



WATER SERVICES
ASSOCIATION OF AUSTRALIA

Independent Sewer Consulting Services Pty Ltd

PRODUCT APPRAISAL REPORT 1832

Cretex Pro-Ring™ Polymeric Make-up Rings for Sewerage Access Chambers

WSA PS 345 Polymeric Make-up Rings for Sewerage Access Chambers

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Name/Title	Organisation	Date
Product Appraisal Technical Advisory Group	WSAA	28 November 2019
WSAA Expert Panel	WSAA	28 November 2019
Peter Pittard, WSAA Consultant	WSAA	4 November 2019
Carl Radford, Product Appraisal Manager	WSAA	28 November 2019

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

Independent Sewer Consulting Services Pty Ltd (ISC Services) commenced operations in 2002 to provide a service to councils and water agencies for inflow and infiltration studies relating to maintenance holes, pump stations and sewerage treatment plant inlet structures to assist in minimisation of asset degradation and the reduction of operational and whole of life asset costs. In 2016 ISC Services commenced offering a range of specialised products and systems to support its services.

Cretex Pro-Ring™ make-up pieces are manufactured by JSP International LLC in Butler, Pennsylvania for Cretex Specialty Products, a member of the USA based Cretex Companies Inc., which has been providing manhole solutions to customers since 1983. Cretex supplies the Pro-Ring make-up rings to ISC Services for sales and distribution within Australia and New Zealand.

This Appraisal is for the Cretex Pro-Ring system of moulded make-up rings for grade adjustment of concrete and masonry sewerage access chambers and catch basins.

The rings are manufactured from expanded polypropylene (EPP) in circular, square or rectangular shapes with an extensive range of dimensions. Rings are available in both flat and angled versions with thicknesses from 19mm to 152mm and can be stacked to achieve the required height. EPP is known for its exceptional strength to weight ratio, stability and toughness with excellent chemical and UV resistance.

The joints are keyed to prevent lateral movement between adjacent rings and sealed using a polyether waterproof structural adhesive with acid and chemical resistance suitable for sewer environments. This jointing mechanism also minimises the likelihood of root intrusion.

The system is promoted as an alternative to traditional concrete rings with approximately 1/20th of the mass of concrete, thereby allowing installation by a single worker. The mass of any make-up ring does not exceed 10kg. The make-up rings have been tested to demonstrate compliance with a Class D rating, which means they are suitable for use in major roads including freeway and motorway shoulders.

Other promoted benefits of the make-up rings include a 50-year design life, resistance to infiltration and exfiltration, reduced risk for installers, no special installation equipment required, resistant to handling and transport damage, resistant to chemicals and corrosion commonly associated with sewer environments including hydrogen sulphide, easily drilled if required and no stacking limitations.

Testing has been conducted to the relevant Class D performance requirements of AS 3996:2019 *Access covers and grates* for load requirements, watertightness, gas tightness and fatigue resistance.

Independent Sewer Consulting Services Pty Ltd has a Quality Management System licence to ISO 9001 and JSP International LLC has a licence to IATF 16949, the automotive quality assurance equivalent to ISO 9001.

The Cretex Pro-Ring make-up rings described within this appraisal meet the requirements of WSA PS 345 *Polymeric Make-up Rings for Sewerage Access Chambers* and are therefore deemed as 'fit for purpose'.

1.1 Recommendations

It is recommended that WSAA members, subject to any specific requirements of the member, accept or authorise the Cretex Pro-Ring polymeric make-up rings as detailed in this report for use in sewerage access chambers provided they are installed in accordance with any relevant conditions relating to the design, installation, and acceptance testing provided in relevant standards, WSAA Codes and the manufacturer's requirements.

2 THE APPLICANT

The applicant is Independent Sewer Consulting Services Pty Ltd (ISC Services).

