

Jamesbury™ control valves ICV & ICVA

injection control valves
series 4000 model C

Installation, maintenance and
operating instructions

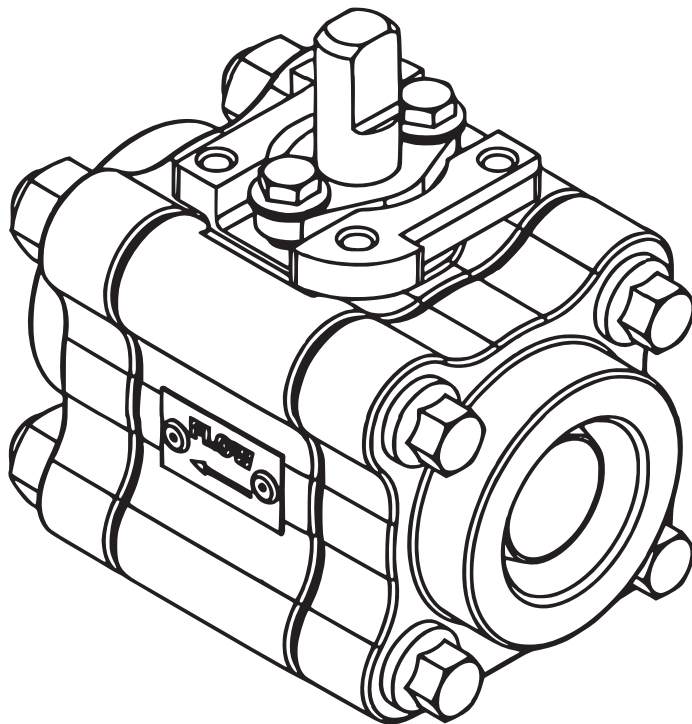


Table of contents

GENERAL	3
Safety Precautions	3
INSTALLATION	3
MAINTENANCE	3
Disassembly	4
Assembly	4
ACTUATOR MOUNTING	5
SERVICE / SPARE PART	5

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

This instruction manual contains information regarding the installation, operation and troubleshooting of the Jamesbury™ Series 4000 Model C ICV and ICVA Injection Control Valves. Please read these instructions carefully and save them for future reference.

1.1 SAFETY PRECAUTIONS

WARNING

FOR YOUR SAFETY, TAKE THE FOLLOWING PRECAUTIONS BEFORE REMOVING THE VALVE FROM THE LINE, OR BEFORE ANY DISASSEMBLY.

1. DURING REMOVAL AND DISASSEMBLY, WEAR ANY PROTECTIVE EQUIPMENT NORMALLY REQUIRED TO PROTECT AGAINST DISCHARGE OF TRAPPED FLUID.
2. DEPRESSURIZE THE LINE AND VALVE AS FOLLOWS:
 - A. PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE LINE.
 - B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE LINE.
 - C. AFTER REMOVAL, AND BEFORE ANY DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.
3. **SEAT AND BODY RATINGS** - THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. READ THE NAME TAG AND CHECK BOTH RATINGS. THIS PRODUCT IS AVAILABLE WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS HAVE PRESSURE RATINGS THAT ARE **LESS THAN** THE BODY RATINGS. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON **VALVE TYPE AND SIZE, SEAT MATERIAL AND TEMPERATURE**. DO NOT EXCEED THESE RATINGS.

WARNING:

AS THE USE OF THE VALVE IS APPLICATION SPECIFIC, A NUMBER OF FACTORS SHOULD BE TAKEN INTO ACCOUNT WHEN SELECTING A VALVE FOR A GIVEN APPLICATION. THEREFORE, SOME OF THE SITUATIONS IN WHICH THE VALVES ARE USED ARE OUTSIDE THE SCOPE OF THIS MANUAL.

IF YOU HAVE ANY QUESTIONS CONCERNING THE USE, APPLICATION OR COMPATIBILITY OF THE VALVE WITH THE INTENDED SERVICE, CONTACT VALMET AUTOMATION FOR MORE INFORMATION.

