



Rapid Clamps Pty Ltd

PRODUCT APPRAISAL REPORT 2404

Rapid Repair and Tapped Off-take Stainless-Steel Clamps

AS 4181:2013 Repair and off-take clamps for water industry purposes

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| Carl Radford, Product Appraisal Manager | WSAA | 16 August 2024 |

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

Rapid Clamps Pty Ltd is the Australian distributor of stainless-steel repair clamps, tapping saddles and associated fittings manufactured by Cascade Control Pty Ltd in South Africa. Rapid Clamps operates a warehouse and distribution business located in Narangba Queensland.

This appraisal is for a range of Rapid PN16 Type R repair and tapped stainless-steel clamps in sizes DN 50 to DN 600 manufactured in conformance with AS 4181:2013 *Repair and off-take clamps for water industry purposes*.

The clamps are suitable for application to rigid pipes including Ductile and Cast Iron, Copper, Reinforced Concrete and Asbestos Cement.

The Rapid repair and off-take clamps incorporate Grade 316 stainless steel bodies and fasteners with Nitrile elastomeric sealing mats.

Details of the product range included in this appraisal are provided in Section 3.

Cascade holds an ISO 9001:2015 Quality Management System Licence.

The Rapid stainless steel clamp range has ISO Type 5 ApprovalMark product certification to AS 4181:2013.

This Appraisal has determined that stainless steel repair and off-take clamps, as detailed in this report, meet the requirements of WSA PS-313 *Repair and Off-Take Clamps for Pressure Applications – Drinking Water and Non-Drinking Water Supply* 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 Type R Rapid repair and tapped stainless-steel clamps, as detailed in this report, for application to water and sewerage pipes, provided they are installed in accordance with WSAA Codes and the manufacturers requirements, where specified

2 THE APPLICANT

The Applicant is Rapid Clamps Pty Ltd.

2.1 The Supplier

Rapid Clamps Pty Ltd is the Australian exclusive distributor of Cascade stainless steel repair clamps, tapping saddles and associated fittings. It operates a warehouse and distribution business located in Brendale Queensland.

2.2The Manufacturer

The manufacturing facility of Cascade Control Pty Ltd is located in Germiston, South Africa. Cascade has been manufacturing stainless steel pipe repair couplings and related fittings since 1986. Cascade distributes its stainless-steel pipe repair clamps throughout South Africa and also services UK, Middle East, Malaysia and Australia.

3 THE PRODUCT

This appraisal is for a range of Rapid PN16 Type R repair and tapped stainless-steel clamps in sizes DN 50 to DN 600 manufactured in conformance with AS 4181:2013 *Repair and off-take clamps for water industry purposes*.

The Rapid repair and off-take clamps incorporate Grade 316 stainless steel bodies and fasteners with Nitrile elastomeric sealing mats.

The Type R clamps included in this appraisal are suitable for application on rigid pipes with a wide range of pipe OD's including grey or ductile cast iron, steel, copper, reinforced

concrete and asbestos cement. They are not deemed suitable for use with PVC, GRP, PE or other plastic pipes.

Stainless steel repair clamps are suitable for repairing cracks, holes, splits and pinholes in rigid water and sewerage pipes. They also provide an effective means of reinforcing old pipe in critical areas or providing a seal for decommissioned service connections.

Tapped off-take clamps are intended to provide a permanent threaded connection into new and existing pipelines and may be used for replacement of existing damaged tapped connections.

The clamps have limited ability to accommodate axial deflection and should not be used to join two pipes together.

The clamps are rated as PN16 and may be provided with single or multiple parts with various lengths.

Stainless steel clamps are suitable for use in contact with potable water and neutral fluids (sewage) with a temperature range of -10 to 60 degrees C and for use with pipes of stiffness of SN10 or greater.

See Tables 1 to 5 for details of the clamps included in the Scope of this Appraisal.

