



Assets Planning and Delivery Group
Engineering

Strategic Product Specification

SPS 152

Stainless Steel Repair Clamps for Waterworks Pipes

VERSION 0
REVISION 6

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FOREWORD

Each Strategic Product Specification has been prepared to inform Water Corporation staff, consultants, contractors and land developers of the requirements for selecting and acquiring a manufactured product to be used in strategic Corporation infrastructure. The definition of 'Product' includes items that comprise assembled components, equipment or plant for mechanical, electrical and civil infrastructure applications.

The objective of a Strategic Product Specification is to specify fit-for-purpose Product which will contribute to the provision of effective water services at least whole-of-life cost and with least risk to service standards and safety. A Strategic Product Specification also provides uniform standards for compatibility of new water infrastructure with existing water assets.

Many Strategic Product Specifications have drawn on the design, asset management and operational experience of Product performance in live service gained by the Corporation over time. Some Strategic Product Specifications have drawn on the experience of the water industry nationally by referencing Australian or WSA standards.

Strategic Product Specifications are intended for reference and use in the following typical procurement scenarios:

- Capital funded infrastructure design and construction work;
- Private developer funded subdivision infrastructure for takeover by the Corporation;
- Operationally funded infrastructure design and construction work;
- Corporation period contracts for Product purchases;
- Product purchases for stock or for miscellaneous minor work.

A published Strategic Product Specification will, in some cases, comprise technical content that is typical of a range of products of the same type (type specification) but may exclude specific requirements that should apply to a particular project or application. In such cases, the project designer is required to document the supplementary project specific requirements in the appropriate Clause of the 'Project Specific Requirements' Appendix of the Specification.

The text of a published Specification should not be directly modified. In the event that a text variation is considered necessary to accommodate the needs of a particular project or application, the text modification should be documented in the appropriate Clause of a 'Project Specific Requirements' Appendix.

Enquiries relating to the technical content of this Specification should be directed to the Senior Principal Engineer Water Standards, , Advisory, Engineering, as appropriate to the application and to the particular enquiry. Future Specification changes, if any, will be issued to registered Specification users as and when published.

Head of Engineering

This document is prepared without the assumption of a duty of care by the Water Corporation. The document is not intended to be nor should it be relied on as a substitute for professional engineering design expertise or any other professional advice.

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REVISION STATUS

The revision status of this specification is shown section by section below.

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SPS 152

Stainless Steel Repair Clamps for Waterworks Pipes

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1 SCOPE AND GENERAL

1.1 Scope

This Specification sets out requirements for the manufacture, supply, handling and delivery of stainless steel clamps for the repair of pipelines for cold water, drainage and sewerage applications. It is not intended for applications that involve gas, steam, oil, strong acids or fluids having a temperature in excess of 50°C. It also details acceptance criteria for pipe repair clamps intended for use in Corporation infrastructure and the means of demonstrating compliance with the Specification.

1.2 Referenced Documents

The following documents are referenced in this Specification:

AS

- | | |
|-------|--|
| 1646 | Elastomeric seals for waterworks purposes
<i>(Performance requirements in AS 681 Parts 1 to 4)</i> |
| 681.1 | Material requirements for pipe joint seals used in water and drainage applications -
Vulcanized rubber |
| 681.2 | Material requirements for pipe joint seals used in water and drainage applications -
Thermoplastic elastomers |
| 681.3 | Material requirements for pipe joint seals used in water and drainage - Cellular
materials of vulcanized rubber |
| 681.4 | Material requirements for pipe joint seals used in water and drainage applications -
Cast polyurethane sealing elements |
| 4181 | Stainless steel clamps for waterworks purposes |

AS/NZS

- | | |
|------|---|
| 4020 | Products for use in contact with drinking water |
|------|---|

AS/NZS ISO

- | | |
|------|---|
| 9001 | Quality management systems - requirements |
|------|---|

SAA

- | | |
|---------|---|
| HB18.23 | Guidelines for third-party certification and accreditation- Guide 23-Methods of
indicating conformity with standards for third-party certification systems (ISO/IEC
Guide 23) |
| HB18.28 | Conformity assessment - Guidance on a third-party certification system for
products (ISO/IEC Guide 28) |

1.3 Definitions and Notation

The following definitions are intended to clarify the terminology used in this Specification.

1.3.1 Australian Standards®

Standards that are developed, published and maintained by Standards Australia

1.3.2 Certificate

A formal certificate issued by a Certification Body in accordance with the third party product certification system described in HB 18.28, including associated Product licence schedules.

1.3.3 Certification Body

An independent (or third party) organisation duly accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) to operate Certification Schemes and more commonly known over recent years as a Conformity Assessment Body (CAB).

1.3.4 Certification Mark

A proprietary mark of product conformity issued in accordance with HB 18.23.

1.3.5 Certification Scheme

A third party product certification system operated in accordance with HB 18.28.

