



# Betta Fluid Control Co Ltd

## PRODUCT APPRAISAL REPORT 1121 Issue 10

BETTA Resilient Seated Gate Valves

**AS/NZS 2638.2:2011 Gate valves for waterworks purposes –  
Resilient seated**

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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

Betta Fluid Control Co Ltd is a privately-owned joint venture, originally incorporated in 2007 as Betta Fluid Machinery Manufacturing Co Ltd, with four Chinese and two Australian partners. Appointed stocking agents distribute the Betta range of products within Australia.

Betta in Wuxi, Jiangsu Province, Peoples Republic of China, manufactures the BETTA Resilient Seated Gate Valves (RSV's) to AS/NZS 2638.2:2011 *Gate valves for waterworks purposes-Part 2: Resilient seated*.

This Issue 10 is to include DN 100 and DN 150 RSV's with integral PE tail ends.

This appraisal covers BETTA resilient seated gate valves in the following sizes and end configurations for both clockwise and anticlockwise closing. See Section 4 for details.

DN 80 – DN 600: Flange – Flange

DN 375, DN 450 and DN 600: Flange – Flange with integral bypass

DN 100 – DN 375: Socket - Socket

DN 100 – DN 150: Flange – Socket

DN 100 – DN 150: Spigot - Spigot

DN 90 – DN 315: Restrained Joints for PE pipe.

DN 100 – DN 150: DN 125 and DN 180 integral PE Tail Ends

BETTA RSV's are fully coated and lined with Jotaguard VA 5001 thermosetting fusion bonded epoxy coatings, using the fluidised bed process, to comply with AS/NZS 4158.

The design of the PE restrained joint incorporates an elastomeric seal and copper alloy gripper ring. Sealing and joint anchoring is accomplished by bolting a gland ring onto the body of the valve.

The RSV with integral PE tails utilises PE 100 SDR 11 PN16 pipe press fitted over a multiple grooved spigot on the end of the valve using a high-pressure hydraulic press. The hydraulic press is then used to fit a steel collar over the joint. A polyethylene sleeve is subsequently shrink wrapped over the entire joint to prevent potential corrosion of the steel sleeve. This end configuration allows the gate valves to be fitted into a PE pipeline using fusion welding or electrofusion couplings.

AS/NZS 2638.2 does not currently include restrained flexible joints for PE pipes or PE integral tails as end connection options, however WSAA has developed product specifications to cover these options. The restrained joints meet the requirements of EN12842-2012 *Ductile Iron Fittings for PVC-U or PE Piping Systems - Requirements and Test Methods* and the PE tail ends are required to meet specified type tests.

BETTA RSV's have ISO Type 5 product certification to AS/NZS 2638.2:2011 *Gate valves for waterworks purposes-Part 2: Resilient-seated*.

Betta has a certified Quality Management System in compliance with ISO 9001:2015.

The product range included in this appraisal report meets the requirements of WSA PS 260 - *Gate Valves, Resilient Seated for Pressure Applications – Drinking Water, Non-Drinking Water Supply and Sewerage*, WSA PS 281 - *Gate Valves, Resilient Seated with Restrained Flexible Joints for Polyethylene Pipe in Pressure Applications – Drinking Water, Non-Drinking Water Supply and Sewerage* and WSA PS 278 *Gate Valves, Resilient Seated with Integral Polyethylene (PE) Ends for Pressure Applications - Drinking Water, Non-Drinking Water Supply and Sewerage*. The BETTA RSV's have been deemed to comply with the WSAA Product Specifications and are therefore considered 'fit-for-purpose'.

### 1.1 Recommendations

It is recommended that WSAA members and associates, accept/authorise the BETTA range of Resilient Seated Gate Valves, as described in Section 4, for use in water supply and

sewerage pressure pipelines provided they are installed in accordance with applicable WSAA codes and manufacturers requirements, where specified.

## 2 THE APPLICANT

### 2.1 The Supplier

Betta Fluid Control Co Ltd does not hold stocks of BETTA RSV's in Australia. Appointed stocking agents purchase the products directly from the Betta factory in Wuxi and distribute the range of products within Australia. Contact numbers for the stocking agents are listed in Appendix C.

### 2.2 The Manufacturer

Betta Fluid Control Co Ltd is located at Beigongwu Road, Yuqi Industry Park, Huishan District, Wuxi, Jiangsu Province, China.

Betta Fluid Control Co Ltd is a privately-owned joint venture, originally incorporated in 2007 as Betta Fluid Machinery Manufacturing Co Ltd with four Chinese and two Australian partners. Betta currently employs 45 people that include qualified technical engineers, design engineers and mechanical engineers. Betta occupies 3000 square metres of factory with the possibility of adding another 2000 square metres for future expansion.

Betta's current annual capacity is 150,000 units with the possibility to expand, as their product range increases. Betta currently manufactures spring hydrants, fire hydrants, swing check valves, resilient seated gate valves and air release valves.

Betta sources its components locally from ISO 9001 certified suppliers.

The components are inspected and tested for compliance to Betta drawings and specifications in accordance with their quality procedures.

Material certification is documented and receipted with each shipment received from the suppliers.

## 3 THE PRODUCT

The complete range of gate valves covered by this Appraisal is detailed in Section 4.

BETTA RSV's are manufactured to AS/NZS 2638.2:2011 *Gate valves for waterworks purposes-Part 2: Resilient-seated*. The range includes RSV's from DN 80 to DN 600 with various end combinations. See Table 1.