WARNING:

BEWARE OF BALL MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE VALVE. WHEN THE VALVE IS ACTUATED, THE BALL FUNCTIONS AS A CUTTING DEVICE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

WARNING:

VALVE RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE CWP RATINGS: CAREFULLY CHECK RATING. THIS IS THE SAFE USE PRESSURE FOR THIS VALVE BETWEEN -20 TO +100F (-29 TO +38C). DO NOT EXCEED THESE RATINGS! FOR INSTALLATION TEMPERATURES BELOW AND ABOVE THESE LIMITS CONTACT VALMET.

2. INSTALLATION

Screwed End Style - Use standard piping practices to install valves with threaded end caps. When tightening valve to pipe, apply wrench to end cap nearest the pipe being worked.

SPECIAL PRECAUTIONS FOR WELDED END VALVES:

1. End caps must be completely removed from the valve.
2. Remove all diffusers if necessary and related seals or sealants from each end cap.
3. Weld the end caps into the pipeline.

After welding end caps, reassemble the diffusers (32) using Loctite® Gasket Eliminator #515 or equivalent, then assemble valve per the Assembly Section of this IMO.

CAUTION: IF THE VALVE IS BEING DISASSEMBLED FOR WELDING, DO NOT CUT OR SCRATCH THE SEATS, SEALS OR SEALING SURFACES. DAMAGE TO THE SEALING SURFACES MAY CAUSE LEAKAGE.

After valve is in line, or before any testing, tighten compression plate hex head cap screws according to the **MAINTENANCE** Section below.

3. MAINTENANCE

Although *Jamesbury* valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depends on the actual application and process condition.

Routine maintenance consists of tightening the compression plate hex head cap screws periodically to compensate for the wear caused by the stem turning against the stem seals. Check to make sure that the compression plate hex head cap screws are tightened to the torque listed (**in Table 3**). Overhaul maintenance consists of replacing seats and seals. A standard repair kit consisting of these parts may be obtained from your Valmet Distributor (**see Table 1**).

3.1 DISASSEMBLY

The Series 4000 ball valve is designed to be serviced in or out of the line. The following instructions are for in-line disassembly. (For bench disassembly, which may be more convenient, follow a similar sequence.)

1. Comply fully with the instructions in the **WARNING** Section on Page 3.
2. Be sure to cycle the valve. Leave in the open position. The body center section will not swing out in the closed position.
3. Loosen all four body bolts (52). Remove three from the valve. Leave the remaining bolt in place with the hex nut (53) backed off at least 1/4" (6.3 mm).
4. For positive alignment and ease of in-line assembly, each end cap is interlocked approximately 1/16" (1.6 mm) into the body as shown (in Figure 3). To overcome this feature during in-line disassembly it is necessary to separate each cap at least 1/8" (3.2 mm) from the body. Sharply rap body and caps with a block of wood or plastic mallet to break loose body seal. Spread end caps and swing the body out of the line. If pipe does not allow simple spreading, remove the remaining body bolt and rotate center section (per Figure 1). This will improve access to the end cap flange for ease of spreading. Swing the valve body (1) out from between the end cap (2). Be careful not to damage the sealing surfaces "A" (see Figure 3) at each end of the valve.

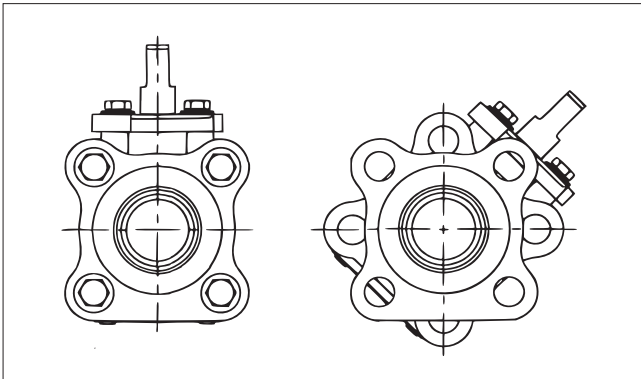


Figure 1.

