Global Pipe Australia Pty Ltd

PRODUCT APPRAISAL REPORT 2107

Arpol Stainless Steel Flexible Unrestrained Couplings

WSA PS 285 Flexible Stainless-Steel Couplings, Restrained and Non-Restrained Joints

Published: 25 August 2021

Document History

The following information indicates the changes made to this document.

Date	Version
11 August 2021	Client Review
11 August 2021	Peer Review
25 August 2021	Publication

Peer Reviewers

Name/Title	Organisation	Date
Product Appraisal Technical Advisory Group	WSAA	25 August 2021
WSAA Expert Panel	WSAA	25 August 2021
Peter Pittard, WSAA Consultant	WSAA	11 August 2021
Carl Radford, Product Appraisal Manager	WSAA	25 August 2021

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.

Copyright

CONTENTS

1 EXECUTIVE SUMMARY

The Trustee for Global Pipe Unit Trust trading as Global Pipe Australia Pty Ltd, a 100% Australian owned company, was established in 2007 and is a major supplier of pipe and pipe couplings for infrastructure projects throughout Australia.

Uniones Arpol SA, headquartered in Barcelona, Spain, is the manufacturer of ARPOL stainless steel flexible couplings.

This appraisal is for a range of ARPOL Instal and Rep stainless steel flexible unrestrained couplings manufactured to meet the requirements of WSA PS 285 *Flexible stainless-steel couplings, restrained and non-restrained join*ts with testing completed in accordance with the principles of ASTM F 1476:07 (2019*) Standard specification for performance of gasketed mechanical couplings for use in piping applications.*

The couplings submitted for appraisal are manufactured from Grade 316 stainless steel casings, components and fasteners and incorporate an EPDM sealing gasket suitable for pressure and non-pressure applications for water supply and sewerage, with the following attributes:

- Size range: DN 150 to DN 1200.
- Standard widths: 95, 140, 200 and 300mm.
- Allowable Operating Pressures: PN4 to PN35.

See Section 4 for additional details of the range.

Instal couplings are considered as the standard coupling in the ARPOL range and are suitable for joining DI, AC, PVC, steel, PE, GRP and concrete pipes. Rep couplings are designed for repair applications and may be opened out to allow fitment around the pipe to be repaired. Rep 2 has two locks and Rep 3 has 3 locks.

Uniones Arpol SA holds an ISO 9001:2015 Quality Management System Licence.

This Appraisal has determined that the ARPOL stainless steel flexible unrestrained couplings, as detailed in this report, meet the requirements of WSA PS 285 *Flexible stainless-steel couplings, restrained and non-restrained joints* and are considered 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 ARPOL stainless steel flexible unrestrained couplings, as detailed in this report, for use in water supply and sewerage applications provided the design, installation and acceptance testing are in accordance with WSAA codes and manufacturer’s requirements.

2 THE APPLICANT

The Applicant is The Trustee for Global Pipe Unit Trust trading as Global Pipe Australia Pty Ltd.

2.1 The Supplier

Global Pipe, a 100% Australian owned company, was established in 2007 and is a major supplier of pipe and pipe couplings for infrastructure projects throughout Australia.

Global Pipe has been appointed as the agent and distributor for the Arpol range of stainless-steel flexible couplings within Australia and New Zealand.

2.2 The Manufacturer

Uniones Arpol SA, headquartered in Barcelona, Spain, is the manufacturer of ARPOL stainless steel flexible couplings.

Arpol commenced operations in 1976 as a pioneering family business and has grown to become an internationally recognised manufacturer of couplings servicing pipelines including for the water, chemical, power, construction, mining, domestic and bottling sectors.

3 THE PRODUCT

This appraisal is for a range of ARPOL Instal and Rep stainless steel flexible unrestrained couplings manufactured to meet the requirements of WSA PS 285 *Flexible stainless-steel couplings, restrained and non-restrained join*ts with testing completed in accordance with the principles of ASTM F 1476:07 (2019*) Standard specification for performance of gasketed mechanical couplings for use in piping applications.*

The couplings submitted for appraisal are manufactured from Grade 316 stainless steel casings, components and fasteners and incorporate an EPDM sealing gasket suitable for pressure and non-pressure applications for water supply and sewerage, with the following attributes.

- Sizes range: DN 150 to DN 1200.
- Standard widths: 95, 140, 200 and 300mm.
- Allowable Operating Pressures: PN4 to PN35.

PN16 is recommended for reticulation pressure applications however couplings can be specifically supplied to suit other pressure applications by varying the body wall thickness, width of coupling and number of bolts.

This style of coupling is more robust in design than AS 4181 stainless steel repair clamps and are therefore suitable for joining pipes and are compatible with higher pressure pipelines.

Instal couplings are considered as the standard coupling in the ARPOL range and are suitable for joining DI, AC, PVC, steel, PE, GRP and concrete pipes.

FIGURE 1 ARPOL INSTAL COUPLING

Rep couplings are designed for repair applications and may be opened out to allow fitment around the pipe to be repaired. Rep 2 has two locks and Rep 3 has 3 locks.

REP-2

REP-3

FIGURE 2 ARPOL REP COUPLINGS

4 SCOPE OF THE APPRAISAL

The scope of this appraisal includes ARPOL stainless steel flexible unrestrained couplings in sizes from DN 150 to DN 1200 with pressure ratings available from PN4 to PN35. See Tables 1 and 2 for details of the range included.

TABLE 1 ARPOL INSTAL COUPLING RANGE

DN	PIPE OD RANGE mm	WIDTH OF COUPLING mm			
		95	140	200	300
150	137-199	✓	✓	✓	✓
200	200-249	✗	✓	✓	✓
250	250-299	✗	✓	✓	✓
300	300-349	✗	✓	✓	✓
350	350-399	✗	✓	✓	✓
400	400-449	✗	✓	✓	✓
450	450-499	✗	✓	✓	✓
500	500-549	✗	✓	✓	✓
550	550-599	✗	✓	✓	✓
600	600-649	✗	✓	✓	✓
650	650-699	✗	✓	✓	✓
700	700-749	✗	✓	✓	✓
750	750-799	✗	✓	✓	✓
800	800-849	✗	✓	✓	✓
850	850-899	✗	✓	✓	✓
900	900-949	✗	✓	✓	✓
950	950-999	✗	✓	✓	✓
1000	1000-1099	✗	✓	✓	✓
1100	1100-1199	✗	✓	✓	✓
1200	1200-1299	✗	✓	✓	✓
PN6, PN16 and PN35 are standard. Other pressure ratings are available on request.					

TABLE 2 ARPOL REP COUPLING RANGE

DN	PIPE OD RANGE mm	WIDTH OF COUPLING mm			
		95	140	200	300
150	137-199	✓	✓	✓	✓
200	200-249	✗	✓	✓	✓
250	250-299	✗	✓	✓	✓
300	300-349	✗	✓	✓	✓
350	350-399	✗	✓	✓	✓
400	400-449	✗	✓	✓	✓
450	450-499	✗	✓	✓	✓
500	500-549	✗	✓	✓	✓
550	550-599	✗	✓	✓	✓

600	600-649	✗	✓	✓	✓
650	650-699	✗	✓	✓	✓
700	700-749	✗	✓	✓	✓
750	750-799	✗	✓	✓	✓
800	800-849	✗	✓	✓	✓
850	850-899	✗	✓	✓	✓
900	900-949	✗	✓	✓	✓
950	950-999	✗	✓	✓	✓
1000	1000-1099	✗	✓	✓	✓
1100	1100-1199	✗	✓	✓	✓
1200	1200-1299	✗	✓	✓	✓
PN6, PN16 and PN35 are standard. Other pressure ratings are available on request.					

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts stainless steel flexible couplings manufactured to meet the requirements of WSA PS 285 *Flexible stainless-steel couplings, restrained and non-restrained join*ts with testing completed in accordance with the principles of ASTM F 1476:07 (2019*) Standard specification for performance of gasketed mechanical couplings for use in piping applications.*

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.

5.2 Performance Requirements

ARPOL stainless steel flexible couplings have been appraised for compliance with WSA PS 285 *Flexible stainless-steel couplings, restrained and non-restrained join*ts.

