

N E T A F I M U S A

Pressure Compensating (PC) Spray Stakes

Automated Watering
Systems for Large
Container Production
Improve Plant Quality
and Conserve
Resources



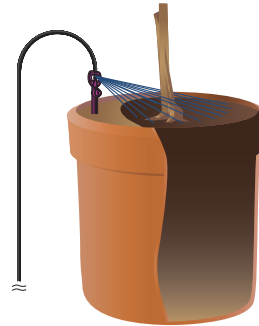
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 **NETAFIM™**
GROW MORE WITH LESS

10 Ten or More Good Reasons to Choose Netafim PC Spray Stakes

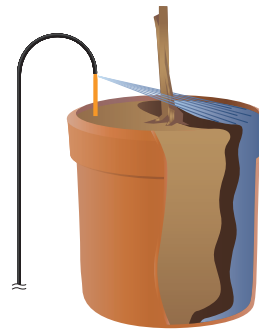
1 Superior Wetting of the Soil Mix Improves plant quality and conserves resources

Netafim PC (Pressure Compensating) Spray Stakes were built from the beginning to fill the needs of the nursery grower. The spray pattern angles downward - just enough - to keep the spray on the soil and not flying into or over the wall of the pot. Water flying out of the pot is wasted. Water that hits the side of the pot typically runs down the side and out the bottom of the pot and is not effective in wetting the soil mix.



Good Wetting Pattern
Even distribution means little or no water and fertilizer will be lost from drainage and the roots will grow evenly throughout.

Water retained by the soil mix is the most important measure of the effectiveness of a spray stake. A poor spray pattern may look good to the eye, but in fact does not apply water uniformly over the soil surface and results in poor water retention. The Netafim spray pattern provides maximum water retention by the soil mix - exactly what the plant needs. An additional benefit of the excellent wetting pattern is the uniform activation of top-dressed fertilizers. The result is superior plant growth and more efficient use of water resources, and fertilizer if liquid feed is being used.



Poor Wetting Pattern
When water is not evenly distributed over the surface of a container, overwatered 'hot spots' develop and water channels quickly through the mix and drains away before the plant can use it.

2 Uniform Watering from the First Pot to the Last Improves plant quality, simplifies design and controls system costs

Have you ever measured the difference in the amount of water the plants closest to the valve get compared to those furthest from the valve? It might be much more than you think and it adds up over time.

In a non-pressure compensating design, the spray stakes at the beginning of the line have a higher pressure and supply more water than those at the end of the line. Therefore, plants at the beginning of the line receive more water than they need by the time the plants at the end of the line are sufficiently watered. Each time the field is watered these differences add up and eventually some plants can outgrow others, resulting in a lack of uniformity and less than a top-quality yield.

Netafim pressure compensating emitters have been in use for over 20 years and can now be used in spray stake systems. As a result, Netafim PC Spray Stakes ensure every pot in the entire system receives exactly the same amount of water. This eliminates the need to overwater some plants to be sure the driest plants receive enough water to thrive. This water savings is typically between 5% and 20% and can be even more.

3 Prevents Water from Blowing Away in the Wind

Saves water while nearly eliminating misting

Have you ever noticed how much mist non-compensating spray stakes produce? It is especially evident on a windy day, as that water is wastefully blown away. One more advantage of pressure compensation is that it conserves water. Even at high pressures, up to 60 psi, the pressure compensating mechanism and the downward water spray of the Netafim PC Spray Stake eliminate misting.



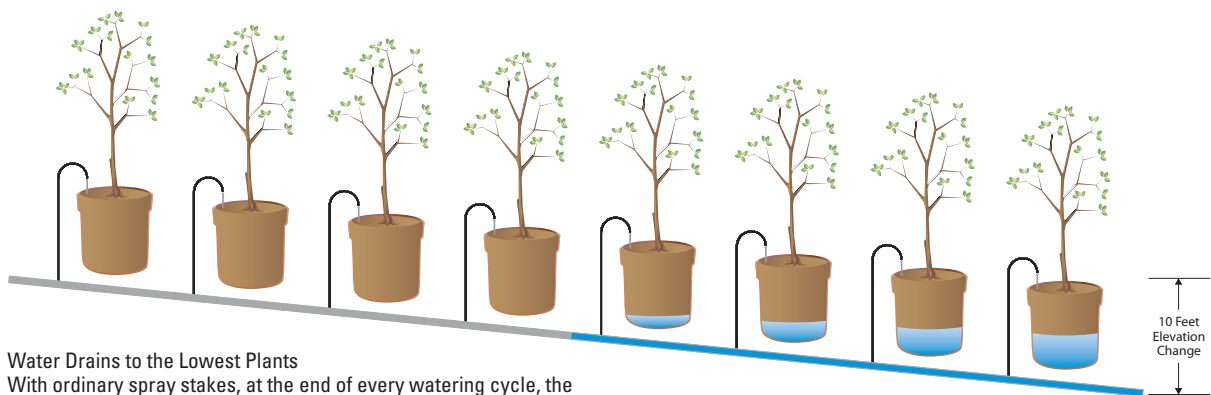
Downward Water Spray
Eliminates misting.

