony Scobie
Chief Executive Officer

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Registered by:
SAI Global Certification Services Pty Ltd (ACN 109 716 609) 216 Sussex Street Sydney NSW 2000 Australia with SAI Global Limited
200 Sussex Street Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Conditions for Certification.

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APPENDIX B - WSA PRODUCT SPECIFICATION

PRODUCT SPECIFICATION
WSA PS – 275 AIR VALVES FOR PRESSURE APPLICATIONS - SEWERAGE

275.1 SCOPE
This specification covers metallic bodied DN 50 to DN 200 air valves\(^1\) for pressure applications in sewerage.

275.2 REQUIREMENTS
(a) Valves shall comply with AS 4883:2008.

275.3 QUALITY ASSURANCE
(a) Valves shall have product certification (ISO Type 5) to AS 4883:2008.
(b) All products shall be marked in accordance with the conformity assessment body’s requirements.

275.4 AGENCY OR PROJECT SPECIFIC REQUIREMENTS

NOTE:
\(^1\) Includes large orifice air, small orifice, double orifice and anti-slam air valves.

\*\*\*

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APPENDIX C - SUPPLIER CONTACTS

GFR Group
Head Office, Level 1
580 Hay St
Perth, 6000
Western Australia

GFR Group Manufacturing Facility
Unit 1, 12 Colin Jamieson Drive
Welshpool, 6106
Western Australia

Principal Contact:
Paul Griffin
M: 0400 250 442
E: paul@gfr.com.au
APPENDIX D - NATA LABORATORY TEST RESULTS & FEA SUMMARY

**TABLE D1 TEST SUMMARIES PTL REPORT No. TT2243 GFR VENT MASTER PX**

<table>
<thead>
<tr>
<th>Clause</th>
<th>Test</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.2</td>
<td>Body Strength Test</td>
<td>A pressure of 2400 kPa was applied for 15 minutes. No leakage of any kind was observed through the valve body.</td>
<td>Complies</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Test 1 Seat Test</td>
<td>The pressure was lowered to 1766 kPa for a period of 15 minutes. No leakage of any kind was observed through the valve body.</td>
<td>Complies</td>
</tr>
<tr>
<td>5.2.4</td>
<td>Test 2 Seat Sensitivity Test</td>
<td>At the end of the Seat Test the pressure was lowered to 50 kPa for 1 minute, no leakage was observed. This procedure was repeated at 40, 30, 20 &amp; 10 kPa. The seat started to leak at 12 kPa. The valve was drained and retested at 20 kPa. There were no visible signs of any leakage.</td>
<td>Complies</td>
</tr>
<tr>
<td>5.2.5</td>
<td>Test 3 Endurance Test</td>
<td>Clause 5.2.5.1. Cycling test from 1600 kPa to 0 kPa totalling 200 cycles. Upon completion Clauses 5.2.3 and 5.2.4 were repeated. No leakage was observed at either test.</td>
<td>Complies</td>
</tr>
<tr>
<td>5.2.6</td>
<td>Test 5 Unseating Test</td>
<td>The specimen was submerged in a test tank at a controlled heat of 60 degree C and pressurized to 1600 kPa for 72 hours and the test completed as specified. Tests 1 and 2 were repeated. No leakage of any kind was observed and the specimen complied with the test requirements.</td>
<td>Complies</td>
</tr>
<tr>
<td>5.3.2</td>
<td>Test 6a Air discharge Test</td>
<td>Test for large orifice valves only. Not required to undertake as test valve is a dual orifice, anti-slam design.</td>
<td>N/A</td>
</tr>
<tr>
<td>5.3.3</td>
<td>Test 6b Air discharge Test</td>
<td>Test for anti-slam valves only. Determine normalisation discharge flow rates for various pressure differentials up to 80 kPa and determine pressure value at point of dynamic closure.</td>
<td>Complies</td>
</tr>
<tr>
<td>5.3.4</td>
<td>Test 7 Air intake Test</td>
<td>Test for large orifice valves and anti-slam valves. Determine normalisation intake flow rates for various pressure differentials and choking point of valve.</td>
<td>Complies</td>
</tr>
</tbody>
</table>

**TABLE D2 SUPPLEMENTARY TEST REPORT PTL REPORT No. TT2405 GFR VENT MASTER PX**

<table>
<thead>
<tr>
<th>Clause</th>
<th>Test</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Strength Test</td>
<td>The valve body has been successfully tested at a pressure equal to 0.6 x PN (960 kPa) for 1000 hours at a temperature of 80°C No leakage of any kind was observed through the valve body. There was no evidence of other damage to the specimen.</td>
<td>Complies</td>
<td></td>
</tr>
<tr>
<td>5.2.4</td>
<td>Test 2 Seat Sensitivity Test</td>
<td>At the end of the 1000 hour test, the pressure was lowered to 50 kPa for 1 minute, no leakage was observed. This procedure was repeated at 40, 30, 20 &amp; 10 kPa. The seat started to leak at 15 kPa. The valve was drained and retested at 20 kPa. There were no visible signs of any leakage.</td>
<td>Complies</td>
</tr>
</tbody>
</table>

