

VINIDEX PTY LTD

PRODUCT APPRAISAL REPORT PA 1525 Issue 2

PE100 MOULDED SPIGOT FITTING FOR PRESSURE APPLICATIONS

AS/NZS 4129:2008 “Fittings for polyethylene (PE) pipes for pressure applications”

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WATER SERVICES
ASSOCIATION OF AUSTRALIA

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Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

1. influencing national and state policies on the provision of urban water services and sustainable water resource management
2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

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1 EXECUTIVE SUMMARY

This Issue 2 is to close out a Future Work item that required a field installation trial to be conducted and also includes updated copies of QA certification. Since the original Appraisal these products have been approved and installed by a number of water agencies including QUU, Unity Water, Sydney Water and MRWA. It is considered that nothing new can be learned from a field installation trial.

This Product Appraisal Report introduces the PLASTIK range of PE injection moulded spigot fittings for pressure applications including water supply and sewerage.

The PLASTIK range of PE injection moulded spigot fittings is manufactured by NTG PLASTIK in Istanbul, Turkey, and distributed throughout Australia by Vinidex Pty Ltd.

Vinidex is an Australian manufacturer of thermoplastic pipe and fittings systems. Vinidex manufactures and distributes plastic piping systems used in the transportation of fluids, energy and data for infrastructure development, agriculture, mining and building. Founded in 1960, Vinidex now has factories and distribution centres located in Sydney, Wagga Wagga, Melbourne, Brisbane, Toowoomba, Townsville, Launceston, Perth, Adelaide and Darwin.

NTG PLASTIK was founded in 2005 in Istanbul, Turkey to produce PE100 fittings and exports 65% of its production to over 40 countries around the world. NTG PLASTIK has been issued with ISO Type 5 Certificate of Conformity and Watermark for the NTG PLASTIK range of moulded spigot fittings by ApprovalMark International Certification for compliance with AS/NZS 4129:2008 *"Fittings for polyethylene (PE) pipes for pressure applications"*.

The PLASTIK range of injection moulded spigot fittings includes:

- 90° & 45° Elbows
- 90° & 45° Equal Tees & Reducing Tees
- Reducers & Stepped Reducers
- Stub flanges (long & short spigot)
- End caps

PLASTIK PE100 injection moulded spigot fittings are available in PN16 (SDR11) and PN10 (SDR 17), some with short or long spigot. (A long spigot is suitable for electrofusion or butt welding and a short spigot is suitable for butt welding only.) Not all fittings are available in every size nominated, Refer Table 4.

The PLASTIK range of injection moulded spigot fittings are suitable for use with polyethylene (PE) pipes manufactured in accordance with AS/NZS 4130 *"Polyethylene (PE) pipes for pressure applications"* for the conveyance of potable water, recycled water, and sewage in buried and above ground pressure applications.

Plastics pipe systems are often designed on the basis of 50 year extrapolated test data. This is established international practice but is not intended to imply the service life of drainage pipe is limited to 50 years. For correctly manufactured and installed systems, the actual life cannot be predicted, but can logically be expected to be well in excess of 100 years before major rehabilitation is required.

The appraisal concludes that:

- The PLASTIK PE100 injection moulded spigot fittings are 'fit for purpose' and suitable for use in water supply and sewer gravity, pressure and vacuum systems.
- The PLASTIK PE100 injection moulded spigot fittings are suitable for use with PE pipe conforming to AS/NZS 4130.

- The ApprovalMark International ISO Type 5 Certification for the PLASTIK PE100 moulded spigot fittings has been addressed to the satisfaction of WSAA

1.1 Recommendations

It is recommended that WSAA members, subject to any specific requirements of the member, accept or authorise the NTG PLASTIK range of moulded spigot fittings as detailed in this report for use in pressure applications including water supply, recycled water and sewerage pressure applications provided pipeline design and installation is in accordance with relevant conditions relating to the design, installation and acceptance testing, AS/NZS 4129:2008, the relevant WSAA Code and the manufacturer's requirements.

2 THE APPLICANT

Vinidex is an Australian manufacturer of thermoplastic pipe and fittings systems. Vinidex manufactures and distributes plastic piping systems used in the transportation of fluids, energy and data for infrastructure development, agriculture, mining and building. Founded in 1960, Vinidex now has factories and distribution centres located in Sydney, Wagga Wagga, Melbourne, Brisbane, Toowoomba, Townsville, Launceston, Perth, Adelaide and Darwin.

On the 1st August 2014, Vinidex was acquired by the Aliaxis group of companies. The Aliaxis Group is a leading global manufacturer and distributor of primarily plastic fluid handling systems used in residential and commercial construction, as well as in industrial and public infrastructure applications. Vinidex is now wholly owned by Aliaxis Australia Holdings Pty Ltd.

Key Aliaxis Group facts:

- Head office in Brussels, Belgium
- Family owned
- €2.9 billion annual revenue
- Presence in 40 countries
- Over 100 manufacturing and commercial entities
- Employs 15,700 people around the world.



ALIAxis GROUP BRANDS WORLDWIDE

Region	Brands and History
North America	<p>canplas Founded in 1966</p> <p>IPEX IPEX, with more than 50 years of experience in plastics</p> <p>1959 : Harrington Industrial Plastics LLC was founded</p>
Latin America	<p>Durman Since Durman created in 1959 in Costa Rica, it developed across almost all Latin America</p> <p>vinilit More than 40 years of experience in Vinilit (Chile)</p>
Europe	<p>Nicoll 1956 : Nicoll starts to manufacture fittings from PVC tubes</p> <p>GIRPI GIRPI originates in 1957 in Marseille with the production of PVC waste fittings</p> <p>REDI REDI SpA in Italy with more than 40 years of experience in producing plastic fittings</p> <p>Jimloni Jimloni was started in 1965 in Alicante (Spain)</p> <p>SANIT SANIT was founded 60 years ago as a handicraft business</p> <p>MARLEY Marley Plastics was founded in United Kingdom in 1966</p> <p>MARLEY Marley Deutschland GmbH has more than 50 years of experience</p> <p>FRIATEC Recently celebrating 150 years of Friatec, active in plastics since 1979</p> <p>FIP In 1954, FIP produced the first plastic valve in Europe by injection moulding technology</p>
Asia	<p>PALING Paling founded in 1971 in Malaysia</p> <p>ashirvad Ashirvad Pipes founded in India in 1975</p>
Australasia	<p>MARLEY Marley New Zealand started in 1957</p> <p>Philmac Established in 1929, Philmac (Australia), developed first all-plastic compression fittings for polyethylene pipe in 1968</p> <p>DMX More than 30 years of experience</p> <p>DMX More than 70 years of experience in the plumbing business</p>
Africa	<p>MARLEY Marley Pipe systems was launched in South Africa in 1963</p>

2.1 The Manufacturer

NTG PLASTIK is a privately owned company that was founded in 2005 in Istanbul, Turkey to produce PE100 fittings. NTG PLASTIK exports 65% of its production to over 40 countries around the world. NTG PLASTIK SAN. VE TIC. A.S. has a Quality Management System certified to ISO 9001:2008.

NTG history is short, commencing in 2005 to produce PE100 fittings. In 2006 ISO 9001 certification was received and products were successfully tested and marketing and sales were started. By 2007 international quality certificates and approvals were gained and targets extended to the global market. In 2009 the spigot fittings range was complete up to 315mm and other electrofusion fittings were being launched. In 2011 new factory construction began and by 2012 14.000sqm of covered production facilities were in operation and the export market exceeded 34 countries.

NTG maintain total quality control from raw material to the finished product by strictly following international standards, utilising only the materials which are proven to be acceptable and the quality management system, in compliance with ISO 9001:2008, is permanently subject to strict controls to satisfy all customer needs quickly and completely.

For more information see the NTG web site at www.ntgplastik.com

3 THE PRODUCT

The PLASTIK range of injection moulded spigot fittings are suitable for use with polyethylene (PE) pipes manufactured in accordance with AS/NZS 4130 *"Polyethylene (PE) pipes for pressure applications"* for the conveyance of potable water, recycled water, and sewage in buried and above ground pressure applications.

PLASTIK injection moulded spigot fittings have been issued with ISO Type 5 Certificate of Conformity and Watermark by ApprovalMark Certification for compliance with AS/NZS 4129:2008 *"Fittings for polyethylene (PE) pipes for pressure applications"*.

The PLASTIK range of injection moulded spigot fittings are manufactured by NTG PLASTIK in Istanbul, Turkey from PE100 materials, either BorSafe HE3490-IM or Eltex TUB 121.

The NTG PLASTIK range of injection moulded spigot fittings includes:

- 90° & 45° Elbows
- 90° & 45° Equal Tees & Reducing Tees
- Reducers & Stepped Reducers
- Stub flanges (long & short spigot)
- End caps

PLASTIK PE100 injection moulded spigot fittings are available in PN16 (SDR11) and PN10 (SDR 17), some with short or long spigot. (A long spigot is suitable for electrofusion or butt welding and a short spigot is suitable for butt welding only.) Not all fittings are available in every size nominated, Refer Table 4.

The ApprovalMark International Certification Schedule includes electrofusion fittings that are not included in this appraisal.

The appraised range is briefly demonstrated below and the complete appraised list is shown in Appendix A Table A1:

Elbows



45° and 90° elbows are available in SDR17 and SDR11, in sizes DN20 to DN400, all with long spigots suitable for electrofusion or butt welding.

Tees



Equal and reducing tees are available in SDR17 and SDR11, in sizes DN20 to DN400, all with long spigots suitable for electrofusion or butt welding.

Reducers



Reducers are available in SDR 17 and SDR11, in sizes DN20 to DN400, all with long spigots suitable for electrofusion or butt welding. Stepped reducers are also available in SDR 17 and SDR11, in sizes DN160 to DN630, with short spigots suitable for butt welding.

Stub Flanges



Stub flanges are available in SDR 17 and SDR11, in sizes DN20 to DN710, with long spigots suitable for electrofusion or butt welding, and short spigots suitable for butt welding.

End Caps



End caps are available in SDR11, (PN16) in sizes DN20 to DN400, with long spigots suitable for electrofusion or butt welding.

4 SCOPE OF THE APPRAISAL

The scope of the appraisal applies to the range of PLASTIK fittings described in Section 3 above and Appendix A Table A1. The ApprovalMark International Schedule to ISO Type 5 & WaterMark Licence No's. AMI 74605 and WM 74605 also includes a complete product listing including model identification, model name and product description including size. This Schedule can be accessed at the WSAA Members Only web site.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Codes and Appraisal Reference Group accepts polyethylene injection moulded spigot fittings manufactured under cover of a third party certified management system complying with AS/NZS ISO 9001 and having ISO Type 5 product certification issued by a

JAS-ANZ accredited certification body or by a certification body accredited by an international accreditation body recognised by JAS-ANZ.

5.2 Performance Requirements

NTG PLASTIK's moulded spigot fittings suitable for butt fusion and electrofusion welding have been appraised for compliance with AS/NZS 4129:2008 *"Fittings for polyethylene (PE) pipes for pressure applications"*.

