covestro	**Procurement Specification - General Valve Requirements** **RS USA 04.17.14.00**	NA Standard **N-E-MP-3003** 2019-11

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1 Scope

This procurement specification is intended to supplement the Covestro Commodity Catalog Description as shown on the purchase requisition. In case of conflict within this document or between this document and the Covestro Commodity Catalog Description, Sub-Contractor shall immediately contact Covestro for a resolution.

2 Normative References

The following documents, if shown, are referenced in this document ("Referenced Documents") and contain the minimum information that needs to be taken into account when applying this Standard. For each undated Referenced Document, the latest revision of such Referenced Document applies. For each dated Referenced Document, only the so identified edition of such Referenced Document applies.

ANSI B1.1	Unified Inch Screw Threads
API 600	Bolted Bonnet Steel Gate Valves for Petroleum and Natural Gas Industries
API 602	Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries
ASME B16.34	Valves Flanged, Threaded, and Welding End
ASME B16.5	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard
G-G-JA-3	General Definitions
MSS SP-6	Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings
N-E-MP-3003	Procurement Specification - General Valve Requirements - RS USA 04.17.14.00

3 Terms, Definitions and Abbreviations

3.1 Terms and Definitions

Capitalized terms used but not defined in this document are defined in Standard G-G-JA-3.

3.2 Abbreviations

AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
EVSP	Expandable Valve Stem Packing
NBR	Nitrile Binder
PSIG	Pound per Square Inch Gauge
PTFE	Polytetrafluoroethylene

4 General

1) Valve descriptions include references to manufacturers and specific model numbers. Where a Vendor proposes products of other manufacturer, such proposals shall be labeled as alternates. Substitutes are not acceptable unless approved by Covestro.
2) All valves supplied shall be new and of first quality and shall be of Vendor's latest design. Valves which are used, rebuilt or surplus, are not acceptable. Where market conditions and construction schedules dictate, rebuilt or surplus valves shall be considered on a case-by-case basis, and will require the written approval from Covestro. Where such valves are proposed, they shall be labeled as alternates and clearly labeled as rebuilt or surplus, as applicable.
3) Valves which have been stored by Supplier over an extended time period shall be carefully examined prior to shipment to ensure that no deterioration has taken place. Valves having defects such as corroded or pitted stems, internal corrosion, damaged end connections, etc., are unacceptable and will be rejected by Covestro.
4) Valves which have been modified in any way from the condition in which they left the factory (except for packing or gasket changes) shall not be acceptable unless inspected and approved by Covestro in writing, prior to shipment.
5) Lever, handle or wrench-operated valves shall be supplied complete with lever, handle or wrench, as applicable.
6) Gate and Globe valves shall have back seating design.
7) When solid wedge discs are specified for gate valves, flexible wedge discs are acceptable provided they are part of Vendor's standard design for that valve.
8) Tapped holes in valve bodies required for bolting to external pipe flanges shall be Unified Standard, Class 2B, in accordance with ANSI B1.1.
9) The finish for gasket contact faces of flanged ends shall be in accordance with the Standard dictating the valve design unless noted otherwise in the Covestro Commodity Catalog Description. Scratches or other damage to these surfaces in excess of those permitted by ASME B16.5 are not acceptable. Special flanged end valves conforming to Standards that do not specify facing finish requirements, shall have the contact faces of flanged ends in accordance with MSS SP-6.
10) The direction of rotation for opening and closing of Gate and Globe valves shall be indicated on the handwheel. Valves shall open when the handwheel is turned in the counter clockwise direction.
11) Where 12%-13% chromium trim is specified in the Covestro Commodity Catalog Description, "Hard Faced" seats and/or discs faced with "Stellite" or equal composition shall be substituted.
12) Where the Covestro Commodity Catalog Description specifies "Hard Faced" trim, both seats and the seating surface of the disc shall be "Hard Faced". Where "Hard Faced" seats are specified, only the valve seating surface requires "Hard Facing". Hard facing shall be "Stellite No. 6" or equal composition.
13) Cast iron, Carbon Steel and Low Alloy Steel valves shall be painted with Vendor's standard paint. Bronze, Brass, Stainless Steel and High Alloy valves do not require painting. Unless stated otherwise valve handles and handwheels shall be painted black with a single coat surface tolerant Epoxy.
14) Multiport valves will have port arrangements called out in the Covestro Commodity Catalog Description as Covestro standard port arrangement No. 1, No. 2, etc. These port arrangements are defined in Section 12 of this specification.
15) Based on the valve application, additional requirements shall be necessary to completely define the valve. When required, an additional procurement specification will be noted in the Covestro Commodity Catalog Description along with this document. In the event of a conflict, the additional procurement specification will normally be the ruling document. The responsible Project Engineer shall be contacted for a resolution.
16) Plastic and Rubber components shall be manufactured from virgin materials. The use of reprocessed materials in valving is not acceptable.
17) Socket weld or threaded auxiliary connections in valves shall conform to ASME B16.34. Threaded connections shall be provided with a forged threaded plug of the same metallurgy as the valve; socket weld connections shall be supplied with a plastic plug.
18) All metallic valves shall maintain electrical continuity to prevent static discharges (i.e., static grounding).
19) End and bonnet cover flanges shall be cast or forged integral with the valve body. The modification of flangeless valves to flanged valves shall only be allowed if the welded joint is 100% radiographed and heat treated (if required) and shall be approved by Covestro before the modification is made.