**TABLE D3 SUPPLEMENTARY TEST REPORT DEACON ENGINEERS REPORT No. 01633-13 GFR VENT MASTER PX**

<table>
<thead>
<tr>
<th>Clause</th>
<th>Test</th>
<th>Conclusion</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEA - GFR VENT MASTER PX</td>
<td>The strength of the body of the valve was assessed to AS 1210:2010 Pressure Vessels and was found to be acceptable for a normal operating pressure of 1600 kPa and a surge pressure of 2000 kPa. The assessment was based on material properties 50 years after production, which limits the service life accordingly.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A copy of the executive summary of the FEA report is attached
The full report can be obtained by contacting the manufacturer (GFR) directly.
Plumbing Testing Laboratory

TEST REPORT No. TT2405

PRODUCT TESTED:
GFR 100MM VENT MASTER PX AIR VALVE
MODEL: AV100078

CLIENT:
GFR

Printed 21 August 2013

This document shall not be reproduced except in full.
TEST REPORT No. TT2405

PRODUCT TESTED:
GFR 100MM VENT MASTER PX AIR VALVE
MODEL: AV100078

CLIENT:
GFR
UNIT 1, 12 COLIN JAMIESON DRIVE
WELSHPOOL WA 6106

TESTS REQUIRED:
COMPLIANCE WITH WSA 112-2002, CLAUSE 3.5.2
AND AS 4883-2008, CLAUSE 5.2.4

The report has been amended and re-issued.
This report replaces the previous Test Report TT2405, dated 14th August 2013.
SPECIMEN DESCRIPTION:

GFR 100mm Vent Master PX Air Valve, Model: AV100078. Class 16 Polyethylene (PE100).

The Client requested supplementary body strength testing of the specimen to align with the Plastic Body requirements of WSA 112-2002 Industry Standard for Sewerage Air Release and Vacuum Break Valves.

Following the requested testing requirements of WSA 112-2002, the client requested additional testing to AS 4883-2008, Clause 5.2.4 – Test 3: Seat sensitivity test.

SPECIMEN No.

TT2405. (The specimen was supplied by the client, and was not marked with the specimen number of the Conformity Assessment Body).

TESTS:

The specimen was tested for compliance with WSA 112-2002, Clause 3.5.2 and AS 4883-2008, Clause 5.2.4.

Testing was completed on 07 August 2013.

RESULTS:

The results are shown in the following pages under the relevant clause numbers.

N/A denotes that the clause is not applicable to the specimen.

N/C denotes that the specimen did not comply with the clause.

N/D denotes that compliance with the clause could not be determined.

The results are applicable only to the specimen(s) tested.

ATTACHMENTS:

Appendix A – Manufacturer’s product data sheets.

Appendix B – Manufacturer’s product drawing.
REPORT:

The following report is in the form of a clause-by-clause discussion of the results of testing and examination of the specimen to the requirements of WSA 112-2002, Clause 3.5.2 and AS 4883-2008, Clause 5.2.4.

WSA 112-2002

Clause 3.5.2 – Plastics Body and Cover ................................................................. COMPLIES

The specimen was tested for compliance to boundary conditions of 960 kPa for 1000 hours at 80°C. The test method used was in line with WSA 112-2002, Clause 3.5.2.

The specimen was subjected to a hydrostatic pressure of 960 kPa at 80°C for 1016 hours 36 minutes. There was no leakage or evidence of other damage to the specimen.

The specimen complied with the requirements of Clause 3.5.2.

AS 4883-2008

Clause 5.2.4 – Test 3: Seat sensitivity test .............................................................. COMPLIES

At the end of the 1000 hour test of Clause 3.5.2, the pressure was lowered to 50 kPa and held for 1 minute, no leakage was observed.

This procedure was repeated at 40, 30, 20 and 10 kPa, the seat started to leak at 15 kPa. The valve was then drained and retested at 20 kPa there were no visible signs of leakage.

The specimen complied with the requirements of clause 5.2.4.