**TABLE 1
RAPID STAINLESS STEEL REPAIR CLAMP RANGE - SINGLE PART**

| DN | Pipe OD Range | Length mm | | | | |
|-----|---------------|-----------|-----|-----|-----|-----|
| | | 150 | 200 | 300 | 400 | 600 |
| 50 | 45-51 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 59-67 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 65 | 69-76 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 80 | 75-83 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 85-95 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 95-104 | | ✓ | ✓ | ✓ | ✓ |
| 100 | 104-113 | | ✓ | ✓ | ✓ | ✓ |
| | 110-120 | | ✓ | ✓ | ✓ | ✓ |
| | 113-123 | | ✓ | ✓ | ✓ | ✓ |
| | 121-130 | | ✓ | ✓ | ✓ | ✓ |
| 125 | 126-136 | | ✓ | ✓ | ✓ | ✓ |
| | 130-140 | | ✓ | ✓ | ✓ | ✓ |
| 150 | 135-145 | | ✓ | ✓ | ✓ | ✓ |
| | 145-155 | | ✓ | ✓ | ✓ | ✓ |
| | 151-161 | | ✓ | ✓ | ✓ | ✓ |
| | 155-165 | | ✓ | ✓ | ✓ | ✓ |
| | 167-178 | | ✓ | ✓ | ✓ | ✓ |
| | 174-183 | | ✓ | ✓ | ✓ | ✓ |
| | 179-189 | | ✓ | ✓ | ✓ | ✓ |
| | 189-199 | | ✓ | ✓ | ✓ | ✓ |
| 200 | 196-205 | | ✓ | ✓ | ✓ | ✓ |
| | 202-212 | | ✓ | ✓ | ✓ | ✓ |
| | 218-228 | | ✓ | ✓ | ✓ | ✓ |

| DN | Pipe OD Range | Length mm | | | | |
|-----|---------------|-----------|-----|-----|-----|-----|
| | | 150 | 200 | 300 | 400 | 600 |
| | 229-238 | | ✓ | ✓ | ✓ | ✓ |
| | 236-245 | | ✓ | ✓ | ✓ | ✓ |
| 225 | 248-257 | | | ✓ | ✓ | ✓ |
| | 255-265 | | | ✓ | ✓ | ✓ |
| 250 | 271-281 | | | ✓ | ✓ | ✓ |
| | 275-285 | | | ✓ | ✓ | ✓ |
| | 280-290 | | | ✓ | ✓ | ✓ |
| | 285-295 | | | ✓ | ✓ | ✓ |
| | 288-298 | | | ✓ | ✓ | ✓ |
| | 298-309 | | | ✓ | ✓ | ✓ |
| | 304-314 | | | ✓ | ✓ | ✓ |
| 300 | 312-322 | | | ✓ | ✓ | ✓ |
| | 322-331 | | | ✓ | ✓ | ✓ |
| | 325-335 | | | ✓ | ✓ | ✓ |
| | 332-342 | | | ✓ | ✓ | ✓ |
| 350 | 343-355 | | | ✓ | ✓ | ✓ |
| | 350-360 | | | ✓ | ✓ | ✓ |
| | 355-365 | | | ✓ | ✓ | ✓ |

TABLE 2

RAPID STAINLESS STEEL REPAIR CLAMP RANGE – TWO PARTS

| DN | Pipe OD Range | Length mm | |
|-----|---------------|-----------|-----|
| | | 400 | 600 |
| 225 | 250-270 | ✓ | ✓ |
| 250 | 270-290 | ✓ | ✓ |
| | 290-310 | ✓ | ✓ |
| 300 | 310-330 | ✓ | ✓ |
| | 330-350 | ✓ | ✓ |
| 350 | 350-370 | ✓ | ✓ |
| | 360-380 | ✓ | ✓ |
| | 370-390 | ✓ | ✓ |
| | 380-400 | ✓ | ✓ |
| | 390-410 | ✓ | ✓ |
| 375 | 400-420 | ✓ | ✓ |
| | 410-430 | ✓ | ✓ |
| | 420-440 | ✓ | ✓ |

