Assets Planning and Delivery Group
Engineering

Strategic Product Specification

SPS 259
Knife-gate Valves

VERSION 1
REVISION 3

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FOREWORD

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

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

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

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

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

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

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

Enquiries relating to the technical content of this specification should be directed to the Senior Principal Mechanical Engineer, Engineering. Future specification changes, if any will be issued to registered specification users as and when published.

Head of Engineering

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

It is the responsibility of the user to ensure they are using the current version of this document.

REVISION STATUS

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

REVISION STATUS						
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Strategic Product Specification
SPS 259
Knife-gate Valves

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1 Scope and General

1.1 Scope

This Specification sets out requirements for the manufacture, supply, handling and delivery of PN 10 knife-gate valves and as further described in the following. The Corporation uses knife-gate valves for both *standard service* and *corrosive service* applications. This Specification covers both types by specifying different materials for each. The valves have been designated standard service knife-gate valves and corrosive service knife-gate valves respectively.

The Specification details the requirements in lieu of specific clauses, or as clarification for options that exist within, or as additional requirements to AS 6401. Accordingly, unless otherwise specified in this Specification, the valves shall be manufactured, tested and supplied in accordance with the requirements of AS 6401.

> **NOTE:** *corrosive service* valves may have bonnet pressure ratings significantly below PN10 and should be limited to use in wastewater pump stations and similar applications where the maximum static head is below the pressure rating of the bonnet.

1.2 Referenced Documents

In addition to documents listed in Appendix A of AS 6401 the following documents are referenced in this Specification:

AS
6401 Knife-gate valves for waterworks purposes

AS/NZS ISO
9001 Quality management systems – requirements

BS EN
10204 Metallic products – Types of inspection documents

ASTM
A 380 Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment and Systems

ISO/IEC
17025 General requirements for the competence of testing and calibration laboratories

SAA Guides
HB 18 Guidelines for third-party certification and accreditation
HB 18.2 Guide 2-General terms and their definitions concerning standardization and related activities
HB 18.22 Guide 22-Information on manufacturer's declaration of conformity with standards and other technical specifications
HB 18.23 Guide 23-Methods of indicating conformity with standards for third-party certification systems
HB 18.28 Guide 28-General rules for model third-party certification system for products
MP 52 Manual of authorization procedures for plumbing and drainage products

1.3 Definitions and Notation

1.3.1 Certificate

A formal certificate defined in SAA HB 18.2 and operated in accordance with SAA HB 18.22 that, as an outcome of Product Certification, attests Product conformity with the nominated product and test standards and authorizes the use of a Certification Mark.

1.3.2 Certification Body

An independent (or third party) organisation duly accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) to operate Certification Schemes.

In the case of a non-strategic plumbing Product, a Certification Body means an organisation approved by Standards Australia to administer the National Certification of Plumbing and Drainage Products (NCPDP) Scheme in accordance with SAA MP 52.

1.3.3 Certification Mark

A trademark or other mark of product conformity with a specified standard defined in SAA HB 18.2 and applied in accordance with SAA HB 18.23 that is issued under the rules of a Certification Scheme.

1.3.4 Certification Scheme

A product certification program or system which is operated in accordance with JAS-ANZ Procedure 15 – General requirements for bodies operating product certification systems and in accordance with the general rules of SAA HB 18.28 and System No. 5 as defined in ISO/ITC publication - Certification - Principles and practice. In the case of a non-strategic plumbing Product, a Certification Scheme means the NCPDP Scheme.

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

1.3.5 Compliant Product

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

1.3.6 Corporation

The Water Corporation of Western Australia.

1.3.7 Corrosive Service

Refer Table 2.1.

1.3.8 Manufacturer

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

1.3.9 Maximum Static Head

The maximum possible differential head to which the valve can be subject in service, expressed in metres of water. In most Corporation gravity flow applications - equal to the vertical distance from the bottom of the valve to the overflow level of the upstream tank, channel or pipe. In pressure piping systems - equal to the maximum operating pressure in the piping system.

