



# Specializing in the supply of horticultural products and equipment to the greenhouse and nursery industry since 1992.!!!

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## INTRODUCTION

## **OUR HISTORY**

It was in the basement of the Ledoux family home that Groupe Horticole Ledoux was founded in August of 1992. From its very beginning GHL specialized in the distribution of greenhouse supplies for the production of vegetables and ornamentals.



Satellite picture of different growth phases

In 1993, GHL expanded its distribution range to the Mexican market and in 1995 to the US. In 1997, due to its constant growth, GHL re-localized its headquarters to the municipality of Sainte-Hélène de Bagot and proceeded to expand its facilities three times, first in 1998, followed by a second in 2000 and a third in 2009..

Proud of its constant growth and eager to maintain a quality of services above market standards, in 2002 GHL implanted the ISO 9001 quality standard system. Being mainly in the distribution of products, our quality policy is one of offering services above and beyond industry standards.

In June of 2002, continuing on their momentum, GHL implanted itself in Mexico, in order to better serve this market.

Groupe Horticole Ledoux is proud to have a team of 15 to 30 employees, dedicated to offering their knowledge, know-how and an above-standard customer service.

#### **OUR MISSION...**

Our mission is to satisfy our customers throughout the various stages of the buying process.

Our main goals are a professional and appropriate customer service, a proper use of the right product for a specific use, thus enabling us to set ourselves apart from other suppliers as the best supply source in the industry.

Our quality policies are to offer services above and beyond industry standards, in terms of choice of products, quality of information, logistics and finally in the followup of current and future needs of our customers and of the industry in general.

#### A SATISFIED CLIENTELE...

Owners of greenhouses, being both fine administrators and highly knowledgeable horticulturists, do most of the sourcing and purchasing of products and equipment needed for their production themselves. In doing so, they are always concerned and constantly on the look-out for ways of optimising the quality of their crops. They know they can rely on the knowledge and competence of GHL.

At GHL we take to heart the satisfaction of our clients and their loyalty is our reward.

#### A QUALIFIED TEAM...

You can put your trust in our team of expert advisers.

At GHL, customer satisfaction is our priority. You can rely on our team of specialists, who are always willing to offer all of their agronomical knowledge and the best of their technical know-how.

Our technical consultants are trained to understand your needs and give you all the support required in order to help you choose the right product or service for your specific needs.

All of our team has been trained under the ISO 9001:2000 standardizations.

GHL, a team you can trust!

#### **CONDITIONS OF SALE**

Your order and subsequent acceptance of the material constitutes acceptance of the terms and conditions below.

#### >PRICE

Prices are FOB Ste-Helene (Quebec), unless otherwise specified, and are subject to change without notice.

#### **≻TERMS**

Payment terms are net 30 days from the billing date with approval of credit. Payment will be requested in advance of delivery on orders where a credit application has not been completed or accepted. An administration fee of 1.25% per month (15% per year) will be applied to all accounts over 30 days.

#### **≻ORDERS**

Orders received before 11 a.m. can be sent the same day, according to product availability. Orders received after 11 a.m. will be sent the day after.

#### **≻TAXES**

Taxes: federal and provincial government taxes are added to products when applicable unless you present a recognized certificate of exemption with your order or provide a valid copy for our records.

#### >SEEDS

All claims on seeds must be submitted within the time prescribed by the seed breeder, allowing them to inspect the germination or crop. In the event of an error made by the seed company, liability is limited to the replacement of the defective seeds free of charge or refund of the payment made. This becomes the limit and the only warranty of our obligations. (This warranty is the maximum accepted by the seed companies).

#### > RECOMMENDATIONS

All recommendations given by our representatives, or presented in this catalogue, come from experimental results in specific locations and several recognized sources. GHL and its employees will in no way be held responsible for any damages or failures incurred due to recommendations given by its representatives.

#### **>WARRANTY**

All guarantees in relation to various products and equipment sold by GHL or described in the present catalogue are those of the manufacturer. The Company shall not be liable for any damages caused to equipment, person or crop, by defective hardware. Any equipment repaired or altered by another supplier or party, without written consent from our company, will automatically void any applicable warranty.



## **NEW ONLINE COMMUNICATION TOOLS**

## "GHL NEWS" NEWSLETTER

GHL NEWS, the newsletter that informs you on the lastest horticultural news



## "HORTICONTACT" SOCIAL NETWORK

HortiContact, the new <u>social network</u> of professionals and future professionals in vegetable and ornamental crops!