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

The following Product Specifications are also relevant to this application.

WSA PS-207 Polyethylene (PE) Pipe for Pressure Applications - Water Supply and Sewerage

WSA PS-208 Plastics Moulded Fittings for Pressure Applications with PE pipe- Water Supply and Sewerage

WSA PS-312 Flange Gaskets and O-Rings

Copies of the above Product Specification can be found in Appendix 'C' or downloaded from the WSAA member's website.

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Vinindex Pty Limited is a Quality Endorsed Company complying with ISO 9001:2008 as demonstrated by a Certificate of Registration by QAS Licence No QEC0570 issued in Australia by SAI Global. This certificate was originally issued on 19 February 1991 and is currently valid until 13 May 2016.

NTG PLASTIK is a Quality Endorsed Company complying with ISO 9001:2008 as demonstrated by a Certificate of Registration by NAVIGA Certificate No 1540671 for "DESIGN, MANUFACTURE AND SALES OF PLASTIC PIPES, FITTINGS, VALVES AND OTHER PLASTIC PARTS MADE WITH INJECTION MOULDING". This certificate was originally issued on 10 August 2015 and is currently valid until 9 August 2018.

NAVIGA Certification provides management system certification and is the Turkish national accreditation body and is accredited according to ISO IEC 17021. Vinindex has submitted a nine page detailed NAVIGA audit report dated 17-19 June 2015 noting all the 23 elements of EN ISO 9001:2008 that were audited. The summary states that no non-compliances were detected during the audit and certification should continue. A copy of this report is being held on file by WSSA.

NTG Plastik has been issued with ISO Type 5 Certificate of Conformity, Certificate No AMI 74605 by ApprovalMark International for Moulded Pressure Fittings for Pressure Applications complying with AS/NZS 4129:2008 - *"Fittings for polyethylene (PE) pipes for pressure applications"*. This certificate was issued on 27 January 2016 and is currently valid until 27 January 2021. The Schedule to this Licence contains the products listed in Appendix A Table A1.

NTG Plastik has been issued with WaterMark Certificate of Conformity – Level 1 Certificate No WM74605 by ApprovalMark International for Moulded Pressure Fittings for Pressure Applications complying with AS/NZS 4129:2008 - *"Fittings for polyethylene (PE) pipes for pressure applications"*. This certificate was originally issued on 15 October 2015 and is currently valid until 15 October 2016. The Schedule to this Licence contains the products listed in Appendix A Table A1..

NTG Plastik has also been issued with a DQS Certificate to demonstrate their manufacturing site maintains an Environmental Management System fulfilling the requirements of ISO 14001:2004 + Cor 1:2009 first certified on 30 April 2014 and valid until 29 April 2017.

Refer to Appendix B for copies of the certificates.

6.2 Compliance with Performance Requirements

6.2.1 Effect on Water

Ref: AS/NZS 4129:2008 Clause 1.12

Vinindex has submitted an AMS Laboratories Ref. No. 1512189 dated 27 July 2015 for NTG moulded spigot fittings with a material designation of BORSAFE 3490-IM and ELTEX TUB 121. The Report results state:-

Based on completion and evaluation of all tests on 27/07/2015, the product, 20mm EF Coupler SDR11 01 117 160 0020; 20mm EF Coupler BORESAFE HE3490-IM and 20mm EF Coupler ELTEX TUB121; fully complied with the test requirements of AS/NZS 4020:2005 to cover a cold water application up to <40°C, at the recommended 0.01 (1/100) of composite exposure of 1 x system (system = 'in-the-product' exposure of 1 x 20mm BoreSAFE Coupler (25mL) + 'in-the-product' exposure of 1x 200 Eltex Coupler (25mL), with extracts from each combined into a composite 50mL extract) at (20 ±2)°C.

6.2.2 Polyethylene Material Composition

Ref: AS/NZS 4129:2008 – Sections 1.13, 3.2.2, 3.2.3, 3.2.4, & 3.2.5.

Eltex TUB 121 is listed on PIPA Industry Guidelines POP004A - Supplementary list – *Materials specific to electrofusion and moulded fittings* and meets the requirements of AS/NZS 4131 and if nominated also the requirements of POP013. This material is nominated as AS/NZS 4020 certified and compliant with temperature re-rating.

HE3490-IM is listed on PIPA Industry Guidelines POP004A - Supplementary list – *Materials specific to electrofusion and moulded fittings* and meets the requirements of AS/NZS 4131. This material is nominated as AS/NZS 4020 certified, but compliance not demonstrated with POP013 for temperature re-rating. Vinindex has provided BECETEL Report No. 9246 concerning the evaluation of BORSAFE HE3490-IM dated 16 February 2009. This report concluded with regard to the calculations of regression curves that according to ISO 12162 – *Thermoplastics materials for pipes and fittings for pressure applications – classification and designation – overall service (design) coefficient*. The BORSAFE HE3490-IM is classified as MRS 10. With reference to Table 1, Section 6 –CLASSIFICATIONS in AS/NZS 4131 a classification of MRS 10 defines the material as PE 100.

6.3 Geometrical Characteristics

Refer: AS/NZS 4129:2008 Clause 6.5

Vinindex has submitted SKZ Inspection Report No. 413513/2.1/110032 dated 04/06/2014 detailing random sample inspection including; appearance, surface finish, colour (RAL 9004, Black) and dimensions. Result: 'Without objection'. (Their words.)

6.4 Type Testing – Mechanical Characteristics

Refer: AS/NZS 4129:2008 Clause 6.8 & Table 6.3.

To demonstrate Type Testing compliance WSAA requires appraisal applicants submit Typical Type Test reports to demonstrate compliance with Clause 6.8 and Table 6.3 of AS/NZS 4129:2008.

Vinindex has submitted SKZ Test Report No. 111598/14 dated 11/09/2014. The test material was Ineos, Eltex TUB 121. Testing was performed as 'Type Test' on fittings with spigots for butt welding according to DVGW-work sheet GW 335-B2 and GW 335-B2-B1 (A) (February 2013), group 16/45 (fittings made from PE80 and PE100.) (Copy not provided but testing appears similar to AS/NZS 4129 requirements.)

The testing included, inter alia; Long-term hydrostatic pressure test and Tensile strength test.

Samples:

1. DN 280-180 SDR11, PE100 NTG reducer.
2. A test tree with 3 SDR11, PE100 NTG reducers.
3. DN250 SDR11, PE100 NTG Elbow.

The 'Long term hydrostatic pressure test' (Refer SKZ Test Report No. 111598/14 Clause 4.7) was carried out on samples 2 & 3 with results as shown in Table 1 below.

TABLE 1

Sample number	Test Temperature (C°)	Test Stress (N/mm ²)	Time to failure	
			Actual value	Set value
2	80°	5.4	>165	≥165
3		4.0	>1,000	≥1,000

Referencing AS/NZS 4129:2008, Table 3.2, the above results are somewhat comparable except for sample 3 where the required test stress is 5 MPa.

The Tensile strength test (Refer SKZ Test Report No. 111598/14 Clause 4.8) does not align with the test requirements of AS/NZS 4129:2008.

On request of further information Vinidex has submitted a testing report from TS EN ISO 17025 accredited UGETAM Test Laboratory. This testing program is dated May/June 2013 and tested the following 3 items:

- DN63 ELBOW 90° PE100 SDR11 "NTG PLASTIK" BRAND
- DN160 EQUAL TE PE100 SDR11 "NTG PLASTIK" BRAND
- DN250 ELBOW 45° PE100 SDR11 "NTG PLASTIK" BRAND

The testing was carried out for compliance with TS EN 12201-3 and AS/NZS 4129:2008.

The source material of the products is not disclosed.

Test results complying with AS/NZS 4129:2008, TABLE 6.3 are shown in Tables 2, 3 and 4 below:

TABLE 2

DN63 ELBOW 90° PE100 SDR11 "NTG PLASTIK" BRAND

Test Method	Test Parameters	Requirements	Unit	Results
Hydrostatic strength at 20°C	ISO 1167	≥100	12.4 MPa	No failure
Hydrostatic strength at 80°C	ISO 1167	≥165	5.4 MPa	No failure
Hydrostatic strength at 80°C	ISO 1167	≥1000	5 MPa	No failure

TABLE 3**DN160 EQUAL TE PE100 SDR11 “NTG PLASTIK” BRAND**

Test Method	Test Parameters	Requirements	Unit	Results
Hydrostatic strength at 20°C	ISO 1167	≥100	12.4 MPa	No failure
Hydrostatic strength at 80°C	ISO 1167	≥165	5.4 MPa	No failure
Hydrostatic strength at 80°C	ISO 1167	≥1000	5 MPa	No failure

TABLE 4**DN250 ELBOW 45° PE100 SDR11 “NTG PLASTIK” BRAND**

Test Method	Test Parameters	Requirements	Unit	Results
Hydrostatic strength at 20°C	ISO 1167	≥100	12.4 MPa	No failure
Hydrostatic strength at 80°C	ISO 1167	≥165	5.4 MPa	No failure
Hydrostatic strength at 80°C	ISO 1167	≥1000	5 MPa	No failure

The above test reports indicate compliance with AS/NZS 4129:2008, TABLE 6.3.

The UGETAM test report carried additional testing related to the PE material and butt fused joints.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

For product information, PE pipeline design and other installation instructions, refer to the NTG PLASTIK Technical Manual. A copy can be downloaded from the WSAA website or from Vinidex.

WSAA has also published the Polyethylene Pipeline Code - WSA 01 with significant input and peer review of the Plastics Industry Pipe Association of Australia (PIPA). WSAA recommend for overall design, installation, pipeline testing and installer training requirements for PE pipeline systems agencies refer to the WSAA Polyethylene Pipeline Code - WSA 01 available from the bookshop at the WSAA web site www.wsaa.asn.au.

Satisfactory completion of a recognised PE pipeline installation training program is a recommended pre-requisite for all PE pipeline installers and supervisors.

8 PRODUCT MARKING

Products are marked in accordance with Clause 1.15 of AS/NZS 4129:2008 “*Fittings for polyethylene (PE) pipes for pressure applications*”. Products are marked with the following information:

- Manufacturer’s name;
- Nominal size;
- Pressure class;
- Material type;

- Date or batch code;
- Standard number;
- Certification Mark

These markings are provided on the body of the fitting, as shown in Figure 1 and as an adhesive label on the plastic bag, as shown in Figure 2



FIGURE 1 PRODUCT MARKING (BODY)

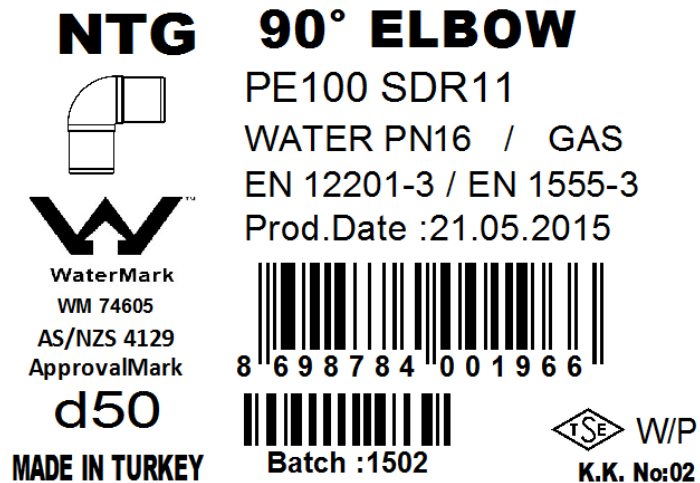


FIGURE 2 PRODUCT MARKING ADHESIVE LABEL ON THE PLASTIC BAG

9 PACKAGING AND TRANSPORTATION

All PLASTIK moulded PE spigot fittings are supplied individually in sealed plastic bags and packed in cardboard cartons to protect the fittings during transport and handling.