2.1 The Supplier

ISC Services commenced operations in 2002 to provide a service to councils and water agencies for inflow and infiltration studies relating to maintenance holes, pump stations and sewerage treatment plant inlet structures to assist in minimisation of asset degradation and the reduction of operational and whole of life asset costs. In 2016 ISC Services commenced offering a range of specialised products and systems to support its services.

The products are supplied by Cretex Specialty Products, a member of the USA based Cretex Companies Inc., which has been providing manhole solutions to customers since 1983.

2.2 The Manufacturer

JSP International LLC, based in Butler, Pennsylvania, USA manufactures the Pro-Ring make-up pieces for Cretex Specialty Products. JSP is a global manufacturer of polymeric products for the automotive, construction, civil engineering and packaging industries.

3 THE PRODUCT

This Appraisal is for the Cretex Pro-Ring system of moulded rings for grade adjustment of concrete and masonry sewerage access chambers and catch basins.

The rings are manufactured from expanded polypropylene (EPP) in circular, square or rectangular shapes with an extensive range of dimensions. Rings are available in both flat and angled versions with thicknesses from 19mm to 152mm and can be stacked to achieve the required height. EPP is known for its exceptional strength to weight ratio, stability and toughness with excellent chemical and UV resistance.

The joints are keyed to prevent lateral movement between adjacent rings and sealed using a polyether waterproof structural adhesive with acid and chemical resistance suitable for sewer environments. This jointing mechanism also minimises the likelihood of root intrusion.



FIGURE 1 CRETEX PRO-RING EPP MAKE-UP RINGS

The system is promoted as an alternative to traditional concrete rings with approximately 1/20th of the mass of concrete, thereby allowing installation by a single worker. The mass of any make-up ring does not exceed 10kg.

See Table 1 for details of the range of flat rings including their masses. Tapered and graded make-up rings are also available.

The make-up rings have been tested to demonstrate compliance with a Class D rating, which means they are suitable for use in major roads including freeway and motorway shoulders.

Other promoted benefits of the make-up rings include a 50-year design life, resistance to infiltration and exfiltration, reduced risk for installers, no special installation equipment required, resistant to handling and transport damage, resistant to chemicals and corrosion commonly associated with sewer environments including hydrogen sulphide, easily drilled if required and no stacking limitations.

TABLE 1 CRETEX PRO-RING FLAT MAKE UP RINGS

Thickness inches	3/4	1	1 ¼	1 ½	1 ¾	2	2 ¼	2 ½	3	4	6
Thickness mm	19	25	32	38	45	51	57	64	76	102	152
	Mass kg										
	Round										
34" OD x 24" ID	.54	.75	0.99	1.19	1.43	1.67	1.87	2.11	-	3.47	5.28
864 OD x 610 ID											
35" OD x 25" ID	.55	.78	1.02	1.25	1.48	1.71	1.94	2.17	-	3.56	5.42
889 OD x 635 ID											
36" OD x 24" ID	.83	1.11	1.39	1.67	1.95	2.22	2.50	2.78	-	4.45	6.67
914 OD x 610 ID											
40" OD x 27" ID	1.01	1.35	1.68	2.02	2.35	2.69	3.03	3.36	-	5.38	8.06
1016 OD x 686 ID											
40" OD x 31" ID	.71	.95	1.22	1.46	-	1.97	-	-	-	3.94	5.91
1016 OD x 787 ID											
46" OD x 36" ID	.75	1.06	1.40	1.70	2.01	2.35	2.65	2.96	-	4.87	7.38
1168 ID x 914 OD											
	Square										
24" x 24"	.82	1.12	1.40	1.67	-	2.25	-	-	3.37	4.53	-
610 x 610											
30" x 30"	.99	1.36	1.7	2.04	-	2.72	-	-	4.12	5.47	-
762 x 762											
	Rectangular										
24" x 20"	.78	1.06	1.29	1.56	-	2.11	-	-	3.16	4.22	-
610 x 610											
30" x 24"	.92	1.22	1.53	1.84	-	2.48	-	-	3.74	5.00	-
762 x 610											
36" x 24"	.99	1.33	1.67	2.01	-	2.72	-	-	4.08	5.44	-
914 x 610											

4 SCOPE OF THE APPRAISAL

The scope of this Appraisal is for the range of Cretex Pro-Ring polymeric make-up rings for grade adjustment of concrete and masonry sewerage access chambers and catch basins.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts polymeric make-up rings manufactured in compliance with WSA PS 345 *Polymeric Make-up Rings for Sewerage Access Chambers*.