The RSV's are rated as PN 16 and are available with either clockwise or anti-clockwise closure directions. Operation can be by key or hand wheel or gearbox.

PE restrained joints comply with EN12842 *Ductile Iron Fittings for PVC-U or PE Piping Systems - Requirements and Test Methods*. The design of the PE restrained joints incorporates an elastomeric seal and copper alloy gripper ring. Sealing and joint anchoring is accomplished by bolting a gland ring onto the body of the valve. The restrained joints may be deflected up to 2 degrees.



**FIGURE 1 RESILIENT SEATED GATE VALVE WITH PE RESTRAINED JOINTS**

The RSV with integral PE tails utilises PE 100 SDR 11 PN16 pipe press fitted over a multiple grooved spigot on the end of the valve using a high-pressure hydraulic press. The hydraulic press is then used to fit a steel collar over the joint. A polyethylene sleeve is subsequently shrink wrapped over the entire joint to prevent potential corrosion of the steel sleeve.

This end configuration allows the gate valves to be fitted into a PE pipeline using fusion welding or electrofusion couplings.



**FIGURE 2 RESILIENT SEATED GATE VALVE WITH INTEGRAL PE TAIL ENDS**

Flanges comply with Figure B5 of AS/NZS 4087 *Metallic flanges for waterworks purposes*.

Sockets and spigots comply with AS/NZS 2280 *Ductile iron pipes and fittings*.

Polymeric coatings conform to AS/NZS 4158 *Thermal bonded polymeric coating on valves and fittings for water industry purposes*.

#### 4 SCOPE OF THE APPRAISAL

The scope of the appraisal covers PN 16 RSV's in various sizes and end configurations in accordance with Table 1 and included in the ISO Type 5 Product Certification product schedule.

**TABLE 1  
BETTA RESILIENT SEATED GATE VALVE RANGE**

DN	Flanged	Socketed	FI-Socket	Spigoted	PE Restrained Joint	PE Tail Ends
80	✓				DN 90	
100	✓	✓	✓	✓	DN 125	DN 125
150	✓	✓	✓	✓	DN 180	DN 180
200	✓	✓			DN 250	
225	✓	✓				
250	✓	✓			DN 280	
300	✓	✓			DN 315	
350	✓					
375 <sup>†</sup>	✓	✓				
400	✓					
450 <sup>†</sup>	✓					
600 <sup>†</sup>	✓					

<sup>†</sup> Integral bypass arrangements are available: DN 375 x DN 100, DN 450 x DN 100 and DN 600 x DN 150  
Whilst DN 375 integral bypass arrangements are not included in AS/NZS 2638.2, the valves meet the requirements of the standard and are deemed acceptable

## 5 APPRAISAL CRITERIA

### 5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts resilient seated gate valves manufactured in compliance with AS/NZS 2638.2 *Gate valves for waterworks applications –Part 2: Resilient seated* 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

BETTA RSV's have been appraised for compliance with AS/NZS 2638.2:2011 *Gate valves for waterworks purposes –Part 2: Resilient seated*.

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 Specifications are also relevant to this application:

WSA PS 260 - *Gate Valves, Resilient Seated for Pressure Applications – Drinking Water, Non-Drinking Water Supply and Sewerage*.

WSA PS 281 - *Gate Valves, Resilient Seated with Restrained Flexible Joints for Polyethylene Pipe in Pressure Applications – Drinking Water, Non-Drinking Water Supply and Sewerage*.

WSA PS 278 *Gate Valves, Resilient Seated with Integral Polyethylene (PE) Ends for Pressure Applications - Drinking Water, Non-Drinking Water Supply and Sewerage*.

Copies of the Product Specifications are 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

Betta has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. 12 100 38509 TMS issued to Wuxi Betta Fluid Control Co Ltd by TÜV SÜD Management Service GmbH.
- AS/NZS 2638.2 ISO Type 5 product certification licence No.25731 issued to Betta Fluid Control Co Ltd by Australian Certification Services Pty Ltd.

Betta has also submitted copies of relevant ISO 9001 Quality Management System licenses appropriate to their component suppliers. These certifications have not been included in this report due to "commercial in confidence" reasons.

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

### 6.2 Compliance with Performance Requirements

#### 6.2.1 Material properties of ductile iron

AS/NZS 2638.2 Table 2.1 requires RSV's manufactured from ductile iron to conform to minimum Grade 400-15 although higher strength ductile irons in accordance with AS 1831



are acceptable. The BETTA RSV's are manufactured using the higher grade ENGJS 500-7 in compliance with AS 1831.

### 6.2.2 Elastomeric joints

BETTA RSV sockets are based on the T type, compatible for jointing to spigots of AS/NZS 2280 ductile iron pipe and Series 2 spigots of AS/NZS 1477 PVC-U, AS/NZS 4441 PVC-O, AS/NZS 4765 PVC-M and AS 3518 ABS pressure pipes.

BETTA RSV sockets have minimum deflection angles in compliance with AS/NZS 2280, Table 3.2.

BETTA RSV socket depth of entry past the rubber seal meets the minimum requirements specified in AS/NZS 2280.