Fittings should be stored in a cool, dry area, out of direct sunlight and transported in their cardboard cartons.

Steps should be taken to prevent:

- damage to the sealed plastic bags;

- large temperature fluctuations which may result in the build-up of moisture within the bags; and
- prolonged exposure to sunlight which may result in degradation of the plastic bags.

10 PRODUCT WARRANTY

The products are covered by the normal commercial and legal requirements of the *Competition and Consumer Act 2010 (Cth)*, which covers manufacture to the relevant standard, and details of Vinidex warranty is included in their terms and conditions of sale.

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD TESTING REPORT

These products are commonly used within the water industry and have been approved and installed by a number of water agencies including QUU, Unity Water, Sydney Water and MRWA.

12 DISCUSSION

The PLASTIK PE100 injection moulded spigot fittings provide connection to PE pipelines using Electrofusion jointing or butt weld jointing which offers a permanently sealed and jointed system provided the fusion process is carried out correctly. The electrofusion and butt weld jointed PE pipeline has the potential to have life expectancy equal to and in some cases well beyond other pipeline materials and jointing systems. The PE material is corrosion resistant and correctly made joints are permanently fused to provide a high level of joint integrity against leakage and/or infiltration over the long-term. Similar to other plastic pipe systems, PE is susceptible to fatigue from cyclic pressure changes and additional design considerations must be made if used in a pumped pipeline. Refer to WSAA Technical Note TN4, plus design material available from Vinidex and NTG PLASTIK.

PE pipelines are susceptible to permeation of specific organic chemicals (as are other pipeline systems) and care must be exercised if designing for installation in contaminated ground and/or brownfield sites. Seek further advice from Vinidex and NTG PLASTIK regarding such installations.

The appraisal concludes that:

- The NTG PLASTIK PE100 moulded spigot fittings are 'fit for purpose' and suitable for use in water supply and sewer gravity, pressure and vacuum systems.
- The NTG PLASTIK PE100 moulded spigot fittings are suitable for use with PE pipe conforming to AS/NZS 4130.
- The ApprovalMark International ISO Type 5 Certification for the NTG PLASTIK PE100 moulded spigot fittings has been addressed to the satisfaction of WSAA Appraisal Network

13 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

There were no outstanding issues as a result of the expert panel review.

14 FUTURE WORKS

No future works are required.

15 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 8605 7601 email carl.radford@wsaa.asn.au.

15.1 Issue of Report

This Report has been published and/or prepared by the Water Services Association of Australia Limited and nominated Project Manager and peer group of technical specialists (the Publishers).

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.

15.2 Limits on Reliance on Information and Recommendations

15.2.1 Disclaimer of liability

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APPENDIX A – NTG PLASTIK TECHNICAL HANDBOOK AND PRODUCT LISTING

For more information see the NTG web site at www.ntgplastik.com



TECHNICAL HANDBOOK

PE PIPE FITTINGS



TABLE A.1**NTG PLASTIK FITTINGS ALSO LISTED IN WATERMARK SCHEDULE WM 74605**

ELBOW 90° SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62971	01 115 021 0063	PN10	DN63 ELBOW 90° SDR17 - LONG SPIGOT
62972	01 115 021 0075	PN10	DN75 ELBOW 90° SDR17 - LONG SPIGOT
62973	01 115 021 0090	PN10	DN90 ELBOW 90° SDR17 - LONG SPIGOT
62974	01 115 021 0110	PN10	DN110 ELBOW 90° SDR17 - LONG SPIGOT
62975	01 115 021 0125	PN10	DN125 ELBOW 90° SDR17 - LONG SPIGOT
62882	01 115 021 0140	PN10	DN140 ELBOW 90° SDR17 - LONG SPIGOT
62976	01 115 021 0160	PN10	DN160 ELBOW 90° SDR17 - LONG SPIGOT
62977	01 115 021 0180	PN10	DN180 ELBOW 90° SDR17 - LONG SPIGOT
62978	01 115 021 0200	PN10	DN200 ELBOW 90° SDR17 - LONG SPIGOT
62979	01 115 021 0225	PN10	DN225 ELBOW 90° SDR17 - LONG SPIGOT
62441	01 115 021 0250	PN10	DN250 ELBOW 90° SDR17 - LONG SPIGOT
62981	01 115 021 0280	PN10	DN280 ELBOW 90° SDR17 - LONG SPIGOT
62982	01 115 021 0315	PN10	DN315 ELBOW 90° SDR17 - LONG SPIGOT
62986	01 115 021 0355	PN10	DN355 ELBOW 90° SDR17 - LONG SPIGOT
62987	01 115 021 0400	PN10	DN400 ELBOW 90° SDR17 - LONG SPIGOT

ELBOW 90° SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62954	01 117 021 0020	PN16	DN20 ELBOW 90° SDR11 - LONG SPIGOT
62955	01 117 021 0025	PN16	DN25 ELBOW 90° SDR11 - LONG SPIGOT
62956	01 117 021 0032	PN16	DN32 ELBOW 90° SDR11 - LONG SPIGOT
62957	01 117 021 0040	PN16	DN40 ELBOW 90° SDR11 - LONG SPIGOT
62958	01 117 021 0050	PN16	DN50 ELBOW 90° SDR11 - LONG SPIGOT
62959	01 117 021 0063	PN16	DN63 ELBOW 90° SDR11 - LONG SPIGOT
62960	01 117 021 0075	PN16	DN75 ELBOW 90° SDR11 - LONG SPIGOT
62961	01 117 021 0090	PN16	DN90 ELBOW 90° SDR11 - LONG SPIGOT
62962	01 117 021 0110	PN16	DN110 ELBOW 90° SDR11 - LONG SPIGOT
62963	01 117 021 0125	PN16	DN125 ELBOW 90° SDR11 - LONG SPIGOT
62866	01 117 021 0140	PN16	DN140 ELBOW 90° SDR11 - LONG SPIGOT
62964	01 117 021 0160	PN16	DN160 ELBOW 90° SDR11 - LONG SPIGOT
62965	01 117 021 0180	PN16	DN180 ELBOW 90° SDR11 - LONG SPIGOT
62966	01 117 021 0200	PN16	DN200 ELBOW 90° SDR11 - LONG SPIGOT
62967	01 117 021 0225	PN16	DN225 ELBOW 90° SDR11 - LONG SPIGOT
62968	01 117 021 0250	PN16	DN250 ELBOW 90° SDR11 - LONG SPIGOT
62969	01 117 021 0280	PN16	DN280 ELBOW 90° SDR11 - LONG SPIGOT
62970	01 117 021 0315	PN16	DN315 ELBOW 90° SDR11 - LONG SPIGOT
62984	01 117 021 0355	PN16	DN355 ELBOW 90° SDR11 - LONG SPIGOT
62985	01 117 021 0400	PN16	DN400 ELBOW 90° SDR11 - LONG SPIGOT

ELBOW 45° SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description

63007	01 115 022 0063	PN10	DN63 ELBOW 45° SDR17 - LONG SPIGOT
63008	01 115 022 0075	PN10	DN75 ELBOW 45° SDR17 - LONG SPIGOT
63009	01 115 022 0090	PN10	DN90 ELBOW 45° SDR17 - LONG SPIGOT
63010	01 115 022 0110	PN10	DN110 ELBOW 45° SDR17 - LONG SPIGOT
63011	01 115 022 0125	PN10	DN125 ELBOW 45° SDR17 - LONG SPIGOT
63038	01 115 022 0140	PN10	DN140 ELBOW 45° SDR17 - LONG SPIGOT
63012	01 115 022 0160	PN10	DN160 ELBOW 45° SDR17 - LONG SPIGOT
63013	01 115 022 0180	PN10	DN180 ELBOW 45° SDR17 - LONG SPIGOT
63014	01 115 022 0200	PN10	DN200 ELBOW 45° SDR17 - LONG SPIGOT
63015	01 115 022 0225	PN10	DN225 ELBOW 45° SDR17 - LONG SPIGOT
63016	01 115 022 0250	PN10	DN250 ELBOW 45° SDR17 - LONG SPIGOT
63017	01 115 022 0280	PN10	DN280 ELBOW 45° SDR17 - LONG SPIGOT
63018	01 115 022 0315	PN10	DN315 ELBOW 45° SDR17 - LONG SPIGOT
63019	01 115 022 0355	PN10	DN355 ELBOW 45° SDR17 - LONG SPIGOT
63023	01 115 022 0400	PN10	DN400 ELBOW 45° SDR17 - LONG SPIGOT

ELBOW 45° SDR11 PE100

VX Code	NTG PLASTIK Code	PN Water	Description
62990	01 117 022 0020	PN16	DN20 ELBOW 45° SDR11 - LONG SPIGOT
62991	01 117 022 0025	PN16	DN25 ELBOW 45° SDR11 - LONG SPIGOT
62992	01 117 022 0032	PN16	DN32 ELBOW 45° SDR11 - LONG SPIGOT
62993	01 117 022 0040	PN16	DN40 ELBOW 45° SDR11 - LONG SPIGOT
62994	01 117 022 0050	PN16	DN50 ELBOW 45° SDR11 - LONG SPIGOT
62995	01 117 022 0063	PN16	DN63 ELBOW 45° SDR11 - LONG SPIGOT
62996	01 117 022 0075	PN16	DN75 ELBOW 45° SDR11 - LONG SPIGOT
62997	01 117 022 0090	PN16	DN90 ELBOW 45° SDR11 - LONG SPIGOT
62998	01 117 022 0110	PN16	DN110 ELBOW 45° SDR11 - LONG SPIGOT
62999	01 117 022 0125	PN16	DN125 ELBOW 45° SDR11 - LONG SPIGOT
63025	01 117 022 0140	PN16	DN140 ELBOW 45° SDR11 - LONG SPIGOT
63000	01 117 022 0160	PN16	DN160 ELBOW 45° SDR11 - LONG SPIGOT
63001	01 117 022 0180	PN16	DN180 ELBOW 45° SDR11 - LONG SPIGOT
63002	01 117 022 0200	PN16	DN200 ELBOW 45° SDR11 - LONG SPIGOT
63003	01 117 022 0225	PN16	DN225 ELBOW 45° SDR11 - LONG SPIGOT
63004	01 117 022 0250	PN16	DN250 ELBOW 45° SDR11 - LONG SPIGOT
63005	01 117 022 0280	PN16	DN280 ELBOW 45° SDR11 - LONG SPIGOT
63006	01 117 022 0315	PN16	DN315 ELBOW 45° SDR11 - LONG SPIGOT
62988	01 117 022 0355	PN16	DN355 ELBOW 45° SDR11 - LONG SPIGOT
62989	01 117 022 0400	PN16	DN400 ELBOW 45° SDR11 - LONG SPIGOT