| DN | Pipe OD Range | Length mm | |
|-----|---------------|-----------|-----|
| | | 400 | 600 |
| 400 | 440-460 | ✓ | ✓ |
| | 450-470 | ✓ | ✓ |
| 450 | 460-480 | ✓ | ✓ |
| | 470-490 | ✓ | ✓ |
| | 480-500 | ✓ | ✓ |
| | 490-510 | ✓ | ✓ |
| 500 | 500-520 | ✓ | ✓ |
| | 510-530 | ✓ | ✓ |
| | 520-540 | ✓ | ✓ |
| | 530-550 | ✓ | ✓ |
| | 540-560 | ✓ | ✓ |
| | 550-570 | ✓ | ✓ |
| 525 | 560-585 | ✓ | ✓ |
| | 570-590 | ✓ | ✓ |
| | 580-600 | ✓ | ✓ |
| | 600-620 | ✓ | ✓ |
| 600 | 610-630 | ✓ | ✓ |
| | 620-640 | ✓ | ✓ |
| | 630-650 | ✓ | ✓ |
| | 650-670 | ✓ | ✓ |

TABLE 3

RAPID STAINLESS STEEL REPAIR CLAMP RANGE – THREE PARTS

| DN | Pipe OD Range | Length mm | |
|-----|---------------|-----------|-----|
| | | 400 | 600 |
| 450 | 490-520 | ✓ | ✓ |
| 500 | 520-550 | ✓ | ✓ |
| | 550-580 | ✓ | ✓ |
| 525 | 560-590 | ✓ | ✓ |
| | 590-620 | ✓ | ✓ |
| 600 | 610-640 | ✓ | ✓ |
| | 650-680 | ✓ | ✓ |

**TABLE 4
RAPID STAINLESS STEEL TAPPED OFF-TAKE CLAMP RANGE**

| DN | Pipe OD Range | Tapped Off-take | | | | |
|-----|---------------|-----------------|----|----|----|----|
| | | 20 | 25 | 32 | 40 | 50 |
| 50 | 45-51 | ✓ | ✓ | ✓ | | |
| | 59-67 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 65 | 69-76 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 80 | 75-83 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 85-95 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 95-104 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 100 | 104-113 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 110-120 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 113-123 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 121-130 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 130-140 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 150 | 135-145 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 145-155 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 151-161 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 155-165 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 160-170 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 167-178 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 174-183 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 200 | 189-199 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 196-205 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 202-212 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 218-228 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 229-238 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 225 | 236-245 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 248-257 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 250 | 255-265 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 271-281 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 280-290 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 288-298 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 298-309 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 300 | 304-314 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 312-322 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 322-331 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 350 | 332-342 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 343-355 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 355-365 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 330-350 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 350-370 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 370-390 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 390-410 | ✓ | ✓ | ✓ | ✓ | ✓ |

| DN | Pipe OD Range | Tapped Off-take | | | | |
|-----|---------------|-----------------|----|----|----|----|
| | | 20 | 25 | 32 | 40 | 50 |
| 375 | 410-430 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 420-440 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 400 | 440-460 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 450 | 460-480 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 480-500 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 490-510 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 500 | 510-530 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 530-550 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 550-570 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 525 | 570-590 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 590-610 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 600 | 610-630 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 630-650 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 650-680 | ✓ | ✓ | ✓ | ✓ | ✓ |

4 SCOPE OF THE APPRAISAL

The scope of this appraisal covers Rapid Type R stainless steel repair and tapped clamps rated as PN16 in sizes from DN 50 to DN 600 as detailed in Section 3 and included in the ISO Type 5 ApprovalMark Product Certification schedule. See Appendix B.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts repair and tapped stainless-steel clamps manufactured in compliance with AS/NZS 4181:2013 *Repair and off-take clamps for water industry 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

Rapid stainless-steel repair and tapped clamps have been appraised for compliance with AS 4181:2013 *Repair and off-take clamps for water industry 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-313 *Repair and Off-Take Clamps for Pressure Applications – Drinking Water and Non-Drinking Water Supply*

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

<https://www.wsaa.asn.au/shop/product/60961>

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Rapid has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. 01 100 928919 issued to Cascade Sales and Distribution by TUV Rheinland.
- AS 4181:2013 ISO Type 5 ApprovalMark Product Certification Licence No. AMI 74602 issued to Cascade Sales and Distribution by ApprovalMark International.