Go to <u>www.horticontact.ghlinc.com</u> to subscribe and gain access to multiple fuctionalities reserved for horticulture professionals such as:

- Horticulture classified ads

  Examples: job offers, business for sale,
  equipment for sale, surplus plants for sale, etc.
- **Broadcasting of horticultural events**
- **Horticulture contacts**
- Btc.

## **SEEDS**

We are the exclusive distributor of **Erma Zaden seeds** for Canada. We also distribute other seed breeders such as **Gautier seeds**. For more information on seeds available, please contact your representative, our website or seed breeder websites.





#### **GREENHOUSE TOMATO VARIETIES**

We offer many different greenhouse tomato seed varieties.

#### **BEEF TOMATO (RED OR PINK)**

Please contact your representative for more info on red or pink beef tomato seeds.

#### **CLUSTER / MEDIUM SIZED TOMATO**

Please contact your representative for more info on cluster round or roma tomato seeds.

#### **COCKTAIL TOMATO**

Please contact your representative for more info on round or roma cocktail tomato seeds.

#### CHERRY / GRAPE / MINI PLUM TOMATO

Please contact your representative for more info on cherry, grape or mini plum tomato seeds.

#### OTHER SPECIALTY TOMATOES

Round, flat/ribbed, plum, roma, orange, yellow, pink, striped brown, black, coeur de boeuf, san marzano, mini, midi, medium sized, small beef, cluster, single, etc! Please contact your representative for more info on specialty tomato seeds.

#### TOMATO ROOTSTOCK

Please contact your representative for more info on tomato rootstock seeds.

#### **GREENHOUSE CUCUMBER VARIETIES**

Please contact your representative for more info on greenhouse English cucumber (long European type), mini cucumber and American cucumber (slicer) seeds.

#### **GREENHOUSE LETTUCE VARIETIES**

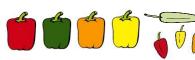
Please contact your representative for more info on greenhouse lettuce seeds.

## **GREENHOUSE PEPPER VARIETIES**

Please contact your representative for more info on greenhouse sweet pepper or hot pepper seeds.









## **NUTRIENTS**

## PERFORMA GLOBALYS WATER-SOLUBLE FORMULATIONS



#### GENERAL PRODUCT CHARACTERISTICS

Performa Globalys water soluble fertilizers are manufactured at our Canadian plant, with high quality ingredients that are perfectly soluble. This family of fertilizers is specially designed to meet the needs of your crops. Performa Globalys PLUS formulations consist of 3 forms of chelated iron which act independently of the soils' pH, a major advantage, for producing healthier and more colourful crops.



SOLUBLE FERTLIZER FORMULATIONS	TYPE OF USE	WEIGHT (NET)	QTY/ SKID	ITEM#
6-11-31 PLUS *	Greenhouse vegetables			<u>100-02010165</u>
8-20-32 F	Young forest trees paver			<u>100-02011000</u>
10-52-10	High phosphorus			<u>100-02011005</u>
11-42-9 F	Young forest trees			<u>100-02011007</u>
13-0-44 PLUS *	Potassium nitrate			<u>100-02011010</u>
13-2-13 PLUS *	Full, clean water			100-02011015
15-0-15 PLUS *	Calcium - Potassium		66 bags	100-02011020
15-30-15	High phosphorus			100-02011025
17-4-28 PLUS *	High potash	15 kg		100-02011030
18-9-18 PLUS * New	Acidifier, multiple uses	(33lbs)		100-02011034
20-2-20 PLUS *	High nitrate, low in phosphorus			100-02011035
20-5-30 PLUS*	Paver high potash			100-02011043
20-8-20 PLUS*	High nitrate, all-purpose			100-02011045
20-8-20 F	High nitrate, young forest trees			100-02011044
20-20-20	Multipurpose	]		100-02011050
21-7-7	Acidifier	]		100-02011065
24-8-16	Leaf and Tropical			100-02010165
CUSTOM BLEND				100-02010135

<sup>\*</sup>All our + formulations contain 3 separate chelated irons that are available for absorption over a wide pH scale (3.5 to 9.0).

# ${\color{red} \underline{New}} \ \underline{LIQUID} \ FERTILIZER \ FORMULATIONS \ (1L)$

New range of ready-to-use liquid products for retail sale! Easy-to-use format of concentrated fertilizer, with oligoelements, equivalent to Performa Globalys formulations used professional greenhouse producers, and made with the same high quality ingredients. You also have the possibility of adding your custom label.







