

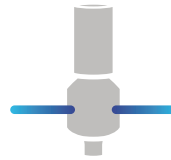
Basic Information

Spray Pattern

01

There are two different types of tank cleaning nozzles, based on their spray patterns: the "solid stream spray" nozzle which sprays the cleaning liquid in a straight single stream, and the "flat spray" nozzle with a flat fan shaped spray pattern.

In general, the solid stream spray nozzle is used for cleaning hard-to-remove and stubborn dirt, the flat spray nozzle is for cleaning dirt that is easily removable.



Solid stream spray nozzles

This nozzle sprays the cleaning liquid in a straight single stream.

- Use for:
- Removing tough, sticky dirt
 - Cleaning off hard to remove dirt



Flat spray nozzles

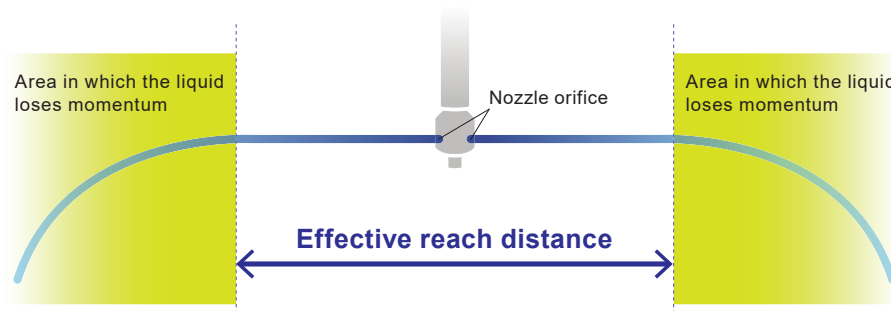
This nozzle sprays the cleaning liquid in a flat fan shaped pattern.

- Use for:
- Washing large surfaces quickly
 - Cleaning off dirt that is easily removable

Reach Distance of Spray

02

The reach distance of spray is the linear distance from the orifice of the nozzle to the point where the spray loses momentum and effectiveness. In other words, it represents not just how far the spray can reach, but the distance at which the spray force remains effective for cleaning.



The illustration shows a solid stream spray nozzle. For the RJ series only, the effective cleaning distance extends beyond the regular reach distance and is given as radius measurement.

Nozzle Rotation

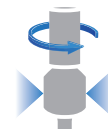
03

Tank cleaning nozzles are classified into three types, based on their rotation specifications: "3D Rotation" (three-dimensional rotation), "2D Rotation" (two-dimensional rotation), and "Fixed".



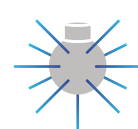
3D Rotation

Uses two rotary drives. Can clean while rotating 360 degrees. Strong cleaning power.



2D Rotation

Uses one rotary drive. Quick cleaning of a large area.



Fixed

No rotary drive or moving parts that can fail or cause wear debris and therefore less downtime for maintenance.

Clog Prevention (Strainer and Flushing the Piping)

04

Clogging can cause malfunction and damage to the product. Be sure to flush the pipe system thoroughly before installing the nozzle to remove dust and debris.

Regardless of the type of cleaning liquid, whether it is used once or can be reused multiple times, it should always run through a strainer to prevent the nozzle from clogging.

Refer to the table on the right for details.

Note: Depending on cleaning liquid type and quality, use a finer mesh strainer or install a filter cartridge to prevent deposits of foreign particles.

Series	Recommended mesh size for the strainer
SR	#200 or more
ES, ESV	#100 or more
RJ, RJ3-MD, RJ2-PON, JA	#50 or more
SWB	#40 or more

Contact us for custom-made models.

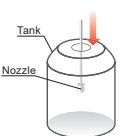
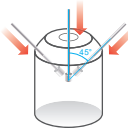
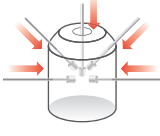
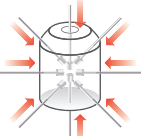
Nozzle Mounting Direction

05

In general, our tank cleaning nozzles are designed with the presumption that they are inserted and installed downward at the top of the tank.

Installing the nozzle sideways and upward at the side or bottom of the tank may result in distortion of the rotary shaft or faulty installation which may cause problems with the operation.

Some series, however, are designed so they can be installed in other directions, please refer to the table on the right.

