i-wob®

The Inverted Pivot Wobbler

Designed and manufactured by Senninger Irrigation Inc.

Unmatched uniformity at low pressures

i-Wob shown with PSR (Pivot-Special Regulator™) and optional i-Wob Weight.

Nothing wets like the. . .

i-wob®

The i-Wob utilizes a remarkable off-center rotary action to perform like no other nozzle on the market.

Gentle, Rain-like Application

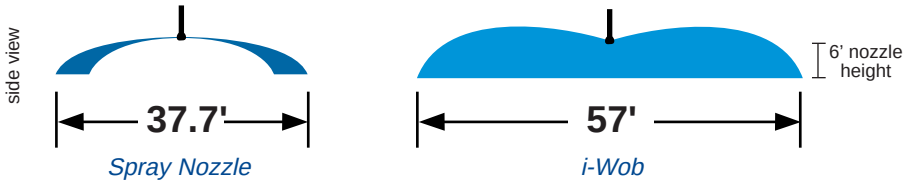
With the i-Wob, water reaches the ground in a gentle rain-like manner. It doesn't dissolve clods and seal-over the soil like other ordinary products. This helps water soak in and keeps the soil structure fit for proper root development.

Unmatched Uniformity

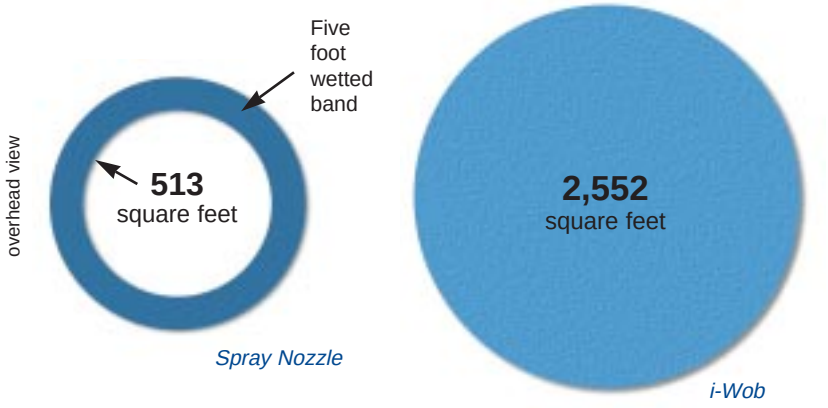
The unique action of **the i-Wob provides the most uniform pattern available** for pivot irrigation.

HIGH UNIFORMITY LEADS TO BETTER CROP QUALITY AND INCREASED PRODUCTION.

Excellent Distance of Throw



The action of its wobbling shroud allows the i-Wob to throw water much farther than other spray nozzles and sprinklers operating at these low pressures (10 to 20 psi). *(In this example, nozzles are at 20 psi, a 6' height, using a 11/32" nozzle, with a flow of 14.27 gpm in no-wind conditions.)*



In this example, the i-Wob is spreading the same amount of water over an area five times greater than the area covered by the spray nozzle. *(Nozzles are at 20 psi, a 6' height, using a 11/32" nozzle, with a flow of 14.27 gpm in no-wind conditions.)*

Lowest Instantaneous Application Rate

Ordinary single-pad spray nozzles place all their water in a ring at the outer edge of their wetted circle. This causes higher application rates, soil compaction and an increased chance of runoff.

The i-Wob uniformally covers the entire area of its wetted circle. This means it is wetting a much larger area at a much lower instantaneous application rate. **The result is less soil compaction and less runoff.**

The i-Wob is a True Low-Pressure Sprinkler

The i-Wob is extremely energy efficient, very little pressure is needed for outstanding performance. The i-Wob operates between 10 and 20 psi which can mean big energy savings over the course of a year *(see energy savings examples inside the last page).*

Senninger does not recommend using i-Wobs at nozzle pressures above 20 psi.

The i-Wob weight is available in 1/2, 3/4 and 1 pound sizes.

