

Deks Industries Pty Ltd

PRODUCT APPRAISAL REPORT No 1204 Issue 3

Deks Flexi-Gib Gibaults

**AS/NZS 4998: 2009 Bolted unrestrained mechanical couplings
for waterworks purposes**

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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

Deks Industries Pty Ltd is a supplier and reseller of products to a wide cross section of industries. Its product segments include Plumbing and Roofing, Civil, Electrical, HVAC, Washers and Solar. A national distribution network with outlets in each state provides a distribution facility for a range of couplings and ductile iron surface fittings to water utilities and installation contractors Australia wide.

This appraisal is for a range of Deks Flexi-Gib Gibaults in sizes from DN 80 to DN 600 manufactured by Dalian Zhuhong Mechanical Co Ltd in Dalian, China to comply with AS/NZS 4998:2009 *Bolted unrestrained mechanical coupling for waterworks purposes*.

This Issue 3 is to renew the previous appraisal that had reached its five-year life.

Deks Flexi-Gib Gibaults are unrestrained mechanical couplings designed to suit a wide range of pipe outside diameters and are intended for jointing spigot ends of pipes, other than PE, in water and sewerage applications, either in above or below ground situations.

Flexi-Gib Gibaults are supplied with Grade 316 stainless steel barrels and polymeric coated ductile iron end rings. The fasteners are Grade 316, coated with a Teflon dry film coating. The seals are NBR (Nitrile).

Both Deks Industries Pty Ltd and Dalian Zhuhong Mechanical Co Ltd have a Quality Management System licence to ISO 9001:2015 and the products are covered by an OceanaMark ISO Type 5 product certification to AS/NZS 4998:2009 *Bolted unrestrained mechanical coupling for waterworks purposes*.

The Deks Flexi-Gib Gibaults described within this appraisal meet the requirements of WSA PS 270 – *Mechanical Couplings Non-end Thrust Restraint for Pressure Applications – Water Supply and Sewerage* and are therefore deemed as 'fit for purpose'

1.1 Recommendation

It is recommended that WSAA members and associates, subject to any specific requirements of the member, accept or authorise the Deks Flexi-Gib Gibaults, as detailed in this report, for use in water supply and sewerage pressure pipelines, 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 Deks Industries Pty Ltd.

2.1 The Supplier

Deks was established in Australia by Mr. George Cupit in 1947 and remained a family business until it became part of the Skellerup Group in 2003. Deks continues to service its clients in over 28 countries, providing the construction and industrial markets with a variety of products.

In 1910, George Skellerup opened the first rubber goods store in New Zealand and developed his Para Rubber Co into 52 stores. Skellerup Industries was listed as a public company in 1947 and has since expanded to cover a wide variety of global operations.

Both companies have a long and successful history as manufacturers of rubber products.

In August 2005, Deks acquired Jenco Products Pty Ltd.

Jenco was a well-established Australian manufacturer producing above and belowground plumbing products, including a comprehensive range of pipe connectors and cast-iron drainage systems.

The Jenco range provided complimentary products to those already offered by Dek's. The acquisition is part of a long-term plan to broaden the range of market leading products for the plumbing and building sector.

A national distribution network with outlets in each state provides a distribution facility for a range of couplings and ductile iron surface fittings to water utilities and installation contractors Australia wide.

2.2 The Manufacturer

Dalian Zhuhong Mechanical Co Ltd is a design and manufacturing company located in the city of Dalian, China. Its main products are pipe couplings, repair clamps and other pipe fittings.

Established in 2000, as a cast iron foundry for pipe couplings and fittings, the company has been transferred into a modern manufacturing base with its own tooling and stamping workshop and facilities for welding, powder coating and assembly. The annual production capacity is over 3000 tons.

The company's products have been exported to North America, Britain, France, Germany, Spain, Singapore, Australia and other parts of the world.

3 THE PRODUCT

The Dek's Flexi-Gib Gibault is an unrestrained mechanical coupling, designed to suit a wide range of pipe OD's and suitable for joining spigot ends of pipe manufactured from grey or ductile cast iron, steel, PVC-U, PVC-M, PVC-O and asbestos cement. The coupling is suitable for use in contact with drinking water and neutral fluids (sewage) to a maximum temperature of 40°C.