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 285 *Flexible stainless-steel couplings, restrained and non-restrained joints.*

A copy of the Product Specification is available at the following link:

https://www.wsaa.asn.au/shop/product/35716

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Global Pipe has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. 257883-2018-AQ-IBE-ENAC issued to Uniones Arpol SA by DNV-GL.

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

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

6.2 Compliance with Performance Requirements

6.2.1 Design

The casings and inner plates are manufactured from hot rolled sheet or strip coils cut, formed and welded to meet specific requirements. The thickness of the casing varies from 1.5mm to 5mm and can be doubled and welded for additional pressure capability. The components are then sandblasted, cleaned and pickled prior to assembly and testing.

The stainless-steel bars are machined in house by Arpol.

The specially designed gaskets incorporate a dynamic lip seal designed to increase effectiveness as internal pressure is applied. See Figure 3 for details of the coupling components.

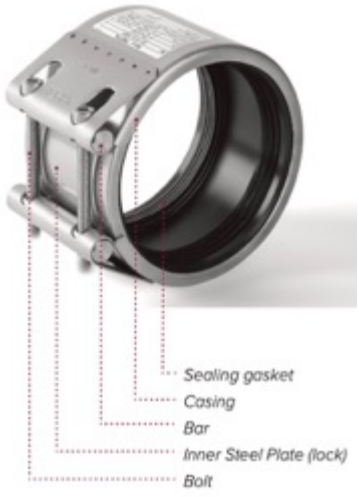


FIGURE 3 COUPLING COMPONENTS

The Arpol Instal couplings are designed to accommodate the tolerances shown in Table 3.

TABLE 3 DESIGN TOLERANCES

DN	Maximum diameter difference mm	Maximum angular deflection degrees	Maximum misalignment mm
150 - 250	2.5	2	2
250 - 500	2.5	2	3
500 - 1200	3.0	2	3

6.2.2 Material requirements

6.2.2.1 *Stainless steel*

The casing, inner plate and bars are manufactured from Grade 316L stainless steel. Copies of material test reports have been submitted by Global to demonstrate compliance to ASTM A240.

6.2.2.2 *Elastomeric seals*

The seals are manufactured from EPDM material by VIP Polymers Limited. The seals are manufactured under cover of an EN 681-1 ISO Type 5 Kitemark Product Certification No. KM 07729 issued to VIP Polymers Limited by BSI.

Seals are also available in Nitrile material where required.

6.2.2.3 *Fasteners*

The fastener material is Grade 316 stainless steel. An anti-seize compound is applied to the mating surfaces.

6.2.3 Type tests

Type tests have been completed for DN 50, DN 400, DN 600 and DN 1200 couplings to demonstrate compliance with the requirements of WSA-PS 285 and ASTM F 1476:07 (2019*).* The tests undertaken at the Arpol manufacturing facility and witnessed by Lloyd's Register include:

- Positive hydrostatic pressure test at 2.4 MPa for 10 minutes.
- Negative internal pressure (infiltration) test at -80kPa to -85kPa for 5 minutes.
- Hydrostatic test at 1.6 MPa for 10 minutes with a pipe axial withdrawal of 10mm.
- Hydrostatic test at 1.6 MPa for 10 minutes with an angular deflection of 6^0.

Additional tests were also completed as follows:

- Pneumatic leak test at 600kPa for 5 minutes

6.2.4 Contact with drinking water

Global Pipe has submitted test report No. AAQ14910 dated 10th August 2021 from Eurofins ams (NATA Accreditation No. 15773) for a DN 50 coupling to demonstrate that the couplings comply with the requirements of AS/NZS 4020:2018.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

Installations instructions for both Instal and Rep type couplings are included in Appendix A.

8 PRODUCT MARKING

The following information is provided on a tag attached to each coupling:

- Manufacturers Name: Arpol
- Type of coupling: e.g., instal, Rep 2
- Product Code: e.g., IBY 320-326 A4E12
- Nominal Pressure: e.g., 16 bar
- Torque: e.g., 25 Nm
- Gasket material: EPDM
- Coupling range: e.g., 320/326 mm
- Angular deflection: e.g., 2^0
- Maximum difference between pipe OD: e.g., 2.5 mm
- Maximum misalignment: e.g., 3 mm

Note: WSAA advises that adhesive labels should not be used on stainless steel components

FIGURE 4 EXAMPLE OF MARKING

9 PACKAGING AND TRANSPORTATION

Each coupling is individually shrink wrapped to protect the locking parts from dust and avoid soiling of the packaging from the greased lock components. The couplings are then packed into individual cardboard boxes. The boxes are then stacked onto pallets and the shipment is shrink wrapped for transport.

FIGURE 5 EXAMPLE OF PACKAGING

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 Global Pipe's warranty is included in their terms and conditions of sale.

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD-TESTING REPORT

Uniones Arpol SA couplings have been used by Australian and NZ Water Agencies including Yarra Valley Water, City West Water, Power and Water (NT), Barwon Water, Watercare Services (NZ), Queensland Urban Utilities and Melbourne Water for more than 5 years. No issues with the coupling quality have been encountered.

The Global Pipe website at https://www.globalpipe.com.au/projects/ includes case studies from various projects.

12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

No issues were raised.

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.

14.2 Limits on Reliance on Information and Recommendations

14.2.1 Disclaimer of liability

Neither the Publisher(s) nor any person involved in the preparation of the Report accept(s) any liability for any loss or damage suffered by any person however caused (including negligence or the omission by any person to do anything) relating in any way to the Report or the product appraisal criteria underlying it. This includes (without limitation) any liability for any recommendation or information in the Report or any errors or omissions.

14.2.2 Intellectual Property and other rights

The Water Services Association of Australia Limited does not undertake any assessment of whether the importation, manufacture, sale or use of the Product the subject of this Report infringes the intellectual property rights or proprietary rights of any person. Recipients of the report should undertake their own assessment of whether (as relevant) the importation, manufacture, sale or use of the relevant Products infringe the intellectual property rights or other proprietary rights of any person. If the Product infringes intellectual property rights or other proprietary rights there is potential for the supply of the Products to be interrupted.

From time to time the Water Services Association of Australia Limited and the other Publishers may receive notice of allegations that the importation, manufacture, sale or use of the Product infringes intellectual property rights or other proprietary rights. The Water Services Association of Australia Limited's policy is to not refer to such allegations in its reports or take any other steps to put Recipients on notice of such allegations, unless and

until it is aware that the allegations have been admitted or proved in Court. As such, Recipients acknowledge, agree and accept that the Water Services Association of Australia Limited may have information in its possession about intellectual property rights infringement allegations or other infringement allegations in relation to the Product which are not referred to or disclosed in this Report and which are not otherwise communicated to Recipients.

14.2.3 Need for independent assessment

The information and any recommendation contained (expressly or by implication) in this Report are provided in good faith (and subject to the limitations noted in this Report). However, you should treat the information as indicative only. You should not rely on that information or any such recommendation except to the extent that you reach an agreement to the contrary with the Publisher(s).

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 indemnify 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.

14.3 No Updating

Neither the Publisher(s) nor any person involved in the preparation of this Report [has] [have] any obligation to notify you of any change in the information contained in this Report or of any new information concerning the Publisher(s) or the Product or any other matter.

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.