NOTE: The effect of this is to require maintenance by the manufacturer of effective production control planning in addition to full type testing from independently sampled production and subsequent verification of conformity with specified standards.

1.3.6 Compliant Product

Product that has been assessed, by means of Product Appraisal, as conforming with standards and specifications that are specified by the Corporation.

1.3.7 Corporation

The Water Corporation of Western Australia.

1.3.8 Manufacturer

An entity or combination of entities that are responsible for selection, processing and control of Product constituent materials or compounds and for the processing equipment that collectively result in the manufactured product.

1.3.9 Notation

Statements governed by use of the word 'shall' are mandatory or 'normative' requirements of the Specification. Statements expressed by use of the words 'should' or 'may' are 'informative' but not mandatory and are provided for information and guidance. Notes in Specification text are informative. Notes that form part of Specification Tables are normative. An Appendix to the Specification that is designated 'normative' contains mandatory requirements. An Appendix that is designated 'informative' is provided for information and guidance only. The term 'specified' includes requirements of the Specification and requirements stated or referenced in other project documentation.

1.3.10 Officer

A duly authorised representative or appointed agent of the Corporation.

1.3.11 Product

A single unit or multiple units of manufactured end product or an assembly of manufactured component products, materials or equipment. This Specification and accompanying Purchasing Schedule define the engineering and operational performance requirements of Product to be supplied.

NOTE 1: An end product is most commonly an output of manufacturing processes that result in finished end products having the same features and characteristics and can be the result of a single or multiple production batches.

NOTE 2: Manufactured equipment and assemblies of Product components or materials are commonly procured for mechanical, electrical and civil infrastructure applications.

1.3.12 Product Appraisal

A formal process whereby Product, including product design, is subjected to systematic engineering assessment to determine Product fitness for prescribed end uses and to evaluate conformity of its production systems with specified standards and requirements. Product Appraisal includes verification of the extent of compliance in accordance with the requirements of a relevant 'Technical Compliance Schedule'.

1.3.13 Product Assessor

An organization, Officer or other person who, having demonstrated specialist product knowledge and competence acceptable to the Corporation, is appointed to evaluate Product, appraises the Product and issues one or more Product Verification Reports.

1.3.14 Product Certification

A formal process whereby the production and management systems for the manufacture of Product, are assessed by a Certification Body to evaluate compliance of these systems with specified product standards and tests, in accordance with Certification Scheme rules.

1.3.15 Product Verification Report

A formal report wherein a Product Assessor evaluates the extent of Product compliance with the specified product standards and specifications.

NOTE: Verification may be on a project-by-project basis or at agreed intervals, as appropriate to the scope of a Purchasing Schedule and Product end use, subject to determination by the Corporation.

1.3.16 Product Warranty

A formal express undertaking by a Supplier that indemnifies the Corporation against the consequences of supplied Product failure to comply with specified fitness for application and in-service life expectancy performance requirements.

1.3.17 Purchasing Schedule

A Corporation purchase order, tender, schedule of prices, bill of quantities, or specification that details the nature, quantity and other characteristics of Product to be supplied, purchased or installed.

1.3.18 Quality System

A management system that establishes, documents, implements and maintains organizational structures, resources, responsibilities, processes and procedures for the manufacture of Product and provision of Product related services in accordance with the requirements of AS/NZS ISO 9001.

1.3.19 Standards Australia

The peak non-government standards development body in Australia which develops Australian Standards®.

1.3.20 Strategic Product

An essential infrastructure component whose performance is critical to the elimination of risk to the safe and effective provision of water services, which are functions of the Corporation under the Water Corporation Act as licensed under the Water Services Coordination Act.

NOTE Strategic product is a component of permanent Corporation infrastructure. Ancillary operational and safety equipment that does not form part of permanent infrastructure but offers exceptional enhancements in operational performance or personnel safety may also be deemed strategic.

1.3.21 Strategic Product Appraisal Process

The process whereby manufactured products and equipment are evaluated and, where they comply with specified requirements, authorised for use in Corporation infrastructure and duly registered in the Strategic Products Register.

1.3.22 Supplier

An entity or combination of entities that is responsible for the supply of Product.

NOTE: A Supplier may be a Manufacturer, owner, producer, distributor, vendor, agent, tenderer or contractor for supply of Product or Product related service.

1.3.23 Testing

The determination of Product characteristics by inspection and by the application of specified test procedures.

2 Design, Handling and Storage Requirements

2.1 Clamp Materials and Design

Clamp bodies, seals, fasteners and washers shall comply with the requirements of AS 4181 Table 2.1 and shall be rated for an allowable operating pressure, as defined in AS 4181, not less than 1.6 MPa. Allowable (steady state) clamp operating pressures, maximum allowable (dynamic – including operational surge) pressures and allowable site test pressures shall be in accordance with AS 4181 Table 1.1. All clamps shall comply with AS/NZS 4020, using a scaling factor of 0.05.

