

Spray Parts Guide



Spray Parts Guide



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Spray Nozzles

John Deere offers spray products for a variety of pressure ranges, flow rates and spray patterns to fit any spray process. Spray nozzles are available in materials including: ceramic, polyacetal, PVDF, stainless steel and brass.



Selecting the Right Spray Nozzle

Visit nozzleselector.deere.com for John Deere's online nozzle selection tool.

Spray nozzles are often the smallest and most overlooked piece of equipment on a machine. However, they have the greatest effect on the accuracy and efficiency of each application. John Deere offers spray nozzles for a variety of pressure ranges, flow rates and spray patterns to fit any spray application.

To be effective, a pesticide must be applied properly. To select the correct spray nozzle for the job, first fully read the pesticide label and look for information on droplet size, application rate, spray quality, and environmental restrictions. Then...

- 1) Check which type of spraying technique you will be using – broadcast or banding.
- 2) Check your sprayer speed.
- 3) Select the application rate from the pesticide label.
- 4) Determine the flow rate (GPM) needed for the spray tip, or use the application rate (GPA) chart for the desired tip.
- 5) Select the pattern type.
- 6) Select tip size and pressure that provides the desired flow rate and application rate.
- 7) Check the spray quality tables to be sure the spray tip and pressure create the droplet spectrum you require.

1) Spraying Technique:

Broadcast spraying is when the entire field is to be treated. The width that each nozzle sprays, adjusted for spray overlap, is the distance between nozzles on the spray boom.

Band spraying is when planted rows or unplanted gaps are treated. The width that each nozzle sprays is the width of the treated band.

2) Sprayer Speed:

Forward speed of the spraying machine should be measured accurately. Radar or ultrasound speed sensors should be calibrated after installation or servicing. Wheel-driven speedometers should be calibrated whenever the driving surface changes, such as after cultivation. Speed can be determined if it is known how long it takes to drive a measured distance:

$$\text{speed in MPH} = \frac{\text{distance (feet)} \times 60}{\text{time (seconds)} \times 88}$$

or

$$\text{speed in Kmph} = \frac{\text{distance (m)} \times 3.6}{\text{time (seconds)}}$$

Improved vehicle design means that speeds up to 20 MPH are now possible. Higher speeds (10-20 MPH) improve work rates and timeliness; lower speeds (5-10 MPH) give improved canopy penetration and make spray drift control simpler.

3) Application Rate:

Read the pesticide label closely to determine an appropriate spray application rate. If a range of acceptable application rates is listed, choose a rate that best matches your situation.

4) Flow Rate:

Determine the exact flow required from each tip by calculating:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times w}{5,940}$$

or

$$\text{LPM} = \frac{\text{L/ha} \times \text{Kmph} \times w}{600}$$

'W' changes depending on the type of applications:

- Nozzle spacing (in/m) for broadcast spraying
- Spray width (in/m) for single-nozzle band spraying or boomless spraying
- Row spacing (in/m) divided by the number of nozzles per row for directed spraying

Or you can read the application tables throughout this guide.

Selecting the Right Spray Nozzle

5) Spray Pattern Type:

Flat Fan pattern – Available as a tapered spray for boom applications or an even spray for single tip applications. Even spray tips produce a narrow pattern, where spray is evenly deposited across the spray's width. Tapered spray tips produce an elliptical spray pattern where more of the spray is deposited immediately under the tip. By overlapping tapered sprays, an even distribution across the entire boom can be obtained.



Deflect pattern – Also known as anvil or flood tips, deflect tips produce a wide-angled flat pattern when operated at low pressures (10-40 PSI/1-3 BAR). The tips generally produce a coarse, even spray.



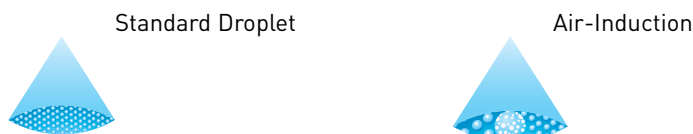
Cone pattern – These spray tips produce either a solid circular (full cone tips) or a hollow circular footprint (hollow cone tips). Full cones are ideal for spot spraying, whereas hollow cones are used on air-assisted sprayers and directed sprays.



Other patterns – Specialty sprays call for specialty patterns, such as off-center or streaming sprays. An off-center pattern is used to extend spray patterns past the boom structure and streaming patterns are commonly used for fertilizer applications.



Technology – Standard or Air Induction – Along with the spray pattern, it's important to consider the engineering behind each droplet. Standard droplets produce the traditional solid droplet. Air-induction technology creates air-filled droplets, which increase droplet retention and reduces the number of small droplets prone to drift.



6) Tip Size and Pressure:

Use the flow rate tables provided throughout this guide to select the nozzle and pressure that provides the flow needed for the nozzle application.

Selecting the Right Spray Nozzle

7) Spray Quality:

An important performance characteristic of a spray tip is both the size and the variation of droplets or spray quality that it produces.

ASABE S572.1 Droplet Size Classification

The American Society of Agricultural and Biological Engineers (ASABE) developed the ASABE S572.1 standard to measure and interpret spray quality from tips.

Spray Quality*	Size of Droplets	VMD Range (Microns**)	Color Code	Retention on Difficult to Wet Leaves	Drift Potential
Extremely Fine	Small	<60	Purple	Excellent	High
Very Fine		61-105	Red	Excellent	
Fine		106-235	Orange	Very Good	
Medium		236-340	Yellow	Good	
Coarse		341-403	Blue	Moderate	
Very Coarse		404-502	Green	Poor	
Extremely Coarse	Large	503-665	White	Very Poor	Low
Ultra Coarse		>665	Black	Very Poor	

*Always read the pesticide label to determine which spray quality is required.

** Estimated from sample reference graph in ASABE/ANSI/ASAE Standard S572.1.

The ASABE S572.1 standard uses eight droplet classification categories, six of which are common for agriculture and horticulture: Very Fine, Fine, Medium, Coarse, Very Coarse and Extremely Coarse. Most agrochemical applications recommend a fine, medium, or coarse spray.

Fine

sprays provide enhanced retention for directed spraying on the target including:

- Foliar-acting weed control
- Contact-acting fungicides and insecticides

Medium

sprays are the most widely used spray type.

- Used by default by most applicators when spray quality is not defined by the label.
- Systemic-acting fungicides, insecticides and herbicides.

Coarse

sprays are used with systemic, residual, and soil-applied herbicides.

Selecting the Right Spray Nozzle

The following chart has been designed to simplify selection of the correct spray nozzle type for the agrochemical to be applied. It is based on having good conditions for spraying and should be used in conjunction with the agrochemical manufacturer's label. Increased carrier rates may allow for coarser sprays to reduce risk of drift. Always follow the agrochemical label exactly.

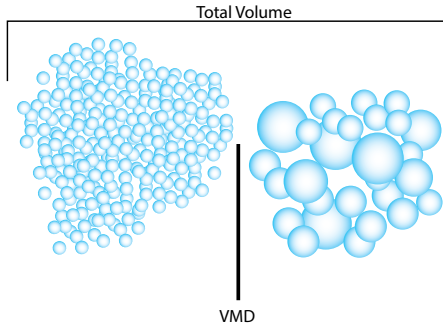
John Deere Spray Nozzle Selection Guide

Section	Code	Spray Tip	Common Use	Pattern	Technology	Orifice Material	Nominal Spray Angle	Pressure Range		ASABE Droplet Classification								
								PSI	BAR	XF	VF	F	M	C	VC	XC	UC	
Broadcast	ULD	Ultra Low-drift	Weeds	Tapered Flat Fan	Air Induction	Polyacetal	120	15 - 115	1 - 8									
	ULAC	Ultra Low-drift ceramic	Weeds	Tapered Flat Fan	Air Induction	Ceramic	80, 110	30 - 100	2 - 7									
	GAT	GuardianAIR Twin™	Plant Health	Tapered Flat Fan	Air Induction	Polyacetal	110	30 - 115	2 - 8									
	LDA	Low-drift Air	Plant Health	Tapered Flat Fan	Air Induction	Polyacetal	110	15 - 115	1 - 8									
	LDX	Guardian™	Plant Health	Tapered Flat Fan	Pre-Orifice	Polyacetal	120	15 - 115	1 - 8									
	LD	Low-drift	Plant Health	Tapered Flat Fan	Pre-Orifice	Polyacetal	80, 110	15 - 70	1 - 5									
	LDC	Low-drift ceramic	Plant Health	Tapered Flat Fan	Air Induction	Ceramic	110	30 - 70	2 - 5									
	ER	Extended Range	General	Tapered Flat Fan	Elliptical Orifice	Polyacetal	80, 110	15 - 70	1 - 5									
	ERC	Extended Range ceramic	General	Tapered Flat Fan	Elliptical Orifice	Ceramic	80, 110	20 - 70	1 - 5									
	ERI	Extended Range Stainless	General	Tapered Flat Fan	Elliptical Orifice	Stainless	80, 110	15 - 70	1 - 5									
Wide	FF	Flat Fan	General	Tapered Flat Fan	Elliptical Orifice	Polyacetal	80, 110	30 - 60	2 - 4									
	HF	High Flow	Fertilizer	Tapered Flat Fan	Pre-Orifice	Polyacetal	140	20 - 80	1.5 - 6									
	FL	Flood	Weeds & Fertilizer	Flood	Deflection	Polyacetal	80 to 160	10 - 60	1 - 4									
Stream	STC	Straight Stream Ceramic	Fertilizer	Stream	Pre-Orifice	Ceramic	110 Equivalent	15 - 60	1 - 4							S		
	ST	Straight Stream	Fertilizer	Stream	Round-Orifice	PVDF	110 Equivalent	15 - 60	1 - 4							S		
	D-C	Flow-Regulating Disc	Fertilizer	Stream	Round Orifice	Polyacetal	0	10 - 150	1 - 10							S		
Banding & Directed	D-C	Disc and Core	Plant Health	Hollow Cone	Swirl	Polyacetal	25 to 110	10 - 150	1 - 10									
	HCC	Hollow Cone ceramic	Plant Health	Hollow Cone	Swirl	Ceramic	80	40 - 350	3 - 24									
	ES	Even Spray	Weeds	Even Flat Fan	Elliptical Orifice	Polyacetal	80	30 - 60	2 - 4									
	OC	Off-Center	Unspecialized	Off-center Fan	Elliptical Orifice	Brass	80	30 - 60	2 - 4									
Special	XT	Fence row/boomless	Weeds	Boomless Fan	Pre-Orifice	Polyacetal or Stainless	105	30 - 60	2 - 4									
	CR	Chemical Resistant	Acid Defoliants	Tapered Flat Fan	Pre-Orifice	PVDF	110	30 - 60	2 - 4									

S - These nozzles produce streams to minimize atomization

Color Code	Classifications
XF	Extremely Fine
VF	Very Fine
F	Fine
M	Medium
C	Course
VC	Very Course
XC	Extremely Course
UC	Ultra Course

Understanding Droplet VMD



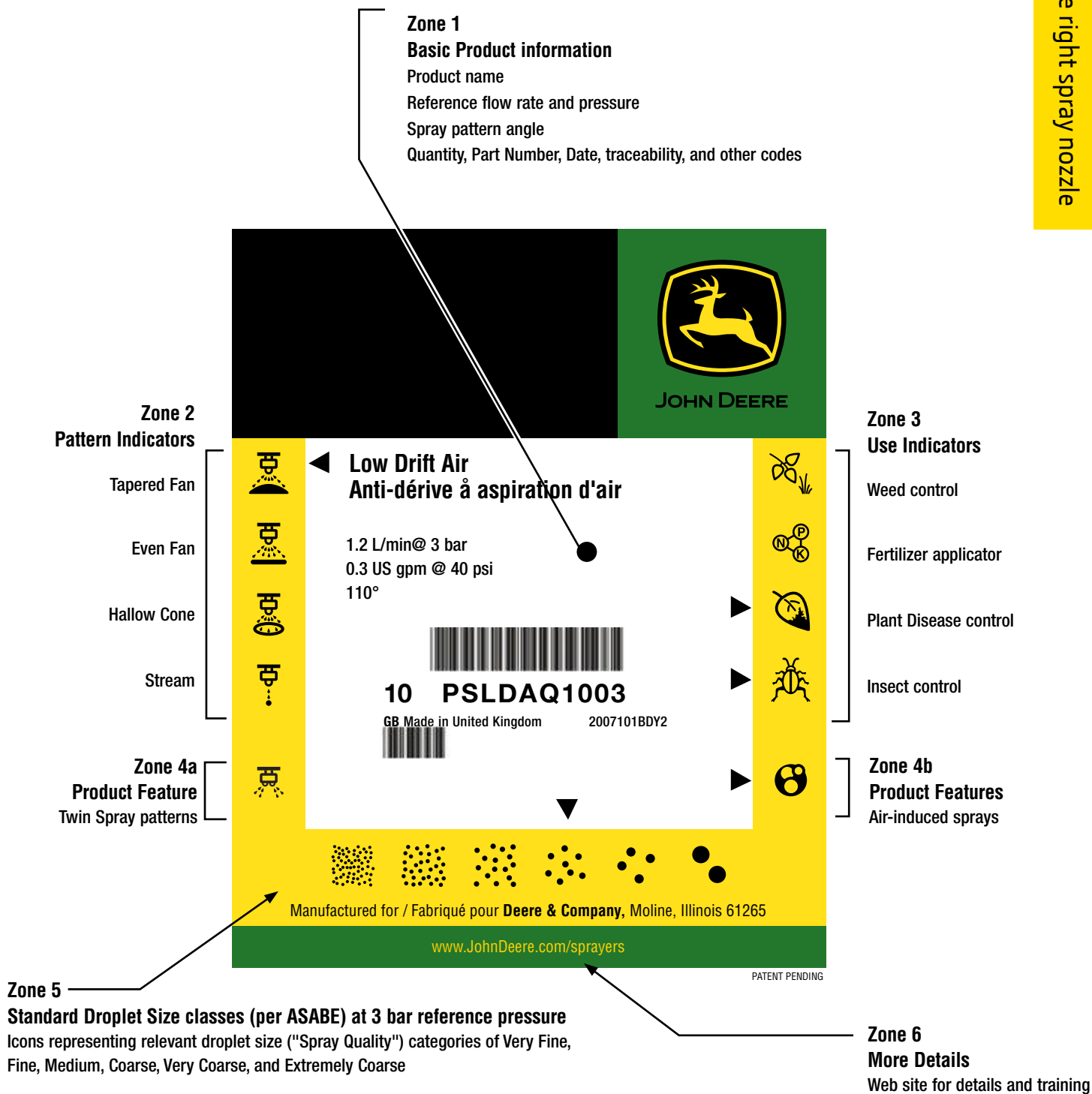
VMD is the droplet size at which 50% of the spray volume is in droplets larger than the VMD and 50% of the volume is in droplets smaller than the VMD (adapted from Matthews 1992).

Understanding Micron Size

Degree of Atomization	Droplet Size (Microns)	Relative Size Related to Common Objects
Fog	Up to 25	Point of a Needle (25 Microns)
Fine Mist	20-100	Human Hair (100 Microns)
Fine Drizzle	100-250	Sewing Thread (150 Microns)
Heavy Drizzle	250-500	Toothbrush Bristle (300 Microns)
Light Rain	500-800	Staple (550 Microns)
Heavy Rain	800-1000	Paper Clip (850 Microns)
Thunderstorm Rain	1000-4000	#2 Pencil Lead (2000 Microns)

Droplet sizes are usually expressed in microns (micrometers). One micron equals one thousandth of a millimeter. Other than the effects of the specific material being sprayed, the four major factors effecting droplet size are: tip style, capacity, spraying pressure and spray pattern type. Lower spraying pressures provide larger droplet sizes, while higher spraying pressures yield smaller droplet sizes. The smallest droplet sizes are achieved by air atomizing tips. Generally speaking, the largest spray droplets are produced by wide-angle, flat hydraulic spray tips. In the hydraulic spray tip series, the smallest droplet sizes are produced by hollow-cone spray tips.

John Deere Label Information



Broadcast and Turf Application Chart-20" Spacing

Spray Tip	Pressure (PSI)	Flow Rate (GPM)	Gallons per Acre 20-inch Nozzle Spacing											GAL/1000 ft 20-inch Nozzle Spacing				
			MPH											MPH				
			4	5	6	7	8	10	12	14	16	18	20	2	3	4	5	
01	15	0.06	4.5	3.6	3.0	2.5	2.2	1.8	1.5	1.3	1.1	1.0	0.9	0.20	0.14	0.10	0.08	
	30	0.09	6.7	5.3	4.5	3.8	3.3	2.7	2.2	1.9	1.7	1.5	1.3	0.31	0.20	0.15	0.12	
	40	0.10	7.4	5.9	5.0	4.2	3.7	3.0	2.5	2.1	1.9	1.7	1.5	0.34	0.23	0.17	0.14	
	60	0.12	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5	2.2	2.0	1.8	0.41	0.27	0.20	0.16	
	80	0.14	10.4	8.3	6.9	5.9	5.2	4.2	3.5	3.0	2.6	2.3	2.1	0.48	0.32	0.24	0.19	
	100	0.16	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4	3.0	2.6	2.4	0.55	0.36	0.27	0.22	
115	0.17	12.6	10.1	8.4	7.2	6.3	5.0	4.2	3.6	3.2	2.8	2.5	0.58	0.39	0.29	0.23		
015	15	0.09	6.7	5.3	4.5	3.8	3.3	2.7	2.2	1.9	1.7	1.5	1.3	0.31	0.20	0.15	0.12	
	30	0.13	9.7	7.7	6.4	5.5	4.8	3.9	3.2	2.8	2.4	2.1	1.9	0.44	0.30	0.22	0.18	
	40	0.15	11.1	8.9	7.4	6.4	5.6	4.5	3.7	3.2	2.8	2.5	2.2	0.51	0.34	0.26	0.20	
	60	0.18	13.4	10.7	8.9	7.6	6.7	5.3	4.5	3.8	3.3	3.0	2.7	0.61	0.41	0.31	0.25	
	80	0.21	15.6	12.5	10.4	8.9	7.8	6.2	5.2	4.5	3.9	3.5	3.1	0.72	0.48	0.36	0.29	
	100	0.24	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1	4.5	4.0	3.6	0.82	0.55	0.41	0.33	
115	0.25	18.6	14.9	12.4	10.6	9.3	7.4	6.2	5.3	4.6	4.1	3.7	0.85	0.57	0.43	0.34		
02	15	0.12	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5	2.2	2.0	1.8	0.41	0.27	0.20	0.16	
	30	0.17	12.6	10.1	8.4	7.2	6.3	5.0	4.2	3.6	3.2	2.8	2.5	0.58	0.39	0.29	0.23	
	40	0.20	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	0.68	0.45	0.34	0.27	
	60	0.24	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1	4.5	4.0	3.6	0.82	0.55	0.41	0.33	
	80	0.28	20.8	16.6	13.9	11.9	10.4	8.3	6.9	5.9	5.2	4.6	4.2	0.95	0.64	0.48	0.38	
	100	0.32	23.8	19.0	15.8	13.6	11.9	9.5	7.9	6.8	5.9	5.3	4.8	1.09	0.73	0.55	0.44	
115	0.34	25.2	20.2	16.8	14.4	12.6	10.1	8.4	7.2	6.3	5.6	5.0	1.16	0.77	0.58	0.46		
025	15	0.15	11.1	8.9	7.4	6.4	5.6	4.5	3.7	3.2	2.8	2.5	2.2	0.51	0.34	0.26	0.20	
	30	0.22	16.3	13.1	10.9	9.3	8.2	6.5	5.4	4.7	4.1	3.6	3.3	0.75	0.50	0.38	0.30	
	40	0.25	18.6	14.9	12.4	10.6	9.3	7.4	6.2	5.3	4.6	4.1	3.7	0.85	0.57	0.43	0.34	
	60	0.31	23.0	18.4	15.3	13.2	11.5	9.2	7.7	6.6	5.8	5.1	4.6	1.06	0.70	0.53	0.42	
	80	0.35	26.0	20.8	17.3	14.9	13.0	10.4	8.7	7.4	6.5	5.8	5.2	1.19	0.80	0.60	0.48	
	100	0.40	29.7	23.8	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	1.36	0.91	0.68	0.55	
115	0.42	31.2	24.9	20.8	17.8	15.6	12.5	10.4	8.9	7.8	6.9	6.2	1.43	0.95	0.72	0.57		
03	15	0.18	13.4	10.7	8.9	7.6	6.7	5.3	4.5	3.8	3.3	3.0	2.7	0.61	0.41	0.31	0.25	
	30	0.26	19.3	15.4	12.9	11.0	9.7	7.7	6.4	5.5	4.8	4.3	3.9	0.89	0.59	0.44	0.35	
	40	0.30	22.3	17.8	14.9	12.7	11.1	8.9	7.4	6.4	5.6	5.0	4.5	1.02	0.68	0.51	0.41	
	60	0.37	27.5	22.0	18.3	15.7	13.7	11.0	9.2	7.8	6.9	6.1	5.5	1.26	0.84	0.63	0.50	
	80	0.42	31.2	24.9	20.8	17.8	15.6	12.5	10.4	8.9	7.8	6.9	6.2	1.43	0.95	0.72	0.57	
	100	0.47	34.9	27.9	23.3	19.9	17.4	14.0	11.6	10.0	8.7	7.8	7.0	1.60	1.07	0.80	0.64	
115	0.51	37.9	30.3	25.2	21.6	18.9	15.1	12.6	10.8	9.5	8.4	7.6	1.74	1.16	0.87	0.70		
035	15	0.21	15.6	12.5	10.4	8.9	7.8	6.2	5.2	4.5	3.9	3.5	3.1	0.72	0.48	0.36	0.29	
	30	0.30	22.3	17.8	14.9	12.7	11.1	8.9	7.4	6.4	5.6	5.0	4.5	1.02	0.68	0.51	0.41	
	40	0.35	26.0	20.8	17.3	14.9	13.0	10.4	8.7	7.4	6.5	5.8	5.2	1.19	0.80	0.60	0.48	
	60	0.43	31.9	25.5	21.3	18.2	16.0	12.8	10.6	9.1	8.0	7.1	6.4	1.47	0.98	0.73	0.59	
	80	0.49	36.4	29.1	24.3	20.8	18.2	14.6	12.1	10.4	9.1	8.1	7.3	1.67	1.11	0.84	0.67	
	100	0.55	40.8	32.7	27.2	23.3	20.4	16.3	13.6	11.7	10.2	9.1	8.2	1.88	1.25	0.94	0.75	
115	0.59	43.8	35.0	29.2	25.0	21.9	17.5	14.6	12.5	11.0	9.7	8.8	2.01	1.34	1.01	0.80		
04	15	0.24	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1	4.5	4.0	3.6	0.82	0.55	0.41	0.33	
	30	0.35	26.0	20.8	17.3	14.9	13.0	10.4	8.7	7.4	6.5	5.8	5.2	1.19	0.80	0.60	0.48	
	40	0.40	29.7	23.8	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	1.36	0.91	0.68	0.55	
	60	0.49	36.4	29.1	24.3	20.8	18.2	14.6	12.1	10.4	9.1	8.1	7.3	1.67	1.11	0.84	0.67	
	80	0.57	42.3	33.9	28.2	24.2	21.2	16.9	14.1	12.1	10.6	9.4	8.5	1.94	1.30	0.97	0.78	
	100	0.63	46.8	37.4	31.2	26.7	23.4	18.7	15.6	13.4	11.7	10.4	9.4	2.15	1.43	1.07	0.86	
115	0.68	50.5	40.4	33.7	28.9	25.2	20.2	16.8	14.4	12.6	11.2	10.1	2.32	1.55	1.16	0.93		
05	15	0.31	23.0	18.4	15.3	13.2	11.5	9.2	7.7	6.6	5.8	5.1	4.6	1.06	0.70	0.53	0.42	
	30	0.43	31.9	25.5	21.3	18.2	16.0	12.8	10.6	9.1	8.0	7.1	6.4	1.47	0.98	0.73	0.59	
	40	0.50	37.1	29.7	24.8	21.2	18.6	14.9	12.4	10.6	9.3	8.3	7.4	1.71	1.14	0.85	0.68	
	60	0.61	45.3	36.2	30.2	25.9	22.6	18.1	15.1	12.9	11.3	10.1	9.1	2.08	1.39	1.04	0.83	
	80	0.71	52.7	42.2	35.1	30.1	26.4	21.1	17.6	15.1	13.2	11.7	10.5	2.42	1.61	1.21	0.97	
	100	0.79	58.7	46.9	39.1	33.5	29.3	23.5	19.6	16.8	14.7	13.0	11.7	2.69	1.80	1.35	1.08	
115	0.85	63.1	50.5	42.1	36.1	31.6	25.2	21.0	18.0	15.8	14.0	12.6	2.90	1.93	1.45	1.16		
06	15	0.37	27.5	22.0	18.3	15.7	13.7	11.0	9.2	7.8	6.9	6.1	5.5	1.26	0.84	0.63	0.50	
	30	0.52	38.6	30.9	25.7	22.1	19.3	15.4	12.9	11.0	9.7	8.6	7.7	1.77	1.18	0.89	0.71	
	40	0.60	44.6	35.6	29.7	25.5	22.3	17.8	14.9	12.7	11.1	9.9	8.9	2.05	1.36	1.02	0.82	
	60	0.73	54.2	43.4	36.1	31.0	27.1	21.7	18.1	15.5	13.6	12.0	10.8	2.49	1.66	1.24	1.00	
	80	0.85	63.1	50.5	42.1	36.1	31.6	25.2	21.0	18.0	15.8	14.0	12.6	2.90	1.93	1.45	1.16	
	100	0.95	70.5	56.4	47.0	40.3	35.3	28.2	23.5	20.2	17.6	15.7	14.1	3.24	2.16	1.62	1.30	
115	1.02	75.7	60.6	50.5	43.3	37.9	30.3	25.2	21.6	18.9	16.8	15.1	3.48	2.32	1.74	1.39		
08	15	0.49	36.4	29.1	24.3	20.8	18.2	14.6	12.1	10.4	9.1	8.1	7.3	1.67	1.11	0.84	0.67	
	30	0.69	51.2	41.0	34.2	29.3	25.6	20.5	17.1	14.6	12.8	11.4	10.2	2.35	1.57	1.18	0.94	
	40	0.80	59.4	47.5	39.6	33.9	29.7	23.8	19.8	17.0	14.9	13.2	11.9	2.73	1.82	1.36	1.09	
	60	0.98	72.8	58.2	48.5	41.6	36.4	29.1	24.3	20.8	18.2	16.2	14.6	3.34	2.23	1.67	1.34	
	80	1.13	83.9	67.1	55.9	47.9	42.0	33.6	28.0	24.0	21.0	18.6	16.8	3.85	2.57	1.93	1.54	
	100	1.26	93.6	74.8	62.4	53.5	46.8	37.4	31.2	26.7	23.4	20.8	18.7	4.30	2.86	2.15	1.72	
115	1.36	101.0	80.8	67.3	57.7	50.5	40.4	33.7	28.9	25.2	22.4	20.2	4.64	3.09	2.32	1.86		
10	15	0.61	45.3															

High Flow Application Chart - 20", 40" & 60" Spacing

Tip	PSI	GPM	Application Rate (GPA) 20 inch spacing								Application Rate (GPA) 40 inch spacing								Application Rate (GPA) 60 inch spacing							
			MPH								MPH								MPH							
			5	6	8	10	12	14	16		5	6	8	10	12	14	16		5	6	8	10	12	14	16	
08	20	0.57	34	28	21	17	14	12	11		17	14	11	8	7	6	5		11	9	7	6	5	4	4	
	30	0.69	41	34	26	20	17	15	13		20	17	13	10	9	7	6		14	11	9	7	6	5	4	
	40	0.80	48	40	30	24	20	17	15		24	20	15	12	10	8	7		16	13	10	8	7	6	5	
	50	0.89	53	44	33	26	22	19	17		26	22	17	13	11	9	8		18	15	11	9	7	6	6	
	60	0.98	58	49	36	29	24	21	18		29	24	18	15	12	10	9		19	16	12	10	8	7	6	
	70	1.06	63	52	39	31	26	22	20		31	26	20	16	13	11	10		21	17	13	10	9	7	7	
	80	1.13	67	56	42	34	28	24	21		34	28	21	17	14	12	10		22	19	14	11	9	8	7	
10	20	0.71	42	35	26	21	18	15	13		21	18	13	11	9	8	7		14	12	9	7	6	5	4	
	30	0.87	52	43	32	26	22	18	16		26	22	16	13	11	9	8		17	14	11	9	7	6	5	
	40	1.00	59	50	37	30	25	21	19		30	25	19	15	12	11	9		20	17	12	10	8	7	6	
	50	1.12	67	55	42	33	28	24	21		33	28	21	17	14	12	10		22	18	14	11	9	8	7	
	60	1.22	72	60	45	36	30	26	23		36	30	23	18	15	13	11		24	20	15	12	10	9	8	
	70	1.32	78	65	49	39	33	28	25		39	33	25	20	16	14	12		26	22	16	13	11	9	8	
	80	1.41	84	70	52	42	35	30	26		42	35	26	21	17	15	13		28	23	17	14	12	10	9	
15	20	1.06	63	52	39	31	26	22	20		31	26	20	16	13	11	10		21	17	13	10	9	7	7	
	30	1.30	77	64	48	39	32	28	24		39	32	24	19	16	14	12		26	21	16	13	11	9	8	
	40	1.50	89	74	56	45	37	32	28		45	37	28	22	19	16	14		30	25	19	15	12	11	9	
	50	1.68	100	83	62	50	42	36	31		50	42	31	25	21	18	16		33	28	21	17	14	12	10	
	60	1.84	109	91	68	55	46	39	34		55	46	34	27	23	20	17		36	30	23	18	15	13	11	
	70	2.0	119	99	74	59	50	42	37		59	50	37	30	25	21	19		40	33	25	20	17	14	12	
	80	2.1	125	104	78	62	52	45	39		62	52	39	31	26	22	19		42	35	26	21	17	15	13	
20	20	1.41	84	70	52	42	35	30	26		42	35	26	21	17	15	13		28	23	17	14	12	10	9	
	30	1.73	103	86	64	51	43	37	32		51	43	32	26	21	18	16		34	29	21	17	14	12	11	
	40	2.0	119	99	74	59	50	42	37		59	50	37	30	25	21	19		40	33	25	20	17	14	12	
	50	2.2	131	109	82	65	54	47	41		65	54	41	33	27	23	20		44	36	27	22	18	16	14	
	60	2.4	143	119	89	71	59	51	45		71	59	45	36	30	25	22		48	40	30	24	20	17	15	
	70	2.6	154	129	97	77	64	55	48		77	64	48	39	32	28	24		51	43	32	26	21	18	16	
	80	2.8	166	139	104	83	69	59	52		83	69	52	42	35	30	26		55	46	35	28	23	20	17	
30	20	2.1	125	104	78	62	52	45	39		62	52	39	31	26	22	19		42	35	26	21	17	15	13	
	30	2.6	154	129	97	77	64	55	48		77	64	48	39	32	28	24		51	43	32	26	21	18	16	
	40	3.0	178	149	111	89	74	64	56		89	74	56	45	37	32	28		59	50	37	30	25	21	19	
	50	3.4	202	168	126	101	84	72	63		101	84	63	50	42	36	32		67	56	42	34	28	24	21	
	60	3.7	220	183	137	110	92	78	69		110	92	69	55	46	39	34		73	61	46	37	31	26	23	
	70	4.0	238	198	149	119	99	85	74		119	99	74	59	50	42	37		79	66	50	40	33	28	25	
	80	4.2	249	208	156	125	104	89	78		125	104	78	62	52	45	39		83	69	52	42	35	30	26	
40	20	2.8	166	139	104	83	69	59	52		83	69	52	42	35	30	26		55	46	35	28	23	20	17	
	30	3.5	208	173	130	104	87	74	65		104	87	65	52	43	37	32		69	58	43	35	29	25	22	
	40	4.0	238	198	149	119	99	85	74		119	99	74	59	50	42	37		79	66	50	40	33	28	25	
	50	4.5	267	223	167	134	111	95	84		134	111	84	67	56	48	42		89	74	56	45	37	32	28	
	60	4.9	291	243	182	146	121	104	91		146	121	91	73	61	52	45		97	81	61	49	40	35	30	
	70	5.3	315	262	197	157	131	112	98		157	131	98	79	66	56	49		105	87	66	52	44	37	33	
	80	5.7	339	282	212	169	141	121	106		169	141	106	85	71	60	53		113	94	71	56	47	40	35	
50	20	3.5	208	173	130	104	87	74	65		104	87	65	52	43	37	32		69	58	43	35	29	25	22	
	30	4.3	255	213	160	128	106	91	80		128	106	80	64	53	46	40		85	71	53	43	35	30	27	
	40	5.0	297	248	186	149	124	106	93		149	124	93	74	62	53	46		99	83	62	50	41	35	31	
	50	5.6	333	277	208	166	139	119	104		166	139	104	83	69	59	52		111	92	69	55	46	40	35	
	60	6.1	362	302	226	181	151	129	113		181	151	113	91	75	65	57		121	101	75	60	50	43	38	
	70	6.6	392	327	245	196	163	140	123		196	163	123	98	82	70	61		131	109	82	65	54	47	41	
	80	7.1	422	351	264	211	176	151	132		211	176	132	105	88	75	66		141	117	88	70	59	50	44	
60	20	4.2	249	208	156	125	104	89	78		125	104	78	62	52	45	39		83	69	52	42	35	30	26	
	30	5.2	309	257	193	154	129	110	97		154	129	97	77	64	55	48		103	86	64	51	43	37	32	
	40	6.0	356	297	223	178	149	127	111		178	149	111	89	74	64	56		119	99	74	59	50	42	37	
	50	6.7	398	332	249	199	166	142	124		199	166	124	99	83	71	62		133	111	83	66	55	47	41	
	60	7.3	434	361	271	217	181	155	136		217	181	136	108	90	77	68		145	120	90	72	60	52	45	
	70	7.9	469	391	293	235	196	168	147		235	196	147	117	98	84	73		156	130	98	78	65	56	49	
	80	8.5	505	421	316	252	210	180	158		252	210	158	126	105	90	79		168	140	105	84	70	60	53	