**TABLE 2**  
**SOCKET DEPTH OF ENTRY PAST THE SEAL**

Size DN	BETTA RSV Depth of Entry mm	AS/NZS 2280 Min Depth of Entry mm
100	58	42
150	62	50
200	69	58
225	85	62
250	90	66
300	94	71
375	105	83

### 6.2.3 Elastomeric seals

The EPDM elastomeric seals are dual hardness "cast iron" gaskets provided by Gulf Rubber and are suitable for Series 2 PVC and CIOD pipes. For Series 1 PVC pipes transition lip seals are supplied. These seal types have a long history of satisfactory performance.

The elastomeric seals are manufactured to AS 1646:2007 and covered by StandardsMark Licence and Schedule No. SMKP 20133 issued to Thong Nhat Rubber and Gulf Rubber Australia.

### 6.2.4 PE restrained joints

The design of the PE restrained joints incorporates an EPDM elastomeric seal and Grade C37710 copper alloy gripper ring. Sealing and joint anchoring is accomplished by bolting a ductile iron polymeric coated gland ring onto the body of the valve using grade 316 fasteners.

Betta has provided copies of material test reports to demonstrate compliance with the nominated material of the components, including dezincification resistance of the copper alloy.

Pipe stiffener inserts are recommended for PE pipes  $\geq$  SDR 17, i.e. PN10 or less for PE100 pipes.

### 6.2.5 PE integral tail ends

WSA PS 278 requires type tests to be conducted to demonstrate that the joint is leakproof whilst under longitudinal load and that the integrity of the joint will withstand pull out. The tests were successfully undertaken by Queensland Testing Laboratory (NATA Accreditation No.14783) for a DN 100 and DN 150 valve.

### 6.2.6 Components material list

The BETTA RSV component materials are detailed in Table 3.

**TABLE 3**  
**BETTA RSV COMPONENT MATERIAL LIST**

Item	Material	Standard	Grade
Body	Ductile Iron	AS 1831	GJS/500-7
Bonnet	Ductile Iron	AS 1831	GJS/500-7
Spindle Seal Retainer ≤ DN300	Stainless Steel # / POM	ASTM A276	316
Spindle Seal Retainer >DN300	Copper Alloy	AS1565	C95210
Gate Core	Ductile Iron	AS 1831	GJS/500-7
Gate Encapsulation	Synthetic Rubber	AS 1646	EPDM
Gate Nut	Copper Alloy	AS 1565	C95210
Spindle	Stainless Steel	ASTM A276	431
Spindle Cap	Ductile Iron	AS 1831	GJS/500-7
Fasteners	Stainless Steel	ASTM A276	316
Gaskets	Synthetic Rubber	AS 1646	EPDM
Sealing O-rings	Synthetic Rubber	AS 1646	65-75 IRHD NBR
Gland ring for PE restrained joint	Ductile Iron	AS 1831	GJS/500-7
PE restrained joint rubber seal	Synthetic Rubber	AS1646	EPDM
PE restrained joint gripper ring	Copper Alloy	AS 1568	C37710
PE Tails	Polyethylene	AS/NZS 4130	PE 100 SDR 11

### 6.2.7 Flanges

Flange dimensions conform to AS/NZS 4087 Figure B5.

Recommended installation is in accordance with the requirements of AS/NZS 4087.

Note: WSAA recommend flanged joints to be assembled in accordance with Drawing Number WAT-1313 included in the Water Supply Code of Australia – WSA 03 (as amended) and that gasket materials comply with industry standard WSA-109.

### 6.2.8 Polymeric thermal bonded coatings

AS/NZS 2638.2 requires thermal bonded polymeric coating to comply with AS/NZS 4158 - *Thermal-bonded polymeric coatings on valves and fittings for water industry purposes*.

BETTA RSV's are coated at their Wuxi factory using Jotaguard VA 5001 fusion bonded epoxy powder coloured blue (internally and externally).

Jotaguard VA 5001 has AS/NZS 4158:2003 product certification, StandardsMark Licence No. SMKP20551, issued by SAI Global.

Jotaguard VA 5001 FBE is applied using the fluidised bed process and testing is carried out in accordance with the requirements of AS/NZS 4158. ACS audits application procedures and testing in conjunction with regular ISO Type 5 certification audits.

### 6.2.9 Type tests

Betta has submitted copies of Type Test reports for the range of RSV's to demonstrate compliance with the performance requirements of AS/NZS 2638.2.

Queensland Testing Laboratory Pty Ltd (QTL) and the National Centre for Supervision & Inspection of Drainage Irrigation and Water Saving Equipment Products Quality, Anhui Province, China carried out the testing.

QTL is a NATA accredited laboratory (No. 14783) and The National Centre for Supervision & Inspection of Drainage Irrigation and Water-Saving Equipment Products Quality (Licence No L0606) is accredited by the China National Accreditation Service for Conformity Assessment (CNAS).

The CNAS is a signatory to the International Laboratory Accreditation Co-operation (ILAC) with mutual recognition arrangements (MRA) within the Asia Pacific Laboratory Accreditation Cooperation (APLAC).

Type tests have been satisfactorily completed by Queensland Testing Laboratory Pty Ltd for DN 125 DN and DN 180 PE restrained joints to demonstrate compliance with EN 12842-2012 *Ductile Iron Fittings for PVC-U or PE Piping Systems - Requirements and Test Methods*. Tests include positive internal pressure, negative internal pressure, cyclic internal pressure, 1000-hour long term hydrostatic strength and pull out at 25°C. According to EN 12842 type tests on a joint between DN 63 and DN 140 qualifies all sizes within that range and between DN 160 and DN 315 qualifies all sizes within that range.