Copies of the quality certificates have been included in Appendix B and are also available from WSAA.

6.2 Compliance with Performance Requirements

6.2.1 Materials

AS 4181:2013 details allowable material requirements for the clamp components as detailed below.

6.2.1.1 *Clamp body*

Rapid clamps are manufactured from Grade 316L stainless steel in accordance with ASTM A240M. Welding is required to be carried out in accordance with AS/NZS 1554.6 with welding quality Category 2B and be capable of meeting the requirements of the inter-granular corrosion test specified in AS 2205.10.1. All stainless-steel components are to be passivated in accordance with ASTM A380. Test results have been provided to demonstrate compliance.

6.2.1.2 *Nuts, bolts and washers*

The fasteners used on the Rapid clamps are Grade 316 stainless steel studs, nuts and washers. The threads of the fasteners are coated with a dry film anti-galling coating.

6.2.1.3 *Elastomeric seals*

The sealing gaskets used in Rapid clamps are moulded from HT4627 nitrile rubber, supplied by Hultec Asia Pacific and manufactured by Thai Duong Joint Stock Company. The gaskets are covered by AS 1646 ISO Type 5 Product Certification and copies of the licence and schedule are held on file by WSAA.

6.2.1.4 *Effect on water*

Only the nitrile rubber (NBR) sealing gaskets in the clamps are exposed to drinking water. Test Report No. AAL22382 was undertaken by Eurofins (NATA Accreditation No. 15773) on 14th August 2020 for Hultec HT 4627 NBR material to demonstrate compliance with AS/NZS 4020:2018 together with Report No. AAP12401 dated 9th March 2021 to demonstrate compliance with NDMA residual requirements when exposed to monochloramine dosed water.

6.2.2 Design

Rapid clamps are of standard design with single part, two part and multiple parts. The length and size of the clamp determines the number of studs used to tighten the clamp to the pipe.

Repair and off-take clamps may be designed to suit either flexible pipes (Type F) or rigid pipes (Type R) or may be designed to suit both flexible and rigid. Type F clamps are required to have a full circle design incorporating a positive stop feature to prevent diametrical deflection greater than 2.5%.

The clamps included in this appraisal are designated as Type R and have been tested accordingly. The clamps are therefore deemed unsuitable for flexible plastic pipes.

6.2.3 Performance

Rapid has submitted copies of Type Test reports to demonstrate compliance with the performance requirements of AS 4181:2013.

Testing was carried out by South African Bureau of Standards (SABS) (SANAS Accreditation No. T0696). The SANAS accreditation does not specifically include AS 4181 in its accreditation Scope however does include a large range of mechanical and hydraulic testing for plumbing products including gate valves and butterfly valves.

Tests were conducted on each DN clamp size from DN 50 to DN 600 for both repair clamps and offtake versions with DN 50 offtakes. The tests undertaken included:

- Joint infiltration for each DN
- Hydrostatic leak-tightness for each DN
- Resistance to rotation longitudinal sliding and depressurization for each DN (Off-take clamps only)
- Leak-tightness test during application of a bending moment to the connecting pipe for each DN (Off-take clamps only)
- Bi-metallic couple

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

Each Rapid clamp is supplied with an installation guide attached to the product.

A copy of the installation instructions are included in Appendix A.

Stainless Steel Repair Clamps are common fittings in the water industry and installation training is not regarded as an industry requirement.

8 PRODUCT MARKING

The products have the following markings stencilled onto the body of the clamp, as specified in AS 4181:

- Manufacturers mark: Rapid Clamps
- Nominal diameter: e.g., DN 100
- Flange or tapping offtake size: e.g., 50mm BSP
- Pressure classification: e.g., PN16
- Pipe outside diameter range: e.g., 121-130
- Type of clamp: Type R
- The number of this standard: AS 4181
- Manufacturing Date: e.g., 2023/11/02
- Product certification mark: ApprovalMark

Additional markings including product code, body material (SS 316), gasket material (NBR) and clamp length are also included.