1.3.10 Nominal Size

An alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number which is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

1.3.11 Notation

Statements expressed by use of the word ‘shall’ are mandatory or ‘normative’ requirements of the Specification. Statements expressed by use of the words ‘should’ or ‘may’ are ‘informative’ but not

mandatory and are provided only for information and guidance. Notes in Specification text are informative. Notes that form part of Specification Tables are normative. An Appendix to the Specification that is designated 'normative' contains mandatory requirements. An Appendix that is designated 'informative' is provided for information and guidance only. The term 'specified' includes requirements of the Specification and requirements stated or referenced in other project documentation.

1.3.12 Officer

A duly authorised representative or appointed agent of the Corporation.

1.3.13 Pressure Class (PN)

A classification of pressure by PN number, based on the allowable operating pressure (AOP) expressed in Megapascals (PN = 10 x AOP). Reference to 'class of valve' in AS 6401 shall mean pressure class (PN).

1.3.14 Product

A single unit or multiple units of manufactured end product or an assembly of manufactured component products, materials or equipment. This Specification and accompanying Purchasing Schedule define the nature and details of Product to be supplied. In this Specification the Product shall refer to a knife-gate valve.

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

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

1.3.15 Product Appraisal

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

1.3.16 Product Assessor

An organization, Officer or other person who, having demonstrated specialist product knowledge and competence acceptable to the Corporation, is nominated by the Corporation, subjects Product to Product Appraisal and issues one or more Product Verification Reports.

1.3.17 Product Certification

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

1.3.18 Product Verification Report

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

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

1.3.19 Product Warranty

A formal express undertaking by a Supplier or Manufacturer that Product is:

a) In conformity with the nominated product specification and referenced standards;

b) Fit for the nominated Product end use or application;

c) Designed for sustained operation at the nominated service performance levels for the specified design life;

d) Adequately packaged for intended transportation, handling and storage conditions;

e) Supported by English language installation, operating and servicing instructions;

f) Adequately supported by Supplier capacity to provide technical Product support.

NOTE: Where required, a Product Warranty should indemnify the Corporation against claims made or losses suffered as a result of breach of the Warranty by means of Public and Products Liability Insurances as specified in the undertaking.

1.3.20 Purchasing Schedule

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

1.3.21 Quality System

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

1.3.22 Standard Service

Refer Table 2.1.

1.3.23 Strategic Product

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

NOTE 1: Strategic product is most commonly an element of permanent Corporation infrastructure. Ancillary operational and safety equipment, not intended to form part of this infrastructure, may be considered strategic by virtue of enhanced operational performance or personnel safety.

NOTE 2: Plumbing products (end-of-line water service fittings DN 32 or smaller) used in strategic services may, by virtue of statutory and regulatory requirements, be considered strategic in Corporation applications.

1.3.24 Supplier

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

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

1.3.25 Testing

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

1.3.26 Valve

Valve or valves referred to in this Specification shall mean knife-gate valve as defined in AS 6401.

1.3.27 WSAA

The Water Services Association of Australia of which the Water Corporation is a corporate member.

1.3.28 Designation of Size

Knife-gate valves referred to in this Specification shall be designated by the following nominal sizes listed in Clause 1.6 of AS 6401.

2 Materials and Components

2.1 General

The design, materials and components used in the manufacture of the valves shall be selected based on the environment in which the valve is located.

The following classification of service shall apply for the purpose of this specification:

Table 2.1 Classification of Service

Classification	Description and examples
Standard Service	Valve is subject to general corrosion due to water or sewage liquid but high levels of hydrogen sulphide are not present. E.g. sewage treatment plant - open or vented channel; suction pipework in a pump station drywell; water tank or reservoir inlet.
Corrosive Service	Valve is located in a sewage pump station wet-well with potential hydrogen sulfide gas levels to ~1000ppm forming a sulfuric acid solution; corrosive, deposit forming atmosphere; sewage containing sand. E.g. Sewage Pump Station wet-well gravity sewer inlet isolation valve.

Materials shall comply with the relevant materials section of AS 6401 and as further detailed below.

2.2 Standard Service Knife-gate Valves

Knife-gate valves for standard service shall comply with the materials listed in Table 2.1 of AS 6401 (Table 2.2 below) and shall be fitted with a PTFE Viton^{TM} seat.

Where required in the 'technical requirements', the valve spindle cap shall be stainless steel of the same material and grade as the spindle.

2.3 Corrosive Service Knife-gate Valves

Knife-gate valves for corrosive service shall be designed in accordance with section 3.