The available range is DN80, DN 100, DN 150, DN 200, DN225, DN 250, DN 300, DN 375, DN 450, DN500 and DN600. The DN 80,100 and 150 sizes are available in both short and long barrel series. All other sizes are available in long barrel series only.

The pipe outside diameter range (reach) of the couplings is given in Tables 1 and 2 and Appendix A.

TABLE 1 DEKS FLEXI-GIB GIBAULT- SHORT SERIES

Part No	Nominal Pipe Size	Size Range – Reach (mm)	
	DN	Min	Max
DGB80BS	80	88	103
DGB100BS	100	108	132
DGB150BS	150	158	182

TABLE 2 DEKS FLEXI-GIB GIBAULT - LONG SERIES

Part No	Nominal Pipe Size	Size Range – Reach (mm)	
	DN	Min	Max
DGB80BL	80	88	103
DGB100BL	100	108	132
DGB150BL	150	158	182
DGB200BL	200	214	238
DGB225BL	225	242	269
DGB250BL	250	270	295

Part No	Nominal Pipe Size	Size Range – Reach (mm)	
	DN	Min	Max
DGB300BL	300	330	356
DGB375BL	375	400	429
DGB450BL	450	488	512
DGB500BL	500	540	565
DGB600BL	600	656	680

The DI end rings are polymeric coated using Akzo Nobel Resicoat R4 Fusion Bonded Epoxy.

The bolts, nuts and washers are Grade 316 Stainless Steel. Plastic caps are fitted to the end of the bolts to protect the protruding thread beyond the nut. The threads of the bolts and nuts are treated with a Teflon dry film coating to prevent galling.

The elastomeric seals are moulded from NBR (Nitrile) rubber.

The couplings have an allowable operating pressure of 1600 kPa.

The maximum allowable angular deflection varies by size and is nominated in Deks literature and marked on the product. Refer to Appendix A for details.



FIGURE 1 DEKS FLEXI-GIB GIBAULT

4 SCOPE OF THE APPRAISAL

The scope of this appraisal covers Deks Flexi-Gib Gibaults with DI polymeric coated end rings and Grade 316 stainless steel barrel and fasteners, as specified in Section 3 and listed in Appendix A.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts unrestrained mechanical couplings manufactured in compliance with AS/NZS 4998:2009 *Bolted unrestrained mechanical coupling for waterworks purposes* and duly certified by means of an ISO Type 5 product certification scheme undertaken by a JAS-ANZ accredited Conformity Assessment Body (CAB) or by an international accreditation system recognised by JAS-ANZ.

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.

The ISO Type 5 Product Certification Scheme shall meet the criteria described in WSA TN-08.

5.2 Performance Requirements

Deks Flex-Gib Gibaults have been appraised for compliance with AS/NZS 4998:2009 *Bolted unrestrained mechanical couplings for waterworks purposes*.

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 relevant to this application:

WSA PS 270 – *Mechanical Couplings Non-end Thrust Restraint for Pressure Applications – Water Supply and Sewerage*.

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

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Deks has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No.C39465 issued to Deks Industries Pty Ltd by International Certifications Limited.
- AS 4998:2009 OceanaMark ISO Type 5 product certification licence No. OMK30040 issued to Deks Industries Pty Ltd by IAPMO R&T Oceana.
- ISO 9001:2015 Certificate of Registration No. USA16Q33585R2S issued to Dalian Zhuhong Mechanical Co Ltd by Beijing East Allreach Certification Center Co Ltd.

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

6.2 Compliance with Performance Requirements

6.2.1 Material Requirements

6.2.1.1 End rings and Barrel

AS/NZS 4998:2009 specifies allowable material requirements for the coupling components. End rings manufactured from Ductile Iron shall conform to minimum AS 1831 Grade 400-15. Barrels manufactured from stainless steel shall conform to minimum ASTM A240M for Grade 316L or ASTM A276 for Grade 316.

Typical material test reports have been supplied by Deks to demonstrate compliance with the material requirements.

6.2.1.2 Elastomeric seals

AS/NZS 4998:2009 allows for EPDM, NBR or SBR elastomeric joint seals in compliance with AS 1646 and AS 681.1.

Deks seals are manufactured from NBR (Nitrile). A test report has been supplied to demonstrate compliance with the performance standards of AS 681.1.