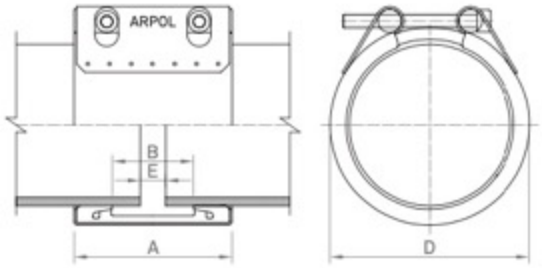
APPENDIX A – PRODUCT LITERATURE

ARPOL INSTAL

Nominal width 95

Series IBX

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316 L	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM / NBR / Silicone*

OD		Pressure							Bolts	
mm	mm	PN bar	PS bar	A mm	B mm	D mm	E^1 mm	E^2 mm	Diam.	Tor. Nm
48,3	47 - 49	16	45	78	31	67,3	5	15	M 8	7
54,0	53 - 55	16	45	78	31	73,0	5	15	M 8	7
57,0	56 - 58	16	40	78	31	76,0	5	15	M 8	7
60,3	59 - 61	16	40	78	31	79,3	5	15	M 8	7
63,0	62 - 65	16	40	78	31	82,0	5	15	M 8	7
76,1	74 - 77	16	30	94	45	98,1	5	15	M 8	7
84,0	82 - 85	16	30	94	45	106,0	5	15	M 8	7
88,9	87 - 91	16	30	95	45	110,9	5	15	M 8	7
104,0	102 - 106	16	30	95	45	126,0	5	15	M 8	10
108,0	107 - 111	14	30	95	45	130,0	5	15	M 8	10
114,3	112 - 117	13	30	95	45	136,3	5	15	M 8	10
125,0	124 - 127	12	20	95	45	147,0	5	15	M 8	10
129,0	127 - 131	12	20	95	45	151,0	5	15	M 8	10
133,0	131 - 136	11	20	95	45	155,0	5	15	M 8	10
139,7	137 - 142	11	20	95	45	161,7	5	15	M 8	10
154,0	152 - 156	10	20	95	45	176,0	5	15	M 8	10
159,0	156 - 161	10	20	95	45	181,0	5	15	M 8	10
168,3	166 - 171	10	20	95	45	190,3	5	15	M 8	10

E^1 *Permitted gaps without internal band* ***E^2*** *Permitted gaps with internal band*
PN *Shipbuilding industry safety factor ≥4* ***PS*** *Working pressure* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

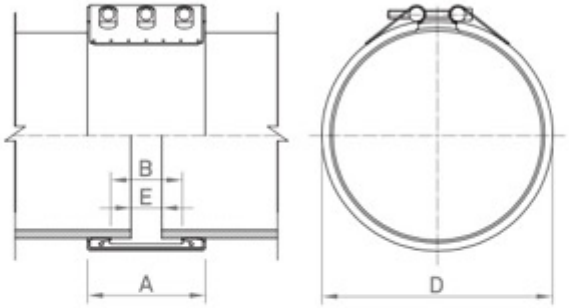
OD	Maximum diameter difference	Maximum angular deflection	Maximum misalignment
mm	mm	degrees	mm
48,3	0,5	4,0	1,0
54 - 63	1,0	4,0	1,0
76,1 - 104	1,5	4,0	1,0
108 - 154	2,5	4,0	1,0
159 - 168,3	2,5	4,0	2,0

See page 7 (Permitted tolerances)

Nominal width 140

Series IBY to IFY

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	IBY	ICY	IDY	IEY	IFY
	mm	mm	mm	mm	mm
A	139	140	141	142	144
B	86	86	86	86	86
D	DE + 23	DE + 24	DE + 25	DE + 26	DE + 28
E¹	10	10	10	10	10
E²	35	35	35	35	35

	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM / NBR / Silicone*

DN	IBY			ICY			IDY			IEY			IFY		
mm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm
150	23	M 10	20	30	M 10	20									
200	18	M 10	20	24	M 10	20	30	M 10	20						
250	15	M 10	20	19	M 10	20	24	M 10	20						
300	12	M 10	25	16	M 10	20	20	M 10	20						
350	11	M 10	30	14	M 10	20	18	M 10	20	21	M 10	20	28	M 12	25
400	9	M 10	30	13	M 10	20	16	M 10	20	19	M 10	20	25	M 12	25
450	8	M 10	25	11	M 10	25	14	M 10	25	17	M 12	30	22	M 12	30
500	8	M 10	30	10	M 10	25	13	M 10	25	15	M 12	30	20	M 12	35
550	7	M 10	30	9	M 10	30				14	M 12	35	19	M 12	35
600	6	M 10	30	9	M 10	30				13	M 12	35	17	M 12	35
650	6	M 10	35	8	M 10	35				12	M 12	45	16	M 12	45
700	6	M 10	35	7	M 10	35				11	M 12	45	15	M 12	45
750	5	M 10	40	7	M 10	40				10	M 12	45	14	M 16	60
800	5	M 10	40	6	M 12	50				10	M 12	50	13	M 16	70
850				6	M 12	60				9	M 12	60	12	M 16	70
900				6	M 12	60				9	M 12	60	12	M 16	80
950				5	M 12	60				8	M 12	60	11	M 16	80
1000				5	M 12	70				8	M 12	70	10	M 16	90
1100				5	M 12	70				7	M 16	90	9	M 16	90
1200				4	M 12	80				7	M 16	100	9	M 16	100

Nominal diameter serve as guidance of the pressure scale. Measures in between DN range can be manufactured.
E¹ *Permitted gaps without internal band* ***E²*** *Permitted gaps with internal band* ***PS*** *Working pressure* ***DN*** *Nominal Diameter* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

OD	Maximum diameter difference	Maximum angular deflection	Maximum misalignment
mm	mm	degrees	mm
150 - 250	2,5	2,0	2,0
250 - 500	2,5	2,0	3,0
500 - 1200	3,0	2,0	3,0

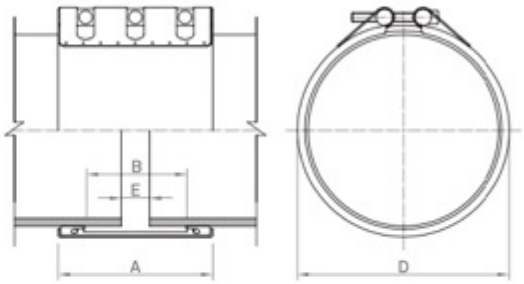
See page 7 (Permitted tolerances)

ARPOL INSTAL

Nominal width 200

Series IBZ to IHFZ

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	IBZ	ICZ	IDZ	IEZ	IFZ	IGZ	IHFZ
	mm	mm	mm	mm	mm	mm	mm
A	199	200	201	202	204	206	204
B	142	142	142	142	142	142	142
D	DE + 23	DE + 24	DE + 25	DE + 26	DE + 28	DE + 30	DE + 52
E^1	15	15	15	15	15	15	15
E^2	60	60	60	60	60	60	60

	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM / NBR / Silicone*

DN	IBZ			ICZ			IDZ			IEZ			IFZ			IGZ			IHFZ		
mm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm
150	23	M 12	20	30	M 12	20															
200	18	M 12	25	24	M 12	25	30	M 12	20												
250	15	M 12	25	19	M 12	25	24	M 12	20												
300	12	M 12	30	16	M 12	30	20	M 12	20												
350	11	M 12	35	14	M 12	30	18	M 12	25	21	M 12	25	28	M 16	30						
400	9	M 12	35	13	M 12	25	16	M 12	30	19	M 12	25	25	M 16	60						
450	8	M 12	45	11	M 12	30	14	M 12	30	17	M 12	30	22	M 16	40						
500	8	M 12	45	10	M 12	35	13	M 12	35	15	M 12	30	20	M 16	40						
550	7	M 12	35	9	M 12	35				14	M 16	45	19	M 16	45						
600	6	M 12	35	9	M 12	35				13	M 16	50	17	M 16	50	21	M 20	60	27	M 20	70
650	6	M 12	40	8	M 12	45				12	M 16	60	16	M 16	60	20	M 20	70	25	M 20	80
700	6	M 12	45	7	M 12	45				11	M 16	60	15	M 16	60	18	M 20	70	24	M 20	80
750	5	M 12	45	7	M 12	45				10	M 16	60	14	M 16	60	17	M 20	80	22	M 20	80
800	5	M 12	50	6	M 12	50				10	M 16	70	13	M 16	70	16	M 20	90	20	M 20	90
850				6	M 12	60				9	M 16	70	12	M 16	70	15	M 20	90	19	M 20	90
900				6	M 12	60				9	M 16	80	12	M 16	80	14	M 20	100	19	M 20	100
950				5	M 12	60				8	M 16	80	11	M 16	80	14	M 20	100	17	M 20	100
1000				5	M 12	70				8	M 16	90	10	M 16	90	13	M 20	120	16	M 20	110
1100				5	M 16	90				7	M 16	90	9	M 16	90	12	M 20	120	15	M 20	120
1200				4	M 16	100				7	M 16	100	9	M 16	10	11	M 20	140	14	M 20	140
1300										6	M 16	120	9	M 16	120	10	M 20	140	13	M 20	140
1400										6	M 16	120	7	M 16	120	9	M 20	160	12	M 20	160
1500										5	M 16	140	7	M 16	140	9	M 20	160	11	M 20	160