2.2 Clamp Elastomeric Gaskets

Clamp elastomeric lining gaskets shall be continuously and uniformly bonded to the inner stainless steel clamp surface and shall be designed to provide a continuous circumferential seal over the entire pipe surface encompassed by the clamp.

2.3 Clamp Dimensions

Clamp length and outside diameter (OD) range shall comply with the designated dimensional requirements of Table 1 below. Clamp lengths nominated in Table 1 are minimum lengths. Repair clamps shall not be used to join pipeline ends as they are designed for the sole purpose of restoring pipe hydraulic integrity where its structural strength and pressure capacity is not otherwise impaired.

2.4 Clamp Construction

Clamps shall be designed to have the least number of wrap-around clamping body segments to accommodate the pipe to be repaired. Single segment clamp styles shall be preferred for use on pipe $DN \leq 300$ and to double part clamps or pipe $DN \geq 300$ and $DN \leq 600$. Repair clamps shall be designed for optimal ease of fastening and installation and for least installation time.

2.5 Clamp Selection

Table 1 sets out some guidelines on nominal clamp sizes, dimensions, dimensional tolerances and inventory ‘part’ numbers (MMRs) for the selection and use of stainless steel clamps for repair of Corporation pipelines. Material Master Records (MMR) descriptions are provided in Appendix A.

2.6 Handling and Storage

2.6.1 General

Repair clamps shall be handled and stored so as to prevent damage by impact, rough handling, crushing, piercing by sharp objects, contact with aggressive chemicals, or exposure to high temperatures. Repair clamps shall not be lifted by hooking at ends or by dropping off elevated vehicle platforms or sites.

2.6.2 Packaging

Repair clamps shall be packaged so as to prevent damage by chafing, scoring, or other incidental damage during transportation, handling and storage operations. Packaged clamps shall include clamp installation instructions and sufficient anti-seize lubricants for all clamp fasteners.

2.6.3 Preservation of Product in Storage

Repair clamps shall be stored in original product packaging, prior to installation and in accordance with the published requirements of the clamp manufacturer. Elastomeric clamp gaskets shall be stored (including protection from extended exposure to direct sunlight, high temperatures) in accordance with the storage recommendations of AS 1646/AS 681.

2.6.4 Table 1: Guidelines for Pipe Repair Clamp Selection (DN 50 - 900)

Pipe Material:		Asbestos Cement		Grey and Cast Iron			Ductile Iron	Steel			Reinforced Concrete		PVC Blue	PVC White	GRP	Copper	PVC	Asbestos Cement		Vitreous Clay	Grey/Cast Iron	GRP	FRC
Pipe Class/Type:		A & B	CIOD C & D	B	CIOD C & D	Standard Drawings	CIOD K9/12	GW1	Imperial	Metric		Maximum Pressure	CIOD Series 2	Metric Series 1	CIOD		SH, SEH, SN8, SN16	35	50		B	CIOD	X
Pipe OD Tolerance (mm) :		± 0.8	± 0.8	± 2	± 2		+ 1, -2	± 0.5 to ± 1	± 0.5%	± 0.5%		± 5	± 0.2 to + 0.45	± 0.15 to + 0.45	+ 0.6, - 1.2	± 0.05 to + 0.2	± 0.15 to + 0.5	± 0.8	± 0.8	± 0.8 to ± 1	± 1.5	± 0.9	
REPAIR CLAMP DESIGNATIONS		PRESSURE PIPE NOMINAL SIZES AND OUTSIDE DIAMETERS														NON-PRESSURE PIPE NOMINAL SIZES & OUTSIDE DIAMETERS							
DN		DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	PSI	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD	DN Mean OD
50								50/2"	2"					50		65							
80			58 77.6					65/2.5"	60.3				58 77.6	65 75.4		80 76.1							
80								80/3"						80 88.9		90 88.8							
80		80/3"	80/3"	80/3"	80/3"	80/3"	80									100 101.5							
100								100/4"		100				100 114.3			100 110.2	100/4"			100/4"		
100		100/4"	100/4"	100/4"	100/4"	100/4"	100		4"				100 121.9			125 126.9			100/4"			100/4"	124
125								125/5"														125/5"	
125				125/5"	125/5"									125 140.2							100/4"		
150											4"	180				150 152.2							
150								150/6"		150		180		150 160.3			150 160.2					150/6"	
150		150/6"	150/6"	150/6"	150/6"	150/6"	150	6"					150 177.3					150/6"	150/6"				150/6"
150																				150/6"			
200				175/7"	175/7"							180		175 200.3		200 203	175 200.3					200/8"	
200										200				200 225.3				200/8"					
200		200/8"	200/8"	200/8"	200/8"	200/8"	200	8"					200 232.2								225/9"		
225		225/9"	225/9"	225/9"	225/9"	225/9"	225						225 259.2	225 250.4			225 250.3	225/9"	225/9"				200/8"
250										250				250 280.4					250/10"			225/9"	
250		250/10"	250/10"	250/10"	250/10"		250	10"				135	250 286.2						250/10"				
300												75		300 315.5			300 315.4						
300										300		135										300/12"	
300		300/12"		300/12"									300 323.9									300/12"	
300														250/10"	100			300/12"	300/12"				
300			300/12"		300/12"		300	12"					300 345.4			300 345						300	300/12"
300														350 355.6									
300														300/12"	50								
300														11/11.5/12"	135								
300														381									