END OF REPORT

Authorised Signatory:

LYNDON BUNN
SENIOR LABORATORY TECHNICIAN
21 August 2013
TT2405 Report & App.docx
# Product Name: Vent Master PX – 100mm with Standard Insert
## Model Number: AV100078

### DATASHEET

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td><strong>TYPE</strong></td>
<td>Dual Orifice, double acting, anti hammer/surge protection air release valve</td>
</tr>
<tr>
<td><strong>CLASS/PN</strong></td>
<td>Class 16 / 1600 kPa(g)</td>
</tr>
<tr>
<td><strong>PORT</strong></td>
<td>60mm dia primary orifice for built release on start up, 1.5mm sec. (autovent) orifice for venting during pressurisation</td>
</tr>
<tr>
<td><strong>BODY &amp; END CONSTRUCTION</strong></td>
<td>HDPE PELOO (End)</td>
</tr>
<tr>
<td><strong>MAXIMUM OUTFLOW</strong></td>
<td>670 litres per second through primary orifice</td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
<td>1.9 kg</td>
</tr>
<tr>
<td><strong>OPERATING TEMPERATURE RANGE</strong></td>
<td>1 deg Celsius to 60 deg Celsius</td>
</tr>
<tr>
<td><strong>MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP)</strong></td>
<td>1600 kPa(g) at 20 deg Celsius</td>
</tr>
<tr>
<td><strong>SERVICE</strong></td>
<td>Potable Water, Raw Water, Waste Water, Sewage, Some Acids and Alkalis</td>
</tr>
<tr>
<td><strong>PHASE</strong></td>
<td>Two phase flow – Gaseous phase atmosphere and methane in GIS applications</td>
</tr>
<tr>
<td><strong>BACK PRESSURE</strong></td>
<td>Vents to atmosphere and vacuum break (non-valve available as a custom option – P&amp;O specify an order)</td>
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<tr>
<td><strong>BAROMETRIC PRESSURE</strong></td>
<td>101.325 kPa abs. DESIGN</td>
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<td><strong>DESIGN TEMPERATURE RANGE</strong></td>
<td>-5 deg Celsius to 65 deg Celsius</td>
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<tr>
<td><strong>MINIMUM PRESSURE TO EFFECT 100% SEAL</strong></td>
<td>20 kPa(g)</td>
</tr>
</tbody>
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### GENERAL VALVE DESIGN & MANUFACTURE

- Designed and Manufactured by GFR under a quality System Certified to ISO9001

### FACE TO FACE DIMENSIONS

- 210mm nominal
- 510mm

### END CONNECTIONS

- 300NB Table 6-Flange (316 Stainless Steel) – Other flanges available upon request. Please specify on order (eg AS4087)

### CONSTRUCTION AND MATERIALS

- HDPE PELOO
- HDPE PELOO
- 316 Stainless Steel
- 316 Stainless Steel
- HDPE PELOO

### SEALS

- Outlet orifice seal = Natural Rubber Grade M, all G-Nuts = Nitrile

### PRESSURE TEST

- AS4066 to 1.5xMAOP = 2400kPa(g)

### TEST CERTIFICATE

- Supplied upon request at additional cost

### PERFORMANCE STANDARDS

- Meets and exceeds: 1) AS4883 Air valves for Sewerage and 2) AS4628 Testing of Products in Contact with Drinking Water
GFR's Vent Master PX air release valve protects your pipelines in the harshest of conditions, slashes maintenance costs, and stays reliably online look free continually protecting your asset.

GFR'S Vent Master PX delivers:

- Green and eco-friendly offering energy cost savings by decreasing pumping costs whilst increasing pump life
- Safe and easy-bolt change out cartridge design for in-situ servicing, lightweight at 13kg. The Vent Master PX can be safely installed by one operator
- Automatic venting of entrained gases optimises pipeline efficiency
- Protection of pipelines from vacuum collapse
- Anti-hammer/surge protection technology
- Unique patented design protects seals from contaminants
- Choice of internal configuration to suit various applications
- Non-corroding HDPE body and float plus corrosion resistant S/S 316 (optional super duplex) components
- GFR Group's guarantee of worldwide technical support
- Australian designed and made under ISO 9001 certified system.
- Meets AS 4883 Testing Requirements.

Engineered to protect sewer and recycling pipelines in highly corrosive environments, the GFR Vent Master PX is world best air release/vacuum break valve technology.

With drop-tight sealing over full pressure range 0-1600 kPa.