6.2.1.3 *Stainless Steel Fasteners*

AS/NZS 4998 specifies material, dimensional and mechanical requirements for bolts, nuts and washers.

The Deks Flexi-Gib Gibault is fitted with stainless steel fasteners to the following specifications, which comply with AS/NZS 4998.

ASTM F593 for bolts, (316 stainless steel, M16 square necked coach bolt, Grade A, thread pitch 2 mm, dimensions as per the report TR121211. Mechanical properties as per test report TR130201.)

ASTM F594 for Nuts (316 stainless steel, M16 Hexagon nut, Grade A, Dimensions as per the report TR121211. Mechanical properties as per test report TR130201.)

ASTM F844 for washers (316 stainless steel, flat washer, OD 29.7 mm, ID 17.2 mm, 2.7 mm thick.)

AS/NZS 4998:2009 Table 2.1 specifies molybdenum disulphide or Teflon dry film lubricant. Deks advise that fastener threads are treated with a Teflon dry film coating.

6.2.1.4 *Polymeric Coatings*

AS/NZS 4998 specifies that Ductile Iron components shall be coated with a thermal bonded polymeric coating in accordance with AS/NZS 4158.

The DI end rings on the Deks Flexi-Gib Gibault are fully coated with Akzo Nobel Resicoat R4, a fusion bonded epoxy powder coating. The coating is product certified by SAI-Global and a copy is retained on file by WSAA.

The coating is applied utilising an electrostatic spray method at the Dalian Zhuhong Powder Coating Plant.

A typical production test report has been submitted to demonstrate compliance with the production test requirements of AS/NZS 4158.

The coating application process is also audited as part of the product certification licensing procedures by IAPMO R&T Oceana.

6.2.1.5 *Contamination of Drinking Water*

Deks has supplied a copy of a test report by Australian Water Quality Centre dated 11 February 2019 to demonstrate compliance with AS/NZS 4020:2005.

6.2.2 Design, Manufacture and Operation

6.2.2.1 *Design*

The Deks Flexi-Gib Gibault is of basic standard design, using 3 bolts for sizes up to DN 150, 5 bolts for DN200 and DN225, 6 bolts for sizes DN 250 and DN 300, 8 bolts for DN 375, 10 bolts for DN 450, 12 bolts for DN500 and 14 bolts for DN600.

The pipe diameter sealing range is typical for this type of coupling and is detailed in Table 1 and Appendix A.

6.2.2.2 *Barrel lengths*

AS/NZS 4998 specifies minimum barrel lengths.

The Deks Flexi-Gib Gibault barrel lengths exceed the minimum requirements specified in AS/NZS 4998. See Appendix A for details of both short and long barrel lengths.

6.2.2.3 *Nominated Joint Deflection*

AS/NZS 4998 requires the manufacturer to nominate the maximum allowable joint deflection allowable at each coupling end, for both minimum and maximum pipe outside diameters, within the nominated coupling reach. See Table 3 for allowable deflections.

TABLE 3
ALLOWABLE JOINT DEFLECTIONS FOR EACH COUPLING END

Nominal Pipe Size	Maximum Deflection, degrees, at:	
	Min Pipe OD	Max Pipe OD
80 to 300	3	nil
375	2 ½	nil
450-500	2	nil
600	1½	nil

6.2.2.4 Nominal Pipe setting Gap

The manufacturers' nominated pipe setting gap range is specified in the Deks Flexi-Gib Gibault Selection Guide. See Appendix A.

6.2.2.5 Welding Stainless Steel

Deks Mechanical Coupling welding manual outlines the scope and requirements of welding on stainless steel barrels in relation to AS/NZS 1554.6. The fabricator Dalian Zhuhong Mechanical Co Ltd uses several automatic Panasonic YC-315TX welding machines to TIG weld the barrels to category 2B. All the barrels are welded and tested in accordance with Deks welding manual and AS/NZS 1554.6.

Deks welding procedure specification (WPS) sets out the plan, qualification and requirement for the welders. Welders are all certified by local authorities, and qualified and approved by Deks Procedure Qualification Record (PQR).

The workmanship and quality of welds are examined and assured by regular inspections. As category 2B, the welds satisfy the surface imperfection permissible levels set out in Table 6.3.2 of AS/NZS 1554.6, utilising two key visual examination methods, i.e. weld macro and liquid penetrant examination.