Broadcast and Turf Application Chart-15" Spacing

Spray Tip	Pressure (PSI)	Flow Rate (GPM)	Gallons per Acre 15-inch Nozzle Spacing												GAL/1000ft ² 15-inch Nozzle Spacing			
			MPH												MPH			
			4	5	6	7	8	10	12	14	16	18	20	2	3	4	5	
01	15	0.06	6.1	4.8	4.0	3.5	3.0	2.4	2.0	1.7	1.5	1.3	1.2	0.28	0.19	0.14	0.11	
	30	0.09	8.6	6.9	5.7	4.9	4.3	3.4	2.9	2.4	2.1	1.9	1.7	0.39	0.26	0.20	0.16	
	40	0.10	9.9	7.9	6.6	5.7	5.0	4.0	3.3	2.8	2.5	2.2	2.0	0.45	0.30	0.23	0.18	
	60	0.12	12.1	9.7	8.1	6.9	6.1	4.8	4.0	3.5	3.0	2.7	2.4	0.56	0.37	0.28	0.22	
	80	0.14	14.0	11.2	9.3	8.0	7.0	5.6	4.7	4.0	3.5	3.1	2.8	0.64	0.43	0.32	0.26	
	100	0.16	15.7	12.5	10.4	8.9	7.8	6.3	5.2	4.5	3.9	3.5	3.1	0.72	0.48	0.36	0.29	
115	0.17	16.8	13.4	11.2	9.6	8.4	6.7	5.6	4.8	4.2	3.7	3.4	0.77	0.51	0.39	0.31		
015	15	0.09	9.1	7.3	6.1	5.2	4.5	3.6	3.0	2.6	2.3	2.0	1.8	0.42	0.28	0.21	0.17	
	30	0.13	12.9	10.3	8.6	7.3	6.4	5.1	4.3	3.7	3.2	2.9	2.6	0.59	0.39	0.30	0.24	
	40	0.15	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	0.68	0.45	0.34	0.27	
	60	0.18	18.2	14.5	12.1	10.4	9.1	7.3	6.1	5.2	4.5	4.0	3.6	0.84	0.56	0.42	0.33	
	80	0.21	21.0	16.8	14.0	12.0	10.5	8.4	7.0	6.0	5.3	4.7	4.2	0.96	0.64	0.48	0.39	
	100	0.24	23.5	18.8	15.7	13.4	11.7	9.4	7.8	6.7	5.9	5.2	4.7	1.08	0.72	0.54	0.43	
115	0.25	25.2	20.1	16.8	14.4	12.6	10.1	8.4	7.2	6.3	5.6	5.0	1.16	0.77	0.58	0.46		
02	15	0.12	12.1	9.7	8.1	6.9	6.1	4.8	4.0	3.5	3.0	2.7	2.4	0.56	0.37	0.28	0.22	
	30	0.17	17.1	13.7	11.4	9.8	8.6	6.9	5.7	4.9	4.3	3.8	3.4	0.79	0.53	0.39	0.32	
	40	0.20	19.8	15.8	13.2	11.3	9.9	7.9	6.6	5.7	5.0	4.4	4.0	0.91	0.61	0.45	0.36	
	60	0.24	24.2	19.4	16.2	13.9	12.1	9.7	8.1	6.9	6.1	5.4	4.8	1.11	0.74	0.56	0.45	
	80	0.28	28.0	22.4	18.7	16.0	14.0	11.2	9.3	8.0	7.0	6.2	5.6	1.29	0.86	0.64	0.51	
	100	0.32	31.3	25.1	20.9	17.9	15.7	12.5	10.4	8.9	7.8	7.0	6.3	1.44	0.96	0.72	0.58	
115	0.34	33.6	26.9	22.4	19.2	16.8	13.4	11.2	9.6	8.4	7.5	6.7	1.54	1.03	0.77	0.62		
025	15	0.15	15.2	12.1	10.1	8.7	7.6	6.1	5.1	4.3	3.8	3.4	3.0	0.70	0.46	0.35	0.28	
	30	0.22	21.4	17.1	14.3	12.2	10.7	8.6	7.1	6.1	5.4	4.8	4.3	0.98	0.66	0.49	0.39	
	40	0.25	24.8	19.8	16.5	14.1	12.4	9.9	8.3	7.1	6.2	5.5	5.0	1.14	0.76	0.57	0.45	
	60	0.31	30.3	24.2	20.2	17.3	15.2	12.1	10.1	8.7	7.6	6.7	6.1	1.39	0.93	0.70	0.56	
	80	0.35	35.0	28.0	23.3	20.0	17.5	14.0	11.7	10.0	8.8	7.8	7.0	1.61	1.07	0.80	0.64	
	100	0.40	39.1	31.3	26.1	22.4	19.6	15.7	13.0	11.2	9.8	8.7	7.8	1.80	1.20	0.90	0.72	
115	0.42	42.0	33.6	28.0	24.0	21.0	16.8	14.0	12.0	10.5	9.3	8.4	1.93	1.28	0.96	0.77		
03	15	0.18	18.2	14.5	12.1	10.4	9.1	7.3	6.1	5.2	4.5	4.0	3.6	0.84	0.56	0.42	0.33	
	30	0.26	25.7	20.6	17.1	14.7	12.9	10.3	8.6	7.3	6.4	5.7	5.1	1.18	0.79	0.59	0.47	
	40	0.30	29.7	23.8	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	1.36	0.91	0.68	0.55	
	60	0.37	36.4	29.1	24.2	20.8	18.2	14.5	12.1	10.4	9.1	8.1	7.3	1.67	1.11	0.84	0.67	
	80	0.42	42.0	33.6	28.0	24.0	21.0	16.8	14.0	12.0	10.5	9.3	8.4	1.93	1.29	0.96	0.77	
	100	0.47	47.0	37.6	31.3	26.8	23.5	18.8	15.7	13.4	11.7	10.4	9.4	2.16	1.44	1.08	0.86	
115	0.51	50.4	40.3	33.6	28.8	25.2	20.1	16.8	14.4	12.6	11.2	10.1	2.31	1.54	1.16	0.93		
035	15	0.21	21.2	17.0	14.1	12.1	10.6	8.5	7.1	6.1	5.3	4.7	4.2	0.97	0.65	0.49	0.39	
	30	0.30	30.0	24.0	20.0	17.1	15.0	12.0	10.0	8.6	7.5	6.7	6.0	1.38	0.92	0.69	0.55	
	40	0.35	34.6	27.7	23.1	19.8	17.3	13.9	11.6	9.9	8.7	7.7	6.9	1.59	1.06	0.80	0.64	
	60	0.43	42.4	33.9	28.3	24.2	21.2	17.0	14.1	12.1	10.6	9.4	8.5	1.95	1.30	0.97	0.78	
	80	0.49	49.0	39.2	32.7	28.0	24.5	19.6	16.3	14.0	12.3	10.9	9.8	2.25	1.50	1.13	0.90	
	100	0.55	54.8	43.8	36.5	31.3	27.4	21.9	18.3	15.7	13.7	12.2	11.0	2.52	1.68	1.26	1.01	
115	0.59	58.8	47.0	39.2	33.6	29.4	23.5	19.6	16.8	14.7	13.1	11.8	2.70	1.80	1.35	1.08		
04	15	0.24	24.2	19.4	16.2	13.9	12.1	9.7	8.1	6.9	6.1	5.4	4.8	1.11	0.74	0.56	0.45	
	30	0.35	34.3	27.4	22.9	19.6	17.1	13.7	11.4	9.8	8.6	7.6	6.9	1.58	1.05	0.79	0.63	
	40	0.40	39.6	31.7	26.4	22.6	19.8	15.8	13.2	11.3	9.9	8.8	7.9	1.82	1.21	0.91	0.73	
	60	0.49	48.5	38.8	32.3	27.7	24.2	19.4	16.2	13.9	12.1	10.8	9.7	2.23	1.48	1.11	0.89	
	80	0.57	56.0	44.8	37.3	32.0	28.0	22.4	18.7	16.0	14.0	12.4	11.2	2.57	1.71	1.29	1.03	
	100	0.63	62.6	50.1	41.7	35.8	31.3	25.1	20.9	17.9	15.7	13.9	12.5	2.88	1.92	1.44	1.15	
115	0.68	67.1	53.7	44.8	38.4	33.6	26.9	22.4	19.2	16.8	14.9	13.4	3.08	2.06	1.54	1.23		
05	15	0.31	30.3	24.2	20.2	17.3	15.2	12.1	10.1	8.7	7.6	6.7	6.1	1.39	0.93	0.70	0.56	
	30	0.43	42.9	34.3	28.6	24.5	21.4	17.1	14.3	12.2	10.7	9.5	8.6	1.97	1.31	0.98	0.79	
	40	0.50	49.5	39.6	33.0	28.3	24.8	19.8	16.5	14.1	12.4	11.0	9.9	2.27	1.52	1.14	0.91	
	60	0.61	60.6	48.5	40.4	34.6	30.3	24.2	20.2	17.3	15.2	13.5	12.1	2.78	1.86	1.39	1.11	
	80	0.71	70.0	56.0	46.7	40.0	35.0	28.0	23.3	20.0	17.5	15.6	14.0	3.21	2.14	1.61	1.29	
	100	0.79	78.3	62.6	52.2	44.7	39.1	31.3	26.1	22.4	19.6	17.4	15.7	3.59	2.40	1.80	1.44	
115	0.85	83.9	67.1	56.0	48.0	42.0	33.6	28.0	24.0	21.0	18.7	16.8	3.85	2.57	1.93	1.54		
06	15	0.37	36.4	29.1	24.2	20.8	18.2	14.5	12.1	10.4	9.1	8.1	7.3	1.67	1.11	0.84	0.67	
	30	0.52	51.4	41.2	34.3	29.4	25.7	20.6	17.1	14.7	12.9	11.4	10.3	2.36	1.58	1.18	0.95	
	40	0.60	59.4	47.5	39.6	33.9	29.7	23.8	19.8	17.0	14.9	13.2	11.9	2.73	1.82	1.36	1.09	
	60	0.73	72.7	58.2	48.5	41.6	36.4	29.1	24.2	20.8	18.2	16.2	14.5	3.34	2.23	1.67	1.34	
	80	0.85	84.0	67.2	56.0	48.0	42.0	33.6	28.0	24.0	21.0	18.7	16.8	3.86	2.57	1.93	1.54	
	100	0.95	93.9	75.1	62.6	53.7	47.0	37.6	31.3	26.8	23.5	20.9	18.8	4.31	2.88	2.16	1.73	
115	1.02	100.7	80.6	67.1	57.6	50.4	40.3	33.6	28.8	25.2	22.4	20.1	4.63	3.08	2.31	1.85		
08	15	0.49	48.5	38.8	32.3	27.7	24.2	19.4	16.2	13.9	12.1	10.8	9.7	2.23	1.48	1.11	0.89	
	30	0.69	68.6	54.9	45.7	39.2	34.3	27.4	22.9	19.6	17.1	15.2	13.7	3.15	2.10	1.58	1.26	
	40	0.80	79.2	63.4	52.8	45.3	39.6	31.7	26.4	22.6	19.8	17.6	15.8	3.64	2.42	1.82	1.45	
	60	0.98	97.0	77.6	64.7	55.4	48.5	38.8	32.3	27.7	24.2	21.6	19.4	4.45	2.97	2.23	1.78	
	80	1.13	112.0	89.6	74.7	64.0	56.0	44.8	37.3	32.0	28.0	24.9	22.4	5.14	3.43	2.57	2.06	
	100	1.26	125.2	100.2	83.5	71.6	62.6	50.1	41.7	35.8	31.3	27.8	25.1	5.75	3.83	2.88	2.30	
115	1.36	134.3	107.4	89.5	76.7	67.1	53.7	44.8	38.4	33.6	29.8	26.9	6.17	4.11				

High Flow Application Chart - 15", 30" & 45" Spacing

Tip	PSI	GPM	Application Rate (GPA) 15 inch spacing							Application Rate (GPA) 30 inch spacing							Application Rate (GPA) 45 inch spacing						
			MPH							MPH							MPH						
			5	6	8	10	12	14	16	5	6	8	10	12	14	16	5	6	8	10	12	14	16
08	20	0.57	45	38	28	23	19	16	14	23	19	14	11	9	8	7	15	13	9	8	6	5	5
	30	0.69	55	46	34	27	23	20	17	27	23	17	14	11	10	9	18	15	11	9	8	7	6
	40	0.80	63	53	40	32	26	23	20	32	26	20	16	13	11	10	21	18	13	11	9	8	7
	50	0.89	70	59	44	35	29	25	22	35	29	22	18	15	13	11	23	20	15	12	10	8	7
	60	0.98	78	65	49	39	32	28	24	39	32	24	19	16	14	12	26	22	16	13	11	9	8
	70	1.06	84	70	52	42	35	30	26	42	35	26	21	17	15	13	28	23	17	14	12	10	9
	80	1.13	89	75	56	45	37	32	28	45	37	28	22	19	16	14	30	25	19	15	12	11	9
10	20	0.71	56	47	35	28	23	20	18	28	23	18	14	12	10	9	19	16	12	9	8	7	6
	30	0.87	69	57	43	34	29	25	22	34	29	22	17	14	12	11	23	19	14	11	10	8	7
	40	1.00	79	66	50	40	33	28	25	40	33	25	20	17	14	12	26	22	17	13	11	9	8
	50	1.12	89	74	55	44	37	32	28	44	37	28	22	18	16	14	30	25	18	15	12	11	9
	60	1.22	97	81	60	48	40	35	30	48	40	30	24	20	17	15	32	27	20	16	13	12	10
	70	1.32	105	87	65	52	44	37	33	52	44	33	26	22	19	16	35	29	22	17	15	12	11
	80	1.41	112	93	70	56	47	40	35	56	47	35	28	23	20	17	37	31	23	19	16	13	12
15	20	1.06	84	70	52	42	35	30	26	42	35	26	21	17	15	13	28	23	17	14	12	10	9
	30	1.30	103	86	64	51	43	37	32	51	43	32	26	21	18	16	34	29	21	17	14	12	11
	40	1.50	119	99	74	59	50	42	37	59	50	37	30	25	21	19	40	33	25	20	17	14	12
	50	1.68	133	111	83	67	55	48	42	67	55	42	33	28	24	21	44	37	28	22	18	16	14
	60	1.84	146	121	91	73	61	52	46	73	61	46	36	30	26	23	49	40	30	24	20	17	15
	70	2.0	158	132	99	79	66	57	50	79	66	50	40	33	28	25	53	44	33	26	22	19	17
	80	2.1	166	139	104	83	69	59	52	83	69	52	42	35	30	26	55	46	35	28	23	20	17
20	20	1.41	112	93	70	56	47	40	35	56	47	35	28	23	20	17	37	31	23	19	16	13	12
	30	1.73	137	114	86	69	57	49	43	69	57	43	34	29	24	21	46	38	29	23	19	16	14
	40	2.0	158	132	99	79	66	57	50	79	66	50	40	33	28	25	53	44	33	26	22	19	17
	50	2.2	174	145	109	87	73	62	54	87	73	54	44	36	31	27	58	48	36	29	24	21	18
	60	2.4	190	158	119	95	79	68	59	95	79	59	48	40	34	30	63	53	40	32	26	23	20
	70	2.6	206	172	129	103	86	74	64	103	86	64	51	43	37	32	69	57	43	34	29	25	21
	80	2.8	222	185	139	111	92	79	69	111	92	69	55	46	40	35	74	62	46	37	31	26	23
30	20	2.1	166	139	104	83	69	59	52	83	69	52	42	35	30	26	55	46	35	28	23	20	17
	30	2.6	206	172	129	103	86	74	64	103	86	64	51	43	37	32	69	57	43	34	29	25	21
	40	3.0	238	198	149	119	99	85	74	119	99	74	59	50	42	37	79	66	50	40	33	28	25
	50	3.4	269	224	168	135	112	96	84	135	112	84	67	56	48	42	90	75	56	45	37	32	28
	60	3.7	293	244	183	147	122	105	92	147	122	92	73	61	52	46	98	81	61	49	41	35	31
	70	4.0	317	264	198	158	132	113	99	158	132	99	79	66	57	50	106	88	66	53	44	38	33
	80	4.2	333	277	208	166	139	119	104	166	139	104	83	69	59	52	111	92	69	55	46	40	35
40	20	2.8	222	185	139	111	92	79	69	111	92	69	55	46	40	35	74	62	46	37	31	26	23
	30	3.5	277	231	173	139	116	99	87	139	116	87	69	58	50	43	92	77	58	46	39	33	29
	40	4.0	317	264	198	158	132	113	99	158	132	99	79	66	57	50	106	88	66	53	44	38	33
	50	4.5	356	297	223	178	149	127	111	178	149	111	89	74	64	56	119	99	74	59	50	42	37
	60	4.9	388	323	243	194	162	139	121	194	162	121	97	81	69	61	129	108	81	65	54	46	40
	70	5.3	420	350	262	210	175	150	131	210	175	131	105	87	75	66	140	117	87	70	58	50	44
	80	5.7	451	376	282	226	188	161	141	226	188	141	113	94	81	71	150	125	94	75	63	54	47
50	20	3.5	277	231	173	139	116	99	87	139	116	87	69	58	50	43	92	77	58	46	39	33	29
	30	4.3	341	284	213	170	142	122	106	170	142	106	85	71	61	53	114	95	71	57	47	41	35
	40	5.0	396	330	248	198	165	141	124	198	165	124	99	83	71	62	132	110	83	66	55	47	41
	50	5.6	444	370	277	222	185	158	139	222	185	139	111	92	79	69	148	123	92	74	62	53	46
	60	6.1	483	403	302	242	201	173	151	242	201	151	121	101	86	75	161	134	101	81	67	58	50
	70	6.6	523	436	327	261	218	187	163	261	218	163	131	109	93	82	174	145	109	87	73	62	54
	80	7.1	562	469	351	281	234	201	176	281	234	176	141	117	100	88	187	156	117	94	78	67	59
60	20	4.2	333	277	208	166	139	119	104	166	139	104	83	69	59	52	111	92	69	55	46	40	35
	30	5.2	412	343	257	206	172	147	129	206	172	129	103	86	74	64	137	114	86	69	57	49	43
	40	6.0	475	396	297	238	198	170	149	238	198	149	119	99	85	74	158	132	99	79	66	57	50
	50	6.7	531	442	332	265	221	190	166	265	221	166	133	111	95	83	177	147	111	88	74	63	55
	60	7.3	578	482	361	289	241	206	181	289	241	181	145	120	103	90	193	161	120	96	80	69	60
	70	7.9	626	521	391	313	261	223	196	313	261	196	156	130	112	98	209	174	130	104	87	74	65
	80	8.5	673	561	421	337	281	240	210	337	281	210	168	140	120	105	224	187	140	112	94	80	70

Pre- and Post-Emerge Fertilizer

Wide Angle Drift Reducing



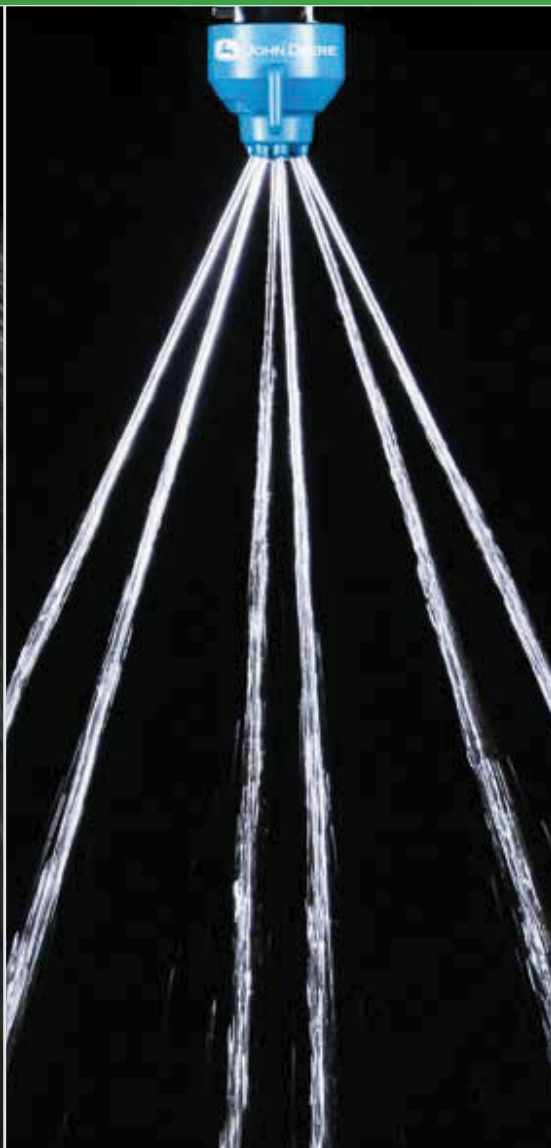
High Flow

Ideal for pre-emerge application of fertilizers

- ☒ Wide 140-degree fan pattern maximizes uniformity and consistency on wide or narrow spacing.
- ☒ Delivers extremely coarse spray for pre-plant liquid applications.

Fertilizer

Six Stream



Straight Stream Ceramic

Ideal for post-emerge application of fertilizers

- ☒ Six stream tip is ideal for applying fertilizer to solid seeded crops
- ☒ Reduced atomization limits leaf burn and scorching

Fertilizer

Pre- and Post-Emerge Herbicide

Drift Reducing, Dual Air Induction



Ultra Low-drift

Ideal for pre- and post-emerge application of systemic herbicides

- ☒ Patented venturi technology to greatly reduce drift.
- ☒ Its air-filled droplets and unique thick pattern deliver a more effective drift-reduced spray.

Weed Control

Post-Emerge Plant Health

Twin Enhanced Coverage, Air Induction



Enhanced Coverage



Enhanced Coverage, Air Induction



GuardianAIR Twin™

Ideal for high-coverage application of post-emerge plant health protectants

- ☒ Ideal for high-coverage applications where on-target spray delivery is critical.
- ☒ Combines uniform coverage and reduces drift in one easy-to-install design.
- ☒ Ideally suited for a wide speed range while maintaining consistent spray efficacy

Plant Health

Guardian™

Ideal for on-target application of post-emerge plant health protectants

- ☒ Delivers effective medium and coarse sprays at more rates and pressures.
- ☒ Its 20-degree-inclined spray enhances applicator ability to aim and deliver spray coverage.

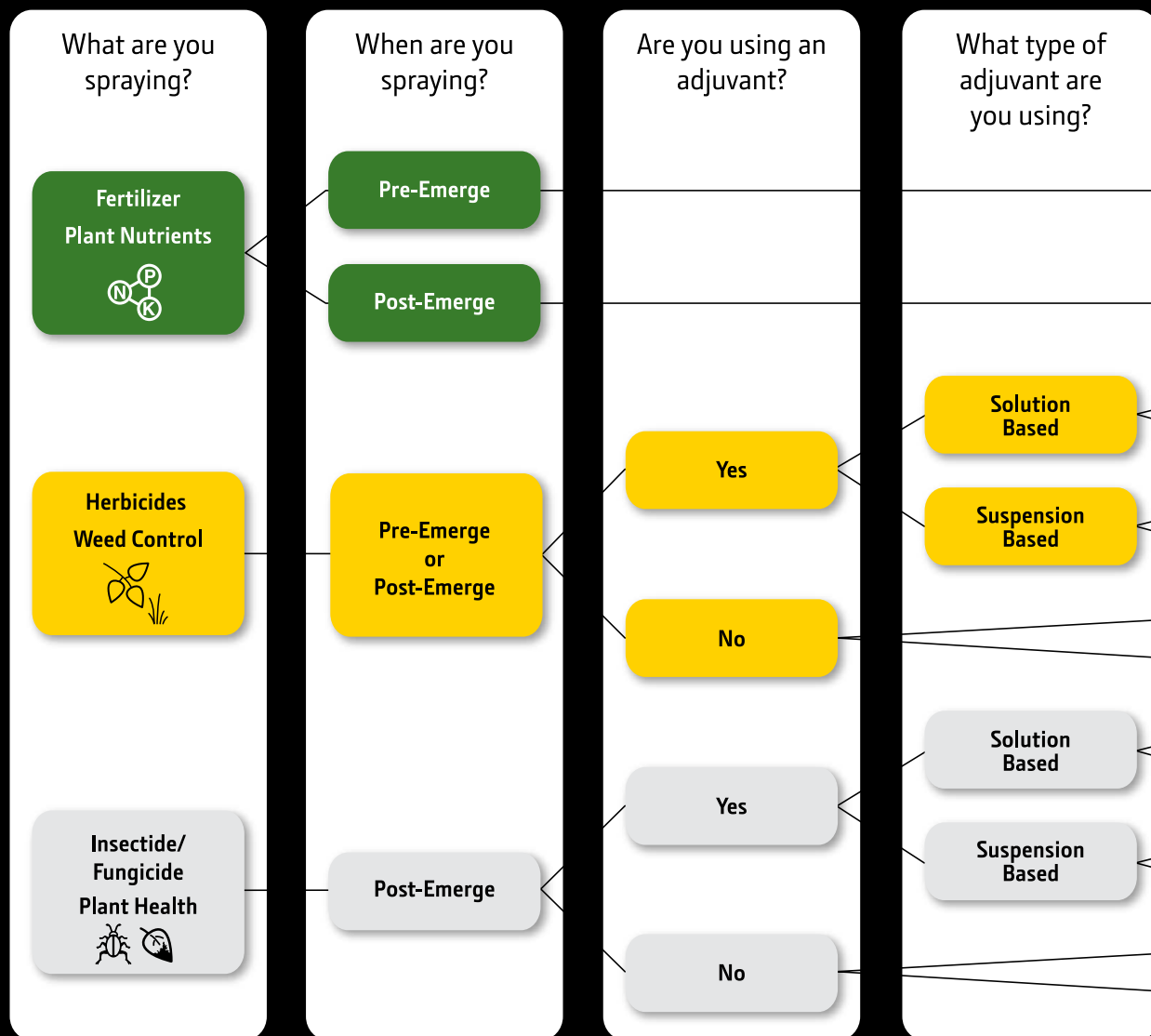
Plant Health

Low-drift Air

Good for application of post-emerge plant health protectants

- ☒ Delivers exceptional on-target coverage.
- ☒ Consistent droplets over a range of pressure settings, reducing drift risks.

Plant Health



High-Flow



Straight Stream Ceramic



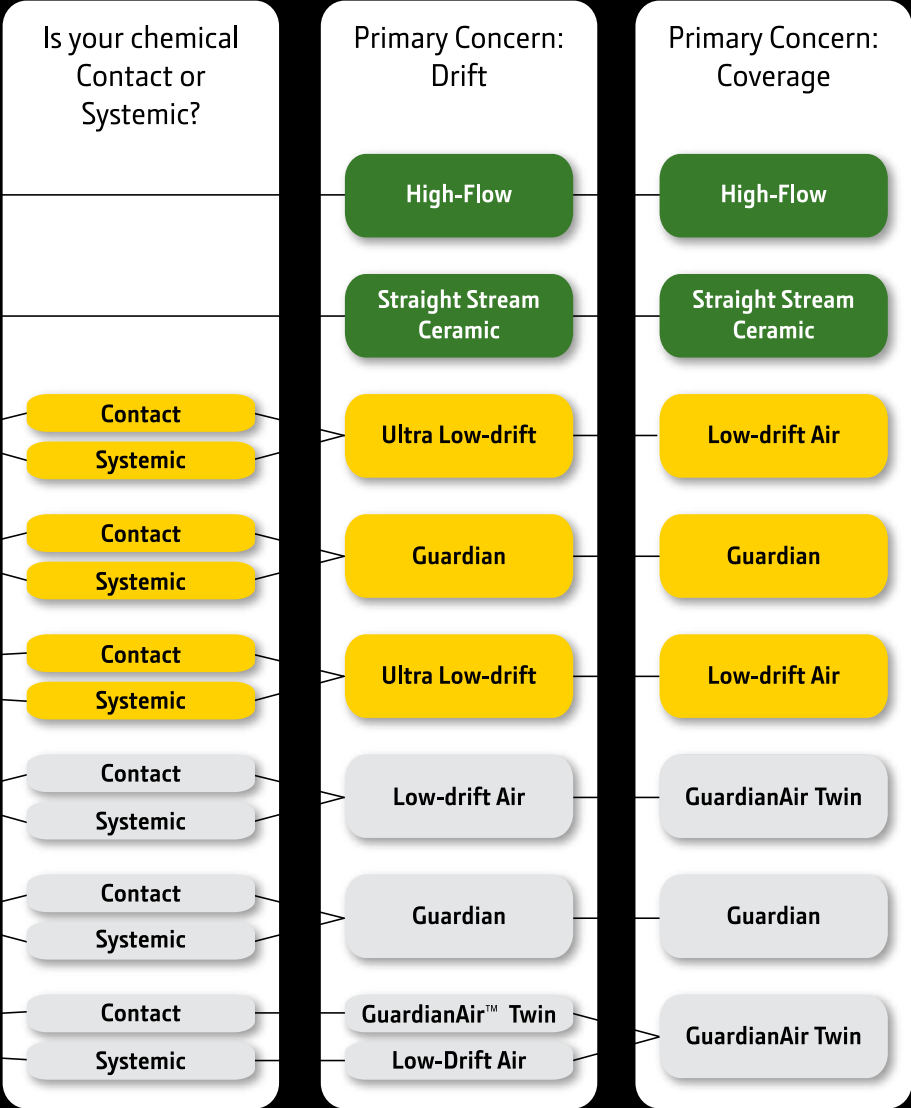
Ultra Low-drift

Improve Plant Health with spot-on coverage from every angle

Try our online selector tool at JohnDeere.com/NozzleSelector or see your John Deere Dealer

This Decision Tree is designed to be illustrative in providing guidance when selecting spray nozzles for different applications. Always follow the chemical manufacturers' recommendations for application rates and sprayer configuration when selecting an application specific nozzle.

Selection Guide



Guardian



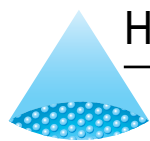
Low-drift Air



GuardianAir Twin



JOHN DEERE



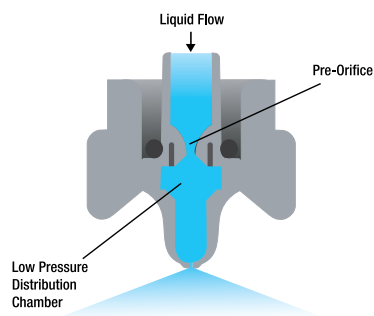
High Flow (HF) 140°



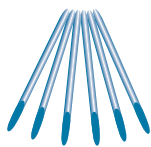
The High Flow (HF) nozzle is a premium choice for pre-plant liquid fertilizers, including the use of fertilizer blends with pre-emergent herbicides for “burndown.” The wide 140° pattern allows a low boom height, minimizing corrosive effects on application equipment. A tapered, wide-angle, fan style promotes uniform nutrient application.

- Features a removable pre-orifice for in-field cleaning
- Straight-through design helps reduce clogging and drift
- Molded from a wear-resistant polyacetal to promote increased durability
- Quick Change nozzle assembly includes tip and cap (one piece) and gasket for sizes 08-60

GPM @ 40 PSI	LPM @ 2.8 BAR	HF 140 deg. -ASABE droplet classification chart							Quick Change Nozzle
		20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	
		1.5 BAR	2.0 BAR	2.5 BAR	3.0 BAR	4.0 BAR	5.0 BAR	6.0 BAR	10 pack
0.80	3.2	UC	UC	UC	UC	XC	XC	XC	PSHFQ4008
1.00	4.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4010
1.50	6.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4015
2.00	8.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4020
3.00	12.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4030
4.00	16.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4040
5.00	20.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4050
6.00	24.0	UC	UC	UC	UC	XC	XC	XC	PSHFQ4060
Replacement Cap Gasket									PM65BS205



Features	
Common Use	Fertilizer
Pattern	Tapered Flat Fan
Technology	Pre-Orifice
Material	Polyacetal
Spray Angle	140°
Pressure Range	20-80 PSI
Configuration	Quick Change



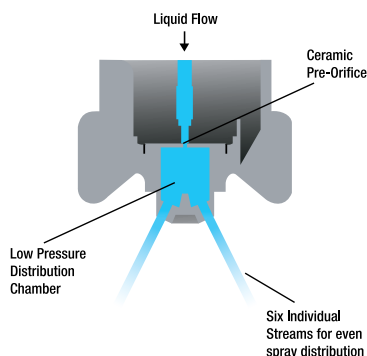
Straight Stream Ceramic (STC)



The Straight Stream Ceramic (STC) provides an optimized solution for applying liquid fertilizer into solid seeded crops, such as timed nutrient applications. By providing a six stream pattern, foliar contact is minimized and uniform coverage is ensured. The STC's ceramic metering orifice and low pressure distribution chamber keeps the streams stable, reducing atomization and preventing leaf burn, making it ideal for top-dress use.

- Compact design provides rapid installation onto standard nozzle bodies
- A six stream design distributes fertilizer more evenly than a three stream design
- Ceramic metering orifice provides a reliable and accurate flow distribution
- Molded from a wear-resistant polyacetal to promote increased durability
- Quick Change nozzle includes tip and cap (one piece) and gasket for sizes 015-15, including 025

GPM @ 40 PSI	LPM @ 2.8 BAR	STC 110 deg. -ASABE droplet classification chart						Quick Change Nozzle
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	
		1.0 BAR	1.5 BAR	2.0 BAR	2.5 BAR	3.0 BAR	4.0 BAR	
0.15	0.6	S	S	s	S	S	S	PSSTCQ10015
0.20	0.8	S	S	s	S	S	S	PSSTCQ1002
0.25	1.0	S	S	s	S	S	S	PSSTCQ10025
0.30	1.2	S	S	s	S	S	S	PSSTCQ1003
0.40	1.6	S	S	s	S	S	S	PSSTCQ1004
0.50	2.0	S	S	s	S	S	S	PSSTCQ1005
0.60	2.4	S	S	s	S	S	S	PSSTCQ1006
0.80	3.2	S	S	s	S	S	S	PSSTCQ1008
1.00	4.0	S	S	s	S	S	S	PSSTCQ1010
1.50	6.0	S	S	s	S	S	S	PSSTCQ1015
S = Six Individual Streams								Replacement Cap Gasket
								PM65BS205



Features	
Common Use	Fertilizer
Pattern	Streams
Technology	Pre-Orifice
Material	Ceramic
Spray Angle	110° Equivalent
Pressure Range	15-60 PSI
Configuration	Quick Change



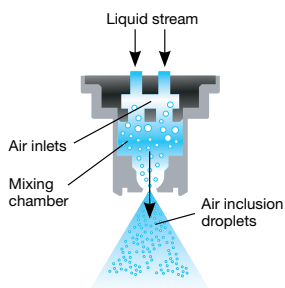
Ultra Low-drift (ULD) 120°



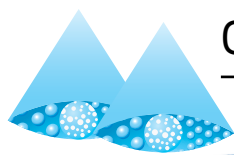
The Ultra Low-drift (ULD) is the ideal spray nozzle for pre-and post-emergence product applications, where drift reduction is paramount. A unique thick spray pattern, measuring nearly 60° front to back, coupled with the 120° wide spray angle, enables the boom height to be lowered to further decrease drift potential.