Knife-gate valves for corrosive service shall comply with the materials listed in Table 2.1 of AS 6401 (Table 2.2 below) and shall be fitted with a PTFE Viton^{TM} seat, except as follows:

Where required in the Technical Requirements, the valve spindle cap shall be stainless steel of the same material and grade as the spindle.

Corrosive service valves are normally in the fully open position and may be exercised (operated) on an infrequent basis – i.e. once per year or less. Sliding components (e.g. gland seal, spindle nut) shall be self-lubricating and designed for reliable operation under these service conditions.

2.4 Material Certification

Material certificates shall be provided for valve body, gate and spindle nut to the requirements of EN10204 – Certificate type 2-2 (Batch) for valves of size DN350 and up.

For ease of reference the materials required by AS6401 (2003) are tabulated as follows:

TABLE 2.2

BASIC MATERIAL REQUIREMENTS

FOR KNIFE-GATE VALVES

Component	**Basic Material**		
	Material	**Standard**	**Grade**
Cast lugged or flanged body and gland box, seat integral	Stainless steel	ASTM A743 (AS 2074)	CF8M
Fabricated bodies, gland boxes and up-stands	Stainless steel	ASTM A480	316L
Mating Flange	Stainless steel	ASTM 240	316
Gate	Stainless steel	ASTM A240	316
Gate Guide	Stainless steel	ASTM A276	431
Cast Bonnet	Stainless steel	ASTM A743 (AS2074)	CF8M
Fabricated bonnet	Stainless steel	ASTM A480	316
Seat	PTFE		Viton™ or Fluorel™
Spindle	Stainless Steel	ASTM A276	316
Gland Packing	PTFE		Viton™ or Fluorel™
Bridge	Stainless Steel	ASTM A743 (AS2074)	CF8M
Pillar	Stainless Steel	ASTM A276 or ASTM A480	316
Nut	Gunmetal	AS 1565	C83600
Thrust Washer	Polyamide	ASTM D5989	S-PA0411 (Nylon 6™)
Fasteners	Stainless Steel	ASTM A276	316
Washers	Stainless Steel	ASTM A480	316

3 Design and Manufacture

3.1 General

Knife Gate Valves shall have a nominal pressure rating of Class 10 (10 x 100kPa) in accordance with AS 6401.

In addition to the requirements of Section 3 of AS 6401, valves shall be:

(a) Of the non-rising spindle type for corrosive service;

(b) Unidirectional type unless otherwise specified;

(c) Resilient seated unless otherwise stated.

(d) Be provided with a spindle cap to AS 2638 fig 3.4 either attached or separate to the spindle as required under 'technical requirements'.

3.2 Standard Service Knife-gate Valves

Standard Service Valves can be of the bridge and gland box configuration.

Wafer style valves are acceptable except at termination points where lugged valves shall be supplied. Lugged valves shall be suitable for end of line service. Where required to achieve 'end-of-line service' capability, the valve shall incorporate a downstream mating flange and fasteners.

Standard Service valves shall be suitable for confined-space isolation and have a minimum design life of 50 years.

3.3 Corrosive Service Knife-Gate Valves

3.3.1 Design Requirements

Corrosive service knife gate valves shall be of the lugged and non-rising spindle type and shall be of fully bonneted design such that; with the valve in the open position; the gate, spindle, spindle nut and gland box are protected from both the corrosive environment and from (sulfur) deposit formation on spindle, gate and gate/gland interface. Where required to achieve 'end-of-line service' capability, the valve shall incorporate a downstream mating flange and fasteners

The bonnet shall be of robust design, either cast or fabricated and the seal between the gate and bridge shall effectively prevent the accumulation of debris in the bonnet. For gravity flow applications the bonnet may have a lower pressure rating than the body and gate of the valve, but shall be designed to withstand a pressure of 1.5 times the maximum static pressure of the piping system.

Corrosive Service valves shall be suitable for confined space isolation and have a minimum design life of 50 years.

3.3.2 Sewage Pump Station Requirements

Where required in the Technical Requirements, the following requirements are for applications (typically submersible sewage pump stations) requiring site installation of spindle extension tubes:

(a) The valve shall be supplied with a square spindle cap as prescribed above.