EQUAL TEE SDR17 PE100

VX Code	NTG PLASTIK Code	PN Water	Description
63163	01 115 041 0063	PN10	DN63 EQUAL TEE SDR17 - LONG SPIGOT
63164	01 115 041 0075	PN10	DN75 EQUAL TEE SDR17 - LONG SPIGOT
63165	01 115 041 0090	PN10	DN90 EQUAL TEE SDR17 - LONG SPIGOT
63166	01 115 041 0110	PN10	DN110 EQUAL TEE SDR17 - LONG SPIGOT
63167	01 115 041 0125	PN10	DN125 EQUAL TEE SDR17 - LONG SPIGOT
63144	01 115 041 0140	PN10	DN140 EQUAL TEE SDR17 - LONG SPIGOT

EQUAL TEE SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63168	01 115 041 0160	PN10	DN160 EQUAL TEE SDR17 - LONG SPIGOT
63169	01 115 041 0180	PN10	DN180 EQUAL TEE SDR17 - LONG SPIGOT
63170	01 115 041 0200	PN10	DN200 EQUAL TEE SDR17 - LONG SPIGOT
63171	01 115 041 0225	PN10	DN225 EQUAL TEE SDR17 - LONG SPIGOT
63172	01 115 041 0250	PN10	DN250 EQUAL TEE SDR17 - LONG SPIGOT
63173	01 115 041 0280	PN10	DN280 EQUAL TEE SDR17 - LONG SPIGOT
63174	01 115 041 0315	PN10	DN315 EQUAL TEE SDR17 - LONG SPIGOT
63179	01 115 041 0355	PN10	DN355 EQUAL TEE SDR17 - LONG SPIGOT
63180	01 115 041 0400	PN10	DN400 EQUAL TEE SDR17 - LONG SPIGOT

EQUAL TEE SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63146	01 117 041 0020	PN16	DN20 EQUAL TEE SDR11 - LONG SPIGOT
63147	01 117 041 0025	PN16	DN25 EQUAL TEE SDR11 - LONG SPIGOT
63148	01 117 041 0032	PN16	DN32 EQUAL TEE SDR11 - LONG SPIGOT
63149	01 117 041 0040	PN16	DN40 EQUAL TEE SDR11 - LONG SPIGOT
63150	01 117 041 0050	PN16	DN50 EQUAL TEE SDR11 - LONG SPIGOT
63151	01 117 041 0063	PN16	DN63 EQUAL TEE SDR11 - LONG SPIGOT
63152	01 117 041 0075	PN16	DN75 EQUAL TEE SDR11 - LONG SPIGOT
63153	01 117 041 0090	PN16	DN90 EQUAL TEE SDR11 - LONG SPIGOT
63154	01 117 041 0110	PN16	DN110 EQUAL TEE SDR11 - LONG SPIGOT
63155	01 117 041 0125	PN16	DN125 EQUAL TEE SDR11 - LONG SPIGOT
63145	01 117 041 0140	PN16	DN140 EQUAL TEE SDR11 - LONG SPIGOT
63156	01 117 041 0160	PN16	DN160 EQUAL TEE SDR11 - LONG SPIGOT
63157	01 117 041 0180	PN16	DN180 EQUAL TEE SDR11 - LONG SPIGOT
63158	01 117 041 0200	PN16	DN200 EQUAL TEE SDR11 - LONG SPIGOT
63159	01 117 041 0225	PN16	DN225 EQUAL TEE SDR11 - LONG SPIGOT
63160	01 117 041 0250	PN16	DN250 EQUAL TEE SDR11 - LONG SPIGOT
63161	01 117 041 0280	PN16	DN280 EQUAL TEE SDR11 - LONG SPIGOT
63162	01 117 041 0315	PN16	DN315 EQUAL TEE SDR11 - LONG SPIGOT
62430	01 117 041 0355	PN16	DN355 EQUAL TEE SDR11 - LONG SPIGOT
63112	01 117 041 0400	PN16	DN400 EQUAL TEE SDR11 - LONG SPIGOT

REDUCING TEE SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63270	01 115 042 0076	PN10	DN75-63 REDUCING TEE SDR17 - LONG SPIGOT
63272	01 115 042 0091	PN10	DN90-75 REDUCING TEE SDR17 - LONG SPIGOT
63271	01 115 042 0092	PN10	DN90-63 REDUCING TEE SDR17 - LONG SPIGOT
63275	01 115 042 0111	PN10	DN110-90 REDUCING TEE SDR17 - LONG SPIGOT
63274	01 115 042 0112	PN10	DN110-75 REDUCING TEE SDR17 - LONG SPIGOT
63273	01 115 042 0113	PN10	DN110-63 REDUCING TEE SDR17 - LONG SPIGOT
63277	01 115 042 0126	PN10	DN125-110 REDUCING TEE SDR17 - LONG SPIGOT
63276	01 115 042 0127	PN10	DN125-90 REDUCING TEE SDR17 - LONG SPIGOT
63359	01 115 042 0141	PN10	DN140-125 REDUCING TEE SDR17 - LONG SPIGOT
63358	01 115 042 0142	PN10	DN140-110 REDUCING TEE SDR17 - LONG SPIGOT

REDUCING TEE SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63355	01 115 042 0143	PN10	DN140-90 REDUCING TEE SDR17 - LONG SPIGOT
63361	01 115 042 0161	PN10	DN160-140 REDUCING TEE SDR17 - LONG SPIGOT
63360	01 115 042 0162	PN10	DN160-125 REDUCING TEE SDR17 - LONG SPIGOT
63281	01 115 042 0163	PN10	DN160-110 REDUCING TEE SDR17 - LONG SPIGOT
63280	01 115 042 0164	PN10	DN160-90 REDUCING TEE SDR17 - LONG SPIGOT
63279	01 115 042 0165	PN10	DN160-75 REDUCING TEE SDR17 - LONG SPIGOT
63278	01 115 042 0166	PN10	DN160-63 REDUCING TEE SDR17 - LONG SPIGOT
63260	01 115 042 0181	PN10	DN180-160 REDUCING TEE SDR17 - LONG SPIGOT
63283	01 115 042 0183	PN10	DN180-125 REDUCING TEE SDR17 - LONG SPIGOT
63362	01 115 042 0184	PN10	DN180-110 REDUCING TEE SDR17 - LONG SPIGOT
63228	01 115 042 0185	PN10	DN180-90 REDUCING TEE SDR17 - LONG SPIGOT
63370	01 115 042 0202	PN10	DN200-160 REDUCING TEE SDR17 - LONG SPIGOT
63368	01 115 042 0204	PN10	DN200-125 REDUCING TEE SDR17 - LONG SPIGOT
63367	01 115 042 0205	PN10	DN200-110 REDUCING TEE SDR17 - LONG SPIGOT
63366	01 115 042 0206	PN10	DN200-90 REDUCING TEE SDR17 - LONG SPIGOT
63365	01 115 042 0208	PN10	DN200-63 REDUCING TEE SDR17 - LONG SPIGOT
63289	01 115 042 0228	PN10	DN225-160 REDUCING TEE SDR17 - LONG SPIGOT
63238	01 115 042 0230	PN10	DN225-125 REDUCING TEE SDR17 - LONG SPIGOT
63371	01 115 042 0231	PN10	DN225-110 REDUCING TEE SDR17 - LONG SPIGOT
63414	01 115 042 0251	PN10	DN250-225 REDUCING TEE SDR17 - LONG SPIGOT
63384	01 115 042 0252	PN10	DN250-200 REDUCING TEE SDR17 - LONG SPIGOT
63383	01 115 042 0254	PN10	DN250-160 REDUCING TEE SDR17 - LONG SPIGOT
63376	01 115 042 0256	PN10	DN250-125 REDUCING TEE SDR17 - LONG SPIGOT
63374	01 115 042 0257	PN10	DN250-110 REDUCING TEE SDR17 - LONG SPIGOT
63236	01 115 042 0258	PN10	DN250-90 REDUCING TEE SDR17 - LONG SPIGOT
63432	01 115 042 0281	PN10	DN280-250 REDUCING TEE SDR17 - LONG SPIGOT
63431	01 115 042 0282	PN10	DN280-225 REDUCING TEE SDR17 - LONG SPIGOT
63425	01 115 042 0283	PN10	DN280-200 REDUCING TEE SDR17 - LONG SPIGOT
63423	01 115 042 0285	PN10	DN280-160 REDUCING TEE SDR17 - LONG SPIGOT
63422	01 115 042 0288	PN10	DN280-110 REDUCING TEE SDR17 - LONG SPIGOT
63450	01 115 042 0317	PN10	DN315-250 REDUCING TEE SDR17 - LONG SPIGOT
63449	01 115 042 0318	PN10	DN315-225 REDUCING TEE SDR17 - LONG SPIGOT
63438	01 115 042 0319	PN10	DN315-200 REDUCING TEE SDR17 - LONG SPIGOT
63437	01 115 042 0321	PN10	DN315-160 REDUCING TEE SDR17 - LONG SPIGOT
63433	01 115 042 0324	PN10	DN315-110 REDUCING TEE SDR17 - LONG SPIGOT

REDUCING TEE SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63240	01 117 042 0051	PN16	DN50-40 REDUCING TEE SDR11 - LONG SPIGOT
63230	01 117 042 0052	PN16	DN50-32 REDUCING TEE SDR11 - LONG SPIGOT
63229	01 117 042 0053	PN16	DN50-25 REDUCING TEE SDR11 - LONG SPIGOT
63243	01 117 042 0064	PN16	DN63-50 REDUCING TEE SDR11 - LONG SPIGOT
63269	01 117 042 0065	PN16	DN63-40 REDUCING TEE SDR11 - LONG SPIGOT
63261	01 117 042 0066	PN16	DN63-32 REDUCING TEE SDR11 - LONG SPIGOT
63246	01 117 042 0076	PN16	DN75-63 REDUCING TEE SDR11 - LONG SPIGOT