- Creates air-induced droplets to significantly reduce spray drift potential
- A wide (120°) spray pattern enables boom height to be lowered to further decrease drift
- Small, compact size reduces the chances of accidental breakage
- Molded from a wear-resistant polyacetal to promote increased durability
- Quick Change nozzle assembly includes tip, cap, gasket and strainer for sizes 015 – 08, including 025

GPM @ 40 PSI	LPM @ 2.8 BAR	ULD 120 deg. - ASABE droplet classification chart											Quick Change Nozzle
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	115 PSI	
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.5 BAR	6.0 BAR	6.5 BAR	7.0 BAR	8.0 BAR	
0.15	0.60	UC	UC	XC	VC	VC	C	C	C	M	M	M	PSULDQ20015
0.20	0.08	UC	UC	XC	VC	C	C	M	M	M	M	M	PSULDQ2002
0.25	1.0	UC	XC	XC	C	C	C	M	M	M	M	M	PSULDQ20025
0.30	1.20	UC	XC	XC	C	C	C	M	M	M	M	M	PSULDQ2003
0.40	1.60	UC	UC	UC	UC	XC	XC	XC	VC	VC	C	C	PSULDQ2004
0.50	2.00	UC	UC	UC	XC	XC	XC	VC	VC	VC	C	C	PSULDQ2005
0.60	2.40	UC	UC	UC	XC	XC	VC	C	C	C	C	M	PSULDQ2006
0.80	3.20	UC	UC	XC	VC	VC	C	C	C	M	M	M	PSULDQ2008
													Replacement Cap Gasket
													PS17000255
													50 Mesh Strainer for all sizes
													PS310



Features	
Common Use	Weeds
Pattern	Tapered Flat Fan
Technology	Air Induction
Material	Polyacetal
Spray Angle	120°
Pressure Range	15-115 PSI
Configuration	Tips, Quick Change



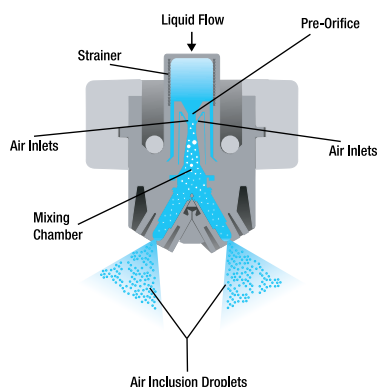
GuardianAIR Twin™ (GAT) 110°



GuardianAIR Twin™ spray nozzles are the best choice for high coverage applications, where plant health management is critical. The GAT is ideal for crops with complex canopies, such as vegetables, small/cereal grains and soybeans where thorough coverage of the target and protection of surroundings is important.

- High-coverage forward (30°) and rear facing (30°) fans help penetrate dense canopies
- Ideally suited for a wide speed range while maintaining consistent spray efficacy
- Easy-to-install, patent-pending locking ring and o-ring seal design
- Molded from a wear-resistant polyacetal to promote increased durability
- Quick Change nozzle assembly includes tips, cap, gasket, and integrated strainer for sizes 02-08, including 025

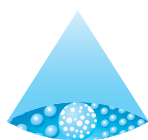
GPM @ 40 PSI	LPM @ 2.8 BAR	GAT 110 deg. - ASABE droplet classification chart									Quick Change Nozzle
		30PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	115 PSI	
		2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	5.5 BAR	6.0 BAR	7.0 BAR	8.0 BAR	
0.20	0.80	C	M	M	M	M	M	M	F	F	PSGAT1002
0.25	1.00	VC	C	M	M	M	M	M	M	M	PSGAT10025
0.30	1.20	VC	C	M	M	M	M	M	M	M	PSGAT1003
0.35	1.40	VC	C	M	M	M	M	M	M	M	PSGAT10035
0.40	1.60	C	M	M	M	M	M	M	M	M	PSGAT1004
0.50	2.00	VC	C	M	M	M	M	M	M	M	PSGAT1005
0.60	2.40	VC	C	M	M	M	M	M	M	M	PSGAT1006
0.80	3.20	VC	VC	C	C	M	M	M	M	M	PSGAT1008



Replacement Cap Gasket
PM65BS205
50 Mesh strainer for all sizes
PS0250

Features	
Common Use	Plant Health
Pattern	Tapered Flat Fan
Technology	Air Induction
Material	Polyacetal
Spray Angle	110°
Pressure Range	30-115 PSI
Configuration	Quick Change

Guardian™ (LDX) 120°



Guardian (LDX) spray nozzles are ideal for insecticide, fungicide, and general purpose applications. The LDX has been re-engineered for today's high-speed application equipment. With an operating range of 15-115 PSI, the LDX offers premium application versatility. A unique 20° rearward spray pattern improves on-target coverage.

- Complete versatility when targeting weeds, fungus, and insects, even when using adjuvants
- A bold arrow indicates incline direction for easy installation
- Molded from a wear-resistant polyacetal to promote increased durability
- Quick Change nozzle assembly includes tip and cap (one piece), gasket, and strainer for sizes 01-08, including 015 and 025

GPM @ 40 PSI	LPM @ 2.8 BAR	LDX 120 deg. - ASABE droplet classification chart											Quick Change Nozzle
		15 PSI 1.0BAR	20 PSI 1.5 BAR	30 PSI 2.0 BAR	40 PSI 3.0 BAR	50 PSI 3.5 BAR	60 PSI 4.0 BAR	70 PSI 5.0 BAR	80 PSI 5.5 BAR	90 PSI 6.0BAR	100 PSI 7.0 BAR	115 PSI 8.0 BAR	
0.10	0.4	F	F	F	F	F	F	F	F	F	VF	VF	PSLDXQ2001
0.15	0.60	M	M	F	F	F	F	F	F	F	F	F	PSLDXQ20015
0.20	0.80	M	M	M	M	M	M	F	F	F	F	F	PSLDXQ2002
0.25	1.00	M	M	M	M	M	M	F	F	F	F	F	PSLDXQ20025
0.30	1.20	M	M	M	M	M	M	M	M	M	F	F	PSLDXQ2003
0.40	1.60	C	C	C	C	M	M	M	M	M	M	M	PSLDXQ2004
0.50	2.00	C	C	C	C	M	M	M	M	M	M	M	PSLDXQ2005
0.60	2.40	VC	VC	C	C	C	C	M	M	M	M	M	PSLDXQ2006
0.80	3.20	VC	VC	C	C	C	C	M	M	M	M	M	PSLDXQ2008

Replacement Cap Gasket

PM200040-1

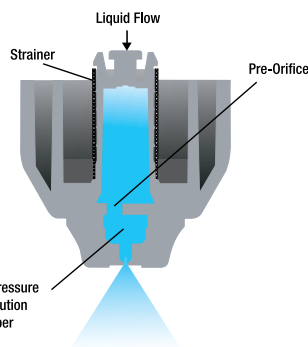
PM200040V1

50 mesh strainer
for size 04-08

PS0250

100 mesh strainer for size
01-03

PS02100



Features

Common Use	Plant Health
Pattern	Tapered Flat Fan
Technology	Pre-Orifice
Material	Polyacetal
Spray Angle	120°
Pressure Range	15-115 PSI
Configuration	Quick Change



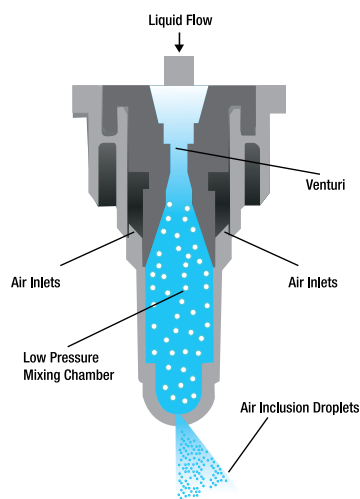
Low-drift Air (LDA) 110°



The Low-drift Air (LDA) spray nozzle is engineered to meet the demands of self-propelled sprayers for insecticide and fungicide applications. The LDA is the only technologically advanced tip capable of maintaining a constant relationship between droplet size and pressure regardless of tip size. Class leading air-induced droplets per gallon provides superior drift control and spray efficacy.

- Air-induced droplets reduce drift while increasing deposition and retention on foliage
- Provides better coverage with more drops per gallon compared to other common air-induced spray tips
- Speed-optimized spray incline allows more uniform coverage
- Molded from a wear-resistant polyacetal to promote increased durability
- Quick Change nozzle assembly includes tip, cap, and gasket in sizes 015 to 05, including 025 and 035

GPM @ 40 PSI	LPM @ 2.8 BAR	LDA 110 deg. -ASABE droplet classification chart											Quick Change Nozzle
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	115 PSI	
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	5.5 BAR	6.0 BAR	7.0 BAR	8.0 BAR	
0.15	0.60	UC	UC	XC	C	C	M	M	M	M	M	M	PSLDAQ10015
0.20	0.80	UC	XC	VC	M	M	M	M	M	M	M	M	PSLDAQ1002
0.25	1.00	UC	XC	VC	C	M	M	M	M	M	M	M	PSLDAQ10025
0.30	1.20	UC	UC	XC	VC	C	C	M	M	M	M	M	PSLDAQ1003
0.35	1.40	UC	UC	XC	VC	C	C	M	M	M	M	M	PSLDAQ10035
0.40	1.60	UC	XC	VC	C	C	M	M	M	M	M	M	PSLDAQ1004
0.50	2.00	UC	XC	XC	C	C	C	M	M	M	M	M	PSLDAQ1005



Replacement Cap Gasket

EPDM PM200040-1

Viton PM200040V1

Features

Common Use	Plant Health
Pattern	Tapered Flat Fan
Technology	Air Induction
Material	Polyacetal
Spray Angle	110°
Pressure Range	15-115 PSI
Configuration	Tips, Quick Change

Focus Nozzles Index

High Flow (HF)

Quick Change Nozzle	Replacement Cap Gasket
10 pack	10 pack
PSHFQ4008	PM65BS205
PSHFQ4010	
PSHFQ4015	
PSHFQ4020	
PSHFQ4030	
PSHFQ4040	
PSHFQ4050	
PSHFQ4060	

GuardianAIR Twin (GAT)

Quick Change Nozzle	50 Mesh Strainer	Replacement Cap Gasket
10 pack	10 pack	10 pack
PSGAT1002	PS0250	PM65BS205
PSGAT10025		
PSGAT1003		
PSGAT10035		
PSGAT1004		
PSGAT1005		
PSGAT1006		
PSGAT1008		

Straight Stream Ceramic (STC)

Quick Change Nozzle	Replacement Cap Gasket
10 pack	10 pack
PSSTCQ10015	PM65BS205
PSSTCQ1002	
PSSTCQ10025	
PSSTCQ1003	
PSSTCQ1004	
PSSTCQ1005	
PSSTCQ1006	
PSSTCQ1008	
PSSTCQ1010	
PSSTCQ1015	

Guardian (LDX)

Quick Change Nozzle	50 Mesh Strainer	100 Mesh Strainer	Replacement Cap Gasket
10 pack	10 pack	10 pack	40 pack
PSLDXQ2001	PS0250	PS02100	EPDM PM200040-1
PSLDXQ20015	Sizes: 04-08	Sizes: 01-03	Viton - PM200040V1
PSLDXQ2002			
PSLDXQ20025			
PSLDXQ2003			
PSLDXQ2004			
PSLDXQ2005			
PSLDXQ2006			
PSLDXQ2008			

Ultra Low-drift (ULD)

Quick Change Nozzle	Spray Tips	Caps	50 Mesh Strainers	Replacement Cap Gasket
10 pack	10 pack	10 pack	10 pack	40 pack
PSULDQ20015	PSULD20015	PS900015	PS310	PS17000255
PSULDQ2002	PSULD2002	PS900002		
PSULDQ20025	PSULD20025	PS900025		
PSULDQ2003	PSULD2003	PS900003		
PSULDQ2004	PSULD2004	PS900004		
PSULDQ2005	PSULD2005	PS900005		
PSULDQ2006	PSULD2006	PS900006		
PSULDQ2008	PSULD2008	PS900008		

Low-drift Air (LDA)

Quick Change Nozzle	Spray Tips	Caps	Replacement Cap Gasket
10 pack	10 pack	10 pack	40 pack
PSLDAQ10015	PSLDA10015	PS900015	EPDM - PM200040-1
PSLDAQ1002	PSLDA1002	PS900002	Viton - PM200040V1
PSLDAQ10025	PSLDA10025	PS900025	
PSLDAQ1003	PSLDA1003	PS900003	
PSLDAQ10035	PSLDA10035	PS900035	
PSLDAQ1004	PSLDA1004	PS900004	
PSLDAQ1005	PSLDA1005	PS900005	

Broadcast Spray Nozzles

When a product needs to be applied to an entire field or area of a field, a broadcast nozzle should be used to ensure good spray uniformity. The best broadcast nozzle use a tapered fan pattern that is designed to overlap with the spray patterns of nozzles next to it. The result is a uniform application of spray across the treated area.

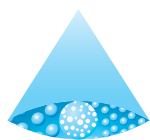
- John Deere offers many different product families of broadcast nozzles.
- Each family is designed to deliver a droplet size that is beneficial in certain situations.
- Different materials of construction may be available, such as economical long-wearing polyacetal and longest-wearing ceramic orifice inserts.
- Broadcast spraying is when the entire field is treated. The width that each nozzle sprays, adjusted for overlap, is equivalent to the distance between tips on the spray boom.



Broadcast



Ultra Low-drift Ceramic 110° (ULAC)



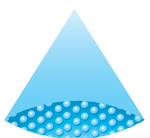
The Ultra Low-drift Ceramic (ULAC) draws air into the tip and mixes it with the spray to create very coarse droplets that minimize spray drift. The air-filled droplets have a larger footprint on the leaf than similar non-air droplets and hold to the leaf for better control. Durable ceramic orifice create the longest wearing spray tip of its kind.

- Excellent drift reduction with large air-filled droplets
- Large passages resist plugging
- Wear-resistant ceramic orifice
- Quick Change includes tip, cap and gasket

Features	
Common Use	Weeds
Pattern	Tapered Flat Fan
Technology	Air Induction
Material	Ceramic
Spray Angle	110°
Pressure Range	30-100 PSI
Configuration	Tips, Quick Change

GPM @ 40 PSI	LPM @ 2.8 BAR	ULAC 110 deg. - ASABE droplet classification chart								Quick Change Nozzle
		30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	
		2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	5.5 BAR	6.0 BAR	7.0 BAR	
0.10	0.40	VC	VC	VC	C	C	C	C	C	PSULACQ1001
0.15	0.60	VC	VC	VC	C	C	C	C	C	PSULACQ10015
0.20	0.80	VC	VC	VC	C	C	C	C	C	PSULACQ1002
0.25	1.00	XC	VC	VC	C	C	C	C	C	PSULACQ10025
0.30	1.20	XC	XC	VC	C	C	C	C	C	PSULACQ1003
0.40	1.40	XC	XC	XC	VC	VC	VC	VC	VC	PSULACQ1004
0.50	2.00	XC	XC	XC	XC	VC	VC	VC	VC	PSULACQ1005
0.60	2.40	XC	XC	XC	XC	XC	VC	VC	VC	PSULACQ1006
0.80	3.20	XC	XC	XC	XC	XC	XC	XC	XC	PSULACQ1008
1.00	4.00	XC	XC	XC	XC	XC	XC	XC	XC	PSULACQ1010
										Replacement Cap Gasket
										EPDM - PM200040-1
										Viton - PM200040V1

Low-drift 110° (LD)



The Low-drift (LD) is the original drift-reducing tip. The special two-part construction includes a pre-orifice, which reduces the number of drift prone droplets.

- Significantly reduces spray drift, widening the operational window
- Balanced droplet size for effective, on-target spray

Features	
Common Use	Plant Health
Pattern	Tapered Flat Fan
Technology	Pre-Orifice
Material	Polycetal
Spray Angle	110°
Pressure Range	15-70 PSI
Configuration	Tips

GPM @ 40 PSI	LPM @ 2.8 BAR	LD 110 deg. - ASABE droplet classification chart							Spray Tips	Caps
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI		
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR		
0.15	0.60	M	M	M	M	M	M	F	PSLD10015	PS900015
0.20	0.80	C	M	M	M	M	M	M	PSLD1002	PS90002
0.25	1.00	C	M	M	M	M	M	M	PSLD10025	PS900025
0.30	1.20	C	C	C	M	M	M	M	PSLD1003	PS90003
0.40	1.60	C	C	C	M	M	M	M	PSLD1004	PS90004
0.50	2.00	C	C	C	C	C	M	M	PSLD1005	PS90005
0.60	2.40	VC	VC	C	C	C	C	M	PSLD1006	PS90006
0.80	3.20	VC	VC	C	C	C	C	C	PSLD1008	PS90008



Low-drift Ceramic 110° (LDC)

The Low-drift Ceramic (LDC) spray tip provides a versatile balance of drift reduction and target coverage. The proven pre-orifice design creates droplets that are well suited for a wide range of spray applications. The ceramic orifice resists wear better than other materials and will provide acre after acre of service.

- Droplet size balances drift reduction and target coverage
- Simple and effective pre-orifice design
- Versatile and long-lasting tip

Features	
Common Use	Plant Health
Pattern	Tapered Flat Fan
Technology	Air Induction
Material	Ceramic
Spray Angle	110°
Pressure Range	30-70 PSI
Configuration	Tips

GPM @ 40 PSI	LPM @ 2.8 BAR	LDC 110 deg. - ASABE droplet classification data					Spray Tips	Caps
		30 PSI	40 PSI	50 PSI	60 PSI	70 PSI		
		2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR		
0.10	0.40	M	M	F	F	F	PSLDC1001	PS90001
0.15	0.60	M	M	M	M	M	PSLDC10015	PS900015
0.20	0.80	M	M	M	M	M	PSLDC1002	PS90002
0.30	1.20	C	M	M	M	M	PSLDC1003	PS90003
0.40	1.60	VC	C	C	C	M	PSLDC1004	PS90004



Extended Range 80° & 110° (ER)

Extended Range (ER) nozzles maintain a consistent spray angle over a wide pressure range down to 15 PSI and are available in 80 degree and 110 degree versions to work with different boom heights.

- Adjustable droplet size according to pressure
- Maintains good spray distribution and makes larger droplets at low pressures
- Quick Change includes tip, cap and gasket

Features	
Common Use	General
Pattern	Tapered Flat Fan
Technology	Elliptical Orifice
Material	Polyacetal
Spray Angle	80° & 110°
Pressure Range	15-70 PSI
Configuration	Tips, Quick Change

GPM @ 40 PSI	LPM @ 2.8 BAR	ER 80 deg. - ASABE droplet classification chart							Quick Change Nozzle
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	
0.15	0.60	M	M	F	F	F	F	F	PSERQ80015
0.20	0.80	M	M	F	F	F	F	F	PSERQ8002
0.30	1.20	M	M	M	F	F	F	F	PSERQ8003
0.40	1.60	C	M	M	M	M	F	F	PSERQ8004
0.50	2.00	C	C	M	M	M	M	F	PSERQ8005
0.60	2.40	C	C	C	C	M	M	M	PSERQ8006

Replacement Cap Gasket

EPDM - PM200040-1

Viton - PM200040V1

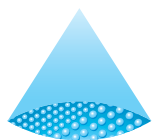
GPM @ 40 PSI	LPM @ 2.8 BAR	ER 110 deg. - ASABE droplet classification chart							Quick Change Nozzle
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	
0.15	0.60	M	F	F	F	F	F	F	PSERQ10015
0.20	0.80	M	F	F	F	F	F	F	PSERQ1002
0.25	1.00	M	M	F	F	F	F	F	PSERQ10025
0.30	1.20	M	M	F	F	F	F	F	PSERQ1003
0.40	1.60	M	M	M	F	F	F	F	PSERQ1004
0.50	2.00	M	M	M	F	F	F	F	PSERQ1005
0.60	2.40	C	M	M	M	F	F	F	PSERQ1006
0.80	3.20	C	C	M	M	M	M	M	PSERQ1008
1.00	4.00	VC	C	C	M	M	M	M	PSERQ1010
1.50	6.00	VC	VC	VC	C	C	M	M	PSERQ1015

Replacement Cap Gasket

EPDM - PM200040-1

Viton - PM200040V1

Extended Range Stainless Steel 80° (ERI)



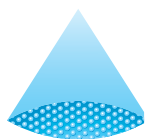
The Extended Range Stainless Steel (ERI) nozzle series consists of a metal insert that is held in a plastic carrier. The nozzles are able to maintain a constant spray angle over a wide pressure range down to 15 PSI.

- Adjustable droplet size according to pressure
- Insert is precision-machined stainless steel and carrier is molded in tough and durable polyacetal
- Maintains good spray distribution and makes larger droplets at low pressures
- Quick Change includes tip, cap and gasket

Features	
Common Use	General
Pattern	Tapered Flat Fan
Technology	Elliptical Orifice
Material	Stainless Steel
Spray Angle	80°
Pressure Range	15-70 PSI
Configuration	Tips, Quick Change

GPM @ 40 PSI	LPM @ 2.8 BAR	ERI 80 deg.- ASABE droplet classification chart							Quick Change Nozzle
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	10 Pack
0.10	0.40	M	F	F	VF	VF	VF	VF	PSERI80001
0.15	0.60	M	F	F	F	F	VF	VF	PSERI80015
0.20	0.80	M	M	F	F	F	F	VF	PSERI80002
0.30	1.20	C	M	M	F	F	F	F	PSERI80003
0.40	1.60	C	C	M	M	M	F	F	PSERI80004
0.50	2.00	C	C	C	M	M	M	F	PSERI80005
0.60	2.40	C	C	C	M	M	M	M	PSERI80006
0.80	3.20	VC	C	C	C	C	M	M	PSERI80008
1.00	4.00	VC	VC	VC	C	C	C	M	PSERSQ8010
1.50	6.00	XC	VC	VC	C	C	C	C	PSERSQ8015
									Replacement Cap Gasket
									EPDM - PM200040-1
									Viton - PM200040V1

Extended Range Ceramic 110° (ERC)



The Extended Range Ceramic (ERC) wide pressure range ceramic spray nozzles are suited for creating numerous fine to medium droplets. The ceramic orifice of the ERC will provide long service life even when spraying abrasive chemicals.

- Adjustable droplet size according to pressure
- Maintains good spray distribution and makes larger droplets at low pressures
- Quick Change includes tip, cap and gasket

Features	
Common Use	General
Pattern	Tapered Flat Fan
Technology	Elliptical Orifice
Material	Ceramic
Spray Angle	110°
Pressure Range	20-70 PSI
Configuration	Tips, Quick Change

GPM @ 40 PSI	LPM @ 2.8 BAR	ERC 110 deg.- ASABE droplet classification chart						Quick Change Nozzle
		20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	
		1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	
0.15	0.60	F	F	F	F	VF	VF	PSERC10015
0.20	0.80	F	F	F	F	F	F	PSERC10002
0.30	1.20	M	M	M	F	F	F	PSERC10003
0.40	1.60	M	M	M	M	M	F	PSERC10004
0.50	2.00	M	M	M	M	M	M	PSERC10005
0.60	2.40	C	M	M	M	M	M	PSERC10006
Replacement Cap Gasket								
EPDM - PM200040-1								
Viton - PM200040V1								



Flat Fan 80° & 110° (FF)

The Flat Fan (FF) is a general spray tip that produces a mixed droplet spectrum over the 30-60 PSI operational pressure range. It is good for broadcast applications.

- Economical option for general spraying
- Simple one-piece design
- Polyacetal construction for superior product life compared to stainless steel or brass.

Features	
Common Use	General
Pattern	Tapered Flat Fan
Technology	Elliptical Orifice
Material	Polyacetal
Spray Angle	80° & 110°
Pressure Range	30-60 PSI
Configuration	Tip

GPM @ 40 PSI	LPM @ 2.8 BAR	FF 80 deg. ASABE droplet classification chart				Spray Tips	Caps
		30 PSI	40 PSI	50 PSI	60 PSI		
		2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR		
0.067	0.27	F	VF	VF	VF	PSFF800067	PS900020
0.10	0.40	VF	VF	VF	VF	PSFF8001	PS900001
0.15	0.60	F	F	F	VF	PSFF80015	PS900015
0.20	0.80	M	F	F	F	PSFF8002	PS900002
0.30	1.20	C	M	M	F	PSFF8003	PS900003
0.40	1.60	C	M	M	M	PSFF8004	PS900004
0.50	2.00	C	M	M	M	PSFF8005	PS900005
0.60	2.40	C	C	C	C	PSFF8006	PS900006
0.80	3.20	VC	C	C	C	PSFF8008	PS900008
1.00	4.00	VC	C	C	C	PSFF8010	PS900020
1.50	6.00	VC	VC	C	C	PSFF8015	PS900020
2.00	8.00	VC	VC	VC	VC	PSFF8020	PS900020
						Replacement Cap Gasket	
						EPDM PM200040-1	
						Viton PM200040V1	

GPM @ 40 PSI	LPM @ 2.8 BAR	FF 110 deg. ASABE droplet classification chart				Spray Tips	Caps
		30 PSI	40 PSI	50 PSI	60 PSI		
		2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR		
0.10	0.40	F	F	F	F	PSFF1001	PS900001
0.15	0.60	F	F	F	F	PSFF10015	PS900015
0.20	0.80	F	F	F	F	PSFF1002	PS900002
0.30	1.20	M	F	F	F	PSFF1003	PS900003
0.40	1.60	M	M	F	F	PSFF1004	PS900004
0.50	2.00	M	M	M	M	PSFF1005	PS900005
0.60	2.40	M	M	M	M	PSFF1006	PS900006
0.80	3.20	C	C	C	C	PSFF1008	PS900008
1.00	4.00	C	C	C	C	PSFF1010	PS900020
1.50	6.00	C	C	C	C	PSFF1015	PS900020
2.00	8.00	C	C	C	C	PSFF1020	PS900020
						Replacement Cap Gasket	
						EPDM PM200040-1	
						Viton PM200040V1	

Broadcast

Wide-Angle Broadcast

Broadcast fertilizers and broadcast turf products are often applied using tips with very wide spray patterns. A wide spray pattern will overlap with adjacent spray patterns to improve spray uniformity. They also allow lower boom heights beneficial for less drift, less conspicuous turf spraying, and for use on tillage implements.

- Wide spray angles provide more overlap to ensure spray uniformity.
- Tips in this category have traditionally used lower spray pressures to reduce drift.
- Deflection pattern tips are available in economical long-wearing polyacetal and longest-wearing ceramic.
- Broadcast spraying is when the entire field is treated. The width that each tip sprays, adjusted for overlap, is equivalent to the distance between tips on the spray boom.
- Very wide pattern tips may be able to cover up to 60 inches, although narrow spacing of 40, 20, or even 15 inches is suitable. Consult the Technical Information section for additional help.

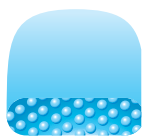


Streaming Spray Nozzles

When applying soil fertilizers, it is advisable to minimize the amount of spray that deposits on the crop and crop residues - dead plant matter - on the soil surface.

- Live plant foliage can be injured by the fertilizer formulations and can die or be browned by fertilizer sprays.
- Streams minimize the number of fertilizer droplets and therefore minimize leaf scorch.
- Single streams are good for applying fertilizer through heavy crop residues and for fields that will be tilled.
- Multiple streams are good for applying fertilizers to crops like wheat, where more uniform applications, and subsequently less striping, are desired.
- Although stream pattern tips do not actually cover every plant or square inch of field, the application is usually considered to be a broadcast application because plants in unsprayed gaps also benefit from the fertilizer.
- When calculating application rates, the width that each tip sprays is considered to be the distance between tips on the spray boom.





Flood 80°- 160° (FL)

The Flood (FL) wide-angle fan tip creates a wide pattern at very low pressures while creating mainly medium and coarse droplets. It is well suited for mounting on machinery where a wide angle or a low spray height is desired and on sprayers using very low pressures, including manual sprayers.

- Sprays at very low pressures
- Medium to coarse spray is suited for a variety of applications
- Larger sizes are suitable for liquid fertilizer applications
- Large circular orifice reduces the chances of blocking

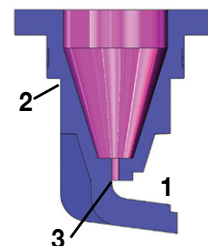


GPM @ 40 PSI	LPM @ 2.8 BAR	FL - ASABE droplet classification chart						Spray Tips	Caps
		10 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI		
		0.5 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR		
0.20	0.91	C	M	M	M	M	F	10 pack	10 pack
0.25	1.14	C	M	M	M	F	F	PSFL2	PS90404
0.30	1.37	C	M	M	M	M	M	PSFL025	PS90405
0.40	1.82	VC	M	M	M	M	M	PSFL3	PS90406
0.50	2.30	C	M	M	M	M	M	PSFL4	PS90407
0.75	3.4	C	C	C	C	C	M	PSFL5	PS90420
1.00	4.6	XC	C	C	C	C	C	PSFL75	PS90420
1.50	6.8	XC	XC	VC	VC	VC	VC	PSFL10	PS90420
2.00	9.1	UC	UC	XC	XC	XC	XC	PSFL15	PS90420
								PSFL20	PS90420
Replacement Cap Gasket									
EPDM - PM200040-1									
Viton - PM200040V1									

US Units

Tip Size	Droplet Size	Spray Angle	Pressure (PSI)	Flow Rate (GPM)	Gallons per Acre 20 inch nozzle spacing										GAL/1000 ^{ft} 20 inch nozzle spacing				
					4	5	6	8	10	12	15	20	2	3	4	5			
2.0	C	105	10	0.20	14.9	11.9	9.9	7.4	5.9	5.0	4.0	3.0	0.68	0.45	0.34	0.27			
	M		20	0.28	21.0	16.8	14.0	10.5	8.4	7.0	5.6	4.2	0.96	0.64	0.48	0.39			
	M		30	0.35	25.7	20.6	17.1	12.9	10.3	8.6	6.9	5.1	1.18	0.79	0.59	0.47			
	M		40	0.40	29.7	23.8	19.8	14.9	11.9	9.9	7.9	5.9	1.36	0.91	0.68	0.55			
	M		50	0.45	33.2	26.6	22.1	16.6	13.3	11.1	8.9	6.6	1.52	1.02	0.76	0.61			
	F		60	0.49	36.4	29.1	24.2	18.2	14.5	12.1	9.7	7.3	1.67	1.11	0.84	0.67			
2.5	C	110	10	0.25	18.6	14.9	12.4	9.3	7.4	6.2	5.0	3.7	0.85	0.57	0.43	0.34			
	M		20	0.35	26.3	21.0	17.5	13.1	10.5	8.8	7.0	5.3	1.21	0.80	0.60	0.48			
	M		30	0.43	32.2	25.7	21.4	16.1	12.9	10.7	8.6	6.4	1.48	0.98	0.74	0.59			
	M		40	0.50	37.1	29.7	24.8	18.6	14.9	12.4	9.9	7.4	1.70	1.14	0.85	0.68			
	M		50	0.56	41.5	33.2	27.7	20.8	16.6	13.8	11.1	8.3	1.91	1.27	0.95	0.76			
	F		60	0.61	45.5	36.4	30.3	22.7	18.2	15.2	12.1	9.1	2.09	1.39	1.04	0.84			
3.0	C	110	10	0.30	22.3	17.8	14.9	11.1	8.9	7.4	5.9	4.5	1.02	0.68	0.51	0.41			
	M		20	0.42	31.5	25.2	21.0	15.8	12.6	10.5	8.4	6.3	1.45	0.96	0.72	0.58			
	M		30	0.52	38.6	30.9	25.7	19.3	15.4	12.9	10.3	7.7	1.77	1.18	0.89	0.71			
	M		40	0.60	44.6	35.6	29.7	22.3	17.8	14.9	11.9	8.9	2.05	1.36	1.02	0.82			
	M		50	0.67	49.8	39.8	33.2	24.9	19.9	16.6	13.3	10.0	2.29	1.52	1.14	0.91			
	M		60	0.73	54.6	43.6	36.4	27.3	21.8	18.2	14.5	10.9	2.51	1.67	1.25	1.00			
4.0	VC	120	10	0.40	29.7	23.8	19.8	14.9	11.9	9.9	7.9	5.9	1.36	0.91	0.68	0.55			
	M		20	0.57	42.0	33.6	28.0	21.0	16.8	14.0	11.2	8.4	1.93	1.29	0.96	0.77			
	M		30	0.69	51.4	41.2	34.3	25.7	20.6	17.1	13.7	10.3	2.36	1.57	1.18	0.94			
	M		40	0.80	59.4	47.5	39.6	29.7	23.8	19.8	15.8	11.9	2.73	1.82	1.36	1.09			
	M		50	0.89	66.4	53.1	44.3	33.2	26.6	22.1	17.7	13.3	3.05	2.03	1.52	1.22			
	M		60	0.98	72.7	58.2	48.5	36.4	29.1	24.2	19.4	14.5	3.34	2.23	1.67	1.34			
5.0	C	125	10	0.50	37.1	29.7	24.8	18.6	14.9	12.4	9.9	7.4	1.70	1.14	0.85	0.68			
	M		20	0.71	52.5	42.0	35.0	26.3	21.0	17.5	14.0	10.5	2.41	1.61	1.21	0.96			
	M		30	0.87	64.3	51.4	42.9	32.2	25.7	21.4	17.1	12.9	2.95	1.97	1.48	1.18			
	M		40	1.00	74.3	59.4	49.5	37.1	29.7	24.8	19.8	14.9	3.41	2.27	1.70	1.36			
	M		50	1.12	83.0	66.4	55.3	41.5	33.2	27.7	22.1	16.6	3.81	2.54	1.91	1.52			
	M		60	1.22	90.9	72.7	60.6	45.5	36.4	30.3	24.2	18.2	4.18	2.78	2.09	1.67			
7.5	C	145	10	0.75	55.7	44.6	37.1	27.8	22.3	18.6	14.9	11.1	2.56	1.70	1.28	1.02			
	C		20	1.06	78.8	63.0	52.5	39.4	31.5	26.3	21.0	15.8	3.62	2.41	1.81	1.45			
	C		30	1.30	96.5	77.2	64.3	48.2	38.6	32.2	25.7	19.3	4.43	2.95	2.21	1.77			
	C		40	1.50	111.4	89.1	74.3	55.7	44.6	37.1	29.7	22.3	5.11	3.41	2.56	2.05			
	C		50	1.68	124.5	99.6	83.0	62.3	49.8	41.5	33.2	24.9	5.72	3.81	2.86	2.29			
	M		60	1.84	136.4	109.1	90.9	68.2	54.6	45.5	36.4	27.3	6.26	4.18	3.13	2.51			
10	C	160	10	1.00	74.3	59.4	49.5	37.1	29.7	24.8	19.8	14.9	3.41	2.27	1.70	1.36			
	C		20	1.41	105.0	84.0	70.0	52.5	42.0	35.0	28.0	21.0	4.82	3.21	2.41	1.93			
	C		30	1.73	128.6	102.9	85.7	64.3	51.4	42.9	34.3	25.7	5.90	3.94	2.95	2.36			
	C		40	2.00	148.5	118.8	99.0	74.3	59.4	49.5	39.6	29.7	6.82	4.55	3.41	2.73			
	C		50	2.24	166.0	132.8	110.7	83.0	66.4	55.3	44.3	33.2	7.62	5.08	3.81	3.05			
	C		60	2.45	181.9	145.5	121.2	90.9	72.7	60.6	48.5	36.4	8.35	5.57	4.18	3.34			
15	C	145	10	1.50	111.4	89.1	74.3	55.7	44.6	37.1	29.7	22.3	5.11	3.41	2.56	2.05			
	XC		20	2.12	157.5	126.0	105.0	78.8	63.0	52.5	42.0	31.5	7.23	4.82	3.62	2.89			
	VC		30	2.60	192.9	154.3	128.6	96.5	77.2	64.3	51.4	38.6	8.86	5.90	4.43	3.54			
	VC		40	3.00	222.8	178.2	148.5	111.4	89.1	74.3	59.4	44.6	10.23	6.82	5.11	4.09			
	VC		50	3.35	249.0	199.2	166.0	124.5	99.6	83.0	66.4	49.8	11.43	7.62	5.72	4.57			
	VC		60	3.67	272.8	218.2	181.9	136.4	109.1	90.9	72.7	54.6	12.53	8.35	6.26	5.01			
20	UC	140	10	2.00	148.5	118.8	99.0	74.3	59.4	49.5	39.6	29.7	6.82	4.55	3.41	2.73			
	UC		20	2.83	210.0	168.0	140.0	105.0	84.0	70.0	56.0	42.0	9.64	6.43	4.82	3.86			
	XC		30	3.46	257.2	205.8	171.5	128.6	102.9	85.7	68.6	51.4	11.81	7.87	5.90	4.72			
	XC		40	4.00	297.0	237.6	198.0	148.5	118.8	99.0	79.2	59.4	13.64	9.09	6.82	5.45			
	XC		50	4.47	332.1	265.6	221.4	166.0	132.8	110.7	88.5	66.4	15.25	10.16	7.62	6.10			
	XC		60	4.90	363.7	291.0	242.5	181.9	145.5	121.2	97.0	72.7	16.70	11.13	8.35	6.68			

Features	
Common Use	Weeds & Fertilizer
Pattern	Flood
Technology	Deflection
Material	Polyacetal
Spray Angle	80°-160°
Pressure Range	10-60 PSI
Configuration	Tip



1. Simple; deflecting spray pattern
2. Polyacetal; single piece design
3. Available in many sizes to meet your flow rate needs

Straight Stream (ST)



The 0-degree Straight Stream (ST) regulates flow, then produces a straight stream pattern. Precision-molded in polyvinylidene fluoride (PVDF) for excellent resistance to acids and many agricultural chemicals.

