

# WSAA PRODUCT APPRAISAL CERTIFICATE

## Clover Pipelines Pty Ltd - SUPERLIT® GRP Pipes and Fittings for Water and Sewerage Applications.

This appraisal is for a range of Superlit filament wound (FW) and centrifugally cast (CC) GRP pipes and fittings for water and sewerage applications in sizes from DN 300 to DN 4000 with nominal pressures from PN1 to PN32 and standard nominal stiffness ratings of SN1250, SN2500, SN5000, SN10000, SN15000 and SN20000. Other stiffness and pressure ratings can be supplied upon request.

The publication of ISO 23856:2021 combined and replaced ISO 10639:2017 (for water) and ISO 10467:2018 (for drainage and sewerage). ISO 23856 now provides a single standard to cover both Filament Wound and Centrifugally Cast GRP pipes for water, drainage or sewerage applications.

This Appraisal now aligns with WSA PS 219 and replaces PA 1419 (FW GRP for Water), PA 1420 (FW GRP for Sewerage), PA 1421 (CC GRP for Water) and PA 1422 (CC GRP for Sewerage). The superseded Appraisals will be withdrawn on 30<sup>th</sup> April 2024.

A listing of Quality Certificates and details of products is included in attached Schedules A and B.

<b>Product Category</b>	GRP Pipes
<b>PA Number:</b>	PA 2039
<b>Supplier</b>	Clover Pipelines Pty Ltd
<b>Brand</b>	SUPERLIT
<b>Standards</b>	23856:2021 <i>Plastics piping systems for pressure and non-pressure water supply, drainage or sewerage – Glass reinforced thermosetting plastics (GRP) systems based on unsaturated polyester (UP)</i>
<b>WSAA Product Specification</b>	WSA PS 219 <i>Glass reinforced thermosetting plastics (GRP) pipes and fittings for pressure and non-pressure applications – Drinking water, non-drinking water supply and sewerage</i>
<b>Other Specifications</b>	
<b>Issue date</b>	15 December 2023
<b>Expiry date</b>	December 14 2028
<b>Recommendations</b>	It is recommended that WSAA members and associates, subject to any specific requirements of the member, accept or authorise Superlit filament wound and centrifugally cast GRP pipes and fittings, as detailed in this report, for use in pressure and non-pressure water and sewerage applications provided they are installed in accordance with any relevant conditions relating to the design, installation and acceptance testing provided in relevant standards, WSAA Codes and the manufacturer's requirements.

**Disclaimer**

The disclaimer on Page 2 explains a number of very important limits on your ability to rely on the information in this Product Appraisal Certificate and the assessment criteria used to underlay it. Please read it carefully and take it into account when considering the content in this Certificate.

## **1. Disclaimer**

This Product Appraisal Certificate (Certificate) is issued by WSAA on the understanding that:

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

To maintain the recommendations of this Certificate any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Certificate including the product appraisal criteria underlying it 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. Certificates will be reviewed and reissued at regular intervals not exceeding five (5) years.

WSAA reserves the right to withdraw this Certificate at any time in its sole and absolute discretion for any reason.

The following information explains a number of very important limits on your ability to rely on the information in this Certificate. Please read it carefully and take it into account when considering the contents of this Certificate.

Any enquiries regarding this Certificate should be directed to the Product Appraisal Manager Phone: 03 8605 7601 email [carl.radford@wsaa.asn.au](mailto:carl.radford@wsaa.asn.au).

### **1.1. Issue of Certificate**

This Certificate has been published and/or prepared by WSAA and nominated Project Manager and peer group of technical specialists (the Publishers).

The Certificate and the underlying product appraisal criteria have been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Certificate (the Recipients).

By accepting this Certificate, the Recipient acknowledges and represents to the Publisher(s) and each person involved in the preparation of the Certificate and product appraisal criteria underlying it that the Recipient has understood and accepted the terms of this Disclaimer.

### **1.2. Limits on Reliance on Information and Recommendations**

#### **1.2.1. Disclaimer of liability**

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

#### **1.2.2. Intellectual Property and other rights**

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

From time to time WSAA and the other Publishers may receive notice of allegations that the importation, manufacture, sale or use of the Product infringes intellectual property rights or other proprietary rights. WSAA's policy is to not refer to such allegations in its Certificate or take any other steps to put Recipients on notice of such allegations. If, however, WSAA becomes aware that the allegations have been admitted or proved in Court, then WSAA may, at its discretion, take such steps as it considers appropriate. As such, Recipients acknowledge, agree and accept that WSAA may have information in its possession about intellectual property rights infringement allegations or other infringement allegations in relation to the Product which are not referred to or disclosed in this Certificate and which are not otherwise communicated to Recipients.