LIQUID FERTILIZER FORMULATION	EQUIVALENT TO	TYPE OF USE	VOLUME/ WEIGHT	QTY/ BOX	ITEM #				
4-0-5 PLUS	13-0-15 PLUS	For root fertilization of seedlings and as a calcium and magnesium source for garden and potted vegetables.			Coming soon				
5-10-5	15-30-15	For root fertilization to use in transplanting when soil temperature is at least 15°C.			Coming soon				
5-1-7 PLUS	20-5-30 PLUS	For root and foliar fertilization of well-established potted or garden plants, favour plant flowering, fruit ripening and green leaves.  *Contains urea!	1L / 1.1 KG	10	10	10	10	10	Coming soon
5-1-8 PLUS	17-4-28 PLUS	For root fertilization of potted plants, favours plant flowering and fruit ripening	Coming soon						
5-0-5 PLUS	20-2-20 PLUS	All-purpose, very low in phosphorus with microelements for root fertilization of potted and garden plants.			Coming soon				
CUSTOM FORMU	ULATION ALSO			Coming soon					



#### **CUSTOM FORMULATION**

#### PROCEDURE FOR ORDERING CUSTOM FORMULATION:

**Step 1**: Contact a representative and communicate your needs (type of formulation desired and quantity of bags required. Minimum of 66 bags of 15 kg at a time)

**Step 2**: Your representative will respond to you (fax or email) with a quote and a description of the formulation that can be manufactured.

<u>Step 3</u>: Sign the description of the formulation and fax it back as soon as possible to your representative to confirm the order.

**Step 4**: Your representative will then be able to confirm production time periods.

#### MICRO-NUTRIENTS COMPOSITION

#### PERFORMA GLOBALYS (basic)

GUARANTEED MINIMUM ANALYSIS	S:
Boron (B) (actual)	0.02 %
Copper (Cu) EDTA chelated (actual)	0.05 %
Iron (Fe) EDTA chelated (actual)	0.10 %
Manganese (Mn) EDTA chelated (actual).	0.05 %
Molybdenum (Mo) (actual)	0.01 %
Zinc (Zn) EDTA chelated (actual)	0.05 %

#### PERFORMA GLOBALYS PLUS (+)

GUARANTEED MINIMUM ANALYSIS	<b>.</b>
Boron (B) (actual)	0.02 %
Copper (Cu) EDTA chelated (actual)	0.05 %
Iron (Fe) chelated total (actual)	0.12 %
Iron (Fe) EDTA chelated0.07 %*	
Iron (Fe) DTPA chelated <b>0.04</b> %*	
Iron (Fe) EDDTA chelated0.01 %*	
Manganese (Mn) EDTA chelated (actual).	0.05 %
Molybdenum (Mo) (actual)	0.01 %
Zinc (Zn) EDTA chelated (actual)	0.05 %



<sup>\*</sup>The 3 separate chelated irons mixture allow iron to stay stable up to a pH of 9!

#### CAUTION:

Performa Globalys fertilizers data-sheets are subject to changes. Please contact your representative to get the latest version.



