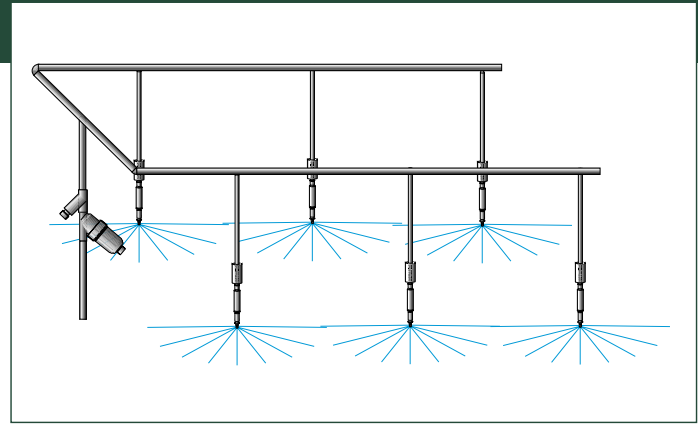
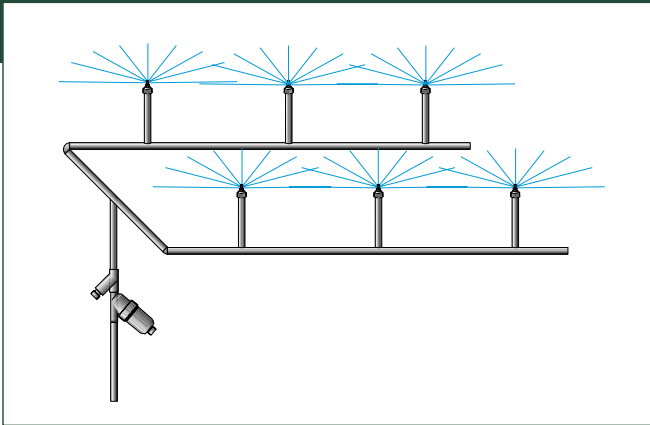


## Greenhouse Sprinkler Systems

**Automated  
Watering Systems  
for Greenhouse  
and Nursery -  
Delivering Superior  
Uniformity and  
Higher Plant Values**

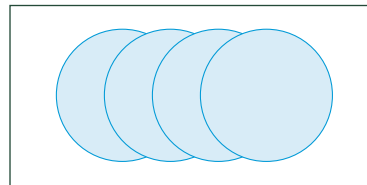




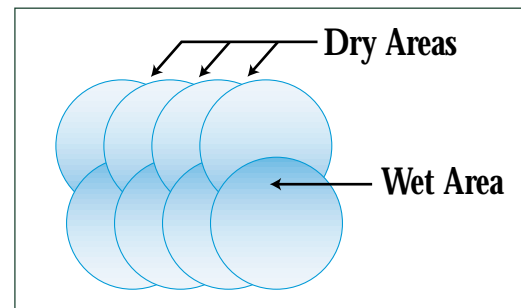
**At First Glance** Netafim sprinkler systems may appear similar to other sprinkler systems. But a closer look will reveal that a very different approach is at work.

## Traditional Layout

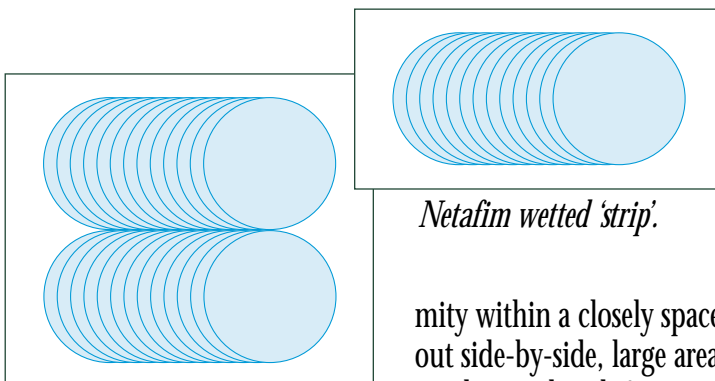
The traditional layout for sprinkler heads is poorly suited to greenhouse watering. The standard “old style” layout is to space the sprinklers “head to head,” or at a spacing equal to the radius of the sprinkler throw. To provide coverage for a large area, the patterns are overlapped, as shown in Figure 1. Since the center of the greenhouse is naturally wetter (slower to dry), this sprinkler layout compounds the condition. Additionally, the scalloped edges of this pattern leave small dry areas where plants can suffer from under-watering.



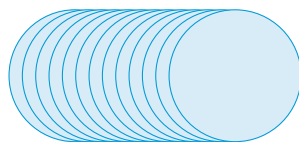
*Traditional 'head to head'.*



*Overlap from traditional layout.*



*Side by side 'strips'.*



*Netafim wetted 'strip'.*

## The Netafim Solution

The Netafim solution avoids the problems of the traditional sprinkler layout. Computer modeling was used to produce a design which thousands of installations have proven to be accurate.