WSA PS requires relevant performance tests from AS 3996:2019 *Access covers and grates* to be undertaken by a test facility complying with the requirements of WSA TN-08.

The manufacturer is generally expected to have a production management and control system that has been duly accredited in accordance with AS/NZS ISO 9001 as a prerequisite to undergoing a product certification audit.

5.2 Performance Requirements

Cretex Pro-Ring make up rings have been appraised for compliance with WSA PS 345 *Polymeric Make-up Rings for Sewerage Access Chambers*.

Appraisal criteria are also determined by the WSAA Product Appraisal Technical Advisory Group and regularly reviewed to ensure that the criteria reflect the requirements of WSAA members.

The following Product Specification is also relevant to this application:

WSA PS 345 *Polymeric Make-up Rings for Sewerage Access Chambers*.

A Copy of the above Product Specification can be found in Appendix C or downloaded from the WSAA members website.

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

ISC Services has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. 908-1522-02 issued to Independent Sewer Consulting Services Pty Ltd by Compass Assurance Services.
- IATF 16949:2016 Certificate of Registration No. 0878-01 issued to JSP International LLC by SRI Quality System Registrar.

Copies of the primary Quality Assurance licences have been included in Appendix B and are also available for downloading from the WSAA Members Website.

Copies of Quality Assurance certificates have also been supplied for the major component suppliers.

6.2 Compliance with Performance Requirements

6.2.1 Material

The make-up rings are manufactured from ARPRO® Expanded Polypropylene (EPP) 5000 series, black, free of fillers, additives and recycled materials. The rings are manufactured using a high-pressure compression Steam Chest moulding process to produce a finished density of 120g/l. The coefficient of linear thermal expansion is nominated as 5.6×10^{-5} mm/mm/°C which equates to approximately 0.70mm diametral movement on a 610mm diameter ring and approximately 0.20mm movement on a 152mm thick ring, assuming the ring is unimpeded by surrounding soil and adhesives.

EPP is commonly used for automotive applications and is well known for its exceptional strength to weight ratio, stability and toughness with excellent chemical resistance, UV resistance and long service life, which makes the material highly compatible with sewer environments.

6.2.2 Jointing

The make-up rings contain an upper and lower keyway (tongue and groove) to provide for vertical alignment and to prevent lateral movement between adjacent rings.

6.2.3 Jointing compounds

Adhesives are utilised on the joints to provide for watertight installations. The recommended adhesive/sealant is M1, a polyether-based compound, manufactured by Chem Link Inc. The adhesive is a water proof structural adhesive and is supplied by ISC Services. The adhesive is applied using a caulk dispenser.

Where the top of the access chamber is not level or is irregular, a non-shrink repair mortar or non-shrink cementitious grout is recommended to be applied prior to installation of the first ring.

Cretex recommend Octocrete repair mortar manufactured in USA by IPA Systems and PennGrout cementitious grout, manufactured by IPA Systems in Australia. Alternative recommended materials are CTS Rapid Set Mortar Mix (a high strength structural repair mortar) and CTS Rapid Set Cement All (a multi-purpose construction material and non-shrink grout).