## PERFORMA GLOBALYS SOLUBLE FERTILIZER COMPARATIVE TABLE

	Formulation	6-11-31+	8-20-32F	10-52-10	11-42-9F	13-0-44+	13-2-13+	15-0-15+	15-30-15	17-4-28+	18-9-18+	20-2-20+	20-5-30+	20-8-20+	20-8-20F	20-20-20	21-7-7	24-8-16
%	N total	6	8	10	11	13	13	15	15	17	18	20	20	20	20	20	21	24
70	NO3	6.0	5.4	1.3	1.5	13.0	12.25	13.9	4.5	12.56	9.2	13	8.7	12.4	12.4	6.0	2.1	4.7
	NH4	-	2.6	8.7	9.5	-	0.75	1.1	6.0	4.55	8.8	7	1.0	7.6	7.6	4.0	13.5	2.2
	Urea	-	-	-	-	-	-	-	4.5	-	-	-	10.3	-	-	10.0	5.4	17.1
	P2O5	11	20	52	42	-	2	-	30	4	9	2	5	8	8	20	7	8
	P	4.8	8.7	22.7	18.3	-	0.9	-	13.1	1.7	3.96	0.9	2.2	3.5	3.5	8.7	3.1	3.5
	K2O	31	32	10	9	44	13	15	15	28	18	20	30	20	20	20	7	16
	K	25.8	26.7	8.3	7.5	36.7	10.8	12.5	12.5	23.3	14.9	16.7	25.0	16.7	16.7	16.7	5.8	13.3
	Ca	-	-	-	-	-	6.6	12.0	-	-	-	-	-	-	-	-	-	-
	Mg	2.5	0.3	-	0.1	-	3	-	0.5	0.8	0.3	1.0	0.1	0.4	0.1	-	-	1.0
	S	4.7	3	-	3.0	-	-	-	0.4	-	4.2	-	0.1	-	-	-	14.0	2.0
	Fe	0.20	0.30	0.10	0.20	0.12	0.12	0.12	0.10	0.12	0.25	0.12	0.12	0.12	0.40	0.10	0.10	0.10
	Fe EDTA	0.053	0.30	0.1	0.20	0.07	0.07	0.07	0.10	0.07	0.14	0.07	0.07	0.07	0.40	0.10	0.10	0.10
	Fe DTPA	0.140	-	-	-	0.04	0.04	0.04	-	0.04	-	0.04	0.04	0.04	-	-	-	-
	Fe EDDHA	0.007	-	-	-	0.01	0.01	0.01	-	0.01	0.11	0.01	0.01	0.01	-	-	-	-
	Mn	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.075	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Zn	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.075	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Cu	0.004	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	В	0.035	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	Mo	0.005	0.0005	0.01	0.0005	0.01	0.01	0.01	0.01	0.01	0.015	0.01	0.01	0.01	0.0005	0.01	0.01	0.01
	EDTA	0.7	2.3	1.24	1.77	1.08	1.08	1.08	1.24	1.08	1.69	1.08	1.08	1.08	2.84	1.24	1.24	1.24
	DTPA	1.04	-	-	-	0.3	0.3	0.3	-	0.3	-	0.3	0.3	0.3	-	-	-	-
	EDDHA	0.05	-	-	-	0.06	0.06	0.06	-	0.06	0.71	0.06	0.06	0.06	-	-	-	-
	Effect on pH*	130(B)	18(A)	390(A)	480(A)	240(B)	170(B)	190(B)	300(A)	neutral	310(A)	130(A)	57(A)	180(A)	180(A)	260(A)	712(A)	330(A)

<sup>\*</sup>A =Potential acidity, B=Potential basicity, in kg equivalent of of CaCO3/ton of fertilizer.

## FORMULATION, MIXING, PACKAGING AND QUALITY CONTROL AT GHL









Custom formulation

Quality control

**Traceability** 

## AVAILABLE SOLUBLE FERTILIZER DESCRIPTION



FORMULATION	NAME	DESCRIPTION
6-11-31+	GREENHOUSE VEGETABLES	Soluble fertilizer for greenhouse vegetable grown on hydroponic substrate: coco coir, rockwool, NFT (nutrient film technique) etc. Must be combined with calcium nitrate for a complete fertilization program. To obtain an irrigation solution of 200 ppm of N, add 115 g of 6-11-31+ to 85 g of calcium nitrate to 100 liters of water. DO NOT MIX 6-11-31+ and calcium nitrate in a single concentrated tank.
8-20-32 F	YOUNG FOREST TREES PAVER	End of season fertilizer for young forest trees. High phosphorus and low potash, favoring rooting and increasing resistance to cold and dryness. Iron rich formula.
10-52-10	HIGH PHOSPHORUS	Formulation used for transplantation. Favors flowering and fruit production. Especially good for tomato and cucumber plants, it can also be used to accentuate the pink color of hortensias. General use formula with a high acidifying potential.
11-42-9 F	YOUNG FOREST TREES	Phosphorus rich formula that promotes the formation of vigorous root systems. Iron rich formula available in multiple pH levels.
13-0-44 +	POTASSIUM NITRATE	High quality potassium nitrate, containing chelated minor elements. Ideal in times of low light intensity or as a finisher. Mixes well with other fertilizers maintaining an adequate level of minor elements in the mixture.
13-2-13 +	FULL, CLEAN WATER	The 13-2-13 formulation containing high levels of calcium and magnesium. Nitric, nitrogen source. This formulation is ideal for multi-cells, artificial substrates and sources of water too pure or too low in alkalinity. It's a fertilizer with a potential to moderate basicity.
15-0-15 +	CALCIUM-POTASSIUM	The 15-0-15 is high in nitrate nitrogen. It is ideal for cool climates and during low light periods. This formulation is high in calcium, which is an essential component of fertility programs. It is used alternately with 20-8-20. This fertilizer has a high alkalinity potential.
15-30-15	HIGH PHOSPHORUS	Excellent formulation for use when transplanting. Promotes flowering and fruit production. Especially good for planting tomatoes and cucumbers, it is also useful to emphasize the color pink in hydrangeas. It is a general purpose formulation with a high acidifying potential.
17-4-28 +	HIGH POTASH	Used to correct mid-season deficiencies of potassium, provide optimal nutrition for the majority of flowering plants and encourages finishing for sale. It contains over 70% of N as nitrate, without urea. It is a source of Mg and minor elements. Acidifying potential is zero. Used when you do not want to affect the pH.