Netafim sprinklers achieve a very high level of uniformity within a closely spaced 'strip of sprinklers'. By designing with these 'strips' laid out side-by-side, large areas can be covered uniformly. All Netafim sprinkler systems are designed with 3' spacing between the sprinklers.

# The NETAFIM Solution

## Why Netafim Systems Are Better

### 1 Low Cost & Fast Payback

Typical System Cost is approximately \$.08 to \$.15 per sq. ft. Payback for a complete system is usually within the first season of operation.

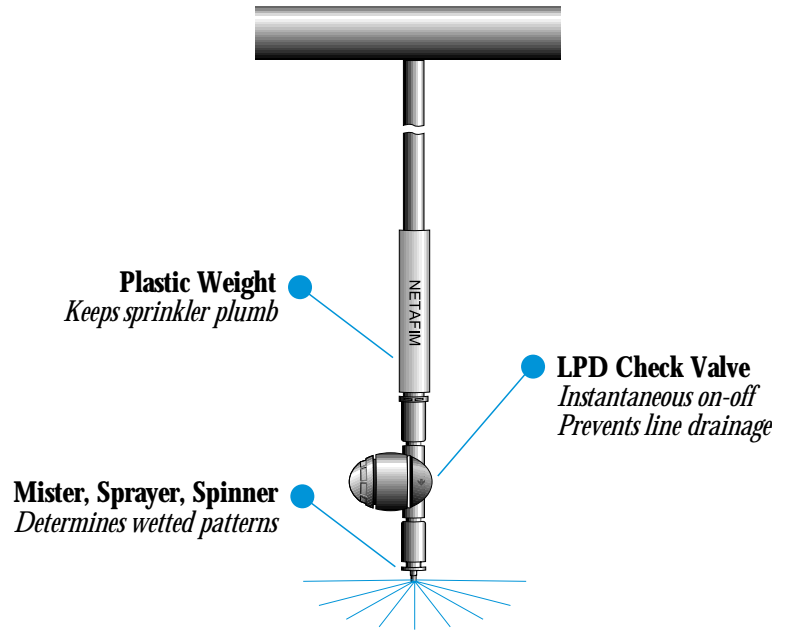
### 2 Highly Uniform Watering Increases Crop Uniformity

### 3 Hanging Sprinklers Without the Headaches

*Sprinklers can be mounted upside-down*, hanging below the supply pipe. This prevents wetting the supply pipe, which when wetted, can cause drip damage to the plants below. The LPD check valve prevents these hanging sprinklers from draining the supply pipe onto the plants below.

*Instantaneous On-Off* for accurate, short cycle misting and watering.

*No pattern distortion* due to twisting of the pipe, or misalignment of hole drilling - both common problems of "old-style" upright sprinklers. Gravity maintains the Netafim sprinklers in perfect plumb, and hence producing a predictable pattern.



### 4 Highly Durable

Netafim Sprinklers are made of the highest quality plastics, with excellent Ultraviolet (UV) resistance. They can withstand heat, direct sun, and harsh chemicals for many years without becoming brittle.

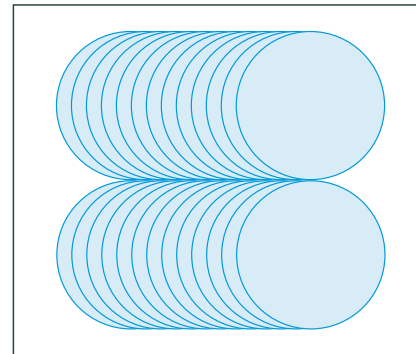
### 5 Low Maintenance

All parts can be assembled and disassembled in the greenhouse without tools.

# How to Select & Size a NETAFIM

## Step 1 Visualize the Greenhouse




Recall that the Netafim system is laid out as individual “strips” to be watered. Visualize where those strips should be. A strip might be an individual bench, half a bay or other larger or smaller growing areas. Evaluate the location of obstacles such as curtains or hanging baskets. Consider aisles and whether they can be wetted. Review cultural practices which might impact the height at which the sprinklers should be placed.