Pipe Material:	Asbestos Cement		Grey and Cast Iron			Ductile Iron	Steel			Reinforced Concrete	PVC Blue	PVC White	GRP	Copper	PVC	Asbestos Cement		Vitreous Clay	Grey/Cast Iron	GRP	FRC	
Pipe Class/Type:	A & B	CIOD C & D	B	CIOD C & D	Standard Drawings	CIOD K9/12	GW1	Imperial	Metric	Maximum Pressure	CIOD Series 2	Metric Series 1	CIOD		SH, SEH, SN8, SN16	35	50		B	CIOD	X	
Pipe OD Tolerance (mm) :	± 0.8	± 0.8	± 2	± 2		+ 1, -2	± 0.5 to +1	± 0.5%	± 0.5%	± 5		± 0.5	± 0.5	+0.6, -1.2 to +1, -2.3	± 0.5	± 0.8	± 0.8	± 1	± 2	± 0.9 to +1, -2.3		
REPAIR CLAMP DESIGNATIONS	PRESSURE PIPE NOMINAL SIZES AND OUTSIDE DIAMETERS														NON-PRESSURE PIPE NOMINAL SIZES & OUTSIDE DIAMETERS							
DN	DN	DN	DN	DN	DN	DN	DN	DN	DN	DN	PSI	DN	DN	DN	DN	DN	DN	DN	DN	DN	DN	
Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD		Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	Mean OD	
375			350/14" 386.6	350/14" 399.3				14" 390.5	400 406.4				375 400.5	350 399		375 400.5					350 399	
375	375/15" 413	375/15" 426.2	375/15" 413	375/15" 426.2	400/16" 439.4	375 425		15" 425.5				375 426.2		375 426		375/15" 418.6	375/15" 424.8	375/15" 428	400/16" 429	375 426	375/15" 426	
400				400/16" 453.1				16" 441.3	450 457	375/15" 445	50		400 450.5	400 453							400 453	
450	450/18" 492.2	450/18" 507	450/18" 492.3	450/18" 507		450 507		18" 497.3	500 508	375/15" 495	120	450 507	450 500.5	450 507	475/19" 500.5	450/18" 496.8	450/18" 505				450 507	450/18" 510
500	525/21" 571.5	525/21" 587.2	525/21" 571.5	500/20" 560.3 525/21" 587.2	550/22" 579.9	500 560		21"/5mm 568.3 21"/6mm 577.9		450/19.5" 597 450/17.5" 597	75 120	525/500 560.3	500 560.5	525 587		525/21" 576.1	525/21" 585.3				525 587	525/21" 594
600								24" 647.7	600 610	500/21/20.75" 635 500/20" 635	75 115		575 630.5		600/24" 630.5							
600	600/24" 650.2	600/24" 667	600/24" 650.2	600/24" 667		600 667						600 667		600 667		600/24" 657	600/24" 664.4				600 667	600/24" 679
600			650/26" 702.6	650/26" 702.6					700 711									600/24" 692				
675		675 746.8		675 746.8										675 747							675 747	
900										750/30" 914 750/28"/29" 915	75 120			900 924							900 924	

NOTES FOR TABLE 1 (Parts A & B)

- Note 1:** Cast Iron Outside Diameter (CIOD) means the range of ODs of Imperial Grey/Cast Iron (CI) Pipe Classes C & D (vintage 1938 onwards) and of other pipes subsequently manufactured to the same ODs, including CI Pipe Class B ≤ DN 250, Metric Ductile Iron (DI), Asbestos Cement (AC) Pipe Classes C & D (and Classes A & B ≤ DN 250), PVC Pipe Series 2 and GRP Pipe. It excludes Steel Pipe, Copper Pipe, RC Pipe, DN 300 and larger CI Pipe Class B, DN 300 and larger AC Pipe Classes A & B, PVC Pipe Series 1 and non-pressure pipe except GRP.
- Note 2:** Nominated AC pipe ODs relate to factory machined pipe spigot ends only. There are no published manufacturing data for unmachined or 'wrinkly' AC pipe barrel ODs or OD tolerances. The use of 'wrap around' clamps to repair unmachined or 'wrinkly' AC pipe is not recommended because the thin elastomeric lining gasket of a repair clamp is not designed for this application and is unlikely to attain a complete seal. The recommended repair method in these circumstances is replacement of the full AC pipe length within which a failure has occurred with PVC pipe, duly coupled to the machined ends of the two adjoining AC pipes with a pair of 'multifit' repair couplings of the modern 'gibault' style.
- Note 3:** Wherever the mean OD of a pipeline to be repaired is very close to the lower or upper limit of a selected clamp OD range, it is recommended that a second clamp from an adjoining OD range is deployed at the repair site as an added precaution, having due regard to the pipe OD tolerance ranges shown in this Table and the sometimes uncertainty of legacy pipe ODs.
- Note 4:** Suitability of SS repair clamps for use with nominated pressure and non-pressure pipe materials is based on compliance of all pipes to be repaired with the appropriate pipe product standards. Not all nominated pipe sizes and materials form part of the operational pipeline infrastructure at present. It is recommended that the ODs of older vintage pipes are verified by direct measurement prior to the selection of an appropriate repair clamp.