Series	Mounting direction	Series	Mounting direction
SR	 <p>Only install downward, from the top</p>	JA3, JA3-D180	 <p>Can be installed downward within 45° of the vertical center</p>
RJ	 <p>Can be installed downward or sideways (within 90° of the vertical center)</p>	ES, ESV, JA2	 <p>Can be installed in any direction 360°</p>

Note: The data in this catalog are based on nozzles installed downward at the top of the tank.

Pre-Shipment Inspection

06

All of IKEUCHI's tank cleaning nozzles undergo the following inspections before being shipped, to ensure complete customer satisfaction.

Rotation

The rotation speed at the specified pressure is checked. The ES/ESV-PTFE series are checked for their smooth rotation since their rotation speed is too fast to measure.

Spray Flow Rate

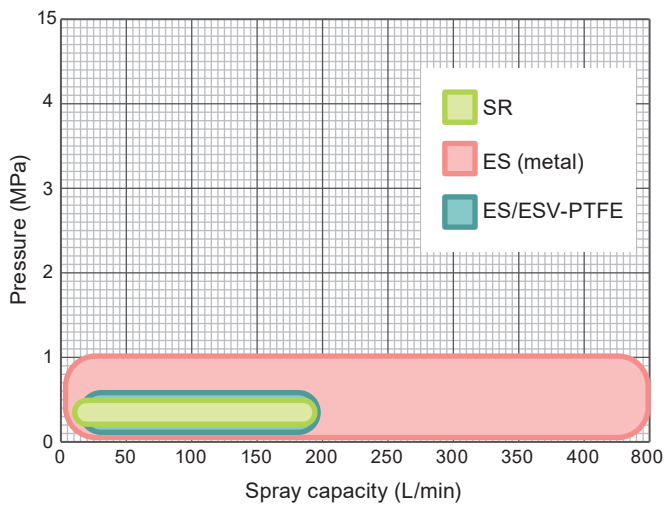
The flow rate is checked if it meets IKEUCHI's spray capacity standard set for each series.

Distribution Chart for Spray Flow Rate

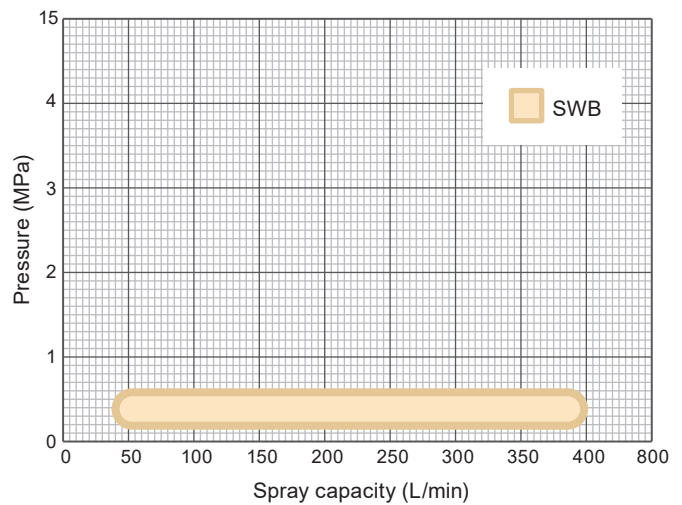
The performance level is not only determined by the operating pressure and spray flow rate. It is important to select a tank cleaning nozzle that matches your application and the conditions it is used in.