Revolutionary i-Wob Weight

When compared to conventional drop weights, the i-Wob weight provides:

- a lower position on drop for better stability
- less stress on flexible drops
- less weight needed for counteracting wind (a 3/4 lb i-Wob weight is as effective as a 2 lb polyethylene weight)
- easier installation

NEW OPTIONS

Hosebarb Base

For direct connection to drop hose.

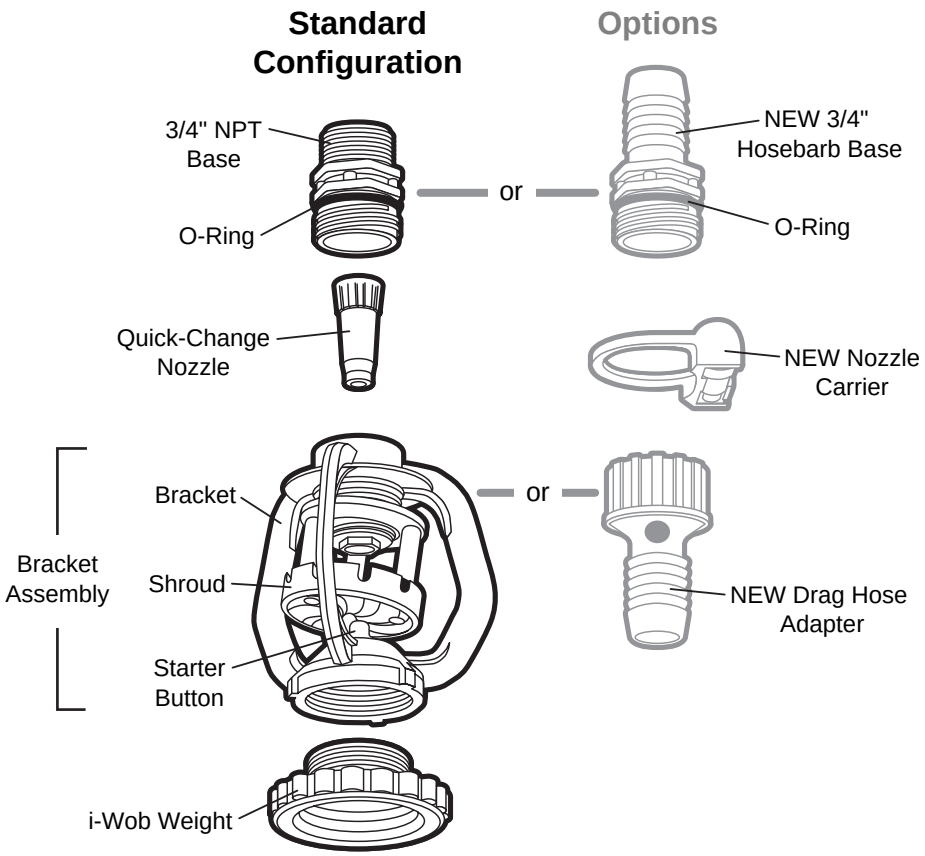
Nozzle Carrier

Simplifies renozzling your pivot for a second flow rate during the season.

Drag Hose Adapter

Allows for easy conversion to direct furrow (LEPA-style) application with a drag hose.

i-Wob Components



Quick-Change Nozzles

Easy to change (no tools required) and color coded for easy size identification. Available in 1/128 inch increments (half sizes).

Splines on tip denote half-size nozzles

 # 14 Nozzle *# 14.5 Nozzle*

i-Wob System Design Criteria

To maintain product warranty, refer to the chart below:

Model	Maximum Spacing	Max. Stream Height Above Nozzle	Recommended Nozzle Sizes	Minimum Ground Clearance	Nozzle Pressure
STANDARD ANGLE I-WOB	20 ft (6.1 m)	3 to 5 ft (0.9 - 1.5 m)	Minimum #7 (7/64" or 2.78mm) Maximum #24 (3/8" or 9.53mm)	3 feet (0.9 m) *(at a maximum outlet spacing of 10 feet (3m))*	Minimum 10 psi (0.7 bar) Maximum 20 psi (1.4 bar)
LOW ANGLE 9-Groove I-WOB	15 ft (4.6 m)	3 to 4.5 ft (0.9 - 1.2 m)	Minimum #7 (3/16" or 4.76mm) Maximum #24 (3/8" or 9.53mm)		
LOW ANGLE 6-Groove I-WOB	15 ft (4.6 m)	3 to 4 ft (0.9 - 1.2 m)	Minimum #12 (3/16" or 4.76mm) Maximum #24 (3/8" or 9.53mm)		

For optimum performance, Senninger recommends using maximum spacing for no more than 2 to 3 spans.

Keep i-Wobs above crop canopy when spacing exceeds 10 feet.

Larger nozzles should only be used on soils and slopes that can handle higher application rates.

Senninger Products are Backed by the Best Warranty in the Business

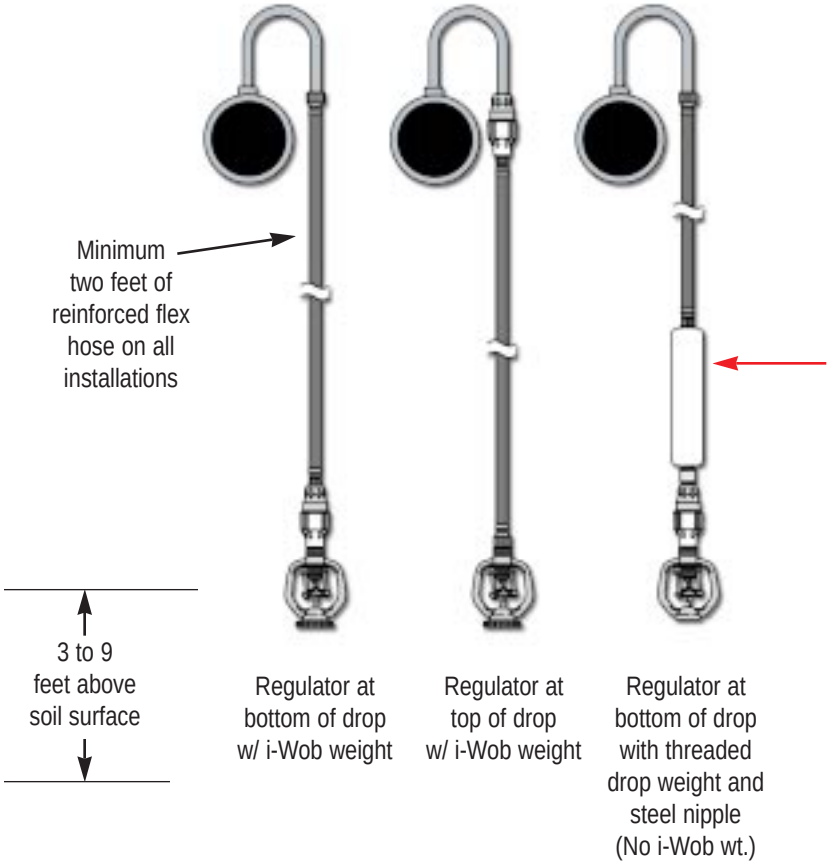
When you choose a Senninger product, you get something extra: the protection of the best warranty in the business. Senninger's **two-year** comprehensive warranty protects not only against defects in materials and workmanship, but also against failure to perform.

Senninger Pivot Packages

For the best performance from your pivot, ask your dealer for a Senninger Pivot Package. Senninger water application engineers will design the ideal i-Wob set for your specific machine, field and climate. Once your set arrives, installation is easy: each i-Wob will be sequence-packed and its location will be clearly numbered on both the product and a computer printout.

i-Wob Drop Configurations

To maintain product warranty and maximize drop component life, refer to the diagrams below:



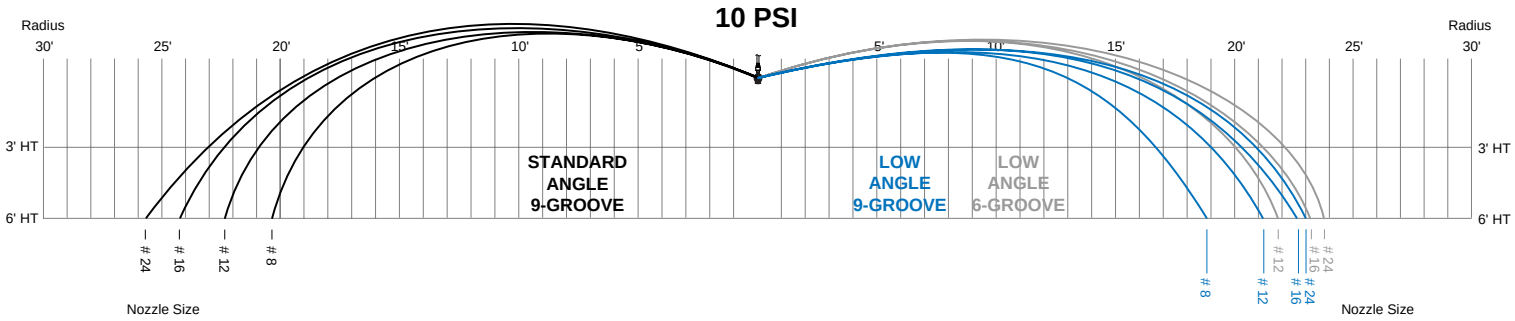
For an accurate pivot package printout, it is critical that you let us know whether regulators are being mounted at the top or bottom of the drop tubes.

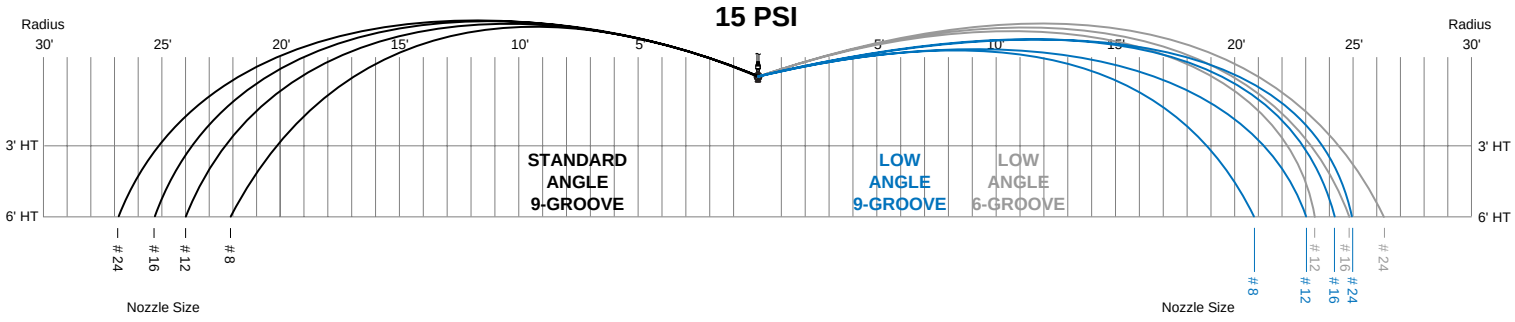
Note: Because of its off-center rotary action, ***it is necessary that the i-Wob be mounted with a minimum of two feet of reinforced flex hose.*** *When using a steel nipple as a drop weight above the i-Wob, Senninger does not recommend using a rigid nipple over 12" in length.*