Nominal diameter serve as guidance of the pressure scale. Measures in between DN range can be manufactured.
E^1 *Permitted gaps without internal band* E^2 *Permitted gaps with internal band* ***PS*** *Working pressure* ***DN*** *Nominal Diameter* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

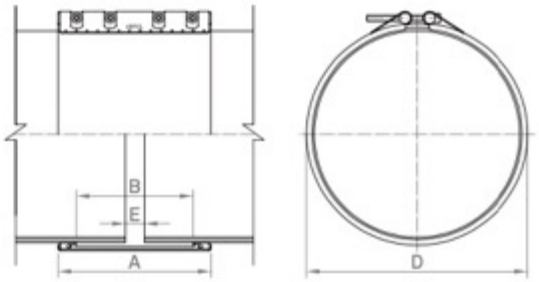
OD	Maximum diameter difference		Maximum angular deflection		Maximum misalignment	
	IBZ - IGZ	IHFZ	IBZ - IGZ	IHFZ	IBZ - IGZ	IHFZ
mm	mm		degrees		mm	
150 - 250	2,5		2,0		2,0	
250 - 500	2,5		2,0		3,0	
500 - 1500	3,0	2,0	2,0	1,0	3,0	2,0

See page 7 (Permitted tolerances)

Nominal width 300

Series IBW a IHGW

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1,5 x PS



	IBW	ICW	IDW	IEW	IFW	IGW	IHFW	IHGW
	mm	mm	mm	mm	mm	mm	mm	mm
A	294	295	296	297	299	301	299	301
B	230	230	230	230	230	230	230	230
D	DE + 23	DE + 24	DE + 25	DE + 26	DE + 28	DE + 30	DE + 52	DE + 56
E¹	15	15	15	15	15	15	15	15
E²	80	80	80	80	80	80	80	80

	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM*

DN	IBW			ICW			IDW			IEW			IFW			IGW			IHFW			IHGW		
mm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm
300	12	M 12	15	16	M 12	15	20	M 12	15															
350	11	M 12	20	14	M 12	20	18	M 12	20	21	M 16	25	28	M 16	25									
400	9	M 12	20	13	M 12	20	16	M 12	20	19	M 16	30	25	M 16	30									
450	8	M 12	25	11	M 12	25	14	M 12	25	17	M 16	30	22	M 16	30									
500	8	M 12	25	10	M 12	25	13	M 12	25	15	M 16	35	20	M 16	35									
550	7	M 12	30	9	M 12	30				14	M 16	35	19	M 16	35									
600	6	M 12	30	9	M 12	30				13	M 16	40	17	M 16	40	21	M 20	40	27	M 20	60	34	M 24	60
650	6	M 12	30							12	M 16	45	16	M 16	45	20	M 20	60	25	M 20	60	32	M 24	60
700	6	M 12	35							11	M 16	45	15	M 16	45	18	M 20	60	23	M 20	70	29	M 24	80
750	5	M 12	35							10	M 16	50	14	M 16	50	17	M 20	60	22	M 20	70	27	M 24	80
800	5	M 12	40							10	M 16	50	13	M 16	50	16	M 20	70	20	M 20	70	26	M 24	90
850										9	M 16	60	12	M 16	60	15	M 20	70	19	M 20	80	24	M 24	90
900										9	M 16	60	12	M 16	60	14	M 20	70	18	M 20	80	23	M 24	100
950										8	M 16	60	11	M 16	60	14	M 20	80	17	M 20	90	22	M 24	100
1000										8	M 16	70	10	M 16	70	13	M 20	80	16	M 20	90	21	M 24	120
1100										7	M 16	70	9	M 16	70	12	M 20	90	15	M 20	100	19	M 24	120
1200										7	M 16	80	9	M 20	100	11	M 20	100	14	M 20	120	17	M 24	140
1300										6	M 16	80	8	M 20	100	10	M 20	100	13	M 20	120	16	M 24	140
1400										6	M 16	90	7	M 20	120	9	M 20	120	12	M 20	120	15	M 24	160
1500										5	M 16	100	7	M 20	120	9	M 20	120	11	M 20	140	14	M 24	160

Nominal diameter serve as guidance of the pressure scale. Measures in between DN range can be manufactured.
E¹ *Permitted gaps without internal band* ***E²*** *Permitted gaps with internal band* ***PS*** *Working pressure* ***DN*** *Nominal Diameter* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

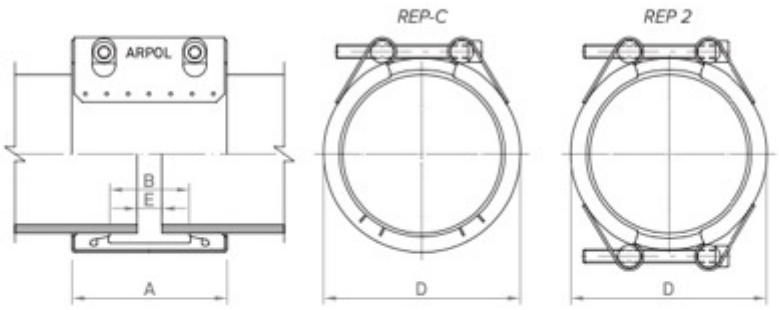
OD	Maximum diameter difference		Maximum angular deflection		Maximum misalignment	
	IBW - IGW	IHFW - IHGW	IBW - IGW	IHFW - IHGW	IBW - IGW	IHFW - IHGW
mm	mm		degrees		mm	
300 - 500	2,5		2,0		3,0	
500 - 1500	3,0	2,0	2,0	1,0	3,0	2,0

See page 7 (Permitted tolerances)

Nominal width 95

Series IBXC - IBXR

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM / NBR / Silicone*

OD	Range		Pressure	Dimensions					Bolts	
mm	IBXC mm	IBXR mm	PS bar	A mm	B mm	D mm	E^1 mm	E^2 mm	Diam.	Tor. Nm
48,3	47 - 49		45	78	31	68	5	15	M 8	7
54,0	53 - 55		45	78	31	74	5	15	M 8	7
57,0	56 - 58		40	78	31	77	5	15	M 8	7
60,3	59 - 61	57 - 64	40	78	31	80	5	15	M 8	7
63,0	62 - 65	60 - 64	40	78	31	84	5	15	M 8	7
66,0		64 - 68	40	94	45	88	5	15	M 8	7
69,0		67 - 72	30	94	45	92	5	15	M 8	7
76,1	74 - 77	74 - 78	30	94	45	99	5	15	M 8	7
84,0	82 - 85	80 - 86	30	94	45	107	5	15	M 8	7
88,9	87 - 91	87 - 93	30	95	45	113	5	15	M 8	7
94,0		90 - 96	30	95	45	116	5	15	M 8	7
104,0	102 - 106	98 - 106	30	95	45	128	5	15	M 8	10
108,0	107 - 111	107 - 111	30	95	45	133	5	15	M 8	10
114,3	112 - 117	110 - 116	30	95	45	139	5	15	M 8	10
125,0	124 - 127	118 - 125	20	95	45	149	5	15	M 8	10
129,0	127 - 131	125 - 131	20	95	45	153	5	15	M 8	10
133,0	131 - 136	131 - 136	20	95	45	158	5	15	M 8	10
139,7	137 - 142	137 - 144	20	95	45	164	5	15	M 8	10
154,0	152 - 156	147 - 156	20	95	45	178	5	15	M 8	10
159,0	156 - 161	156 - 162	20	95	45	183	5	15	M 8	10
168,3	166 - 171	166 - 171	20	95	45	193	5	15	M 8	10

E^1 *Permitted gaps without internal band* ***E^2*** *Permitted gaps with internal band* ***PS*** *Working pressure* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