Distribution Chart for Each Nozzle Series

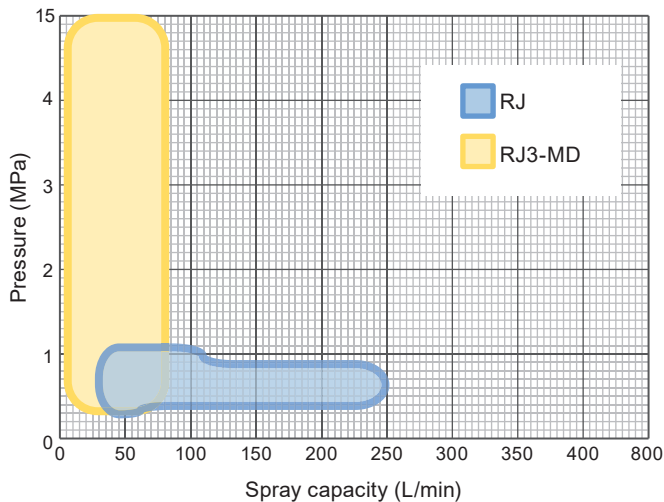
SR, ES, and ESV Series



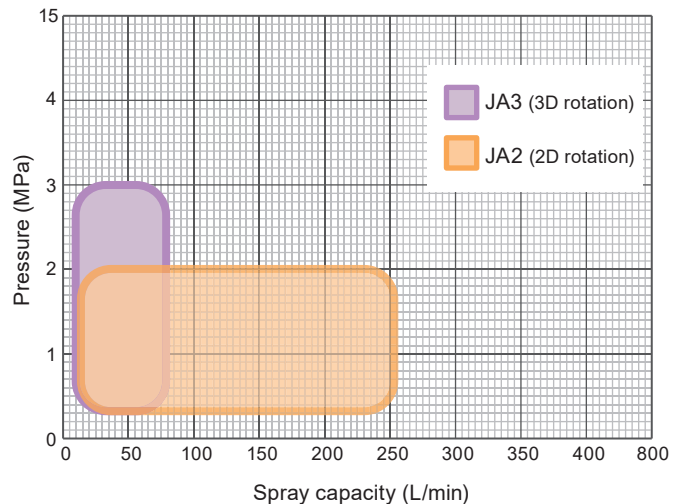
SWB Series



RJ Series

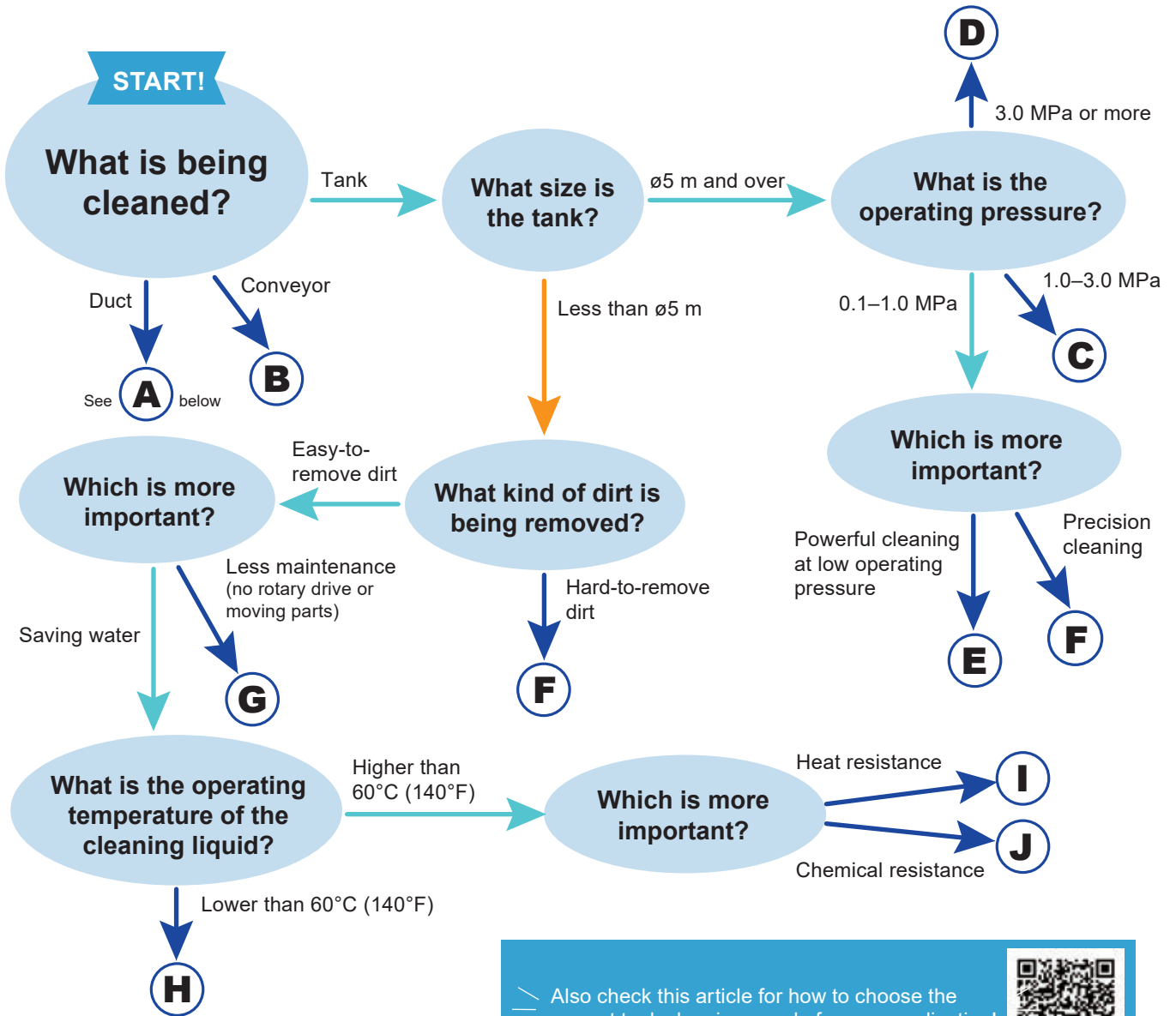


JA Series



Nozzle Selection Guide by Application

Which nozzle is best for what application? Follow this flow chart and find out.



Also check this article for how to choose the correct tank cleaning nozzle for your application!

GOAL!

<p>A</p> <p>Ideal for duct cleaning!</p> <p>RJ2-PON SERIES (page 36)</p>	<p>B</p> <p>Powerful cleaning for conveyors!</p> <p>JA2 SERIES (2D rotation, page 31)</p>	<p>C</p> <p>Impact cleaning with a straight liquid stream!</p> <p>JA3-S SERIES (3D rotation, page 25)</p>	<p>D</p> <p>High impact cleaning! Can be used at pressures from 0.3 to 15 MPa.</p> <p>RJ3-MD SERIES (RJ with Motor, page 22)</p>	<p>E</p> <p>Powerful cleaning at low pressure!</p> <p>JA3-L SERIES (3D rotation, page 25)</p>
<p>F</p> <p>Precise and uniform cleaning with no gaps!</p> <p>RJ SERIES (page 19)</p>	<p>G</p> <p>Non-rotating nozzle, safe for use!</p> <p>SWB SERIES (page 34)</p>	<p>H</p> <p>Can be mounted in any direction (sideways, upward, downward)!</p> <p>ES (metal) SERIES (page 12)</p>	<p>I</p> <p>All stainless steel! Low-speed rotation for effective cleaning.</p> <p>SR SERIES (page 9)</p>	<p>J</p> <p>Made of PTFE, ideal for food products!</p> <p>ES/ESV-PTFE SERIES (page 16)</p>

Case Studies

Here are some examples from actual customers who solved their problems using IKEUCHI nozzles.

01

Pharmaceutical Industry

Cleaning Medical Devices

No more cleaning by hand. Fully automated cleaning to ensure hygiene.

Devices need to be cleaned after every use

It takes time and effort to clean medical tanks by hand and should be avoided due to sanitary consideration. Preventing accidents due to hands on work is something else to be considered. All these points made the client think about installing automated cleaning equipment.