20) Valve operators, such as levers, handles and handwheels shall be painted using the Vendors standard paint and shall be suitable for use in an industrial environment, alternatively they may be supplied made from a corrosion resistance material such as Stainless Steel.

5 Referenced Codes, Standards and Specifications

1) The materials, design, fabrication, testing, critical dimensions, surface finish, etc., shall be in accordance with the referenced codes, Standards and Specifications as called out in the Covestro Commodity Catalog Description.

6 Materials of Construction

1) Materials of construction shall be as specified in the Covestro Commodity Catalog Description.
2) Where pressure containing parts have been specified as forgings, the substitution of castings or plate materials is not permitted unless authorized in writing by Covestro. Where pressure containing parts have been specified as castings, forgings or plate material is acceptable per ASME B16.34.
3) Valves fabricated by welding is not permitted unless authorized in writing by Covestro.
4) Where valves are specified to an ASME specification in the Covestro Commodity Catalog Description, Vendor shall furnish to the responsible Project Engineer, at the time of delivery, Vendors' certification of compliance with the referenced ASME specification for the body and bonnet. The certification shall also state compliance with the applicable ASME specification for bonnet bolting. The certification document shall be identified with Covestro's purchase order number and Commodity Catalog item number and shall be signed by Vendor's authorized agent.

7 Stem Packing, Gasket and Seal Materials

1) Included in the Covestro Commodity Catalog Description for each valve is a Covestro packing and/or gasket code (PK-1, GK-1, etc.). The following data defines the Covestro packing and gasket requirements.

NOTE Representative packings and gaskets are listed to illustrate the acceptable product styles. Vendors other than those listed may be used if equivalent.

Packing

PK-1 General Utility Service to 400ºF

This packing is primarily intended for use in bronze valves in general utility applications to 400ºF. Non-Asbestos Acrylic fibers impregnated with a Teflon dispersion and a break-in lubricant.

Construction:	Lattice (interlock) braid
Temperature:	400ºF maximum
pH Range:	4-10
Representative Packings:	Garlock Style 8922, Klinger Style 10
Alternative Selections:	PK-2, PK-3

PK-2 General Utility Service To 500ºF

This packing is primarily intended for use in iron valves in general utility applications to 500ºF. Non-Asbestos Acrylic Fibers impregnated with a Graphite dispersion and a break in lubricant.

Construction:	Lattice (interlock) braid
Temperature:	500ºF maximum
pH Range:	4-10
Representative Packings:	Garlock Style 8913, Klinger Style 11
Alternative Selections:	PK-2, PK-3

PK-3 Corrosive Service To 500ºF

This packing is primarily intended for use in Stainless Steel and High Alloy valves in corrosive applications up to 500ºF. Teflon cup and cone or Teflon Fiber yarn impregnated with a Teflon dispersion.

Construction:	Cup and Cone
Temperature:	500°F
pH Range:	0-14
Representative Packings:	Garlock, Klinger

Or

Construction:	Lattice (interlock) braid
Temperature:	500ºF maximum
pH Range:	0-14
Representative Packings:	Garlock 5888, Klinger Style 54H

PK-4 General Process Service to 750ºF

This packing is an assembly consisting of a minimum of five packing rings, primarily for use in general service Carbon Steel and Low Alloy Steel valves. The top and bottom rings of each set shall consist of a Graphite coated Carbon Fiber yarn with the inner rings consisting of flexible graphite.

Construction:	Top and Bottom - Lattice (interlock) braid
	Inner - Die formed rings
Temperature:	750ºF maximum
pH Range:	1-14
Representative Packings:	Garlock Style 98/Graph-Lock Rings
	Klinger Style 46/Style 35
Alternative Selections:	PK-7, PK-9

PK-5 Special Service To 1000ºF

This packing is primarily intended for use in valves conveying petroleum, hot gas or heat transfer fluids. Aluminum foil packing utilizing Aluminum Ribbon that is twisted and highly lubricated. Caution: This metallic packing may react with certain chemical services.

Construction:	Twisted
Temperature:	1000ºF maximum
pH Range:	4-10
Representative Packing:	Chesterton 666
Alternative Selections:	PK-7, PK-9

PK-6 General Process Service To 850ºF

This packing is primarily intended for use in Carbon Steel and Low Alloy Steel valves. Graphite filament yarn impregnated with a Graphite dispersion. This packing shall not be used where five or less rings are needed in the valve or where the valve is frequently cycled such as in control applications.

Construction:	Lattice (interlock) braid
Temperature:	850ºF maximum
pH Range:	1-14
Representative Packings:	Garlock G – 200, Klinger Style 36
Alternative Selections:	PK-7, PK-9

PK-7 General Process Service To 1000ºF

This assembly is intended for high temperature/high pressure services and consists of a minimum of five packing rings. The top and bottom rings of each set shall consist of a Graphite coated Graphite fiber yarn with the inner rings consisting of flexible Graphite.