3 Quality Assurance

3.1 Certification

3.1.1 Certification of Product

Compliance with this Specification shall be certified by means of an ISO Type 5 Product Certification Scheme i.e. a scheme that meets the criteria described in HB 18.28 (ISO/IEC Guide 28), conducted by a JAS-ANZ accredited Certification Body. Each Certificate shall expressly attest compliance of all Product items with the nominated Standards. Wherever specified, Certificates shall be submitted to the Officer nominated for this purpose. Product shall be marked in accordance with the requirements of the Certification Body.

NOTE: Compliance of Product including related accessories and services with nominated Standards and specified requirements may be verified by means of a Product Verification Report provided by a Product Assessor. The Product Verification Report should identify all relevant Certificates of Product compliance, duly issued in accordance with Certification Scheme rules.

3.1.2 Quality System

The processes for manufacture, testing, supply, transportation, handling, delivery and storage of Product to be supplied in accordance with this Specification shall form part of a documented Quality System. The System shall be certified by a Certification Body as complying with the requirements of AS/NZS ISO 9001 and shall provide for identification and traceability, control of production and delivery to the specified destination, customer verification and control of documents and records.

3.1.3 Product Re-verification

Product compliance with the Specification shall be subject to re-verification by a Product Assessor when, during the agreed Product supply period, there occurs any:

- substantive change in Product design, material formulation or performance
- Product failure to perform in operational service to the nominated performance specification.

Re-verification shall require the issue of a new or supplementary Product Verification Report. Product components and test outcomes that are not significantly affected by the Product change or failure may be excluded from the scope of re-verification, provided that these outcomes have already been reported in a current valid Product Verification Report that is acceptable to the Corporation.

Wherever the requirements of the Specification apply to a Product supply period in excess of three years, continuing acceptance of Product shall be subject to re-verification. The purpose of re-verification shall be to confirm the continuing compliance of Product quality and production control processes with the requirements of the Specification

3.2 Compliance and Acceptance

3.2.1 Means of Demonstrating Compliance

Compliance with this Specification shall be demonstrated by means of Product Appraisal and issue by a Product Assessor of a Product Verification Report that confirms compliance. Otherwise, Product shall be deemed non-compliant and ineligible for registration as Product authorized for use in Corporation infrastructure.

NOTE 1: Where a project includes design work including Product design, Product Appraisal may form part of the project design review process and the Product Assessor may be a member of the project design review team.

NOTE 2: A Product Verification Report should verify the extent of compliance with the Specification including all relevant 'Technical Compliance Schedule' Appendices and the currency of a Certificate where relevant to the Product.

3.2.2 Acceptance Criteria

For acceptance, Product shall be supplied as specified in the Purchasing Schedule.

Prior to the implementation of any arrangement to supply Product, the Supplier shall, in accordance with specified requirements:

- nominate applicable Product Warranty terms; and
- provide documentary verification in the form of a current valid Certificate or Product Verification Report as appropriate to the Product; and
- detail each element of Product that does not comply with the specified requirements together with the extent of non-compliance.

NOTE : Where the Specification includes Technical Compliance Schedules, the nature and extent of all non-compliances should be recorded in the appropriate Schedules to be submitted for acceptance.

3.3 Non-compliant Product

3.3.1 General

Product whose design, workmanship or performance fails to conform to the specified requirements shall be clearly tagged and quarantined by the Supplier as non-compliant and shall be subject to rejection for return to and replacement by the Supplier.

3.3.2 Manufacturing Repairs (In-process)

Welding, the use of fillers and other repairs shall not be permissible on Product which is in the course of production. Accordingly, details of any defect which the Manufacturer considers can be repaired; together with details of proposed repair procedures shall be submitted in writing for determination by the Corporation.

The Manufacturer shall make provision in its production Quality System and in the appropriate ITP's for sufficient hold points whenever significant defects occur. Production work on non-compliant components shall cease and repair work shall not commence until it has been confirmed by the Corporation in writing that:

- (a) repair of the non-compliant components in lieu of their replacement is acceptable; and
- (b) proposed repair procedures are acceptable; and
- (c) any proposal to vary the terms of the original Product Warranty is acceptable.