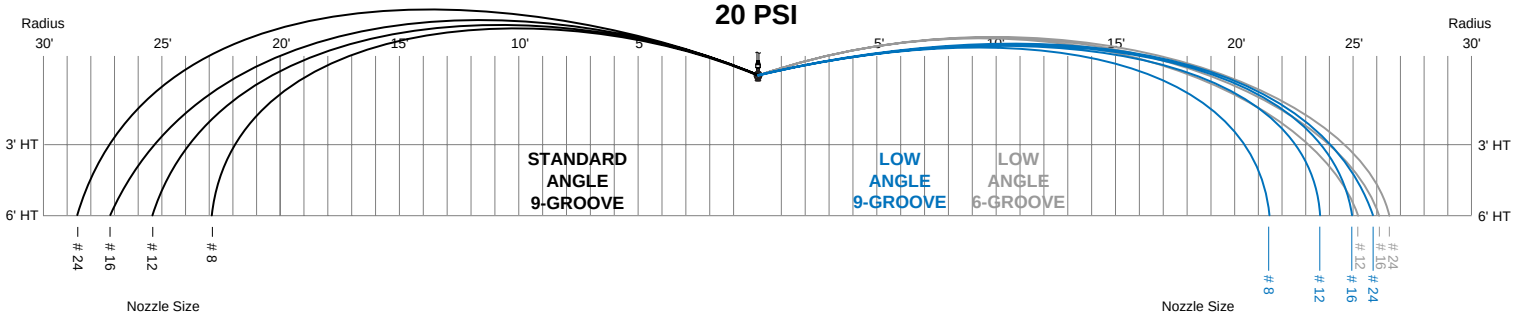
IMPORTANT NOTE: If you are using conventional weights (above nozzle), be sure to use threaded weights, do not use slip over weights with the i-Wob.

The use of i-Wob lower weights in combination with conventional above-nozzle weights is not recommended.

I-WOB MAXIMUM THROW
(in no wind conditions)







PUT MONEY IN YOUR POCKET, NOT IN YOUR PUMP!

ENERGY SAVINGS WITH THE I-WOB

Example 1:

- **Electric motor driven pumping unit**
- **Field has predominately heavy soil with sloping terrain**
- **System flow rate is 900 gpm**
- **Annual run time is 2,000 hours**

The Standard i-Wob produces a droplet size desirable for these conditions when run at 15 to 20 psi. Alternative sprinklers available in today's market require 30 to 35 psi to provide a wetted area and droplet size similar to the i-Wob, yet still lack the i-Wob's uniformity. With a 15 psi difference between the i-Wob and the most comparable alternative, the following calculation reveals the approximate savings in energy costs:

Electric Driven Pumps
Annual Cost for One PSI of System Pressure

(Using $0.065/kwh electricity rate and 75% pumping efficiency)

Flow (gpm)	1000Hrs/Yr	1500Hrs/Yr	2000Hrs/Yr	2500Hrs/Yr
300	$11	$17	$23	$28
400	$15	$23	$30	$38
500	$19	$28	$38	$47
600	$23	$34	$45	$57
700	$26	$40	$53	$66
800	$30	$45	$60	$75
900	$34	$51	$68	$85
1,000	$38	$57	$75	$94
1,100	$41	$62	$83	$104
1,200	$45	$68	$91	$113
1,300	$49	$74	$98	$123
1,400	$53	$79	$106	$132

Sprinkler	Cost per psi	x	Pressure	=	Annual Cost	Five Year Cost
i-Wob	$68	x	15 psi	=	$1,020	$5,100
Alternative Sprinkler	$68	x	30 psi	=	$2,040	$10,200
			Savings	**=**	**$1,020**	**$5,100**

Example 2:

- **Diesel engine driven pumping unit**
- **Field has predominately light sandy soil**
- **Due to water limitations, system flow rate is 600 gpm**
- **Annual run time is 1,500 hours**

Selecting the i-Wob with 10 psi pressure regulators will provide a good coverage and droplet size for these conditions. This pressure is approximately 20 psi lower than what the most comparable package needs. The following calculation reveals the approximate savings in energy costs:

Diesel Driven Pumps
Annual Cost for One PSI of System Pressure

(Using $0.90/gallon diesel cost, 0.4lbs/BHP/hr consumption rate and 75% pumping efficiency)