AS/NZS 2638.2 specifies that provided the valve components of the integral bypass assemblies have been type tested, no further type testing is required. It is noted that DN 375 integral bypass assemblies are not specified in AS/NZS 2638.2, however they comply with the general requirements of the Standard and have been included in the product certification schedule of products. This product is therefore deemed as acceptable and fit for purpose.

#### **6.2.10 Contact with drinking water**

Clause 2.3 of AS/NZS 2638.2 requires compliance with AS/NZS 4020:2005 – *Product for use* in contact with drinking water, with a scaling factor of 0.01.

Betta has submitted a test report dated July 5<sup>th</sup> 2017 to demonstrate that the gate valves comply with AS/NZS 4020:2008. Tests were completed by Beijing Building Materials Testing Academy Co., Ltd. which is registered by China National Accreditation Service for Conformity Assessment (CNAS), Registration Number L1449.

### **7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION**

RSV's are commonly installed throughout water supply networks and have become the standard isolation valve of the urban water industry worldwide. Installation, operation and maintenance are well understood by experienced installers and operators.

### **8 PRODUCT MARKING**

The valves have the following markings conforming to AS/NZS 2638.2:2011:

- (a) Name of Manufacturer: BETTA
- (b) Nominal size: DNXX
- (c) Year of manufacture: XXXX
- (d) Pressure rating: PN 16
- (e) Standard No: AS/NZS 2638.2
- (f) Product Certification Mark:

### **9 PACKAGING AND TRANSPORTATION**

Products are bubble wrapped, placed in individual cardboard cartons and packed in pallet sized 5 ply wooden boxes. Gate valves have additional rubber guards on the flanged ends and the bonnet flange for additional protection. Valves are packed with the wedges in the open position.



**FIGURE 3 VALVE PACKAGING**

## 10 PRODUCT WARRANTY

The products are covered by the normal commercial and legal requirements of the *Competition and Consumer Act 2010 (Cth)*, which covers manufacture to the relevant standard and details of Betta's warranty is included in their terms and conditions of sale.

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

A field test was not requested for this Appraisal.

## 12 DISCUSSION

The BETTA RSV has fulfilled all the design, type testing and product certification requirements of the WSAA Product Appraisal Network.

Valve sizes up to and including DN 300 utilises a spindle seal retainer manufactured from Grade 316 Stainless Steel, incorporating POM (high performance plastic) spacers to facilitate the O-ring groove cavities. Valves larger than DN300 utilise a copper alloy spindle seal retainer. This complies with AS/NZS 2638.2:2011 Amdt 1.

Table 4 highlights the recommendations of use for the BETTA RSV range

**TABLE 4  
BETTA RSV LIMITATION OF USE**

Product Detail	Recommendation
Suitable Applications	Pipelines used in water reticulation, sewage, waste water and irrigation
Limitations	Maximum service temperature 40°C.
	Gate valves should not be used for throttling or adjusting flow.

### 12.1 Valve Anchorage/Thrust Restraint

Various methods for in-line thrust restraint of the Socket / Socket RSV's are detailed in WSA 03 -2011-3.1. The current design of BETTA RSV's do not include holes in the webs at the underside of the valve body to facilitate bolt on DI anchor legs for casting into a 'cast-in-situ' concrete block under the valve.

In-line thrust restraint for the Socket - Socket BETTA RSV's can be achieved by using the nominated method of strapping the valve onto a 'cast-in-situ' concrete block under the valve.

### 12.2 Spindle Cap Colouring

Spindle caps are supplied as blue with a white coloured insert for anticlockwise closing and a red coloured insert for clockwise closing. Purple coloured spindle caps can also be supplied for recycled water supply networks.

### **13 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW**

There are no outstanding requests.

### **14 FUTURE WORKS**

There are no future works identified.

### **15 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](mailto:carl.radford@wsaa.asn.au).

#### **15.1 Issue of Report**

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

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

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

#### **15.2 Limits on Reliance on Information and Recommendations**

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### **15.2.3 Need for independent assessment**

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

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

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

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



### **15.3 No Updating**

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

### **15.4 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

### RESILIENT SEAT GATE VALVE

#### AS 2638.2 - DOUBLE FLANGE PN16 ASZ42 Series



Plastic insert in Red or White for direction of closure

Grade 431 stainless steel spindle for high strength and corrosion resistance

Optionality of acid-resistant stainless steel

Back seal to allow for replacements of stem seals under full operating pressure

Isolated fasteners in stainless steel grade 316 for corrosion protection

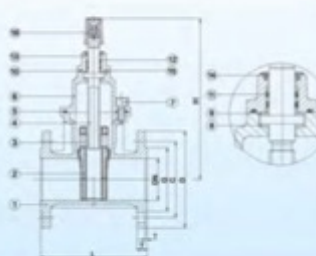
Outside rubber for transport protection

Ductile iron body and bonnet for high strength and impact resistance

Internal and External epoxy resin coating for long life corrosion protection

Ductile iron gate fully encapsulated in EPDM rubber to ensure drop tight sealing

Straight through full bore



#### TECHNICAL SPECIFICATIONS

Size Range	DN50-DN400
Allowable Working Pressure	16Bar
Seat test to AS 2638.2	17.6Bar
Body test to AS 2638.2	24Bar
Maximum Temperature	AS4020 40°C
Operating Direction	Clockwise or Anti

#### GENERAL APPLICATIONS

Ductile iron stem seal replaceable resilient seated gate valves are suitable for use with drinking water, waste water and neutral liquids, below or above ground applications. Used for the isolation of sections and branches in pipelines.