(b) The spindle cap shall be supplied as a loose item separate from the valve spindle.

(c) Both the valve spindle and the valve spindle cap shall be manufactured with an integral socket suitable for insertion into, and site-welding to, a spindle extension tube (by others) manufactured from 50mm schedule 40 stainless steel pipe.

3.4 Direction of Closure

The handwheel shall rotate anticlockwise for closure of the valve.

3.5 Gearbox

Where a gearbox operator is required it shall be grease lubricated and shall incorporate seals on the input and output shafts to prevent the ingress of moisture and grit. Gearboxes shall be manufactured in accordance with AS 1939 with an enclosure rating of IP 67. All gears shall comply with AS 2938.

Note: Gearboxes are not generally suitable for location in a corrosive service environment.

3.6 Frequently Operating Valves

Valves which are required to operate more than one cycle (average) per week shall be direct actuated to the open and closed position and shall not rely on a rotating spindle and spindle nut mechanism to drive the gate.

Note. A typical 'frequently operating' application would be a wastewater treatment plant sequenced batch reactor. The corporation has experienced frequent spindle nut failure in such applications.

3.7 Stainless Steel Components

Stainless steel that has been subjected to heat during manufacture shall be pickled to restore the passive qualities of the surface. Components (other than fasteners) subject to mechanical manufacturing processes shall be passivated in accordance ASTM A380.

All stainless steel welds shall result in a continuous run to avoid crevice corrosion. Stitch welding is not permitted.

4 Testing

4.1 General

Product shall be tested in accordance with the test requirements of this Specification. Testing shall be deemed acceptable when test outcomes have been formally verified by a Certification Body or witnessed by a testing Officer. Product for which a test requirement has not been met shall be classified as non-compliant Product.

NOTE 1: Testing should be carried out by an organisation accredited by NATA or in accordance with ISO/IEC 17025.

NOTE 2: A testing Officer should normally be an Officer who has specialist knowledge of or training in product or materials testing appropriate to the Product characteristics to be tested.

4.2 Notification of Testing

The Corporation shall be notified in writing of each formal test proposal at least seven (7) days prior to the preparation of Product for testing except where a specified test has been the subject of a current valid Certificate issued by a Certification Body. This notification is required to enable the Corporation to make all necessary arrangements including appointment of a testing Officer in a timely manner.

4.3 Access to the Place of Manufacture

The testing Officer shall be afforded access, at all reasonable times, to all places of manufacture of Product or product components and shall be authorised to arrange or undertake such testing there as the Corporation deems appropriate to the testing regime specified.

4.4 Place of Manufacture other than WA

Where any Product or product component is being manufactured other than in Western Australia the Corporation may appoint a local inspecting Officer to undertake inspections and witnessed testing as required. The testing Officer shall be provided with all due authority and permits required to carry out testing at the place of manufacture.

NOTE 1: The cost of witnessed testing arranged by the Corporation will normally be borne by the Corporation unless otherwise negotiated.

4.5 Performance Test Requirements

4.5.1 Production Tests

Each Product item shall be tested in accordance with the test requirements of Section 4 of AS 6401.

Production tests on all high corrosive service valves with non-standard bonnets shall include following tests listed in table 4 below as a minimum.

Table 4.5 – Production tests for corrosive service valve with non-standard bonnet

No	Test	Pressure (kPa)	Duration (min) as per AS6401 Table 4.4		Acceptance Criteria
			DN50-DN300	DN350-DN700	
1	Bonnet test	=> 1.5 x Max static pressure	1	2	No visible leak
2	Valve seat test	1100	1	2	Leakage rate through seat shall not exceed 40ml/min/25mm of nominated diameter

3	Standard critical dimensions				Design drawings

4.5.2 Test Certificates

For the purposes of acceptance, each test certificate shall, as a minimum, bear the relevant Product item serial number and shall certify that the Product item has complied with the specified test requirements.

5 Marking and Packaging

5.1 Marking

5.1.1 Body Markings

Each Product shall be marked in accordance with Section 5 of AS 6401.

5.2 Packaging

5.2.1 General

Product shall be packaged with appropriate protection, which shall prevent damage or defects as a result of handling, storage or transportation. Flexible packaging material shall have a minimum expected life in outside storage conditions of 12 months from the date of delivery.

