



Derwent Industries Pty Ltd

PRODUCT APPRAISAL REPORT PA 1833 Issue 6

Derwent Stainless Steel Repair and Tapped Off-take Clamps

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

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Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

1. influencing national and state policies on the provision of urban water services and sustainable water resource management
2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

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1 EXECUTIVE SUMMARY

Derwent Industries Pty Ltd is a wholly owned operating unit of the Evans Group of Companies, a private family-owned business originally established in 1963. Other members of the Evans Group include Derwent International Pty Ltd, Desal Systems Pty Ltd and Advanced Water Group Pty Ltd. Derwent Foundry and Derwent Pipelines are trading names of Derwent Industries Pty Ltd. The clamps are manufactured at Derwent's stainless-steel fabrication facility in Wodonga, Victoria.

This appraisal covers a range of PN16 Type R stainless steel repair clamps in sizes DN 80 to DN 450 including both repair and tapped off-take clamps suitable for application to rigid pipes including Ductile and Cast Iron, Copper, Reinforced Concrete and Asbestos Cement.

This Issue 6 is to include DN 375 and DN 450 repair and tapped off-take clamps.

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

These products are marketed under the Derwent brand.

Derwent stainless steel repair clamps are designed to act as a permanent repair option for cracks, holes, splits and pinholes in water and sewer pipes.

The Derwent repair and off-take clamps are manufactured with Grade 316 stainless steel body and fasteners. The elastomeric sealing mats are moulded in Nitrile.

Derwent Industries Pty Ltd holds an ISO 9001:2015 Quality Management System Licence.

Derwent stainless steel repair clamps have ISO Type 5 StandardsMark product certification to AS 4181-2013 *Repair and off-take clamps for water industry purposes*.

This Appraisal has determined that Derwent stainless steel repair and tapped off-take clamps, as detailed in Section 3, comply with 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 Derwent DN 80 to DN 450 stainless steel repair and tapped off-take clamps as detailed in this report, for repair of 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 Derwent Industries Pty Ltd.

2.1 The Manufacturer

Derwent Industries Pty Ltd is a wholly owned operating unit of the Evans Group of Companies, a private family-owned business originally established in 1963. Other members of the Evans Group include Derwent International Pty Ltd, Desal Systems Pty Ltd and Advanced Water Group Pty Ltd. Derwent Foundry and Derwent Pipelines are trading names of Derwent Industries Pty Ltd.

The clamps are manufactured at Derwent's stainless-steel fabrication facility in Wodonga, Victoria. The nitrile mats are sourced from CRP Industries Pty Ltd in Dandenong Victoria.

The Evans Group has a long history of involvement in manufacturing and marketing products for the Australian water industry. In 1981 Wang Industries Pty Ltd, a member of the Evans Group, began the manufacture of the first Australian made stainless steel repair clamp range, branded as Kawandah. In the 1990's a range of Varigib repair couplings was introduced to the market. Wang Industries acquired Derwent Foundry, located in Hobart

Tasmania, in 1997, which provided manufacturing capability for a complete range of ductile iron fittings.

In 2001 Tyco International acquired Wang Industries, however the Evans Group retained Derwent Foundry, now operating as the manufacturing arm of Derwent Industries Pty Ltd.

The stainless-steel fabrication facility was established in 2018.

Derwent Industries Pty Ltd is the operations and sales arm of the Group whilst Derwent International Pty Ltd is the logistics business, importing pipeline component products for Derwent Industries, to complement their manufactured products.

For more information see: www.derwentindustries.com.au

3 THE PRODUCT

Derwent stainless steel repair clamps are designed to suit a wide range of pipe OD's and 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.

The Type R clamps included in this appraisal are suitable for application on pipes manufactured from grey or ductile cast iron, steel, copper, reinforced concrete and asbestos cement and are not suitable for use with PVC, GRP, PE or other plastic pipes.

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

Derwent repair clamps are available in sizes from DN 80 to DN 450 with lengths of 200mm, 300mm and 400mm depending on size. Tapped off-take clamps are available for all sizes and with BSP tapped outlets of 3/4", 1", 1 1/4", 1 1/2" or 2".

Table 1 shows details of the clamp range.

The clamps are rated as PN16.

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 SN 10,000 or greater.

TABLE 1
DERWENT STAINLESS STEEL REPAIR CLAMP RANGE

DN	Pipe OD Range	Length mm			Tapped Off-take BSP
		200	300	400	
80	85-95	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
80	95-105	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
100	100-110	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
100	110-120	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
100	120-130	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
100	130-140	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
100	140-150	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
150	150-160	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
150	160-170	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
150	175-185	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
150	190-200	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"