#### COMPONENTS LIST

No.	Part Description	Material	Grade of Material	Standard Ref.
1	BODY	DUCTILE IRON	GGGG	AS1831
		EPOXY RESIN POWDER	DRINKING WATER	AS4158
2	WEDGE	DUCTILE IRON	GGGG	AS1831
		SYNTHETIC ELASTOMER	EPDM ENCAPSULATED	AS1848
3	STEM NUT	ALUMINUM BRONZE	CB313	AS1565
4	STEM	STAINLESS STEEL	1C17N02(431)	ASTM A276
5	SEAL GASKET	SYNTHETIC ELASTOMER	EPDM	AS1848
6	BONNET	DUCTILE IRON	GGGG	AS1831
		EPOXY RESIN POWDER	DRINKING WATER	AS4158
7	CONNECTING BOLT	STAINLESS STEEL	GC17N12M02(316)	ASTM A378
8	WASHER	ENGINEERING PLASTIC	PCM	Du-Pont
9	THURST COLLAR	ALUMINUM BRONZE	CB313	AS1565
10	SEAL RING	SYNTHETIC ELASTOMER	NBR	AS1848
11	O-RINGS	SYNTHETIC ELASTOMER	NBR	AS1848
12	BUSH	ENGINEERING PLASTIC	PCM	Du-Pont
13	SPINDLE SEAL RETAINER	DUCTILE IRON	GGGG	AS1831
		EPOXY RESIN POWDER	DRINKING WATER	AS4158
14	DUST SEAL	SYNTHETIC ELASTOMER	EPDM	AS1848
15	CONNECTING BOLT	STAINLESS STEEL	GC17N12M02(316)	ASTM A378
		STEM OPERATING CAP	DUCTILE IRON	GGGG
16	HAND WHEEL	DUCTILE IRON	GGGG	AS1831

#### DIMENSIONS TABLE ( AS2129 2000 & AS4087 1996 )

DN	L	H	D	C	G		T		F		h-d		WEIGHT (Kg)			
					AS 2129	AS 4087	AS 2129	AS 4087	AS 2129	AS 4087	AS 2129	AS 4087				
50	178	260	150	114	30	-	17	19	-	1.6	-	4-g18	-	12		
65	190	270	165	127	103	-	17	19	-	1.6	-	4-g18	-	15		
80	203	310	185	146	122	-	18	18	1.6	3	-	4-g18	-	22		
100	229	340	210	175	154	-	19	22	20	1.6	3	4-g18	8-g18	24		
125	254	405	235	210	186	-	21	22	-	1.6	-	6-g18	-	46		
150	267	450	260	235	211	207	21	22	23	1.6	3	8-g18	8-g22	8-g18	53	
200	292	580	335	292	268	264	22	22	25	23	1.6	3	8-g18	8-g22	8-g18	90
225	310	670	370	324	-	296	-	24	-	3	-	-	-	8-g18	130	
250	330	670	405	356	328	-	25	24	1.6	3	8-g22	12-g22	8-g22	134		
300	306	780	455	406	378	374	378	25	29	30	1.6	4	12-g22	12-g28	12-g22	180
375	381	1010	550	485	-	483	-	33	-	4	-	-	-	12-g26	278	
400	408	1010	580	521	488	-	29	32	-	1.6	-	12-g26	-	297		

#### STANDARD SPECIFICATIONS

Designed and Certified to AS 2638.2-2011  
Face to face dimensions to AS 2638.2-2011  
Double Flanges drilling to AS 4087 Figure B5  
equal to AS 2129 T10, AS 2129 T8 available  
Operating torque test to AS 2638.2 Table 5.1

#### APPROVALS

AS2638.2 Registration No. CNK25731  
WaterMark Registration No. WM 25731  
Certified to AS4020 – suitable  
for contact with drinking water  
AS/NZS 4158 for drinking water  
EPDM rubber Certified to AS 1546

#### OPTIONAL EXTRAS

Hand Wheel

We Reserve The Right To Make Technical Changes And Use Similar Or Higher-quality Materials.

P07
P08



Betta WaterMark  
Better for Life

# RESILIENT SEAT GATE VALVE

AS/NZS 2280 - SOCKET ENDS PN16  
ASZ52/62 Series



- Plastic insert in Red or White for direction of closure
- Grade 431 stainless steel spindle for high strength and corrosion resistance
- Optionality of acid-resistant stainless steel
- Back seal to allow for replacements of stem seals under full operating pressure
- Isolated fasteners in stainless steel grade 316 for corrosion protection
- Internal and External epoxy resin coating for long life corrosion protection
- Ductile iron body and bonnet for high strength and impact resistance
- Ductile iron gate fully encapsulated in EPDM rubber to ensure drop tight sealing
- PN16 Ductile Iron Pipe Ring



We Reserve The Right To Make Technical Changes And Use Similar Or Higher-quality Materials.