Construction:	Top and Bottom - Lattice (interlock) braid
	Inner - Die formed rings
Temperature:	1000ºF maximum
pH Range:	1-14
Representative Packings:	Garlock G – 100/Graph-Lock Rings
	Klinger Style 36/Style 35
Alternative Selections:	PK-9

PK-8 Oxygen Service

Oxygen service packing. Teflon fiber yarn impregnated with a Teflon dispersion and prepared for Oxygen service.

Construction:	Top and Bottom - Lattice (interlock) braid
	Inner - Die formed rings
Temperature:	500ºF maximum
pH Range:	1-14
Representative Packings:	Garlock Style 5898

PK-9 Environmental Packing System

This assembly is intended for high temperature/high pressure services and consists of a minimum of five packing rings. The top and bottom rings of each set consist of a Graphite coated Carbon Fiber yarn with the next inner rings consisting of a high density flexible graphite and middle rings consisting of a low density flexible Graphite.

Construction:	Top and Bottom - Lattice (interlock) braid
	Inner - Die formed cup and cone rings
Temperature:	1000ºF maximum
pH Range:	1-14
Representative Packings:	Garlock 9000 EVSP Simplified
	(Expandable Valve Stem Packing)

NOTE A high purity carbon bushing such as Garlock style 4525 may be required to shorten existing deep stuffing boxes.

PK-10 Steam Service To 750ºF

This packing is intended for Carbon Steel valves in Steam Service up to 1000 PSIG and consists of at least five packing rings. The packing rings consist of braded flexible Graphite yarns reinforced with Inconel wire. Designs with the yarns woven over a solid core of chopped fiber and Graphite are preferred, but designs without a core are acceptable if designated for Steam Service.

Construction:	Lattice (interlock) braid
Temperature:	750ºF maximum
pH Range:	2-14
Representative Packings:	John Crane Style 3871
Alternative Selections:	PK-9

Gaskets

GK-1 General Utility Service To 350ºF

This sheet gasket is intended for use on valves with flat bonnet to body joints in general utility service to 350ºF. Non-asbestos aramid (Kevlar) fibers with a Nitrile Binder (NBR).

Temperature: 350ºF maximum

Representative Gaskets: Garlock 3000, Klinger C4401

GK-2 General Process Service To 1000ºF

This spiral wound gasket is intended for use on valves with a confined body to bonnet joint. Type 304 Stainless Steel windings layered with a Graphite filler.

Temperature: 1000ºF maximum

Representative Gaskets: Flexitallic, Lamons

GK-3 General Process Service To 750ºF

This gasket is intended for use on Class 150 Carbon Steel valves with varying body to bonnet joints. Valve Vendors' standard corrugated soft iron (90 Brinell maximum hardness) or double corrugated Steel Jacketed Graphite.

Temperature: 750ºF maximum

Representative Gaskets: Flexitallic, Lamons

GK-4 General Process Service To 750ºF

This gasket is intended for use on Class 300 and greater Carbon Steel valves with varying body to bonnet joints. Valve Vendors' standard corrugated Soft Iron (90 Brinell maximum hardness), double corrugated Steel Jacketed Graphite, spiral wound Type 304 Stainless Steel with graphite filler or soft iron ring (90 Brinell maximum hardness).

Temperature: 750ºF maximum

Representative Gaskets: Flexitallic, Lamons

GK-5 Corrosive Service To 500ºF

This gasket is intended for Stainless Steel and High Alloy Steel valves up to Class 300. Solid Teflon sheet made from virgin PTFE Teflon.

Temperature:	500ºF maximum
pH Range:	0-14
Representative Gasket:	Chesterton 2000

Or

	Reinforced Teflon
Temperature:	500°F maximum
pH Range:	0-14
Representative Gasket:	Garlock 3510

GK-6 Corrosive Service To 1000ºF

This gasket is intended for use on Type 304 and Type 316 Stainless Steel valves with varying body to bonnet joints. Valve Vendors' standard corrugated Type 316 Stainless Steel, double corrugated Type 316 Stainless Steel Jacketed Graphite, spiral wound Type 316 Stainless Steel with Graphite filler or Type 316 Stainless Steel ring.

Temperature:	1000ºF
Representative Gaskets:	Flexitallic, Lamons

GK-7 General Process Service To 500ºF

This gasket is intended for use on Class 150 low Alloy Steel valves with varying body to bonnet joints. Valve Vendors' standard corrugated Type 304 Stainless Steel or double corrugated Type 304 Stainless Steel Jacketed Graphite.

Temperature:	500ºF maximum
Representative Gaskets:	Flexitallic, Lamons

GK-8 Vendors' Standard Seals

Varied/special design seals for the valve type and material specified.

GK-9 Corrosive Service To 500ºF

This spiral wound gasket is intended for use on valves with a confined body to bonnet joint. Type 304 Stainless Steel windings layered with a Virgin Teflon filler.