#### **1.2.3. Need for independent assessment**

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

This Certificate does not contain all information that a person might require for the purposes of assessing any product discussed or appraised within it. The product appraisal criteria used in preparing this Certificate 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 Certificate, 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.

### **1.3. No Updating**

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

### **1.4. 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 Certificate, or the accuracy, completeness or reasonableness of any recommendation in this Certificate.

**QUALITY CERTIFICATIONS**

Copies of the Quality Certificates are available from WSAA

**SCHEDULE A1 CLOVER PIPELINES PTY LTD – MANAGEMENT SYSTEMS**

237 Rex Road Campbellfield Victoria	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	AMI-QM-78026
Certifying Agency	ApprovalMark International
First Date of Certification	26 August 2019
Current Date of Certification	4 October 2022
Expiry Date of Certification	26 August 2025

**SCHEDULE A2 - SÜPERLIT BORU SAN A.Ş – MANAGEMENT SYSTEMS**

Karacali Mah Duzce Turkey and 2 Orgaize Sanayi Bolgesi 9 Malatya Turkey	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	01 100 1715894
Certifying Agency	TUV SUD
First Date of Certification	2012
Current Date of Certification	16 October 2021
Expiry Date of Certification	15 October 2024

**SCHEDULE A3 SUPERLIT BORU SAN A.Ş – PRODUCT CERTIFICATION**

Karacali Mah Duzce Turkey and 2 Orgaize Sanayi Bolgesi 9 Malatya Turkey	
Product Standard/Spec.	ISO 23856:2021
Certificate No.	000064-TSE-05/02
Issuing Certification Body	Turkish Standards Institution
First Date of Certification	13 June 2022
Current Date of Certification	1 November 2023
Expiry Date of Certification	7 November 2024



SUPERLIT FW GRP PIPES



# SUPERLIT GRP PIPE & FITTINGS



AS3571 & ISO23856 "Plastics piping systems for pressure & non-pressure water supply, drainage or sewerage pipeline applications - Glass reinforced thermoplastics (GRP) systems based on unsaturated polyester (UP) resin

## GLASS REINFORCED POLYESTER (GRP) PIPE SYSTEM

Version 3.0





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## Technical Data

Superlit GRP Pipe and fittings are manufactured to AS3571 & ISO23856 for potable, non-potable, sewer and industrial pipeline applications.

### Applications

- Pressure & non pressure pipelines
- Below & above ground applications
- Potable & non potable water applications
- Wastewater & irrigation systems
- Detention & cooling systems
- Industrial & petrochemical applications

### AS/NZS2280 Compatible

Conventional socket joint ductile iron fittings and valves complying with AS/NZS2280 dimensions are compatible for use with Superlit GRP pipes in sizes DN300-DN750.

### Ordering Information

Standard nominal stiffness classes for Superlit GRP products;

- SN2,500
- SN5,000
- SN10,000
- SN20,000

Products with higher stiffness classes not listed above are available upon request.

Flanged fittings are supplied standard with AS4087 Fig B5 flanges. PN35 and other high pressure flanges can be made available upon special request.

Flange gasket sets are not included with flange fittings and are sold separately. Bolt and gasket materials must comply with WSA109.

### Features & Benefits

- Full face EPDM coupling system which is simple to join and can not be dislodged during installation.
- Exceptionally smooth internal bore, reducing friction losses and pump operating costs.
- Corrosion resistant material with no need for protective coatings, sleeving or cathodic protection.
- 75-90% lighter than alternate pipe materials reducing installation time and costs.
- Compatible with Australian standard PVC Series 2 and ductile iron pipeline products.
- Superlit GRP pipe and fittings do not require de-rating for cyclic pressure fatigue.
- Lower wave celerity reduces costs associated with water hammer, surge pressure design and mitigation.
- Ultra violet & weather resistant construction suitable for above ground installation and storage.
- Non conductive material which is unaffected by induced or stray currents.
- Custom fittings can be designed to suit specific project requirements.
- 100+ year expected service life.
- No special equipment is required for installation.



## Technical Data

### Water Hammer Surge Celerity (m/s)

TYPE	DN300-375	DN450-750	≥ DN900
PN6 SN5,000	405	382	375
PN10 SN5,000	433	420	406
PN16 SN5,000	502	491	481
PN25 SN5,000	578	568	564
PN6 SN10,000	454	421	415
PN10 SN10,000	454	421	415
PN16 SN10,000	460	492	481
PN25 SN10,000	572	565	557
PN32 SN10,000	624	616	615

**Pressure Rating:** The allowable pressure for a pipeline system is limited to the lowest pressure classification of all pipes, fittings & components within the pipe system.