Deks SOP CP600-20 and CP600-21 have outlined the procedures of the above two test methods. Test reports were also sighted demonstrating the visual inspection conducted and weld quality as satisfactory.

Welding of barrels also meets the requirements of the intergranular corrosion test as required by AS 2205.10.1. Deks SOP CP600-22 specifies the test procedures as per AS 2038.

6.2.3 Performance Tests

DEKS has submitted test reports to demonstrate conformance to the Type Test requirements of AS/NZS4998:2009.

ALS Mechanical Testing Laboratory in North Melbourne (NATA Accreditation No: 218) conducted the type tests for DN80 and DN100 couplings.

CSIRO Hydraulics Plumbing Laboratory in North Ryde (Accreditation No: 165) conducted the type tests for all other sizes.

The Type Tests completed for each size were as follows:

- Hydrostatic leaktightness test
- Joint infiltration test
- Assembly test

6.2.3.1 Hydrostatic leaktightness test

These tests were carried out using pipe pieces with outside diameters equal to the minimum outside diameter of the nominated reach of the coupling, at the nominated angular joint deflection and pipe setting gap, with a test pressure of 2400 kPa for 2 hours.

The couplings displayed no leakage, seal cracking or other failure.

6.2.3.2 Joint infiltration test

These tests were carried out using pipe pieces with outside diameters equal to the minimum outside diameter of the nominated reach of the coupling, at the nominated angular joint deflection and pipe setting gap with a test pressure of –80 to –85 kPa.

The couplings displayed no leakage, seal cracking or other failure.

6.2.3.3 Assembly test

These tests were carried out on two pipe pieces that both have an outside diameter equal to the maximum outside diameter of the nominated reach of the coupling.

There was no interference observed between the coupling and the pipes.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

A copy of Deks Installation Manual is included in Appendix A.

The mechanical coupling is a common fitting in the water industry and installation training is not regarded as an industry requirement.

8 PRODUCT MARKING

The coupling has the following markings on the end clips and / or barrels in accordance with AS/NZS 4998. The markings on the end rings are cast on whilst the markings on the barrel are applied by an electro-chemical etching technique.

- Name of Manufacturer: DEKS
- Batch Identification: e.g. 120810A
- Nominal diameter: e.g. DN100
- The number of this standard: AS/NZS 4998
- Reach in mm: e.g. RANGE 108-132
- PN rating: PN16
- Maximum angle of deflection: e.g. MAX DEF 6 DEG

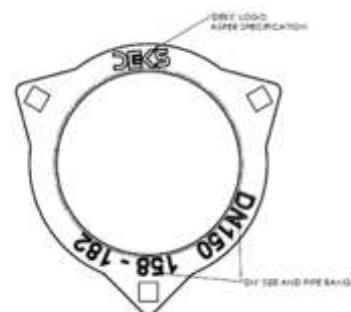


FIGURE 2 EXAMPLE OF MARKING

9 PACKAGING AND TRANSPORTATION

Each gibault is wrapped in bubble wrap and packed onto pallets with a sheet of cardboard separating the layers and also to protect the top layer. Small sizes are nested inside large sizes where possible to maximise the useable volume.



FIGURE 3 EXAMPLE OF PACKAGING

10 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD TESTING REPORT

Deks have been supplying Flexi-Gib Gibaults into the market for more than 6 years now. The original appraisal was published in 2013.

11 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 Deks warranty is included in their terms and conditions of sale.

12 FUTURE WORKS

There are no outstanding future works items.

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

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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.

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Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

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APPENDIX A – PRODUCT LITERATURE



Deks Flexi-Gib Bibault

For Cast Iron, Ductile Iron, Steel, PVC-U, PVC-M and AC pipe connections



- Wedge rubber seal suitable for a wide range of mediums and pipe diameters
- Cost effective installation with no disassembly on site
- Special bolt head makes the tightening quick and easy
- 316 Stainless Steel Barrel

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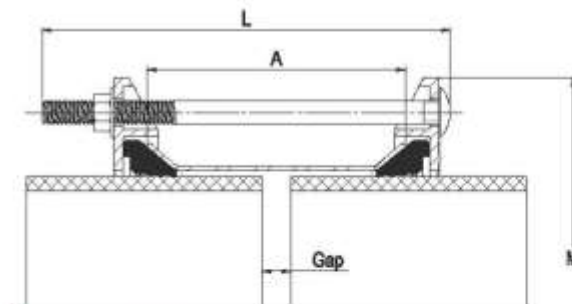
Selection Guide