REDUCING TEE SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63245	01 117 042 0077	PN16	DN75-50 REDUCING TEE SDR11 - LONG SPIGOT
63294	01 117 042 0078	PN16	DN75-40 REDUCING TEE SDR11 - LONG SPIGOT
63244	01 117 042 0079	PN16	DN75-32 REDUCING TEE SDR11 - LONG SPIGOT
63248	01 117 042 0091	PN16	DN90-75 REDUCING TEE SDR11 - LONG SPIGOT
63247	01 117 042 0092	PN16	DN90-63 REDUCING TEE SDR11 - LONG SPIGOT
63295	01 117 042 0093	PN16	DN90-50 REDUCING TEE SDR11 - LONG SPIGOT
63251	01 117 042 0111	PN16	DN110-90 REDUCING TEE SDR11 - LONG SPIGOT
63250	01 117 042 0112	PN16	DN110-75 REDUCING TEE SDR11 - LONG SPIGOT
63249	01 117 042 0113	PN16	DN110-63 REDUCING TEE SDR11 - LONG SPIGOT
63321	01 117 042 0114	PN16	DN110-50 REDUCING TEE SDR11 - LONG SPIGOT
63320	01 117 042 0116	PN16	DN110-32 REDUCING TEE SDR11 - LONG SPIGOT
86635	01 117 042 0126	PN16	DN125-110 REDUCING TEE SDR11 - LONG SPIGOT
63252	01 117 042 0127	PN16	DN125-90 REDUCING TEE SDR11 - LONG SPIGOT
63324	01 117 042 0141	PN16	DN140-125 REDUCING TEE SDR11 - LONG SPIGOT
63323	01 117 042 0142	PN16	DN140-110 REDUCING TEE SDR11 - LONG SPIGOT
63322	01 117 042 0143	PN16	DN140-90 REDUCING TEE SDR11 - LONG SPIGOT
63326	01 117 042 0161	PN16	DN160-140 REDUCING TEE SDR11 - LONG SPIGOT
63325	01 117 042 0162	PN16	DN160-125 REDUCING TEE SDR11 - LONG SPIGOT
63257	01 117 042 0163	PN16	DN160-110 REDUCING TEE SDR11 - LONG SPIGOT
63256	01 117 042 0164	PN16	DN160-90 REDUCING TEE SDR11 - LONG SPIGOT
63255	01 117 042 0165	PN16	DN160-75 REDUCING TEE SDR11 - LONG SPIGOT
63254	01 117 042 0166	PN16	DN160-63 REDUCING TEE SDR11 - LONG SPIGOT
63195	01 117 042 0181	PN16	DN180-160 REDUCING TEE SDR11 - LONG SPIGOT
63259	01 117 042 0183	PN16	DN180-125 REDUCING TEE SDR11 - LONG SPIGOT
63215	01 117 042 0184	PN16	DN180-110 REDUCING TEE SDR11 - LONG SPIGOT
63258	01 117 042 0185	PN16	DN180-90 REDUCING TEE SDR11 - LONG SPIGOT
63203	01 117 042 0202	PN16	DN200-160 REDUCING TEE SDR11 - LONG SPIGOT
87742	01 117 042 0204	PN16	DN200-125 REDUCING TEE SDR11 - LONG SPIGOT
63202	01 117 042 0205	PN16	DN200-110 REDUCING TEE SDR11 - LONG SPIGOT
63193	01 117 042 0206	PN16	DN200-90 REDUCING TEE SDR11 - LONG SPIGOT
63192	01 117 042 0208	PN16	DN200-63 REDUCING TEE SDR11 - LONG SPIGOT
63264	01 117 042 0230	PN16	DN225-125 REDUCING TEE SDR11 - LONG SPIGOT
63263	01 117 042 0231	PN16	DN225-110 REDUCING TEE SDR11 - LONG SPIGOT
63262	01 117 042 0232	PN16	DN225-90 REDUCING TEE SDR11 - LONG SPIGOT
63341	01 117 042 0251	PN16	DN250-225 REDUCING TEE SDR11 - LONG SPIGOT
63336	01 117 042 0252	PN16	DN250-200 REDUCING TEE SDR11 - LONG SPIGOT
63335	01 117 042 0254	PN16	DN250-160 REDUCING TEE SDR11 - LONG SPIGOT
63329	01 117 042 0256	PN16	DN250-125 REDUCING TEE SDR11 - LONG SPIGOT
63328	01 117 042 0257	PN16	DN250-110 REDUCING TEE SDR11 - LONG SPIGOT
63327	01 117 042 0258	PN16	DN250-90 REDUCING TEE SDR11 - LONG SPIGOT
63348	01 117 042 0281	PN16	DN280-250 REDUCING TEE SDR11 - LONG SPIGOT
63347	01 117 042 0282	PN16	DN280-225 REDUCING TEE SDR11 - LONG SPIGOT
63346	01 117 042 0283	PN16	DN280-200 REDUCING TEE SDR11 - LONG SPIGOT
63345	01 117 042 0285	PN16	DN280-160 REDUCING TEE SDR11 - LONG SPIGOT

REDUCING TEE SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63344	01 117 042 0288	PN16	DN280-110 REDUCING TEE SDR11 - LONG SPIGOT
62411	01 117 042 0317	PN16	DN315-250 REDUCING TEE SDR11 - LONG SPIGOT
63354	01 117 042 0318	PN16	DN315-225 REDUCING TEE SDR11 - LONG SPIGOT
63353	01 117 042 0319	PN16	DN315-200 REDUCING TEE SDR11 - LONG SPIGOT
63352	01 117 042 0321	PN16	DN315-160 REDUCING TEE SDR11 - LONG SPIGOT
63351	01 117 042 0324	PN16	DN315-110 REDUCING TEE SDR11 - LONG SPIGOT

EQUAL TEE 45° SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63309	01 115 045 0063	PN10	DN63 EQUAL TEE 45° SDR17 - LONG SPIGOT
63310	01 115 045 0075	PN10	DN75 EQUAL TEE 45° SDR17 - LONG SPIGOT
63311	01 115 045 0090	PN10	DN90 EQUAL TEE 45° SDR17 - LONG SPIGOT
63312	01 115 045 0110	PN10	DN110 EQUAL TEE 45° SDR17 - LONG SPIGOT
63313	01 115 045 0125	PN10	DN125 EQUAL TEE 45° SDR17 - LONG SPIGOT
63314	01 115 045 0160	PN10	DN160 EQUAL TEE 45° SDR17 - LONG SPIGOT
63315	01 115 045 0180	PN10	DN180 EQUAL TEE 45° SDR17 - LONG SPIGOT
63316	01 115 045 0200	PN10	DN200 EQUAL TEE 45° SDR17 - LONG SPIGOT
63317	01 115 045 0225	PN10	DN225 EQUAL TEE 45° SDR17 - LONG SPIGOT
63319	01 115 045 0250	PN10	DN250 EQUAL TEE 45° SDR17 - LONG SPIGOT

EQUAL TEE 45° SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63299	01 117 045 0063	PN16	DN63 EQUAL TEE 45° SDR11 - LONG SPIGOT
63300	01 117 045 0075	PN16	DN75 EQUAL TEE 45° SDR11 - LONG SPIGOT
63301	01 117 045 0090	PN16	DN90 EQUAL TEE 45° SDR11 - LONG SPIGOT
63302	01 117 045 0110	PN16	DN110 EQUAL TEE 45° SDR11 - LONG SPIGOT
63303	01 117 045 0125	PN16	DN125 EQUAL TEE 45° SDR11 - LONG SPIGOT
63304	01 117 045 0160	PN16	DN160 EQUAL TEE 45° SDR11 - LONG SPIGOT
63305	01 117 045 0180	PN16	DN180 EQUAL TEE 45° SDR11 - LONG SPIGOT
63306	01 117 045 0200	PN16	DN200 EQUAL TEE 45° SDR11 - LONG SPIGOT
63307	01 117 045 0225	PN16	DN225 EQUAL TEE 45° SDR11 - LONG SPIGOT
63308	01 117 045 0250	PN16	DN250 EQUAL TEE 45° SDR11 - LONG SPIGOT

REDUCER SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62770	01 115 080 0076	PN10	DN75-63 REDUCER SDR17 - LONG SPIGOT
62773	01 115 080 0091	PN10	DN90-75 REDUCER SDR17 - LONG SPIGOT
62772	01 115 080 0092	PN10	DN90-63 REDUCER SDR17 - LONG SPIGOT
62776	01 115 080 0111	PN10	DN110-90 REDUCER SDR17 - LONG SPIGOT
62374	01 115 080 0112	PN10	DN110-75 REDUCER SDR17 - LONG SPIGOT
62774	01 115 080 0113	PN10	DN110-63 REDUCER SDR17 - LONG SPIGOT
62779	01 115 080 0126	PN10	DN125-110 REDUCER SDR17 - LONG SPIGOT

REDUCER SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62778	01 115 080 0127	PN10	DN125-90 REDUCER SDR17 - LONG SPIGOT
62425	01 115 080 0128	PN10	DN125-75 REDUCER SDR17 - LONG SPIGOT
62422	01 115 080 0129	PN10	DN125-63 REDUCER SDR17 - LONG SPIGOT
62782	01 115 080 0141	PN10	DN140-125 REDUCER SDR17 - LONG SPIGOT
62456	01 115 080 0142	PN10	DN140-110 REDUCER SDR17 - LONG SPIGOT
62453	01 115 080 0143	PN10	DN140-90 REDUCER SDR17 - LONG SPIGOT
62437	01 115 080 0144	PN10	DN140-75 REDUCER SDR17 - LONG SPIGOT
62786	01 115 080 0161	PN10	DN160-140 REDUCER SDR17 - LONG SPIGOT
62785	01 115 080 0162	PN10	DN160-125 REDUCER SDR17 - LONG SPIGOT
62784	01 115 080 0163	PN10	DN160-110 REDUCER SDR17 - LONG SPIGOT
62783	01 115 080 0164	PN10	DN160-90 REDUCER SDR17 - LONG SPIGOT
62473	01 115 080 0181	PN10	DN180-160 REDUCER SDR17 - LONG SPIGOT
62467	01 115 080 0182	PN10	DN180-140 REDUCER SDR17 - LONG SPIGOT
62787	01 115 080 0183	PN10	DN180-125 REDUCER SDR17 - LONG SPIGOT
62466	01 115 080 0184	PN10	DN180-110 REDUCER SDR17 - LONG SPIGOT
62492	01 115 080 0201	PN10	DN200-180 REDUCER SDR17 - LONG SPIGOT
62791	01 115 080 0202	PN10	DN200-160 REDUCER SDR17 - LONG SPIGOT
62484	01 115 080 0203	PN10	DN200-140 REDUCER SDR17 - LONG SPIGOT
30701	01 115 080 0205	PN10	DN200-110 REDUCER SDR17 - LONG SPIGOT
62544	01 115 080 0226	PN10	DN225-200 REDUCER SDR17 - LONG SPIGOT
62540	01 115 080 0227	PN10	DN225-180 REDUCER SDR17 - LONG SPIGOT
62793	01 115 080 0228	PN10	DN225-160 REDUCER SDR17 - LONG SPIGOT
62496	01 115 080 0231	PN10	DN225-110 REDUCER SDR17 - LONG SPIGOT
62599	01 115 080 0251	PN10	DN250-225 REDUCER SDR17 - LONG SPIGOT
63490	01 115 080 0252	PN10	DN250-200 REDUCER SDR17 - LONG SPIGOT
62593	01 115 080 0253	PN10	DN250-180 REDUCER SDR17 - LONG SPIGOT
62586	01 115 080 0254	PN10	DN250-160 REDUCER SDR17 - LONG SPIGOT
62708	01 115 080 0281	PN10	DN280-250 REDUCER SDR17 - LONG SPIGOT
62707	01 115 080 0282	PN10	DN280-225 REDUCER SDR17 - LONG SPIGOT
62689	01 115 080 0283	PN10	DN280-200 REDUCER SDR17 - LONG SPIGOT
62632	01 115 080 0284	PN10	DN280-180 REDUCER SDR17 - LONG SPIGOT
62736	01 115 080 0316	PN10	DN315-280 REDUCER SDR17 - LONG SPIGOT
62714	01 115 080 0317	PN10	DN315-250 REDUCER SDR17 - LONG SPIGOT
62710	01 115 080 0318	PN10	DN315-225 REDUCER SDR17 - LONG SPIGOT
62737	01 115 080 0402	PN10	DN400-315 REDUCER SDR17 - LONG SPIGOT