### STANDARD SPECIFICATIONS

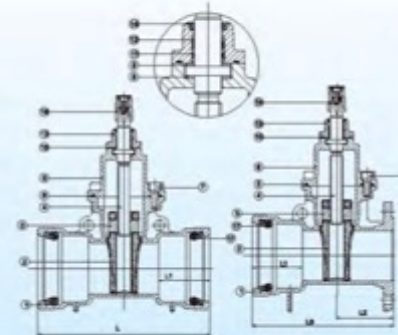
Designed and Certified to AS 2938.3-2011  
Socket Ends to AS/NZS 2280  
Series 2 PN16 Ductile Iron Pipe Ring  
Operating torque test to AS 2938.2 Table 5.1

### APPROVALS

AS2938.2 Registration No. OMK25731  
WaterMark Registration No. WM 25731  
Certified to AS4020 - suitable for contact with drinking water  
AS/NZS 4158 for drinking water  
EPDM rubber Certified to AS 1846

### OPTIONAL EXTRS

Hand Wheel



### TECHNICAL SPECIFICATIONS

Size Range	DN100-DN375
Allowable Working Pressure	16Bar
Seat test to AS 2938.2	17.6Bar
Body test to AS 2938.2	24Bar
Maximum Temperature	AS4020 40°C
Operating Direction	Clockwise or Anti

### GENERAL APPLICATIONS

Ductile iron stem seal replaceable resilient seated gate valves are suitable for use with drinking water, waste water and neutral liquids.

### COMPONENTS LIST

No.	Part Description	Material	Grade of Material	Standard Ref.
1	BODY	DUCTILE IRON	GGG50	AS1831
		EPOXY RESIN POWDER	DRINKING WATER	AS4158
2	WEDGE	DUCTILE IRON	GGG50	AS1831
		SYNTHETIC ELASTOMER	EPDM ENCAPSULATED	AS1646
3	STEM NUT	ALUMINIUM BRONZE	C96210	AS1665
4	STEM	STAINLESS STEEL	1Cr17Ni2	ASTM A278
5	SEAL GASKET	SYNTHETIC ELASTOMER	EPDM	AS1646
6	BONNET	DUCTILE IRON	GGG50	AS1831
		EPOXY RESIN POWDER	DRINKING WATER	AS4158
7	CONNECTING BOLT	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A278
8	WASHER	ENGINEERING PLASTIC	POM	Du-Pont
9	THRUST COLLAR	ALUMINIUM BRONZE	C96210	AS1665
10	SEAL RING	SYNTHETIC ELASTOMER	NBR	AS1646
11	*O'RINGS	SYNTHETIC ELASTOMER	NBR	AS1646
12	BUSH	ENGINEERING PLASTIC	PTFE	Du-Pont
13	SPINDLE SEAL RETAINER	DUCTILE IRON	GGG50	AS1831
		EPOXY RESIN POWDER	DRINKING WATER	AS4158
14	DUST SEAL	SYNTHETIC ELASTOMER	EPDM	AS1646
15	CONNECTING BOLT	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A278
16	STEM OPERATING CAP	DUCTILE IRON	GGG50	AS1831
16	HAND WHEEL	DUCTILE IRON	GGG50	AS1831
		SYNTHETIC ELASTOMER	EPDM	AS1646
17	SOCKET END SEAL RING	SYNTHETIC ELASTOMER	EPDM	AS1646

### DIMENSIONS TABLE

Nominal Size	Outside Diameter Ductile Iron Pipe	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	WEIGHT (Kg)
100	122+1,-2	340	410	135	114.5	320	24
150	177+1,-2	450	463	180	133.5	365	45
200	232+1,-2	580	558	170	146	434	72
225	259+1,-2	670	477	135	152.5	391	85
250	286+1,-2	670	454	135	165	397	92
300	345+1,-2	780	520	144	178	436	120
375	426+2,-2	1010	600	175	-	-	297
100 Series2	122+1,-2	310	342	100	114.5	270	20
150 Series2	177+1,-2	410	372	105	133.5	330	38
200 Series 2	232+1,-2	460	556	122	146	376	69





Be the Water  
Be the Life

# RESILIENT SEAT GATE VALVE

AS/NZS 4130 - RESTRAINED ENDS PN16  
ASZ72 Series



We Reserve The Right To Make Technical Changes And Use Similar Or Higher-quality Materials.

### STANDARD SPECIFICATIONS

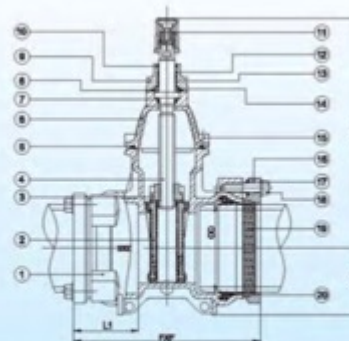
Designed and Certified to AS 2938.3-2011  
Restrained for PE100  
PN16-SDR11 to AS/NZS 4130  
Operating torque test to AS 2938.2 Table 5.1

### APPROVALS

AS2938.2 Registration No. OMK05731  
WaterMark Registration No. WM 25731  
Certified to AS4020 - suitable for contact with drinking water  
AS/NZS 4158 for drinking water  
EPDM rubber Certified to AS 1946

### OPTIONAL EXTRAS

Hand Wheel



### TECHNICAL SPECIFICATIONS

Size Range	DN90-DN250
Allowable Working Pressure	16bar
Seat test to AS 2938.2	17.6bar
Body test to AS 2938.2	24bar
Maximum Temperature	AS4020 40°C
Operating Direction	Clockwise or Anti

### GENERAL APPLICATIONS

Ductile iron stem seal replaceable resilient seated gate valves are suitable for use with drinking water, waste water and neutral liquids.