5. Turn the stem (4) so that the valve is fully closed. Remove the body seals (6) and the seats (5). Body seals will be tightly compressed in their grooves. Use extreme care when prying them out. Damage such as scratches to the bottom of the groove will cause leaks. If the seats are not easily removed, gently tap the ball (3) with a piece of wood or other soft material.
6. Remove the ball (3).
7. Remove the hex head cap screws (29), disc springs (31) and compression plate (20).
8. Press the stem (4) from the top into the valve body (1) and remove it through the end of the body.
9. Carefully pry out and discard the old stem seal (8) being careful not to damage the stem seal bore in the body. Carefully pry out the stem bearings (13) and (24), being careful not to damage the bearing surfaces.

10. Remove diffusers (32) if necessary, by tapping them out of the body caps (2) with a piece of wood, then discard old diffusers if damaged.

3.2 ASSEMBLY

The following instructions are for in-line assembly. For bench assembly, which may be more convenient, follow a similar sequence by holding the valve in a vise by one end cap. Use care not to cut or scratch the seats, seals, or sealing surface.

1. With the valve swung to the out-of-line position, insert from the inside of the body a stem bearing (13), then a second stem bearing (24).
2. Insert the stem (4) horizontally into the body bore (threaded end first). The blade at the ball end of the stem must be vertical (see Figure 2). Guide the stem into the stem bore, being careful not to scratch the bearings.

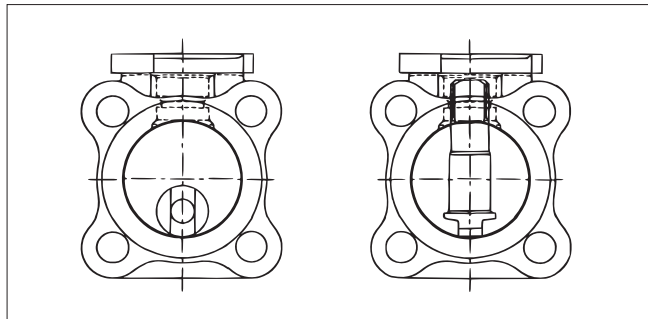


Figure 2.

3. Holding the stem in place from the bottom, install the stem seal (8) and the compression plate (20).
4. Place the disc springs (31) on top of the compression plate over the bolt holes and insert the hex head cap screws (29) and bring them down hand tight with the disc springs. **NOTE:** (See Figure 4) for proper disc spring orientation.
5. While pressing the stem upward from inside the body, torque the hex head cap screws (29) applying the torque shown (in Table 3). Apply torque evenly alternating between the two hex head cap screws so that the compression plate will be parallel with the valve body bonnet.
6. Align the stem blade with the ball slot. Insert the ball (3) and then rotate the stem (4) so that the ball is in the closed position.
7. If removal of diffuser is absolutely necessary, clean off sealing surfaces of diffuser and body caps. Apply Loctite Gasket Eliminator #515 360° around diffuser (32) and mating surfaces of body cap (2). Now insert the small end of the diffuser into the body cap. The diffuser may not press all the way into the body cap at this time. This is normal. The diffuser will seat itself when the valve is fully assembled. Repeat this procedure with the other diffuser and body cap.
8. Work at either end of the body (1). You must pay attention to the flow arrows only if you have an RM coded valve, then place the seat (5) upstream and seat (9) downstream (see Figure 4). Fit the seats snugly against the closed ball. **NOTE:** Be certain the sealing surface of the seat is toward the ball (see Figure 4).