An example of branding is shown in Figure 1.



FIGURE 1 RAPID CLAMP MARKINGS

9 PACKAGING AND TRANSPORTATION

Rapid clamps are packaged in labelled cardboard cartons. The cartons have been designed to fit different clamp sizes with consideration given to manual handling requirements. Packaging material is placed in each carton to provide protection during transport. Larger clamps are packed onto pallets or skids and shrink wrapped.

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 Rapid Clamp's warranty is included in their terms and conditions of sale.

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

Stainless steel repair clamps are commonly used industry products and field testing is not considered necessary.

12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

No issues were raised.

13 FUTURE WORKS

No future works items 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, 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 to 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

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

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

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

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

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

CR Repair Clamps *Rapid clamps*

**Rapid Single & Multi Part
Grade 316 Stainless Steel Clamps**

Rapid CR clamps are a permanent and cost effective pipe repair solution. Available for pipe diameters from 40mm up to 2000mm, with clamp lengths from 150mm to 600mm long. Special sizing and larger clamps can be manufactured on request. Manufactured to conform to WaterMark AS4181 standards.

Components

| | |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shell: | Grade 316 Stainless steel. Fully passivized after welding |
| Armour: | Heavy gauge Grade 316 Stainless steel vulcanized into the gasket at the time of moulding. |
| Gasket: | Nitrile rubber for use with gas, water and petrochemicals. Specially formulated for use with drinking water and incorporating antioxidant agents to increase shelf life. Gaskets have a gridded design, tapered ends and vulcanized armour plates for easy installation and optimum sealing efficiency. |
| Locking Washer Plate: | Grade 316 Stainless steel. Locks into position for easy tightening of nuts |
| Receiver Bars: | Grade 316 Stainless steel TIG-welded to shell to form a strong fusion. Fully passivized after welding |
| Lugs: | Grade 316 Stainless steel MIG-welded to receiver bar and fully passivized after welding. Leading edge is rounded to prevent them from catching bolt bars during installation |
| Bolts: | Grade 316 Stainless steel Thread-rolled for strength and coated to prevent galling. Bolts are MIG-welded to the receiver bar and fully passivized after welding. |
| Nuts/Washers: | Grade 316 Stainless steel |



Operating Pressure

The pressure containing capability of a repair clamp is influenced by the pipe type, the pipe surface finish, extent of damage to the pipe, environment, service conditions and installation workmanship.

The amount of pressure that a full circle repair clamp will contain is proportionate to the diameter of the pipe being repaired and the amount of torque applied to the bolts.

Smaller diameter repair clamps will contain higher pressure than larger diameter repair clamps. Cleaning and lubricating pipe/gasket, will reduce friction between the pipe surface and sealing gasket, creating a better seal. Use soapy water or pipe lubricate.

| PIPE DN | CLAMP OD RANGE | MAX. OPERATING PRESSURE * | RATING |
|---------------|----------------|---------------------------|--------|
| 40mm - 600mm | 45mm - 680mm | 1600kPa | PN16 |
| 675mm - 800mm | 680mm - 900mm | 800kPa | PN8 |
| 800mm+ | 900mm - 1200mm | 600kPa | PN6 |

Maximum Temperature: 0 - 60 degrees C.*
Recommended Field Test Pressure: 1.25 x MAX. OPERATING PRESSURE.
Maximum Test Pressure: 1.5 x MAX. OPERATING PRESSURE.



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CR Repair Clamps

**Rapid
clamps**

Length and Bolts

Rapid clamps are manufactured to fit a range of pipe OD's and are available in various lengths. Length and OD range determine the number of bolts used. Larger clamps are manufactured in multiple parts and each part will contain a number of bolts. See table below.