Fully automated cleaning!
Use it with confidence

In order to work in a doctor's office the cleaning equipment needed to be compact and able to work with the water pressure coming from the tap. A small rotating cleaning nozzle was proposed and tested. After a successful trial, it was decided to incorporate the cleaning nozzle into the equipment.

The nozzle used in this case was **2D rotation/ flat spray nozzle ES Series** >>> For more details see **p.12**

02

Food and Brewing Industry

Brewing Process

By automating the draining of residue from the yeast tank all manual labor was eliminated.

Draining the cleaned tank took too long

At a beer factory, too much time was wasted draining residues from the yeast tank and cleaning the inside after use. Water had to be sprayed to dilute the highly viscous residue and draining it little by little took a lot of time. Cleaning multiple tanks took a whole day.



Solving a sticky situation.
Significant reduction in work time!

The proposal suggested a cleaning nozzle attached to the tank lid and using it like a shower. This agitated the residue while draining it and cleaned the tank at the same time. Automating the draining and cleaning of the tank eliminated the need for manual labor. In addition, cleaning multiple tanks simultaneously reduced the time needed to clean all tanks.

The nozzle used in this case was **non-rotation nozzle SWB Series** >>> For more details see **p.34**

Scan here to access our Tank Cleaning Nozzle Case Studies Collection!
View additional success stories from our satisfied customers across various industries.

<https://www.kirinoikeuchi.co.jp/eng/products/tank/lp/tank-cleaning-nozzles/>



03

Paper and Pulp Industry

Pulp Manufacturing Process

Automatic cleaning of raw material tanks cut the cleaning time in half and made simultaneous cleaning of multiple tanks possible.