The Vent Master PX introduces new best practice OH&S. Easily serviced in-situ without removing the main valve body by inserting a new float cartridge. The Vent Master PX is compact, thus offering significant system installation and trench cost savings.
Report Prepared for

GFR

Vent Master PX Finite Element Analysis

Document reference: 01633-13_2
Vent Master PX Finite Element Analysis

Document Control

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W www.deaconengineers.com.au

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<td>PO0046963</td>
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<td>Deacon Contact</td>
<td>Matt Rudas</td>
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## Vent Master PX Finite Element Analysis

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Vent Master PX Finite Element Analysis

1. EXECUTIVE SUMMARY

This report presents the results of the finite element analysis (FEA) of a pipeline vent valve. The following is the summary of the analysis procedures and results:

1. The following standards were adopted for the load scenarios:
   b. AS 4130:2009 Polyethylene (PE) pipes for pressure applications;
   c. AS 1210-2010: Pressure Vessels
2. Two load scenarios were modelled:
   a. Long term (50 years) internal pressure of 1600 kPa at 20°C
   b. Pressure surge raising internal pressure to 2000 kPa at 20°C
3. The valve was modelled using Strand7, release 2.4.5, FEA software;
4. The geometry of the valve was based on the following drawings supplied by GFR:
   a. GFR-PXD-000 Rev 3
5. The allowable stress calculated according to AS1210-2010 was 27 MPa;
6. The stresses in the valve did not exceed allowable limits;
7. The valve material has a service life limited to 50 years

F Drijfhout
APPENDIX E – PRODUCT ASSEMBLY DRAWING – VENT MASTER MODEL PXD

Dimensions in millimetres.
Do not scale

NOTES:
1. CLAMP IS TO BE HOT DIPPED GALVANIZED TO AS4688, POWDER COATED BLACK FUSION BONDED EPOXY TO AS1550, THEN FITTED WITH ITEM 28 SS GR316 BOLTS/ITEM 29 SS GR316 NUTS AND ITEM 30 SS GR316 FLAT WASHERS.

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<tr>
<td>20</td>
<td>HEX NUT 1/4&quot; BSW</td>
<td>SS GR 316</td>
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<td>19</td>
<td>SCREW SS GR 316</td>
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<td>17</td>
<td>TRANSITION HD.P.Z. 80</td>
<td>1</td>
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<tr>
<td>16</td>
<td>COVER SS GR 316</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>COVER SS GR 316</td>
<td>1</td>
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<tr>
<td>14</td>
<td>VALVE SEAL 333 NY</td>
<td>NYLON &quot;O&quot; RING</td>
</tr>
<tr>
<td>13</td>
<td>FLOAT GUIDE Ø 1/4&quot;</td>
<td>SS GR 316</td>
</tr>
<tr>
<td>12</td>
<td>AUTO CRIMP SS GR 316</td>
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<td>11</td>
<td>VALVE HD.P.Z. 80</td>
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<td>10</td>
<td>SEAL MADE EPDM/SS GR 316</td>
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<td>9</td>
<td>STEM FLANGE HD.P.Z. 80</td>
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<tr>
<td>8</td>
<td>BIBBLE ERALTAN ITA</td>
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<td>7</td>
<td>FLOAT BODY HD.P.Z. 80</td>
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<td>6</td>
<td>HD.P.Z. M 1/2&quot; @ 100 PIPE SWRP</td>
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<td>5</td>
<td>SEAL Ø1.15 mm</td>
<td>NYLON</td>
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<td>4</td>
<td>BODY END HD.P.Z. 80</td>
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<tr>
<td>3</td>
<td>CLAMP SEE NOTE 1</td>
<td>SKIN LAMIN GR 500-3</td>
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<td>2</td>
<td>FLOAT NOSE HD.P.Z. 80</td>
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<tr>
<td>1</td>
<td>CAP PLATE ERALTAN ITA</td>
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1600kPa @ 20°C

REV/DATE REVISION DRAW/CHK
35-04-2012 058-0077 5-AK11 09/11/2003 21/05/2005 22/05/2005 10/06/2005

GFR-PXD-000 1

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APPENDIX F – VENT MASTER PX TECHNICAL DATA

<table>
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<th>4 COMPONENT MATERIALS</th>
<th>MATERIAL</th>
<th>STANDARD</th>
<th>GRADE</th>
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<tr>
<td>4.1 Body</td>
<td>HDPE</td>
<td>AS4130/31</td>
<td>PE100</td>
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<td>4.2 Float</td>
<td>HDPE</td>
<td>AS4130/31</td>
<td>PE100</td>
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<td>4.3 Resilient seal</td>
<td>EPDM</td>
<td>ASTM D2000-01</td>
<td>E300-70</td>
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<td>4.4 Seat</td>
<td>Stainless Steel</td>
<td>ASTM B16.5</td>
<td>316</td>
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<td>4.5 Levers, linkages and pins</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>4.6 Spring</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>4.7 O-rings</td>
<td>Nitrile / NBR</td>
<td>ASTM D2000-99</td>
<td>N100-70</td>
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<td>4.8 Fasteners</td>
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<td>ASTM A276</td>
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<td>4.9 External insect screen</td>
<td>Stainless Steel</td>
<td>ASTM A240M</td>
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<td>4.10 Protective coating (ductile iron components only)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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5. DESIGN AND MANUFACTURE