6.2.4 Type Testing

Type tests were conducted by ALS Industrial Pty Ltd (NATA accreditation number 218) in accordance with the performance requirements of AS3996:2019 *Access covers and grates*. Tests that were successfully completed were:

- Load requirements for Class D (Clause 4.2.2.1)
- Watertightness of joints (Clause 4.2.4)
- Gas-tightness of joints (Clause 4.2.5)
- Fatigue resistance for Class D loadings (Clause 4.2.13)

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

A comprehensive Installation Guide is available from ISC Services or WSAA. A video is also available at the following website link: <https://iscservices.com.au/products/cretex-pro-ring/>

8 PRODUCT MARKING

Cretex make-up rings are marked in accordance the following:

- Manufacturers Name: PRO-RING
- Material identification: Made from ARPRO
- Product Code: e.g. 36-24G-600 = 36" OD, 24" ID, G for Grade Ring, 600 for 6" high
- Date of manufacture: Day month year and shift
- Orientation: This Side Up

9 PACKAGING AND TRANSPORTATION

The make-up rings are generally packed onto pallets and secured by shrink wrap and strapping.

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 ISC Services warranty is included in their terms and conditions of sale. A 25-year material warranty is offered.

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD TESTING REPORT

Cretex Pro-Ring make up rings have been available in USA since 2010 with more than 130,000 units supplied.

Hunter Water has trialled the product and granted approval for general use. There have also been a number of installations by Councils including Tweed, Hawkesbury, Wingecarribee and Shoalhaven.

This Appraisal has been commissioned to provide the means to seek further Water Agency approvals within Australia.

12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

No issues were identified at the completion of the expert panel product appraisal review.

13 FUTURE WORKS

No future works have been identified.

14 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.

14.1 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.

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14.2.1 Disclaimer of liability

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This Report does not contain all information that a person might require for the purposes of assessing any product discussed or appraised within it (Product). The product appraisal criteria used in preparing this Report may not address all relevant aspects of the Product.

Recipients should seek independent evidence of any matter which is material to their decisions in connection with an assessment of the Product and consult their own advisers for any technical information required. Any decision to use the Product should take into account the reliability of that independent evidence obtained by the Recipient regarding the Product.

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.

WSAA has not evaluated the extent of the product liability and professional indemnity insurance that the provider of the product maintains. Recipients should ensure that they evaluate the allocation of liability for product defects and any professional advice obtained in relation to the product or its specification including the requirements for product liability and professional indemnity insurance.

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14.4 No Warranty

The Publisher(s) do[es] not, in any way, warrant that steps have been taken to verify or audit the accuracy or completeness of the information in this Report, or the accuracy, completeness or reasonableness of any recommendation in this Report.

APPENDIX A – PRODUCT LITERATURE

Manhole Grade Adjustment System



Proudly Distributed in
Australia & New Zealand by
ISC Services



INDEPENDENT SEWER
CONSULTING SERVICES PTY LTD
Unit 13/1 Adept Lane Bankstown NSW 2200
Ph 02 9790 2024 sales@iscservices.com.au
www.iscservices.com.au



FASTER, SAFER AND MORE COST EFFECTIVE

PRO-RING™ is the worlds first and only manhole grade adjustment system made from Expanded Polypropylene (EPP), the same engineered polymer material that has been used in the automotive industry since the 1980's.

This high strength, lightweight plastic is the ideal material to replace traditional construction methods

which use concrete, mortar and other masonry materials to raise manhole frames to their final elevation. These masonry materials deteriorate rapidly over time due to the runoff of road salts, freeze-thaw, sewer gases and from continuous traffic impacts.



Approved by DOT's and Sewer Agencies
throughout the U.S. and Canada

FASTER-SAFER-LIGHTER

Ideal Material

ARPRO® Expanded Polypropylene (EPP) has been used for challenging automotive applications and is renowned for its exceptional strength-to-weight ratio, its stability and toughness. EPP is not only durable, it has excellent chemical resistance and a long service life under the harshest conditions.

Faster

People are amazed at our demonstrations, when one person can install an entire PRO-RING™ system in just minutes. The adjustment system is easy to assemble, watertight, and can be installed to within one quarter inch of the desired elevation.