Work more efficiently!
Eliminate waste!

A paper mill took 30 to 40 minutes to clean a single raw material tank by hand, keeping workers from doing anything else. They wanted to save time and labor.

A rotating cleaning nozzle with a proven track record was proposed and tested on-site for real-life results.



No more labor intensive work!

Automation cut the cleaning time by 20 to 25 minutes per tank and allowed for cleaning of multiple tanks simultaneously! This saved significant time and gave workers the opportunity to complete other tasks.

Satisfied with the results, the nozzles were purchased and are still being used.

The nozzle used in this case was **3D rotation/ solid stream spray RJ Series** >>> For more details see **p. 19**

04

Chemical Industry

Spray Drying

The cleaning liquid reaches 1.2 times further using a smaller and more cost effective nozzle.

Uneven cleaning...
Check the nozzle!

The site designed and manufactured spray dryers. This customer was using a pressure opening high-pressure rotating nozzle to clean the ducts, cyclones and powder tank after spray-drying. However, the wind blowing through the ducts was affecting the spray, blowing it around, which could result in uneven cleaning.



Compact and easy installation!

The customer wanted a product with higher performance and lower cost. To meet their requirement, we designed and offered a nozzle that can provide a stable spray with low speed rotation, not disturbed by wind. It turned out this nozzle made the cleaning liquid reach 1.2 times further. It also allowed for a reduction in the nozzle size with a lower cost.

The nozzle used in this case was **duct cleaning nozzle RJ2-PON Series** >>> For more details see **p. 36**

FAQ Frequently Asked Questions

Q. Is it possible to use a rotating nozzle with air instead of liquid?

A. We do not recommend it. Our rotating nozzles may not operate normally and could cause malfunctions. They are designed to be used with liquid. Contact us with the specific application for use requiring supply of air instead of liquid.

Q. Is it possible to specify a rotation speed?

A. It is not possible to set a specific rotation speed. Many of our rotating nozzle series are shipped after being adjusted to a rotation speed in the design range.

Q. What should be done to prevent clogging?

A. Please flush the pipe system thoroughly before installing the nozzle and install a strainer to prevent the nozzle from clogging. See "Clog Prevention (Strainer and Flushing the Piping)" on page 4 for details.

Please feel free to contact us for custom-made products and any other questions.

Helpful Video Guide with English Subtitles

Discover our educational videos with English subtitles, designed to help you choose the right tank cleaning nozzle. Stay tuned for more videos to come.

 <p>How to Choose the Right Cleaning Nozzle for Different Types of Dirt? (2D or 3D Rotation, or Fixed Type)</p>	 <p>Tank Cleaning Nozzle Series Comparison: SR vs ES Series</p>
 <p>Comparing the Cleaning Power of Tank Cleaning Nozzles (ES, SR, and JA3 Series)</p>	 <p>Ideal Cleaning Nozzles for Lidless Tanks: ES Series downward type and JA3-D180 Series (180° downward spray)</p>

Please turn on English subtitles by clicking the CC or gear icon on YouTube.

Description of Thread Size and Type

Threads noted in this catalog are tapered pipe threads unless otherwise specified. The connection thread size and type are described according to the ISO standard. When ordering our nozzles, please specify the thread size using our thread code as shown on the right. For mixed fractions, our thread size code inserts "*" after the whole number. For example, 1*1/4M stands for R1 1/4.

Thread type	ISO standard	British standard	Our thread code
Male tapered pipe threads	R1/4	1/4 BSPT male	1/4M
Female tapered pipe threads	Rc1/4	1/4 BSPT female	1/4F

Note: Specifications of the products and contents of this catalog are subject to change without prior notice for purpose of product improvement.