5.1 Manufacturer’s name | GFR |
5.2 Place of manufacture | Perth, Western Australia |
5.3 Brand and Model | GFR - Vent Master PX |
5.4 Size of valve | As tested 100NB. Connection options of 80, 150 and 200 NB – same working internals/performance |
5.5 Pressure class | PN16 |
5.6 Maximum operating temperature | 60 Degrees Celsius |
5.7 Permanent air gap provided between sewage and the valve sealing components | Yes |
5.8 Type of valve e.g. large orifice, small orifice, combination etc. | Double Orifice – large and small |
5.9 Type of valve port e.g. full or reduced | Reduced |
5.10a Diameter or cross sectional area of large orifice | Diameter = 60mm |
5.10b Large Orifice discharge coefficient | 0.67 |
5.11 Diameter or cross sectional area of small orifice | Diameter = 1.5mm |
5.12 Minimum sealing pressure (large orifice & anti-slam valves) kPa | 20 kPa for Standard insert, Zero kPa for HRI insert |
5.13 a) Dynamic closure pressure of anti-slam disc (large orifice & anti-slam valves) kPa | 17kPa |
5.14 Air discharge capacity for inlet pressure from 5 kPa up to the dynamic closure pressure of anti-slam disc (large orifice & anti-slam valves) normal L/s | 5kPa – 75.2 nL/s |
5.15 Air discharge capacity for inlet pressure from the dynamic closure pressure of anti-slam disc up to 80 kPa (anti-slam valve) normal L/s | 20 kPa – 14.7 nL/s |
5.16 Air intake capacity for inlet pressure from -5kPa up to the choking point pressure (large-orifice, anti-slam and anti-vacuum valves) normal L/s | -5kPa – 67.9 L/s |
5.17 End connection – flanged or screwed | Flanged 316 Stainless Steel |
5.18 Threaded end connection standard | N/A |
5.19 Flange end connection standard | AS 4087 |
5.20 DN 100 stainless steel flange provided per Clause 3.3. (b) | Yes |
5.21 Perform production tests complying with Clause 5.5.1 | Yes/No |
5.22 Manufacturer’s test certificates available if requested | Yes/ |
5.23 Drain valve complies with WSA SPS 252 | Req SPS 252/ |
5.24 Drain valve brand and model | YZNG Trong – model 1-10E |
5.25 Drain valve size | 15 NB |
APPENDIX G – INSTALLATION AND MAINTENANCE INSTRUCTIONS

VENT MASTER PX

AIR RELEASE VACUUM BREAK VALVES FOR SEWERAGE, POTABLE WATER, SALINE/HYPERSONEAL WATER, TAILINGS AND SLURRIES

Installation and Maintenance Manual

Vent Master PX 80 mm Standard Insert: Model AV100077
Vent Master PX 100 mm Standard Insert: Model AV100078
Vent Master PX 80 mm High Response Insert: Model AV100080
Vent Master PX 100 mm High Response Insert: Model AV100081

(Detail also relevant for custom 150 & 200 mm units & Super Duplex wetted internals)

16/10/2012
VENT MASTER PX
AIR RELEASE VACUUM BREAK VALVES FOR WATER, SEWERAGE, SEAWATER, BRINE, TAILINGS AND SLURRIES

OPERATING AND MAINTENANCE INSTRUCTIONS

Product Description

The Vent Master PX valves detailed in this manual include following models:

- Vent Master PX 80 mm Standard Insert: Model AV100077
- Vent Master PX 100 mm Standard Insert: Model AV100078
- Vent Master PX 80 mm High Response Insert: Model AV100080
- Vent Master PX 100 mm High Response Insert: Model AV100081

The Vent Master PX with the standard insert is a dual orifice, double acting valve. The dual orifice description means there is a large and quite separate small outlet orifice. The large diameter orifice provides bulk air release on system start up (bulk venting) and bulk air ingestion should the pipeline experience a state of vacuum. This is known as vacuum breaking mode.

The second orifice is a small orifice designed to handle smaller quantities of air that accumulates in the valve body over time in a pressurised pipeline. When this orifice is actuated, the process is known as autoventing (i.e.: automatic venting).

Double acting simply means that the design of the valve allows for air venting (outflow) as well as vacuum breaking (inflow).