SHORT SERIES										
Part No.	Size Range (mm)		End Ring (OD)	Length	Barrel Length	Total Angular Deflection		Bolts	Pressure	Weight
	Min	Max	M	L	A	@ Min Pipe Size	@ Max Pipe Size	No - Dia.	Mpa	(KG)
DGR20BS	88	103	216	210	101	6	Ni	3-M16	1.6	3.9
DGR100BS	106	128	243	210	121	6	Ni	3-M16	1.6	5.2
DGR150BS	158	182	304	220	135	6	Ni	3-M16	1.6	7

LONG SERIES										
Part No.	Size Range (mm)		End Ring (OD)	Length	Barrel Length	Total Angular Deflection		Bolts	Pressure	Weight
	Min	Max	M	L	A	@ Min Pipe Size	@ Max Pipe Size	No - Dia.	Mpa	(KG)
DGR080L	88	103	216	270	176	6	Ni	3-M16	1.6	4.7
DGR100L	106	128	243	270	176	6	Ni	3-M16	1.6	5.6
DGR150L	158	182	304	270	176	6	Ni	3-M16	1.6	7.7
DGR200L	216	242	354	285	176	6	Ni	3-M16	1.6	12
DGR225L	242	268	397	285	176	6	Ni	3-M16	1.6	13
DGR250L	270	296	417	285	176	6	Ni	6-M16	1.6	14
DGR300L	330	356	481	340	216	6	Ni	6-M16	1.6	22
DGR300AL	310	334	457	340	216	6	Ni	6-110	1.6	23
DGR375L	400	429	565	340	216	5	Ni	6-M16	1.6	35
DGR450L	488	512	636	340	216	3	Ni	10-M16	1.6	47
DGR500L	540	565	703	340	216	4	Ni	12-M16	1.6	49
DGR600L	636	660	818	340	216	3	Ni	14-M16	1.6	58

Application

- For potable and non-potable water applications
- Max 60°C
- 16 bar/1600 kPa allowable operating pressure (AOP)
- More capacity of compensation on axial gaps than other types of couplings



Component List

S.No.	Part	Material	Standard
1	Barrel	316 Stainless Steel	ASTM A240M
2	Elastomeric Seals	NBR	AS 1646
3	End Rings	Ductile Iron	AS 1831
4	Bolts	316 Stainless Steel	ASTM F593
5	Washers	316 Stainless Steel	ASTM F844
6	Nuts	316 Stainless Steel	ASTM F594

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UNIVERSAL STRAIGHT COUPLING

INSTALLATION MANUAL

RECOMMEND EQUIPMENTS

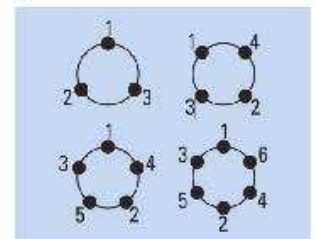
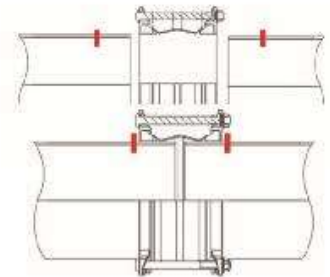
- Tension Wrench (0 – 150Nm) & 24mm long thread socket
- Pipe surface cleaning equipment.
- Gasket Lubricant approved for use with potable water

INITIAL PREPARATION

- All the coupling comes as an assembled and are ready to use, dismantling of the parts is not necessary.
- Examine the coupling before the assembly to ensure no damage has occurred before installation.
- Check the sealing range indicated on the label is compatible with actual pipe size.
- Examine the pipe ends and ensure they are round, smooth, free of bulges, dents, debris and score marks and within the outside diameter range given on the coupling label. Weld beams must be ground flush.