### Design & Installation

Superlit GRP is a flexible pipe system. GRP pipelines should be designed and installed in accordance with AS/NZS 2566 – Buried flexible pipelines (Part 1 & Part 2).

For more information on the installation of GRP pipes, please refer to the Superlit Design & Installation Manuals.

Our experienced team of engineers can assist with free technical support and advice on the design and installation of our complete range of products.

Please contact your local Clover office for further assistance.



GRP Pipe Wall Layers

### Allowable Pipeline Pressure (MPa)

TYPE	PN1	PN6	PN10	PN16	PN20	PN25	PN32
Allowable Operating Pressure	0.1	0.6	1.0	1.6	2.0	2.5	3.2
Max. Allowable Operating Pressure	0.125	0.75	1.25	2.0	2.5	3.125	4.0
Allowable Site Test Pressure	0.125	0.75	1.25	2.0	2.5	3.125	4.0

**Allowable Operating Pressure:** The allowable internal pressure, excluding surge, that a component can safely withstand in service.

**Maximum Allowable Operating Pressure:** The maximum internal pressure, including surge, that a component can safely withstand in service. (Refer table above)

**Allowable site test pressure:** Maximum pressure applied on site in a newly installed pipeline, includes a safety factor and allowances for surge.

### Superlit GRP Pipe Wall

Superlit has developed a system to optimise the distribution of glass fibres across the pipe wall facilitating greater accuracy in pipe design and in determining the long-term behavioural pipe properties.

Each layer of the pipe wall has a specific function. If you take a cross-section of the pipe, the innermost layer consists entirely of flexible resin. This layer is designed to ensure that no fluids or solids carried by the pipe penetrate to the structural layers.

The structural layers vary according to the design pressure and rigidity. The surface layer protects the pipe during the pipe laying process. It also acts as a UV barrier.





## Technical Data

### Design Data

#### Flow Roughness Coefficient

Hazen-William C = 150  
Manning n = 0.009  
Colebrook-White k = 0.029 mm

#### Poissons Ratio

Typically 0.22 to 0.29

#### Thermal Coefficient

Thermal expansion and contraction coefficient of SUPERLIT GRP pipes in axial direction:  
between 24 and 30 x (1/10<sup>6</sup>) mm/mm/°C

#### Temperature Derating:

≤35°	No Pressure derating required.
36-50°	Derate pressure 30% (36°) - 50% (50°).
51-70°	Contact Clover for technical advice regarding vinyl ester resin use for higher operating temperatures.

Refer to Superlit GRP Technical Design Manual for further details.

## Certifications & Appraisals

Clover Pipelines supports a comprehensive quality assurance program and maintains an ISO 9001:2015 accreditation. Our GRP product range is manufactured under strict quality guidelines and our products are third party certified to meet the following Australian and International standards;

#### Product Certification to AS3571.1

AS3571.1 for GRP piping systems for pressure and non-pressure drainage and sewerage

#### Product Certification to AS3571.2

AS3571.2 for GRP piping systems for pressure and non-pressure water supply

#### WSAA Product Appraisal

AS3571.1 & AS3571.2 for GRP piping systems in pressure and non-pressure water supply, drainage & Sewerage

#### Product Certification to ISO 23856

ISO23856 for GRP piping systems for pressure and non-pressure water supply, drainage and sewer

#### WSAA Product Appraisal

ISO 23856 for GRP systems for pressure and non-pressure water supply, drainage and sewer

#### Product Certification to ISO 25780

ISO 25780 for GRP Pipes and Joints for jacking applications

#### Bureau Veritas Certification

ISO 25780-2011 for GRP Pipes and Joints for jacking applications

#### Environmental Product Declaration

EN14025 Environmental labels and declarations — Type III environmental declarations"

EN15804 Sustainability of construction works - Environmental product declarations