### COMPONENTS LIST

No.	Part Description	Material	Grade Of Material	Standard Ref.
1	BODY	DUCTILE IRON	GG050	AS1831
2	WEDGE	DUCTILE IRON	GG050	AS1831
3	WEDGE RUBBER	SYNTHETIC ELASTOMER	EPDM	AS1946
4	STEM NUT	BRASS	C85210	AS1968
5	STEM	STAINLESS STEEL	1Cr17Ni2(431)	ASTM A276
6	BODY BONNET GASKET	SYNTHETIC ELASTOMER	EPDM	AS1946
7	BONNET	DUCTILE IRON	GG050	AS1831
8	WASHER	ENGINEERING PLASTIC	POM	De-Pond
9	BONNET O-RING	SYNTHETIC ELASTOMER	NBR	AS1946
10	WASHER	BRASS	C48600	AS1968
11	SEAL RETAINER	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A276
12	DUST PROOF COVER	SYNTHETIC ELASTOMER	EPDM	AS1946
13	STEM CAP	DUCTILE IRON	GG050	AS1831
14	THRUST COLLAR	ENGINEERING PLASTIC	POM	De-Pond
15	O-RING	SYNTHETIC ELASTOMER	NBR	AS1946
16	BODY BONNET BOLT	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A276
17	SPAN RING	DUCTILE IRON	EPDM	AS1946
18	BOLT	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A276
19	BOLT WASHER	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A276
20	RUBBER SEALING	SYNTHETIC ELASTOMER	EPDM	AS1946
21	GRIP RING	BRASS	C37710	AS1968
22	TOP BONNET BOLT	STAINLESS STEEL	0Cr17Ni12Mo2(316)	ASTM A276

### DIMENSIONS TABLE

DN	FW	L1	OO	H1	H(max)
90	252±2	89±1.5	90	72	310
100	290±2	89±1.5	125	95	330
150	356±2	118±1.5	180	120	420
250	410±2	148±1.5	250	180	670
280	425±2	152±1.5	280	180	670



# INTEGRAL POLYETHYLENE ENDS, BETTA RESILIENT SEATED GATE VALVE, PN16, CC or ACC

for Polyethylene Pipes PE100, DN90~DN315



Gate valve with integral polyethylene tail ends for PE pipes. For drinking water and neutral liquids to max. 40°C

ASZ82X1-PE-16Q

Connection	Polyethylene Tail Ends
Material	Ductile Iron
DN	DN90~315
PN	PN16
Closing Direction	Clockwise to Close
	Anti-Clockwise to Close

## APPENDIX B - QUALITY CERTIFICATIONS

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

### TABLE B1

#### BETTA FLUID CONTROL CO LTD – MANAGEMENT SYSTEMS

Beigongwu Road, Yuqi Industry Park, Huishan District, Wuxi, Jiangsu Province, China	
Quality Systems Standard	ISO 9001:2015
Certification licence no.	12 100 38509 TMS
Certifying agency	TÜV SÜD Management Services GmbH
Current date of certification	15 July 2019
Expiry date of certification	17 June 2022

### TABLE B2

#### BETTA FLUID CONTROL CO LTD – PRODUCT CERTIFICATION

Beigongwu Road, Yuqi Industry Park, Huishan District, Wuxi, Jiangsu Province, China	
Product Standard/Spec.	AS/NZS 2638.2:2011
Certificate No.	25731
Certifying agency	Australian Certification Services Pty Ltd
First date of certification	19 June 2019
Current date of certification	19 June 2019
Expiry date of certification	18 June 2024





PRODUCT CONFORMITY SCHEME – FULL CERTIFICATION

## Certification Licence

Australian Certification Services Pty Ltd grants to:

**Betta Fluid Control Co., Ltd.**

Trading as Betta Fluid Control Co., Ltd.

the right to use the Certification Mark as shown above in conjunction with the Certificate No. on product/s as identified in the Schedule and as listed on the Australian Certification Services Website [www.certificationservices.com.au](http://www.certificationservices.com.au) and have been shown to comply with the relevant Standard/s referred to below. The Licensee is granted a licence to use the Certification Mark subject to the rules governing the use.

Product Type: Gate Valves  
 Brand: BETTA  
 Evaluated to: AS/NZS 2638.2:2011 Amdt 1 2017 Gate Valves for waterworks purposes Part 2: Resilient seated

Issue Date: 19<sup>th</sup> June 2019  
 Initial Issue Date: 19<sup>th</sup> June 2019  
 Expiry Date: 18<sup>th</sup> June 2024

Paul Greig  
 General Manager

Certificate No.: 25731

This certificate remains the property of Australian Certification Services Pty Ltd

The Product Conformity Scheme (PCS) – Full Certification is a conformity assessment scheme based on ISO/IEC 17067 (Scheme Type 5) and SA HB 18.28





## Product Conformity Scheme (PCS)-FULL Certification Licence Schedule

Certificate Holder	Betta Fluid Control Co., Ltd. BeiGongWu Road YuQi Industry Park HuiShan District WuXi 214183 JiangSu Province China Website: <a href="http://www.bettaindustries.com">www.bettaindustries.com</a>
Certificate Number	25731
Certification Standard/s:	AS/NZS 2638.2:2011 Amdt 1 2017 Gate Valves for waterworks purposes Part 2: Resilient seated