Temperature:	500ºF maximum
Representative Gaskets:	Flexitallic, Lamons

GK-10 Corrosive Service To 1000ºF

This spiral wound gasket is intended for use on valves with a confined body to bonnet joint. Monel windings layered with a Graphite filler.

Temperature: 1000ºF maximum

Representative Gaskets: Flexitallic, Lamons

GK-11 Corrosive Service To 500ºF

This spiral wound gasket is intended for use on valves with a confined body to bonnet joint. Monel windings layered with a Virgin Teflon filler.

Temperature: 500ºF maximum

Representative Gaskets: Flexitallic, Lamons

GK-12 General Process Service

This gasket is intended for use on Class 300 and greater low alloy steel valves to 5% Chrome with varying body to bonnet joints. Valve Vendors' standard corrugated Type 304 Stainless Steel, double corrugated 304 Stainless Steel jacketed graphite, spiral wound Type 304 Stainless Steel with graphite filler or 5% Chrome ring (130 Brinell maximum hardness.)

Representative Gaskets: Flexitallic, Lamons

GK-13 Oxygen Service

Vendor's standard bonnet gasket suitable for oxygen service.

GK-14 General Process Service To 850ºF

This sheet gasket is intended for use on valves with flat bonnet to body joints. Pure flexible graphite in a homogeneous sheet (no insert).

Temperature: 850ºF maximum

Representative Gasket: Garlock 3123

GK-15 Corrosive Service To 500ºF

This gasket is intended for use on Class 300 and greater Type 304 and Type 316 Stainless Steel valves with varying body to bonnet joints. Valve Vendors' standard corrugated Type 316 Stainless Steel, double corrugated Type316 Stainless Steel Jacketed Teflon, spiral wound Type 316 Stainless Steel with Virgin Teflon filler or Type 316 Stainless Steel ring.

Temperature: 500ºF maximum

Representative Gaskets: Flexitallic, Lamons

2) The Vendor shall clearly identify packing and gasket materials for each valve included in the proposal. Where valves are quoted having packing and gasket materials which do not meet Covestro Corporation's requirements, they shall be clearly identified as alternates.

8 Bellows Sealed Valves (Gate and Globe)

1) Included within the long description of the commodity catalog number for each bellow sealed valve is mentioned in the Covestro criteria listing of critical service categories.

The following data defines Covestro's requirements:

Category 1

Performance Criteria		Parameters
Application Characteristics	Light Duty	e.g., Environmental Containment, Energy Savings
	Valve Type/Pattern	Gate - T Pattern Globe - T Pattern Globe - Y Pattern
	Bellows Construction	Formed
	Bellows Style	Enclosed
	Bellows Clearance	No Minimum Requirements
	Minimum Plies	One
	Minimum Cycle Life	Gate; 3,000 Cycles Globe; 5,000 Cycles
	Basic Design	ASME B16.34 API 600 API 602 Covestro Engineering Standard N-E-MP-3003 Vendor's Standard Preparation
	Additional Requirements	None
	Target Valves	This Category is intended for all gate valves and low cycle life globe valves. No additional requirements are imposed beyond the ASME/Covestro Standard/Vendor's Standard Inspection, Testing and Preparation.

Category 2

Performance

	Criteria	Parameters
Application	Basic Duty	e.g., Environmental Containment, Solidification/Polymerization Concerns
Characteristics	Valve Type/Pattern	Globe - T Pattern Globe - Y Pattern
	Bellows Construction	Formed
	Bellows Style	Open
	Bellows Clearance	1" and Below; 0.125" Minimum Clearance 1-1/2" and Larger; 0.250" Minimum Clearance
	Minimum Plies	Two
	Minimum Cycle Life	10,000 Cycles
	Basic Design	ASME B16.34 Covestro Engineering Standard N-E-MP-3003 Vendor's Standard Preparation
	Additional Requirements	None
	Target Valves	This Category is intended for a minimum 10,000 cycle life valve with an open bellows for washing action. If a Vendor has two styles, of open bonnet valves that meet this criteria, the low end, economical option will be the preferred. No additional requirements are imposed beyond the ASME/Covestro Standard/Vendor's Standard Inspection, Testing and Preparation.

Category 3

Performance

Criteria		Parameters
Application	Heavy Duty - Enclosed	e.g., Environmental Containment, Abrasion Concerns, Flashing Concerns, High Velocity Concerns
Characteristics	Valve Type/Pattern	Globe - T Pattern Globe - Y Pattern Formed
	Bellows Construction	Enclosed
	Bellows Style	No Minimum Requirements
	Minimum Plies	Two
	Minimum Cycle Life	10,000 Cycles
	Basic Design	ASME B16.34 Covestro Engineering Standard N-E-MP-3003 Vendor's Standard Preparation
	Additional Requirements	None
	Target Valves	This Category is intended for a minimum 10,000 cycle life valve with an enclosed bellows that is protected from the service. No additional requirements are imposed beyond the ASME/Covestro Standard/Vendor's Standard Inspection, Testing and Preparation.