- 0-degree nozzles provide a single jet of spray for streaming or injecting liquid fertilizer
- Precision-molded using chemically-resistant PVDF material
- Superior resistance to orifice wear compared to brass or stainless steel

Features	
Common Use	Fertilizer
Pattern	Stream
Technology	Round Orifice
Material	PVDF
Spray Angle	0°
Pressure Range	15-60 PSI
Configuration	1/4" MNPT

GPM @ 40 PSI	LPM @ 2.8 BAR	ST -ASABE droplet classification chart						Spray Tips	Standard Cap
		15 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI		
		1.0 BAR	1.5 BAR	2.0 BAR	3.0 BAR	3.5 BAR	4. BAR		
1.00	4.00	S	S	S	S	S	S	PSST10	PS91020
1.50	6.00	S	S	S	S	S	S	PSST15	PS91020
2.00	8.00	S	S	S	S	S	S	PSST20	PS91020

S=stream

Replacement Cap Gasket
EPDM PM200040-1
Viton PM200040V1

Disc (D)



Disc

The Disc (D) regulates flow and produces a straight stream pattern. Precision-molded in polyacetal.

Features	
Common Use	Fertilizer
Pattern	Stream
Technology	Round Orifice
Material	Polyacetal
Spray Angle	0°
Pressure Range	10-150 PSI
Configuration	Disc

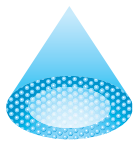
Disc	US Gallon/Min										
	PSI										
	10	15	20	25	30	35	40	60	80	100	150
PSD01	0.057	0.070	0.081	0.090	0.099	0.107	0.114	0.140	0.161	0.180	0.221
PSD015	0.078	0.096	0.110	0.123	0.135	0.146	0.156	0.191	0.221	0.247	0.302
PSD02	0.105	0.129	0.148	0.166	0.182	0.196	0.210	0.257	0.297	0.332	0.407
PSD03	0.133	0.163	0.188	0.210	0.230	0.249	0.266	0.326	0.376	0.421	0.515
PSD04	0.242	0.296	0.342	0.383	0.419	0.453	0.484	0.593	0.684	0.765	0.937
PSD05	0.392	0.480	0.554	0.620	0.679	0.733	0.784	0.960	1.11	1.24	1.52
PSD06	0.570	0.698	0.806	0.901	0.987	1.07	1.14	1.40	1.61	1.80	2.21
PSD07	0.760	0.931	1.07	1.20	1.32	1.42	1.52	1.86	2.15	2.40	2.94
PSD08	0.960	1.18	1.36	1.52	1.66	1.80	1.92	2.35	2.72	3.04	3.72
PSD10	1.55	1.90	2.19	2.45	2.68	2.90	3.10	3.80	4.38	4.90	6.00
PSD12	2.20	2.69	3.11	3.48	3.81	4.12	4.40	5.39	6.22	6.96	8.52

Banding and Directed Spray Tips

Band spraying is when strips are treated, either on the planted rows or between them on the unplanted gaps. The width that each tip sprays is the width of the treated band divided by the number of tips spraying into that band.

- Even pattern tips are designed to uniformly apply spray across the width of the band. This means the edges of the pattern are not designed to overlap with any neighboring pattern.
- Directed spraying is when one or more tips are aimed specifically at a treatment zone on a plant. These can vary from two tips over a single row of edible beans to 20 or more tips on an air-blast sprayer in an apple orchard.
- Air-induced nozzles are capable of providing more on-target deposition and less drift.
- Tip selection, spray method, and sprayer adjustment can be used in an integrated approach to minimize the 'big three wastes' of drift, blow-through and misdirected sprays.
- Consult the Technical Information section for details on tip spacing and application rate calculations.





Hollow Cone Spray – Disc & Cores 25°-110°

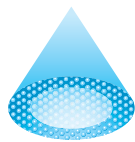
The disc and core hollow-cone spray tips produce finely atomized droplets in a hollow-cone pattern in a variety of spray pattern widths.



Disc

Core

Disc	Core	Spray Angle at 40 PSI	US Gallon/Min								
			Color Disc/Core	10	20	30	40	PSI 60	80	100	150
PSD01	PSC13	50	Gray/Red	-	-	0.06	0.07	0.08	0.09	0.10	0.13
PSD015	PSC13	55	Black/Red	-	-	0.06	0.07	0.09	0.10	0.11	0.14
PSD02	PSC13	65	Brown/Red	-	0.06	0.07	0.08	0.10	0.12	0.13	0.16
PSD03	PSC13	70	Orange/Red	-	0.06	0.08	0.09	0.11	0.12	0.14	0.17
PSD04	PSC13	80	Red/Red	0.06	0.08	0.10	0.12	0.14	0.17	0.19	0.23
PSD01	PSC23	45	Gray/LightBlue	-	-	0.06	0.07	0.09	0.10	0.11	0.14
PSD015	PSC23	50	Black/LightBlue	-	-	0.07	0.09	0.10	0.12	0.13	0.16
PSD02	PSC23	70	Brown/LightBlue	-	0.08	0.09	0.11	0.13	0.15	0.17	0.21
PSD03	PSC23	70	Orange/LightBlue	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.22
PSD04	PSC23	80	Red/LightBlue	0.08	0.11	0.13	0.15	0.19	0.22	0.24	0.30
PSD05	PSC23	90	Blue/LightBlue	0.09	0.13	0.16	0.18	0.22	0.25	0.28	0.35
PSD06	PSC23	90	Yellow/LightBlue	0.10	0.15	0.18	0.21	0.25	0.29	0.33	0.40
PSD01	PSC25	25	Gray/Yellow	-	-	0.09	0.10	0.12	0.14	0.16	0.19
PSD015	PSC25	40	Black/Yellow	-	-	0.11	0.13	0.16	0.19	0.21	0.26
PSD02	PSC25	50	Brown/Yellow	-	0.11	0.13	0.16	0.19	0.22	0.25	0.30
PSD03	PSC25	60	Orange/Yellow	0.09	0.13	0.16	0.19	0.23	0.27	0.30	0.36
PSD04	PSC25	75	Red/Yellow	0.14	0.19	0.24	0.28	0.34	0.39	0.43	0.53
PSD05	PSC25	80	Blue/Yellow	0.18	0.25	0.30	0.35	0.43	0.49	0.55	0.68
PSD06	PSC25	85	Yellow/Yellow	0.23	0.32	0.39	0.45	0.55	0.64	0.71	0.87
PSD07	PSC25	90	Green/Yellow	0.25	0.35	0.43	0.50	0.61	0.71	0.79	0.97
PSD08	PSC25	95	White/Yellow	0.30	0.42	0.52	0.60	0.73	0.85	0.95	1.16
PSD10	PSC25	100	LimeGreen/Yellow	0.38	0.53	0.65	0.75	0.92	1.06	1.19	1.45
PSD12	PSC25	110	RoyalBlue/Yellow	0.46	0.65	0.80	0.93	1.13	1.31	1.46	1.79
PSD01	PSC45	25	Gray/Green	-	-	-	0.12	0.15	0.17	0.19	0.23
PSD015	PSC45	35	Black/Green	-	-	0.14	0.16	0.20	0.23	0.25	0.31
PSD02	PSC45	45	Brown/Green	-	0.14	0.17	0.20	0.24	0.28	0.32	0.39
PSD03	PSC45	55	Orange/Green	-	0.16	0.20	0.23	0.28	0.32	0.36	0.44
PSD04	PSC45	70	Red/Green	0.18	0.25	0.30	0.35	0.43	0.49	0.55	0.68
PSD05	PSC45	75	Blue/Green	0.23	0.32	0.39	0.45	0.55	0.64	0.71	0.87
PSD06	PSC45	80	Yellow/Green	0.29	0.41	0.50	0.58	0.70	0.81	0.91	1.11
PSD07	PSC45	85	Green/Green	0.34	0.48	0.58	0.68	0.83	0.95	1.07	1.31
PSD08	PSC45	90	White/Green	0.41	0.58	0.71	0.83	1.01	1.17	1.30	1.60
PSD10	PSC45	95	LimeGreen/Green	0.55	0.78	0.95	1.10	1.35	1.56	1.74	2.13
PSD12	PSC45	100	RoyalBlue/Green	0.67	0.95	1.16	1.34	1.64	1.90	2.12	2.60



Hollow Cone Ceramic 80° (HCC)



The Hollow Cone Ceramic (HCC) spray tips produce finely atomized droplets in a hollow-cone, 80-degree pattern.

- Easily separated, two-piece construction for simple cleaning
- Wide operating pressure range suitable for many applications
- Commonly used in airblast and other high pressure spraying applications

Features	
Common Use	Plant Health
Pattern	Hollow Cone
Technology	Swirl
Material	Ceramic
Spray Angle	80°
Pressure Range	40-350 PSI
Configuration	Quick Change

GPM @ 40 PSI	LPM @ 2.8 BAR	HCC 80 deg. -ASABE droplet classification chart										Quick Change Nozzle
		40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	125 PSI	150 PSI	350 PSI	
		3.0 BAR	3.5 BAR	4.0 BAR	5.0 BAR	5.5 BAR	6.0 BAR	7.0 BAR	8.5BAR	10.0 BAR	24.0 BAR	10 Pack
0.03	0.114	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF	PSHCCQ3
0.04	0.151	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF	PSHCCQ4
0.06	0.227	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF	PSHCCQ6
0.12	0.454	F	VF	VF	VF	VF	VF	VF	VF	VF	VF	PSHCCQ12
0.17	0.644	F	F	F	F	VF	VF	VF	VF	VF	VF	PSHCCQ17



Even Spray (ES) 80°

The Even Spray (ES) tip is an excellent choice for banding and directed post applications. Its even spray pattern should be used when treating bands.

- Commonly used in hand-held applications
- Even spray pattern provides a precise application rate where no spray overlap is desired
- Large range of flow rates available to meet your application requirements

Features	
Common Use	Weeds
Pattern	Even Flat Fan
Technology	Elliptical Orifice
Material	Polyacetal
Spray Angle	80°
Pressure Range	30-60 PSI
Configuration	Tip

GPM @ 40 PSI	LPM @ 2.8 BAR	ES 80 deg. ASABE droplet classification chart				Spray Tips	Caps
		30 PSI	40 PSI	50 PSI	60 PSI		
		2.0 BAR	3.0 BAR	3.5 BAR	4.0 BAR		
0.10	0.4	F	F	F	F	PSES8001	PS90001
0.15	0.60	M	F	F	F	PSES80015	PS900015
0.20	0.80	M	M	F	F	PSES8002	PS90002
0.30	1.20	C	M	M	M	PSES8003	PS90003
0.40	1.60	C	C	M	M	PSES8004	PS90004
0.50	2.00	C	C	C	C	PSES8005	PS90005
0.60	2.40	C	C	C	C	PSES8006	PS90006
0.80	3.20	VC	C	C	C	PSES8008	PS90008
Replacement Cap Gasket							
EPDM PM200040-1							
Viton PM200040V1							



Off-Center (OC)

The Off-Center (OC) flat fan off-center brass spray tip is an economical tip for spraying around obstacles or defining the edge of a spray swath.

- Creates half of a broadcast pattern
- Generally positioned at the end of a boom
- Designed for use with overlapping broadcast patterns to provide precise width control

Features	
Common Use	Unspecialized
Pattern	Off-Center Fan
Technology	Elliptical Orifice
Material	Brass
Spray Angle	80°
Pressure Range	30-60 PSI
Configuration	Tip

GPM @ 40 PSI	LPM @ 2.8 BAR	OC 80 deg.- ASABE droplet classification chart				Spray Tips	Caps
		30 PSI	40 PSI	50 PSI	60 PSI		
		2.068 BAR	2.757 BAR	3.447 BAR	4.136 BAR		
0.20	0.80	M	F	F	F	PSOCB8002	PS90002
0.30	1.20	M	F	F	F	PSOCB8003	PS90003
0.40	1.60	M	M	M	F	PSOCB8004	PS90004
0.60	2.40	C	M	M	M	PSOCB8006	PS90006
Replacement Cap Gasket							
EPDM PM200040-1							
Viton PM200040V1							

Specialty Spray Nozzles

Specialty applications are diverse. John Deere has a broad range of products that are used to fill several of these niche applications. In addition to these, a full line of agricultural and industrial spray products are used in a variety of applications.

- Boomless spraying uses very wide fan pattern tips to cover swaths. These are especially useful in field edges, parks, pastures, forestry, rangeland, aquatic plant management, and rights-of-way.
- Twin pattern sprays are useful for specialty crops and high value crops requiring the best management techniques.
- Acid-resistant tips are especially designed to handle the rigors of agricultural defoliants, particularly those cotton defoliants that require spray components be made from special materials of construction.
- They are chemically resistant to also allow use with pesticides, disinfectants, and odor control agents as well as dust suppression.



Boomless Flat Fan Nozzles – Fence Row/Boomless (XT)



The XT introduces boomless spray technology, enabling spray to be targeted into places that conventional booms and other tips cannot reach. XT delivers a uniform spray pattern over a distance of up to 16 feet. Ideal for weed control in forests and pastureland.

- Ideal for applications where a conventional boom cannot be used due to obstacles
- Common uses include orchard, vineyard, forestry, pasture, turf and golf course spraying, as well as maintaining rights-of-way and fence rows
- Excellent low-drift option while extending spray reach
- Large droplet size reduces spray drift and promotes spray penetration
- Maintains a consistent spray swath over a pressure range of 30-60 PSI
- Standard models with precision-molded polyacetal tip and threaded stainless steel body provide excellent durability and low maintenance

Features	
Common Use	Weeds
Pattern	Boomless Fan
Technology	Pre-Orifice
Material	Stainless or Polyacetal
Spray Angle	105°
Pressure Range	30-60 PSI
Configuration	Stainless, Quick Change

US Units

Tip Size	Pressure (PSI)	Flow Rate (GPM)	Gallons per Acre at swath shown MPH								GAL/1000 ^{ft} ²				Swath (Ft) at 40 PSI 48 in high	Quick Change Polyacetal	Stainless Steel
			4	5	6	8	10	12	15	20	2	3	4	5			
10 (1/4")	30	0.9	8.9	7.1	5.9	4.5	3.6	3.0	2.4	1.8	0.41	0.27	0.20	0.16	13		PSXTIQ10
	40	1.0	9.9	7.9	6.6	5.0	4.0	3.3	2.6	2.0	0.45	0.30	0.23	0.18			
	50	1.1	10.9	8.7	7.3	5.4	4.4	3.6	2.9	2.2	0.50	0.33	0.25	0.20			
	60	1.2	11.9	9.5	7.9	5.9	4.8	4.0	3.2	2.4	0.55	0.36	0.27	0.22			
20 (1/4")	30	0.9	13.6	10.9	9.0	6.8	5.4	4.5	3.6	2.7	0.62	0.42	0.31	0.25	15	PSXTQ20	PSXTIQ20
	40	1.0	16.0	12.8	10.6	8.0	6.4	5.3	4.3	3.2	0.73	0.49	0.37	0.29			
	50	1.1	17.6	14.1	11.7	8.8	7.0	5.9	4.7	3.5	0.81	0.54	0.40	0.32			
	60	1.2	19.2	15.3	12.8	9.6	7.7	6.4	5.1	3.8	0.88	0.59	0.44	0.35			
24 (1/4")	30	0.9	16.2	13.0	10.8	8.1	6.5	5.4	4.3	3.2	0.75	0.50	0.37	0.30	16	PSXTQ24	PSXTIQ24
	40	1.0	18.6	14.9	12.4	9.3	7.4	6.2	5.0	3.7	0.85	0.57	0.43	0.34			
	50	1.1	20.9	16.7	13.9	10.4	8.4	7.0	5.6	4.2	0.96	0.64	0.48	0.38			
	60	1.2	22.4	17.9	15.0	11.2	9.0	7.5	6.0	4.5	1.03	0.69	0.51	0.41			
43 (3/8")	30	0.9	31.6	25.3	21.1	15.8	12.6	10.5	8.4	6.3	1.45	0.97	0.72	0.58	14	PSXTQ43	
	40	1.0	36.7	29.4	24.5	18.3	14.7	12.2	9.8	7.3	1.68	1.12	0.84	0.67			
	50	1.1	41.0	32.8	27.3	20.5	16.4	13.7	10.9	8.2	1.88	1.25	0.94	0.75			
	60	1.2	45.2	36.2	30.2	22.6	18.1	15.1	12.1	9.0	2.08	1.38	1.04	0.83			

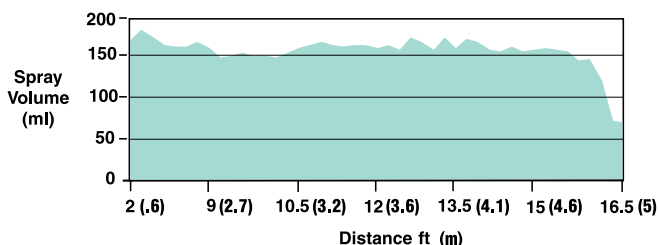
Stainless Replacement Tip Kits - includes gasket, stainless steel insert & polyacetal pattern generator

PSXTIQ10KIT

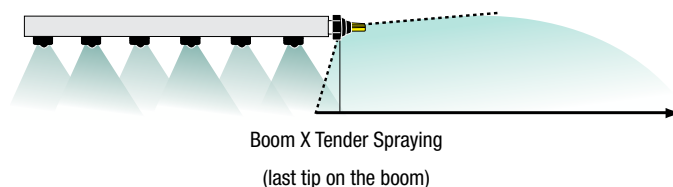
PSXTIQ20KIT

PSXTIQ24KIT

Typical Spray Pattern Produced by XT Series

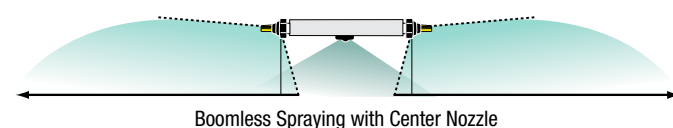
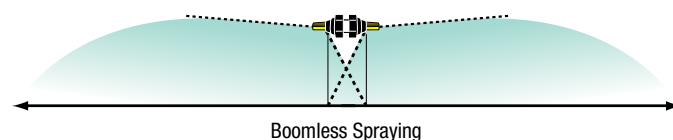
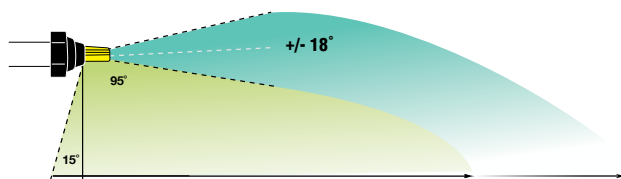


Common Uses of the Boom X Tender Spray Nozzles



Adjustable Swath Width

Swath width can be increased or decreased by adjusting the angle of the tip +/- 18°.



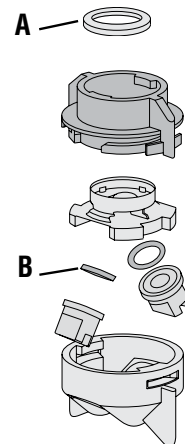


TwinCap™ (TC)

The TwinCap™ is a simple, compact way of accommodating two spray tips back to back. This design allows you to apply the volume per acre you want, at the speed you want, without compromising spray quality.

- Improve control of plant diseases, insects, and difficult weeds
- Twin 30° angles improve canopy penetration
- Combined forward and backward angles enhance coverage on stems and leaves
- Holds any two standard dimension tips, including ULA, LD, LDC, ER, ERI, Flat, and Even tips*
- User can select tips for the most effective spray
- Available in standard Polyacetal or in Gray PVDF for acid sprays

Tips and TwinCap
Parts Breakdown



Part Numbers	
TwinCaps, less tips	
PSTC	Standard cap for agrochemicals
PSTCCR	Gray Acid-resistant cap for defoliants
Replacement Parts	
PM200040-1	Standard cap seal (A)
PM200040V1	Viton cap seal for Acid (A)
PM65MN01113	Standard tip o-ring seal (B)

*Spray tips sold separately



Chemical Resistant 110° (CR)

The Chemical Resistant (CR) is a general spray tip that produces a mixed droplet spectrum over the 30-60 PSI operational pressure range. It is good for broadcast applications.

- Acid-resistant material construction
- Economical option for general spraying
- Simple one-piece design

Features

Common Use	Acid Defoliants
Pattern	Tapered Flat Fan
Technology	Elliptical Orifice
Material	PVDF
Spray Angle	110°
Pressure Range	30-60 PSI
Configuration	Tips

GPM @ 40 PSI	LPM @ 2.8 BAR	CR 110 deg-. ASABE droplet classification chart				Spray Tips
		30 PSI	40 PSI	50 PSI	60 PSI	
		2.068 BAR	2.757 BAR	3.447 BAR	4.136 BAR	
0.20	0.80	F	F	F	F	PSCR1002
0.30	1.20	F	M	M	M	PSCR1003
0.40	1.60	M	M	F	F	PSCR1004
0.50	2.00	M	M	M	M	PSCR1005
0.60	2.40	M	M	M	M	PSCR1006
0.80	3.20	C	C	C	C	PSCR1008
1.00	4.00	C	C	C	C	PSCR1010
1.50	6.00	C	C	C	C	PSCR1015

Spray Tip Only-10 Packs

Ultra Low-drift (ULD)

Spray Tips	Caps	50 Mesh Strainers	Replacement Cap Gasket
10 pack	10 pack	10 pack	40 pack
PSULD20015	PS900015	PS310	PS17000255
PSULD2002	PS90002		
PSULD20025	PS900025		
PSULD2003	PS90003		
PSULD2004	PS90004		
PSULD2005	PS90005		
PSULD2006	PS90006		
PSULD2008	PS90008		

Extended Range (ER)

Spray Tips 80 deg	Spray Tip 110 deg.	Caps	Replacement Cap Gasket
10 pack	10 pack	10 pack	40 pack
PSER80015	PSER10015	PS900015	EPDM - PM200040-1
PSER8002	PSER1002	PS90002	Viton - PM200040V1
PSER8003	PSER10025	PS900025	
PSER8004	PSER1003	PS90003	
PSER8005	PSER1004	PS90004	
PSER8006	PSER1005	PS90005	
	PSER1006	PS90006	
	PSER1008	PS90008	
	PSER1010	PS90020	
	PSER1015	PS90020	

Low-drift Air (LDA)

Spray Tips	Caps	Replacement Cap Gasket
10 pack	10 pack	40 pack
PSLDA10015	PS900015	EPDM - PM200040-1
PSLDA1002	PS90002	Viton - PM200040V1
PSLDA10025	PS900025	
PSLDA1003	PS90003	
PSLDA10035	PS900035	
PSLDA1004	PS90004	
PSLDA1005	PS90005	

Extended Range Stainless Steel 80 (ERI)

Spray Tips 80 deg	Caps	Replacement Cap Gasket
10 pack	10 pack	40 pack
PSERI8001	PS90001	EPDM - PM200040-1
PSERI80015	PS900015	Viton - PM200040V1
PSERI8002	PS90002	
PSERI8003	PS90003	
PSERI8004	PS90004	
PSERI8005	PS90005	
PSERI8006	PS90006	
PSERI8008	PS90008	
PSERS8010	PS90020	
PSERS8015	PS90020	

Ultra Low-drift Ceramic(ULAC)

Spray Tips	Caps	Replacement Cap Gasket
10 pack	10 pack	40 pack
PSULAC1001	PS90101	EPDM - PM200040-1
PSULAC10015	PS901015	Viton - PM200040V1
PSULAC1002	PS90102	
PSULAC10025	PS901025	
PSULAC1003	PS90103	
PSULAC1004	PS90104	
PSULAC1005	PS90105	
PSULAC1006	PS90106	
PSULAC1008	PS90108	
PSULAC1010	PS90020	

Extended Range Ceramic 110-(ERC)

Spray Tips	Caps	Replacement Cap Gasket
10 pack	10 pack	40 pack
PSERC10015	PS900015	EPDM - PM200040-1
PSERC1002	PS90002	Viton - PM200040V1
PSERC1003	PS90003	
PSERC1004	PS90004	
PSERC1005	PS90005	
PSERC1006	PS90006	

Spray Nozzle Caps, Adapters



John Deere caps provide trouble-free spray tip installation and sealing on nozzle bodies and several other common makes.

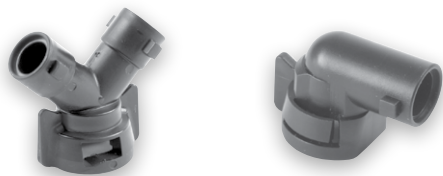
- Color-coded to ISO standards for nozzle flow to simplify tip selection and identification in the field
- Available in configurations optimized to fit a variety of spray tip geometries
- Caps for fan pattern tips automatically align tips for enhanced spray uniformity



	ISO Standard Fan	European Fan (Thick body)	Standard Round (Non-aligning)	Shut-off	Threaded	Push to Connect	Push to Connect	
Fits:	ULD*, LDC, LDA, LD, ER, ERI, OC, FF, ES, ERC	ULAC	FL	Blank	ST 1/4" MNPT	1/4" w/ gasket	3/8" w/ gasket	Std. Pack
Black	PS90020	PS90120	PS90420	PS90920	PS91020	PM42000060	PM42000061	10
Orange	PS90001	PS90101	PS90401	-	-	-	-	10
Green	PS900015	PS901015	PS904015	-	-	-	-	10
Yellow	PS90002	PS90102	PS90402	-	-	-	-	10
Lilac	PS900025	PS901025	PS904025	-	-	-	-	10
Blue	PS90003	PS90103	PS90403	-	-	-	-	10
Dark Red	PS900035	-	-	-	-	-	-	10
Red	PS90004	PS90104	PS90404	-	-	-	-	10
Brown	PS90005	PS90105	PS90405	-	-	-	-	10
Gray	PS90006	PS90106	PS90406	-	-	-	-	10
White	PS90008	PS90108	PS90408	-	-	-	-	10
Included EPDM seal	PM200040-1	PM200040-1	PM200040-1	-	PM200040-1	PM200040-1	PM200040-1	40
Included Nitrile seal	-	-	-	PM65BS205	-	-	-	10
Separate Viton seal	PM200040V1	PM200040V1	PM200040V1	-	PM200040V1	-	-	40

*PS17000255 (split gasket EPDM) is recommended for ULD nozzle

Elbow and Double Adapters for Spray Tip Cap



Part #	Description
PM40291601	45 Double w/ Gasket 6 pack
PM40291401	90 Elbow w/ Gasket 6 pack

Hardi and Jacto Adapters



Part #	Adapters For	Description
PM99500024	Hardi*	6 pack of adapters for converting nozzle body to accept John Deere cap
PM99500027	Jacto**	

* Hardi is a registered trademark of Hardi International A/S.

** Jacto is a registered trademark of Jacto Inc.

Nozzle Strainers



- High quality components and manufacturing ensure reliable spraying in any situation
- Ball check models feature stainless steel screens and springs, nitrile balls, polyacetal structure
- Premium polypropylene tip strainers feature precise straining with more flow
- Strainers snap on the back of Ultra Low-drift tips for reliable, on-target spraying
- International standard colors denote mesh size

General Strainer Recommendations		
Tip Flow Rate at 40 PSI	Strainer Mesh	Example Fan Tip Size
Less than 0.10	200	005-0067
0.10-0.39	100	01-035
0.40-0.79	50	04-06
0.80-2.00	25	08-20



	Premium Polypropylene Flow Tip Strainer		Premium Flow Polypropylene Guardian™ & GuardianAIR Twin Tip Strainer		Slotted Nylon Tip Strainer	Stainless Steel Tip Strainer with Check	
Part Number	PS310	PS311	PS0250	PS02100	PS735089	PS0450	PS04100
ISO Color	Blue	Green	Blue	Green	Black	Blue	Green
Mesh	50	100	50	100	25	50	100

Spray Tip Calibration & Training Tools



Reference Number	Description	Part Number
1	34 oz. Calibration Jug	PM99500022
1	100 oz. Calibration Jug	PM99500023
2	Spray Tip Calibration pressure gauge	PMTESTKIT
3	SpotOn SC-1 Calibrator-.02-1.00 GPM	PM23890
4	SpotOn SC-4 Calibrator-.07-4.00 GPM	PM24200

Sprayer Calibration



Improperly calibrated sprayers threaten the wallet and the environment. A few minutes spent calibrating a sprayer can ensure expensive inputs go where they are supposed to and at their recommended rate. Proper calibration exposes under-pressured systems and worn tips that can sabotage a spray program and its budget. Follow these steps to calibrate your sprayer safely and effectively.

1. The first step in any calibration effort is to check sprayer/tractor speed. Mark off lengths of 100 and 200 ft. for measuring sprayer/tractor speeds of 5 mph and 10 mph, respectively. Fill the sprayer tank half full of water, select the engine throttle setting and gear that you expect to use when spraying, and then record the seconds required to drive the length of each course twice at their respective settings. Average the results of each set, and use the following equation to determine ground speed.

$$\text{Speed} = \frac{\text{Distance (ft.)} \times 60}{\text{Time (sec.)} \times 88}$$

Repeat the test as needed until the correct speed is identified. Mark that setting on the tachometer or speedometer for infield reference.

2. Record the nozzle spacing, nozzle type, ground speed and product label application rate. Check to ensure all nozzles are of a uniform type.

3. Multiply the application rate (gpa) by the speed (mph) and the width of the spray pattern (w)*. Divide this amount by 5940 (a constant) to determine the gallons per minute (gpm) produced by each nozzle.

$$\text{Flow required per nozzle (gpm)} = \frac{\text{gpa} \times \text{mph} \times \text{w}}{5940}$$

4. To set correct pressure, operate the water filled sprayer in place to check for leaks and stoppages. Stop the sprayer, and replace one tip on the boom with an identical new tip and strainer. Check the tip product information sheet for recommended delivery rate and pressure that matches the gpm level calculated in Step 3.

Engage the sprayer and adjust for recommended pressure. Collect the volume of spray produced from the new nozzle tip over a one minute period. Measure the water, and fine tune the pressure setting until the calculated delivery rate is reached.

5. Repeat the collection procedure with several tips on each boom section. If variations in flow in excess of 10% are produced from more than one tip, replace all old tips and screens.

*If calibrating a sprayer for broadcast application, use nozzle spacing for spray pattern width. If calibrating for banding, use only actual spray pattern in inches (12 bands of 10" each on 30" rows equals spray pattern width of 120" on a 30' boom).

Directed applications with multiple nozzles require that the row or band in inches be divided by the number of nozzles directed at the row to calculate width.

$$\text{Width of Spray Pattern in Directed Applications} = \frac{\text{band width}}{\text{\# of nozzles per band}}$$

Spraying Solutions other than Water

Liquids that are more dense than water will flow through a spray tip more slowly than water. Solutions that are less dense than water will flow through a spray tip more quickly than water. Unless otherwise indicated, the performance tables in the spray tip section of this catalog show flow and application rates for water-based sprays. To use those tables when selecting tips to apply non-water sprays you must calculate an intermediate "look-up" application rate. To do this you will multiply your actual desired application rate by a conversion factor and then use the resulting "look-up" figure to select a tip from the water-based performance tables. The conversion factors listed on this page are based on typical values for common fertilizer solutions. For other spray solutions, you can calculate the conversion factor by taking the square root of the solution's specific gravity.

U.S. Units

Density (lb/us gal)	Material	Specific Gravity	Conversion Factor
7.00		0.84	0.92
8.00		0.96	0.98
8.34	water	1.00	1.00
9.00		1.08	1.04
10.00		1.20	1.10
10.30	4-10-10	1.24	1.11
10.65	28-0-0	1.28	1.13
11.00		1.32	1.15
11.05	32-0-0	1.32	1.15
11.20	7-21-7	1.34	1.16
11.65	10-34-0	1.40	1.18
12.00		1.44	1.20

Example:

Your desired application rate of 28% Nitrogen fertilizer (28-0-0) is 30 US GPA.

Multiply 30 GPA by Conversion Factor 1.13 to find the converted look-up application rate of 33.9 GPA.

Select a spray tip that will apply 33.9 GPA of water-based spray. A spray tip that will apply 33.9 GPA of water will apply 30 GPA of 28-0-0 fertilizer solution.

Metric

Density (kg/L)	Material	Conversion Factor
0.80		0.89
0.90		0.95
1.00	water	1.00
1.10		1.05
1.20		1.10
1.24	4-10-10	1.11
1.28	28-0-0	1.13
1.30		1.14
1.32	32-0-0	1.15
1.34	7-21-7	1.16
1.40	10-34-0	1.18
1.50		1.22

Example:

Your desired application rate of 28% Nitrogen fertilizer (28-0-0) is 300 L/ha.

Multiply 300 L/ha X Conversion Factor 1.13 to find the converted look-up application rate of 339 L/ha.

Select a spray tip that will apply 339 L/ha of water-based spray. A spray tip that will apply 339 L/ha of water will apply 300 L/ha of 28-0-0 fertilizer solution.