Flow (gpm)	1000Hrs/Yr	1500Hrs/Yr	2000Hrs/Yr	2500Hrs/Yr
300	$12	$18	$24	$30
400	$16	$24	$32	$40
500	$20	$30	$40	$50
600	$24	$36	$48	$60
700	$28	$42	$56	$70
800	$32	$48	$64	$80
900	$36	$54	$72	$90
1,000	$40	$60	$80	$100
1,100	$44	$66	$88	$110
1,200	$48	$72	$96	$120
1,300	$52	$78	$104	$130
1,400	$56	$84	$112	$140

Sprinkler	Cost per psi	x	Pressure	=	Annual Cost	Five Year Cost
i-Wob	$36	x	10 psi	=	$360	$1,800
Alternative Sprinkler	$36	x	30 psi	=	$1,080	$5,400
			Savings	**=**	**$720**	**$3,600**

PERFORMANCE DATA

i-wob®

Nozzle Sizes & Colors	Nozzle Pressure (psi)	STANDARD ANGLE 10	15	20	LOW ANGLE 9 10	15	20	LOW ANGLE 6 10	15	20
#7 - Lime (7/64")	Flow (gpm)	1.12	1.34	1.56	1.12	1.34	1.56			
	Diameter (ft) at 3 feet ht.	36.9	40.1	42.5	32.0	36.4	39.6			
	Diameter (ft) at 6 feet	39.6	43.2	44.4	36.4	40.4	41.7			
#8 - Lavender (1/8")	Flow (gpm)	1.45	1.73	2.01	1.45	1.73	2.01			
	Diameter (ft) at 3 feet	38.0	41.3	43.8	33.2	37.6	40.8			
	Diameter (ft) at 6 feet	40.6	44.2	45.8	37.6	41.6	42.9			
#9 - Grey (9/64")	Flow (gpm)	1.82	2.17	2.52	1.82	2.17	2.52			
	Diameter (ft) at 3 feet	39.0	42.2	45.1	34.4	38.8	42.0			
	Diameter (ft) at 6 feet	41.6	45.2	47.2	38.8	42.7	44.0			
#10 - Turquoise (5/32")	Flow (gpm)	2.25	2.69	3.12	2.25	2.69	3.12			
	Diameter (ft) at 3 feet	40.0	43.0	46.0	35.6	40.0	43.2			
	Diameter (ft) at 6 feet	42.6	46.2	48.4	40.0	43.8	45.1			
#11 - Yellow (11/64")	Flow (gpm)	2.65	3.21	3.76	2.65	3.21	3.76			
	Diameter (ft) at 3 feet	40.9	43.8	46.8	36.8	41.2	44.2			
	Diameter (ft) at 6 feet	43.6	47.2	49.6	41.2	44.9	46.2			
#12 - Red (3/16")	Flow (gpm)	3.16	3.81	4.45	3.16	3.81	4.45	3.16	3.81	4.45
	Diameter (ft) at 3 feet	41.8	44.6	47.6	38.0	42.4	45.2	40.0	44.5	46.2
	Diameter (ft) at 6 feet	44.6	48.0	50.8	42.4	46.0	47.3	43.6	46.7	50.4
#13 - White (13/64")	Flow (gpm)	3.77	4.50	5.23	3.77	4.50	5.23	3.77	4.50	5.23
	Diameter (ft) at 3 feet	42.6	45.4	48.4	39.2	43.6	46.0	40.9	45.1	46.7
	Diameter (ft) at 6 feet	45.6	48.8	51.8	43.6	47.0	48.3	44.8	47.7	51.4
#14 - Blue (7/32")	Flow (gpm)	4.39	5.24	6.09	4.39	5.24	6.09	4.39	5.24	6.09
	Diameter (ft) at 3 feet	43.4	46.1	49.2	39.8	44.8	46.6	41.5	45.6	47.2
	Diameter (ft) at 6 feet	46.6	49.4	52.8	44.6	47.8	49.1	45.6	48.3	51.8
#15 - Dark Brown (15/64")	Flow (gpm)	5.05	6.03	7.00	5.05	6.03	7.00	5.05	6.03	7.00
	Diameter (ft) at 3 feet	44.2	46.8	49.9	40.2	45.6	47.0	42.0	46.0	47.6