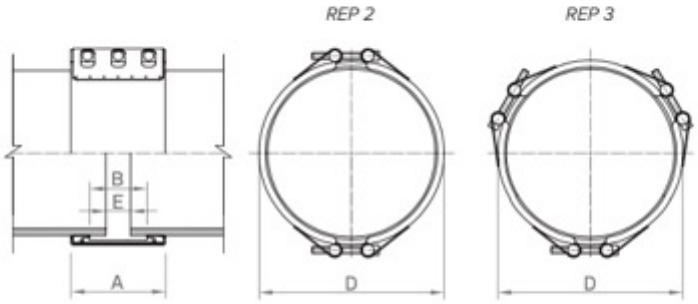
OD	Maximum diameter difference		Maximum angular deflection		Maximum misalignment		Maximum crack width	
	IBXC	IBXR	IBXC	IBXR	IBXC	IBXR	IBXC	IBXR
mm	mm		degrees		mm		mm	
48,3	0,5	-	4,0	-	1,0	-	20	
54 - 69	1,0	2,0	4,0	4,0	1,0	1,0	20	
76,1 - 104	1,5	3,0	4,0	4,0	1,0	1,0	35	
108 - 154	2,5	3,0	4,0	4,0	1,0	1,0	35	
159 - 168,3	2,5	3,0	4,0	4,0	2,0	2,0	35	

See page 7 (Permitted tolerances)

Nominal width 140

Series IBYR to IFYR
IBY3 to IFY3

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	IBYR IBY3	ICYR ICY3	IDYR IDY3	IEYR IEY3	IFYR IFY3
	mm	mm	mm	mm	mm
A	139	140	141	142	144
B	86	86	86	86	86
D	DE + 23	DE + 24	DE + 25	DE + 26	DE + 28
E¹	10	10	10	10	10
E²	35	35	35	35	35

	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM / NBR / Silicone*

DN	IBYR - IBY3			ICYR - ICY3			IDYR - IDY3			IEYR - IEY3			IFYR - IFY3		
mm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm
150	23	M 10	20	30	M 10	20									
200	18	M 10	20	24	M 10	20	30	M 10	20						
250	15	M 10	20	19	M 10	20	24	M 10	20						
300	12	M 10	25	16	M 10	20	20	M 10	20						
350	11	M 10	30	14	M 10	20	18	M 10	20	21	M 10	20	28	M 12	25
400	9	M 10	30	13	M 10	20	16	M 10	20	19	M 10	20	25	M 12	25
450	8	M 10	25	11	M 10	25	14	M 10	25	17	M 12	30	22	M 12	30
500	8	M 10	30	10	M 10	25	13	M 10	25	15	M 12	30	20	M 12	35
550	7	M 10	30	9	M 10	30	12	M 10	30	14	M 12	35	19	M 12	35
600	6	M 10	30	9	M 10	30	11	M 10	30	13	M 12	35	17	M 12	35
650	6	M 10	35	8	M 10	35	10	M 12	40	12	M 12	45	16	M 12	45
700	6	M 10	40	7	M 10	35	9	M 12	45	11	M 12	45	15	M 12	45
750	5	M 10	40	7	M 10	40				10	M 12	45	14	M 16	60
800	5	M 10	40	6	M 12	50				10	M 12	50	13	M 16	70
850	5	M 10	45	6	M 12	60				9	M 12	60	12	M 16	70
900				6	M 12	60				9	M 12	60	12	M 16	80
950				5	M 12	60				8	M 12	60	11	M 16	80
1000				5	M 12	70				8	M 12	70	10	M 16	90
1100				5	M 12	70				7	M 16	90	9	M 16	90
1200				4	M 12	80				7	M 16	100	9	M 16	100

Nominal diameter serve as guidance of the pressure scale. Measures in between DN range can be manufactured.
E¹ *Permitted gaps without internal band* ***E²*** *Permitted gaps with internal band* ***PS*** *Working pressure* ***DN*** *Nominal Diameter* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

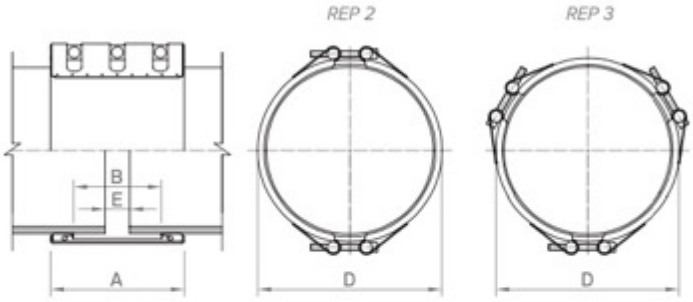
OD	Maximum diameter difference		Maximum angular deflection	Maximum misalignment	Maximum crack width
	2 locks	3 locks			
mm	mm	mm	degrees	mm	mm
150 - 250	5,0	6,0	2,0	2,0	50
250 - 500	5,0	6,0	2,0	3,0	50
500 - 1200	6,0	7,0	2,0	3,0	50

See page 7 (Permitted tolerances)

Nominal width 200

Series IBZR to IHFZR
IBZ3 to IHFZ3

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	IBZR IBZ3	ICZR ICZ3	IDZR IDZ3	IEZR IEZ3	IFZR IFZ3	IGZR IGZ3	IHFZR IHFZ3
	mm	mm	mm	mm	mm	mm	mm
A	199	200	201	202	204	206	204
B	142	142	142	142	142	142	142
D	DE+23	DE+24	DE+25	DE+26	DE+28	DE+30	DE+52
E[1]	15	15	15	15	15	15	15
E[2]	60	60	60	60	60	60	60

	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM / NBR / Silicone*

DN	IBZR - IBZ3			ICZR - ICZ3			IDZR - IDZ3			IEZR - IEZ3			IFZR - IFZ3			IGZR - IGZ3			IHFZR - IHFZ3		
mm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm
150	23	M 12	20	30	M 12	20															
200	18	M 12	25	24	M 12	25	30	M 12	20												
250	15	M 12	25	19	M 12	25	24	M 12	20												
300	12	M 12	30	16	M 12	30	20	M 12	20												
350	11	M 12	35	14	M 12	30	18	M 12	25	21	M 12	25	28	M 16	30						
400	9	M 12	35	13	M 12	25	16	M 12	30	19	M 12	25	25	M 16	60						
450	8	M 12	45	11	M 12	30	14	M 12	30	17	M 12	30	22	M 16	40						
500	8	M 12	45	10	M 12	35	13	M 12	35	15	M 12	30	20	M 16	40						
550	7	M 12	35	9	M 12	35	12	M 12	35	14	M 16	45	19	M 16	45						
600	6	M 12	35	9	M 12	35	11	M 12	40	13	M 16	50	17	M 16	50	21	M 20	60	27	M 20	70
650	6	M 12	40	8	M 12	45	10	M 12	45	12	M 16	60	16	M 16	60	20	M 20	70	25	M 20	70
700	6	M 12	45	7	M 12	45	9	M 12	45	11	M 16	60	15	M 16	60	18	M 20	70	23	M 20	80
750	5	M 12	45	7	M 12	45				10	M 16	60	14	M 16	60	17	M 20	80	22	M 20	80
800	5	M 12	50	6	M 12	50				10	M 16	70	13	M 16	70	16	M 20	90	20	M 20	90
850	5	M 12	60	6	M 12	60				9	M 16	70	12	M 16	70	15	M 20	90	19	M 20	90
900				6	M 12	60				9	M 16	80	12	M 16	80	14	M 20	100	18	M 20	100
950				5	M 12	60				8	M 16	80	11	M 16	80	14	M 20	100	17	M 20	100
1000				5	M 12	70				8	M 16	90	10	M 16	90	13	M 20	120	16	M 20	120
1100				5	M 16	90				7	M 16	90	9	M 16	90	12	M 20	120	15	M 20	120
1200				4	M 16	100				7	M 16	100	9	M 16	100	11	M 20	140	14	M 20	140
1300										6	M 16	120	8	M 16	120	10	M 20	140	13	M 20	140
1400										6	M 16	120	7	M 16	120	9	M 20	160	12	M 20	160
1500										5	M 16	140	7	M 16	140	9	M 20	160	11	M 20	160
1600										5	M 16	140	7	M 20	180	8	M 20	180	10	M 20	180
1700										5	M 16	140	6	M 20	180	8	M 20	180	10	M 20	180
1800										4	M 16	160	6	M 20	200	7	M 20	200	9	M 20	200
1900										4	M 16	160	6	M 20	200	7	M 20	200	9	M 20	200
2000										4	M 16	180	5	M 20	200	7	M 20	220	8	M 20	200