Broadcast Application Formulas

US Standard

Application Formulas – US Standard

GPM – Gallons per minute (per spray tip)

GPA – Gallons per acre

GAL/1000FT² – Gallons per 1000 square feet

MPH – Miles per hour

- W
- Tip spacing (inches) for broadcast spraying
 - Spray width (inches) for single-tip band spraying or boomless spraying
 - Row spacing (inches) divided by the number of tips per row for directed spraying

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5,940}$$

$$\text{GPM} = \frac{\text{GAL}/1000\text{FT}^2 \times \text{MPH} \times \text{W}}{136}$$

$$\text{GPA} = \frac{5,940 \times \text{GPM}}{\text{MPH} \times \text{W}}$$

$$\text{GAL}/1000\text{FT}^2 = \frac{136 \times \text{GPM}}{\text{MPH} \times \text{W}}$$

Metric

Application Formulas – Metric

LPM – Litres per minute (per spray tip)

L/ha – Litres per hectare

Kmph – Kilometres per hour

- W
- Tip spacing (m) for broadcast spraying
 - Spray width (m) for single-tip band spraying or boomless spraying
 - Row spacing (m) divided by the number of tips per row for directed spraying

$$\text{LPM} = \frac{\text{L/ha} \times \text{Kmph} \times \text{W}}{600}$$

$$\text{L/ha} = \frac{600 \times \text{LPM}}{\text{Kmph} \times \text{W}}$$

Band Spraying

US Standard

Volume of Chemical Solution = Required in Gallons	Band Width (inches) [Band Width + Spacing between Bands] (inches)	Label Rate X of Carrier (GPA)	Field X Area (Acres)
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Height Requirement – Band Spraying

Band Width	Height over Target 80°	Height over Target 110°
8"	5"	3"
10"	6"	4"
12"	7"	4"
15"	9"	5"
18"	11"	6"
20"	12"	7"
30"	18"	11"

To find GPA in the band, use the following equation:

$$\text{Band GPA} = \frac{5940 \times \text{GPM} \times \text{N}}{\text{MPH} \times \text{W}}$$

GPM needed per Tip:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940 \times \text{N}}$$

Treated Area Per Field For Banding Applications US Standard

Row Spacing in Inches	Band Width						
	7"	8"	10"	12"	15"	20"	24"
20"	0.350	0.400	0.500	0.600	0.75	1.000	
22"	0.318	0.363	0.454	0.545	0.681	0.909	
30"	0.233	0.266	0.333	0.400	0.500	0.666	0.800
36"	0.194	0.222	0.278	0.333	0.416	0.555	0.666
40"	0.175	0.200	0.250	0.300	0.375	0.500	0.600
48"	0.145	0.166	0.208	0.250	0.321	0.417	0.500

GPA = Gallons per acre

GPM = Gallons per minute

MPH = Speed in miles per hour

W = Band width in inches

N = Number of tips spraying each band

Metric

Volume of Chemical Solution = Required in Litres	Band Width (m) [Band Width + Spacing between Bands] (m)	Label Rate X of Carrier (L/ha)	Field X Area (ha)
--	---	--------------------------------------	-------------------------

Height Requirement – Band Spraying

Band Width	Height over Target 80°	Height over Target 110°
20 cm	12 cm	7 cm
25 cm	15 cm	9 cm
30 cm	18 cm	11 cm
40 cm	24 cm	14 cm
45 cm	27 cm	16 cm
50 cm	30 cm	18 cm
75 cm	45 cm	26 cm

To find the L/ha in the band, use the following equation:

$$\text{Band L/ha} = \frac{600 \times \text{LPM} \times \text{N}}{\text{Kmph} \times \text{W}}$$

LPM needed per Tip:

$$\text{LPM} = \frac{\text{L/ha} \times \text{Kmph} \times \text{W}}{600 \times \text{N}}$$

Treated Area Per Field For Banding Applications Metric

Row Spacing in cm	Band Width						
	18 cm	20 cm	25 cm	30 cm	38 cm	50 cm	60 cm
50 cm	0.360	0.400	0.500	0.600	0.760	1.000	
60 cm	0.300	0.333	0.417	0.500	0.633	0.833	1.000
75 cm	0.240	0.267	0.333	0.400	0.507	0.667	0.800
90 cm	0.200	0.222	0.278	0.333	0.422	0.556	0.667
100 cm	0.180	0.200	0.250	0.300	0.380	0.500	0.600
120 cm	0.150	0.167	0.208	0.250	0.317	0.417	0.500

L/ha = Litres per hectare

LPM = Litres per minute

Kmph = Speed in kilometres per hour

W = Band width in metres

N = Number of tips spraying each band

Accessories

John Deere offers a wide variety of spraying components to suit your needs. From nozzle bodies, strainers and valves to control units, John Deere has the components to suit your application needs.



Nozzle Bodies

Nozzle Bodies with the Highest Flow Rates in the Industry

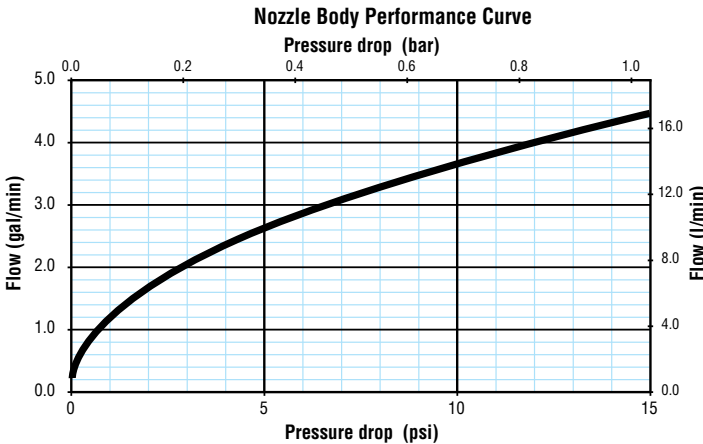


BENEFITS

- Designed to deliver the highest flow rates across the spraying pressure range
- Unique DCV (diaphragm check valve) design reduces restrictions in the flow path, enabling 2.6 gpm with a 5 psi pressure drop through the nozzle
- Supports faster field speeds with the same coverage and supports direct fertilizer application through the nozzle body DCV flow path
- Turret-indexing design provides improved consistency and reliability throughout the life of the nozzle body – eliminating free spinning and seizing problems seen on competitive nozzle bodies
- Automatic spray alignment using flat fan spray tips
- Compact design makes mounting easier with less potential interference with the spray boom structure
- Nozzle bodies come standard with an 8 psi (.55 bar) diaphragm check valve. 4 psi, 12 psi, 20 psi, and 25 psi checks are available as options.

FEATURES

- Three turret styles for an easy change of spray tips: single, 3-way, and 5-way
- Provides lowest pressure drop at any given flow in the industry
- 2.6 gpm (9.84 LPM) with a 5 psi (.345 BAR) pressure drop for standard body
- 5.0 gpm (18.92 LPM) with a 5 psi (.345 BAR) pressure drop for high-flow body (AN206621)
- Available in wet or dry boom versions
- Positive shutoff between each spray position



High-flow nozzle bodies



Part number	Description
AN206621	Nozzle body, high-flow, 5-position, 11/16-in port, Viton seals
PMHF12DCVV	12-psi check valve with Viton diaphragm (16 open / 12 close)
PMHF15DCVV	15-psi check valve with Viton diaphragm (22 open / 15 close)

Viton is a registered trademark of DuPont Dow Elastomers.

3- and 5-Way Nozzle Bodies for Wet Boom (no tab for boom clamp)



Seal Option/ Housing Reference	Turret Options	(to clamp on) Pipe Size	
		3/4"	1"
Viton/Green	3	AN206179	AN305431
	5		AN305432

Single Drop Nozzle Body for Wet Boom



Seal Option/ Housing Reference	(to clamp on) Pipe Size		
	1/2"	3/4"	1"
EPDM/Red	PM745	PM755	PM765

Nozzle Bodies

3- and 5-way Nozzle Bodies with Tab for Boom Clamp



Seal Option/ Housing Reference	Turret Options	(to clamp on) Pipe Size		
		½"	¾"	1"
EPDM/Red	3	PM42W7	PM42Y7	PM42K7
	5		PM49Y7	PM49K7

Dry Boom Adapters for Wet Boom Nozzle Bodies



Part Number	Type	Clamp Size	Hose Barb
PM6413	Single	½" Pipe	½"
PM6519	Single	¾" Pipe	¾"
PM6525	Single	¾" Pipe	1"
PM6619	Single	1" Pipe	¾"
PM6625	Single	1" Pipe	1"
PM7413	Double	½" Pipe	½"
PM7519	Double	¾" Pipe	¾"
PM7525	Double	¾" Pipe	1"
PM7619	Double	1" Pipe	¾"
PM7625	Double	1" Pipe	1"

Hose Barb Dry Boom Nozzle Bodies-with DCV



Single hose barb P/N	Double hose barb P/N	Triple hose barb P/N	Hose ID
PM413211	PM413221	PM413231	¾"
PM413212	PM413222	PM413232	½"
PM413213	PM413223	PM413233	¾"

Hose Barb Dry Boom Nozzle Bodies-with Top-Mounted DCV



Seal Option/ Housing Reference	Single hose barb P/N	Double hose barb P/N	Hose ID
	PM413411	PM413421	¾"
EPDM/Red	PM412	PM422	½"
	PM413	PM423	¾"

Threaded Single Nozzle Bodies-with DCV



Seal Options/ Housing Reference	1/4" MNPT x 1/4" FNPT
	8 PSI
EPDM/Red	PM402CPV01

Push-to-Connect Nozzle Bodies & Caps



Push-to-Connect (PTC) Cap Part Numbers		
Type	Size	1 pack
Caps	1/4"	PM42000060
	3/8"	PM42000061

Includes gasket

Push-to-Connect (PTC) Nozzle Body Part Numbers			
Type	DCV	4 PSI	8PSI
	Size	1 Per Bag	1 Per Bag
PTC to Bayonet	1/4"	PM4247NB119	PM4247NB129
	3/8"	PM4247NB111	PM4247NB121
PTC to PTC	1/4"	PM4247NC119	PM4247NC129
	3/8"	PM4247NC111	PM4247NC121

Hose Barb Dry Boom Nozzle Bodies-No DCV



Single hose barb P/N	Double hose barb P/N	Triple hose barb P/N	Hose ID
PM111	PM121	PM413131	¾"
PM112	PM122	PM413132	½"
PM113	PM123	PM413133	¾"

EXPRESS Nozzle Body End Caps and Fittings

Conventional boom designs trap air in the boom causing a delay from the close signal to when spray actually stops. The Express nozzle body end caps include a passive feature that eliminates the trapped air by allowing the air to escape through the nozzle body. When the boom is completely filled with liquid, the nozzle body's diaphragm check valve (DCV) activation time is greatly improved, by as much as 85%. The Express nozzle body end cap supports today's practice of Precision Agriculture by enabling standard nozzle bodies to have much quicker reaction times in response to GPS boom shut-off control signals, turning off spray quickly and decisively on overlaps, end rows, and boundary areas.

The Express nozzle body end cap improves solution system hygiene by removing the 'dead-zone' on the end of boom pipes, reducing the risk of air and residue accumulation. The removable plug end allows easy access for manual boom pipe cleanout. Proper spray system hygiene is still required.



Express™ Nozzle Body End Cap



Part Number (1 per Bag)	Description	End Cap Plug Kit
PM74333314 = High Flow	1" Express™ fitting with nozzle body end cap that allows trapped air to escape through the nozzle body	PM74332514
PM74333316 = Standard Flow		PM74332600
PM34300790	Clamp and Hardware Kit with Pipe O-rings for high flow and standard	

Express™ Nozzle Body End Cap Retrofit Kit



Part Number	Description	Cutting Jig Material
PM34100043 - High Flow	Kit includes machinist-quality drill bit, drilling and cutting jig for 1" pipe, Emery cloth, and instructions to retrofit conventional wet boom spray pipe for Express nozzle body end caps.	Aluminum
PM34100044 - Standard Flow		

Express™ Wet Boom Fittings



Part Number (1 per Bag)	Description	Ref #
PM74332502	Express Fitting X 1" Universal Flange Straight	1
PM74332503	2 Express Fitting X 1" Universal Flange Tee	2
PM74332608	Express Fitting X 1" Hose Barb Straight	3
PM74332610	Express Fitting X 1" Hose Barb Elbow	4
PM74332613	Express Fitting X 1" Male Cam Lock Straight	5

For high quality sealing to flange fitting, use Hypro's Universal Flange Gasket.

Nozzle Body Accessories

Replacement Check Valve (DCV) includes Flynut, Housing and Spring



Housing Reference	Spring Pressure (PSI)/Plunger Reference Color				
	4 PSI/Orange	8 PSI/Black	12 PSI/Yellow	20 PSI/Gray	25 PSI/Blue
Red	PM4DCVAE	PM8DCVAE	PM12DCVAE	PM20DCVAE	PM25DCVAE
Green	PM4DCVAV	PM8DCVAV	PM12DCVAV	PM20DCVAV	PM25DCVAV

Red housing indicates for use with EPDM Seals. Green housing indicates for use with Viton Seals.
Note: Diaphragm seals are sold separately.

Replacement Diaphragm Seal Options for check valves



Option	Part Number	Color Reference
EPDM	PM03610	Black
Viton	PM036V10	Green

* 8 PSI Diaphragm check valve unless otherwise noted.

11/16" UN Nozzle Bodies



Reference Number	Standard Pack	Description	Poly Part Number
1	6	1 1/16" - 16UN(M) X 3/8" HB Elbows	PM3NTL38
1	6	1 1/16" - 16UN(M) X 1/2" HB Elbows	PM3NTL12
2	6	1 1/16" - 16UN(M) X 3/8" HB Tees	PM3NTT38
2	6	1 1/16" - 16UN(M) X 1/2" HB Tees	PM3NTT12

Includes B12/3B12 nut.

Nozzle Body Cap



Reference Number	Standard Pack	Description	Nylon Part Number	Poly Part Number
1	6	1 1/16" - 16UN(F) Nozzle blank cap		PM33942
2	6	1 1/16" - 16UN(F) Nozzle cap for tip/barb	PM8027H	PM38027

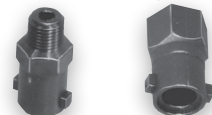
* Fits all nozzle fittings with 1/16" male straight thread.

Hose Drops



Part Number	Length	Description Outlet, Inlet
PM430201	15"	1/4" NPT, Quick Attach Fitting
PM430202	24"	1/4" NPT, Quick Attach Fitting
PM430201V	15"	1/4" NPT, Quick Attach Fitting with Viton
PM430202V	24"	1/4" NPT, Quick Attach Fitting with Viton

Quick Fitting Adapters



Part #	Description
PM400270N	1/4" MNPT x Quick Attach
PM400275N	1/4" FNPT x Quick Attach

Series 404 Swivel and Threaded-Swivel Nozzle Bodies



Part Number	Description
PM404072N	Single Swivel 1/4" FNPT X Quick Attach
PM404172N	Double Swivel 1/4" FNPT X 2 Quick Attach
PM4074N	Single 1/4" FNPT X 1 1/16" - 16UN(M)
PM4174N	Double 1/4" FNPT X 1 1/16" - 16UN(M)

Vari-Spacing Clamps



Part Number	Ball Thread	Piping/Tubing O.D.
PM003	Steel	3/4" Round Pipe (1.050")
PM004	Steel	1" Round Pipe (1.315")
PM005	Steel	1-1/4" Round Pipe (1.660")
PM1075SS	Steel	3/4" Square Tubing
PM1100SS	Steel	1" Square Tubing
PM1125SS	Steel	1-1/4" Square Tubing
PM1150SS	Steel	1-1/2" Square Tubing

* By pipe, dimensions refer to I.D. (inner diameter).

Steel Boom Clamps for use with 11/16" MPS Nozzle Bodies



Part Number	Description
PMBC34R	3/4" Round Pipe
PMBC100R	1" Round Pipe
PMBC100	1" Square
PMBC114	1-1/4" Square

* Dimensions refer to I.D. (inner diameter).

Gauges

SG Series Dry 1½", 2", 2½" and 4" Gauges



PSI only Plastic case

- Movement: Brass
- Bourdon Tube: C Shaped in copper alloy up to 600 psi and Helical in phosphor bronze over 600 psi
- Pointer: Black-enameled aluminum

This series is designed for use with air, gas, oil, and water or any medium not corrosive to brass or bronze.

Order Information

Part Number	PSI Range	Dial Size	Stem Size
PMSG60	0-60	2½"	¼" LM
PMSG100	0-100		
PMSG200	0-200		
PMSG604	0-60	4"	¼" LM
PMSG1004	0-100		
PMSG2004	0-200		

- Dial: White aluminum
- Window: Acrylic
- Connection: ¼" NPT standard on 2½", & 4" sizes
- Accuracy: ASME/ANSI B40.1 Grade B (3-2-3%)

GG Series Glycerin-Filled 2½" and 4" Gauges



PSI only
304 Stainless Steel Case

- Movement: Brass
- Bourdon Tube: Phosphor bronze
- Pointer: Black-enameled aluminum
- Dial: White background

This series is designed for use with air, gas, oil, and water or any medium not corrosive to brass or bronze. Liquid-filled gauges are recommended for reducing shock waves caused by pressure or vibration fluctuations.

Order Information

Part Number	PSI Range	Dial Size	Stem Size
PMGG60	0-60	2½"	¼" LM
PMGG100	0-100		
PMGG200	0-200		
PMGG400	0-400		
PMGG600	0-600		
PMGG2000	0-2000		
PMGG3000	0-3000		
PMGG4000	0-4000		
PMGG5000	0-5000		

- Window: Acrylic
- Liquid Fill: 99.5% pure virgin Glycerin
- Connection: ¼" NPT Brass connection
- Accuracy: ASME/ANSI B40.1 Grade B (3-2-3%)

ASG Series Dry 2½" and 4" Gauges



2½" Gauges
Single Scale - PSI only
Enameled steel case

- Movement: Stainless Steel tube
- Pointer: Black-enameled aluminum
- Dial: White background

This series is designed especially for use with ammonia.

Order Information

Part Number	PSI Range	Dial Size	Stem Size
PMASG60	0-60	2½"	¼" LM
PMASG160	0-160	2½"	¼" LM

- Window: Polycarbonate
- Connection: ¼" NPT Standard
- Accuracy: ASME/ANSI B40.1 Grade B (3-2-3 %)

Adjustable Pattern Spray Guns

PM33810036

- Adjustable pattern spray gun
- 19" barrel
- 3mm nozzle
- 3/8" hose barb

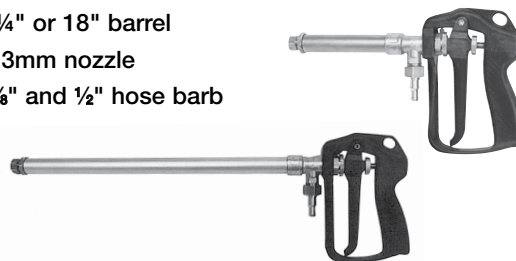


Order Information

Part Number	Max PSI	Max GPM
PM33810036	120	2.5

PM33810043 & PM33810043L

- Adjustable pattern spray gun
- 7 1/4" or 18" barrel
- 2.3mm nozzle
- 3/8" and 1/2" hose barb



Order Information

Part Number	Barrel Length	Max PSI	Max GPM
PM33810043	7 1/4"	600	4.5
PM33810043L	18"	600	4.5
PM26170369	Replacement Barrel for 3381-0043		
PM35170367	Replacement Barrel for 3381-0043L		
PM34300435	Repair Kit		

Spray Gun Nozzles for PM33810043 and PM33810043L Guns

Part no.	Orifice	Performance	45 PSI		100 PSI		150 PSI		200 PSI		300 PSI		450 PSI		600 PSI	
			Cone	Straight	Cone	Straight	Cone	Straight	Cone	Straight	Cone	Straight	Cone	Straight	Cone	Straight
PM61180247	1.5mm	GPM spray angle throw, ft	0.40 32° 3.9	0.50 - 11.5	0.62 35° 6.5	0.80 - 23.0	0.73 45° 8.2	0.93 - 23.0	0.95 45° 8.2	1.25 - 24.0	1.00 42° 8.2	1.30 - 24.5	1.30 42° 8.2	1.70 - 26.0	1.50 42° 10.0	1.95 - 28.0
PM61180268	2.3mm	GPM spray angle throw, ft	0.90 40° 4.9	1.40 - 16.5	1.30 42° 6.5	1.90 - 24.5	1.50 55° 10.0	2.30 - 32.0	2.00 55° 10.0	3.20 - 35.0	2.10 55° 10.0	3.30 - 36.0	2.70 53° 9.8	4.10 - 38.0	3.10 51° 10.5	4.80 - 39.0
PM35180256	4.0mm	GPM throw, ft					1.9 10	3.4 36			4.6 10	8.0 38	5.5 10	9.5 40	6.3 12	11.0 40

PM33810010

- Adjustable pattern spray gun
- 17"
- 3mm or 4mm nozzle
- 1/2" MNPT inlet



Order Information

Part Number	Barrel Length	Nozzle	Max PSI	Max GPM
PM33810010	17"	3mm	1200	25
PM9920KIT10	Repair Kit			

PM33810013

- Adjustable pattern spray gun
- 7" barrel
- 3mm nozzle
- 1/2" MNPT inlet



Order Information

Part Number	Max PSI	Max GPM
PM33810013	700	19
PM34300461	Repair Kit	

Tree Spraying Guide Diaphragm Pump Gas Engine Applications

Spray Height	Pump/Engine Model	Engine	Shaft	Spray Gun	Nozzle
30-35 ft.	9910-D252GRGI58 (w/o engine) 9910-D252GRGI (w/o engine) D252GRGI-25 (w/2.5 hp PowerPro™) D252GRGI-55 (w/5.5 hp PowerPro™) 6 GPM; 290 PSI	Min. 2.5 hp SAE j609a flange mount	5/8" 3/4" 5/8" 3/4"	PM33810010 or PM33810013	PM33853000
35-40 ft.	9910-D30GRGI (w/o engine) D30GRGI-65 (w/6.5 hp PowerPro™) D30HRGI-65 (w/6.5 hp PowerPro™) D30HRGI-65E (w/6.5 hp PowerPro™) 9.5 GPM; 580 PSI	Min. 5.0 hp SAE j609a flange mount	3/4" 3/4" 3/4" 3/4"	PM33810010 or PM33810013	PM33853000

All GRGI pump models come complete with gear reduction and control valve.

Pumps

Because the pump is literally the “heart of the liquid system” on equipment, careful consideration must be made in selecting the right pump. Seldom is there only one pump that will do the job. To make a wise choice, you will need to know about pump types, how the pump is to be driven, and the flow and pressure requirements for your specific spraying system and application.

To ensure you can closely match the pump to your needs, John Deere offers two different types of pumps: centrifugal and roller pumps.



Selecting the Right Pump

Because the pump is the “heart of the liquid system” on equipment, careful consideration must be made in selecting the right pump. Seldom is there only one pump that will do the job. To make a wise choice, you will need to know about pump types, how the pump is driven, and the flow and pressure requirements for your specific spraying system and application.

“Positive displacement” vs. “Non-positive displacement”

Pumps can be divided into two general categories: “positive displacement” and “non-positive displacement.”

Positive Displacement – In a positive displacement pump the flow from the pump is directly proportional to the pump speed. Liquid is captured and discharged as a fixed volume per revolution of the pump shaft. This positive flow is why all positive displacement pump installations must include a relief valve and bypass line between the pump outlet and the nozzle shut-off valve. Roller, diaphragm, piston and plunger pumps are positive displacement pumps.

Non-positive Displacement – In a non-positive displacement pump a rotating impeller creates a centrifugal force that overcomes the restriction of liquid flow through the system. If the outlet is closed, the impeller continues to rotate harmlessly without damaging system components. Centrifugal and transfer pumps are non-positive displacement pumps.

Centrifugal Pumps -Spray & Transfer Applications (non-positive displacement)

In centrifugal pumps, liquid enters through the center of a rotating impeller that is driven at speeds up to 6000 RPM. Liquid is forced to the outer edge of the housing; this centrifugal force is what delivers the liquid to the nozzle.

Traditionally thought of as low to medium pressure pumps, centrifugal pumps can deliver from 0-150 psi (0-10 bar) and flow rates up to 440 gpm (1760 lpm).

Centrifugal pumps have minimum surfaces to wear and no valves, making them very durable, easy to maintain and well suited for pumping abrasive and corrosive materials. Because centrifugal pumps operate at higher speeds than the RPMs of a tractor PTO, the speed must be increased through a gear drive, belt drive, gas engine drive, or high-speed hydraulic motor drive. Pump models are specifically designed for each of these drive applications. The broad, versatile line includes models with rugged housings and components of cast iron, polypropylene, engineered plastics and stainless steel that endure the wide variety of agricultural chemicals.



Selecting the Right Pump

Roller Pumps (positive displacement)

Roller pumps are an economical choice by farmers throughout the world. The rollers revolve inside the pump housing to force spray solution through the pump which then develops pressure and flow. The roller pump offers a compact design with mechanical simplicity to provide a low initial cost pump that is extremely versatile. They operate efficiently at PTO speeds of 540 and 1000 rpm and have a wide pressure range of up to 300 psi (20 bar) and flow rates of 2 to 62 gpm (7 to 235 lpm). Roller pumps are self-priming and easily adapt to PTO or gas engine drives. Specific seal, roller and casting materials can be selected for compatibility with certain herbicides, pesticides, fungicides and fertilizers.



John Deere Pumps Identification Coding

John Deere uses serialized labeling to enable users to precisely identify the pump when ordering parts or requesting warranty service. Following is an example.

John Deere
MODEL
PM6500XL
03251 10005
SERIAL NO.
PATENTED

First line: Model Number

Second line: Serial Number

First & second digit:
year (03=2003)

Third through fifth digits:
consecutive day of the year
the pump was manufactured.

Sixth digit: shift the pump
was built on.

Seventh through tenth digits:
consecutive pump number
built on the shift.



Selecting the Right Pump

Pump Drives

How a pump is to be driven is often a primary consideration in selecting the proper type of pump. If the power source has already been determined, the following chart may be of further help in selecting the type of John Deere pump that is best suited to your needs.

You can use these pump types:

If your power source is:		Roller	Centrifugal
540 rpm PTO	direct coupled:	✓	
	through gear drive:		✓
	through belt/pulley:		✓
1000 rpm PTO	direct coupled:	✓	
	through gear drive:		✓
	through belt/pulley:		✓
Hydraulic Motor		✓	✓
12 Volt DC Motor		✓	✓
Gas Engine	direct coupled:	✓	✓
	through gear reduction:	✓	
	through belt/pulley:	✓	✓
Electric Motor	direct coupled:	✓	✓
	through belt/pulley:	✓	✓

Pump shaft rotation

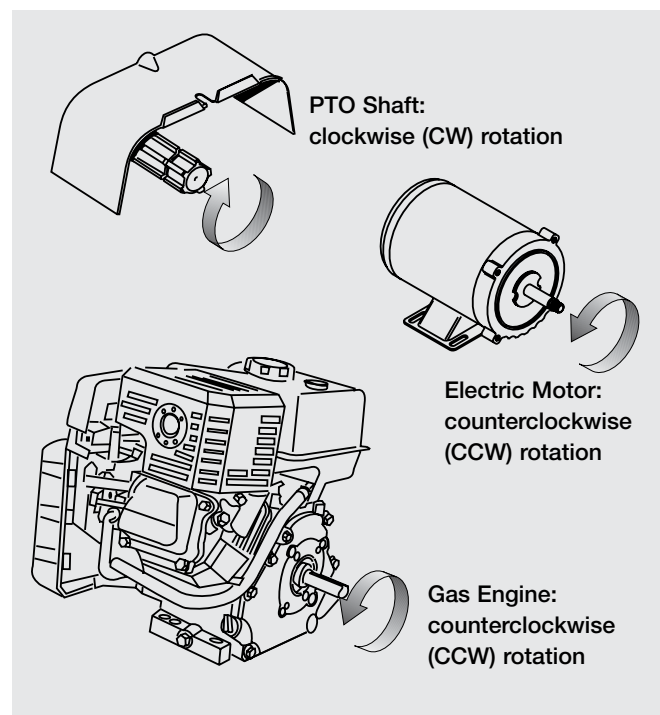
With many pumps, you need to specify which direction the shaft rotates... either clockwise (CW) or counterclockwise (CCW). Rules on shaft rotation are as follows:

Rule #1 "Eyes on the end"

Always view the rotation when you are facing the end of the drive shaft. If it turns clockwise, it is a clockwise shaft. Always use this rule for determining rotation of the pump shaft and for the power source shaft (PTO, for example). Once you have determined the rotation of the power source shaft, remember rule #2:

Rule #2 "Opposites attract"

A clockwise (CW) rotating PTO shaft will require a counterclockwise (CCW) rotating pump shaft, and vice versa. All shaft rotation references in this catalog are based on these two rules.



Selecting the Right Pump

Determining Pump Flow and Pressure Requirements

Every pumping task has an optimum volume and pressure requirement. Determining that optimum (and selecting the pump that delivers it) is key to an efficient and economical spraying system operation.

Pressure requirements for agricultural pumps are dependent on both the material to be applied and application targets. Soil-applied herbicides generally require a relatively low pressure pump rating of 30-60 psi with foliar-applied herbicides at the top end of that range and slightly higher. Insecticides and fungicides can require higher pressure ratings of 100 to 500 psi. Pressure must be sufficient, in the case of heavy foliage field crops and orchard crops, to penetrate the leaf foliage. In the case of orchard crops, pressure must also be sufficient to carry material up and over as well as into the canopy.

A number of factors must be considered to properly determine the total flow you will need from your pump. They include:

- Type of spray operation (broadcast, banding, low-level, etc.)
- The chemical's application rate, ground speed, boom width, hose length, tank agitation, etc.

The spray task is the first consideration in determining flow rate and pressure needs. The following formulas and calculations may help.

Calculating agitation requirements

The pump must produce enough flow for both the application rate and tank agitation requirements. Too little agitation will not keep the solution in proper suspension and too much agitation may cause foaming. Here are rule of thumb formulas for calculating how much additional pump flow you will need for agitation.

Liquids:

$$\text{Tank volume (gallons)} \times .05 = \text{total agitation in gpm} \quad \text{or} \quad \text{Tank volume (litres)} \times .05 = \text{total agitation in lpm}$$

Wetable Powders and Flowables:

$$\text{Tank volume (gallons)} \times .125 = \text{total agitation in gpm} \quad \text{or} \quad \text{Tank volume (litres)} \times .125 = \text{total agitation in lpm}$$

EXAMPLE: If you will be spraying a wettable powder from a 100-gallon tank, proper agitation will require 12.5 gpm additional flow from the pump.

Reducing agitation flow requirements

Agitation flow requirements can be reduced by using jet agitation in the tank. Jet agitators use a venturi design to multiply agitation output. Depending on the jet agitator model and pressure, one gallon per minute input can provide two to ten gallons per minute agitation output. If your sprayer is equipped with a jet agitator, consult the operator's manual or documentation to find the output to input ratio and adjust your flow required for agitation accordingly.

Agitation Flow with Jet Agitation:

$$\text{required gpm} \times \frac{\text{input}}{\text{output}} \quad \text{or} \quad \text{required lpm} \times \frac{\text{input}}{\text{output}}$$

For example: If you calculate a requirement of 63 gpm of agitation and your jet agitator produces 3 to 1 output to input ratio, your pump would only need 1/3 of 63 gpm, or 21 gpm.

Selecting the Right Pump

Factor in an “Excess Flow” Requirement

It is wise to have some excess flow capacity so you will not end up with an undersized pump because actual operation conditions may cause changes in spray system performance (such as normal pump wear, operating at less than rated speeds, etc.). John Deere recommends you add an additional 20% to your calculated total pump flow requirement to compensate for these variables. Plumbing systems have a number of restrictions that will result in a pressure drop from the pump to the actual spray point. These must be taken into account and minimized.

Calculating pump flow for broadcast boom sprayers

Chemical application is measured in gallons per acre (gpa) or litres per hectare (l/ha), whereas pump flow is stated in gallons per minute (gpm) or litres per minute (lpm). To calculate the pump flow required by a broadcast boom sprayer, multiply the application rate (from the chemical label) by the sprayer ground speed. Multiply the sum by the boom width on your sprayer. Then, divide that number by 495 for US units or by 600 for metric units. As a formula, it is written like this:

Flow required for boom:

$$\text{gpm} = \frac{\text{gpa} \times \text{mph} \times \text{boom width (ft.)}}{495}$$

or

$$\text{lpm} = \frac{\text{l/ha} \times \text{km/hr} \times \text{boom width (m)}}{600}$$

The result will be the pump flow required to deliver the proper application rate at the boom's nozzles. Then calculate your total pump flow requirement (broadcast):

Flow required for boom:	_____	gpm
Flow required for agitation:	+ _____	gpm
Sub-total	= _____	gpm
Excess flow requirement:	x 1.20	
TOTAL PUMP FLOW NEEDED:	= _____	gpm

or

Flow required for boom:	_____	lpm
Flow required for agitation:	+ _____	lpm
Sub-total	= _____	lpm
Excess flow requirement:	x 1.20	
TOTAL PUMP FLOW NEEDED:	= _____	lpm

Calculating pump flow for banding sprayers

First, multiply the band width by the number of rows to determine the total width (w). Then, multiply the application rate (from the chemical label) by the ground speed. Multiply that result by the total width (w) calculated earlier, then divide the result by 5940 for US units or 60,000 for metric units. Here's how the formula appears:

Total band width of sprayer:

$$w = \text{rows} \times \text{band width (inches)}$$

or

$$w = \text{rows} \times \text{band width (cm)}$$

Flow required for banding nozzles:

$$\text{gpm} = \frac{\text{gpa} \times \text{mph} \times w}{5940}$$

or

$$\text{lpm} = \frac{\text{l/ha} \times \text{km/hr} \times w}{60,000}$$

The result will be the pump flow required to deliver the proper application rate at the boom's nozzles. Then calculate your total pump flow requirement (banding):

Flow required for boom:	_____	gpm
Flow required for agitation:	+ _____	gpm
Sub-total	= _____	gpm
Excess flow requirement:	x 1.20	
TOTAL PUMP FLOW NEEDED:	= _____	gpm

or

Flow required for boom:	_____	lpm
Flow required for agitation:	+ _____	lpm
Sub-total	= _____	lpm
Excess flow requirement:	x 1.20	
TOTAL PUMP FLOW NEEDED:	= _____	lpm

Selecting the Right Pump

Calculating pump flow for hand gun spraying

For low-level spraying with a hand gun, such as for lawn and turf care, professional applicators typically “walk” the lawn at about 1,000 sq. ft. per minute or 100 sq. m per minute. That means the “gpm” or “lpm” rate of the hand gun will generally be the same as “gallons per 1,000 sq. ft.” or “litres per 100 sq. m.”

To determine your total pump flow requirement:

Flow required for gun/nozzle:	_____	gallons per 1,000ft ² (same as gpm)
Flow required for agitation:	+ _____	gpm
Sub-total	= _____	gpm
Excess flow requirement:	x 1.20	
TOTAL PUMP FLOW NEEDED:	= _____	gpm

or

Flow required for gun/nozzle:	_____	Litres per 100 m ² (same as lpm)
Flow required for agitation:	+ _____	lpm
Sub-total	= _____	lpm
Excess flow requirement:	x 1.20	
TOTAL PUMP FLOW NEEDED:	= _____	lpm

Use this same method for calculating the pump flow requirement for high pressure spraying, such as trees. Even though the application “rate” is usually a visual saturation of the tree, the known gpm or lpm factor will be the hand gun nozzle output, which is the rate you use for the calculation.

Calculating pump pressure for hand gun spraying

For most hand gun chemical spraying, 40 psi (3 bar) at the nozzle is typical. To properly select a pump that can deliver the right nozzle pressure, you must consider the normal “pressure drop” that occurs within the length of hose. The amount of pressure drop through the hose depends on hose length, hose diameter and flow rate. For example, 300’ (90 m) of 1/2” hose spraying at 6 gpm (23 lpm), will have a pressure drop of approximately 120 psi (8 bar). That means you need a pump delivering at least 160 psi (12 bar) in order to ensure 40 psi (3 bar) at the nozzle.