1 Part Clamps

| Clamp OD Range | Clamp Length | No. Bolts | Bolts | No. Parts |
|------------------|---------------|-----------|-------|-----------|
| 45mm-104mm | 150mm - 200mm | 2 | M12 | 1 |
| 105mm and larger | 150mm - 200mm | 2 | M16 | 1 |
| Up to 250mm | 300mm | 3 | M16 | 1 |
| 250mm and larger | 300mm | 4 | M16 | 1 |
| Up to 250mm | 400mm | 4 | M16 | 1 |
| 250mm and larger | 400mm | 5 | M16 | 1 |
| Up to 104mm | 600mm | 6 | M12 | 1 |
| Up to 249mm | 600mm | 6 | M16 | 1 |
| 250mm and larger | 600mm | 8 | M16 | 1 |



2 Part Clamps

| Clamp OD Range | Clamp Length | No. Bolts | Bolts | No. Parts |
|----------------|--------------|-----------|-------|-----------|
| 250mm - 670mm | 300mm | 8 | M16 | 2 |
| 250mm - 670mm | 400mm | 10 | M16 | 2 |
| 250mm - 670mm | 600mm | 16 | M16 | 2 |



3 Part Clamps

| Clamp OD Range | Clamp Length | No. Bolts | Bolts | No. Parts |
|----------------|--------------|-----------|-------|-----------|
| 490mm - 840mm | 300mm | 12 | M16 | 3 |
| 490mm - 840mm | 400mm | 15 | M16 | 3 |
| 490mm - 840mm | 600mm | 24 | M16 | 3 |



Larger OD clamps available in 4+ parts

General Information

The general recommendation is that the clamp length should be four times that of the damage being repaired. Where a large section of the pipe wall is broken away, a section of thin gauge sheet metal should be placed over the opening to provide a sealing surface for the gasket. Stainless Steel Repair Clamps do not restrain axial pipe movement. (Suitable anchorage must be provided where pipe movement may occur.)

Pressure ratings may vary due to pipe condition and type. Refer to AS4181-2013 up to and including DN600mm clamps. Type R.

Not recommended for low stiffness factor pipes below SN7500.

Re-tension clamp at Max. operating temp (Specifications are subject to change without notice).

Installation instructions

Clean the pipe where the clamp is to be fitted.

Position the clamp so that the holes in the pipe are in the centre of the clamp and mark the position on the pipe at each end of the clamp.

Remove the clamp from the pipe.

Apply a suitable plumbing lubricant smoothly on the whole area to be covered by the clamp.

Open the clamp by loosening the nuts to the end of the bolts (do not remove the nuts).

Wrap the clamp around the pipe and engage the washer plate/s behind the receiver plate/s.

Position the sides of the clamp to line up with the marks you made ensuring that the hole/s are in the centre of the clamp. Make sure the gasket forms fully around the pipe. No folds.

Tension the nuts, evenly, uniformly, and keep gaps between segments equal. Do not fully tension one nut at a time, slowly tension nuts, moving from one nut to another, until final tension is achieved to all the nuts.

Recommended torque (M16 135Nm) (M12 95Nm).

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CTR BSP Clamps

**Rapid
clamps**

Rapid BSP Clamps Grade 316 Stainless Steel

Our CTR clamps provide a secure full circumference clamp solution for branch connections requiring a BSP offtake on an existing pipe.

CTR clamps share their design with our CR repair clamps with the addition of a BSP parallel threaded offtake.

CTR Clamps cover a large surface of the host pipe with length options from 150mm to 600mm. This increased surface area reinforces the host pipe at the tapping point to provide maximum strength and reliability.

Manufactured to conform to WaterMark AS4181 standards.

Components

| | |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shell: | Grade 316 Stainless steel. Fully passivized after welding |
| Offtake: | BSP parallel treaded socket AS 1722 Grade 316 Stainless steel DN15 to DN100 |
| Gasket: | Nitrile rubber for use with gas, water and petrochemicals. Specially formulated for use with drinking water and incorporating antioxidant agents to increase shelf life. Gaskets have a gridded design, tapered ends and vulcanized armour plates for easy installation and optimum sealing efficiency. |
| Locking Washer Plate: | Grade 316 Stainless steel. Locks into position for easy tightening of nuts |
| Receiver Bars: | Grade 316 Stainless steel TIG-welded to shell to form a strong fusion. Fully passivized after welding |
| Lugs: | Grade 316 Stainless steel MIG-welded to receiver bar and fully passivized after welding. Leading edge is rounded to prevent them from catching bolt bars during installation |
| Bolts: | Grade 316 Stainless steel Thread-rolled for strength and coated to prevent galling. Bolts are MIG-welded to the receiver bar and fully passivized after welding. |
| Nuts/Washers: | Grade 316 Stainless steel |



Operating Pressure

The pressure containing capability of a repair clamp is influenced by the pipe type, the pipe surface finish, extent of damage to the pipe, environment, service conditions and installation workmanship.