Nominal diameter serve as guidance of the pressure scale. Measures in between DN range can be manufactured.
E[1] *Permitted gaps without internal band* ***E[2]*** *Permitted gaps with internal band* ***PS*** *Working pressure* ***DN*** *Nominal Diameter* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

OD	Maximum diameter difference				Maximum angular deflection		Maximum misalignment		Maximum crack width
	2 locks	3 locks	2 locks	3 locks	IBZR-IGZR	IHFZR	IBZR-IGZR	IHFZR	
	IBZR-IGZR	IBZ3-IGZ3	IHFZR	IHFZ3	IBZ3-IGZ3	IHFZ3	IBZ3-IGZ3	IHFZ3	
mm	mm	mm	mm	mm	degrees	degrees	mm	mm	mm
150 - 250	5,0	7,0			2,0		2,0		100
250 - 500	5,0	7,0			2,0		2,0		100
500 - 1500	6,0	8,0	3,0	4,0	2,0	1,0	3,0	2,0	100
1500 - 2000	6,0	8,0	3,0	4,0	1,0	1,0	3,0	2,0	100

See page 7 (Permitted tolerances)

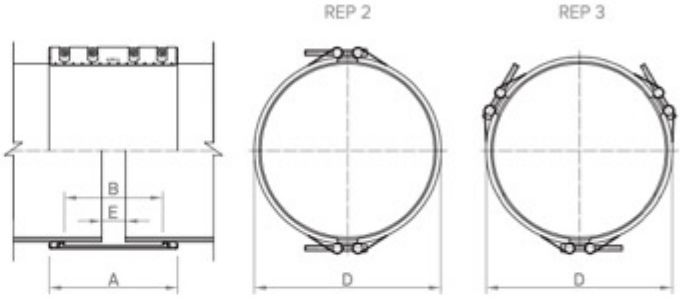
Please enquire about diameters above 2000 mm.

ARPOL REP

Nominal width 300

Series IBWR to IHGWR
IBW3 to IHGW3

To ensure correct operation, Fitting instructions must be respected.
Test pressure = 1.5 x PS



	IBWR IBW3	ICWR ICW3	IDWR IDW3	IEWR IEW3	IFWR IFW3	IGWR IGW3	IHFWR IHFW3	IHGWR IHGW3
	mm	mm	mm	mm	mm	mm	mm	mm
A	294	295	296	297	299	301	299	301
B	230	230	230	230	230	230	230	230
D	DE+23	DE+24	DE+25	DE+26	DE+28	DE+30	DE+52	DE+56
E^1	15	15	15	15	15	15	15	15
E^2	80	80	80	80	80	80	80	80

	Quality W1		Quality W2		Quality W4		Quality W5	
	AISI	DIN	AISI	DIN	AISI	DIN	AISI	DIN
Casing			304 L	1.4307	304 L	1.4307	316 L	1.4404
Bolts			1035	1.0501	304	1.4301	316	1.4401
Bars			1045	1.0503	304 L	1.4307	316 L	1.4404
Inner Steel Plate (Lock)			304 L	1.4307	304 L	1.4307	316 L	1.4404

Sealing gasket: *EPDM*

DN	IBWR - IBW3			ICWR - ICW3			IDWR - IDW3			IEWR - IEW3			IFWR - IFW3			IGWR - IGW3			IHFWR - IHFW3			IHGWR - IHGW3		
mm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm	PS bar	Diam.	Tor. Nm
300	12	M 12	15	16	M 12	15	20	M 12	15															
350	11	M 12	20	14	M 12	20	18	M 12	20	21	M 16	25	28	M 16	25									
400	9	M 12	20	13	M 12	20	16	M 12	20	19	M 16	30	25	M 16	30									
450	8	M 12	25	11	M 12	25	14	M 12	25	17	M 16	30	22	M 16	30									
500	8	M 12	25	10	M 12	25	13	M 12	25	15	M 16	35	20	M 16	35									
550	7	M 12	30	9	M 12	30	12	M 12	25	14	M 16	35	19	M 16	35									
600	6	M 12	30	9	M 12	30	11	M 12	30	13	M 16	40	17	M 16	40	21	M 20	40	27	M 20	60	34	M 24	60
650	6	M 12	30	8	M 12	30	10	M 12	30	12	M 16	45	16	M 16	45	20	M 20	60	25	M 20	60	32	M 24	60
700	6	M 12	35	7	M 12	35	9	M 12	30	11	M 16	45	15	M 16	45	18	M 20	60	23	M 20	70	29	M 24	80
750	5	M 12	35	7	M 12	35				10	M 16	50	14	M 16	50	17	M 20	60	22	M 20	70	27	M 24	80
800	5	M 12	35	6	M 12	40				10	M 16	50	13	M 16	50	16	M 20	70	20	M 20	70	26	M 24	90
850				6	M 12	45				9	M 16	60	12	M 16	60	15	M 20	70	19	M 20	80	24	M 24	90
900				6	M 12	45				9	M 16	60	12	M 16	60	14	M 20	70	18	M 20	80	23	M 24	100
950										8	M 16	60	11	M 16	60	14	M 20	80	17	M 20	90	22	M 24	100
1000										8	M 16	70	10	M 16	70	13	M 20	80	16	M 20	90	21	M 24	120
1100										7	M 16	70	9	M 16	70	12	M 20	90	15	M 20	100	19	M 24	120
1200										7	M 16	80	9	M 20	100	11	M 20	100	14	M 20	120	17	M 24	140
1300										6	M 16	80	8	M 20	100	10	M 20	100	13	M 20	120	16	M 24	140
1400										6	M 16	90	7	M 20	120	9	M 20	120	12	M 20	120	15	M 24	160
1500										5	M 16	100	7	M 20	120	9	M 20	120	11	M 20	140	14	M 24	160
1600										5	M 16	100	7	M 20	140	8	M 20	140	10	M 20	140	13	M 24	180
1700										5	M 20	140	6	M 20	140	8	M 20	140	10	M 20	160	12	M 24	180
1800										4	M 20	140	6	M 20	140	7	M 20	140	9	M 20	160	12	M 24	200
1900										4	M 20	160	6	M 20	160	7	M 20	160	9	M 20	180	11	M 24	200
2000										4	M 20	160	5	M 20	160	7	M 20	160	8	M 20	180	11	M 24	220

Nominal diameter serve as guidance of the pressure scale . Measures in between DN range up to 4000 mm can be manufactured..
E^1 *Permitted gaps without internal band* E^2 *Permitted gaps with internal band* ***PS*** *Working pressure* ***DN*** *Nominal Diameter* ***OD*** *Outside Diameter* ***Tor.*** *Torque Value*

OD	Maximum diameter difference				Maximum angular deflection		Maximum misalignment		Maximum crack width
	2 locks	3 locks	2 locks	3 locks	IBWR-IGWR	IHFWR-IHGWR	IBWR-IGWR	IHFWR-IHGWR	
	IBWR-IGWR	IBW3-IGW3	IHFWR-IHGWR	IHFW3-IHGW3	IBW3-IGW3	IHFW3-IHGW3	IBW3-IGW3	IHFW3-IHGW3	
mm	mm	mm	mm	mm	degrees	degrees	mm	mm	mm
300 - 500	5,0	7,0			2,0		3,0		190
500 - 1500	6,0	8,0	3,0	4,0	2,0	1,0	3,0	2,0	190
1500 - 2000	6,0	8,0	3,0	4,0	1,0	1,0	3,0	2,0	190

Please enquire about diameters above 2000 mm.