REDUCER SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62245	01 117 080 0026	PN16	DN25-20 REDUCER SDR11 - LONG SPIGOT
62236	01 117 080 0033	PN16	DN32-25 REDUCER SDR11 - LONG SPIGOT
62377	01 117 080 0034	PN16	DN32-20 REDUCER SDR11 - LONG SPIGOT
62237	01 117 080 0041	PN16	DN40-32 REDUCER SDR11 - LONG SPIGOT
62217	01 117 080 0042	PN16	DN40-25 REDUCER SDR11 - LONG SPIGOT
62796	01 117 080 0051	PN16	DN50-40 REDUCER SDR11 - LONG SPIGOT

REDUCER SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62238	01 117 080 0052	PN16	DN50-32 REDUCER SDR11 - LONG SPIGOT
62242	01 117 080 0053	PN16	DN50-25 REDUCER SDR11 - LONG SPIGOT
62241	01 117 080 0064	PN16	DN63-50 REDUCER SDR11 - LONG SPIGOT
62240	01 117 080 0065	PN16	DN63-40 REDUCER SDR11 - LONG SPIGOT
62239	01 117 080 0066	PN16	DN63-32 REDUCER SDR11 - LONG SPIGOT
62742	01 117 080 0067	PN16	DN63-25 REDUCER SDR11 - LONG SPIGOT
62244	01 117 080 0076	PN16	DN75-63 REDUCER SDR11 - LONG SPIGOT
62243	01 117 080 0077	PN16	DN75-50 REDUCER SDR11 - LONG SPIGOT
62231	01 117 080 0078	PN16	DN75-40 REDUCER SDR11 - LONG SPIGOT
62230	01 117 080 0079	PN16	DN75-32 REDUCER SDR11 - LONG SPIGOT
62247	01 117 080 0091	PN16	DN90-75 REDUCER SDR11 - LONG SPIGOT
62246	01 117 080 0092	PN16	DN90-63 REDUCER SDR11 - LONG SPIGOT
62251	01 117 080 0093	PN16	DN90-50 REDUCER SDR11 - LONG SPIGOT
62250	01 117 080 0111	PN16	DN110-90 REDUCER SDR11 - LONG SPIGOT
62276	01 117 080 0112	PN16	DN110-75 REDUCER SDR11 - LONG SPIGOT
62248	01 117 080 0113	PN16	DN110-63 REDUCER SDR11 - LONG SPIGOT
62253	01 117 080 0126	PN16	DN125-110 REDUCER SDR11 - LONG SPIGOT
62252	01 117 080 0127	PN16	DN125-90 REDUCER SDR11 - LONG SPIGOT
62283	01 117 080 0128	PN16	DN125-75 REDUCER SDR11 - LONG SPIGOT
62221	01 117 080 0129	PN16	DN125-63 REDUCER SDR11 - LONG SPIGOT
62256	01 117 080 0141	PN16	DN140-125 REDUCER SDR11 - LONG SPIGOT
62314	01 117 080 0142	PN16	DN140-110 REDUCER SDR11 - LONG SPIGOT
62313	01 117 080 0143	PN16	DN140-90 REDUCER SDR11 - LONG SPIGOT
62310	01 117 080 0144	PN16	DN140-75 REDUCER SDR11 - LONG SPIGOT
62259	01 117 080 0161	PN16	DN160-140 REDUCER SDR11 - LONG SPIGOT
62258	01 117 080 0162	PN16	DN160-125 REDUCER SDR11 - LONG SPIGOT
62257	01 117 080 0163	PN16	DN160-110 REDUCER SDR11 - LONG SPIGOT
62800	01 117 080 0164	PN16	DN160-90 REDUCER SDR11 - LONG SPIGOT
62262	01 117 080 0181	PN16	DN180-160 REDUCER SDR11 - LONG SPIGOT
62315	01 117 080 0182	PN16	DN180-140 REDUCER SDR11 - LONG SPIGOT
62260	01 117 080 0183	PN16	DN180-125 REDUCER SDR11 - LONG SPIGOT
70140	01 117 080 0184	PN16	DN180-110 REDUCER SDR11 - LONG SPIGOT
62316	01 117 080 0201	PN16	DN200-180 REDUCER SDR11 - LONG SPIGOT
62264	01 117 080 0202	PN16	DN200-160 REDUCER SDR11 - LONG SPIGOT
62263	01 117 080 0203	PN16	DN200-140 REDUCER SDR11 - LONG SPIGOT
70163	01 117 080 0205	PN16	DN200-110 REDUCER SDR11 - LONG SPIGOT
62335	01 117 080 0226	PN16	DN225-200 REDUCER SDR11 - LONG SPIGOT
62329	01 117 080 0227	PN16	DN225-180 REDUCER SDR11 - LONG SPIGOT
62795	01 117 080 0228	PN16	DN225-160 REDUCER SDR11 - LONG SPIGOT
62328	01 117 080 0231	PN16	DN225-110 REDUCER SDR11 - LONG SPIGOT
74254	01 117 080 0251	PN16	DN250-225 REDUCER SDR11 - LONG SPIGOT
70193	01 117 080 0252	PN16	DN250-200 REDUCER SDR11 - LONG SPIGOT
62337	01 117 080 0253	PN16	DN250-180 REDUCER SDR11 - LONG SPIGOT
70680	01 117 080 0254	PN16	DN250-160 REDUCER SDR11 - LONG SPIGOT

REDUCER SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62347	01 117 080 0281	PN16	DN280-250 REDUCER SDR11 - LONG SPIGOT
62346	01 117 080 0282	PN16	DN280-225 REDUCER SDR11 - LONG SPIGOT
62343	01 117 080 0283	PN16	DN280-200 REDUCER SDR11 - LONG SPIGOT
73437	01 117 080 0284	PN16	DN280-180 REDUCER SDR11 - LONG SPIGOT
62349	01 117 080 0316	PN16	DN315-280 REDUCER SDR11 - LONG SPIGOT
70212	01 117 080 0317	PN16	DN315-250 REDUCER SDR11 - LONG SPIGOT
62348	01 117 080 0318	PN16	DN315-225 REDUCER SDR11 - LONG SPIGOT
62350	01 117 080 0402	PN16	DN400-315 REDUCER SDR11 - LONG SPIGOT

STEP REDUCER SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63427	01 115 081 0228	PN10	DN225-160 STEP REDUCER SDR17 - SHORT SPIGOT
63428	01 115 081 0318	PN10	DN315-225 STEP REDUCER SDR17 - SHORT SPIGOT
63429	01 115 081 0453	PN10	DN450-315 STEP REDUCER SDR17 - SHORT SPIGOT
63430	01 115 081 0633	PN10	DN630-450 STEP REDUCER SDR17 - SHORT SPIGOT

STEP REDUCER SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
63421	01 117 081 0453	PN16	DN450-315 STEP REDUCER SDR11 - SHORT SPIGOT
63454	01 117 081 0633	PN16	DN630-450 STEP REDUCER SDR11 - SHORT SPIGOT

STUB FLANGE LONG SPIGOT SDR17 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description
62475	01 115 104 0063	PN10	DN63 STUB FLANGE SDR17 - LONG SPIGOT
62486	01 115 104 0075	PN10	DN75 STUB FLANGE SDR17 - LONG SPIGOT
62489	01 115 104 0090	PN10	DN90 STUB FLANGE SDR17 - LONG SPIGOT
62490	01 115 100 0110	PN10	DN110 STUB FLANGE SDR17 - LONG SPIGOT
62491	01 115 100 0125	PN10	DN125 STUB FLANGE SDR17 - LONG SPIGOT
62493	01 115 100 0140	PN10	DN140 STUB FLANGE SDR17 - LONG SPIGOT
62495	01 115 102 0160	PN10	DN160 STUB FLANGE SDR17 - LONG SPIGOT
69721	01 115 102 0180	PN10	DN180 STUB FLANGE SDR17 - LONG SPIGOT
62497	01 115 102 0200	PN10	DN200 STUB FLANGE SDR17 - LONG SPIGOT
62499	01 115 102 0225	PN10	DN225 STUB FLANGE SDR17 - LONG SPIGOT
62500	01 115 102 0250	PN10	DN250 STUB FLANGE SDR17 - LONG SPIGOT
62674	01 115 102 0280	PN10	DN280 STUB FLANGE SDR17 - LONG SPIGOT
62686	01 115 102 0315	PN10	DN315 STUB FLANGE SDR17 - LONG SPIGOT
69791	01 115 102 0355	PN10	DN355 STUB FLANGE SDR17 - LONG SPIGOT
69793	01 115 102 0400	PN10	DN400 STUB FLANGE SDR17 - LONG SPIGOT

STUB FLANGE LONG SPIGOT SDR11 PE100			
VX Code	NTG PLASTIK Code	PN Water	Description

62694	01 117 100 0020	PN16	DN20 STUB FLANGE SDR11 - LONG SPIGOT
64032	01 117 100 0025	PN16	DN25 STUB FLANGE SDR11 - LONG SPIGOT
64033	01 117 100 0032	PN16	DN32 STUB FLANGE SDR11 - LONG SPIGOT
64034	01 117 100 0040	PN16	DN40 STUB FLANGE SDR11 - LONG SPIGOT
62289	01 117 100 0050	PN16	DN50 STUB FLANGE SDR11 - LONG SPIGOT
69722	01 117 100 0063	PN16	DN63 STUB FLANGE SDR11 - LONG SPIGOT
69723	01 117 100 0075	PN16	DN75 STUB FLANGE SDR11 - LONG SPIGOT
69769	01 117 100 0090	PN16	DN90 STUB FLANGE SDR11 - LONG SPIGOT
69724	01 117 100 0110	PN16	DN110 STUB FLANGE SDR11 - LONG SPIGOT
69725	01 117 100 0125	PN16	DN125 STUB FLANGE SDR11 - LONG SPIGOT
62292	01 117 100 0140	PN16	DN140 STUB FLANGE SDR11 - LONG SPIGOT
69726	01 117 102 0160	PN16	DN160 STUB FLANGE SDR11 - LONG SPIGOT
69727	01 117 102 0180	PN16	DN180 STUB FLANGE SDR11 - LONG SPIGOT
69728	01 117 102 0200	PN16	DN200 STUB FLANGE SDR11 - LONG SPIGOT
69730	01 117 102 0225	PN16	DN225 STUB FLANGE SDR11 - LONG SPIGOT
69731	01 117 102 0250	PN16	DN250 STUB FLANGE SDR11 - LONG SPIGOT
69732	01 117 102 0280	PN16	DN280 STUB FLANGE SDR11 - LONG SPIGOT
69733	01 117 102 0315	PN16	DN315 STUB FLANGE SDR11 - LONG SPIGOT
69790	01 117 102 0355	PN16	DN355 STUB FLANGE SDR11 - LONG SPIGOT
69792	01 117 102 0400	PN16	DN400 STUB FLANGE SDR11 - LONG SPIGOT