Safer

Concrete grade rings are heavy and may cause injury during handling and installation. The PRO-RING™ system reduces the risk of injury, lost time and comp claims. At 7.5 pcf density, a single 36" x 24" x 6" PRO-RING™ weighs just 14 pounds and is easy to handle and install by a single worker. The ability to hand carry these adjustment rings into back yards, easements and remote locations, makes the overall process safer and less disruptive.

Cost Effective

The PRO-RING™ system dramatically reduces the time and equipment required to construct or reconstruct a single manhole adjustment. Manhole repair sites can be opened and closed in a single day or in a few hours depending on pavement type and site conditions. This results in significant savings and minimizes the impact on traffic when it is necessary to close traffic lanes or streets to complete the work. The PRO-RING™ system is installed and assembled using a polyether based adhesive/sealant which is applied using a caulk dispenser. This adhesive/sealant material has proven to be effective at sealing and bonding the rings to the manhole cone and to each other. The use of the PRO-RING™ system may

result in as much as a **20% to 30% Overall Savings** when considering the expected **50 Year Design Life**. The PRO-RING™ system is also backed by an industry leading **25 Year Material Warranty**.



TESTED TO MEET OR EXCEED THE FOLLOWING STANDARDS:

- AASHTO M306 HS-20 & HS-25 Load
- ASTM C1244
- ASTM C969
- ASTM D4819-13
- SAE J1885



ROUND RINGS 34" O.D. X 24" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
34-24F-075	FINISH	3/4"
34-24F-100	FINISH	1"
34-24F-125	FINISH	1-1/4"
34-24F-150	FINISH	1-1/2"
34-24F-175	FINISH	1-3/4"
34-24F-200	FINISH	2"
34-24F-225	FINISH	2-1/4"
34-24F-250	FINISH	2-1/2"
34-24F-400	FINISH	4"
34-24F-600	FINISH	6"
34-24A-100	ANGLE	3/4" TO 1-3/4"
34-24G-200	GRADE	2"
34-24G-400	GRADE	4"
34-24G-600	GRADE	6"

ROUND RINGS 36" O.D. X 24" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
36-24F-075	FINISH	3/4"
36-24F-100	FINISH	1"
36-24F-125	FINISH	1-1/4"
36-24F-150	FINISH	1-1/2"
36-24F-175	FINISH	1-3/4"
36-24F-200	FINISH	2"
36-24F-225	FINISH	2-1/4"
36-24F-250	FINISH	2-1/2"
36-24F-400	FINISH	4"
36-24F-600	FINISH	6"
36-24A-100	ANGLE	3/4" TO 1-3/4"
36-24G-200	GRADE	2"
36-24G-400	GRADE	4"
36-24G-600	GRADE	6"

ROUND RINGS 40" O.D. X 27" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
40-27F-075	FINISH	3/4"
40-27F-100	FINISH	1"
40-27F-125	FINISH	1-1/4"
40-27F-150	FINISH	1-1/2"
40-27F-175	FINISH	1-3/4"
40-27F-200	FINISH	2"
40-27F-225	FINISH	2-1/4"
40-27F-250	FINISH	2-1/2"
40-27F-400	FINISH	4"
40-27F-600	FINISH	6"
40-27A-100	ANGLE	3/4" TO 1-3/4"
40-27G-200	GRADE	2"
40-27G-400	GRADE	4"
40-27G-600	GRADE	6"

ROUND RINGS 40" O.D. X 31" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
40-31G-075F	GRADE FLAT	3/4"
40-31G-100F	GRADE FLAT	1"
40-31G-125F	GRADE FLAT	1-1/4"
40-31G-150F	GRADE FLAT	1-1/2"
40-31G-200F	GRADE FLAT	2"
40-31A-100	ANGLE	3/4" TO 1-3/4"
40-31G-400F	GRADE FLAT	4"
40-31G-600F	GRADE FLAT	6"