See page 7 (Permitted tolerances)

ARPOL INSTAL

CONEXIÓN
CONNECTIONS
VERBINDUNG
CONNEXION

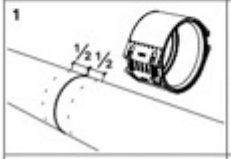
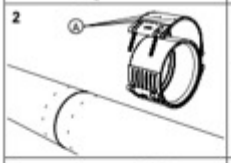
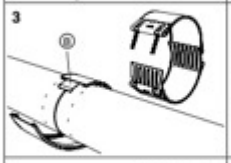
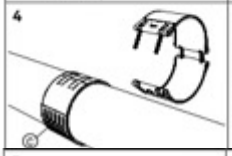
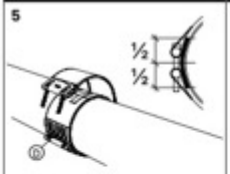
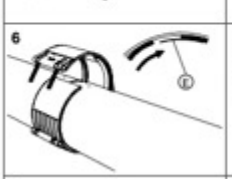
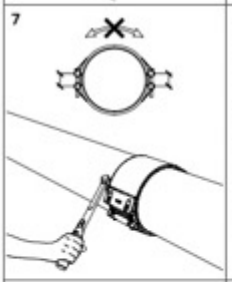
INSTRUCCIONES DE MONTAJE
FITTING INSTRUCTIONS
MONTAGEANLEITUNG
INSTRUCTION DE MONTAGE

	ESPAÑOL	ENGLISH	DEUTSCH	FRANÇAIS
	La unión ARPOL INSTAL, no está diseñada para soportar el peso o las fuerzas axiales de la tubería. **Respetar las indicaciones especificadas en la etiqueta**.	The ARPOL INSTAL couplings are not designed to withstand the weight or the axial forces of the pipe line. **The specifications on the label must be observed**.	Die Rohrkupplung ARPOL INSTAL ist nicht ausgelegt um das Gewicht oder axiale Kräfte des Rohres aufzunehmen. **Beachten Sie die Angaben auf dem Produktetikett**.	Le raccord ARPOL INSTAL n'est pas conçu pour supporter le poids ou les forces axiales de la conduite. **Respecter les indications spécifiées sur l'étiquette**.
1	Limpiar los extremos de los tubos y eliminar las irregularidades que puedan existir.	Clean the pipe ends and remove any irregularities.	Reinigen Sie die Rohrenden und entfernen Sie eventuelle Unregelmässigkeiten.	Nettoyer les extrémités des tuyaux et éliminer toute irrégularité existante.
2	En el extremo de los tubos, hacer una marca a una distancia igual a la mitad del ancho de la unión.	Measure and mark half the width of the coupling on each pipe end.	Markieren Sie die halbe Kupplungsbreite an beiden Rohrenden.	Marquer à chaque extrémité des tuyaux la moitié de la largeur du raccord à installer.
3	Deslizar la unión sobre el extremo de uno de los tubos **sin abrirla**.	Slide the coupling over one pipe end **without opening the coupling**.	Schieben Sie die Rohrkupplung über ein Rohrende **ohne die Kupplung zu öffnen**.	Faire glisser le raccord sur l'extrémité d'un des tuyaux **sans ouvrir le raccord**.
4	Encarar el segundo tubo, teniendo cuidado de alinear los tubos concéntricamente y de que los extremos estén bien apoyados. Ver tolerancias indicados en la etiqueta.	Bring the second pipe closer to the pipe end already fitted with the coupling. Align both pipes concentrically and make sure that they are resting on a firm support. Check the tolerances indicated on the label.	Positionieren Sie das zweite Rohrende. Achten Sie darauf, dass die Rohrenden konzentrisch ausgerichtet sind und beide Rohrenden gut gestützt sind. Siehe Toleranzen auf dem Produktetikett.	Placer en face le deuxième tuyau en prenant soin de les aligner concentriquement et que les extrémités soient bien appuyées. Voir les tolérances spécifiées sur l'étiquette.
5	Colocar la unión entre las marcas realizadas al principio y comprobar que **el acero del cierre de la unión este correctamente centrado**.	Slide the coupling into place, between the two marks (step 2). **Make sure that the inner steel plate is correctly placed under the lock**.	Platzieren Sie die Rohrkupplung zwischen die Markierungen (Schritt 2). Stellen Sie sicher, dass **das Verschlussblech korrekt unter dem Verschluss liegt**.	Placer le raccord entre les marques faites avant et **vérifier que la fermeture d'acier intérieure du raccord soit correctement centrée**.
6	**No girar la unión ni el tubo durante el apriete de los tornillos. Es muy importante no sobrepasar el par de apriete**. Iniciar el apriete con una llave de chicharra. Apretar los tornillos alternativamente (cierres con 3 tornillos avanzar primero el tornillo central). Continuar con una llave dinamométrica. Ajustarla al **par de apriete indicado en la etiqueta de la unión**. Seguir apretando los tornillos hasta el «clic» característico.	**Do not rotate the coupling or the pipes while you are tightening the screws**. Start tightening them with a ratchet spanner, alternating between the screws. **Important: Do not exceed the torque rate**. If the lock has three screws, you must tighten the central screw first. Carry on tightening with a torque wrench after you have **adjusted the wrench to the torque rate indicated on the label**. Keep on tightening until you hear the typical "click" noise.	**Während dem Verschliessen darf weder die Rohrkupplung noch das Rohr gedreht werden**. Ziehen Sie die Schrauben abwechslend an **ohne das Anziehmoment zu überschreiten**. Bei Verschlüssen mit drei Schrauben zuerst die mittlere Schraube anziehen. Ziehen Sie danach die Schrauben mit einem Drehmomentschlüssel mit dem **angebenen Anziehmoment auf der Produktetikette** an, bis der typische «klick» ertönt.	**Ne tourner pas le raccord ni le tuyau lors du serrage des vis**. Commencer le serrage avec une clé à cliquet. Serrer les vis alternativement. **C'est très important de ne pas dépasser le couple**. Pour les fermetures avec trois vis commencer à serrer la vis centrale. Continuer le serrage avec une clé dynamométrique. **Serrer jusqu'au couple indiqué sur l'étiquette du raccord**. Continuer a serrer les vis jusqu'à écouter le «clic» caractéristique.
7	Si se quiere ensayar la unión hidráulicamente, puede aplicarse hasta 1,5 veces la presión de trabajo (PT).	If testing is required, you can carry out a hydraulic test increasing the pressure up to 1.5 times the working pressure (PS).	Wenn nötig, kann die Rohrkupplung bis zum 1,5 fachen Betriebsdruck (PS) geprüft werden.	Si on veut essayer le raccord hydrauliquement, il est possible d'appliquer 1,5 fois la pression de service (PS).