The amount of pressure that a full circle repair clamp will contain is proportionate to the diameter of the pipe being repaired and the amount of torque applied to the bolts.

Smaller diameter repair clamps will contain higher pressure than larger diameter repair clamps. Cleaning and lubricating pipe/gasket, will reduce friction between the pipe surface and sealing gasket, creating a better seal. Use soapy water or pipe lubricate.

| PIPE DN | CLAMP OD RANGE | MAX. OPERATING PRESSURE * | RATING |
|---------------|----------------|---------------------------|--------|
| 40mm - 600mm | 45mm - 680mm | 1600kPa | PN16 |
| 675mm - 800mm | 680mm - 900mm | 800kPa | PN8 |
| 800mm+ | 900mm - 1200mm | 600kPa | PN6 |

Maximum Temperature: 0 - 60 degrees C.*

Recommended Field Test Pressure: 1.25 x MAX. OPERATING PRESSURE.

Maximum Test Pressure: 1.5 x MAX. OPERATING PRESSURE.



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CTR BSP Clamps

**Rapid
clamps**

Length and Bolts

Rapid clamps are manufactured to fit a range of pipe OD's and are available in various lengths. Length and OD range determine the number of bolts used. Larger clamps are manufactured in multiple parts and each part will contain a number of bolts. See table below.

1 Part Clamps

| Clamp OD Range | Clamp Length * | No. Bolts | Bolts | No. Parts |
|------------------|----------------|-----------|-------|-----------|
| 45mm-104mm | 150mm - 200mm | 2 | M12 | 1 |
| 105mm and larger | 150mm - 200mm | 2 | M16 | 1 |
| Up to 250mm | 300mm | 3 | M16 | 1 |
| 250mm and larger | 300mm | 4 | M16 | 1 |
| Up to 250mm | 400mm | 4 | M16 | 1 |
| 250mm and larger | 400mm | 5 | M16 | 1 |
| Up to 104mm | 600mm | 6 | M12 | 1 |
| Up to 249mm | 600mm | 6 | M16 | 1 |
| 250mm and larger | 600mm | 8 | M16 | 1 |

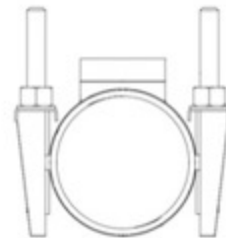
* The socket size will determine the minimum length of the clamp

2 Part Clamps

| Clamp OD Range | Clamp Length | No. Bolts | Bolts | No. Parts |
|----------------|--------------|-----------|-------|-----------|
| 250mm - 620mm | 300mm | 8 | M16 | 2 |
| 250mm - 620mm | 400mm | 10 | M16 | 2 |
| 250mm - 620mm | 600mm | 16 | M16 | 2 |

3 Part Clamps

| Clamp OD Range | Clamp Length | No. Bolts | Bolts | No. Parts |
|----------------|--------------|-----------|-------|-----------|
| 490mm - 840mm | 300mm | 12 | M16 | 3 |
| 490mm - 840mm | 400mm | 15 | M16 | 3 |
| 490mm - 840mm | 600mm | 24 | M16 | 3 |



General Information

Stainless Steel Clamps do not restrain axial pipe movement.

Suitable anchorage must be provided where pipe movement may occur.

Pressure ratings may vary due to pipe condition and type. Refer to AS4181-2013 up to and including DN600mm clamps. Type R.

Not recommended for low stiffness factor pipes below SN7500.

Re-tension clamp at Max. operating temp (Specifications are subject to change without notice).