	Diameter (ft) at 6 feet	47.6	50.0	53.6	45.0	48.2	49.5	46.0	48.9	52.0
#16 - Orange (1/4")	Flow (gpm)	5.79	6.91	8.03	5.79	6.91	8.03	5.79	6.91	8.03
	Diameter (ft) at 3 feet	44.8	47.4	50.6	40.6	45.8	47.2	42.4	46.4	48.0
	Diameter (ft) at 6 feet	48.4	50.6	54.4	45.2	48.5	49.9	46.4	49.5	52.2
#17 - Dark Green (17/64")	Flow (gpm)	6.50	7.76	9.01	6.50	7.76	9.01	6.50	7.76	9.01
	Diameter (ft) at 3 feet	45.2	48.0	51.3	40.8	46.0	47.3	42.8	46.8	48.4
	Diameter (ft) at 6 feet	49.0	51.0	55.0	45.3	48.7	50.2	46.8	50.0	52.3
#18 - Purple (9/32")	Flow (gpm)	7.25	8.65	10.04	7.25	8.65	10.04	7.25	8.65	10.04
	Diameter (ft) at 3 feet	45.4	48.5	52.0	41.0	46.2	47.4	43.2	47.2	48.6
	Diameter (ft) at 6 feet	49.4	51.4	55.4	45.4	48.9	50.4	47.0	50.5	52.4
#19 - Black (19/64")	Flow (gpm)	7.99	9.54	11.08	7.99	9.54	11.08	7.99	9.54	11.08
	Diameter (ft) at 3 feet	45.5	48.9	52.6	41.2	46.4	47.5	43.6	47.6	48.7
	Diameter (ft) at 6 feet	49.8	51.8	55.8	45.5	49.1	50.6	47.1	50.9	52.5
#20 - Dark Turquoise (5/16")	Flow (gpm)	8.75	10.44	12.13	8.75	10.44	12.13	8.75	10.44	12.13
	Diameter (ft) at 3 feet	45.6	49.3	53.2	41.4	46.6	47.6	43.8	47.9	48.8
	Diameter (ft) at 6 feet	50.2	52.2	56.2	45.6	49.3	50.8	47.2	51.3	52.6
#21 - Mustard (21/64")	Flow (gpm)	9.52	11.36	13.20	9.52	11.36	13.20	9.52	11.36	13.20
	Diameter (ft) at 3 feet	45.7	49.6	53.7	41.5	46.8	47.7	43.9	48.2	48.9
	Diameter (ft) at 6 feet	50.6	52.6	56.6	45.7	49.5	51.0	47.3	51.6	52.7
#22 - Maroon (11/32")	Flow (gpm)	10.29	12.28	14.27	10.29	12.28	14.27	10.29	12.28	14.27
	Diameter (ft) at 3 feet	45.8	49.9	54.1	41.6	47.0	47.8	44.0	48.4	49.0
	Diameter (ft) at 6 feet	51.0	53.0	56.9	45.8	49.7	51.2	47.4	51.9	52.8
#23 - Cream (23/64")	Flow (gpm)	11.18	13.34	15.50	11.18	13.34	15.50	11.18	13.34	15.50
	Diameter (ft) at 3 feet	45.9	50.1	54.3	41.7	47.2	47.9	44.1	48.6	49.1
	Diameter (ft) at 6 feet	51.2	53.4	57.1	45.9	49.8	51.4	47.5	52.2	52.9
#24 - Dark Blue (3/8")	Flow (gpm)	12.06	14.40	16.73	12.06	14.40	16.73	12.06	14.40	16.73
	Diameter (ft) at 3 feet	46.0	50.2	54.4	41.8	47.4	48.0	44.2	48.8	49.2
	Diameter (ft) at 6 feet	51.4	53.6	57.2	46.0	49.9	51.6	47.6	52.5	53.0

Half-size nozzles also available.

Figures reflect actual test data obtained under ideal conditions.
Consult factory for higher flow demands.

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