Furthermore, the Vent Master PX includes an antislam (or antishock) disc. This is a disc that slows the process of air outflow after column separation has occurred, and columns of water are coming back together. It is important to control the rate that these columns rejoin, as water is incompressible and can cause a massive shock or hammer when they come together in an uncontrolled fashion. Anti-shock is a simple yet very effective feature that mitigates this situation.

The High Response Insert (HRI) is fitted when low pressure closure (down to zero pipeline pressure) is required. E.g.: systems that exhibit low pressure transients on start up and shutdown. The HRI is a single orifice insert that

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combines a lightweight, highly reactive float system. It provides bulk air release and vacuum break protection.

**Component Parts**

1. Valve component part numbers are provided as part of the GA (General Arrangement) drawing
2. Many components are common between the various sizes of PX Ventmaster
3. Component part numbers are unique to the actual part. Thus, parts will carry the same part number regardless of the Product in which they are utilised. Some parts are common between the various derivatives

**Special or Custom Valves**

1. Where operating conditions are extreme or customer requirements are situation specific, GFR's engineering expertise can be drawn upon to create Custom or Special configurations. This may include unique materials of construction like Super Duplex stainless steels for wetted internals or even the complete body structure
2. For installation, parts or maintenance notes on these custom valves, please refer directly to GFR

**Installation**

1. All Vent Master air valves must be mounted vertically on the top of the pipeline in an accessible position
2. Best practice is to install an air valve every 500 metres on flat sections and at every high point or change in gradient
3. To optimise air venting, a plenum TEE should be installed for each valve. This is a TEE with an offtake greater than or equal to 0.5 times the diameter of the main carrier pipeline
4. It is strongly recommended that an isolation valve be fitted immediately below each air valve. This allows for air valve servicing without the need to shut the system down
5. All PX Ventmaster derivatives are mounted using a 316 SS flange mount system. The bolt set used is to be the same material of construction
6. As the PX Ventmaster is a flange mounted valve, anti-seize compound should be applied to the mounting bolts to aid assembly and removal at a later date
7. As a minimum, an appropriately sized insertion rubber gasket should be used to provide a seal between the valves stub flange mount and the attachment surface on the pipe. It is preferential for seal integrity and pressure handling capability of the joint to use a CMF (Compressed Mineral Fibre) gasket where possible
8. It is important to nip the bolts up progressively using a diagonal pattern of torqueing
9. When installing air valves to a newly constructed pipeline, (and particularly polyethylene pipelines,) wherever possible, flush out each mounting position by operating the isolation valve before mounting the air valve. This

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will purge any possible debris within the pipeline such as HDPE swarf from the facing process prior to pipe welding. It is recommended that the purged water should run clear for at least 30 seconds prior to valve fitment.

**Warranty**

GFR's standard warranty terms and conditions apply. All product is warranted for a period of no less than 24 months after product delivery or 12 months after product installation whichever period elapses first. Any non-compliant product shall be replaced with product that conforms to the acceptance criteria or shall repair or rectify and defect.

**Maintenance - Standard Insert**

1. Refer Drawing GFR-PXD-000
2. Prior to performing maintenance on any air valves, ensure the operation can be carried out in conformance with the applicable Safety Requirements and Regulations
3. It is incumbent upon the client to ensure that trained personnel conversant with safe working practices perform all maintenance and installation
4. Before undertaking any work on air valves, close the isolation valve that is fitted between the valve on the pipeline or take
5. The Vent Master PX is a unique valve design that is exceptionally easy to service. Open the ball valve (item 25) on the side wall of the main valve to depressurise the body
6. The entire working internals are possible to extract by undoing the two hex bolt, nut and washer assemblies (items 28, 29, and 33)
7. Carefully undo these bolts holding the two clamp halves (item 3) together. Using a flat blade screwdriver to lever the clamp halves apart and remove the clamps
8. Withdraw the working internal insert and inspect all seals, o-rings and seal surfaces for integrity and that there is no foreign material contacting them
9. There are 3 Nitrile o-rings (items 5, 14 and 32) and one specially formed EPDM seal (item 10) that need checking. To perform a visual inspection of item 10, set screw (item 30) must be backed off several turns until the float (item 2 + 7) and Valve member (item 11) separate
10. Clean o-rings and contact surfaces. It is possible to do this without stripping down the insert any further
11. If o-rings are deformed and require replacing a seal kit is available from GFR Group to service the insert