Desired pressure at gun nozzle:	_____	psi
Hose pressure loss:	+ _____	psi
TOTAL PUMP PRESSURE NEEDED:	= _____	psi

or

Desired pressure at gun nozzle:	_____	bar
Hose pressure loss:	+ _____	bar
TOTAL PUMP PRESSURE NEEDED:	= _____	bar

NOTE: When determining the total pump pressure requirement for high tree spraying, you must also consider the spray height (or reach) you need to attain. Generally, pumps of up to 700 psi (50 bar) are used for this purpose.

Centrifugal Pumps

For today's machinery and tomorrow's demands, John Deere centrifugal pumps lead the industry! Pump capabilities range up to 440 gpm and 190 psi. With the largest selection of models, John Deere allows you to match the right pump to your equipment and task. Use John Deere centrifugal pumps for chemical spraying and transfer applications.

The broad, versatile line includes models with rugged housings of cast iron, stainless steel and polypropylene that stand up to strong chemical herbicides. Stainless steel pumps are ideal for use with Roundup® or other acid applications. Polypropylene pumps are lightweight and provide excellent resistance to corrosive chemicals. Choose from gear, pedestal, flange, DC clutch, hydraulic motor and belt drives.

All of the John Deere centrifugal pumps share these quality features:

- Compatible with corrosive, abrasive and general use chemicals
- Models with high volume (440 gpm), high pressure (190 psi) capabilities
- Nylon, polypropylene impellers on most models
- Hydraulically-driven models feature high-efficiency, cast-iron hydraulic motor
- Hydraulic motor equipped with proprietary double-lip Teflon seals
- Life Guard® silicon carbide mechanical seals standard on all stainless steel pumps and available in select cast iron and polypropylene models
- Viton mechanical seals standard on cast iron and polypropylene models
- Standard shafts are stainless steel
- Stainless steel wear ring for extended life on cast iron models
- Hydraulically-driven pumps are max performance tested using proprietary software



Gear Driven, Cast Iron

Series 9000CO



- Planetary oil-bath gear drive
- Port sizes: 1½" NPT inlet, 1¼" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Housing: cast iron
- Impeller: Nylon
- Pump shaft rotation: CCW*
- Weight: 44 lbs./20 kg
- Pump seals: Viton/ceramic standard

Order Information

Model Number	Max GPM	Max PSI	Max RPM	PTO Output	Locking Collar and Mounting Clip
PM9006CO	117	78	600	1 ¾" 540 rpm female	x
PM9008CO	110	75	1000	1 ¾" 1000 rpm female	x
PM9016CO	117	78	600	1" Solid Shaft	
PM34300334	Seal and o-ring repair kit				

PM9006CO, PM9016CO

U.S. Units

RPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI
500	97	86	71	47		
540	106	96	87	70	47	
600	117	113	104	96	82	63

PM9008CO

U.S. Units

RPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI
800	82	70	53			
900	96	88	76	60	24	
1000	110	102	96	86	70	46

PM9006CO, PM9016CO

Metric Units

RPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR
500	367	326	269	178		
540	401	363	329	265	178	
600	443	428	394	363	310	238

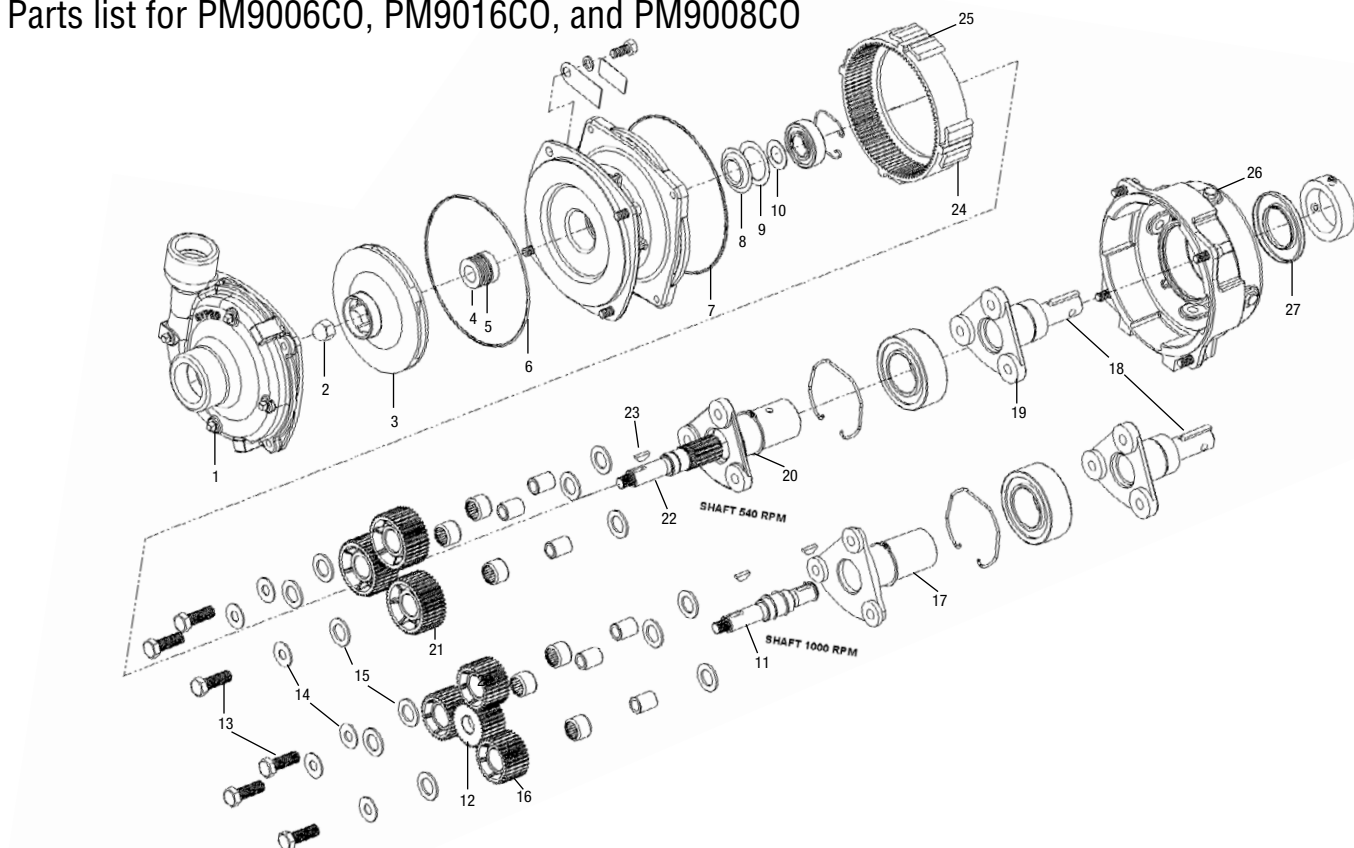
PM9008CO

Metric Units

RPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR
800	310	265	201			
900	363	333	288	227	91	
1000	416	386	363	326	265	174

*CCW (counterclockwise) CW (clockwise) are determined when looking at the shaft end.

Parts list for PM9006CO, PM9016CO, and PM9008CO

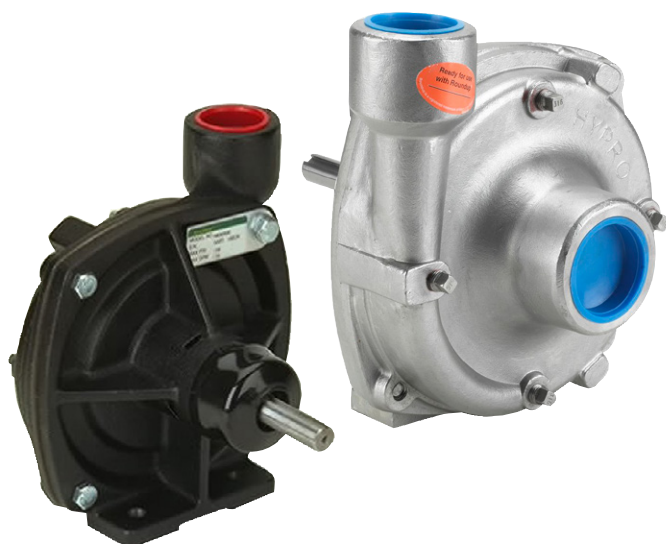


Reference number	Part number	Description	Quantity
1	PM24060007	Drain plug	4
2	PM22530001	Impeller nut	1
3	PM04009000P	Impeller-nylon	1
4	PM17000101	Gasket	1
5	PM21200011	Mechanical Seal (Std Viton)	1
6	PM17200083	O-ring	1
7	PM17200139	O-ring	1
8	PM21300018	Bearing Lip Seal	1
9	PM17000098	Gasket	1
10	PM18100013	Retaining ring	1
11	PM22100046	Capscrew	3
12	PM05009002	Impeller shaft (1000 rpm)	1
13	PM39000013	Sun gear	1
14	PM22700003	Washer	3
15	PM22650003	Thrust washer	6
16	PM39000040	Driver gear w/bearing (1000 rpm)	3
17	PM05629002D	Driver hub (Model 9008C)	2
18	PM16100005	Key	1
19	PM05019016D	Driver hub (Model 9016C)	1
20	PM05629000D	Driver hub (Model 9006C)	1
21	PM39000039	Driver gear w/bearing (540 rpm)	3
22	PM39000010	Impeller shaft (540 rpm)	1
23	26H77	Woodruff key	1 (540 rpm), 2 (1000 rpm)
24	PM39000009	Ring gear	1
25	PM14500004	Cushion bumper	8
26	PM24040193	Breather vent	1
27	PM21020025	Oil seal	1

Repair parts kit			
Reference number	Part number	Description	Quantity
4,5,6	PM34300334	Standard seal kit	1
Gear lube equipment: PHILLUBE SAE 80W90 Oil			

Pedestal Mount, Cast Iron & Stainless Steel

Series 9203C and 9203S



- Available in cast iron and 316 stainless steel
- Pedestal mount, direct drive
- Port sizes: 1-1/4" NPT inlet, 1" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Impeller: Nylon (cast iron standard); polypropylene (stainless standard); GTX available
- Pump shaft rotation: CCW* (9203CR is CW)
- Weight: 19 lbs./8.6 kg
- Pump seals: Cast Iron models – Viton/ceramic standard; Life Guard® silicon carbide; Stainless Steel models – Life Guard® silicon carbide standard

Order Information

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM9203C	140	170	6000	5/8" solid shaft
PM9203CR	140	170	6000	5/8" solid shaft
PM9203S	140	170	6000	5/8" stainless steel shaft
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

PM9203C, PM9203S, PM9203CR

U.S. Units

RPM	10 PSI		20 PSI		40 PSI		60 PSI		80 PSI		100 PSI		120 PSI		140 PSI	
	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
2400	80	1.9	65	1.8												
3600	105	5.3	105	5.3	92	5.0	50	3.7								
4200	122	8.2	120	7.9	115	7.7	98	7.1	56	5.3						
5000	140	12.6	140	12.6	138	12.6	130	12.2	118	11.6	88	9.9	45	7.2		
5500	140	14.9	140	14.9	138	14.9	135	15.2	130	15.2	118	14.4	90	12.5	60	9.8
6000	140	17.1	140	17.1	140	17.5	140	18.0	135	18.2	132	18	125	18.2	103	16.3

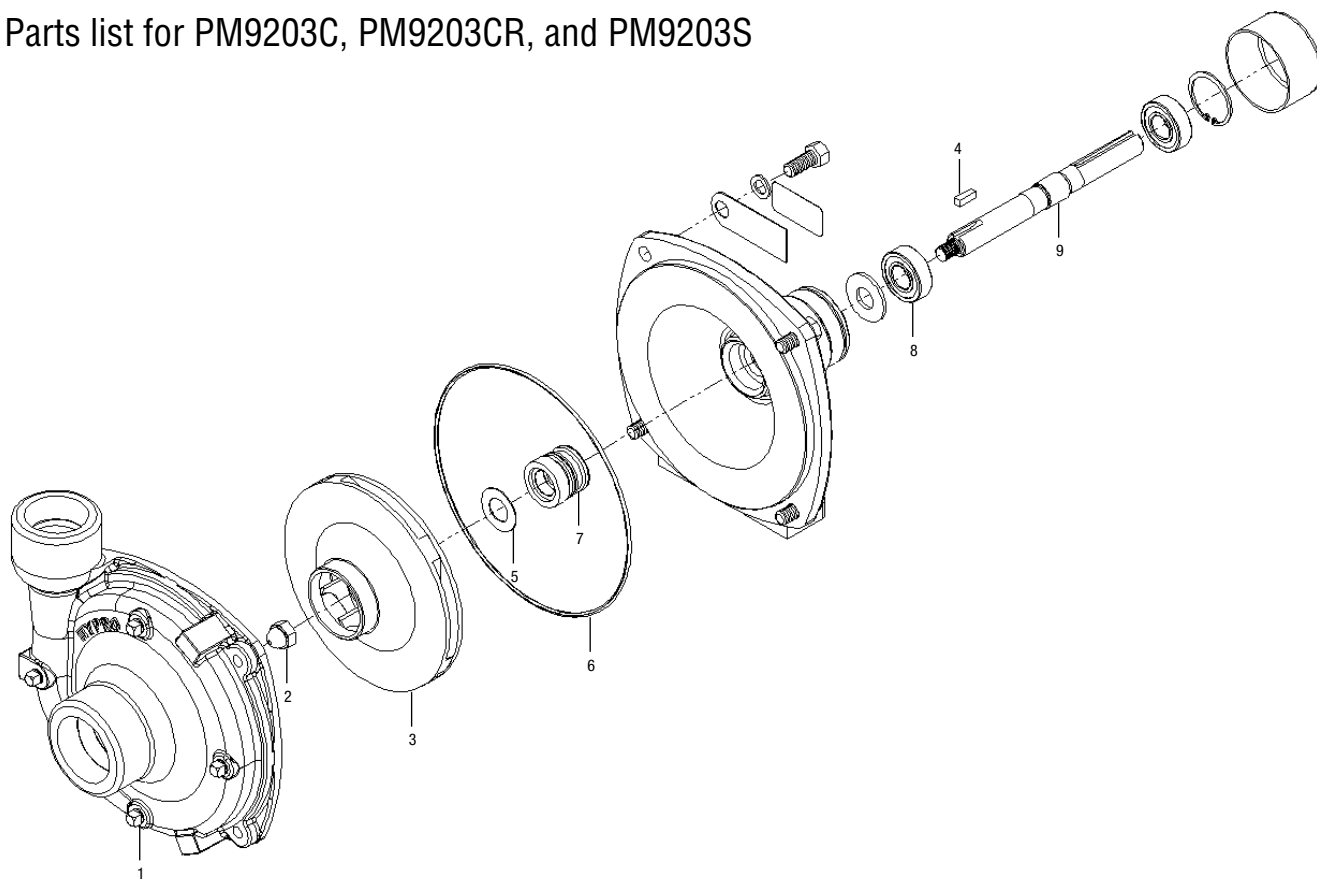
PM9203C, PM9203S, PM9203CR

Metric Units

RPM	0.7 BAR		1.4 BAR		2.8 BAR		4.1 BAR		5.5 BAR		6.9 BAR		8.3 BAR		9.7 BAR	
	LPM	HP	LPM	HP	LPM	HP	LPM	HP	LPM	HP	LPM	HP	LPM	HP	LPM	HP
2400	303	1.9	246	1.8												
3600	397	5.3	397	5.3	348	5.0	189	3.7								
4200	462	8.2	454	7.9	435	7.7	371	7.1	212	5.3						
5000	530	12.6	530	12.6	522	12.6	492	12.2	447	11.6	333	9.9	170	7.2		
5500	530	14.9	530	14.9	522	14.9	511	15.2	492	15.2	447	14.4	341	12.5	227	9.8
6000	530	17.1	530	17.1	530	17.5	530	18.0	511	18.2	500	18	473	18.2	409	16.3

*CCW (counterclockwise) CW (clockwise) are determined when looking at the shaft end.

Parts list for PM9203C, PM9203CR, and PM9203S



Reference number	Part number	Description	Quantity
1	PM24060007	Drain plug	4
2	PM22530002	Impeller nut (9203C)	1
2	N206701	Impeller nut (9203S)	1
3	PM04019100P	Impeller-nylon (9203C)	1
3	PM04029100P	Impeller-poly (9203CR)	1
3	PM04049100P	Impeller-reverse nylon (9203S)	1
3	PM04039100P	Pump shaft	1
4	PM16100015	Key (9203C)	1
4	PM16100057	Key (9203S)	1
5	PM17000100	Rubber gasket	1
6	PM17200083	O-ring	1
7	PM21200009	Mechanical seal (Std. Viton)	1
7	AN206043	Mechanical seal (Silcon Carbide/9203S)	1
8	PM20000010	Ball bearing	2
9	PM05019200	Pump shaft	1

Repair parts kit			
Reference number	Part number	Description	Quantity
6,7	AN206043	Life Guard premium silcon carbide seal kit	1
5,6,7	PM34300332	Standard seal kit	1

*Poly impellers offer excellent chemical resistance, especially for use with defoilers. Nylon impellers provide excellent strength.

Hydraulically-Driven, Cast Iron

Series 9302C



- Available in cast iron
- Hydraulic motor drive (for open center, closed center)
- Port sizes: 1¼" NPT inlet, 1" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Impeller: Cast Iron models – Nylon
- Motor: internal gear gerotor
- Hydraulic ports: ½" NPT inlet, ¾" NPT outlet-HM Series
- Weight: 26 lbs./11.8 kg
- Pump seals: Cast Iron models – Viton/ceramic standard; Life Guard® silicon carbide; Stainless Steel models – Life Guard® silicon carbide standard
- Hydraulic motor seal: double-lip Teflon
- Max. motor psi: 3000

Order Information

Model Number	Max GPM	Max PSI	Max Hyd. GPM	Hydraulic Selection System
PM9302CHM1C	72	150	13 GPM	Open/Closed
PM9302CHM4C	72	120	7 GPM	Open/Closed
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

PM9302CHM1C

U.S. Units

Hyd. Flow GPM	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI	GPM at 110 PSI	GPM at 120 PSI	GPM at 130 PSI	GPM at 140 PSI
11	72	72	71	65	56	45	29				
12	72	72	72	72	70	63	53	40			
13	72	72	72	72	72	71	68	63	56	48	35

PM9302CHM1C

Metric Units

Hyd. Flow LPM	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR	LPM at 7.6 BAR	LPM at 8.3 BAR	LPM at 9.0 BAR	LPM at 9.7 BAR
41.6	273	273	269	246	212	170	110				
45.4	273	273	273	273	265	238	201	151			
49.2	273	273	273	273	273	269	257	238	212	182	132

PM9302CHM4C

U.S. Units

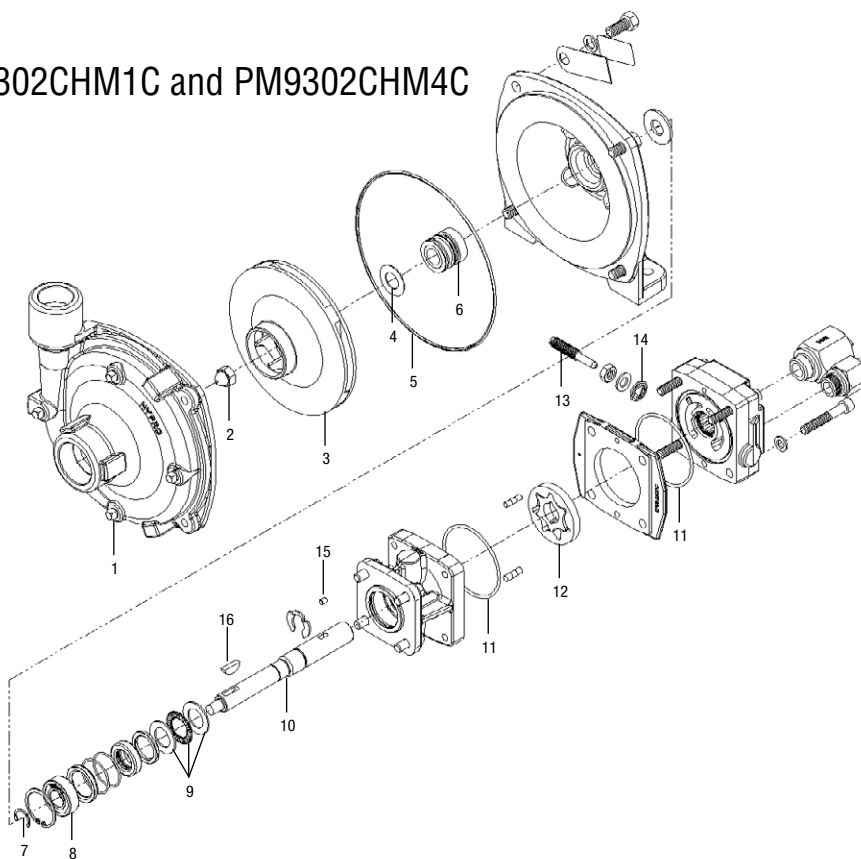
Hyd. Flow GPM	GPM at 10 PSI	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI	GPM at 110 PSI
6	65	63	59	51	41	29	12				
7	72	72	71	67	60	51	42	31	17		
8	72	72	72	72	70	64	57	50	42	32	16

PM9302CHM4C

Metric Units

Hyd. Flow LPM	LPM at 0.7 BAR	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR	LPM at 7.6 BAR
22.7	246	238	223	193	155	110	45				
26.5	273	273	269	254	227	193	159	117	64		
30.3	273	273	273	273	265	242	216	189	159	121	61

Parts list for PM9302CHM1C and PM9302CHM4C



Reference number	Part number	Description	Quantity
1	PM24060007	Drain/vent plug	4
2	PM22530002	Impeller nut	1
3	PM04019100P	Impeller-nylon std.	1
4	PM17200083	O-ring	1
5	PM17000100	Rubber gasket	1
6	PM21200009	Mechanical seal (Viton)	1
6	AN206043	Mechanical seal (Silicon Carbide)	1
7	PM18100014	Snap ring	1
8	PM20000010	Ball bearing	1
9	PM20290014	Thrust bearing assembly	1
10	PM05312500	Shaft (HM4C)	1
10	PM05332500	Shaft (HM1C)	1
11	PM17200110	O-ring	2
12	PM39000022	Gerotor (HM1C)	1
12	PM39000025	Gerotor (HM4C)	1
13	PM32200029	Bypass adjusting screw	1
14	PM17000047	Gasket	1
15	PM16100032	Roll Pin (HM4C)	1
15	PM16100031	Roll Pin (HM1C)	1
16	26H77	Woodruff key	1

Repair parts kit			
Reference number	Part number	Description	Quantity
4,6	AN206043	Life Guard premium silicon carbide seal kit	1
4,5,6	PM34300332	Standard seal kit	1
	PM34300748	Shaft seal kit	1

Hydraulically-Driven, Cast Iron & Stainless Steel

Series 9303C and 9303S



- Available in cast iron and 316 stainless steel
- Hydraulic motor drive (for open center, closed center)
- Port sizes: 1½" NPT inlet, 1¼" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Impeller: Cast Iron models – Nylon
Stainless Steel models – Polypropylene
- Motor: internal gear gerotor
- Hydraulic ports: ½" NPT inlet, ¾" NPT outlet
- Weight: 26 lbs./11.8 kg
- Pump seals: Cast Iron models – Viton/ceramic standard; Life Guard® silicon carbide; Stainless Steel models – Life Guard® silicon carbide standard
- Hydraulic motor seal: double-lip Teflon
- Max. motor psi: 3000

Order Information

Model Number	Max GPM	Max PSI	Max Hyd. GPM	Hydraulic Selection System
PM9303CHM1C	114	130	13 GPM	Open/Closed
PM9303CH1CBU	114	130	13 GPM	Open/Closed
PM9303CHM4C	115	93	7 GPM	Open/Closed
PM9303SHM1C	114	130	13 GPM	Open/Closed
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

PM9303CHM1C, PM9303CH1CBU, PM9303SHM1C

U.S. Units

Hyd. Flow GPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI	GPM at 110 PSI	GPM at 120 PSI
11	104	101	96	90	82	71	60	47	31		
12	110	109	107	105	101	92	81	67	53	36	9
13	112	111	109	107	104	102	96	85	76	63	33

PM9303HM1C, PM9303CH1CBU, PM9303SHM1C

Metric Units

Hyd. Flow LPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR	LPM at 7.6 BAR	LPM at 8.3 BAR
41.6	394	382	363	341	310	269	227	178	117		
45.4	416	413	405	397	382	348	307	254	201	136	34
49.2	424	420	413	405	394	386	363	322	288	238	125

PM9303CHM4C

U.S. Units

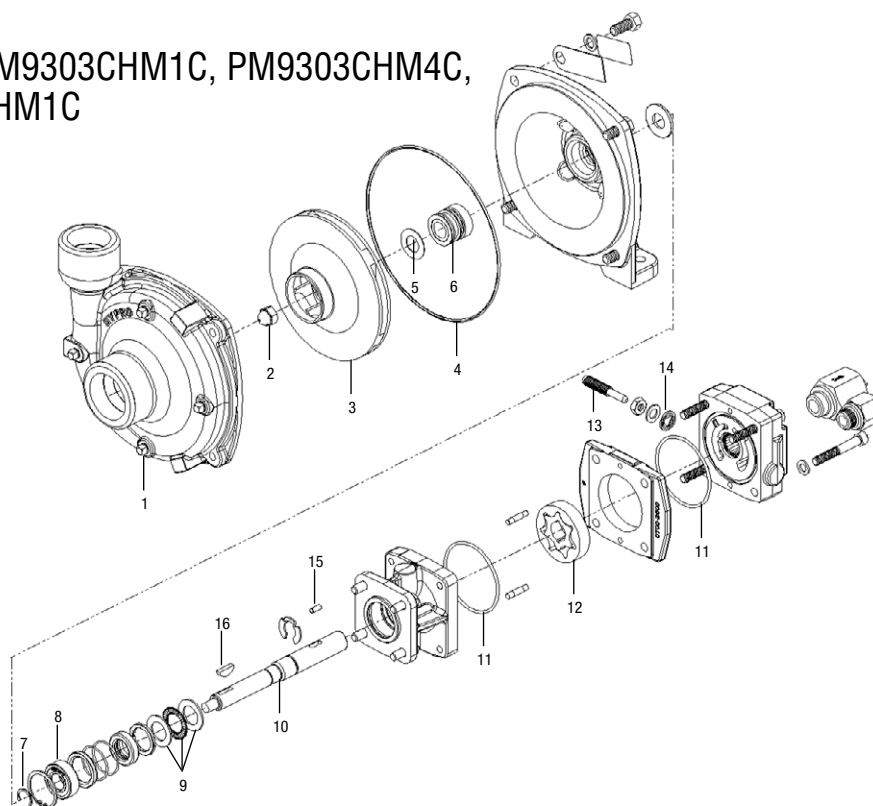
Hyd. Flow GPM	GPM at 10 PSI	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI
5	84	76	66	52	34				
6	97	92	86	78	67	50	25		
7	110	104	98	91	82	69	55	38	14

PM9303CHM4C

Metric Units

Hyd. Flow LPM	LPM at 0.7 BAR	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR
18.9	318	288	250	197	129				
22.7	367	348	326	295	254	189	95		
26.5	416	394	371	344	310	261	208	144	53

Parts list for PM9303CHM1C, PM9303CHM4C, and PM9303SHM1C



Reference number	Part number	Description	Quantity
1	PM24060007	Drain/vent plug	4
2	PM22530002	Impeller nut (9303C)	1
2	N206701	Impeller nut (9303S)	1
3	PM04019100P	Impeller -nylon (9303C)	1
3	PM04029100P	Impeller-poly (9303S)	1
4	PM17200083	O-ring	1
5	PM17000100	Rubber gasket	1
6	PM21200009	Mechanical seal (Viton-9303C)	1
6	AN206043	Mechanical seal (Silcon Carbide-9303S)	1
7	PM18100014	Snap ring	1
8	PM20000010	Ball bearing	1
9	PM20290014	Thrust bearing assembly	1
10	PM05312500	Shaft (HM4C)	1
10	PM05332500	Shaft (HM1C)	1
11	PM17200110	O-ring	2
12	PM39000022	Gerotor (HM1C)	1
12	PM39000025	Gerotor (HM4C)	1
13	PM32200029	Bypass adjusting screw	1
14	PM17000047	Gasket	1
15	PM16100032	Roll Pin (HM4C)	1
15	PM16100031	Roll Pin (HM1C)	1
16	26H77	Woodruff key (9303C)	1
16	PM04432	Woodruff key (9303S)	1

Repair parts kit			
Reference number	Part number	Description	Quantity
4,6	AN206043	Life Guard premium silcon carbide seal kit	1
4,5,6	PM34300332	Standard seal kit	1
	PM34300748	Shaft seal kit	1

Hydraulically-Driven, Polypropylene

Series 9303P



- Hydraulic motor drive (for open center, closed center and load-sensing systems)
- Port sizes: 1½" NPT inlet, 1¼" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Housing: Polypropylene
- Impeller: Polypropylene
- Motor: internal gear gerotor
- Hydraulic ports: ½" NPT inlet, ¾" NPT outlet
- Weight: 21 lbs./9.5 kg
- Pump seals: Viton/ceramic standard; Life Guard® silicon carbide
- Hydraulic motor seal: double-lip Teflon
- Max. motor psi: 3000

Order Information

Model Number	Max GPM	Max PSI	Max Hyd. GPM	Hydraulic Selection System
PM9303PHM4C	82	84	7 GPM	Open/Closed
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

PM9303PHM4C

U.S. Units

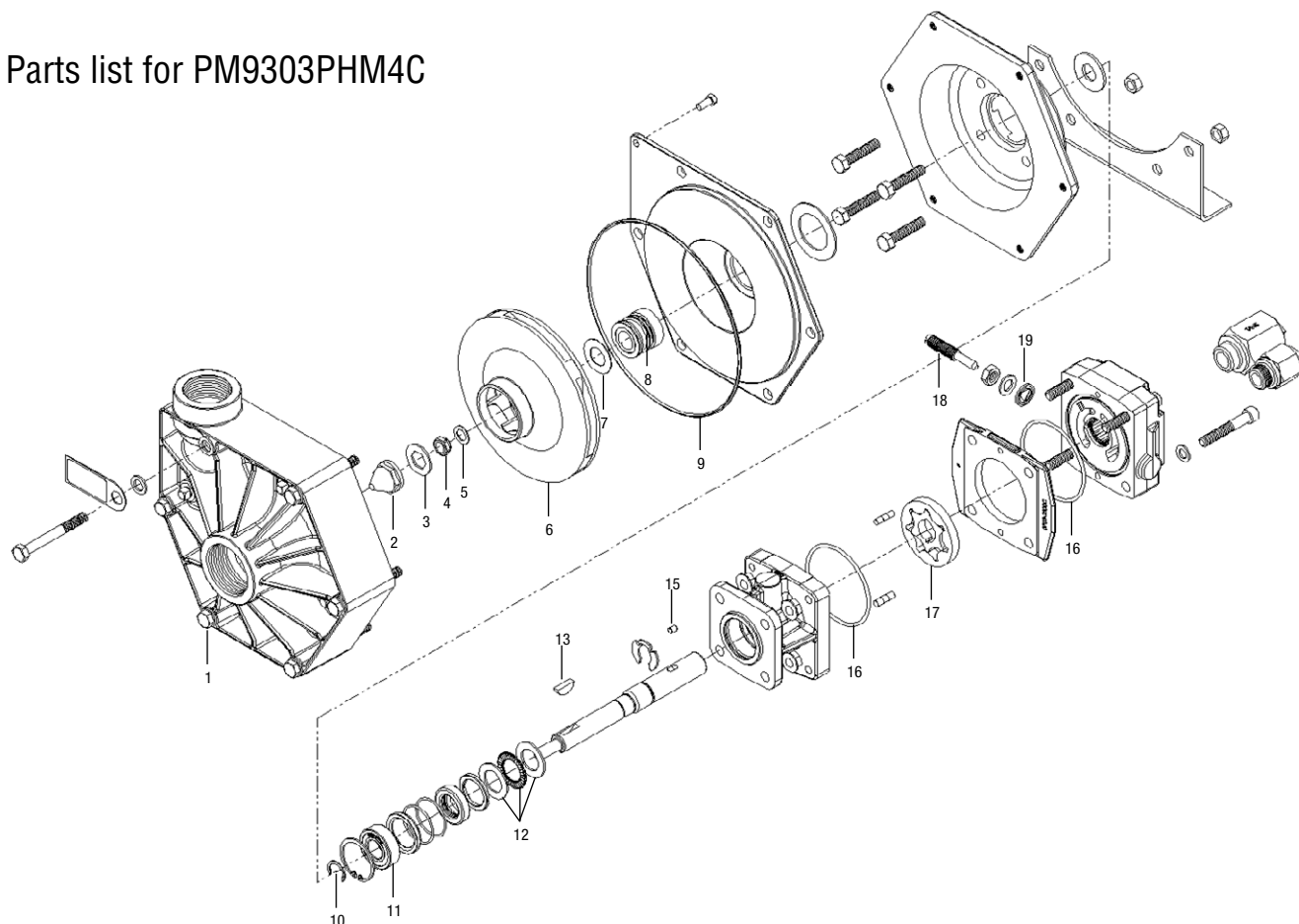
Hyd. Flow GPM	GPM at 10 PSI	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI
5	60	52	41	26				
6	70	66	58	48	37	21		
7	80	76	70	63	55	45	32	15

PM9303PHM4C

Metric Units

Hyd. Flow LPM	LPM at 0.7 BAR	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR
18.9	227	197	155	98				
22.7	265	250	220	182	140	79		
26.5	303	288	265	238	208	170	121	57

Parts list for PM9303PHM4C



Reference number	Part number	Description	Quantity
1	PM24060020K	Pipe plug	4
2	PM22500052	Impeller nut	1
3	PM22500051	Jam nut	1
4	PM17000097	Gasket	1
5	PM22700057	Washer	1
6	PM04029100P	Impeller	1
7	PM17000100	Rubber gasket	1
8	PM21200009	Mechanical seal (Viton)	1
9	PM17210083	O-ring	1
10	PM18100014	Snap ring	1
11	PM20000010	Ball bearing	1
12	PM20290014	Thrust bearing assembly	1
13	26H77	Woodruff key	1
15	PM16100032	Roll pin (HM4C)	1
16	PM17200110	O-ring	2
17	PM39000025	Gerotor (HM4C)	1
18	PM32200029	Bypass adjusting screw	1
19	PM17000047	Gasket	1

Repair parts kit			
Reference number	Part number	Description	Quantity
8	AN206043	Life Guard premium silicon carbide seal kit	1
7,8,9	PM34300332	Standard seal kit	1
	PM34300748	Shaft seal kit	1

Hydraulically-Driven, Cast Iron

Series 9304C



- Available in cast iron and stainless steel (for open center, closed center)
- Port sizes: 2" NPT inlet, 1½" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Impeller: Nylon
- Motor: internal gear gerotor
- Hydraulic ports: ½" NPT inlet
- Max. motor psi: 2200 continuous duty, 2200 intermittent duty
- Weight: 32 lbs./ 14.5 kg
- Pump seals: Cast Iron models-Viton/ceramic (except AN206253) standard AN206253
- Hydraulic motor seal: double-lip Teflon

Order Information

Model Number	Max GPM	Max PSI	Max Hyd. GPM	Hydraulic Selection System
PM9304CHM1C	207	130	13	Open/Closed
PM9304CHM5C	212	140	17	Open/Closed
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