Category 4

Performance

	Criteria	Parameters
Application	Heavy Duty - Open	e.g., Environmental Containment, Critical Service with Solidification/Polymerization Concerns
Characteristics	Valve Type/Pattern	Globe - T Pattern Globe - Y Pattern
	Bellows Construction	Formed
	Bellows Style	Open
	Bellows Clearance	1" and Below; 0.125" Minimum Clearance 1-1/2" and Larger; 0.250" Minimum Clearance
	Minimum Plies	Two
	Minimum Cycle Life	10,000 Cycles
	Basic Design	ASME B16.34 Covestro Engineering Standard N-E-MP-3003 Vendor's Standard Preparation
	Additional Requirements	None
	Target Valves	This Category is intended for a minimum 10,000 cycle life valve with an open bellows for washing action. If a Vendor has two styles, of open bonnet valves that meets this criteria, the high end, performance option will be the preferred. No additional requirements are imposed beyond the ASME/Covestro Standard/Vendor's Standard Inspection, Testing and Preparation.

Category 5

Performance

	Criteria	Parameters
Application	Special - Preparatory	e.g., Environmental Containment, Specially Cleaned Valves such as for Chlorine Service
Characteristics	Valve Type/Pattern	Globe - T Pattern Globe - Y Pattern
	Bellows Construction	Formed
	Bellows Style	Enclosed
	Bellows Clearance	No Minimum Requirements
	Minimum Plies	Two
	Minimum Cycle Life	10,000 Cycles
	Basic Design	ASME B16.34 Covestro Engineering Standard N-E-MP-3003 Vendor's Standard Preparation
	Additional Requirements	Special Preparation Requirements for The Service Stated In The Ordering Description
	Target Valves	This Category is intended for a minimum 10,000 cycle life valve with an enclosed bellows that requires special preparation such as chlorine or oxygen cleaning along with any bagging or sealing. Additional requirements for preparing the valve for service has been imposed along with the ASME/Covestro Standard/Vendor's Standard Inspection, Testing and Preparation.

Category 6

Performance

Criteria		Parameters
Application	Special - Examination/Testing	e.g., Environmental Containment Valves Requiring Radiography
Characteristics	Valve Type/Pattern	Globe - T Pattern Globe - Y Pattern
	Bellows Construction	Formed
	Bellows Clearance	1" and Below; 0.125" Minimum Clearance 1-1/2" and Larger; 0.250" Minimum Clearance
	Minimum Plies	Two
	Minimum Cycle Life	10,000 Cycles
	Basic Design	ASME B16.34 Covestro Engineering Standard N-E-MP-3003 Vendor's Standard Preparation
	Additional Requirements	Special Preparation Requirements for The Service Stated In The Ordering Description
	Target Valves	This Category is intended for a minimum 10,000 cycle life valve with an open bonnet that requires additional examination and testing such as radiography and helium testing. The additional requirements will be provided separately and shall be imposed along with the ASME/Covestro Standard/Vendor's Standard Inspection, Testing and Preparation.

9 Special Preparation

1) Valves intended for use in critical services shall, where so noted in the Covestro Commodity Catalog Description, require special preparation. Specifically, valves for Chlorine, Oxygen and in some cases, lube oil, seal oil and hydraulic oil services shall require special cleaning and packaging. In such cases, Vendor shall include in his proposal a detailed description of Vendor's preparation procedures for the intended service.

10 Operators

1) Where called for in the Covestro Commodity Catalog Description, manual gear operators shall be furnished with and mounted on the valves. Gear operators shall not be mounted by using the pressure containing bolts of the valve.
2) Operator sizing shall be based upon the maximum rated differential pressure of the valve at 100°F (38°C).
3) The gear operator shall be designed to operate the valve under all possible pressure/temperature conditions within the valve rating. The desired RIM-PULL is from 40 to 80 pounds, with a higher but reasonable pull to seat or unseat the valve.

$$\text{RIM-PULL} = \frac{2 \times OT}{}$$

$$\frac{R \times E \times HWO}{}$$

Where:

RIM-PULL	=	Rim effort in, Lbs. Pull
OT	=	Output torque in, Inch-Lbs.
R	=	Gear Ratio
E	=	Gear Efficiency
HWO	=	Handwheel Diameter in, Inches

4) Gear operators shall be fully enclosed in a weatherproof housing, factory lubricated for the life of the unit. Exposed gearing is not acceptable.
5) Handwheel on gear operators shall be of the spoke type made from ductile iron or steel.
6) Gear operators will have hardened bolts as opposed to shear pins.
7) All chain wheel operators shall be secured to a stationary part of the valve by means of a safety cable.