SQUARE RINGS 24" I.D. X 24" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
SQ 24-24-075	FLAT	3/4"
SQ 24-24-100	FLAT	1"
SQ 24-24-125	FLAT	1-1/4"
SQ 24-24-150	FLAT	1-1/2"
SQ 24-24-200	FLAT	2"
SQ 24-24-300	FLAT	3"
SQ 24-24-400	FLAT	4"
SQ 24-24A1-2	ANGLE	1" TO 2"

SQUARE RINGS 30" I.D. X 30" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
SQ 30-30-075	FLAT	3/4"
SQ 30-30-100	FLAT	1"
SQ 30-30-125	FLAT	1-1/4"
SQ 30-30-150	FLAT	1-1/2"
SQ 30-30-200	FLAT	2"
SQ 30-30-300	FLAT	3"
SQ 30-30-400	FLAT	4"
SQ 30-30A1-2	ANGLE	1" TO 2"

RECTANGULAR 30" I.D. X 24" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
RT 30-24-075	FLAT	3/4"
RT 30-24-100	FLAT	1"
RT 30-24-125	FLAT	1-1/4"
RT 30-24-150	FLAT	1-1/2"
RT 30-24-200	FLAT	2"
RT 30-24-300	FLAT	3"
RT 30-24-400	FLAT	4"
RT 30-24A1-2L	ANGLE	1" TO 2"
RT 30-24A1-2S	ANGLE	1" TO 2"

RECTANGULAR 36" I.D. X 24" I.D.

PART NUMBER	RING TYPE	RING HEIGHT
RT 36-24-075	FLAT	3/4"
RT 36-24-100	FLAT	1"
RT 36-24-125	FLAT	1-1/4"
RT 36-24-150	FLAT	1-1/2"
RT 36-24-200	FLAT	2"
RT 36-24-300	FLAT	3"
RT 36-24-400	FLAT	4"
RT 36-24A1-2L	ANGLE	1" TO 2"
RT 36-24A1-2S	ANGLE	1" TO 2"

YouTube CHECK OUT OUR VIDEO



2018/2019 AVAILABLE SIZES, SHAPES & WEIGHTS

ROUND
(OD/ID/Thickness)

Part #	Style	Weight (lbs)
34-24F-075	Finish	1.20
34-24F-100	Finish	1.65
34-24F-125	Finish	2.18
34-24F-150	Finish	2.63
34-24F-175	Finish	3.15
34-24F-200	Finish	3.68
34-24F-225	Finish	4.13
34-24F-250	Finish	4.65
34-24F-400	Finish	7.65
34-24F-600	Finish	11.63
34-24G-200	Grade	3.83
34-24G-400	Grade	7.80
34-24G-600	Grade	11.70
34-24A-100	Angle	2.40
35-25F-075	Finish	1.22
35-25F-100	Finish	1.73
35-25F-125	Finish	2.24
35-25F-150	Finish	2.75
35-25F-175	Finish	3.26
35-25F-200	Finish	3.77
35-25F-225	Finish	4.28
35-25F-250	Finish	4.79
35-25F-400	Finish	7.85
35-25F-600	Finish	11.94
35-25A-100	Angle	2.5
35-25G-200	Grade	3.94
35-25G-400	Grade	8.02
35-25G-600	Grade	12.11

ROUND
(OD/ID/Thickness)