## Step 2 Select a Sprinkler Head

Based on: The Application: Misting or Watering  
The “Strip Width”  
The Height of the Sprinkler

Watering

Bench Width in feet	Upright 1' 		Inverted 3' 		Inverted 5' 	
	Code	Catalog No.	Code	Catalog No.	Code	Catalog No.
4	VY-GN	0301050L-B	VY-GN	0301050L-B		
5	VY-GN	0301050L-B	VY-GN	0301050L-B		
6	VY-GN	0301050L-B	VY-BK	0301070L-B	VY-GN	0301050L-B
7	VY-BK	0301070L-B	VY-BK	0301070L-B	VY-GN	0301050L-B
8			YF-O	7870655L-B	BR-O	7820855L-B
10			BR-O	7820855L-B	BR-O	7820855L-B
12			BR-O	7820855L-B	BR-O	7820855L-B
14			GK-O	7820255L-B	GK-O	7820255L-B
15			GK-O	7820255L-B	GK-O	7820255L-B
16			GK-O	7820255L-B	GK-O	7820255L-B

Part Number Code 	VY-GN	Vibro-Spray Green with LPD (15 GPH)	BR-O	Black Round Spinner Orange Nozzle & Antimist with LPD (19 GPH)
	VY-BK	Vibro-Spray Black with LPD (21 GPH)	GK-O	Green Kiwi Spinner Orange Nozzle & Antimist with LPD (19 GPH)
			YF-O	Yellow Flat Spreader Orange Nozzle & Antimist with LPD (19 GPH)

Misting

Description	Catalog Number
Vibro-Mist Violet	0306020L-B

Misting heads should be placed 3' to 5' above the crop and spaced on a 4' x 4' or 5' x 5' grid. The misting diameter is 8' to 10'.

# Sprinkler System for Bench Crops

## Step 3

### Select a Sprinkler Base

Appropriate for the type of pipe used to supply water to the sprinklers - Polyethylene (*recommended*), or rigid pipe (*PVC or aluminum*).



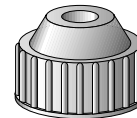
Tube Length	Catalog Number
24"	0300HSA-24
30"	0300HSA-30
36"	0300HSA-36
48"	0300HSA-48
60"	0300HSA-60



**A**

**Hanging Sprinkler Assembly**  
(for Polyethylene Pipe)

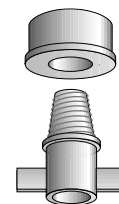
Catalog Number
03206-B



**B**

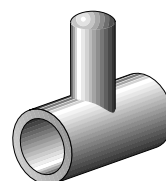
**1/2" Adapter**  
(for Pipe Thread)

Base Description	Catalog Number
3/8" Tapered Thread Adapter	03228-B
Grommet	58-AI-B



**C**

**3/8" Tapered Thread Adapter**



**D**

**MicroNet Sprinkler to Dan Base Adapter**

Catalog Number
03302-B

# How to Select & Size a NETAFIM

## Step 4 Size the Sprinkler Supply Pipe

Vibro-Mist: <i>Violet, Average Flow: 6 GPH</i>			Vibro-Spray: <i>Green, Average Flow: 15 GPH</i>			Vibro-Spray: <i>Black, Average Flow: 21 GPH</i>			Bridge Sprinklers: <i>YF-O; BE-O; GK-O Average Flow: 19 GPH</i>		
Bench Length	GPM per Line	PE Size	Bench Length	GPM per Line	PE Size	Bench Length	GPM per Line	PE Size	Bench Length	GPM per Line	PE Size
25'	0.9	3/4"	25'	2.3	3/4"	25'	3.0	3/4"	25'	2.6	3/4"
50'	1.8	3/4"	50'	4.6	3/4"	50'	6.0	3/4"	50'	5.3	3/4"
75'	2.6	3/4"	75'	7.0	3/4"	75'	9.0	3/4"	75'	7.9	3/4"
100'	3.5	3/4"	100'	9.3	3/4"	100'	12.1	1"	100'	10.6	1"
125'	4.4	3/4"	125'	11.6	1"	125'	15.1	1"	125'	13.2	1"
150'	5.3	3/4"	150'	13.9	1"	150'	18.1	1"	150'	15.8	1"

Use the chart above to select the correct sprinkler supply pipe size. Low Density Polyethylene is strongly recommended. PVC can be used with precautions taken to prevent light penetration into the pipe, which can cause algae growth, leading to nozzle plugging. Use either a gray PVC pipe, or use a dark paint to coat any exposed white PVC piping.