11 Identification

1) Each valve shall be marked in strict accordance with the specified valve design standard (e.g., ASME B16.34)
2) Each valve shall be provided with an identification tag. Tags shall be made from AISI 300 series Stainless Steel, and shall be rectangular in shape with all the edges rounded. The following information shall be included on the tag:

   - Covestro Commodity Catalog Number and Covestro Item Number
   - Covestro Purchase Order Number
   - When a specific service is called out in the COVESTRO CATALOG DESCRIPTION, that service shall also be noted on the tag.
   - Example: "Chlorine"
   - Covestro standard port arrangement number, where applicable
     Example: “Covestro Port No. 4”
   - Any special cleaning of preparation

3) Tags shall be securely attached to the valve with Stainless Steel wire twisted at least six times.
4) Tags shall normally be attached to the gland bolting or yoke. Tags on valves that do not have these attachment points shall be attached to the handwheel or other appropriate location.
5) Tags shall not be attached to the bolt holes of end flanges.
6) Minimum dimensional requirements for valve tags shall be as follows:

   - Size of tag: 1" x 2"
   - Lettering Height: 3/16"
   - Thickness of Tag: 0.015”
   - Wire diameter: 0.030"

7) Valves that have been modified shall be identified as follows:

   - A metal tag indicating the valve required for the application per this document.
   - An additional tag indicating any change in the valve packing gasket.
   - A permanent tag attached to the valve indicating a change in the valve other than the packing or gasket. Vendor’s tag shall remain on the valve and shall not be modified.

12 Multi-Port Valve Port Arrangement

1) The commodity catalog description for 3-way valve flow arrangements are as shown at the end of this document.

13 Handling and Shipping

1) Prior to shipment, all valves shall be cleaned inside and outside such as to remove all dirt, metal chips or filings, excessive oil or grease, rags or any other debris.
2) Valves shall be shipped with the correct stem packing installed and the gland follower sufficiently tightened such as to prevent in service leakage.
3) Gate and globe valves shall be in the closed position for shipment, except when they have a thermoplastic liner, then they shall be delivered with the valve slightly open. Plug and Ball valves shall be in the open position for shipment. Butterfly valves shall have the disc cracked open, off of the seat.
4) Threaded or socket-welding openings shall be closed with plastic or metal protective plugs to exclude dirt or other foreign material from the interior of the valves. If metal is used, it shall be of the same nominal material as the valve.
5) Flange facings and butt-welding ends shall be protected with wood, plastic or metal covers over the entire gasket seating surface for butt weld end to exclude dirt or other foreign material from the interior of the valves and to protect the machined surfaces from damage during shipment.
6) Valves intended for critical services requiring special cleaning and packaging (Refer Section 9) shall be carefully handled during cleaning, packaging and shipping such that the required level of cleanliness is maintained.
7) If check valves have been blocked to keep the checking mechanism from moving, the block needs to be removed prior to installation.