3.3.3 Product Warranty

The Supplier shall replace non-compliant Product with Product that conforms to the acceptance criteria or shall repair or rectify all faults, damage or losses caused by defective Product. Except as may otherwise be specified, the Product Warranty shall indemnify and keep indemnified the Corporation against all losses suffered by the Corporation as a result of non-compliant Product for a period no less than 24 months after Product delivery or 12 months after Product installation, whichever period elapses first.

3.3.4 Product Repair

All reasonable proposals for repair or remedy of defects will be considered, provided that each such proposal is accompanied by a methodology statement that accords with the performance objectives of this Specification, as determined by the Corporation. For acceptance, a proposal for repair or remedy of Product defects shall not void or otherwise diminish the provisions of the Product Warranty.

APPENDIX A: Material Master Records (Informative)

The following Material Master Records (MMR) comprise Corporation catalogue numbers that are unique to the particular products described for the purposes of Corporation activities or work.

MMR records maintained by Procurement Section.

MMR	PURCHASE ORDER LONG TEXT (Repair Clamp)
9121	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN50 x 150mm Minimum Clamp Length; To Suit Pipe OD Range 59mm - 64mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN63 PE Pipe. Note: Not Permissible, unless an all Stainless Steel Design Available. Need to check for Dissimilar Metals Contact.
19939	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN80 x 150mm Minimum Clamp Length; To Suit Pipe OD Range 76mm - 81mm; To suit DN58 AC, DN65 PVC Series 1 White and Steel Pipe; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
17197	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN80 x 150mm Minimum Clamp Length; To Suit Pipe OD Range 88mm - 95mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN90 PE Pipe.
22702	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN80 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 88mm - 95mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN90 PE Pipe.
9120	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN80 x 150mm Minimum Clamp Length; To Suit Pipe OD Range 95mm - 102mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
16630	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN100 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 110mm - 120mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN110 PE Pipe.
21760	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN100 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 100mm - 110mm; Single Section; For use with Non-Standard White PVC. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN110 PE Pipe.
22704	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN100 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 110mm - 120mm; Single Section. For use with Pipe Materials and Sizes as shown in Table 1 of SPS152. Not Permissible for DN110 PE Pipe.
9122	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN100 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 120mm - 130mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN125 PE Pipe.
22703	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN100 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 120mm - 130mm; Single Section. For use with Pipe Materials and Sizes as shown in Table 1 of SPS152. Not Permissible for DN125 PE Pipe.
19931	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN125 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 130mm - 140mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
16779	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN125 x 200mm Minimum Clamp Length;

	To Suit Pipe OD Range 140mm - 150mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
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MMR	PURCHASE ORDER LONG TEXT (Repair Clamp)
20111	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN125 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 145mm - 155mm; For Old 5-7/8 Inch Steel Pipe; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
22701	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN125 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 145mm - 155mm; For Old 5-7/8 Inch Steel Pipe; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
8073	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN150 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 150mm - 160mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
19932	Clamp, Repair, Pipe; Type 316L Stainless Steel; DnN150 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 160mm - 170mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not permissible for DnN160 PE Pipe.
21291	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN150 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 175mm - 185mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not permissible for DN160 PE Pipe.
9123	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN150 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 175mm - 185mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN180 PE Pipe.
19933	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN150 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 190mm - 200mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
8074	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN175 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 200mm - 210mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN200 PE Pipe.
64062	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN200 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 215mm - 225mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
9124	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN200 x 200mm Minimum Clamp Length; To Suit Pipe OD Range 230mm - 240mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
22949	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN200 x 300mm Minimum Clamp Length; To Suit Pipe OD Range 230mm - 240mm; Single Section; 3 Bolt. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
22829	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN200 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 230mm - 240mm; Single Section; 5 Bolt. For use with Pipe Materials and Sizes as shown in Table 1 of SPS152.
16997	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN225 x 300mm Minimum Clamp Length; To Suit Pipe OD Range 250mm - 260mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN250 PE Pipe.
19935	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN250 x 300mm Minimum Clamp Length; To Suit Pipe OD Range 270mm - 280mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN280 PE Pipe.

MMR	PURCHASE ORDER LONG TEXT (Repair Clamp)
22304	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN250 x 300mm Minimum Clamp Length; To suit Pipe OD Range 275mm - 285mm; Single Section. For use with Pipe Materials and Sizes as shown in Table 1 of SPS152. Not Permissible for DN280 PE Pipe.
9126	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN250 x 300mm Minimum Clamp Length; To Suit Pipe OD Range 285mm - 295mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
8076	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN300 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 310mm - 320mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN315 PE Pipe.
19937	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN300 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 320mm - 330mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
16631	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN300 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 330mm - 340mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
13974	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN300 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 340mm - 350mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
21068	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN300 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 340mm - 360mm; Single Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
19936	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN300 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 360mm - 380mm; Double Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
16632	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN375 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 385mm - 405mm; Double Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN400 PE Pipe.
16684	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN375 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 410mm - 430mm; Double Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
9128	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN400 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 440mm - 460mm; Double Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN450 PE Pipe.
16633	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN450 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 490mm - 510mm; Double Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN500 PE Pipe.
16634	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN500 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 570mm - 600mm; Triple Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
16635	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN600 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 620mm - 650mm; Triple Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN630 PE Pipe.