ARPOL REP

REPARACIÓN
REPAIR
REPARATUR
RÉPARATION

INSTRUCCIONES DE MONTAJE
FITTING INSTRUCTIONS
MONTAGEANLEITUNG
INSTRUCTION DE MONTAGE

	ESPAÑOL	ENGLISH	DEUTSCH	FRANÇAIS
	La unión ARPOL REP, no está diseñada para soportar el peso o las fuerzas axiales de la tubería. **Respetar las indicaciones especificadas en la etiqueta**.	The ARPOL REP couplings are not designed to withstand the weight or the axial forces of the pipe line. **The specifications on the label must be observed**.	Die Rohrkupplung ARPOL REP ist nicht ausgelegt um das Gewicht oder axiale Kräfte des Rohres aufzunehmen. **Beachten Sie die Angaben auf dem Produktetikett**.	Le raccord ARPOL REP n'est pas conçu pour supporter le poids ou les forces axiales de la conduite. **Respecter les indications spécifiées sur l'étiquette**.
1 	Limpiar los extremos de los tubos y eliminar las irregularidades que puedan existir. En el extremo de los tubos, hacer una marca a una distancia igual a la mitad del ancho de la unión.	Clean the cracked area, or the pipe ends, and remove any irregularities. If you are joining two pipe ends, measure and mark half the width of the coupling on each pipe end.	Reinigen Sie die Rohrenden und entfernen Sie eventuelle Unregelmässigkeiten. Markieren Sie die halbe Kupplungsbreite an beiden Rohrenden.	Nettoyer les extrémités des tuyaux et éliminer toute irrégularité existante. Marquer à chaque extrémité des tuyaux la moitié de la largeur du raccord à installer.
2 	Abrir la unión por el cierre que lleva las juntas tóricas en los tornillos. 👁 **Si la unión lleva sujeto el perfil de goma Ⓐ pasar a la figura nº 6.**	Open the coupling by unfastening the screws fitted with o-rings. 👁 **If the sealing gasket Ⓐ is attached to the casing, please to go step nº 6.**	Öffnen Sie die Rohrkupplung an dem Verschluss mit den O-Ringen an den Schrauben. 👁 **Wenn die Dichtmanschette Ⓐ am Gehäuse befestigt ist, folgen Sie den Anweisungen gemäss Abb. 6.**	Ouvrir le raccord par la fermeture avec les joints toriques sur les vis. 👁 **Si le raccord a le manchette Ⓐ ensemblé, alle à la figure nº 6.**
3 	Colocar el manguito alrededor del tubo sin solapar los extremos. Utilizar la guía Ⓑ para que los extremos de la junta queden bien alineados. **No cortar la junta de caucho**.	Place the sealing gasket around the pipe without overlapping the ends. Use the guide Ⓑ to make sure that the ends are correctly aligned. **Do not cut the sealing gasket**.	Platzieren Sie die Dichtmanschette um das Rohr ohne die Enden zu überlappen. Benutzen Sie die Führung Ⓑ damit die Enden korrekt ausgerichtet sind. **Dichtmanschette nicht verkürzen**.	Placer la manchette autour du tuyau sans chevaucher les extrémités. Utiliser la guide Ⓑ pour aligner correctement les extrémités du joint. **Ne pas couper le joint en caoutchouc**.
4 	Comprobar si los aceros interiores Ⓒ de los cierres están colocados encima del manguito, bien encajados y opuestos el uno al otro en sentido horizontal, de forma que la unión del manguito quede a 90º de los cierres.	Make sure that the inner steel plates Ⓒ are correctly placed on the sealing gasket and facing each other at both sides of the coupling. The ends of the sealing gasket should be perpendicular to the lock.	Überprüfen Sie, dass die Verschlussbleche Ⓒ korrekt über der Dichtmanschette liegen und gegenüber von einander positioniert sind. Die Verbindung der Dichtmanschette sollte senkrecht zum Verschluss stehen.	Vérifier si les aciers intérieurs Ⓒ sont correctement placés sur la manchette, serrés et en face les uns aux autres horizontalement, de sorte que le joint de la manchette soit a 90º des fermetures.
5 	Colocar las dos mitades de la carcasa encima del manguito haciendo coincidir los aceros con los cierres. Al cerrar la unión **comprobar que el manguito no está solapado y los aceros interiores Ⓒ están correctamente centrados**.	Place both halves of the casing over the sealing gasket. The inner steel plate should rest under the locks. When closing the coupling, double **check that the sealing gasket is not overlapped and the steel plates Ⓒ are correctly placed under the lock.**	Platzieren Sie beide Gehäusehälften über die Dichtmanschette. Die Verschlussbleche müssen unter den Verschlüssen liegen. Beim Verschliessen ist darauf zu achten, dass sich die **Dichtmanschette nicht überlappt und die Verschlussbleche Ⓒ richtig plaziert sind**.	Placer les deux moitiés du boitier sur la manchette en faisant coincider les aciers intérieurs avec les fermetures. Pendant la fermeture du raccord, **vérifier que la manchette ne se chevauche pas et que les aciers intérieurs Ⓒ soient correctement centrés**.
6 	Colocar la unión alrededor del tubo e introducir el perfil de goma entre la lengüeta Ⓔ y la carcasa. Cerrar unión.	Place the coupling around the pipe and introduce the rubber band between the tab Ⓔ and the casing. Lock the coupling.	Plazieren Sie die Reparaturkupplung auf dem Rohr. Fügen Sie dabei das Ende der Dichtmanschette zwischen Führungsblech Ⓔ und Gehäuse ein. Schliessen Sie die Reparaturkupplung.	Placer le raccord autour du tuyau et entrer la manchette entre la guide Ⓔ et le boitier. Fermer le raccord.
7 	**No girar la unión ni el tubo durante el apriete de los tornillos. Es muy importante no sobrepasar el par de apriete**. Iniciar el apriete con una llave de chicharra. Apretar los tornillos alternativamente (cierres con 3 tornillos avanzar primero el tornillo central). Continuar con una llave dinamométrica. Ajustarla al **par de apriete indicado en la etiqueta de la unión**. Seguir apretando los tornillos hasta el «clic» característico.	**Do not rotate the coupling or the pipes while you are tightening the screws**. Start tightening them with a ratchet spanner, alternating between the screws. **Important: Do not exceed the torque rate**. If the lock has three screws, you must tighten the central screw first. Carry on tightening with a torque wrench after you have **adjusted the wrench to the torque rate indicated on the label**. Keep on tightening until you hear the typical "click" noise.	**Während dem Verschliessen darf weder die Rohrkupplung noch das Rohr gedreht werden**. Ziehen Sie die Schrauben abwechslend an **ohne das Anziehmoment zu überschreiten**. Bei Verschlüssen mit drei Schrauben zuerst die mittlere Schraube anziehen. Ziehen Sie danach die Schrauben mit einem Drehmomentschlüssel mit dem **angebenen Anziehmoment auf der Produktetikette** an, bis der typische «klick» ertönt.	**Ne tourner pas le raccord ni le tuyau lors du serrage des vis**. Commencer le serrage avec une clé à cliquet. Serrer les vis alternativement. **C'est très important de ne pas dépasser le couple**. Pour les fermetures avec trois vis commencer à serrer la vis centrale. Continuer le serrage avec une clé dynamométrique. **Serrer jusqu'au couple indiqué sur l'étiquette du raccord**. Continuer a serrer les vis jusqu'à écouter le «clic» caractéristique.
8 	Si se quiere ensayar la unión hidráulicamente, puede aplicarse hasta 1,5 veces la presión de trabajo (PT).	If testing is required, you can carry out a hydraulic test increasing the pressure up to 1.5 times the working pressure (PS).	Wenn nötig, kann die Rohrkupplung bis zum 1,5 fachen Betriebsdruck (PS) geprüft werden.	Si on veut essayer le raccord hydrauliquement, il est possible d'appliquer 1,5 fois la pression de service (PS).

APPENDIX B - QUALITY CERTIFICATIONS

A copy of the following Quality Certification Certificate is available from WSAA.

TABLE B1 UNIONE ARPOLE SA – MANAGEMENT SYSTEMS

C/Rosa dels Vents 17-23, Pol Ind La Suissa, Premia de Dalt Barcelona Spain	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	257883-2018-AQ-IBE-ENAC
Certifying Agency	DNV-GL
First Date of Certification	18 February 2000
Current Date of Certification	3 March 2021
Expiry Date of Certification	2 March 2024

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.:	Initial certification date:	Valid:
257883-2018-AQ-IBE-ENAC	18 February 2000	03 March 2021 – 02 March 2024

This is to certify that the management system of

UNIONES ARPOL, S.A.

C/ Rosa dels Vents 17-23, Pol. Ind. La Suïssa, 08338, Premià de Dalt, Barcelona, Spain

has been found to conform to the Quality Management System standard:

ISO 9001:2015

This certificate is valid for the following scope:

Design, development and manufacture of flexible couplings for pipes.

Place and date:
Barcelona, 30 March 2021

For the issuing office:
DNV - Business Assurance
Gran Via de les Corts Catalanes 130-136, Pl. 9, 08038, Barcelona, Spain

ENAC CERTIFICACIÓN Nº 03/C-SC065

IAF

Ana del Río Salgado
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV GL Business Assurance España, S.L.U., Gran Via de les Corts Catalanes 130-136, Pl. 9, 08038 Barcelona, Spain - TEL: +34 93 479 26 00. www.dnvgl.es/assurance

APPENDIX C - SUPPLIER CONTACTS

Global Pipe Australia Pty Ltd

25 Beaumaris Parade
Highett Vic 3190

Phone: 03 9305 0600
Email: admin@globalpipe.com.au
Web: www.globalpipe.com.au

Melbourne Office
Level 8, Suite 8.02
401 Docklands Drive
Docklands VIC 3008

Sydney Office
Level 9 420 George Street
Sydney NSW 2000
GPO Box 915
Sydney NSW 2001

P +61 (0) 3 8605 7666
email: info@wsaa.asn.au

www.wsaa.asn.au