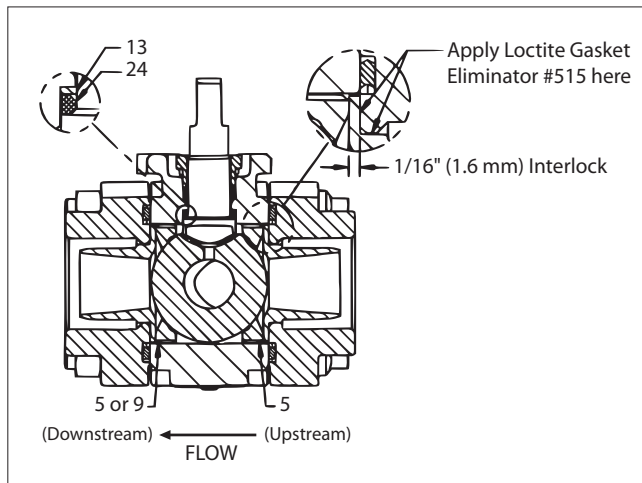


Figure 3.

9. Place a body seal (6) into the machined sealing groove of the body cap (2). Be certain the groove and seal are clean.
10. Repeat steps 7, 8 and 9 for assembly at the opposite end.
11. Turn the stem so that the ball is in the full open position.
12. Swing the entire body assembly back into the properly aligned and interlock position between the body caps, being careful not to scratch the body seals. Body caps may have to be spread slightly to accept the body.
13. Close the valve.
14. Bolt the valve together with lubricated body bolts (52) and hex nuts (53). Tighten these bolts evenly and alternately (**see Table 2 for the torques**).

4. ACTUATOR MOUNTING

IMPORTANT: When the actuator is removed to service the valve, PROPER ALIGNMENT OF THE ACTUATOR DRIVER AND VALVE STEM IS ESSENTIAL WHEN THE ACTUATOR IS REMOUNTED. With a split no-play coupling, tighten the coupling bolts before final tightening of the valve bracketry bolts.

1. Install the actuator and bracket before the valve is in the pipeline. For maximum potential Cv adjust the actuator so that the ball port is in line with the pipe axis (**Figure 4**). For minimum potential Cv adjust the actuator so that the position indicator on top of the actuator reads, over closed, or past the closed position as much as possible, i.e. the valve and actuator should stroke as close to 105° as possible.
2. Refer to AMI-10 for proper linkage assembly and actuator adjustment.

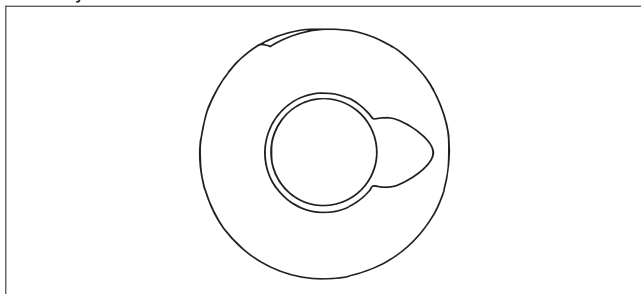


Figure 4.

TABLE 1

ICV& ICVA

Seat Combinations	Repair Kits
Acetal & Filled PTFE Seats	RKN-257RM
Acetal Seats	RKN-257RT
PEEK® Seats	RKN-257LT
Metal Seats	RKN-257DT

NOTE: Repair kits include two seats (5) or one (5) and one (9), one stem seal (B), one stem bearing (13), one stem bearing (24) and two 316 stainless steel/graphite body seals (6). Two o-rings (49) are included if ordering metal seats (DT kit).

ICVA, 11/32" (8.73 mm) Port

Seat Combinations	Repair Kits
Acetal & Filled PTFE Seats	RKN-258RM
Acetal Seats	RKN-258RT
PEEK Seats	RKN-258LT
Metal Seats	RKN-258DT

NOTE: Repair kits include two seats (5) or one (5) and one (9), one stem seal (B), one stem bearing (13), one stem bearing (24), two 316 stainless steel/graphite body seals (6), two 11/32 port diffusers (32) and Loctite Gasket Eliminator #515. Two o-rings (49) are included if ordering metal seats (DT kit).