Installation instructions

Clean and remove any debris around the host pipe where the clamp will be fitted.

Apply suitable pipe lubricant to rubber gasket and pipe. Loosen the nuts to the end of the threads.

Position the off take to its required position. Hand-tighten the nuts and check it is in the required position.

Tension the nuts, evenly, uniformly, and keep gaps between segments equal.

Do not fully tension one nut at a time, slowly tension nuts, moving from one nut to another, until final tension is achieved to all the nuts.

Re-tension all the nuts 10-15 minutes later to final tension and or when max. operating temperature is reach.

It is necessary to mechanically support the off take fittings separately to the clamp.

It is recommended to pressure test the clamp and fittings before drilling into the pipe.

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APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certificates are available from WSAA.

TABLE A1 CASCADE SALES & DISTRUBUTION – MANAGEMENT SYSTEMS

| Cnr Bream and Lantern Roads Wadeville Germiston South Africa | |
|--------------------------------------------------------------|-----------------|
| Quality Systems Standard | ISO 9001:2015 |
| Certification Licence No. | 01 1090 928919 |
| Certifying Agency | TUV |
| First Date of Certification | 2022 |
| Current Date of Certification | 6 December 2022 |
| Expiry Date of Certification | 5 December 2025 |

TABLE A2 CASCADE SALES & DISTRUBUTION – PRODUCT CERTIFICATION

| Cnr Bream and Lantern Roads Wadeville Germiston South Africa | |
|--------------------------------------------------------------|----------------------------|
| Product Standard/Spec. | AS 4181:2013 |
| Certificate No. | AMI 74602 |
| Issuing Certification Body | ApprovalMark International |
| First Date of Certification | 25 July 2024 |
| Current Date of Certification | 25 July 2024 |
| Expiry Date of Certification | 25 July 2029 |

CERTIFICATE

Standard ISO 9001:2015

Certificate Registr. No. 01 100 928919

TÜV Rheinland Inspection Services Certifies:

Certificate Holder: **Cascade Sales & Distribution**
C/o Bream & Lantern Road
Wadeville
Germiston
1432

Scope: Manufacturer of stainless repair clamps for water pipes.

An audit was performed, Report No. 928919. Proof has been furnished that the requirements according to ISO 9001:2015 are fulfilled.

The due date for all future audits is 01 – 11 (dd.mm).

Validity: The certificate is valid from 2022-12-06 until 2025-12-05
First Certification 2022



South Africa, 2022-12-06 TÜV Rheinland Inspection Services (Pty) Ltd
4th Floor
138 West Street
Sandton
2196
Certification Body No. C09



C09

The Product Certification schedule has 32 pages and has not included in this report. A copy may be obtained from Rapid Clamps or WSAA.

ISO TYPE 5

CERTIFICATE OF CONFORMITY



ApprovalMark International hereby grants:

Rapid Clamps Pty Ltd

3/32 Business Drive
Narangba, QLD 4504
Australia

ISO Type 5 Certificate of Conformity

Evaluated to:

AS/NZS 4181:2013 – Repair and off-take clamps for water industry purposes

The ISO Type 5 License shall comply with all the terms and conditions as stipulated by the governance of the operating rules of the ISO Type 5 Scheme and shall comply with the standard requirements at all times including when the standard is amended. The ISO Type 5 License only covers the product which is identified in the attached product schedule.

Certificate No. AMI 74602

Issued: 25th July 2024

Original Issue: 25th July 2024

Expires: 25th July 2029

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

John PRASAD

Director

ApprovalMark International Pty Ltd
18/33 Holbeche Road, Arndell Park 2148, Australia
www.approvalmark.com



Registered by: ApprovalMark International Pty Ltd (ABN 69 143 259 974) Unit 18, 33 Holbeche Road, Arndell Park NSW 2148 Australia. The assessment was carried with appropriate skill and assessment by ApprovalMark International Pty Ltd, however it will only accept its responsibility for proven negligence. The certificate remains the property of ApprovalMark International Pty Ltd.

APPENDIX C - SUPPLIER CONTACTS

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