STUB FLANGE SHORT SPIGOT SDR17 PE100

VX Code	NTG PLASTIK Code	PN Water	Description
71168	01 115 103 0200	PN10	DN200 STUB FLANGE SDR17 - SHORT SPIGOT
71169	01 115 103 0225	PN10	DN225 STUB FLANGE SDR17 - SHORT SPIGOT
71305	01 115 103 0250	PN10	DN250 STUB FLANGE SDR17 - SHORT SPIGOT
71301	01 115 103 0280	PN10	DN280 STUB FLANGE SDR17 - SHORT SPIGOT
71285	01 115 103 0315	PN10	DN315 STUB FLANGE SDR17 - SHORT SPIGOT
71173	01 115 103 0355	PN10	DN355 STUB FLANGE SDR17 - SHORT SPIGOT
71174	01 115 103 0400	PN10	DN400 STUB FLANGE SDR17 - SHORT SPIGOT
71175	01 115 103 4500	PN10	DN450 STUB FLANGE SDR17 - SHORT SPIGOT
71176	01 115 103 0500	PN10	DN500 STUB FLANGE SDR17 - SHORT SPIGOT
71193	01 115 105 0560	PN10	DN560 STUB FLANGE SDR17 - SHORT SPIGOT
62410	01 115 105 0630	PN10	DN630 STUB FLANGE SDR17 - SHORT SPIGOT
62398	01 115 101 0710	PN10	DN710 STUB FLANGE SDR17 - SHORT SPIGOT
71199	01 115 101 0800	PN10	DN800 STUB FLANGE SDR17 - SHORT SPIGOT
65414	01 115 101 0900	PN10	DN900 STUB FLANGE SDR17 - SHORT SPIGOT
71202	01 115 101 1000	PN10	DN1000 STUB FLANGE SDR17 - SHORT SPIGOT

STUB FLANGE SHORT SPIGOT SDR11 PE100

VX Code	NTG PLASTIK Code	PN Water	Description
71184	01 117 103 0200	PN16	DN200 STUB FLANGE SDR11 - SHORT SPIGOT
71185	01 117 103 0225	PN16	DN225 STUB FLANGE SDR11 - SHORT SPIGOT
71186	01 117 103 0250	PN16	DN250 STUB FLANGE SDR11 - SHORT SPIGOT
71187	01 117 103 0280	PN16	DN280 STUB FLANGE SDR11 - SHORT SPIGOT
71188	01 117 103 0315	PN16	DN315 STUB FLANGE SDR11 - SHORT SPIGOT
71189	01 117 103 0355	PN16	DN355 STUB FLANGE SDR11 - SHORT SPIGOT

71190	01 117 103 0400	PN16	DN400 STUB FLANGE SDR11 - SHORT SPIGOT
71191	01 117 103 4500	PN16	DN450 STUB FLANGE SDR11 - SHORT SPIGOT
73435	01 117 103 0500	PN16	DN500 STUB FLANGE SDR11 - SHORT SPIGOT
71192	01 117 105 0560	PN16	DN560 STUB FLANGE SDR11 - SHORT SPIGOT
71198	01 117 105 0630	PN16	DN630 STUB FLANGE SDR11 - SHORT SPIGOT
62361	01 117 101 0710	PN16	DN710 STUB FLANGE SDR11 - SHORT SPIGOT

END CAP SDR111 PE100

VX Code	NTG PLASTIK Code	PN Water	Description
63385	01 117 140 0020	PN16	DN20 END CAP SDR11 - LONG SPIGOT
63386	01 117 140 0025	PN16	DN25 END CAP SDR11 - LONG SPIGOT
63387	01 117 140 0032	PN16	DN32 END CAP SDR11 - LONG SPIGOT
63388	01 117 140 0040	PN16	DN40 END CAP SDR11 - LONG SPIGOT
63389	01 117 140 0050	PN16	DN50 END CAP SDR11 - LONG SPIGOT
63390	01 117 140 0063	PN16	DN63 END CAP SDR11 - LONG SPIGOT
63391	01 117 140 0075	PN16	DN75 END CAP SDR11 - LONG SPIGOT
63392	01 117 140 0090	PN16	DN90 END CAP SDR11 - LONG SPIGOT
63393	01 117 140 0110	PN16	DN110 END CAP SDR11 - LONG SPIGOT
63394	01 117 140 0125	PN16	DN125 END CAP SDR11 - LONG SPIGOT
63375	01 117 140 0140	PN16	DN140 END CAP SDR11 - LONG SPIGOT
63395	01 117 140 0160	PN16	DN160 END CAP SDR11 - LONG SPIGOT
63396	01 117 140 0180	PN16	DN180 END CAP SDR11 - LONG SPIGOT
63397	01 117 140 0200	PN16	DN200 END CAP SDR11 - LONG SPIGOT
63398	01 117 140 0225	PN16	DN225 END CAP SDR11 - LONG SPIGOT
63399	01 117 140 0250	PN16	DN250 END CAP SDR11 - LONG SPIGOT
63400	01 117 140 0280	PN16	DN280 END CAP SDR11 - LONG SPIGOT
63401	01 117 140 0315	PN16	DN315 END CAP SDR11 - LONG SPIGOT
62431	01 117 140 0355	PN16	DN355 END CAP SDR11 - LONG SPIGOT
62429	01 117 140 0400	PN16	DN400 END CAP SDR11 - LONG SPIGOT

APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certification Certificates are available for downloading from the WSAA Member's Website.

TABLE B1 NTG PLASTIK– MANAGEMENT SYSTEMS

Headquarters: Sanayi Mah. Akcicek Sokak No. 18 Pendik, INSTANBUL	
Factory: Yazli Gurgun Mah. Fabrikalar Cad. No. 49 Karpurcek, SAKARYA, TURKEY.	
Quality Systems Standard	ISO 9001:2008
Certification licence no.	15Q296
Certifying agency	NAVIGA Certification
First date of certification	10 August 2015
Current date of certification	10 August 2015
Expiry date of certification	9 August 2018

TABLE B2 VINIDEX PTY LTD – MANAGEMENT SYSTEMS

This Certification applies to 13 locations throughout Australia	
Quality Systems Standard	ISO 9001:2008
Certification licence no.	QEC0570
Certifying agency	SAI Global
First date of certification	19 February 1991
Current date of certification	28 April 2016
Expiry date of certification	14 September 2018

TABLE B3 NTG PLASTIK– ISO TYPE 5 CERTIFICATE OF CONFORMITY

Yaziligurgun Gurgun Mah. Fabrikalar Cad. No. 49 Karpurcek, SAKARYA, TURKEY.	
Product Standard.	AS/NZS 4129:2008
Certification	WaterMark Level 1
Certificate No.	AMI 74605
Issuing certification body	ApprovalMark International
First date of certification	27 January 2016
Current date of certification	27 January 2016
Expiry date of certification	27 January 2021

TABLE B4 NTG PLASTIK– WATERMARK CERTIFICATE OF CONFORMITY

Yaziligurgen Gurgen Mah. Fabrikalar Cad. No. 49 Karpurcek, SAKARYA, TURKEY.	
Product Standard.	AS/NZS 4129:2008
Certification	WaterMark Level 1
Certificate No.	WM 74605
Issuing certification body	ApprovalMark International
First date of certification	15 October 2015
Current date of certification	15 October 2015
Expiry date of certification	15 October 2016

CERTIFICATE



ISO 9001:2008 Quality Management System

NTG PLASTİK SAN. VE TİC. A.Ş.

Headquarters: Sanayi Mah. Akçiçek Sokak No:18 Pendik, İSTANBUL

Factory: Yazılı Gürgen Mah. Fabrikalar Cad. No:49 Karpürçek, SAKARYA

In accordance with NAVIGA procedures, it's hereby certified that the above company applies a management system in line with the above standard for the following scope.

Scope

DESIGN, MANUFACTURING AND SALES OF PLASTIC PIPES, FITTINGS, VALVES AND OTHER PLASTIC PARTS MADE WITH INJECTION MOULDING.

Report No : 15Q296

Certificate Expiry Date: 09.08.2018

Certificate Reg. No: 1540671

First Certification Date: 10.08.2015

This certification has been completed according to NAVIGA's audit and certification procedures and is valid until surveillance audit (19.06.2016).

Certification Body

NAVİGA ULUSLARARASI BELGELENDİRME
VE EĞİTİM HİZ. LTD. ŞTİ.



Istanbul, 10.08.2015



İşbu sertifika, Naviga'nın belgelendirme prosedür ve talimatlarına, yukarıdaki standardın gerekliliklerine uyulduğu sürece, yukarıdaki adres ve kapsam dahilinde geçerlidir.

NAVİGA ULUSLARARASI BELGELENDİRME VE EĞİTİM HİZMETLERİ LTD. ŞTİ.
Ali Rıza Gürçan cad. Metropol Center Kat: 11 No 46 Merter 34015 / İSTANBUL
Tel: 0212 482 96 56 Fax: 0212 482 94 24 www.navigaltld.com - info@navigaltld.com

FR.069 REV.02 13.12.2010



CERTIFICATE OF REGISTRATION

This is to certify that:

Vinidex Pty Ltd

ABN 42 000 664 942

Level 4 26 College Street Darlinghurst NSW 2010 AUSTRALIA

(Refer to Attachment to Certificate of Registration dated 28 April 2016 for additional certified sites)

operates a

QUALITY MANAGEMENT SYSTEM

which complies with the requirements of

ISO 9001:2008

for the following scope

The design, manufacture and distribution of polyethylene, polypropylene and unplasticised PVC pipes, conduits and associated fittings for the water supply, sewerage, drainage, electrical, mining, gas, rural and communications industries.

Certificate No: QEC0570

Issued: 28 April 2016

Expires: 14 September 2018

Originally Certified: 19 February 1991

Current Certification: 26 April 2016

Heather Mahon
Acting Head of Policy, Risk and Certification



Registered by:
SAI Global Certification Services Pty Ltd (ACN 108 716 669) 680 George Street Sydney NSW 2000 Australia with SAI Global Limited
680 George Street Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Conditions for Certification.
While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility only for proven negligence.
This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. To verify that this certificate is
current please refer to SAI Global On-Line Certification register at <http://www.saiglobal.com>



SAI GLOBAL
INFORM. INSPIRE. IMPROVE.