INSTALLATION

- Align the pipes to be joined, ensuring the pipe ends are concentric and the recommended pipe gaps (refer to selection guide) are applied. To aid installation, mark both pipe ends at a distance equal half of the overall assembled width of the coupling. Refer to diagram for illustration.
- Loosen the nuts to the point where the coupling components are slack and unrestrained. Lubricate all the surfaces of the sealing ring with the approved lubricant as required.
- Using the marking that were made on the pipes, slide coupling on to the fixed pipe end.
- Slide the free pipe end into the coupling, ensuring the marking on both pipes ends line up with the ends of the fitting
- Tighten the nuts in small increments in a diametrically sequence as shown in the diagram. Ensure that the barrel and end rings are kept centred around the pipe. It is essential that all the bolts are torque using a torque evenly as indicated on the table provided. Always retention bolts after 20 to 30 minutes to compensate the rubber sealing ring relaxation.



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UNIVERSAL STRAIGHT COUPLING

Recommended Torque

Coupling	'O'PVC Pipe Nm	All Other Pipe Nm
DGB100	40	60 - 70
DGB150 to DGB250	60	60 - 70
DGB300 and above	70	70 - 80

IMPORTANT NOTES

- DEKS Universal Pipe Couplings DO NOT provide axial pipe restraint, this must be provided by other means to both the coupling and pipes.
- External loading (i.e. weights of the pipelines, spool pieces, back fill etc.,) might affect the performance of the coupling, so all pipes should be supported independently on each side of the coupling.
- Rubber Sealing rings are only recommended for use in temperatures from 0° to 60°C.
- It is advisable to replace all stainless steel fasteners in the event of having to reposition the fitting.
- It is recommended that periodic assessment and maintenance of the coupling be undertaken in such environment.

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APPENDIX B - QUALITY ASSURANCE CERTIFICATES AND SCHEDULES

Copies of the following Quality Certification Certificates are also available for downloading from the WSAA members website.

TABLE B1 DEKS INDUSTRIES PTY LTD – MANAGEMENT SYSTEMS

5/841 Mountain Hwy Bayswater VIC 3153	
Quality Systems Standard	ISO 9001:2015
Certificate licence no.	C39465
Certifying agency	International Certification
Current date of certification	20 April 2017
Expiry date of certification	4 April 2020

TABLE B2 DEKS INDUSTRIES PTY LTD – PRODUCT CERTIFICATION

5/841 Mountain Hwy Bayswater VIC 3153	
Product Standard/Spec.	AS/NZS 4998:2009
Certificate No.	OMK30040
Issuing certification body	IAPMO R&T Oceana
First date of certification	6 th December 2013
Current date of certification	6 th December 2018
Expiry date of certification	5 th December 2023

TABLE B3 DALIAN ZHUHONG MECHANICAL CO LTD – MANAGEMENT SYSTEMS

Qingshan Village Yangzheng Street, Jinzhoun District, Dalian, Liaoning Province, China	
Quality Systems Standard	ISO 9001:2015
Certificate licence no.	USA16Q33585R2S
Certifying agency	Beijing East Allreach Certification Centre
First date of certification	8 September 2000
Current date of certification	22 June 2016
Expiry date of certification	21 June 2019

certificate of registration



This is to certify that the management systems of

DEKS Industries Pty Ltd

have been formally assessed by International Certifications and found to comply with the requirements of

ISO 9001:2015

Quality Management Systems - Requirements

20 Apr 2017

Issue Date

04 Apr 2020

Expiry Date

Oliver. L. Evans
Chief Executive Officer
International Certifications

Scope of Registration:

Importing storage and distribution of products for civil and construction industry.

Registered Site(s):

5/841 Mountain Hwy, Bayswater, VIC, 3153, Australia



JAS-ANZ



This certificate of registration is issued by International Certifications Limited, 138 Harris Road, East Tamaki, Auckland, New Zealand, 2013 (www.intlcert.com). Accreditation by Joint Accreditation System of Australia and New Zealand (www.jas-anz.org/register). Joint Accreditation System of Australia and New Zealand is a signatory to the IAF multi-lateral agreement (www.iaf.nu). This certificate remains the property of International Certifications Limited and must be returned upon request. It must not be altered or defaced in any way and deliberate misuse of the certificate or misrepresentation of the certification will result in cancellation without notification.