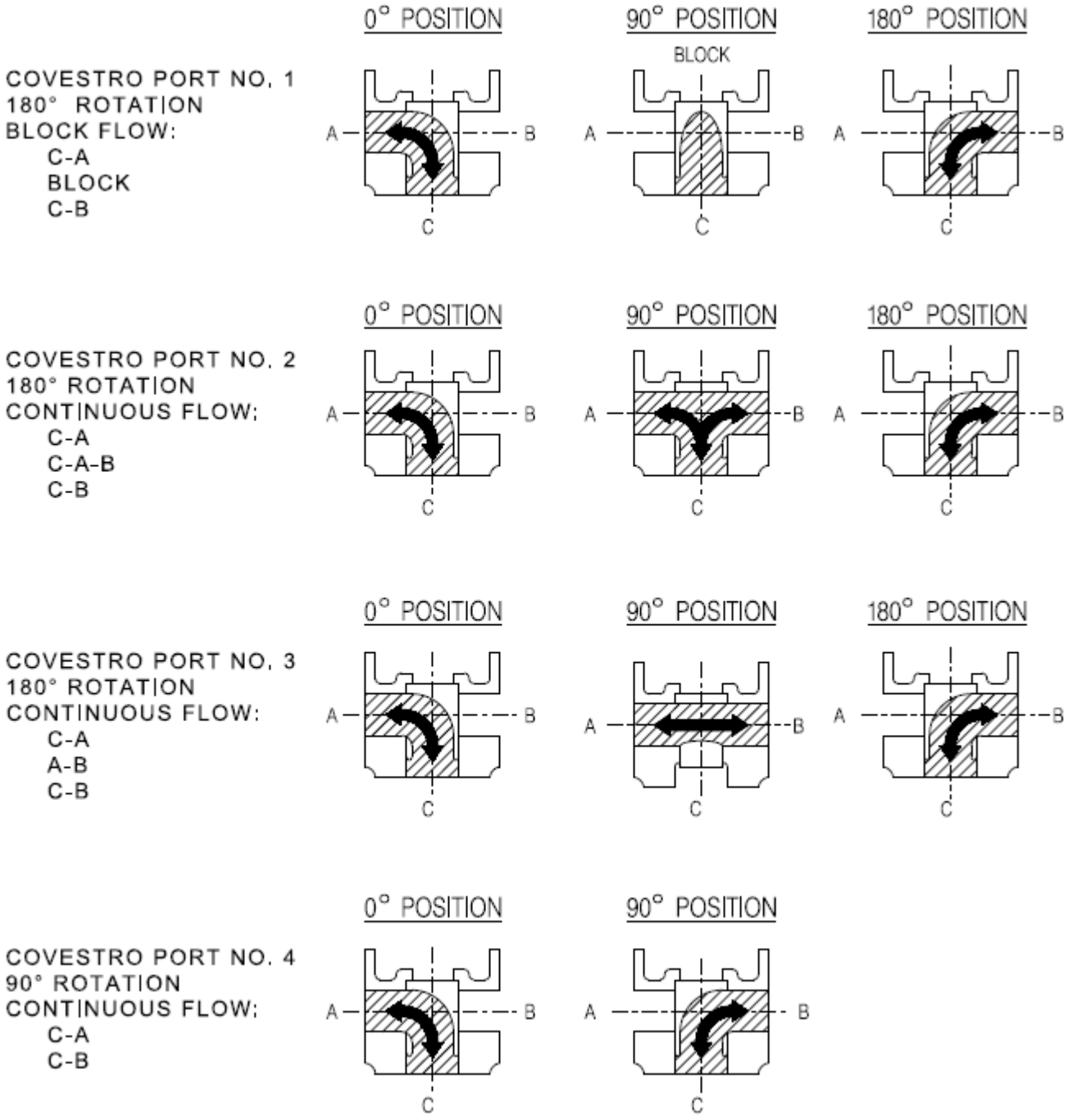

Figure 1 — Multiport Valve Port Arrangement

(The Description for Multiport Valve Flow Arrangements Are as Above)

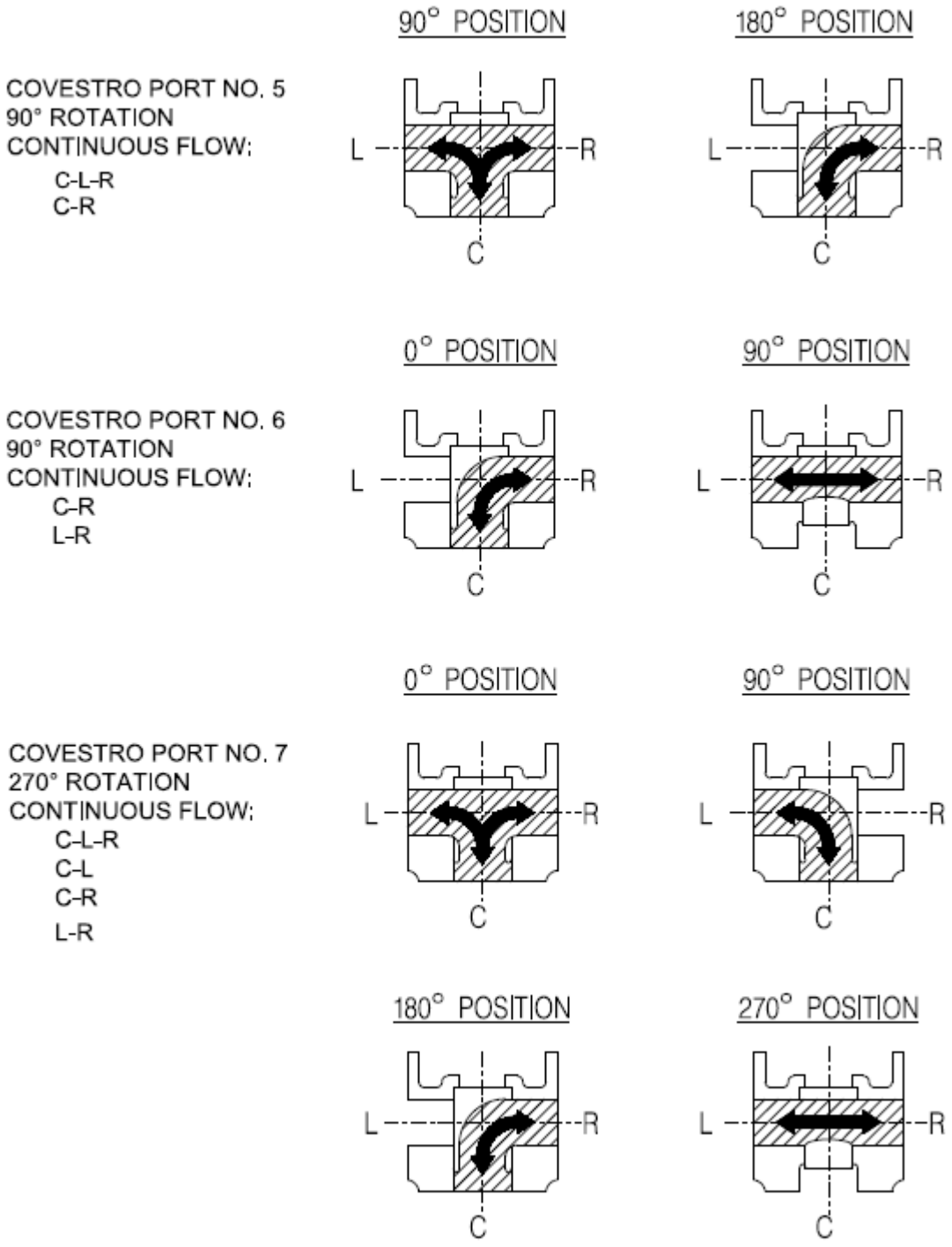

Figure 2 — Multiport Valve Port Arrangement

(The Description for Multiport Valve Flow Arrangements Are as Above)