ICV, 5/8" (15.88 mm) Port

Seat Combinations	Repair Kits
Acetal & Filled PTFE Seats	RKN-259RM
Acetal	RKN-259RT
PEEK Seats	RKN-259LT
Metal Seats	RKN-259DT

NOTE: Repair kits include two seats (5) or one (5) and one (9), one stem seal (B), one stem bearing (B), one stem bearing (24), two 316 stainless steel/graphite body seals (6), two 5/8 port diffusers (32) and Loctite Gasket Eliminator #515. Two o-rings (49) are included if order- no metal seats (DT kit).

5. SERVICE / SPARE PART

We recommend that valves be directed to our service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

NOTE: When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

For further information on spare parts and service or assistance visit our web-site at www.neles.com/valves.

NOTE: When ordering spare parts, always include the following information:

- a. Valve catalog code from identification plate,
- b. If the valve is serialized – the serial number (from identification plate)
- c. From **Figure 5**, the ballooned part number, part name and quantity required.

TABLE 2	
Body Bolt / Hex Nut Torque	
Valve Size (Full Port Size)	Torque
1" (3/4") / DN 25 (DN 20)	26 in•lbs (3 N•m)

TABLE 4	
Handle Nut Torque	
Valve Size (Full Port Size)	Torque
1" (3/4") / DN 25 (DN 20)	23 in•lbs (2.6 N•m)

TABLE 3	
Hex Head Cap Screw Torque	
Valve Size (Full Port Size)	Torque
1" (3/4") / DN 25 (DN 20)	15 in•lbs (1.7 N•m)