4 Prevents Draindown Onto Lowest Plants

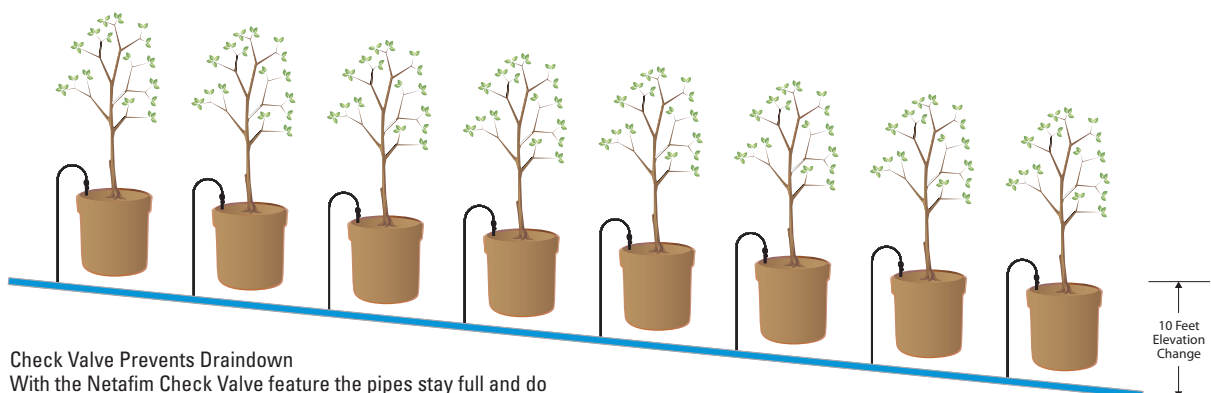
Avoids plant stress from drowning

Everyone knows that water flows downhill - just ask the plants at the bottom of a hill. Downhill flow is exactly what happens after every irrigation in systems without Netafim's check valve feature. All the water in the pipe drains out through the lowest spray stakes downhill. When large pipes are used, this can be a very large volume of water. One hundred feet of 1" pipe contains 15 gallons of water and one hundred feet of 4" pipe contains 65 gallons of water. When tens, or hundreds of gallons of water flow out onto the low lying plants after each irrigation, the plants eventually become stressed by excess water.

This problem is eliminated with Netafim's built-in check valve feature. The check valve prevents the system from draining (up to 10 feet of elevation) after each irrigation.



Water Drains to the Lowest Plants
With ordinary spray stakes, at the end of every watering cycle, the pipes drain into the lowest lying plants.



Check Valve Prevents Draindown
With the Netafim Check Valve feature the pipes stay full and do not drain into the lowest lying plants.

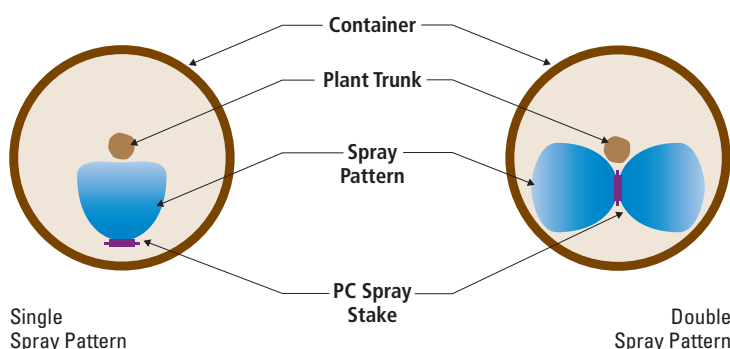


5 Spray Patterns Designed for Nursery Containers

Pick the spray pattern that is right for your plants

For simplicity, some growers place the spray stake near the edge of the pot, making the single-sided spray stake the best selection. Other growers prefer the advantages created by our unique 'bow-tie' double-spray pattern:

- Doubles the size of the spray pattern, useful for optimized wetting in very coarse mixes, or large pots. One spray stake can do the work of two or more traditional spray stakes.
- Allows positioning of the spray stake near the stem of the plant. This placement minimizes wetting of the base of the stem, a vulnerable point for some plant species.