16/10/2012
12. To replace seal (item 10), o-ring items (14 and 32), the insert must be stripped down further.
13. Undo the three nuts (items 20) on the bottom of the float guides.
14. Remove the plastic baffle piece (item 8) at the end of the float guides.
15. Extract the float nose assy (item 2 + 7) and valve member assembly (item 11).
16. Loosen the set screw (item 30) that holds these two items together.
17. Extract the antishock disc (item 31).
18. Relace the seal and o-rings as required.
19. Reassemble the insert in reverse order, making sure that set screw (item 30) is gently wound in to just bottom against seal (item 10), then backed off slightly to allow the float nose assy (item 2 + 7) and valve member (item 11) to remain captive, but separate slightly. This action breaks the auto orifice seal allowing air to automatically vent in a pressurised pipeline.
20. Re- Fit the insert assembly into the valve body.
21. Fit the cover clamp halves and tighten with the two bolts to 20 Nm torque. Do not over-torque these bolts. (There is no need for the two clamp halves to bottom cut on one another). Ensure that tightening is progressive and even for both bolts. The head of the bolt fits in the clamp in such a way that a cast locking feature prevents the bolt from spinning. The washer should be fitted on the nut side.
22. Partially open the isolation valve and allow the valve to pressurise.
23. Visually check for leaks.
24. If no leaks are detected, fully open the isolation valve.
25. To minimise downtime, it is recommended to have an insert already serviced with clean/new seals and to simply swap it over. The old insert can then be serviced for the next valve and so on. Using this leap frog approach, the valves can be serviced in situ in 2 minutes.
26. It is recommended that every 12 months the valve internals are inspected and cleaned. This frequency will however depend on individual system requirements.

**Note:** When functioning correctly, the valve will expel small audible quantities of air from the vent when the line is up to pressure. This is the process of autoventing. The actual amount will depend upon specific operational conditions.

**Maintenance – High Response Insert (HRI)**

![Maintenance – High Response Insert (HRI)](image_url)

16/10/2012
1. Refer Drawing GFR-PXD-000 for general overview of valve body and drawing GFR-PXC-HR-000 that refers specifically to the HRI.
2. Prior to performing maintenance on any air valves, ensure the operation can be carried out in conformance with the applicable Safety Requirements and Regulations.
3. It is incumbent upon the client to ensure that trained personnel conversant with safe working practices perform all maintenance and installation.
4. Before undertaking any work on air valves, close the isolation valve that is fitted between the valve and the pipeline offtake.
5. The Vent Master PX is a unique valve design that is exceptionally easy to service. Open the ball valve (item 25) on the side wall of the main valve to depressurise the body.
6. The entire working internals are possible to extract by undoing the two hex bolt, nut and washer assemblies (items 28, 29, and 33 on drawing GFR-PXD-000).
7. Carefully undo these bolts holding the two clamp halves (item 3) together. Using a flat blade screwdriver to lever the clamp halves apart and remove the clamps.
8. Withdraw the working internal insert and inspect the o-ring seal (item 9) Drawing GFR-PXC-HR-000) and check corresponding seal surfaces for integrity and that there is no foreign material contacting them.
9. Clean seal and surfaces as required. It is possible to do this without stripping down the insert any further.
10. If the seal is deformed or damaged and requires replacing, a seal kit is available from GFR Group to service the insert. The o-ring seal (item 9) can be changed without any further disassembly. This is also true for the main cover seal (item 8, Drawing GFR-PXC-HR-000). It should be inspected and cleaned as well.
11. Re-fit the insert assembly into the valve body.
12. Fit the cover clamp halves and tighten with the two bolts to 20 Nm torque. Do not over-torque these bolts. (There is no need for the two clamp halves to bottom out on one another). Ensure that tightening is progressive and even for both bolts. The head of the bolt fits in the clamp in such a way that a cast locking feature prevents the bolt from spinning. The washer should be fitted on the nut side.
13. Partially open the isolation valve and allow the valve to pressurise.
15. If no leaks are detected, fully open the isolation valve.
16. To minimise downtime, it is recommended to have an insert already serviced with clean/new seals and to simply swap it over. The old insert can then be serviced for the next valve and so on. Using this leap frog approach, the valves can be serviced in situ in 2 minutes.
17. It is recommended that every 12 months the valve internals are inspected and cleaned. This frequency will however depend on individual system requirements.

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16/10/2012
Dimensions in millimetres.
Do not scale.