MMR	PURCHASE ORDER LONG TEXT (Repair Clamp)
16998	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN600 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 650mm - 680mm; Triple Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
16999	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN600 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 685mm - 715mm; Double Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152. Not Permissible for DN710 PE.
19019	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN675 x 400mm Minimum Clamp Length; To Suit Pipe OD Range 740mm - 770mm; Triple Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.
19020	Clamp, Repair, Pipe; Type 316L Stainless Steel; DN900 x 600mm Minimum Clamp Length; To Suit Pipe OD Range 910mm - 950mm; Quadruple Section. For use with Pipe Materials & Sizes as shown in Table 1 of SPS152.

MMR	PURCHASE ORDER LONG TEXT (Tapped Boss Repair Clamp-Tapping Band)
20403	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN80; Tapped Rp1 25mm; To Suit Pipe Sizes 88-98mm OD; Threads to AS ISO 7.1; Band 150mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit CI & AC Pipe.
20402	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN80; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 88-98mm OD; Threads to AS ISO 7.1; Band 150mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit CI & AC Pipe.
20404	Tapping Band, Pipe; All Stainless Steel (Gde 316); Dn80; Tapped Rp3/4 20mm; To Suit Pipe Sizes 88-98mm OD; Threads to AS ISO 7.1; Band 150mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit CI & AC Pipe.
20400	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp1 25mm; To Suit Pipe Sizes 114-124mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S1, PVC S2, CI, AC, & Steel Pipe.
20394	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp1 25mm; To Suit Pipe Sizes 152-162mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC & Dn150 PVC S1 Pipe.
20397	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp1 25mm; To Suit Pipe Sizes 130-140mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit AC Sutton Pipe.
20399	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 114-124mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S1, PVC S2, CI, AC, & Steel Pipe.
20396	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 130-140mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit AC Sutton Pipe.
20401	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp3/4 20mm; To Suit Pipe Sizes 114-124mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S1, PVC S2, CI, AC, & Steel Pipe.
20398	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp3/4 20mm; To Suit Pipe Sizes 130-140mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit AC Sutton Pipe.

MMR	PURCHASE ORDER LONG TEXT (Tapped Boss Repair Clamp-Tapping Band)
20395	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp3/4 20mm; To Suit Pipe Sizes 152-162mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC & Dn150 PVC S1 Pipe.
20393	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN100; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 152-162mm OD; Threads to AS ISO 7.1; Band 150mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276 & Nuts to ISO 4032 & AS 1112.1; To Suit RC & Dn150 PVC S1 Pipe.
21756	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN125 (5"); Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 140-150mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile(NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit Crinkley AC Pipe.
20392	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN150; Tapped Rp3/4 20mm; To Suit Pipe Sizes 168-178mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S2, CI, AC & Steel Pipe.
20391	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN150; Tapped Rp1 25mm; To Suit Pipe Sizes 168-178mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S2, CI, AC & Steel Pipe.
20388	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN150; Tapped Rp1 25mm; To Suit Pipe Sizes 200-220mm OD; Threads to AS 1772.1; Band 200mm Minimum Length; Full Circle Nitrile NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC Pipe.
21755	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN150; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 175-185mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile(NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit CIOD, AC & Steel Pipe.
20390	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN150; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 168-178mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S2, CI, AC & Steel Pipe.
20387	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN150; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 200-220mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile(NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC Pipe.
20389	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN150; Tapped Rp3/4 20mm; To Suit Pipe Sizes 200-220mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC Pipe.
20385	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN200; Tapped Rp1 25mm; To Suit Pipe Sizes 215-235mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S1, PVC S2, CI, AC & Steel Pipe.