6 Simplifies Design Layout

Reduces system costs

Pressure compensation has advantages beyond the improvement in watering uniformity. It also simplifies the design layout and allows you to reduce system costs with:

- Longer runs - see Design Help section for specific recommendations
- Smaller supply pipes - pipe downsizing usually pays for the pressure compensation feature
- Fewer sub-mains - a very significant cost, especially in areas of difficult trenching
- Fewer valves - longer runs mean a simpler layout requiring fewer system components

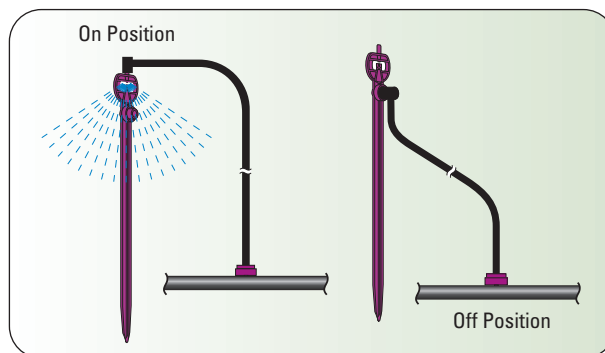


WPCJL Drifter
Provides pressure
compensation.

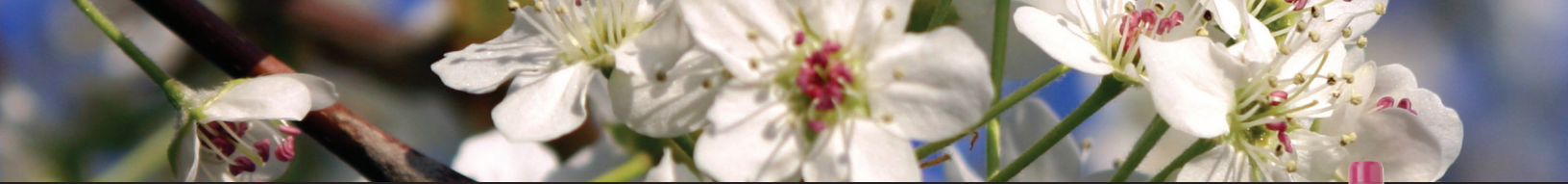
7 Simple, Secure Shut-Off

Prevents water waste and accidental close-offs

The side-mounted, secure shut off is easy and fool-proof. For close-off, remove the nipple and tubing from the top of the spray stake and attach it to the side of the spray stake. This provides a clear, visual indication – even from a distance - if a unit is in the on or off position.



Simple Shut-Off Mechanism
Remove tubing from top and attach to the side.



8 Adaptable to All Soil Media Types

Stake option available

All flows are available in a 7" stake.

9 Full Range of Flows

Choose the flow best suited to your water source and plant needs

Netafim PC Spray Stakes are color-coded and available in four flow options: 3.2 and 6.6 GPH. Color-coded spray stakes make it easy to identify the flow from a distance. Based on your water source and plant needs, you can choose the best flow for your nursery pots.

Flows

Stake Color	Flow (GPH)
Plum	3.2
Grey	6.6

10 Low Maintenance

Lowers cost of operation

Some systems are inexpensive to purchase initially, but as they age the cost of maintenance begins to outweigh the initial low cost. Netafim PC Spray Stakes are designed to avoid the plugging that occurs in many lower cost stakes. Each individual stake assembly has an inlet filter to prevent debris from entering. This filter is swept clean by the natural velocity of the water in the pipe. Netafim recommends appropriate central filtration for all spray stake systems but the individual inlet filter greatly reduces the incidence of field plugging from construction repair and other contaminants.

11 Easy Installation

Prevents problems that increase installation costs

Quick, fool-proof installation lowers costs and prevents problems. There is no risk of mis-cutting or pushing the micro-tubing in too far as some growers experience with standard spray stakes. Simply punch a hole in the supply tube using a Netafim hole punch, insert the dripper and tubing assembly and attach the spray stake. Each assembly comes ready to use.