OUTLINE OF PXC VALVE

AY101382
AY101662
AY101667
AY101412
AY101276
AY101655

PHILMAC FLOAT
Ø 80 x 125 LONG

1600 kPa @ 20°C

ALL DIMENSIONS ± 0.8 mm.
APPENDIX H – USAGE REFERENCES

The following Water Agencies/ Maintenance service Providers have used GFR Vent Master PX:

Veolia – Western Corridor Eastern Pipeline - Greg Ogilvie – Manger Water Services BNE, 0429 158 126

Water Corporation – WA

SSWA (Southern Seawater Alliance) – Biningup Desalination Plant – WA, Superduplex internals – Chris Davey WA Water Corp - (08) 9720-0715 (Commissioning system Q2 2011)

Sunshine Coast Water – Now Unitywater – Andrew Matthews, Senior Development Engineer - (07) 5409 3800

Wide Bay Water – Steven Cook – Asset Maintenance - (07) 4194-7622

Coff’s Harbour Water – Paul Barling, Head Design Engineer (02) 6648 -4413

Gold Coast City Council –Allconnex Pimpana Coomera Waterfuture Project

Hope Island RSM Project – valves yet to be installed at time of drafting

SA Water – Mount Gambier – Brian Klintberg 0417 088 145

Water Corporation – WA – Karratha Desalination Project – Narelle D’Amico (Project Mgr - (08) 9186 8246)

GFR Group has supplied the GFR Vent Master PX with HRI (High Response Insert) to several Water Agency Projects.

The following Water Agencies/ Water Agency Maintenance Service Providers have provided testimonials for the Vent Master PX with HRI (High Response Insert). Details of the project specifics and testimonials are available for download on the WSAA Member only web Portal.

- Unity Water
- Veolia
- Coffs Harbour City Council
- SSWA - Southern Seawater Joint Venture

Copies of the above testimonials can be downloaded from the WSAA ‘Member Only’ area of the WSAA website
Tuesday, 11 December 2012

PRODUCT APPRAISAL - FIELD TRIAL REPORTING - GFR VENTMASTER AIR RELEASE VALVE

1. INSTALLATION DETAILS

- Name of Project and location – Air valve replacement: 450mm trunk potable water main.
- Date of installation of valves – 3/9/11
- Name of Product installed, manufacturer and model number – GFR Vent Master PX 80 mm Standard Insert: Model AV100077
- Number of valves installed - 4
- Period of in-service operation – 15 months
- Who was installer (Contactor or asset owner?) – Asset owner
- Diameter & length of pipeline that valves are fitted to. Grade of pipeline? – 450mm AC class D and 450mm DICL (DICL installed at the same time as the air valves)
- Operating pressure of pipeline, maximum design pressure – 1200 -1400kPa
- Media flowing through pipe – Potable water
- Were valves installed in pits or above ground – attach photos – in pits
- Type of ground if pipe buried – N/A
- Ease of installation – Simple bolted flange to 4 bolted hydrant/AV isolating valve.
- Commissioning details, in service pressure test etc – Pressure tested to system working pressure on site. Passed pressure test but failed a few days later, with the valve body fracturing at the top neck. When reported to GFR, they replied that the failure was due to a sharp corner on the outside of the machined diameter. This had been modified with the new valve and the pressure rating raised from 1400kPa to 1600kPa. 4 new valves were supplied
from GFR free of charge an installed. The new valves have a rounded corner on the machined OD to relieve the stress in this area. The new valves have been trouble free.

- What functional tests will be performed for the preventative Maintenance Strategy to ensure valves don’t leak – 2 yearly: Isolate, drain and re-pressurise to check seat tightness. Strip and clean as necessary.

- Are specialised tools required for servicing - No

- Is installation and Maintenance Manual clear and concise - Yes

2. PRODUCT DELIVERY

- Condition of product upon delivery - Excellent
- Photographs any surface damage
- Other issues
3. PRODUCT MARKING/NAMEPLATE INFORMATION

- Easy to read - Yes
- Are details relevant and complete - Yes

4. PRODUCT SUITABILITY/QUALITY

- Where there any signs of failure or concern for the installation? – photo if relevant - No
- Did the product perform to expectations? - Yes
- What was learned about the product that could make it better or worse than other brands? – The clamping ring has only 2 bolts to remove to access all internals, which makes it easy to maintain. All work can be done in situ without the need to remove the valve.

5. SUMMARY

- Why was this valve specified for the nominated project, what was your assessment criteria – Corrosion proof for longevity, and ease of maintenance.
- What was learned about the product that could make it better or worse than other brands
• What are the advantages (if any) in using this product? What features and benefits attracted your Agency to using this product. — The condition of many of our old cast iron air valves has rendered them difficult to take apart for maintenance. The ease of access to the working parts of this valve means that the scheduled maintenance costs will be greatly reduced over the life of the valve, when compared to other types of air valve we have used.

• Would you recommend this product and will you continue to purchase it as required — Yes, I’m about to place orders for two more projects, and intend to standardise GFR air valves across our sewerage and water networks.

• Summary of product and any other relevant comments.

Report compiled by:-
Steve Cook
Asset maintenance planner
Wide Bay Water Corporation
Hervey Bay QLD