PRODUCT RANGE

## Pipe & Fittings Specifications

### Pipe CFW SN10,000

DN	PIPE OD	ID	KG/M	ID	KG/M	ID	KG/M
PN1, PN6 & PN10				PN 16		PN25	
300	345	333	13	333	14	334	14
375	426	411	17	412	18	412	20
450	507	489	26	490	30	492	28
525	587	566	41	568	33	569	35
600	667	644	50	646	47	647	46
675	747	721	64	723	58	724	57
750	826	797	70	800	72	800	71
900	924	891	103	894	91	897	86
1000	1026	990	128	994	112	996	106
1100	1126	1085	155	1089	135	1093	127
1200	1229	1185	183	1190	161	1193	151
1300	1331	1284	215	1289	188	1292	176
1400	1434	1382	249	1388	218	1392	204
1500	1536	1482	284	1488	250	1490	238
1600	1638	1581	324	1587	284	1589	271
1700	1740	1678	365	1685	319	1686	309
1800	1842	1777	409	1784	358		
1900	1944	1875	455	1883	398		
2000	2045	1973	503	1981	441		
3000	3066	2956	1064	2968	931		
4000	4085	3941	1883	3957	1596		



### Pipe CFW SN20,000

DN	PIPE OD	ID	KG/M	ID	KG/M
PN1, PN6 & PN10				PN16	
300	345	329	17	330	16
375	426	407	25	408	24
450	507	484	36	485	34
525	587	561	48	562	44
600	667	638	59	639	56
675	747	714	75	716	71
750	826	790	93	792	85

Contact Clover for information on alternate stiffness classes, pressure classes and jacking pipe. Standard pipe lengths include 11.8m, 5.8m & 2.8m. Other lengths available upon request.



PRODUCT RANGE

Coupling

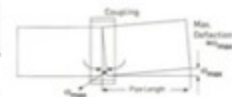
DN	W	OD	KG	OD	KG	OD	KG
		PN1, PN6 & PN10		PN16		PN25	
300	220	375	5.8	375	5.8	379	6.6
375	242	457	8.6	458	9.1	462	10.1
450	242	539	10.6	542	11.3	547	12.5
525	242	619	12.5	623	14	631	16.2
600	242	703	14.4	706	16.1	715	20.4
675	260	783	19	786	20.8	795	26.3
750	260	863	20.1	867	22.2	876	28.3
900	260	963	23.5	967	26.3	977	33.5
1000	260	1067	27.3	1071	30.4	1081	38.4
1100	260	1169	30	1174	34.7	1185	43.5
1200	260	1271	32.6	1276	37.7	1290	50
1300	260	1375	36.9	1381	42.3	1394	55.7
1400	275	1479	47.8	1483	53.2	1498	70
1500	275	1582	52.6	1587	58.4	1602	75.8
1600	275	1686	58.3	1693	64.5	1705	83.1
1700	275	1788	61.7	1794	69.6	1809	89.9
1800	275	1893	67.7	1898	76	1915	99.6
1900	275	1995	71.3	2002	82.3	2018	107.2
2000	275	2098	75.1	2106	89	2122	115.2
3000	330	3121	159	3129	182	3144	224
4000	330	4160	256	4168	289	4181	339



Contact Clover for alternate pressure classes.

Maximum Angular Joint Deflection

DN	DEF°
DN300 – DN450	3.0
DN525 – DN900	2.0
DN1000 – DN1800	1.0
DN1900+	0.5



## SUPERLIT CC GRP PIPES

### Technical Data

Superlit CC GRP Pipe and fittings are manufactured to AS/NZS 3571 and ISO23856 for potable, non-potable, sewer and industrial pipeline applications.

#### Applications

- Pressure & non pressure pipelines
- Below & above ground applications
- Potable & non potable water applications
- Wastewater & irrigation systems
- Detention & cooling systems
- Industrial & petrochemical applications

#### Ordering Information

Standard nominal stiffness classes for Superlit GRP products;

- SN1,250
- SN2,500
- SN5,000
- SN10,000
- SN20,000

Products with higher stiffness classes not listed above are available upon request.

Flanged fittings are supplied standard with AS4087 Fig B5 flanges. PN35 and other high pressure flanges can be made available upon special request.

Flange gasket sets are not included with flange fittings and are sold separately. Bolt and gasket materials must comply with WSA109.

#### Features & Benefits

- Full face EPDM coupling system which is simple to join and can not be dislodged during installation.
- Exceptionally smooth internal bore, reducing friction losses and pump operating costs.
- Corrosion resistant material with no need for protective coatings, sleeving or cathodic protection.
- 75-90% lighter than alternate pipe materials reducing installation time and costs.
- Superlit GRP pipe and fittings do not require de-rating for cyclic pressure fatigue.
- Lower wave celerity reduces costs associated with water hammer, surge pressure design and mitigation.
- Ultra violet & weather resistant construction suitable for above ground installation and storage.
- Non conductive material which is unaffected by induced or stray currents.
- Custom fittings can be designed to suit specific project requirements.
- 100+ year expected service life.
- No special equipment is required for installation.