Step 1: Punch a 3mm hole in the supply line tubing.



Step 2: Insert the dripper assembly into the tubing.



Step 3: Attach spray stake to dripper assembly.



Standard Spray Stake (shown actual size)



Selecting the Right Netafim PC Spray Stake for Your Application

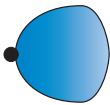
First Select the flow rate for the spray stake.
As long as you have enough water and pressure for the stake you select, it's hard to go wrong. Netafim PC Spray Stakes will work in a very wide range of pot sizes (see table at right for general recommendations). Just remember, these are not strict limitations, just general guidelines. Many growers with larger pots use higher flow spray stakes while others prefer to use lower flow spray stakes and simply operate them longer.

Product Selection Guide

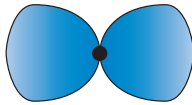
Container Size	Flow (GPH)	Stake Color
1 to 5 gallons	3.2	Plum
2 to 7 gallons	6.6	Grey

The next consideration is how long a row or 'run' of pots you want to water. Lower flow spray stakes can water longer runs than higher flow spray stakes. See the Design Help section of this brochure to be sure the flow you select will be appropriate for your water resources and field configuration.

Second Select the spray pattern.
Most flow models offer both a single and a double spray pattern. The double spray pattern is selected when the stake will be placed closer to the trunk of the tree than the side of the container. Here it will wet more soil than the single spray and can be positioned to minimize wetting the base of the trunk.



Single Spray Pattern
Best choice for placing near edge of container.



Double Spray Pattern
Used when stake is placed closer to tree trunk.

Design Help for Netafim PC Spray Stakes

Step 1

Determine how many spray stakes you can operate at the same time. Use the **Zone Flow** chart to establish how much water it would take to operate one zone of spray stakes with the spray stake flow rate you have selected. You do not need to operate the maximum amount, but do not exceed the maximum. If the amount of water required exceeds the amount you have available, you might reduce the zone size or consider using a lower flow spray stake. **Suggestion:** Build a table listing the flow of each zone you wish to operate.

Zone Flow (GPM)

Spray Stake Flow Rate	Number of Spray Stakes in a Zone										
	100	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000
3.2 GPH	5	27	53	80	107	133	160	187	213	240	267
6.6 GPH	11	55	110	165	220	275	330	385	440	495	550

Step 2

Determine how long a row or 'run' you can make with each line of spray stakes. This is influenced by several factors and you can balance them according to your priorities. The **Length of Run Considerations** chart demonstrates how the influencing factors are related.

When the spacing for the spray stakes has been determined, you are ready to select the pipe size and operating pressure:

- There are four **Length of Run** charts, one for each flow rate. Select the chart based on the flow rate you will be using (see pages 9 and 10).
- Select the spacing to be used for the spray stakes.
- Reading across to each pipe size, find the maximum length of run (in feet) available for several inlet pressures (in psi). Each option also includes the number of pots for that length of run (shown in parenthesis).

Note: The Length of Run charts do not account for slope. Although the pressure compensating feature of the PC spray stake will ensure that all flows will be the same, it is still necessary to operate the spray stake with a minimum of 22 psi and a maximum of 55 psi. If you are working with slopes, it is advisable to use a qualified Netafim Dealer to assist you in your design to be certain you have a pressure balanced system.

Length of Run Considerations

Longer Run	Shorter Run
Spray stake with lower flow rate	Spray stake with higher flow rate
Higher pressure	Lower pressure
Wider spacing of spray stakes	Closer spacing of spray stakes
Larger tubing diameter	Smaller tubing diameter
Downhill slope	Uphill slope





Design Help for Netafim PC Spray Stakes

Step 3 Select the major system components. Once you have selected the spray stake, established the flow of each zone and sized the poly pipe, it is time to size the major system components. Several key components and the most commonly selected models are listed here. For additional options, contact Netafim USA Customer Service.

Valves

Netafim offers Valve solutions for nearly every need. The **Valves** chart shows the most common valves used in spray stake systems and includes electric solenoid valves for automatic systems (used with a controller).



VALVES			
Part Number (Hawthorne)	Model Number (Netafim)	Flow Range	Description
HGC747713	LVET.75GH2	0.01 to 26 GPM	¾" Globe valve – 24VAC
HGC747715	LVET1GH2	0.01 to 44 GPM	1" Globe valve – 24VAC
HGC747754	61ET1.5GH2	0.25 to 110 GPM	1 ½" Globe valve – 24VAC

Filters

Filter options include disc, screen, sand media and hydrocyclones (for sandy wells). Some filters are for specific water applications and some are multi-purpose. Excellent options are available for both well water and surface water sources. Recommended filtration is 140 mesh.