MMR	PURCHASE ORDER LONG TEXT (Tapped Boss Repair Clamp-Tapping Band)
20384	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN200; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 215-235mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S1, PVC S2, CI, AC, & Steel Pipe.
20386	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN200; Tapped Rp3/4 20mm; To Suit Pipe Sizes 215-235mm OD; Threads to AS ISO 7.1; Band 200mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit PVC S1, PVC S2, CI, AC & Steel Pipe.
20382	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN250; Tapped Rp1 25mm; To Suit Pipe Sizes 290-310mm OD; Threads to AS ISO 7.1; Band 300mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC Pipe.
20381	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN250; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 290-310mm OD; Threads to AS ISO 7.1; Band 300mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC Pipe.
21757	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN250; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 270-290mm OD; Threads to AS ISO 7.1; Band 300mm Minimum Length; Full Circle Nitrile(NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit CIOD & AC Pipe.
20383	Tapping Band, Pipe; All Stainless Steel (Gde 316); DN250; Tapped Rp3/4 20mm; To Suit Pipe Sizes 290-310mm OD; Threads to AS ISO 7.1; Band 300mm Minimum Length; Full Circle Nitrile (NBR) Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit RC Pipe.
21759	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN300; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 330-350mm OD; Threads to AS ISO 7.1; Band 300mm Minimum Length; Full Circle Nitrile(NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit AC, CI & DN250 (10") RC Pipe.
21758	Tapping Band, Pipe; All Stainless Steel(Gde 316); DN300; Tapped Rp1-1/2 40mm; To Suit Pipe Sizes 300-320mm OD; Threads to AS ISO 7.1; Band 300mm Minimum Length; Full Circle Nitrile(NBR)Sealing Gasket to AS 1646 & AS/NZS 4020; Molybond Coating of Studs to ASTM A276, Nuts to ISO 4032 & AS 1112.1; To Suit DN215 (8.5") RC, DN250 (10") RC, S1PVC & Sewer Pipe.

MMR	PURCHASE ORDER LONG TEXT (Flanged Offtake Repair Clamp)
21708	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN100 x 400mm Length; Clamp Range 120mm - 125mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Single Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21927	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN100 x 400mm Length; Clamp Range 155mm - 165mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Single Section; To Suit DN100 RC (Reinforced Concrete) Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21830	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN125 x 400mm Length; Clamp Range 140mm - 150mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Single Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21829	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN125 x 400mm Length; Clamp Range 130mm - 135mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Single Section; To suit Sutton (Crinkly) AC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21754	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN125 x 400mm Length; Clamp Range 135mm - 140mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN110 PVC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21709	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN150 x 400mm Length; Clamp Range 175mm - 185mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Single Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21723	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN150 x 400mm Length; Clamp Range 150mm - 160mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Single Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21724	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN150 x 400mm Length; Clamp Range 160mm - 170mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN100 RC (Reinforced Concrete) Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21934	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN150 x 400mm Length; Clamp Range 175mm - 185mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Single or Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21753	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN200 x 400mm Length; Clamp Range 200mm - 210mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN150 RC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21752	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN200 x 400mm Length; Clamp Range 210mm - 220mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21711	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN200 x 400mm Length; Clamp Range 230mm - 245mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
22729	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN200 x 400mm Length; Clamp Range 210mm - 220mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21935	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN200 x 400mm Length; Clamp Range 230mm - 240mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.

MMR	PURCHASE ORDER LONG TEXT (Flanged Offtake Repair Clamp)
21938	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN225 x 400mm Length; Clamp Range 250mm - 265mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21727	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN250 x 400mm Length; Clamp Range 275mm - 285mm; 90 Degree Offtake, Size DN100; Flange to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21712	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN250 x 400mm Length; Clamp Range 285mm - 300mm; 90 Degree Offtake, Size DN100; Flange to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
22765	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN250 x 400mm Length; Clamp Range 285mm - 295mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21936	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN250 x 400mm Length; Clamp Range 275mm - 285mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Double Section. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
22481	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN300 x 400mm Length; Clamp Range 340mm - 350mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN300 CIOD Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
22735	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN300 x 400mm Length; Clamp Range 380mm - 390mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN300 (11/11.5/12in) RC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21766	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN300 x 400mm Length; Clamp Range 360mm - 370mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN300/12inch (50Psi) RC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21765	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN300 x 400mm Length; Clamp Range 330mm - 340mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN250/10inch (100 Psi) RC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21764	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN300 x 400mm Length; Clamp Range 310mm - 320mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Double Section; To Suit DN250/10inch (75Psi) or DN215/8.75inch (135Psi) RC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
22930	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN300 x 400mm Length; Clamp Range 310mm - 320mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Double Section; To Suit DN250/10inch (75Psi) or DN215/8.75inch (135Psi) RC Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
22931	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN16; DN350 x 400mm Length; Clamp Range 380mm - 390mm; 90 Degree Offtake, Size DN150; Flanged to AS 4087 Fig B7; Double Section; To Suit DN350/14inch (Class B) Grey Cast Iron Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21726	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN12; DN525 x 400mm Length; Clamp Range 570mm - 580mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Triple Section; To Suit DN525 AC (Asbestos Cement) Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.

MMR	PURCHASE ORDER LONG TEXT (Flanged Offtake Repair Clamp)
21725	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN12; DN525 x 400mm Length; Clamp Range 580mm - 590mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Triple Section; To Suit DN525 AC (Asbestos Cement) Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.
21939	Clamp, Pipe; Flanged Offtake Clamp; 316 Stainless Steel; PN10; DN600 x 400mm Length; Clamp Range 650mm - 660mm; 90 Degree Offtake, Size DN100; Flanged to AS 4087 Fig B7; Triple Section; To Suit DN600 AC (Asbestos Cement) Type A/B and Grey Cast Iron Type B Pipe. For use with Pipe Materials and Sizes as Shown in Table 1 of SPS152.

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