Reference Data

■ Conversion of Units

Length	μm	mm	cm	m	in	ft
	1	1×10 ³	1×10 ⁻⁴	1×10 ⁻⁶	3.94×10 ⁻⁵	3.28×10 ⁻⁶
	1×10 ³	1	0.1	1×10 ⁻³	3.94×10 ⁻²	3.28×10 ⁻³
	1×10 ⁴	10	1	1×10 ⁻²	3.94×10 ⁻¹	3.28×10 ⁻²
	1×10 ⁶	1×10 ³	100	1	3.94×10	3.28
	2.54×10 ⁴	25.4	2.54	2.54×10 ⁻²	1	8.33×10 ⁻²
	3.05×10 ⁵	3.05×10 ²	3.05×10	3.05×10 ⁻¹	12	1

Viscosity	1 P = 100 cP 1 St = 100 cSt
Weight	1 kg ≈ 2.21 lb 1 lb ≈ 0.454 kg
Temperature	[°F] ≈ ([°C] × 9/5) + 32 [°C] ≈ 5/9 ([°F] - 32)

Area	cm ²	m ²	in ²	ft ²
	1	1×10 ⁻⁴	0.155	1.08×10 ⁻³
	1×10 ⁴	1	1.55×10 ³	10.8
	6.45	6.45×10 ⁻⁴	1	6.94×10 ⁻³
9.30×10 ²	9.30×10 ⁻²	1.44×10 ²	1	

■ Water flow rate and proper pipe size

Nominal size		Steel pipe		Flow rate (L/min) when pressure loss is 0.01–0.03MPa per pipe length of 10 m
A	B	Inside dia. (mm)	Outside dia. (mm)	
6A	1/8B	6.5	10.5	1.3–2.2
8A	1/4B	9.2	13.8	3–5.2
10A	3/8B	12.7	17.3	7–12
15A	1/2B	16.1	21.7	12–21
20A	3/4B	21.6	27.2	22–38
25A	1B	27.6	34.0	38–65
32A	1¼B	35.7	42.7	70–120
40A	1½B	41.6	48.6	120–210
50A	2B	52.9	60.5	215–370
65A	2½B	67.9	76.3	410–700
80A	3B	80.7	89.1	680–1,200
100A	4B	105.3	114.3	1,200–2,100
125A	5B	130.8	139.8	2,100–3,600
150A	6B	155.2	165.2	3,300–5,700

Volume	cm ³	L (Liter)	m ³ (kL)	ft ³	imperial gal.	U.S. gal.
	1	1×10 ⁻³	1×10 ⁻⁶	3.53×10 ⁻⁵	2.2×10 ⁻⁴	2.64×10 ⁻⁴
	1×10 ³	1	1×10 ⁻³	3.53×10 ⁻²	0.220	0.264
	1×10 ⁶	1×10 ³	1	35.3	220	264
	2.83×10 ⁴	28.3	2.83×10 ⁻²	1	6.23	7.48
	4.55×10 ³	4.55	4.55×10 ⁻³	0.16	1	1.2
	3.79×10 ³	3.79	3.79×10 ⁻³	0.134	0.833	1

Pressure	MPa	bar	kg/cm ²	psi (lb/in ²)	atm	mmHg	mmH ₂ O (mmAq)
	1	10	10.2	145	9.87	7.5×10 ³	1.02×10 ⁵
	0.1	1	1.02	14.5	0.987	750	1.02×10 ⁴
	0.098	0.981	1	14.2	0.968	736	1×10 ⁴
	6.89×10 ⁻³	0.069	0.070	1	0.068	51.7	703
	0.101	1.01	1.03	14.7	1	760	1.03×10 ⁴
	1.33×10 ⁻⁴	1.33×10 ⁻³	1.36×10 ⁻³	0.019	1.32×10 ⁻³	1	13.6
	9.81×10 ⁻⁶	9.81×10 ⁻⁵	1×10 ⁻⁴	1.42×10 ⁻³	9.68×10 ⁻⁵	0.074	1

Flow rate	L/min	m ³ /min	m ³ /hr	in ³ /hr	ft ³ /hr	Imperial gal./min	U.S. gal./min
	1	1×10 ⁻³	0.06	3.66×10 ³	2.12	0.22	0.264
	1×10 ³	1	60	3.66×10 ⁶	2.12×10 ³	220	264
	16.7	0.017	1	6.10×10 ⁴	35.3	3.67	4.40
	2.73×10 ⁻⁴	2.7×10 ⁻⁷	1.64×10 ⁻⁵	1	5.79×10 ⁻⁴	6.01×10 ⁻⁵	7.22×10 ⁻⁵
	0.472	4.72×10 ⁻⁴	0.028	1.73×10 ³	1	0.104	0.125
	4.55	4.55×10 ⁻³	0.273	1.66×10 ⁴	9.63	1	1.20
	3.79	3.79×10 ⁻³	0.227	1.39×10 ⁴	8.02	0.833	1