ATTACHMENT TO CERTIFICATE OF REGISTRATION

**These sites are registered under Certificate No: QEC0570
issued on 28 April 2016.**

Vinidex Pty Ltd

ABN 42 000 664 942

Extrusion 254 Woodpark Road Smithfield NSW 2164 AUSTRALIA

Injection Moulding 254 Woodpark Road Smithfield NSW 2164 AUSTRALIA

101 Byrnes Road Wagga Wagga NSW 2650 AUSTRALIA

3846 Marjorie Street Berrimah NT 0828 AUSTRALIA

49 Enterprise Street Bohle QLD 4818 AUSTRALIA

14 Enterprise Street Bohle QLD 4818 AUSTRALIA

Lot 2, Witmack Road Charlton QLD 4350 AUSTRALIA

224 Musgrave Road Coopers Plains QLD 4108 AUSTRALIA

9 - 11 Kaurna Avenue Edinburgh SA 5111 AUSTRALIA

15 Thistle Street South Launceston TAS 7249 AUSTRALIA

Unit 1 10 Duerdin Street Notting Hill VIC 3168 AUSTRALIA

231 - 245 St Albans Road Sunshine VIC 3020 AUSTRALIA

Sainsbury Road O'Connor WA 6163 AUSTRALIA

These registrations are dependent on Vinidex Pty Ltd maintaining their scope of registration to ISO 9001:2008.

Registered by:

SAI Global Certification Services Pty Ltd (ACN 108 716 669) 680 George Street Sydney NSW 2000 Australia with SAI Global Limited 680 George Street Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility only for proven negligence. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. To verify that this certificate is current please refer to SAI Global On-Line Certification register at <http://www.sai-global.com>



ISO TYPE 5

CERTIFICATE OF CONFORMITY



ApprovalMark International hereby grants:

NTG Plastik San.ve Tic. A.Ş.

Yazılıgürgen Mah. Fabrikalar Cad. No: 49
Karapürçek/Sakarya 54430
TURKEY

Evaluated to:

AS/NZS 4129: 2008 – Fittings for polyethylene (PE) pipes for pressure applications

The ISO Type 5 licensee shall comply with all the terms and conditions as stipulated by the governance of the operating rules of ISO Type 5 scheme, and shall comply with standard requirement at all times including when standard is amended. The ISO Type 5 license only covers the product which is identified in the product schedule.

Certificate No. AMI 74605

Issued: 27th January 2016

Expires: 27th January 2021

A handwritten signature in black ink, appearing to read "John Prasad".

John PRASAD
Certification Manager



ApprovalMark Certification



ApprovalMark

ZERTIFIKAT • CERTIFICATE • 認証証書 • CERTIFICADO • CERTIFICAT



Türkiye

CERTIFICATE OF CONFORMITY

Subject: Manufacturing of plastic pipe fittings in accordance with TS EN 1555-3

Project No: TGK 14-B-00421-02 R1

Manufacturer: NTG PLASTİK SANAYİ VE TİCARET A.Ş.
YAZILIGÜRGEN MH. FABRİKALAR CAD. No:49
54430 KARAPÜRÇEK SAKARYA TURKEY

Products: POLYETHYLENE (HDPE100) SDR11 AND SDR17
SPIGOT AND ELECTROFUSION FITTINGS
EF COUPLER sizes from 16mm up to 400mm
EF TAPPING SADDLE sizes from 40mm up to 315mm
ELBOW 90° sizes from 20mm up to 315mm
ELBOW 45° sizes from 20mm up to 315mm
EQUAL TEE sizes from 20mm up to 315mm
REDUCED TEE sizes from 50-20mm up to 315-280mm
END CAP sizes from 20mm up to 400mm
REDUCER sizes from 25-20mm up to 900-630mm
FLANGE ADAPTOR sizes from 20mm up to 1000mm

Date of expiry: 08.07.2017

Basis: TS EN 1555-3 and related standards

Remarks:

Related material certificates, type acceptance, test on fittings, type approval, test procedures, qualification of test equipments with calibrated certificates, test reports and manufacturing line according to Quality Plan have been audited by TÜV SÜD Auditor. Additionally TÜV SÜD inspector witnessed spot type approval tests. During audit and witnessed of type tests TÜV SÜD observed NTG PLASTİK comply all the requirement of manufacturing of polyethylene spigot and electrofusion fittings according to TS EN 1555-3. After the satisfactory result this certificate has been prepared and approved by TÜV SÜD / Turkey and given to NTG PLASTİK to identify company has capability of manufacturing of polyethylene spigot and electrofusion fittings according to TS EN 1555-3.

Audit date & place: May-June 2014, Karapürçek Sakarya Turkey

Annex: TS EN 1555-3 technical file

Audit result Passed

<u>Place</u>	<u>Rev. Date</u>
İstanbul Turkey	08.07.2014

Signature 
TÜV SÜD TURKEY
HAKIM ÖZLÜK



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Türkiye

CERTIFICATE OF CONFORMITY

Subject: Manufacturing of plastic pipe fittings in accordance with TS EN 12201-3

Project No: TKG 14-B-00421-01 R1

Manufacturer: NTG PLASTIK SANAYI VE TICARET A.S.
YAZILIGÜRGEN MH. FABRİKALAR CAD. No:49
54430 KARAPÜRÇEK SAKARYA TURKEY

Products: POLYETHYLENE (HDPE100) SDR11 AND SDR17
SPIGOT AND ELECTROFUSION FITTINGS
EF COUPLER sizes from 16mm up to 400mm
EF TAPPING SADDLE sizes from 40mm up to 315mm
ELBOW 90° sizes from 20mm up to 315mm
ELBOW 45° sizes from 20mm up to 315mm
EQUAL TEE sizes from 20mm up to 315mm
REDUCED TEE sizes from 50-20mm up to 315-280mm
END CAP sizes from 20mm up to 400mm
REDUCER sizes from 25-20mm up to 900-630mm
FLANGE ADAPTOR sizes from 20mm up to 1000mm

Date of expiry: 08.07.2017

Basis: TS EN 12201-3 and related standards

Remarks:

Related material certificates, type acceptance, test on fittings, type approval, test procedures, qualification of test equipments with calibrated certificates, test reports and manufacturing line according to Quality Plan have been audited by TÜV SÜD Auditor. Additionally TÜV SÜD inspector witnessed spot type approval tests. During audit and witnessed of type tests TÜV SÜD observed NTG PLASTIK comply all the requirement of manufacturing of polyethylene spigot and electrofusion fittings according to TS EN 12201-3. After the satisfactory result this certificate has been prepared and approved by TÜV SÜD / Turkey and given to NTG PLASTIK to identify company has capability of manufacturing of polyethylene spigot and electrofusion fittings according to TS EN 12201-3.

Audit date & place: May-June 2014, Karapürçek Sakarya Turkey

Annex: TS EN 12201-3 technical file

Audit result Passed

<u>Place</u>	<u>Rev. Date</u>
İstanbul Turkey	08.07.2014



Signature
TÜV SÜD TURKEY
HAKIM ÖZLÜK

TÜV SÜD Türkiye • Büyükdere Caddesi • No 103/A • Sarı İle Merkezi • 4. Blok Kat 5 34398 Masniye/İstanbul • Türkiye

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APPENDIX C WSAA PRODUCT SPECIFICATION

WATER SERVICES ASSOCIATION of Australia

PRODUCT SPECIFICATION

WSA PS - 208 PLASTICS MOULDED FITTINGS FOR PRESSURE APPLICATIONS WITH PE PIPE – WATER SUPPLY AND SEWERAGE

208.1 SCOPE

This specification covers plastics¹ moulded

- (a) electrofusion fittings;
- (b) mechanical compression joint fittings;
- (c) elongated spigot fittings for butt fusion and for use with electrofusion socketed fittings; and
- (d) short² spigot fittings for butt fusion
in pressure applications with PE pipes in water supply³ and sewerage.

208.2 REQUIREMENTS

- (a) Plastics¹ moulded material of the fitting body⁴ shall comply with AS/NZS 4129:2008/Amdt 1:2013.
- (b) Mechanical joint elastomeric seals shall be EPDM complying with AS 1646:2007 and AS 681.1:2008 (EN 681-1:1996).
- (c) Joint seals, flange gaskets⁵ and jointing lubricant shall comply with AS/NZS 4020:2005.

208.3 QUALITY ASSURANCE

- (a) Plastics moulded fittings shall have product certification (ISO Type 5) to AS/NZS 4129:2008/Amdt 1:2013.
- (b) Elastomeric joint seals shall have product certification (ISO Type 5) to AS 1646:2007 and AS 681.1:2008 (EN 681-1:1996).
- (c) Flange gaskets shall have certificates of compliance to WSA 109:2011.
- (d) All products shall be marked in accordance with the conformity assessment body's requirements.

208.4 AGENCY OR PROJECT SPECIFIC REQUIREMENTS

Pressure Class ⁶ , PN	
Type of fitting e.g. mechanical or electrofusion	
Fitting types (configurations)	
Flange standard (e.g. AS/NZS 4331.1:1995 or AS/NZS 4087:2011/Amdt 1:2012 or AS ISO 9624:2008)	
Alternative elastomeric material for joint seals	

NOTES:

- 1 Plastics moulded material of the fitting body shall be in accordance with Table 1.1 of AS/NZS 4129:2008/Amdt 1:2013.
- 2 The dimensions of short spigot fittings for butt fusion shall conform to the requirements given in Table 3 (see Figure 2) in EN 12201-3:2001+A1:2012.

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- 3 Includes water supply and recycled water supply.
- 4 All fittings to AS/NZS 4129:2008/Amdt 1:2013 for applications other than fuel gas are required to comply with AS/NZS 4020:2005. Fittings may be used for drinking water, recycled water and sewerage pipework. Individual colour identification for each application is not required.
- 5 Flange gaskets and O-rings should be supplied to [WSA PS-312](#).
- 6 Pressure Class and type of fitting shall be as specified in the Project Specification or on the Design Drawings.

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APPENDIX D - SUPPLIER CONTACTS

VINIDEX PTY LTD
Postal address: PO Box 379
Sunnybank Qld 4109
Contact person: Ian Paterson
Phone: (07) 3277 2822
Fax: (07) 3277 9500
Email: ipaterson@vinidex.com.au

For additional Vinidex offices see attachment to Vinidex Certificate of Registration in Appendix 'B' above.

Melbourne Office

Level 8, 401 Docklands Drive
Docklands VIC 3008

Phone: (03) 8605 7666

Fax: (03) 8605 7612

Sydney Office

Level 11, 39 Martin Place
Sydney NSW 2000

GPO Box 915

Sydney NSW 2001

Phone: (02) 9221 5966

Fax: (02) 9221 5977

www.wsaa.asn.au



WATER SERVICES
ASSOCIATION OF AUSTRALIA