Performance data

PM9304CHM1C

U.S. Units

Hyd. flow gpm	gpm at 20 psi	gpm at 30 psi	gpm at 40 psi	gpm 50 psi	gpm at 60 psi	gpm at 70 psi	gpm at 80 psi	gpm at 90 psi	gpm at 100 psi	gpm at 110 psi
11	209	208	203	178	140	89	44	—	—	—
12	210	209	206	187	160	130	87	35	—	—
13	211	210	208	200	175	149	120	93	64	26

PM9304CHM1C

Metric Units

Hyd. flow gpm	gpm at 1.4 bar	gpm at 2.1 bar	gpm at 2.8 bar	gpm 3.4 bar	gpm at 4.1 bar	gpm at 4.8 bar	gpm at 5.5 bar	gpm at 6.2 bar	gpm at 6.9 bar	gpm at 7.6 bar
41.6	791	787	768	674	530	337	167	—	—	—
45.4	795	791	780	708	606	492	329	132	—	—
49.2	799	795	787	757	662	564	454	352	242	98

PM9304CHM5C

U.S. Units

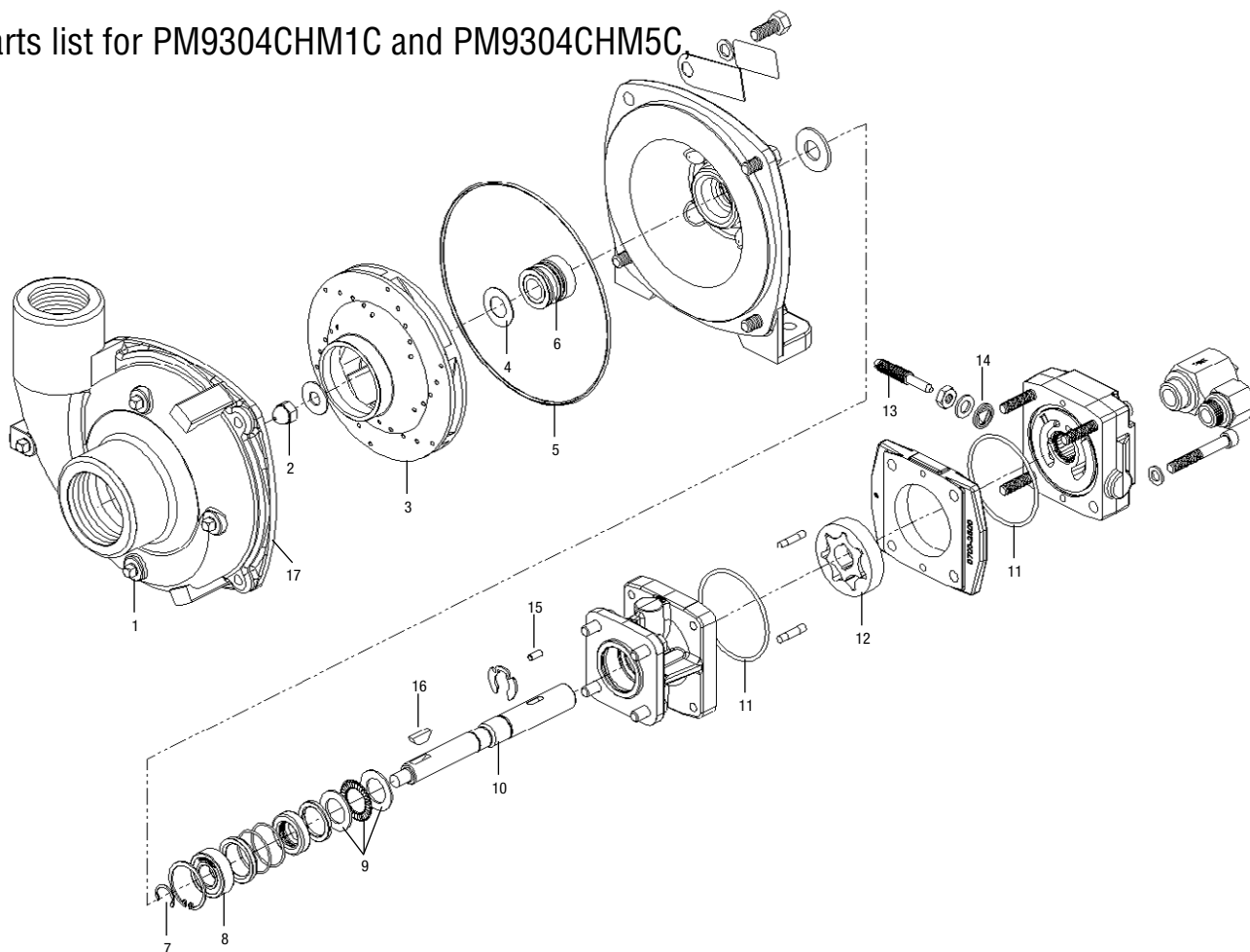
Hyd. flow gpm	gpm at 40 psi	gpm 50 psi	gpm at 60 psi	gpm at 70 psi	gpm at 80 psi	gpm at 90 psi	gpm at 100 psi	gpm at 110 psi	gpm at 120 psi	gpm at 130 psi
15	205	205	195	170	145	119	85	40	—	—
16	205	205	204	188	165	143	120	87	49	—
17	205	205	204	200	184	168	150	128	96	52

PM9304CHM5C

Metric Units

Hyd. flow gpm	gpm at 2.8 bar	gpm 3.4 bar	gpm at 4.1 bar	gpm at 4.8 bar	gpm at 5.5 bar	gpm at 6.2 bar	gpm at 6.9 bar	gpm at 7.6 bar	gpm at 8.3 bar	gpm at 9.0 bar
56.8	776	776	738	644	549	450	322	151	—	—
60.6	776	776	772	712	625	541	454	329	185	—
64.4	776	776	772	757	697	636	568	485	363	197

Parts list for PM9304CHM1C and PM9304CHM5C



Reference number	Part number	Description	Quantity
1	PM24060007	Pipe plug	4
2	PM22530002	Impeller nut	1
3	N306173	Impeller	1
4	PM17000100	Rubber gasket	1
5	PM17200083	O-ring	1
6	PM21200009	Mechanical seal (Viton)	1
7	PM18100014	Snap ring	1
8	PM20000010	Ball bearing	1
9	PM20290014	Thrust bearing assembly	1
10	PM05332500	Shaft	1
11	PM17200110	O-ring	2
12	PM39000022	Gerotor (HM1C)	1
12	PM39000048	Gerotor (HM5C)	1
13	PM32200029	Bypass adjusting screw	1
14	PM17000047	Gasket	1
15	PM16100031	Roll pin	1
16	26H77	Woodruff key	1
17	AN206174	Volute, Pump Casing	1

Repair parts kit			
Reference number	Part number	Description	Quantity
5,6	AN206043	Life Guard premium silicon carbide seal kit	1
4,5,6	PM34300332	Standard seal kit	1
	PM34300748	Shaft seal kit	1

Hydraulically-Driven, Cast Iron & Stainless Steel

Series 9306C and 9306S



- Hydraulic motor drive (for open center, closed center and load-sensing systems)
- Port sizes: 2" NPT inlet, 1½" NPT outlet
- Max. fluid temperature: 140°F/60°C
- Housing: available in cast iron
- Impeller: Nylon (cast iron models)
- Motor: internal gear gerotor
- Hydraulic ports: ½" NPT inlet, ¾" NPT outlet
- Max. motor psi: 3000
- Weight: 33 lbs./15 kg
- Pump seals: Cast Iron models – Viton/ceramic standard; Life Guard® silicon carbide; Stainless Steel models – Life Guard® silicon carbide standard
- Hydraulic motor seal: double-lip Teflon
- 220 x 220 (U) Universal flange available

Order Information

Model Number	Max GPM	Max PSI	Max Hyd. GPM	Hydraulic Selection System
PM9306CH1CBU	207	127	13	Open/Closed
PM9306CH5CBU	212	140	17	Open/Closed
PM9306SHM5C	212	140	17	Open/Closed
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

PM9306CH1CBU

U.S. Units

Hyd. Flow GPM	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI	GPM at 110 PSI	GPM at 120 PSI
11	207	207	186	155	122	90	37			
12	207	207	207	199	167	134	100	60		
13	207	207	207	207	196	170	143	115	85	44

PM9306CH1CBU

Metric Units

Hyd. Flow LPM	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR	LPM at 7.6 BAR	LPM at 8.3 BAR
41.6	784	784	704	587	462	341	140			
45.4	784	784	784	753	632	507	379	227		
49.2	784	784	784	784	742	644	541	435	322	167

PM9306CH5CBU, PM9306SHM5C

U.S. Units

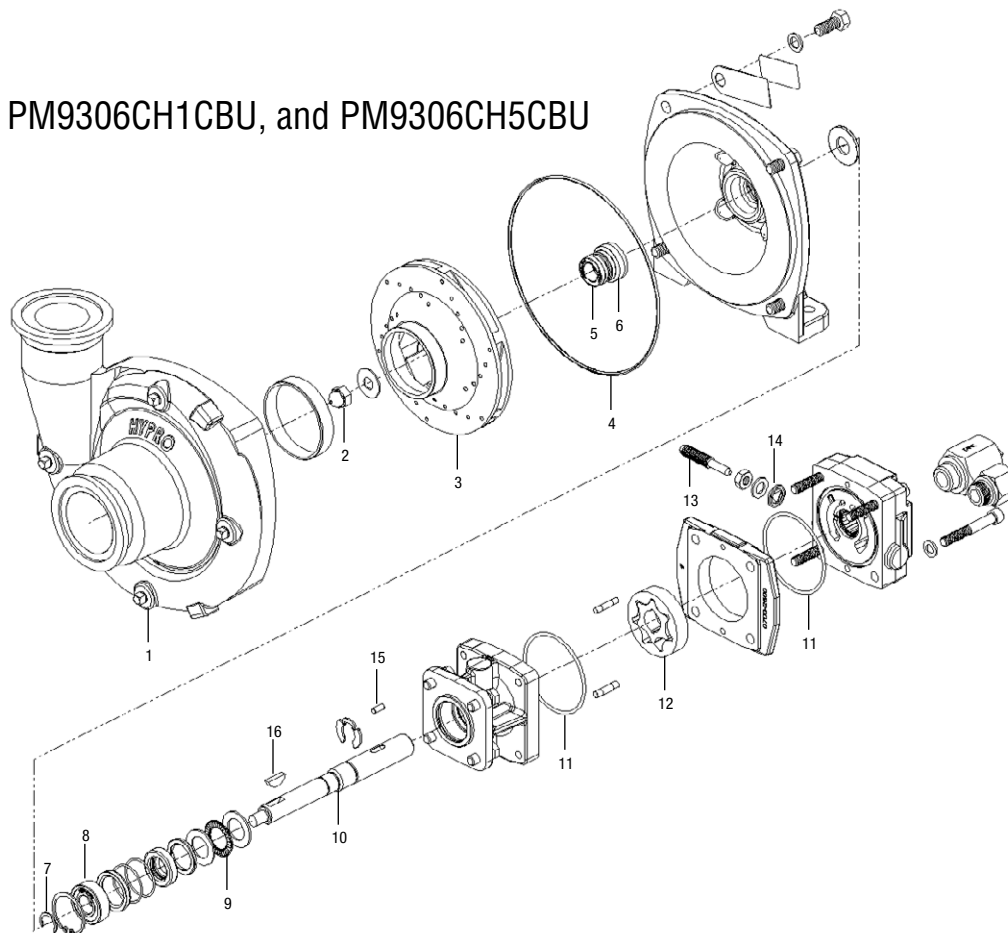
Hyd. Flow GPM	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI	GPM at 110 PSI	GPM at 120 PSI	GPM at 130 PSI
15	212	212	212	187	150	114	65	19		
16	212	212	212	212	189	158	125	87	42	
17	212	212	212	212	212	189	162	133	102	58

PM9306CH5CBU, PM9306SHM5C

Metric Units

Hyd. Flow LPM	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR	LPM at 7.6 BAR	LPM at 8.3 BAR	LPM at 9.0 BAR
56.8	803	803	803	708	568	432	246	72		
60.6	803	803	803	803	715	598	473	329	159	
64.4	803	803	803	803	803	715	613	503	386	220

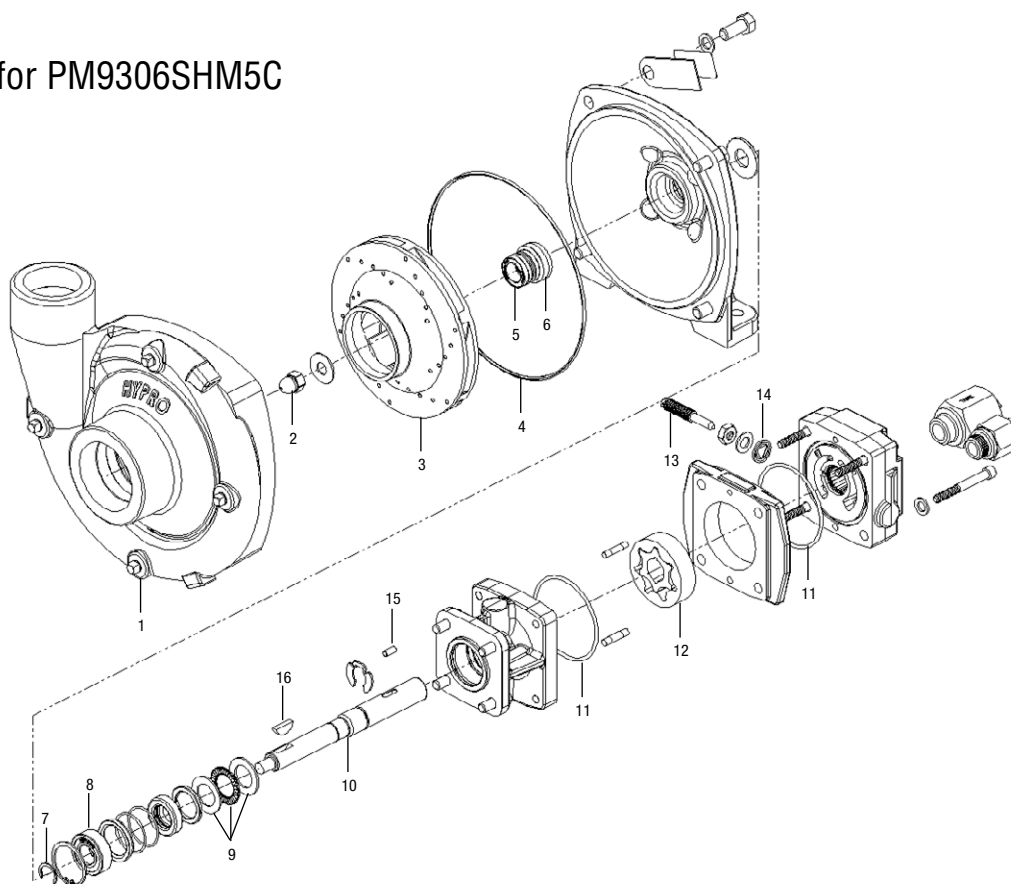
Parts list for PM9306CH1CBU, and PM9306CH5CBU



Reference number	Part number	Description	Quantity
1	PM24060007	Drain/vent plug	4
2	N206701	Impeller nut	1
3	PM04019200P	Impeller-nylon	1
3	N306173	Impeller (AN206042)	1
4	PM17200083	O-ring	1
5	PM17000100	Rubber gasket	1
6	PM21200009	Mechanical seal (Viton-9306C)	1
6	AN206043	Mechanical seal (Silcon Carbide)	1
7	PM18100014	Snap ring	1
8	PM20000010	Ball bearing	1
9	PM20290014	Thrust bearing assembly	1
10	PM05312500	Shaft (HM2C/HM4C)	1
10	PM05332500	Shaft (HM1C/HM5C)	1
10	PM05362500	Shaft (HM3C)	1
11	PM17200110	O-ring	1
12	PM39000022	Gerotor (HM1C)	1
12	PM39000048	Gerotor (HM5C)	1
13	PM32200029	Bypass adjusting screw	1
14	PM17000047	Gasket	1
15	PM16100031	Roll pin (HM1C/HM5C)	1
16	26H77	Woodruff key	1

Repair parts kit			
Reference number	Part number	Description	Quantity
4,6	AN206043	Life Guard premium silcon carbide seal kit	1
4,5,6	PM34300332	Standard seal kit	1
	PM34300748	Shaft seal kit	1

Parts list for PM9306SHM5C



Reference number	Part number	Description	Quantity
1	TCU17873	Drain/vent plug	4
2	PM22530006	Impeller nut	1
3	PM04059200P	Impeller-poly	1
4	PM17200083	O-ring	1
5	PM17000100	Rubber gasket	1
6	AN206043	Mechanical seal (Silicon Carbide)	1
7	PM18100014	Snap ring	1
8	PM20000010	Ball bearing	1
9	PM20290014	Thrust bearing assembly	1
10	PM05332500	Shaft (HM5C)	1
11	PM17200110	O-ring	1
12	PM39000048	Gerotor (HM5C)	1
13	PM32200029	Bypass adjusting screw	1
14	PM17000047	Gasket	1
15	PM16100031	Roll pin (HM5C)	1
16	PM04432	Woodruff key	1

Repair parts kit			
Reference number	Part number	Description	Quantity
4,6	AN206043	Life Guard premium silicon carbide seal kit	1
4,5,6	PM34300332	Standard seal kit	1
	PM34300748	Shaft seal kit	1

Belt-Driven, Cast Iron, Polypropylene & Stainless Steel

Series 9400 Belt Drive



- Drive: 12-groove belt
- Spring-loaded belt tensioner
- Stainless steel wear ring
- Stainless steel pump shaft, standard
- Port sizes: 9402 models – 1½" NPT inlet, 1" NPT outlet;
9403 models – 1½" NPT inlet
- Max. fluid temperature: 140°F/60°C
- Impeller: Cast Iron models – Nylon;
Poly & Stainless Steel models – Polypropylene
- Pump shaft rotation: Counter clockwise when looking
at shaft end.
- Weight: 40-45 lbs./18.2-20.5 kg
- Pump seals: Viton/ceramic standard; Life Guard® silicon
carbide

Order Information

Model Number	Max GPM	Max PSI	Max RPM	PTO Output
PM9402C540Q	76	95	600	1-3/8" 6-spline quick coupler
PM9402C1000	76	95	1000	1-3/8" female, 21-spline shaft
PM9403C540Q	140	104	600	1-3/8" 6-spline quick coupler
PM9403C540S	140	104	600	1" solid shaft
PM9403C1000	140	104	1000	1-3/8" female, 21-spline shaft
PM9403C1000S	140	104	1000	1" solid shaft
PM34300332	Seal and o-ring repair kit			
AN206043	Life Guard® silicon carbide seal kit			

PM9402C540Q

U.S. Units

RPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI
450	61	58	50	36				
500	67	66	62	56	42			
540	71	71	70	65	58	44		
600	76	76	76	75	73	66	56	42

PM9402C540Q

Metric Units

RPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR
450	231	220	189	136				
500	254	250	235	212	159			
540	269	269	265	246	220	167		
600	288	288	288	284	276	250	212	159

PM9402C1000

U.S. Units

RPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI
800	68	67	64	57	41				
900	74	74	73	71	64	54	41		
1000	76	76	76	76	76	72	65	56	43

PM9402C1000

Metric Units

RPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR
800	257	254	242	216	155				
900	280	280	276	269	242	204	155		
1000	288	288	288	288	288	273	246	212	163

PM9403C540Q, PM9403C540S

U.S. Units

RPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI
450	107	99	86	50					
500	121	116	106	93	76	42			
540	129	127	120	111	98	80	50		
600	140	138	135	130	121	112	94	73	40

PM9403C540Q, PM9403C540S

Metric Units

RPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR
450	405	375	326	189					
500	458	439	401	352	288	159			
540	488	481	454	420	371	303	189		
600	530	522	511	492	458	424	356	276	151

PM9403C1000, PM9403C1000S

U.S. Units

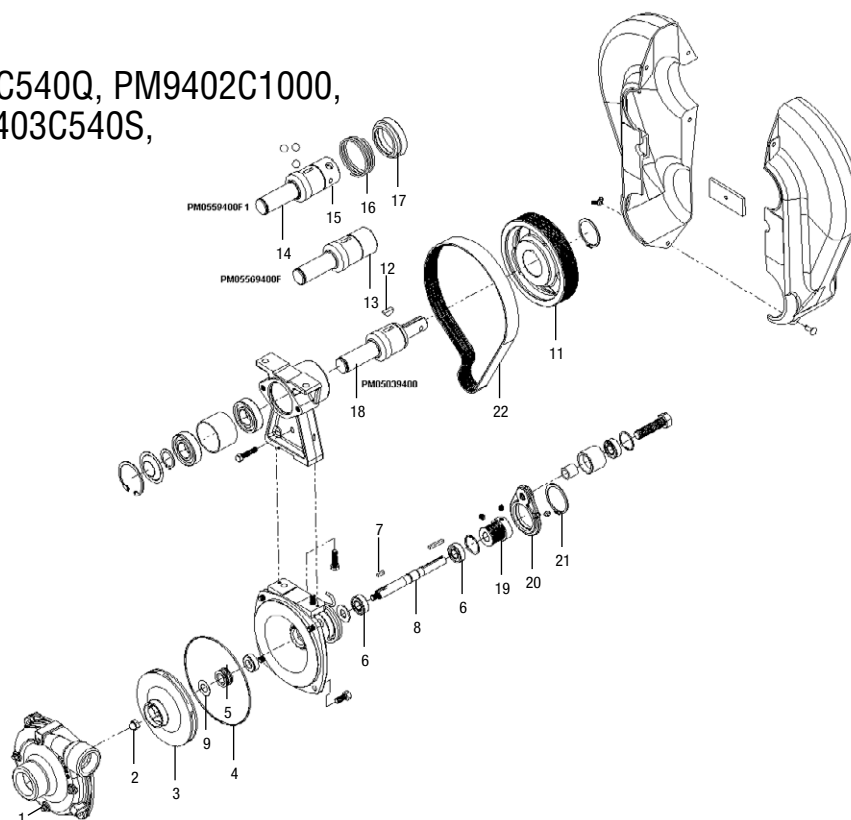
RPM	GPM at 20 PSI	GPM at 30 PSI	GPM at 40 PSI	GPM at 50 PSI	GPM at 60 PSI	GPM at 70 PSI	GPM at 80 PSI	GPM at 90 PSI	GPM at 100 PSI
800	115	106	96	80	56				
900	129	127	120	111	98	80	50		
1000	140	139	137	133	128	119	100	76	46

PM9403C1000, PM9403C1000S

Metric Units

RPM	LPM at 1.4 BAR	LPM at 2.1 BAR	LPM at 2.8 BAR	LPM at 3.4 BAR	LPM at 4.1 BAR	LPM at 4.8 BAR	LPM at 5.5 BAR	LPM at 6.2 BAR	LPM at 6.9 BAR
800	435	401	363	303	212				
900	488	481	454	420	371	303	189		
1000	530	526	519	503	485	450	379	288	174

Parts list for PM9402C540Q, PM9402C1000,
PM9403C540Q, PM9403C540S,
PM9403C1000, and
PM9403C1000S



Reference number	Part number	Description	Quantity
1	PM24060007	Drain/vent plug	4
2	PM22530002	Impeller nut	1
3	PM04019100P	Impeller-nylon	1
4	PM17200083	O-ring	1
5	PM21200009	Mechanical seal (Viton)	1
5	AN206043	Mechanical seal (Silcon Carbide)	1
6	PM20000010	Ball bearing	3
7	PM16100015	Key	1
8	PM05019200	Pump shaft	1
9	PM17000100	Rubber gasket	1
10	PM20010006	Driver shaft bearings	2
11	PM31150031	Driver pulley (540 rpm)	1
11	PM31150032	Driver pulley (1000 rpm)	1
12	PM16100033	Key-driver pulley	1
13	PM05569400F	Shaft (1000 rpm)	1
14	PM05559400F1	Shaft (540 rpm quick coupler)	1
15	PM32500004	Locking ball	3
16	PM19000115	Collar spring	1
17	PM14000021	Collar	1
18	PM05039400	Shaft (1" solid)	1
19	PM31150034	Driven pulley (5/8" dia. Bore)	1
20	PM07069400C	Idler bracket	1
21	PM19000156	Torsion spring	1
22	PM31000006	Poly V-Belt (540 rpm)	1
22	PM31000005	Poly V-Belt (1000 rpm)	1

Repair parts kit			
Reference number	Part number	Description	Quantity
4,5	AN206043	Life Guard premium silcon carbide seal kit	1
4,5,9	PM34300332	Standard seal kit	1

Life Guard® Silicon Carbide Pump Seals

Specially designed to prolong seal life



The drawing to the right represents a cross sectional view of a Life Guard® Premium Silicon Carbide Seal (top) and a standard seal (bottom). There are three key differences shown in the drawing: material, mating rings and balance.

Material:

The Life Guard® seal utilizes silicon carbide (SiC) for its seal surfaces (primary ring and mating ring). This is more abrasion resistant than the carbon graphite and ceramic used in standard seals. SiC also runs cooler if the pump is run dry, improving the life of the seal.

Mating Rings:

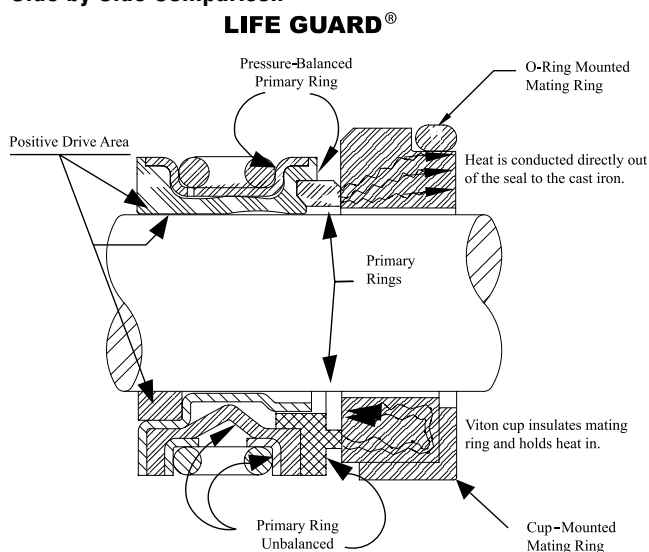
The O-ring style of the Life Guard® seal mating ring allows heat to dissipate into the pump casting. This keeps the seal at a lower temperature and dramatically improves the chances of the seal to survive a dry-run episode.

Balance:

The bellows and primary ring of the Life Guard® seal are pressure balanced. This results in cooler operation at higher pressures.

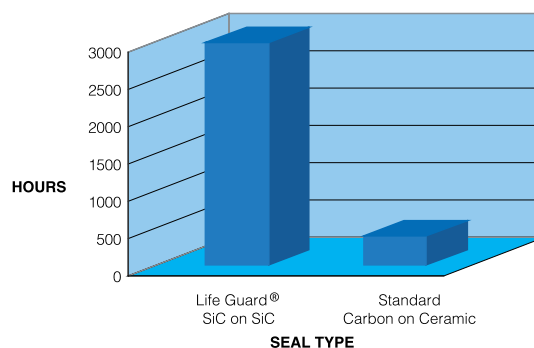
Life Guard® silicon carbide seals are available in the following models: Pedestal mount, Flange mount, Clutch-driven, Hydraulically-driven, Belt-driven.

Side by Side Comparison

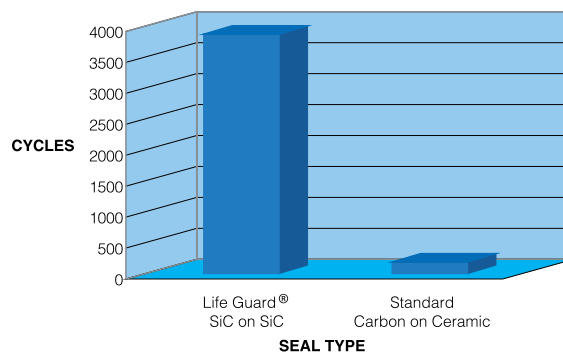


STANDARD

LIFE TEST IN ABRASIVE SOLUTION



DRY-RUN SURVIVABILITY (5 MINUTES/CYCLE)



Life Guard® Silicon Carbide Seal Kits

Part Number	Pump Series/Model #	Size	Description	Estimated Weight Ea.
AN206043	9200, 9300 and 9400 Cast and Stainless	¾"	Mechanical seal and o-ring	4 oz.

Roller Pumps

Roller pumps are the most popular pumps worldwide for agricultural tasks. These low-cost, highly-versatile pumps are used for spraying and transferring a variety of fluids including insecticides, herbicides, fungicides, emulsives, aromatic solvents, liquid fertilizers and many other non-abrasive liquids. All pumps are available in three materials: Cast Iron, Ni-Resist or Silver Series XL®.

These pumps contain rollers that revolve inside the pump housing to force the spray solution through the outlet to the nozzle. John Deere roller pumps are easily adaptable to PTO, gas engine or electric motor drives. The pumps operate efficiently at PTO speeds of 540 and 1000 rpm. Pressure ranges are up to 300 psi (20.7 bar) with flow rates of 2 to 62 gpm (7.6 to 235 lpm).

* Based on independent laboratory tests.

John Deere roller pump quality features:

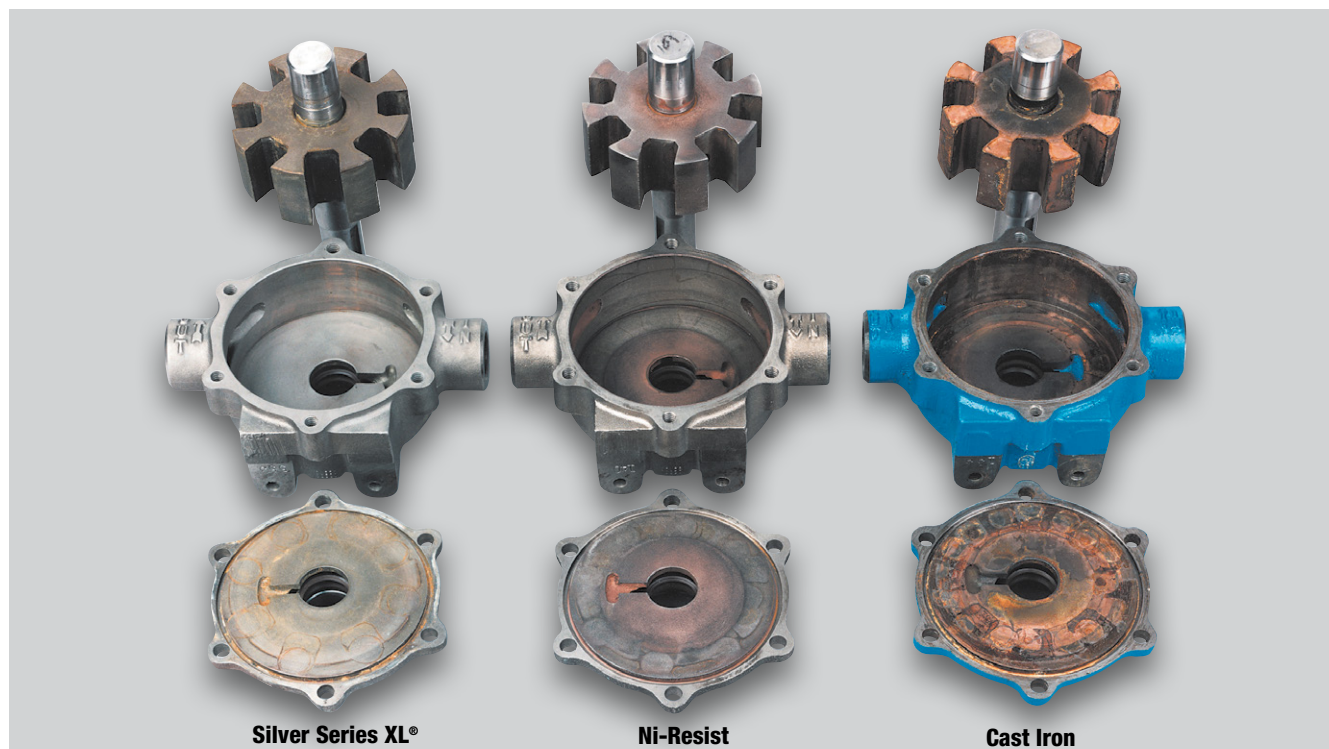
- Housing available in Cast Iron, Ni-Resist or Silver Series XL®
 - Ni-Resist is a high nickel content alloy for better corrosion resistance
 - Silver Series XL® has a custom alloy that provides the best corrosion resistance and is Ready for use with Roundup®
- Self-priming operation; roller pumps should NOT be run dry
- Adaptable to PTOs or gas engines
- Standard seals are Viton or Buna-N



Roller Pump Comparisons

Herbicide Users

Get up to 10 times longer pump life with Silver Series XL® Roller pumps!



Roller Pumps

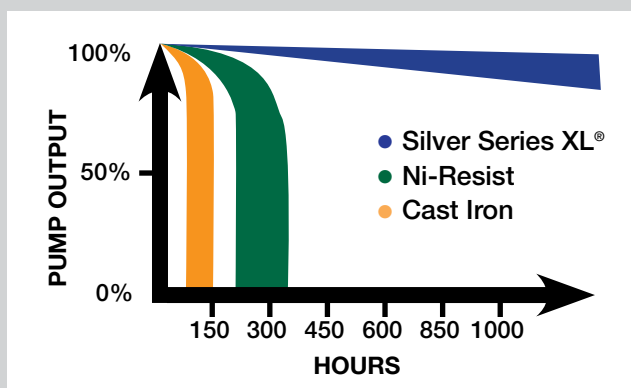
The three pumps shown above were photographed after being tested with a 30:1 mix of water and Roundup® herbicide.

The Ni-Resist and Cast Iron indicate damage from pitting and corrosion, but the Silver Series XL® is in like-new condition after more than 1000 hours of use.

Herbicide users:

Get up to 10 times longer pump life!

- Cast Iron pumps lasted to 140 hours before failure.
- Ni-Resist pumps lasted to 332 hours before failure.
- Silver Series XL® pumps ran over 1000 hours and still met new pump specs!



Roundup is a registered trademark of Monsanto Company. Silver Series XL is a registered trademark of Hypro.

Pump Recommendations for Applications

WHICH ROLLER PUMP, ROLLERS AND SEALS SHOULD YOU USE?

Material options for rollers and seals are listed in the order of recommendations for usage. These recommendations are only a general guide. For suggestions on specific chemicals or applications, call Pentair's Technical/Applications Department at (800) 445-8360.