DN	Pipe OD Range	Length mm			Tapped Off-take BSP
		200	300	400	
200	200-210	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
200	210-220	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
200	220-230	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
200	230-240	✓	✓		3/4", 1", 1 1/4", 1 1/2", 2"
250	240-25-		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
250	250-260		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
250	255-265		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
250	260-270		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
250	270-280		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
250	275-285		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
250	285-295		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
300	200-3120		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
300	310-320		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
300	320-330		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
300	330-340		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
300	340-350		✓	✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	350-370			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	360-380			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	380-400			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	390-410			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	400-420			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	410-430			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	420-440			✓	3/4", 1", 1 1/4", 1 1/2", 2"
375	440-460			✓	3/4", 1", 1 1/4", 1 1/2", 2"
450	450-470			✓	3/4", 1", 1 1/4", 1 1/2", 2"
450	470-490			✓	3/4", 1", 1 1/4", 1 1/2", 2"
450	490-510			✓	3/4", 1", 1 1/4", 1 1/2", 2"
450	500-520			✓	3/4", 1", 1 1/4", 1 1/2", 2"

4 SCOPE OF THE APPRAISAL

The scope of this appraisal covers Derwent branded Type R stainless steel repair and tapped off-take clamps rated as PN 16 in sizes from DN 80 to DN 450. See Table 1.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts 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

Derwent stainless steel repair 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 also 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/35716>

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Derwent has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. QEC 2004 issued to Derwent Industries Pty Ltd by SAI-Global.
- AS 4181:2013 ISO Type 5 StandardsMark product certification Licence No. SMK26386 issued to Derwent Industries Pty Ltd by SAI-Global.

Derwent has also supplied copies of ISO 9001 certificates for the suppliers of the stainless-steel fasteners and Nitrile rubber mats.

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

6.2 Compliance with Performance Requirements

6.2.1 Materials

AS 4181:2013 details allowable material requirements for the clamp components and are addressed in the clauses below.

6.2.1.1 Clamp body

Derwent 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 Derwent clamps are M16 Grade 316 stainless steel studs, nuts and washers. The threads of the fasteners are coated with a dry film anti-galling coating. The studs are supplied by Tong Ming Enterprise Co Ltd and the nuts and washers are supplied by James Glen Pty Ltd. Both companies have ISO 9001 certification.

6.2.1.3 Elastomeric seals

The sealing gasket used in the Derwent clamps are moulded by CRP Industries Pty Ltd from nitrile rubber. Type test reports have been submitted to demonstrate compliance with AS1646. CRP Industries Pty Ltd is licenced to ISO 9001:2015.

6.2.1.4 Effect on water

The design of the Derwent clamp means that only the nitrile rubber sealing gasket in the clamps are exposed to drinking water. A complying test report No. 266114 dated 17th December 2019 from Australian Water Quality Centre has been submitted to demonstrate compliance of the 8898 Nitrile material to AS/NZS 4020:2018.

6.2.2 Design

Derwent clamps are of standard design with a single part. The length and size of the clamp determines the number of studs used to tighten the clamp to the pipe.

Repair 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 Type R clamps included in this appraisal have not been tested for Type F compatibility and are therefore deemed unsuitable for plastic pipes.

6.2.3 Performance

Derwent has submitted copies of Type Test reports to demonstrate compliance with the performance tests in AS 4181:2013.

Testing was carried out by Queensland Testing Laboratory Pty Ltd (NATA accreditation No. 14783).

Tests included joint infiltration, hydrostatic leak tightness and bi-metallic couple and were conducted on pipe diameters of 95mm, 140mm, 190mm, 230mm, 285mm, 340mm, 440mm and 500mm in accordance with the requirements of AS 4181.

The tapped off-take tests were conducted on clamps with a 2" tapped off-take and the same pipe diameters as the repair clamps. Additional tests for leak-tightness during application of a bending moment to the connecting pipe and resistance to rotation were also completed successfully.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION


Each Derwent clamp is supplied with an installation guide attached.

A copy of the installation instructions is attached 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 in compliance with AS 4181.

- Manufacturer's name: Derwent
- Nominal diameter: e.g., DN150
- Pressure Classification: PN16
- Pipe outside diameter range: e.g., 175-185
- Type of clamp: Type R
- The number of this standard: AS 4181
- Manufacturing Date: (DD/MM/YY)
- Product certification mark:  LIC 26386
- Tension: e.g., 70Nm

An example of marking is shown in Figure 1.



FIGURE 1 DERWENT CLAMP MARKINGS

9 PACKAGING AND TRANSPORTATION

Derwent clamps are packaged in cardboard cartons to prevent damage during handling and transport. The quantity of clamps per carton is dependent on the product size and weight.

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 Derwent Industries Pty Ltd 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

There were no issues 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, Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

14.1 Issue of Report

This Report has been published and/or prepared by the Water Services Association of Australia Limited and nominated Project Manager and peer group of technical specialists (the Publishers).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

By accepting this Report, the Recipient acknowledges and represents to the Publisher(s) and to each person involved in the preparation of the Report that the Recipient has understood and accepted the terms of this Disclaimer.

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

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

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

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

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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



KAWANDAH - SINGLE PART REPAIR CLAMPS

316 STAINLESS STEEL REPAIR CLAMPS

Derwent Industries 316 Stainless Steel Repair Clamps are Australian manufactured. Stainless Steel Clamps are used throughout various industries as a fast, simple and economical permanent solution for pipe repair. Derwent Clamps are manufactured to AS4181. Note: Clamps may not be suitable for all pipe types and should not be used for axial restraint or for joining pipes together in new works.