5.2.2 Identification Tag

Wherever requested in the Technical Requirements each Product item shall be identified using a weatherproof marking pen on a corrosion resistant metal identification tag securely wired to the Product in a conspicuous position using a galvanized tie wire with the following information:

a) Material Master Record number (MMR)

b) Contract number

c) Purchase order number.

5.2.3 Marking of Packaging

Where requested in the purchasing schedule the Product shall be identified by marking on the outside of any protective packaging the same information as shown on the identification tag.

6 Manuals

6.1 Format and Language

Where required, Product shall be supplied complete with appropriate installation, operation and maintenance instructions or manuals, in clear diagrammatic and text format, in English.

6.2 Content

The manuals shall contain all the relevant information required to commission and maintain the Product in operational service, including the following:

a) Details of Product features

b) Operational adjustments

c) Installation and commissioning instructions

d) Preventative maintenance requirements and intervals

e) Testing procedures

f) Trouble shooting guidelines

g) Complete list of parts and associated exploded views or sectional diagrams and reference part numbers.

7 Spare Parts and Special Tools

7.1 Spare Parts

7.1.1 Interchangeability

All spare parts shall be interchangeable for a manufacturer's Product of the same size and model.

7.1.2 Availability

Spare parts and servicing facilities for the product shall be readily available in Western Australia.

7.2 Special Tools

Any special tools required for service and maintenance of the Product shall be supplied.

8 Transportation, Handling and Storage

8.1 General

Transportation, handling and storage facilities shall be designed to prevent Product damage or defects and to maintain Product free of deleterious matter. Product shall not be dropped off elevated vehicle platforms or sites. Mechanical handling equipment shall be in accordance with AS 2550.1, AS 2550.3, AS 2550.5 and AS 2550.11 and shall be appropriate to the loads to be lifted. Manual handling shall be in accordance with the National Standard for Manual Handling and the National Code of Practice for Manual Handling, published by National Occupational Health and Safety Commission, Australia. Product restraint during transportation shall be in accordance with Load Restraint Guide—Guidelines for Safe Carriage of Loads on Road Vehicles, published jointly by the Federal Office of Road Safety and the National Road Transport Commission, Australia.

NOTE: Where wire ropes or chains are used for loading and unloading, they should not come into direct contact with Product. Lifting elements in direct contact with Product should be of a non-abrasive design e.g. elastomeric or fabric webbing straps. During transportation, Product restraints should be checked for tension at regular intervals of travel and should not be released until the transporting vehicle is resting in a secure stable disposition on level ground.

8.2 Preservation of Product in Storage

Product shall be stored in original Product packaging in accordance with the published requirements of the manufacturer, prior to installation. Sensitive component materials shall be protected from extended exposure to direct sunlight and high temperatures e.g. elastomeric components shall be stored in accordance with the general principles of AS 1646.1 Clause 6. Designated Product storage areas shall be of sufficient size to accommodate Product deliveries and shall be flat, reasonably level and free of combustible vegetation, sharp stones or projections that could cause Product damage or defects.

9 Quality Assurance

9.1 Certification

9.1.1 Certification of Product

Wherever this Specification requires compliance with nominated Product and test Standards, conformance shall be certified by means of a Certification Scheme, conducted by a Certification Body. Each Certificate shall expressly attest compliance of all Product items with the nominated Standards. Wherever specified, Certificates shall be submitted to the Officer nominated for this purpose. Product shall be marked in accordance with the requirements of the Certification Body.

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

9.1.2 Quality System

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

9.1.3 Product Re-verification

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

a) Substantive change in Product design, material formulation or performance

a) Product failure to perform in operational service to the nominated performance specification.

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

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

9.2 Compliance and Acceptance

9.2.1 Means of Demonstrating Compliance

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

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

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

9.2.2 Acceptance Criteria

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

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

a) Nominate applicable Product Warranty terms; and

b) Provide documentary verification in the form of a current valid Certificate or Product Verification Report as appropriate to the Product; and

c) Detail each element of Product that does not comply with the specified requirements together with the extent of non-compliance.

NOTE: Where the Specification includes Technical Compliance Schedules, the nature and extent of all non-compliances should be provided in accordance with the appropriate Schedules.