IAPMO R&T OCEANA

1040 Dandenong Road, Carnegie VIC 3163 AUSTRALIA



OceanaMark



IAPMO R&T Oceana is a product certification body which inspects and arranges for the independent laboratory testing of samples taken from the manufacturer's stock or from the market or a combination of both, to verify compliance of the requirements of applicable Standards and Specifications. This activity is coupled with periodic surveillance of the certified product, taken from the market place or the manufacturer's factory. This certification is subject to the conditions set forth in the characteristics below and is not to be construed as any recommendation, assurance or guarantee by IAPMO R&T Oceana of the product acceptance by Authorities Having Jurisdiction. The IAPMO R&T Oceana "OceanaMark" Product Certification Scheme is a JAS-ANZ accredited ISO Guide 87 Type 5 Product Certification Scheme.

OCEANAMARK CERTIFICATE

IAPMO R&T Oceana hereby grants to:

Deks Industries Pty Ltd

A.B.N.: 77 107 135 544

5/841 Mountain Highway, Bayswater, Melbourne, Victoria, Australia, 3153

the right to use the OceanaMark in accordance with IAPMO Oceana Pty Ltd 'Mark Rules' on the product as described in the attached OceanaMark Schedule. The Certificate is granted subject to IAPMO Oceana Pty Ltd 'Governance Rules'.

Evaluated to:

AS/NZS 4998:2009 Bolted unrestrained mechanical couplings for waterworks purposes

Manufacturer:

Refer to Certificate Holder

Certificate No.:	OMK30040	Certified Date:	6 December 2013
Issue Date:	6 December 2018	Expiry Date:	5 December 2023

Chief Executive Officer of the IAPMO Group

This OceanaMark certification is for the period indicated herein and is void after the date shown above. Any change in material, manufacturing process, marking or design without having first obtained the approval of IAPMO R&T Oceana, or any evidence of non-compliance with applicable Standards, Specifications or of inferior workmanship, may be deemed sufficient cause for revocation of this certification. Reproduction of or reference to this certificate for advertising purposes may be made only by specific written permission of IAPMO R&T Oceana. Any alteration of this certificate could be grounds for revocation of this certification.



OCEANAMARK SCHEDULE



Certificate Holder: Deks Industries Pty Ltd
Address: 5/841 Mountain Highway
 Bayswater, Victoria 3153
 AUSTRALIA
A.B.N.: 77 107 135 544

Manufacturer: Refer to Certificate Holder

Certificate No.: OMK30040

Issue Date: 06-Dec-18

Expiry Date: 05-Dec-23

First Certified: 06-Dec-13

Standards: AS/NZS 4998-2009

Bolted unrestrained mechanical couplings for waterworks purpose

Std/Spec: AS/NZS 4998-2009

Certificate No.: OMK30040

Brand Name	Model Name	Model ID	Product Type	Product Description	Nominal Size	Nominal Pressure	Material	Additional Product Information
Deks	Flexi-Gib	DGB80BS	Bolted unrestrained mechanical couplings for waterworks purposes	DN80 Short Barrel 88 - 103	DN80	PN16	316 SS/FBE coated DI	88 - 103mm
Deks	Flexi-Gib	DGB100BS	Bolted unrestrained mechanical couplings for waterworks purposes	DN100 Short Barrel 108 - 132	DN100	PN16	316 SS/FBE coated DI	108 - 132mm
Deks	Flexi-Gib	DGB150BS	Bolted unrestrained mechanical couplings for waterworks purposes	DN150 Short Barrel 158 - 182	DN150	PN16	316 SS/FBE coated DI	158 - 182mm
Deks	Flexi-Gib	DGB80BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN80 Long Barrel 88 - 103	DN80	PN16	316 SS/FBE coated DI	88 - 103mm
Deks	Flexi-Gib	DGB100BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN100 Long Barrel 108 - 132	DN100	PN16	316 SS/FBE coated DI	108 - 132mm
Deks	Flexi-Gib	DGB150BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN150 long Barrel 158 - 182	DN150	PN16	316 SS/FBE coated DI	158 - 182mm
Deks	Flexi-Gib	DGB200BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN200 Long Barrel 214 - 238	DN200	PN16	316 SS/FBE coated DI	214 - 238mm
Deks	Flexi-Gib	DGB225BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN225 Long Barrel 242 - 269	DN225	PN16	316 SS/FBE coated DI	242 - 269mm
Deks	Flexi-Gib	DGB250BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN250 Long Barrel 270 - 295	DN250	PN16	316 SS/FBE coated DI	270 - 295mm
Deks	Flexi-Gib	DGB300AL	Bolted unrestrained mechanical couplings for waterworks purposes	DN300 Long Barrel 310 - 334	DN300	PN16	316 SS/FBE coated DI	310 - 334mm
Deks	Flexi-Gib	DGB300BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN300 Long Barrel 330 - 356	DN300	PN16	316 SS/FBE coated DI	330 - 356mm