EXPLODED VIEW

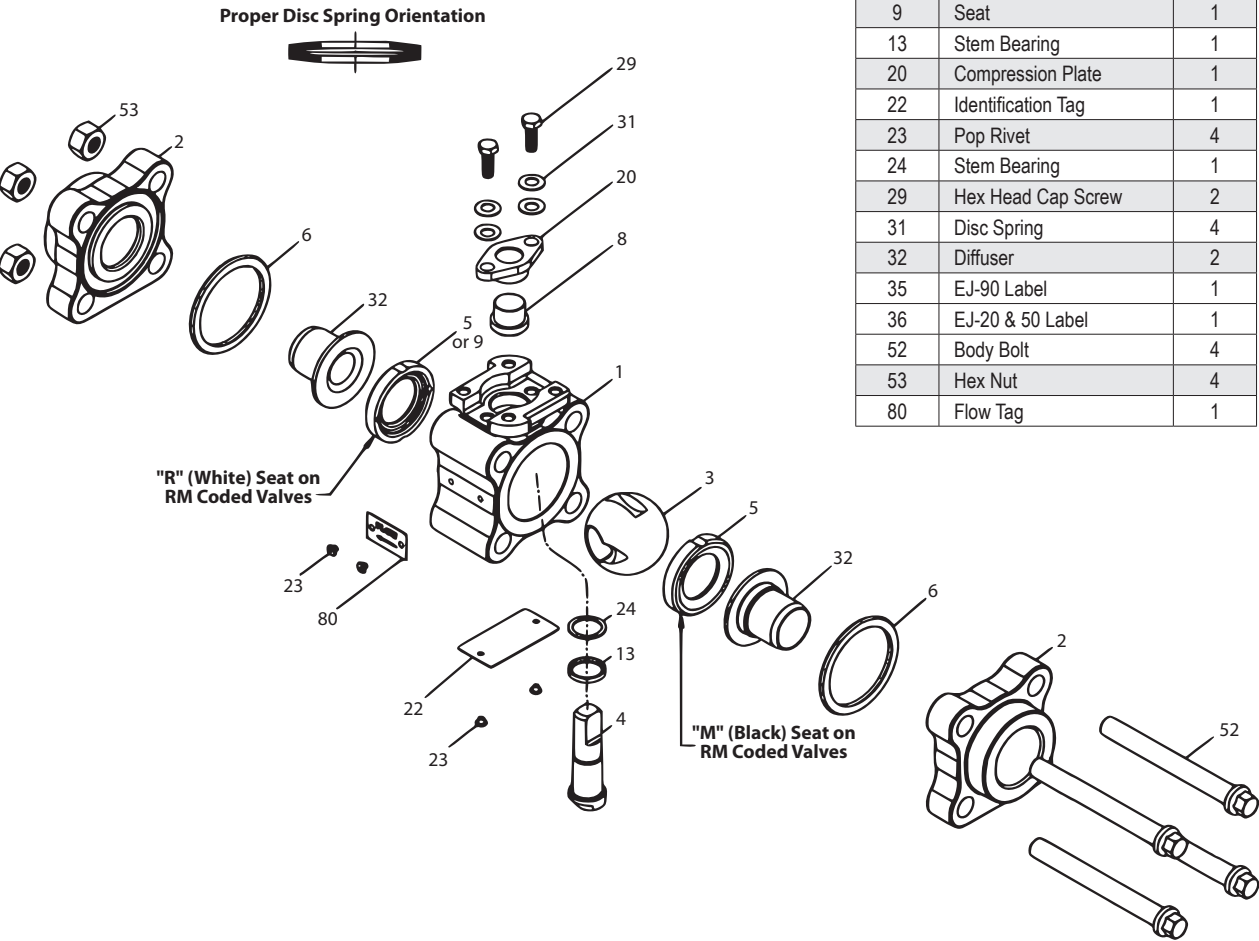


Figure 5.

HOW TO ORDER

1	2	3	3*	4	5	6	7	8	9	10
0100	4	A	ICV	X	36	HB	RM	C	1	Modifier Code

1	Valve Size
0100	1" (DN 25)

2	Valve Size
4	Series 4000

3	Body Type
A	Standard Bore NPT Ends
C	Standard Bore Socket Weld Ends
F	Standard Bore Butt Weld Ends, SCH-5
G	Standard Bore Butt Weld Ends, SCH-10
H	Standard Bore Butt Weld Ends, SCH-40
M	Standard Bore NPT x Soc Weld Ends
Q	Standard Bore Butt Weld Ends, SCH-80
<i>* The codes below are to follow the letter codes given above.</i>	
ICV	Injection Control Valve (5/8" Port)
ICVA	Injection Control Valve (11/32" Port)

4	Special Service
Standard Service	
C	Chlorine
H	Live Loaded
N	NACE (MR-01-7s) - Specify when bolting may be denied exposure to atmosphere 10 Modifier Code
O	Oxygen
P1	Hydrogen Peroxide Passivated
P2	Hydrogen Peroxide Non-Passivated
STGR	Static Ground
TG	Top Ground
V	High Vacuum
VC	High Vacuum Certified
Exxx	Signifies a special engineered product

5	Body / Body Cap Material
22	Carbon Steel
36	316 Stainless Steel

6	Ball & Stem Material
00	same as Body
36	316 Stainless Steel
HB	316 Stainless Steel ball & 17-4PH stem
71	Monel®
73	Hastelloy C®

7	Seat & Seal Material
RT	Acetal Seats, PTFE stem seals
OT	17-4PH seats & PTFE stem seals
RM	(1) Acetal seat & (1) Filled PTFE seat, PTFE stem seals
LT	PEEK seats, PTFE stem seals

8	Model
C	Model C

9	Body Fastener Material
1	AsTM A193 Gr.B7 Bolts, AsTM A194 Gr. 2H or 2HB nuts
2	AsTM A193 Gr.B8 Class 2B bolts, AsTM A194 Gr. 8 nuts

Monel® is the registered trademark of Special Metals Corporation.
Hastelloy® is the registered trademark of Haynes International.

Valmet Flow Control Oy

Vanha Porvoontie 229, 01380 Vantaa, Finland.

flowcontrol@valmet.com

Tel. +358 10 417 5000.

www.valmet.com/flowcontrol

Subject to change without prior notice.

Neles, Neles Easyflow, Jamesbury, Stonel, Valvcon and Flowrox, and certain other trademarks, are either registered trademarks or trademarks of Valmet Oyj or its subsidiaries in the United States and/or in other countries.

For more information www.neles.com/trademarks