9.3 Non-compliant Product

9.3.1 General

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

Where the Specification includes a 'Technical Compliance Schedule', Product shall be deemed non-compliant except where a Supplier has demonstrated compliance in accordance with the requirements of the 'Technical Compliance Schedule' Appendices of the Specification.

9.3.2 Manufacturing Repairs (In-process)

Welding, the use of fillers and other repairs shall generally not be permissible on Product which is in the course of production. Repairs to custom-built Products such as axially-split pumps and large valves may be considered only if determined by the Corporation to be minor casting repair work in non-strategic locations. Accordingly, details of any defect which the Manufacturer considers can be repaired; together with details of proposed repair procedures shall be submitted in writing for determination by the Corporation.

The Manufacturer shall make provision in its production Quality System and in the appropriate inspection and test plans (ITP's) for sufficient hold points whenever casting defects are encountered. Production work on non-compliant components shall cease and repair work shall not commence until the following details have been confirmed by the Corporation in writing that:

a) Repair of the non-compliant components in lieu of their replacement is acceptable; and

b) Proposed repair procedures are acceptable; and

c) Any proposal to vary the terms of the original Product Warranty as a consequence of the in-process repair is acceptable.

9.3.3 Product Warranty

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

9.3.4 Product Repair

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

10 Appendix A: Project Specific Requirements (Normative)

10.1 General

Project specific information and requirements, not included elsewhere in this Strategic Product Specification shall apply as specified in the following Clauses.

10.2 Technical Requirements

The following table details project specific requirements for the valves to be procured.

TABLE 10.1: SCHEDULE OF PROJECT TECHNICAL REQUIREMENTS

Clause	Specific Requirement	Alternatives
2.1	Service Classification	Standard / Corrosive
-	Nominal Diameter DN	Size (mm)
3.1	Spindle Cap attached to Spindle to AS 2638	Yes / No
3.3.1	Maximum Static Head (gravity flow application)	Metres of Water
3.3.2	Spindle Cap (to AS 2638 fig 3.4) provided as a separate item with provision for site welding spindle and cap to a DN50mm extension tube.	Yes / No
3.6	Frequently Operating Valve (> 1 cycle per week)	Yes / No
5.2.2	Identification Tag Required	Yes / No
5.2.3	Marking of Packaging Required	Yes / No

11 Appendix B: Technical Compliance Schedules (Normative)

11.1 Compliance Schedules

Suppliers shall demonstrate Product compliance with the Specification by completing Technical Compliance Schedule 1 as shown in **TABLE 11.1** on an item by item basis. For acceptance, the extent of scheduled technical item compliance shall be supported by verifiable documentary evidence. Each scheduled item nominates a Specification clause number with which the extent of Product compliance shall be demonstrated.

The Supplier shall denote compliance of an item by ticking the unshaded 'Yes' column appropriate to that item. Where Product does not comply with specified requirements, the Supplier shall tick the 'No' column and shall detail the reasons for non-conformance and any proposed alternatives in the 'Comments' column. The Supplier shall denote acceptance and understanding of a Specification clause by ticking the corresponding 'Noted' column wherever unshaded.

Failure to notify the Corporation of all non-compliant Product components, including the extent of non-compliance, may void an accepted offer to supply or may result in rectification of all non-compliant Product elements, at the Supplier's cost.

TABLE 11.1: TECHNICAL COMPLIANCE SCHEDULE 1

Knife-gate Gate Valves					
Section/Clause		**Noted**	**Compliance**		**Comments**
			Yes	**No**	
1. SCOPE AND GENERAL					
1.1	Scope				
1.2	Referenced documents				
1.3	Definitions and notations				
2. MATERIALS AND COMPONENTS					
2.1	General				
2.2	Standard Service knife-gate valves				
2.3	Corrosive service knife-gate valves				
2.4	Material certification				
3. DESIGN & MANUFACTURE					
3.1	General				
3.2	Standard Service knife-gate valves				
3.3	Corrosive Service knife-gate valves				
3.4	Direction of closure				
3.5	Gearbox				
3.6	Stainless steel components				
4. TESTING					
4.1	General				
4.2	Notification of testing				
4.3	Access to the place of manufacture				
4.4	Place of manufacture other than WA				
4.5	Performance test requirements				
4.5.1	Production tests				
4.5.2	Test certificates				
5. MARKINGS AND PACKAGING					
5.1	Marking				
5.1.1	Body markings				
5.2	Packaging				
5.2.1	General				
5.2.2	Identification tag				
5.2.3	Marking of packaging				
6. MANUALS					
6.1	Format and language				
6.2	Content				
7. SPARE PARTS & SPECIAL TOOLS					