### Product Listing

Model Identification	Brand Name	Product Description
80ASZ42X1-16Q	BETTA	DN80 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
90ASZ72X1-16Q	BETTA	DN80X90 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (PE) Connections Coated with Blue Thermosetting Polymeric Material
100ASZ42X1-16Q	BETTA	DN100 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
100ASZ42X1-16Q-2	BETTA	DN100 PN16 Resilient Seated Ductile Iron Gate Valve (Light Pattern) Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
100ASZ52X1-16Q	BETTA	DN100 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material
100ASZ52X1-16Q-2	BETTA	DN100 PN16 Resilient Seated Ductile Iron Gate Valve (Light Pattern) Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End Connections Coated with Blue Thermosetting Polymeric Material



Model Identification	Brand Name	Product Description
100ASZ62X1-16Q	BETTA	DN100 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket (AS 2280) x Flange End Connections Coated with Blue Thermosetting Polymeric Material
100ASZ72X1-16Q	BETTA	DN100 x125 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (PE) Connections Coated with Blue Thermosetting Polymeric Material
100ASZ82X1-16Q	BETTA	DN100 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Spigot End (AS 2280)Connections Coated with Blue Thermosetting Polymeric Material
150ASZ42X1-16Q	BETTA	DN150 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
150ASZ42X1-16Q-2	BETTA	DN150 PN16 Resilient Seated Ductile Iron Gate Valve (Light Pattern) Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
150ASZ52X1-16Q	BETTA	DN150 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material
150ASZ52X1-16Q-2	BETTA	DN150 PN16 Resilient Seated Ductile Iron Gate Valve (Light Pattern) Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End Connections Coated with Blue Thermosetting Polymeric Material
150ASZ62X1-16Q	BETTA	DN150 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket (AS 2280) x Flange End Connections Coated with Blue Thermosetting Polymeric Material
150ASZ72X1-16Q	BETTA	DN150x180 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (PE) Connections Coated with Blue Thermosetting Polymeric Material



Model Identification	Brand Name	Product Description
150ASZ82X1-16Q	BETTA	DN150 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Spigot End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material
200ASZ42X1-16Q	BETTA	DN200 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
200ASZ42X1-16Q-2	BETTA	DN200 PN16 Resilient Seated Ductile Iron Gate Valve (Light Pattern) Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
200ASZ52X1-16Q	BETTA	DN200 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material
200ASZ52X1-16Q-2	BETTA	DN200 PN16 Resilient Seated Ductile Iron Gate Valve (Light Pattern) Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End Connections Coated with Blue Thermosetting Polymeric Material
225ASZ42X1-16Q	BETTA	DN225 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
225ASZ52X1-16Q	BETTA	DN225 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material
250ASZ42X1-16Q	BETTA	DN250 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
250ASZ52X1-16Q	BETTA	DN250 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material





Model Identification	Brand Name	Product Description
250ASZ72X1-16Q	BETTA	DN250x250 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (PE) Connections Coated with Blue Thermosetting Polymeric Material
280ASZ72X1-16Q	BETTA	DN250x280 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (PE) Connections Coated with Blue Thermosetting Polymeric Material
300ASZ42X1-16Q	BETTA	DN300 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
300ASZ52X1-16Q	BETTA	DN300 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material
300ASZ72X1-16Q	BETTA	DN300x315 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (PE) Connections Coated with Blue Thermosetting Polymeric Material
350ASZ42X1-16Q	BETTA	DN350 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
375ASZ342X1-16Q 100 BY-PASS	BETTA	DN375 PN16 Resilient Seated Ductile Iron Gate Valve with DN100 By Pass Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
375ASZ42X1-16Q	BETTA	DN375 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
375ASZ52X1-16Q	BETTA	DN375 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Socket End (AS 2280) Connections Coated with Blue Thermosetting Polymeric Material



Model Identification	Brand Name	Product Description
400ASZ42X1-16Q	BETTA	DN400 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
450ASZ42X1-16Q	BETTA	DN450 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
450ASZ42X1-16Q-2 100 BY-PASS	BETTA	DN450 PN16 Resilient Seated Ductile Iron Gate Valve with DN100 By Pass Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
600ASZ42X1-16Q	BETTA	DN600 PN16 Resilient Seated Ductile Iron Gate Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material
600ASZ42X1-16Q-2 150 BY-PASS	BETTA	DN600 PN16 Resilient Seated Ductile Iron Gate Valve with DN150 By Pass Valve Inside Screw Non Rising Spindle Anti Clockwise/Clockwise Closure Operated by a Removable Key for Buried Applications Flanged End Connections Coated with Blue Thermosetting Polymeric Material



## **APPENDIX C – SUPPLIER CONTACTS**

### **Australian Office**

Betta Fluid Control Co. Ltd

45 Cyperus Crescent Carseldine, QLD 4034

Tony Iskra Mobile: 0417 500132

Paul Chesterfield Mobile: 0407 736526

Email: sales@bettavalves.com

Website: www.bettaindustries.com

### **China Office and Factory**

Betta Fluid Control Co. Ltd

BeiGongwu Road, YuQi Industry Park, HuiShan District, WuXi, China. P.C. 214183

Mr Jacky Zhang

Tel: +86-510-83881123

Fax: +86-510-83881217

### **Stocking Agents**

#### **Clover Pipelines**

VIC: 03 8373 8000

QLD: 07 3073 7000

NSW: 02 8279 8000

TAS: 03 6111 9500

WA: 08 6166 6800

NT: 08 7999 8400

SA: 08 8120 4600

#### **Civil Pipe Supplies**

QLD: 07 3204 8906

#### **Dobbie Dico**

WA: 08 9249 7000



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