MANUAL DISC FILTERS (140 MESH)			
Part Number (Hawthorne)	Model Number (Netafim)	Flow Range	Description
HGC747733	25A45-140	1 to 12 GPM	¾" Manual Disc Filter
HGC747734	25A47-140	5 to 26 GPM	1" Manual Disc Filter
HGC747756	25A17-140	10 to 52 GPM	1 ½" Super Manual Disc Filter

Automation

With a variety of controllers to fit many needs; from 16 to 600 valves with standard multi-wire, dual strand cable, stand-alone, radio control or central control, you can start with simple or richly featured programs and immediately realize the full potential of an automated system.

Piping, Fittings and Accessories

Netafim and Hawthorne offers a wide selection of Polyethylene (PE) Pipe, Fittings and Accessories used in a successful spray stake system. Your qualified Netafim dealer should be able to guide you through this selection process.



Length of Run Charts

3.2 GPH Plum

Spacing (inches)	Inlet Pressure	Polyethylene (PE) Pipe Size			
		16mm (0.52" ID)	1/2" (0.60" ID)	3/4" (0.82" ID)	1" (1.06" ID)
24	25 psi	108' (54)	138' (69)	246' (123)	384' (192)
	30 psi	146' (73)	188' (94)	332' (166)	522' (261)
	35 psi	170' (85)	220' (110)	390' (195)	614' (307)
	40 psi	190' (95)	244' (122)	436' (218)	686' (343)
	45 psi	206' (103)	266' (133)	476' (238)	748' (374)
36	25 psi	144' (48)	186' (62)	324' (108)	504' (168)
	30 psi	195' (65)	249' (83)	438' (146)	684' (228)
	35 psi	228' (76)	294' (98)	516' (172)	807' (269)
	40 psi	255' (85)	327' (109)	576' (192)	903' (301)
	45 psi	276' (92)	357' (119)	627' (209)	981' (327)
48	25 psi	176' (44)	224' (56)	392' (98)	608' (152)
	30 psi	236' (59)	304' (76)	532' (133)	828' (207)
	35 psi	280' (70)	360' (90)	624' (156)	975' (244)
	40 psi	312' (78)	400' (100)	696' (174)	1,092' (273)
	45 psi	340' (85)	436' (109)	760' (190)	1,188' (297)
60	25 psi	185' (37)	235' (47)	410' (82)	635' (127)
	30 psi	270' (54)	340' (68)	590' (118)	920' (184)
	35 psi	315' (63)	400' (80)	700' (140)	1,100' (220)
	40 psi	350' (70)	450' (90)	795' (159)	1,235' (247)
	45 psi	385' (77)	490' (98)	860' (172)	1,350' (270)
72	25 psi	234' (39)	294' (49)	510' (85)	798' (133)
	30 psi	312' (52)	402' (67)	696' (116)	1,079' (180)
	35 psi	366' (61)	474' (79)	816' (136)	1,272' (212)
	40 psi	414' (69)	528' (88)	912' (152)	1,422' (237)
	45 psi	450' (75)	576' (96)	995' (166)	1,548' (258)
96	25 psi	280' (35)	360' (45)	616' (77)	960' (120)
	30 psi	384' (48)	488' (61)	840' (105)	1,303' (163)
	35 psi	448' (56)	576' (72)	984' (123)	1,535' (192)
	40 psi	496' (62)	640' (80)	1,103' (138)	1,719' (215)
	45 psi	544' (68)	696' (87)	1,199' (150)	1,871' (234)

Reading the Length of Run Chart

220' (110)

Flow: 3.2 GPH

Spacing: 24"

Pressure: 35 psi

PE Pipe Size: 1/2"

Maximum Run
Length: 220'