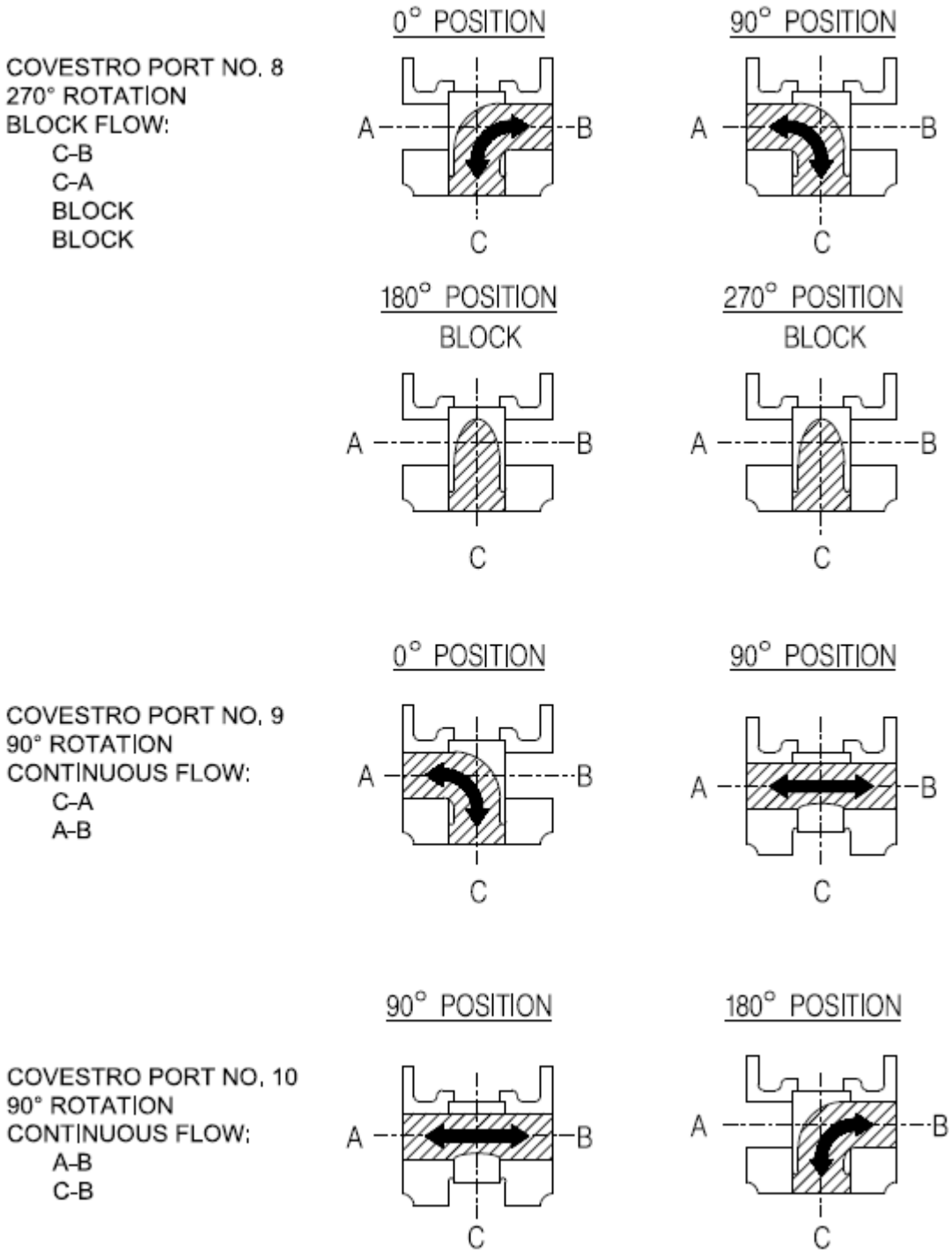

Figure 3 — Multiport Valve Port Arrangement

(The Description for Multiport Valve Flow Arrangements Are as Above)

Table 1 — Covestro Port Arrangements Cross Reference for Selective Manufacturers

MANUFACTURER	PORT ARRANGEMENT									
	1	2	3	4	5	6	7	8	9	10
XOMOX CORPORATION	A	C	D	AX	C Position 2 & 3	—	—	—	D Position 1 & 2	D Position 2 & 3
DUCRO /FLOWSERVE	13	7	8	1	3	5	—	—	—	—
NORDSTROM	13	7	8	1	6	5	—	—	—	4
KTM	—	—	—	L	—	—	T	L	—	—
JAMESBURY	—	FD	3TR	—	—	2TR	—	—	—	—
WORCESTER	LB1	TB3	—	TB4	—	—	—	—	—	—
SWAGELOK	—	—	—	L	—	—	—	—	—	—
HOKE	L	—	—	—	—	—	—	—	—	—
BRADFORD	—	—	—	T	—	—	—	—	—	—
PARKER	—	—	—	L	—	—	—	—	—	—
FLUOROSEAL	FA1	FA3	FA4	FA2	FA3 Position B & C	FA4 Position A & B	—	—	FA4 Position A & B	FA4 Position B & C

Amendments

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