## Step 5 Size the Distributor and Main

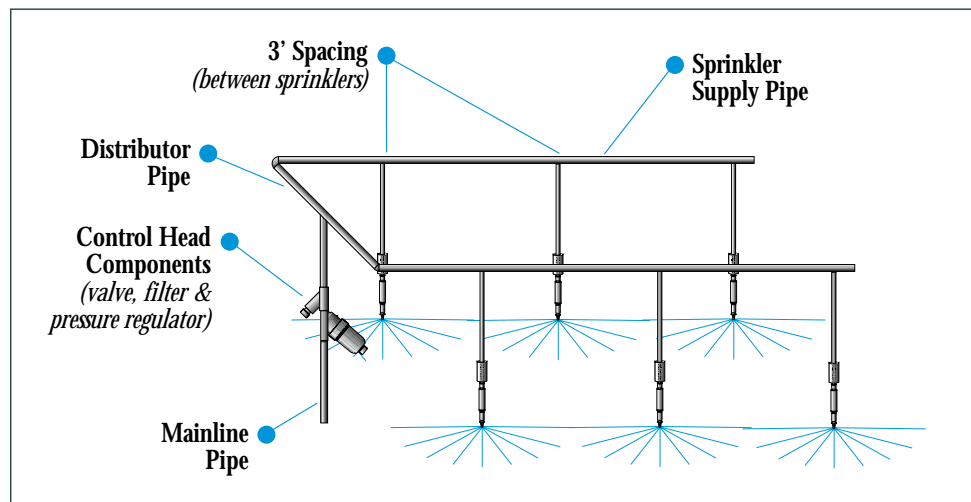
Use the charts at below to select the correct size for the distributor and mainline. These are intended to serve as general guidelines. Pipe size recommendations include assumptions for the number of sprinklers the pipes will be supplying, the length of pipe, and whether or not the pipe will be used as a main or distributor. For distributor lines over 40 ft., mainlines over 100 ft., when slopes are a factor, or for other special conditions, please consult a certified Netafim System designer for assistance.

### Distributor Pipe Sizing

Pipe Size	Maximum GPM
3/4"	10
1"	15.8
1 1/4"	20
1 1/2"	27
2"	35

### Mainline Pipe Sizing

Pipe Size	Maximum GPM
3/4"	7
1"	11
1 1/4"	20
1 1/2"	28
2"	45





# Sprinkler System for Bench Crops

## Step 6

### Size the Head Control Components

The components should be sized according to the flow range shown in the table below. The pipe connecting to the components can be of a different size.

#### Filter, Valve & Pressure Regulator Sizing

	Flow Range <i>in GPM</i>	Unit Size
<b>Electric Valve</b>	Up to 15	3/4"
	Up to 20	1"
	Up to 60	1 1/2"
	Up to 100	2"
<b>Disk Filter (120 Mesh)</b>	Up to 18	3/4"
	Up to 26	1"
	Up to 53	1.5" (Super)
	Up to 120	2"
<b>Pressure Regulator (35 psi)</b>	0.5 to 5	3/4" Low Flow
	3.5 to 20	3/4"
	7 to 35	1 1/2"
	15 to 80	2" (x4)

## Step 7

### Starting Up a System for the First Time

The most important point to remember when starting up a new system is to flush the mainlines. Debris from construction can otherwise be washed into the sprinklers, causing a plug, or improper operation. To properly flush a system, first connect all the pipes and assemblies, except the sprinklers with LPDs. Next, open the ends of the distributor line and the sprinkler supply pipes. Close them off, one by one, starting with the opening closest to the Head Control, and proceeding to the most distant opening. Only after complete flushing should the sprinklers with LPDs be attached to the assemblies.



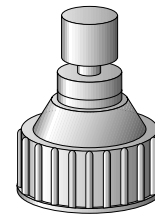
# Vibro-Spray HF



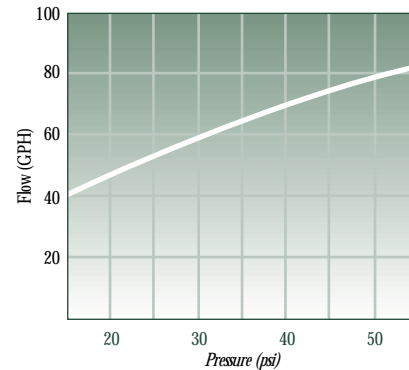
The Vibro-Spray HF is a high flow sprinkler (1 GPM) with a flat trajectory that delivers extraordinarily high uniformity even under windy conditions.

## Applications

- Mounted upright or upside down: 1/2" female pipe thread.
- Use where fast uniform watering is required.
- Excellent for nursery and other heavy foliage container crops.
- Low price permits cost effective conversion of large sprinkler areas.
- Ideal for use where wind drift is a problem with low volume sprinklers.



**VIBRO-SPRAY HF (Part #0302210-B)**  
*Flow Rate vs. Pressure*



## Vibro-Spray Uniformity (at 45 psi)

Spacing (feet)	Height		
	1' Upright	4' Upside Down	6' Upside Down
6 x 6	99%	95%	99%
8 x 8	96%	88%	96%
8 x 10	88%	84%	88%
8 x 12	91%	90%	89%
8 x 14	95%	87%	93%
10 x 10	86%	83%	85%

Chart above assumes rectangular overlap spacing.  
Maximum strip width for single line – 10'.

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