Number of Pots: 110

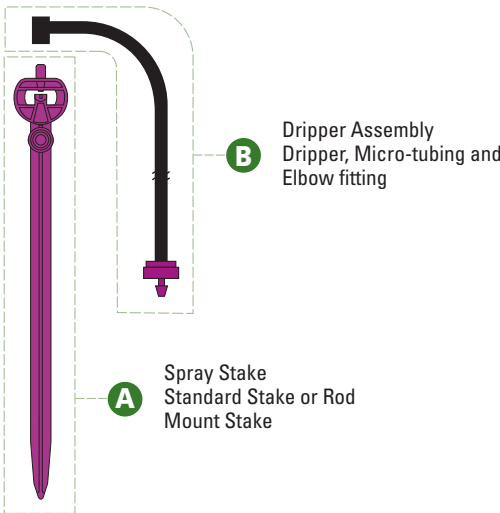
6.6 GPH Grey

24	25 psi	68' (34)	88' (44)	154' (77)	240' (120)
	30 psi	92' (46)	118' (59)	208' (104)	326' (163)
	35 psi	106' (53)	138' (69)	244' (122)	384' (192)
	40 psi	120' (60)	154' (77)	274' (137)	430' (215)
	45 psi	130' (65)	166' (83)	298' (149)	468' (234)
36	25 psi	90' (30)	117' (39)	204' (68)	315' (105)
	30 psi	123' (41)	156' (52)	276' (92)	429' (143)
	35 psi	144' (48)	183' (61)	324' (108)	504' (168)
	40 psi	159' (53)	204' (68)	360' (120)	564' (188)
	45 psi	174' (58)	222' (74)	393' (131)	615' (205)
48	25 psi	112' (28)	144' (36)	244' (61)	384' (96)
	30 psi	152' (38)	192' (48)	332' (83)	520' (130)
	35 psi	176' (44)	224' (56)	392' (98)	612' (153)
	40 psi	196' (49)	252' (63)	436' (109)	684' (171)
	45 psi	212' (53)	272' (68)	476' (119)	744' (186)
60	25 psi	115' (23)	145' (29)	255' (51)	400' (80)
	30 psi	160' (32)	205' (41)	365' (73)	575' (115)
	35 psi	195' (39)	245' (49)	435' (87)	685' (137)
	40 psi	220' (44)	275' (55)	490' (98)	770' (154)
	45 psi	240' (48)	305' (61)	535' (107)	840' (168)
72	25 psi	150' (25)	186' (31)	324' (54)	498' (83)
	30 psi	198' (33)	252' (42)	438' (73)	678' (113)
	35 psi	234' (39)	300' (50)	510' (85)	798' (133)
	40 psi	258' (43)	330' (55)	570' (95)	893' (149)
	45 psi	282' (47)	360' (60)	624' (104)	972' (162)
96	25 psi	176' (22)	232' (29)	392' (49)	600' (75)
	30 psi	240' (30)	304' (38)	528' (66)	816' (102)
	35 psi	280' (35)	360' (45)	616' (77)	960' (120)
	40 psi	312' (39)	400' (50)	696' (87)	1,079' (135)



Ordering the Right Netafim PC Spray Stake




Use the following Ordering Charts to determine the correct Netafim PC Spray Stake for your application. A complete PC Spray Stake Assembly consists of one **A** Spray Stake (either standard or rod mount) and one **B** Dripper Assembly (see illustration).



Ordering Charts

A Spray Stake Selection


- Select the flow rate
- Select either standard (7") or rod mount stake
- Select either single or double spray pattern

		Standard Stake		Single Spray		Double Spray	
							
Flow (GPH)	Stake Color			Part Number (Hawthorne)	Model Number (Netafim)	Part Number (Hawthorne)	Model Number (Netafim)
3.2	Plum			HGC747735	01PSDS-PL1-B	Not Available	
6.6	Grey			HGC747736	01PSDS-GY1-B	HGC747737	01PSDS-GY2-B

Sold in bags of 50 each.

B Dripper Assembly Selection

- Select the dripper assembly based on the flow rate chosen in the Spray Stake Selection chart and desired tube length
- Color-coded components - spray stake and dripper assembly - must match

		36" Tube Length		48" Tube Length	
					
Flow (GPH)	Stake Color	Part Number (Hawthorne)	Model Number (Netafim)	Part Number (Hawthorne)	Model Number (Netafim)
3.2	Plum	HGC747769	01PSD032-36B	HGC747768	01PSD032-48B
6.6	Grey	HGC747771	01PSD066-36B	HGC747770	01PSD066-48B

Sold in bundles of 25 each.
Custom lengths available by special order.



Specifications

Technical Specifications

Filtration	140 Mesh
Operating Pressure	22 - 55 psi
Stake Length	8" Overall
Tubing	Flex Black PE 5/3mm
Spray Radius	8" - 10"*
Single Spray Pattern	160 Degrees

*Spray radius at 3.5" elevation.

Netafim PC Spray Stakes