APPLICATION	SPECIFIC CHEMICALS	SUGGESTIONS							
		Housing Materials			Roller Materials			Seal Materials	
		Silver Series XL	Ni-Resist	Cast Iron	Super Roller	Poly Rollers	Teflon® Rollers*	Viton®	Buna-N
WEED CONTROL CHEMICALS	Emulsions, soluble powders, sodium arsenate.	X	X	X	X			X	
	Chemicals containing glyphosate (such as Roundup®) or other acidics	X			X	X	X*	X	
INSECT CONTROL	Emulsions not containing aromatic solvents.	X	X	X	X			X	
BRUSH CONTROL	Heavy-duty sprays using diesel oil for carrier.	X	X	X	X			X	
PEST CONTROL CHEMICALS, FUMIGANTS, ETC.	This category or use includes mosquito sprays, termite control liquids, nematocides, soil and grain fumigants where any of the following chemicals with aromatic solvents are present: Pentachlorophenol, xylene, xylol, benzene, high sulphur fuel or diesel oil. Fumigants containing: ethylene dichloride, ethylene dibromide, carbon tetrachloride, perchlorethylene, trichlorethylene, methyl bromide, and other aromatic solvents.	X	X	X	X			X	
LIQUID FERTILIZERS	Up to 32% nitrogen content, or others if the liquid is atmospheric pressure and the temperature is handled.	X	X			X			X
POWDERED FERTILIZERS	Fertilizers dissolved in water (greenhouse plant food).	X	X	X	X	X		X	X
PUMPING	Large quantities of plain water.	X	X	X	X	X		X	X
SPRAYING	Wettable powder sprays.	X	X	X	X	X		X	X
MATERIAL HANDLING	Heavy abrasive powders in suspension.	X	X	X	X	X		X	X
ACIDS	Mild sulfuric acid for spraying. Mild muriatic acid, inhibited muriatic, etc.	X				X	X*	X	

*Note: Limit Pressure at 100 psi (6.9 bar) when using Teflon® Rollers.

Teflon® is a registered trademark of E.I. DuPont de Nemours and Co. Roundup® is a registered trademark of Monsanto Company. Viton® is a registered trademark of DuPont. Hypro® is a registered trademark of Pentair.

Cast Iron or Silver Series XL®

Series 4101 4-Roller



- Port size: 3/4" NPT
- Max. fluid temperature: 140°F/60°C
- Housing: Cast Iron (C), or Silvercast (XL)
- Pump shaft rotation: CW
- Weight: 5 lbs./2.27 kg
- Rollers: Super Rollers standard
- Shaft Seals: Viton standard
- Available shaft adapters: See page 101
- Rotor: Cast Iron, Ni-Resist or Silvercast
- Standard rotation directly couples to gasoline engines

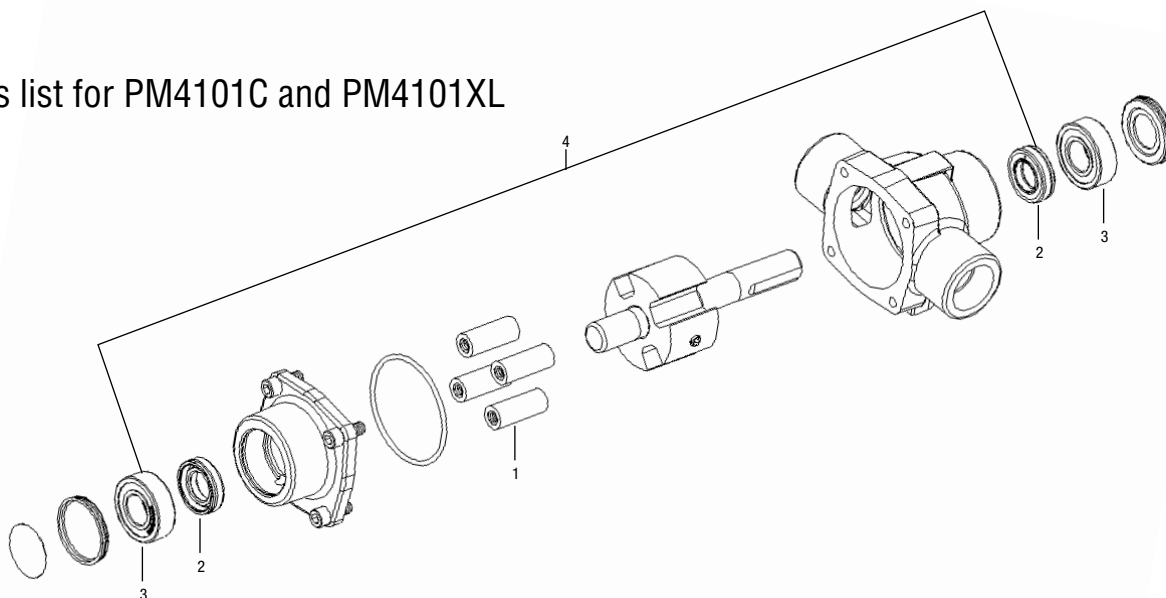
Order Information

Pressure in PSI and BAR	GPM		HP		GPM		HP		GPM		HP	
	LPM		HP		LPM		HP		LPM		HP	
	@1800 RPM		@2200 RPM		@2600 RPM		@2600 RPM		@2600 RPM		@2600 RPM	
0 PSI	5.0	.11	6.2	.14	7.2	.16						
0 BAR	18.9	.11	23.5	.14	27.3	.16						
25 PSI	4.8	.21	5.8	.27	6.9	.30						
1.7 BAR	18.1	.21	21.9	.27	26.1	.30						
50 PSI	4.5	.34	5.6	.40	6.6	.46						
3.4 BAR	17.0	.34	21.2	.40	25.0	.46						
75 PSI	4.2	.45	5.4	.55	6.4	.62						
5.2 BAR	15.9	.45	20.4	.55	24.2	.62						
100 PSI	3.9	.56	5.0	.68	6.0	.76						
6.9 BAR	14.8	.56	18.9	.68	22.7	.76						
125 PSI	3.7	.68	4.7	.82	5.7	.92						
8.6 BAR	14.0	.68	17.8	.82	21.6	.92						
150 PSI	3.4	.78	4.4	.96	5.4	1.08						
10.3 BAR	12.9	.78	16.6	.96	20.4	1.08						

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM4101C	7.2	150	2600	5/8" solid shaft
PM4101XL	7.2	150	2600	5/8" solid shaft
PM4101XLH	7.2	150	2600	1/2" hollow shaft

Roller Pumps

Parts list for PM4101C and PM4101XL

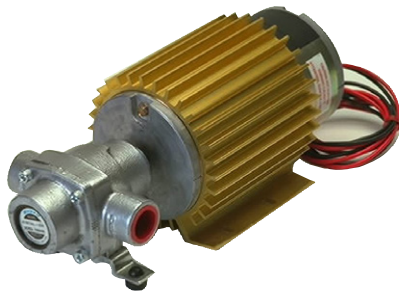


Reference number	Part number	Description	Quantity
1	PM10050002	Super rollers	4
2	PM21070002	Viton seal	2
3	PM20000010	Ball bearing	2

Repair parts kit			
Reference number	Part number	Description	Quantity
4	PM34300581	4-Super rollers, 1-O-ring gasket, and 2-Viton seals	1

Silver Series XL®

Series 4101 12 volt DC 4-Roller



- Super Rollers and Viton seals standard
- Locking collar and torque arm come in each package
- Rotor: Silvercast (XL)
- Weight: 16-18 lbs./7.3-8.2 kg

Note: All models come in either Ni-Resist or Silver Series XL housings.

Order Information

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM4101XLEH	7.5	50	1900	½" Hollow Shaft
PM25700013	12-volt motor only	12-volt motor only	PM4104XLEH pumps	

Model PM4101XLEH				
Series 4101-EH and 4101-E2H	Volts	PSI	AMPS	GPM
	12.0 (Battery) Engine Off	0	10.0	6.3
		5	11.3	6.0
		10	12.5	5.8
		15	13.7	5.6
		20	15.1	5.4
		25	16.7	5.2
		30	18.6	5.0
		35	20.3	4.8
		40	22.3	4.6
		45	24.1	4.4
		50	25.7	4.2
	13.5 (Alternator) Engine Running	0	10.4	7.5
		5	11.7	7.0
		10	13.0	6.6
		15	14.2	6.4
		20	15.8	6.2
		25	17.4	6.0
		30	19.6	5.8
		35	20.9	5.6
		40	22.5	5.4
		45	24.3	5.2
		50	26.1	5.0

Model PM4101XLEH				
Series 4101-EH and 4101-E2H	Volts	BAR	AMPS	LPM
	12.0 (Battery) Engine Off	0	10.0	23.8
		.3	11.3	22.7
		.7	12.5	22.0
		1.0	13.7	21.2
		1.4	15.1	20.4
		1.7	16.7	19.7
		2.1	18.6	18.9
		2.4	20.3	18.2
		2.8	22.3	17.4
		3.1	24.1	16.7
		3.4	25.7	15.9
	13.5 (Alternator) Engine Running	0	10.4	28.4
		.3	11.7	26.5
		.7	13.0	25.0
		1.0	14.2	24.2
		1.4	15.8	23.5
		1.7	17.4	22.7
		2.1	19.6	22.0
		2.4	20.9	21.2
		2.8	22.5	20.4
		3.1	24.3	19.7
		3.4	26.1	18.9

Cast Iron or Silver Series XL®

Series 6500 6-Roller



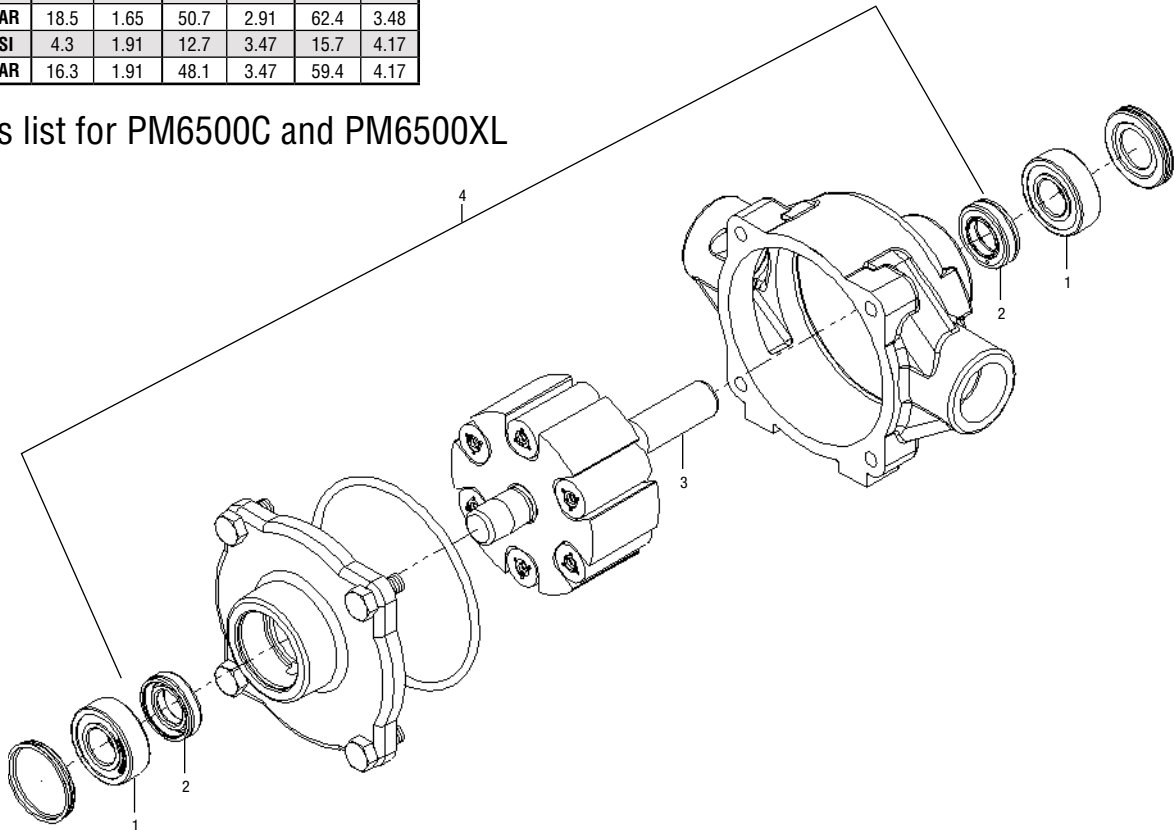
Pressure in PSI and BAR	GPM	HP	GPM	HP	GPM	HP
	LPM	HP	LPM	HP	LPM	HP
	@540 RPM		@1000 RPM		@1200 RPM	
0 PSI	9.7	.08	18.2	.20	21.8	.30
0 BAR	36.7	.08	68.9	.20	82.5	.30
50 PSI	8.0	.38	16.5	.71	20.1	.90
3.4 BAR	30.3	.38	62.4	.71	76.1	.90
100 PSI	7.2	.68	15.4	1.26	19.1	1.51
6.9 BAR	27.3	.68	58.3	1.26	72.3	1.51
150 PSI	6.6	.97	14.7	1.80	18.2	2.14
10.3 BAR	25	.97	55.6	1.80	68.9	2.14
200 PSI	5.6	1.29	14.0	2.34	17.3	2.84
13.8 BAR	21.2	1.29	53	2.34	65.5	2.84
250 PSI	4.9	1.65	13.4	2.91	16.5	3.48
17.2 BAR	18.5	1.65	50.7	2.91	62.4	3.48
300 PSI	4.3	1.91	12.7	3.47	15.7	4.17
20.7 BAR	16.3	1.91	48.1	3.47	59.4	4.17

- Port size: ¾" NPT
- 1" hose barb inlet fitting for 1000 rpm operation
- Max. fluid temperature: 140°F/60°C
- Housing: Cast Iron (C), or Silvercast (XL)
- Pump shaft rotation: CCW
- Weight: 9 lbs./4.1 kg
- Rollers: Super Rollers standard
- Shaft Seals: Viton standard
- Available PTO adapters: See page 101
- Recommended PTO torque arm kit 3430-0540
- Rotor: Cast Iron, Ni-Resist or Silvercast

Order Information

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM6500C	21.8	300	1200	¾" solid shaft
PM6500XL	21.8	300	1200	¾" solid shaft

Parts list for PM6500C and PM6500XL



Reference number	Part number	Description	Quantity
1	PM20000010	Ball bearing	2
2	PM21070002	Viton seal	2
3	PM10050004	Super rollers	6

Repair parts kit			
Reference number	Part number	Description	Quantity
4	PM34300582	6-Super rollers, 1-O-ring gasket, and 2-Viton seals	1

Cast Iron, Ni-Resist or Silver Series XL®

Series 7560 8-Roller



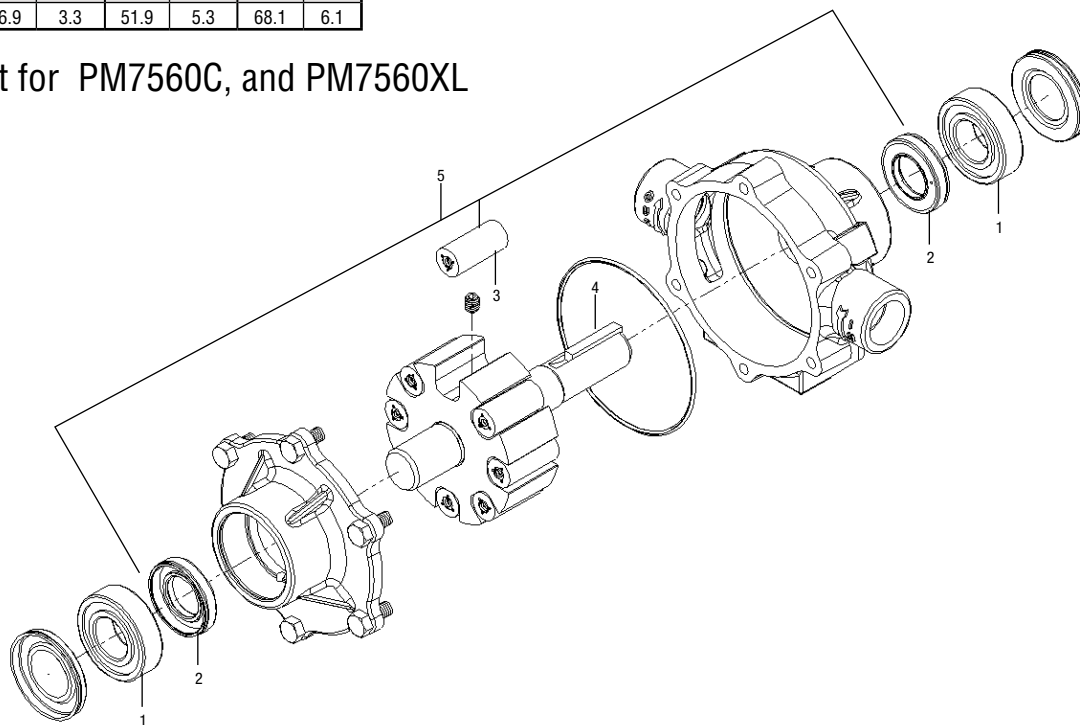
- Max. fluid temperature: 140°F/60°C
- Port sizes: 3/4" NPT
- 1" hose barb inlet fitting for 1000 rpm operation
- Housing: Cast Iron (C), Ni-Resist (N) or Silvercast (XL)
- Shaft rotation: CCW
- Weight: 13 lbs./5.89 kg
- Rollers: Super Rollers standard
- Shaft Seals: Viton standard
- Available PTO adapters: See page 101
- Recommended PTO torque arm kit 3430-0540
- Rotor: Cast Iron, Ni-Resist or Silvercast

Order Information

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM7560C	22.5	300	1200	1 5/16" solid shaft
PM7560XL	22.5	300	1200	1 5/16" solid shaft

Pressure in PSI and BAR	GPM	HP	GPM	HP	GPM	HP
	LPM	HP	LPM	HP	LPM	HP
	@540 RPM		@800 RPM		@1000 RPM	
0 PSI	12	.33	18.3	.89	22.5	1.56
0 BAR	45.4	.33	69.3	.89	85.2	1.56
50 PSI	11.1	.74	17.5	1.26	22	1.78
3.4 BAR	42	.74	66.2	1.26	83.3	1.78
100 PSI	10.3	1.25	16.9	1.95	21.3	2.53
6.9 BAR	39	1.25	64	1.95	80.6	2.53
150 PSI	9.5	1.77	16.1	2.65	20.6	3.5
10.3 BAR	36	1.77	60.9	2.65	78	3.5
200 PSI	8.6	2.26	15.5	3.4	20	4.2
13.8 BAR	32.5	2.26	58.7	3.4	75.7	4.2
250 PSI	7.0	2.78	14.5	4.2	18.9	5.3
17.2 BAR	29.5	2.78	54.9	4.2	71.5	5.3
300 PSI	7.1	3.3	18.9	5.3	18.0	6.1
20.7 BAR	26.9	3.3	51.9	5.3	68.1	6.1

Parts list for PM7560C, and PM7560XL



Reference number	Part number	Description	Quantity
1	PM20000010	Ball bearing	2
2	PM21070002	Viton seal	2
3	PM10050004	Super rollers	8
4	PM16100005	Key	1
Repair parts kit			
Reference number	Part number	Description	Quantity
5	PM34300583	8-Super rollers, 1-0-ring gasket, and 2-Viton seals	1

Cast Iron, Ni-Resist or Silver Series XL®

Series 7700 7-Roller



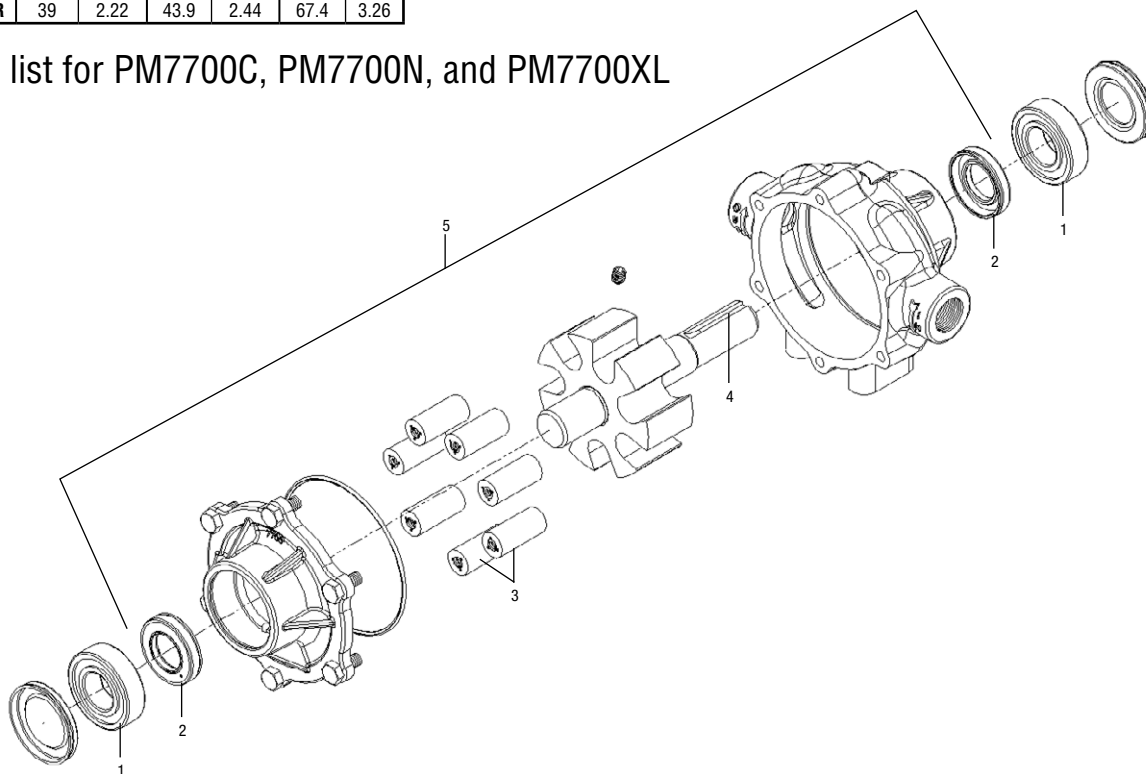
- Max. fluid temperature: 140°F/60°C
- Port size: ¾" NPT
- Housing: Cast Iron (C), Ni-Resist (N) or Silvercast (XL)
- Weight: 14 lbs./6.36 kg
- Pump shaft rotation: CCW (CW available)*
- Rollers: Super Rollers standard
[Poly (T3), Teflon (T2) and Buna-N (G) available]
- Shaft Seals: Viton standard [Buna-N (M) available]
- Available PTO adapters: See page 101
- Recommended PTO torque arm kit 3430-0540
- Rotor: Cast Iron, Ni-Resist or Silvercast

Pressure in PSI and BAR	GPM	HP	GPM	HP	GPM	HP
	LPM	HP	LPM	HP	LPM	HP
	@540 RPM		@600 RPM		@800 RPM	
0 PSI	14.2	.23	15.3	.28	22.1	.37
0 BAR	53.7	.23	57.9	.28	83.6	.37
50 PSI	12.9	.56	14.0	.62	20.7	.86
3.4 BAR	48.8	.56	53	.62	78.3	.86
100 PSI	11.9	1.10	13.0	1.20	19.5	1.66
6.9 BAR	45	1.10	49.2	1.20	73.8	1.66
150 PSI	11.2	1.64	12.3	1.80	18.6	2.40
10.3 BAR	42.4	1.64	46.6	1.80	70.4	2.40
200 PSI	10.3	2.22	11.6	2.44	17.8	3.26
13.8 BAR	39	2.22	43.9	2.44	67.4	3.26

Order Information

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM7700C	22.1	200	800	15/16" solid shaft
PM7700N	22.1	200	800	15/16" solid shaft
PM7700XL	22.1	200	800	15/16" solid shaft

Parts list for PM7700C, PM7700N, and PM7700XL



Reference number	Part number	Description	Quantity
1	PM20080001	Ball bearing	2
2	PM21120003	Viton seal	2
3	PM10050004	Super rollers	8
4	PM16100005	Key	1

Repair parts kit			
Reference number	Part number	Description	Quantity
5	PM34300583	8-Super rollers, 1-O-ring gasket, and 2-Viton seals	1

Cast Iron, Ni-Resist or Silver Series XL®

Series 1700 5-Roller



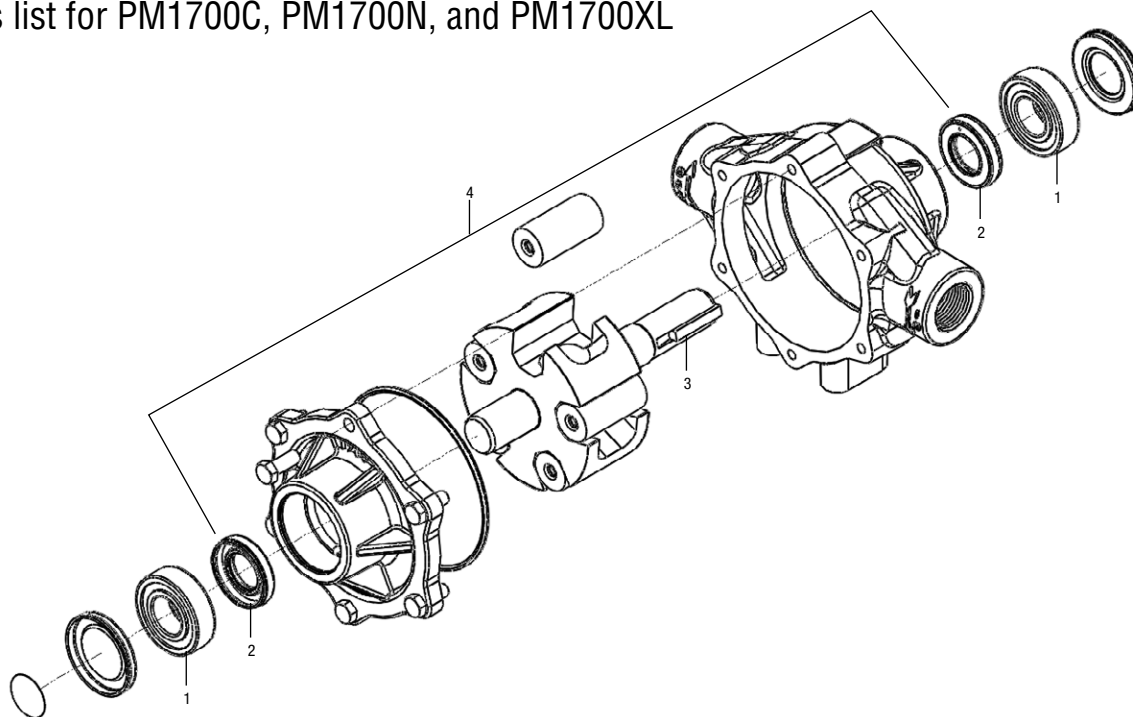
- Max. fluid temperature: 140°F/60°C
- Port size: 1" NPT
- Housing: Cast Iron (C), Ni-Resist (N) or Silvercast (XL)
- Pump shaft rotation: CCW (CW available)*
- Weight: 19 lbs./8.6 kg
- Rollers: Super Rollers standard
- Shaft Seals: Viton standard
- Available PTO adapters (forged steel recommended): See page 101
- Recommended PTO torque arm kit 3430-0540
- Rotor: Cast Iron, Ni-Resist or Silvercast

Pressure in PSI and BAR	GPM		HP		GPM		HP		GPM		HP	
	LPM		HP		LPM		HP		LPM		HP	
	@540 RPM		@600 RPM		@1000 RPM		@1000 RPM		@1000 RPM		@1000 RPM	
0 PSI	25.0	2.7	28.0	.34	45.0	1.42						
0 BAR	94.6	2.7	106	.34	170	1.42						
50 PSI	21.0	1.18	24.5	1.39	43.0	3.0						
3.4 BAR	79.5	1.18	92.7	1.39	163	3.0						
100 PSI	19.0	2.13	22.0	2.36	41.0	4.67						
6.9 BAR	71.9	2.13	83.3	2.36	155	4.67						
150 PSI	17.0	2.89	20.0	3.34	39.0	6.07						
10.3 BAR	64.3	2.89	75.7	3.34	148	6.07						
200 PSI	15.0	3.85	18.0	4.39								
13.8 BAR	56.8	3.85	681	4.39								

Order Information

Model Number	Max GPM	Max PSI	Max RPM	Shaft Output
PM1700C	45	200	1000	1 5/16" solid shaft
PM1700N	45	200	1000	1 5/16" solid shaft
PM1700XL	45	200	1000	1 5/16" solid shaft

Parts list for PM1700C, PM1700N, and PM1700XL



Reference number	Part number	Description	Quantity
1	PM20080001	Ball bearing	2
2	PM21120003	Viton seal	2
3	PM16100005	Key	1
Repair parts kit			
Reference number	Part number	Description	Quantity
4	PM34300437	5-Super rollers, 1-0-ring gasket, and 2-Viton seals	1

Roller Pump Kits and Accessories

Roller Pump Accessory Selection Guide

Description	Series 1700	Series 6500	Series 7560	Series 7700	Series 4000
1000 rpm 1 $\frac{1}{4}$ " Forged Steel PTO Adapter	PM13200080	————	PM13200080	PM13200080	————
Multi-Speed 1 $\frac{1}{2}$ " Die Cast Quick Coupler	————	PM13210012	————	————	PM13210012
1000 rpm 1 $\frac{1}{2}$ " Forged Steel Quick Coupler	PM13230073	————	PM13230073	PM13230073	————
Multi-Speed 1 $\frac{1}{2}$ " Forged Steel Quick Coupler	PM13230076	————	PM13230076	PM13230076	————
Steel Shaft Adapter $\frac{3}{4}$ " x $\frac{5}{8}$ "	————	PM13200015	————	————	PM13200015
Repair Kits	PM34300437	PM34300582	PM34300583	PM34300583	PM34300581
Torque Arm Kit	PM34300540	PM34300540	PM34300540	PM34300540	————

* For electric motor drive 3 $\frac{1}{2}$ " shaft centerline (4001, 4101).

** For gas engine drive 4 $\frac{1}{16}$ " shaft centerline (4101 only).

Roller and Rotor Repair Kits

Kit Number	Pump Series	Description	Estimated Weight Ea.
PM34300437	1700	Roller kit includes: 5 Super Rollers, 1 o-ring gasket, and 2 Viton® seals	1 lb. 5 oz.
PM34300582	6500	Roller kit includes: 6 Super Rollers, 1 o-ring gasket, and 2 Viton® seals	8 oz.
PM34300583	7560/7700	Roller kit includes: 8 Super Rollers, 1 o-ring gasket, and 2 Viton® seals	12 oz.
PM34300581	4101	Roller kit includes: 4 Super Rollers, 1 o-ring gasket, and 2 Viton® seals	3 oz.

Cleaners, Foam and Dye

John Deere offers a variety of cleaners, foam and dye to meet your needs.

Cleaners, Foam and Dye



Cleaners

Erase™ Spray System Cleaner



Erase(TM) is a powerful spray system cleaner that emulsifies oily residues in sprayer lines and hoses while elevating rinsate pH to degrade vulnerable crop protection products. This cleaner penetrates and removes dried on residue left behind from incompatible tank mixes allowing easier purging of the system. When used in conjunction with proper sprayer cleaning technique, Erase ensures more thorough clean-outs and reduced risk of cross contamination that leads to crop injury and yield loss. It also contains anti-corrosion inhibitors to protect equipment pumps, seals and plumbing.

Erase™ use rates: 2 quarts per 100 gallons of rinsate

Part Number	Description	Pkg qty
PM433QT	1 Quart (.95L)	12

Incide-Out™ Spray Tank Cleaner



Incide-Out™ is a liquid spray tank cleaner that emulsifies and bonds pesticide residues to rinse water for complete purging. It penetrates residue buildup but won't plug screens and nozzles like dry tank cleaners. It contains corrosion inhibitors to protect equipment and can be disposed of with normal rinsate solution.

Incide-Out™ use rates: 1 quart per 100 gallons of clean water rinsate

Part Number	Description	Pkg qty
PM434QT	1 Quart (.95 L)	12

Foam

Enduron PSI™ Marking Foam



Enduron PSI™ is a marking foam formulated to maximize performance in pressurized marker systems. It generates greater volumes of heat stable marking foam under a wider range of operating pressures. Enduron's high expansion formulation produces large volumes of thick, long lasting foam that allows applicators to drop more foam at higher operating pressures and application speeds.

Enduron PSI™ use rates: 13 oz per 10 gallons of water

Part Number	Description	Pkg qty
PM65201	1 Gallon (3.78 L)	4

Dye

Tracer™ Hot Pink Marking Foam Colorant



Tracer™ Hot Pink Marking Foam Colorant increases marking foam visibility in drilled crops and heavy residue situations where optical clarity of white foam is limited. High-impact color leaves a mark on foliage even if foam won't. Highly visible in light colored soils and in bright sunlight.

Tracer™ use rates: 1-2 ounces of Tracer per 10 gallons of foam mixture. Note: Water hardness and other variables can affect the concentration of Tracer needed to reach the desired visibility. - make adjustments accordingly.

Part Number	Description	Pkg qty
PM741QT	1 Quart (.95 L)	12

Defoamer

Gundown Max™ Defoamer



Gundown Max™ Foam Destroyer works in seconds to provide fast results. It's unique formulation prevents gelling and won't plug sprayer screens and nozzles. Gundown Max's concentrated formula mean less inventory and better value than with ordinary defoamers. It can be used as either a defoamer or an antifoam on the toughest foaming tank mixes.

Gundown Max™ use rates:

Antifoam: 1-2 ounces/100 gal, add entire volume of Gundown Max needed for load when tank is 1/4 full

General Defoamer: 2-4 ounces/100 gal, add to spray solution at point of greatest agitation

Spot Defoaming: Apply by misting over established foam until desired results are achieved

Part Number	Description	Pkg qty
PM737QT	1 Quart (.95 L)	12

Precision Laboratories is a leading provider of specialized chemistries applied to plants, seeds, soil and water to maximize resource and biological performance potential while stewarding the environment.

Foam Markers

Marking foam collector boot



Durable polyethylene shell. Bright yellow for boom-end visibility. Includes fine-mesh screen that resists tearing from crop residue and creates excellent back pressure for large foam dollops. Kit includes clamp for attaching to the drop.

Part Number	Description	Pkg. qty.
AN204606	Collector boot kit	1

Winterizer and Corrosion Protection



Sprayer Winterizer Fluid, a John Deere exclusive, is the only cold-weather protection fluid specifically formulated to protect the entire wet system of sprayers from damage caused by freezing and corrosion during cold weather or long-term storage.

- Concentrated formulation dilutes easily with water to provide the right amount of protection for every environment.
- Special lubricant additive protects critical, high-value sprayer components from dry storage corrosion and deterioration.
- The only cold-weather protection that is guaranteed to be in compliance with Title 40 of the Federal Code of Regulations 180.1001. This means it can be disposed of during normal spraying operations or added to the rinse tank for disposal later in the season, reducing user liability.

Part Number	Description	Pkg. qty.
N305634	2 1/2 gallon (9.45L)	32
TY26555	55 gallon drum (208L)	1

Corrosion Protection



John Deere Clear-Coat Epoxy kit is designed specifically for corrosion protection of hardware on sprayers. When applying chemicals and fertilizers, many sprayer components risk corrosion. Parts most susceptible to corrosion include zinc-plated parts such as: bolts, nuts, screws, hydraulic fittings, spacers, metal solenoid covers, etc. Not recommended for painted surfaces.

Note: 2.5-to-1 mix ratio yields one quart when mixed. A single two-can mix will coat the necessary components of one sprayer. Once mixed, there is no shelf life for the product.

Part Number	Description	Pkg. qty.
TY25396	Clear-coat epoxy	1 quart (mixed)

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