7.1	Spare Parts				
7.1.1	Interchangeability				
7.1.2	Availability				
7.2	Special tools				
8. TRANSPORTATION, HANDLING AND STORAGE					
8.1	General				
8.2	Preservation of product in storage				
9. QUALITY ASSURANCE					
9.1	Certification				
9.1.1	Certification of product				
9.1.2	Quality system				
9.1.3	Product re-verification				
9.2	Compliance and acceptance				
9.2.1	Means of demonstrating compliance				
9.2.2	Acceptance criteria				
9.3	Non-compliant product				
9.3.1	General				
9.3.2	Manufacturing repairs (in-process)				
9.3.3	Product warranty				
9.3.4	Product repair				

Name of Supplier:

Signature: Date:

When requested by the Corporation, the Supplier shall provide the information required by Technical Compliance Schedule 2 as shown in **TABLE 11.2**.

TABLE 11.2: TECHNICAL COMPLIANCE SCHEDULE 2

Knife-gate Valves		
1.	**SUPPLIER'S REPRESENTATIVE**	
1.1	Full name	
1.2	Postal address	
1.3	Facsimile number	
1.4	Email address	
1.5	Phone number	
1.6	Mobile number	
2.	**QUALITY ASSURANCE**	
2.1	Extent of third party accreditation of supplier	
2.2	Extent of third party accreditation of manufacturer	
2.3	Details of certificates and verification reports attached	(Yes/No)
2.4	Does valve have Standards Mark or equivalent	(Yes/No)
3.	**TECHNICAL INFORMATION**	
3.1	Valve performance information supplied	(Yes/No)
3.2	Valve cross sectional general arrangement drawing supplied	(Yes/No)
3.3	Manufacturer's inspection and testing plans supplied.	(Yes/No)
3.4	Details of servicing facilities in Perth supplied.	(Yes/No)
4.	**DESIGN AND MANUFACTURE**	
4.1	Manufacturer's name	
4.2	Place of manufacture	
4.3	Valve model	
4.4	Valve type e.g. knife-gate	
4.5	Size (DN)	
4.6	Pressure class (PN)	
4.7	Maximum operating temperature ºC	

4.8	Marking complies with AS 6401 Section 5	(Yes/No)		
4.9	AS/NZS 4020 compliance - AS 6401 Clause 2.3	(Yes/No)		
4.10	End connection flanges comply with AS 6401 Clause 3.2	(Yes/No)		
4.11	Component design complies with AS 6401 Clause 3.3	(Yes/No)		
4.12	Dimensions comply with AS 6401 Clause 3.4.	(Yes/No)		
4.13	Gate complies with AS 6401 Clause 3.5	(Yes/No)		
4.14	Spindle complies with AS 6401 Clause 3.7	(Yes/No)		
4.15	Lifting devices comply with AS 6401 Clause 3.8	(Yes/No)		
4.16	Operation complies with AS 6401 Clause 3.10	(Yes/No)		
4.17	Handwheel direction of valve closure			
4.28	Valve direction of flow e.g. unidirectional or bi-directional			
4.29	Valve spindle configuration e.g. rising or non-rising spindle			
4.30	Valve end connection type e.g. wafer or lugged	(Yes/No)		
4.31	Valve coating details (general purpose knife-gate valves)			
5.0	**COMPONENTS**	**MATERIAL**	**STANDARD**	**GRADE**
5.1	Body			
5.2	Gland box			
5.3	Gate			
5.4	Gate guide			
5.5	Seat			
5.6	Spindle			
5.7	Gland packing			
5.8	Bridge			
5.9	Pillar			
5.10	Nut			
5.11	Thrust washer			
5.12	Fasteners and washers			

Name of Supplier:

Signature: Date:

12 Appendix C: Material Master Records (Informative)

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

MMR	PURCHASE ORDER LONG TEXT

END OF DOCUMENT