Part #	Style	Weight (lbs)
36-24F-075	Finish	1.84
36-24F-100	Finish	2.45
36-24F-125	Finish	3.06
36-24F-150	Finish	3.68
36-24F-175	Finish	4.29
36-24F-200	Finish	4.90
36-24F-225	Finish	5.51
36-24F-250	Finish	6.13
36-24F-400	Finish	9.80
36-24F-600	Finish	14.71
36-24G-200	Grade	4.90
36-24G-400	Grade	9.80
36-24G-600	Grade	14.71
36-24A-100	Angle	3.06
40-27F-075	Finish	2.23
40-27F-100	Finish	2.97
40-27F-125	Finish	3.71
40-27F-150	Finish	4.45
40-27F-175	Finish	5.18
40-27F-200	Finish	5.93
40-27F-225	Finish	6.67
40-27F-250	Finish	7.41
40-27F-400	Finish	11.86
40-27F-600	Finish	17.78
40-27G-200	Grade	5.93
40-27G-400	Grade	11.86
40-27G-600	Grade	17.78
40-27A-100	Angle	3.71
40-31G-075F	Flat	1.57
40-31G-100F	Flat	2.10
40-31G-125F	Flat	2.70
40-31G-150F	Flat	3.22
40-31G-200F	Flat	4.34
40-31G-400F	Flat	8.68
40-31G-600F	Flat	13.02
40-31A-100	Angle	2.70

Updated 10/19/2018



SQUARE & RECTANGULAR
(ID/ID/Thickness)

Part #	Style	Weight (lbs)
SQ 24-24-075	Flat	1.80
SQ 24-24-100	Flat	2.48
SQ 24-24-125	Flat	3.08
SQ 24-24-150	Flat	3.68
SQ 24-24-200	Flat	4.95
SQ 24-24-300	Flat	7.43
SQ 24-24-400	Flat	9.98
SQ 24-24A1-2	Angle	3.68
RT 36-24-075	Flat	2.18
RT 36-24-100	Flat	2.93
RT 36-24-125	Flat	3.68
RT 36-24-150	Flat	4.43
RT 36-24-200	Flat	6.00
RT 36-24-300	Flat	9.00
RT 36-24-400	Flat	12.00
RT 36-24A1-2L	Angle	4.43
RT 36-24A1-2S	Angle	4.43

SQUARE & RECTANGULAR
(ID/ID/Thickness)

Part #	Style	Weight (lbs)
SQ 30-30-075	Flat	2.18
SQ 30-30-100	Flat	3.00
SQ 30-30-125	Flat	3.75
SQ 30-30-150	Flat	4.50
SQ 30-30-200	Flat	6.00
SQ 30-30-300	Flat	9.08
SQ 30-30-400	Flat	12.07
SQ 30-30A1-2	Angle	4.50
RT 30-24-075	Flat	2.03
RT 30-24-100	Flat	2.70
RT 30-24-125	Flat	3.38
RT 30-24-150	Flat	4.05
RT 30-24-200	Flat	5.47
RT 30-24-300	Flat	8.25
RT 30-24-400	Flat	11.02
RT 30-24A1-2L	Angle	4.05
RT 30-24A1-2S	Angle	4.05

Updated 10/19/2018

APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certification Certificates are available for downloading from the WSAA Members Website.

**TABLE B1 INDEPENDENT SEWER CONSULTING SERVICES PTY LTD
– MANAGEMENT SYSTEMS**

Unit 13 1 Adept Lane Bankstown NSW 2200	
Quality Systems Standard	ISO 9001:2015
Certification licence no.	908-1522-02
Certifying agency	Compass Assurance Services Pty Ltd
First date of certification	16 February 2018
Current date of certification	16 February 2018
Expiry date of certification	16 February 2021

TABLE B2 JSP INTERNATIONAL LLC – MANAGEMENT SYSTEMS

150 East Brook Lane Butler Pennsylvania USA	
Quality Systems Standard	IATF 16949:2016
Certification licence no.	0878-01
Certifying agency	SRI Quality System Registrar
Current date of certification	17 July 2018
Expiry date of certification	16 July 2021



CERTIFICATE OF REGISTRATION

Independent Sewer Consulting Services Pty Ltd

Unit 13, 1 Adept Lane, Bankstown, NSW 2200, Australia

Has been assessed and certified by Compass Assurance Services to the following management systems, standards and guidelines:

ISO 9001:2015

QUALITY MANAGEMENT SYSTEMS

The scope of Certification covers the following activities:

Importing and distribution of specialty products associated with controlling or preventing inflow and infiltration into sewer and stormwater systems.