Features:

- 316 Stainless Steel for superior corrosion protection.
- Bolts and Nuts coated with molybond to prevent galling.
- Provide a simple and permanent repair whilst supporting the integrity of the main.
- Nitrile Gasket providing a full circle seal.
- Clamps are fully submersed passivated, ensuring superior quality.
- All bolts are supplied with plastic thread protectors.
- Variable OD range allows for pipe variance.
- Manufactured in Australia



Applications:

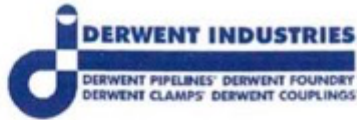
The Derwent Industries 316 Stainless Steel Repair Clamps are ideal as a fast, simple and economical permanent solution for pipe repair for most pipe types.

Repair clamps are an ideal product for use on Holes, splits, pulled service connections or branch lines or even full breaks. Installation must be in line with the relevant water authority installation allowances. The flexibility given via the OD range of the clamps provides the user with a simple repair solution.

Please refer to installation instruction for all installations.

Technical Data:

Size Range:	DN40 – DN 1200 (Larger sizes are available as specials)
Temperature Range:	-10°C to 60°C
Max. Operating Pressure:	1600 kPa (Only to OD 690mm)
Quality Assurance:	ISO9001:2015
Certificate Number:	QEC2004
AS/NZS 4181:	SMK26386 (Refer Schedule)



DERWENT CLAMPS

CLAMP FITTING INSTRUCTION

1. Ensure pipe is clean where clamp is to be located.
2. Loosen the nuts to the end of the stud - do not remove.
3. Apply an approved RRJ lubricant (supplied in attached sachet) to rubber gasket and pipe.
4. Wrap clamp around pipe ensuring damaged area is in centre of clamp and gasket is flat.
5. Locate locking plate into position with folded edge locked under flat bar, hand tighten nuts to lock mechanism into position.
6. Evenly tighten nuts to required tension as printed on the clamp.
7. Re-tension after 15 minutes minimum to counter gasket rubber relaxation.

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Form No: 5:28 R2

PIPE COMPATIBILITY CHART

Ensure clamp is suited to pipe - clamp is labelled Type 'R' or 'F'

TYPE R (RIGID PIPE)

AC	DI	CI	RC
CU	MSCL	GW	

TYPE F (FLEXIBLE PIPE)

UPVC (PN9 MIN.)	MPVC (PN12 MIN.)
OPVC (PN16 MIN.)	GRP (SN10000 MIN.)

APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certification Certificates are also available from WSAA.

TABLE B1 DERWENT INDUSTRIES PTY LTD – MANAGEMENT SYSTEMS

Quality Systems Standard	ISO 9001:2015
Certification Licence No.	QEC2004
Certifying Agency	SAI Global
First Date of Certification	8 August 1994
Current Date of Certification	25 June 2021
Expiry Date of Certification	4 July 2024

TABLE B2 DERWENT INDUSTRIES PTY LTD – PRODUCT CERTIFICATION

Product Standard/Spec.	AS 4181:2013
Certificate No.	SMK26386
Issuing Certification Body	SAI Global
First Date of Certification	11 February 2019
Current Date of Certification	28 June 2021
Expiry Date of Certification	10 February 2024



CERTIFICATE OF REGISTRATION

This is to certify that:

Derwent Industries Pty Ltd

ABN 48 096 997 152

8 Stead Street Wodonga VIC 3690 AUSTRALIA

102 - 104 Sunderland Street Derwent Park TAS 7009 AUSTRALIA

operates a

QUALITY MANAGEMENT SYSTEM

which complies with the requirements of

ISO 9001:2015

for the following scope

Design, manufacturing, sourcing and distribution of pipeline fittings and accessories for the water, waste treatment, gas and irrigation industries as well as castings made to clients specifications and other merchandise which has been bought in to complement our own ranges.

Certificate No: QEC2004

Issued: 25 June 2021

Expires: 4 July 2024

Originally Certified: 8 August 1994

Current Certification: 25 June 2021

Frank Camasta
Global Head of Technical Services
SAI Global Assurance



WWW.IAS-ANZ.ORG/REGISTER

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The product schedule attached to this certification is 25 pages. A copy may be obtained from Derwent or WSAA or from the following link:

<https://register.saiglobal.com/Client/PrintSchedule/schedules/Temp/Certificate%20SMK26386%2020210628.pdf>



STANDARDSMARK LICENCE

SAI Global hereby grants:

Derwent Industries Pty Ltd

ABN 48 096 997 152

102 - 104 Sunderland Street, Derwent Park, TAS 7009, Australia
8 Stead Street, Wodonga, VIC 3690, Australia

StandardsMark Licence

Manufactured to:

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

"the StandardsMark Licensee" the right to use the STANDARDSMARK as shown below only in respect of the goods described and detailed in the Schedule which are produced by the Licensee or on behalf of the Licensee* and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.

Licence No: SMK26386

Issued : 28 June 2021

Expires : 10 February 2024

Originally Certified : 11 February 2019

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* For details of manufacture, refer to the licensee

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APPENDIX D - SUPPLIER CONTACTS

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