W:

Std/Spec: AS/NZS 4998-2009

Certificate No.: OMK30040

Brand Name	Model Name	Model ID	Product Type	Product Description	Nominal Size	Nominal Pressure	Material	Additional Product Information
Deks	Flexi-Gib	DGB350AL	Bolted unrestrained mechanical couplings for waterworks purposes	DN350 Long Barrel 346 - 370	DN350	PN16	316 SS/FBE coated DI	346 - 370mm
Deks	Flexi-Gib	DGB375BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN375 Long Barrel 400 - 429	DN375	PN16	316 SS/FBE coated DI	400 - 429mm
Deks	Flexi-Gib	DGB400BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN400 Long Barrel 440 - 460	DN400	PN16	316 SS/FBE coated DI	440 - 460mm
Deks	Flexi-Gib	DGB450BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN450 Long Barrel 488 - 512	DN450	PN16	316 SS/FBE coated DI	488 - 512mm
Deks	Flexi-Gib	DGB500BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN500 Long Barrel 540 - 565	DN500	PN16	316 SS/FBE coated DI	540 - 565mm
Deks	Flexi-Gib	DGB600BL	Bolted unrestrained mechanical couplings for waterworks purposes	DN600 Long Barrel 656 - 680	DN600	PN16	316 SS/FBE coated DI	656 - 680mm

END RECORD

END RECORD



Chief Executive Officer of the IAPMO Group



APPENDIX C - WSA PRODUCT SPECIFICATION

WATER SERVICES ASSOCIATION of Australia

PRODUCT SPECIFICATION

WSA PS – 270 MECHANICAL COUPLINGS, NON-END THRUST RESTRAINT FOR PRESSURE APPLICATIONS – WATER SUPPLY AND SEWERAGE

270.1 SCOPE

This specification covers non-end thrust restraint mechanical couplings for use with PVC and ductile iron pipes having "cast iron outside diameters" (CIOD) in pressure applications in water supply¹ and sewerage.

270.2 REQUIREMENTS

- (a) Couplings for pipelines other than PE shall comply with AS/NZS 4998:2009.
- (b) Couplings for PE pipelines shall comply with AS/NZS 4129:2008/Amdt 1:2013.
- (c) Elastomeric joint seals shall be EPDM complying with AS 1646:2007 and AS 681.1:2008 (EN 681-1:1996).
- (d) Flange adaptor connections shall comply with AS/NZS 4087:2011/Amdt 1:2012.
- (e) For flanged adaptor end connections, full face and integral gaskets and O-rings shall comply with WSA 109:2011.
- (f) Jointing lubricants shall comply with AS/NZS 4020:2005.

270.3 QUALITY ASSURANCE

- (a) Couplings shall have product certification (ISO Type 5) to AS/NZS 4998:2009.
- (b) Polymeric coatings shall have product certification (ISO Type 5) to AS/NZS 4158:2003/Amdt 1:2005.
- (c) Elastomeric joint seals shall have product certification to AS 1646:2007 and AS 681.1:2008 (EN 681-1:1996).
- (d) For flanged adaptor end connections, full face and integral gaskets and O-rings shall have a certificate of compliance to WSA 109:2011.
- (e) Jointing lubricants shall have a certificate of compliance to AS/NZS 4020:2018.
- (f) All products shall be marked in accordance with the conformity assessment body's requirements.

270.4 AGENCY OR PROJECT SPECIFIC REQUIREMENTS

Pressure Class, PN	
Pipe material(s) to be joined	
Coupling length i.e. short series or long series	
Coupling type e.g. straight, stepped, flange adaptor	
For stepped couplings nominate the range of outside diameters to be joined	
For flange adaptors nominate the flange drilling Figure from AS/NZS 4087:2011/Amdt 1:2012 or other nominated flange Standard	
Alternative elastomeric material for joint seals	

NOTE:

- 1 Includes drinking water and recycled water supply. Colour differentiation is not required.

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APPENDIX D - SUPPLIER CONTACTS

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WATER SERVICES
ASSOCIATION OF AUSTRALIA