A handwritten signature in black ink, appearing to be "R. P. P.".

Managing Director, Compass Assurance Services



CERTIFICATION DATE:	DATE OF ISSUE:	EXPIRY DATE:	CERTIFICATE#:
16 February 2018	28 February 2018	16 February 2021	908-1522-02



Compass Assurance Services Pty Ltd
 Level 1, 135 Queen Street, Cleveland, 4163 QLD
 1300 495 855 | compassassurance.com.au

Compass Assurance Services is accredited by The Joint Accreditation System of Australia and New Zealand (www.jas-anz.org/register) - accreditation number: M5310713AO

CERTIFICATE OF REGISTRATION



Having been audited in accordance with requirements of

IATF 16949:2016 First Edition

SRI Quality System Registrar, 300 Northpointe Circle, Seven Fields, Pennsylvania, 16046, USA, hereby grants to:

JSP International LLC

Registration of the management system at its location:

**150 East Brook Lane
Butler, Pennsylvania, 16001, USA**

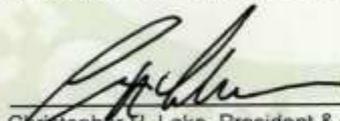
The conditions for maintaining this certificate of registration are set forth in the SRI registration agreements R20.3 and R20.4. Further clarification regarding the validity of this certificate can be obtained on SRI's website with this code 018803.

Scope of IATF 16949:2016 registration: "Design of resins and manufacture of expanded polymer product and components used for energy absorbers, filler blocks, and interior bolsters, seat cores, floor levelers, laminated door pads and impact pads."

Exclusions: None

Current registration period: July 17, 2018 through July 16, 2021

Signed for SRI:


Christopher H. Lake, President & COO

Release Date: July 17, 2018
IATF Certificate Number: 0316934
Certificate Number: 0878-01



APPENDIX C - WSA PRODUCT SPECIFICATION

WATER SERVICES ASSOCIATION of Australia

PRODUCT SPECIFICATION

WSA-PS 345 POLYMERIC MAKE-UP RINGS FOR SEWERAGE ACCESS CHAMBERS

345.1 SCOPE

This specification covers lightweight polymeric make-up rings for concrete and masonry sewerage access chambers.

345.2 REQUIREMENTS

- (a) The make-up rings shall be moulded from a polymeric material including but not limited to polypropylene (PP), expanded polypropylene (EPP), fibre reinforced plastic (FRP) and high-density polyethylene HDPE.
- (b) The make-up rings shall be circular, square or rectangular in shape and flat or tapered in cross section.
- (c) The mass of each make-up ring shall not exceed 10 kg.
- (d) The make-up rings shall be designed to ensure that they are keyed to prevent lateral movement between adjacent make up rings.
- (e) The joints shall be sealed using a polyurethane or polyether based waterproof structural adhesive with acid and chemical resistance suitable for sewer environments.
- (f) The make-up rings shall comply with the performance requirements of AS 3996:2019 as follows:
 - Load requirements for Class D (Clause 4.2.2.1)
 - Watertightness of joints (Clause 4.2.4)
 - Gas-tightness of joints (Clause 4.2.5)
 - Fatigue resistance for Class D loadings (Clause 4.2.13)

345.3 QUALITY ASSURANCE

- (a) The manufacturer shall have certification to ISO 9001.
- (c) Performance tests shall be completed in accordance with this specification by a laboratory or facility accredited in accordance with WSA TN-08.

345.4 AGENCY OR PROJECT SPECIFIC REQUIREMENTS

Shape	
External dimensions	
Internal dimensions	

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File Name: WSA_PS_345
 Doc Name: Product Specifications for Products & Materials

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 Issue: 01

May 2019
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APPENDIX D - SUPPLIER CONTACTS

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