## Technical Data

### Water Hammer Surge Celerity (m/s)

TYPE	DN400	DN450-800	≥ DN900
PN6 SN5,000	405	382	375
PN10 SN5,000	433	420	406
PN16 SN5,000	502	491	481
PN25 SN5,000	578	568	564
PN6 SN10,000	454	421	415
PN10 SN10,000	454	421	415
PN16 SN10,000	460	492	481
PN25 SN10,000	572	565	557
PN32 SN10,000	624	616	615

**Pressure Rating:** The allowable pressure for a pipeline system is limited to the lowest pressure classification of all pipes, fittings & components within the pipe system.

### Design & Installation

Superlit GRP is a flexible pipe system. GRP pipelines should be designed and installed in accordance with AS/NZS 2566 – Buried flexible pipelines (Part 1 & Part 2).

For more information on the installation of GRP pipes, please refer to the Superlit Design & Installation Manuals.

Our experienced team of engineers can assist with free technical support and advice on the design and installation of our complete range of products.

Please contact your local Clover office for further assistance.

### Allowable Pipeline Pressure (MPa)

TYPE	PN1	PN6	PN10	PN16	PN20	PN25	PN32
Allowable Operating Pressure	0.1	0.6	1.0	1.6	2.0	2.5	3.2
Max. Allowable Operating Pressure	0.125	0.75	1.25	2.0	2.5	3.125	4.0
Allowable Site Test Pressure	0.125	0.75	1.25	2.0	2.5	3.125	4.0

**Allowable Operating Pressure:** The allowable internal pressure, excluding surge, that a component can safely withstand in service.

**Maximum Allowable Operating Pressure:** The maximum internal pressure, including surge, that a component can safely withstand in service. (Refer table above)

**Allowable site test pressure:** Maximum pressure applied on site in a newly installed pipeline, includes a safety factor and allowances for surge.

### Superlit GRP Pipe Wall

Superlit has developed a system to optimise the distribution of glass fibres across the pipe wall facilitating greater accuracy in pipe design and in determining the long-term behavioral pipe properties.



Each layer of the pipe wall has a specific function. If you take a cross-section of the pipe, the innermost layer consists entirely of flexible resin. This layer is designed to ensure that no fluids or solids carried by the pipe penetrate to the structural layers.

The structural layers vary according to the design pressure and rigidity. The surface layer protects the pipe during the pipe laying process. It also acts as a UV barrier.





PRODUCT RANGE

## Pipe & Fittings Specifications

### Pipe (CC) SN1250 - SN20000 (PN1 – PN32)

DN	OD
400	426.6
450	477.6
500	529.5
600	632.5
700	718.0
800	820.0
900	924.0
1000	1026.0
1100	1126.0
1200	1229.0
1300	1331.0
1400	1434.0



Contact Clover for information on alternate stiffness classes, pressure classes and jacking pipe. Standard pipe lengths include 11.8m, 5.8m & 2.8m. Other lengths available upon request.

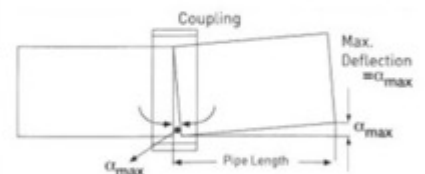
### Coupling

DN	W	PN1, PN6 & PN10		PN16		PN25/32	
		OD	KG	OD	KG	OD	KG
400	242	460	8.6	470	9.1	480	10.1
450	242	510	10.6	520	11.3	530	12.5
500	242	565	12.5	575	14	585	16.2
600	242	670	14.4	680	16.1	690	20.4
700	260	760	19	770	20.8	780	26.3
800	260	860	20.1	870	22.2	880	28.3
900	260	965	23.5	975	26.3	985	33.5
1000	260	1070	27.3	1080	30.4	1090	38.4
1100	260	1170	30	1180	34.7	1190	43.5
1200	260	1275	32.6	1285	37.7	1295	50
1300	260	1375	36.9	1380	42.3	1395	55.7
1400	275	1480	47.8	1490	53.2	1500	70



### Maximum Angular Joint Deflection

DN	DEF°
DN300 – DN450	3.0
DN525 – DN900	2.0
DN1000 – DN1800	1.0
DN1900+	0.5





## SUPPLIER CONTACTS

### **Clover Pipelines Pty Ltd**

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Rocklea Qld 4108  
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487 Woolcock Street (Townsville)  
Garbutt QLD 4814

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Wetherill Park NSW 2164  
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#### **South Australia**

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Ketttering Road  
Elizabeth South SA 5112  
Phone: 08 81204600

#### **Western Australia**

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#### **Northern Territory**

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