FORMULATION	NAME	DESCRIPTION
18-9-18 +	ACIDIFIER, BALANCED	No urea formulation, high nitrate and increased oligoelement ratio with IRON supplement.  More than half of nitrogen is under nitrate form for quick absorption. It is a magnesium source. Iron, manganese and zinc are higher than in other fertilizers to compensate for assimilation problems due to higher pH. This fertilizer helps to prevent pH increase due to high water alkalinity.
20-2-20 +	HIGH NITRATE, LOW IN PHOSPHORUS	Low phosphorus mix, for artificial substrates already containing phosphorus or to limit its availability. Containing over 60% of its nitrogen in a nitrate form, without urea, it is well suited for crops in cool climate and low light intensity. Although reduced in P, it is also a source of Mg and minor elements.
20-5-30 +	PAVER HIGH POTASH	Excellent fertilizer for use during flowering and ripening of plants, due to its high potassium content. Since 50% of the nitrogen is in the form of urea, this fertilizer provides a luxuriant growth and bright green colour. Fertilizer with a low acidifying potential.
20-8-20 +	HIGH NITRATE ALL-PURPOSE	Excellent fertilizer for artificial substrates with over 60% of nitrogen as nitrate, without urea. It is well suited for crops in cool climates and low light intensity. It is also a source of magnesium and minor elements
20-8-20 F	HIGH NITRATE FOR YOUNG FOREST TREES	Fertilizer used to favour apex growth on young forest trees. Iron rich formulation with nitrogen mainly in nitrate form. It also contains magnesium and other minor elements.
20-20-20	MULTIPURPOSE	A multi-purpose fertilizer designed to be used both in greenhouses and outdoors. It can be used either in a soil application or in foliar application in hot climates. It has a low electrical conductivity and allows balanced vegetative growth.
21-7-7	ACIDIFIER	Fertilizer with high ammonia nitrogen and sulphur content, excellent for acidophilic plants such as camellia, azaleas, rhododendron, blueberries, etc. It has the ability to lower substrate pH.
24-8-16	LEAF AND TROPICAL	The ratio 3: 1: 2 (nitrogen: phosphorus: potassium) is recommended for tropical plants, lawns and indoor plants. The ease of assimilation of the urea content of this fertilizer by the foliage makes it an excellent foliar fertilizer.

## CONCENTRATION CALCULATION TABLE



Formulation	6-11-31+	8-20-32F	10-52-10	11-42-9F	13-0-44+	13-2-13+	15-0-15+	15-30-15	17-4-28+	18-9-18+	20-2-20+	20-5-30+	20-8-20+	20-8-20F	20-20-20	21-7-7	24-8-16
	Fertilizer weight (g) per litre of concentrate (with injector at 1:100)																
25 ppm of N	42	31	25	23	19	19	17	17	15	13.9	13	13	13	13	13	12	10
50 ppm of N	83	63	50	46	38	38	33	33	29	27.8	25	25	25	25	25	24	21
75 ppm of N	125	94	75	68	58	58	50	50	44	41.7	38	38	38	38	38	36	31
100 ppm of N	167	125	100	91	77	77	67	67	59	55.6	50	50	50	50	50	48	42
150 ppm of N	250	188	150	136	115	115	100	100	88	83.3	75	75	75	75	75	71	63
200 ppm of N	333	250	200	182	154	154	133	133	118	111.1	100	100	100	100	100	95	83
250 ppm of N	417	313	250	227	192	192	167	167	147	138.9	125	125	125	125	125	119	104
300 ppm of N	500	375	300	273	231	231	200	200	176	166.7	150	150	150	150	150	143	125
350 ppm of N	583	438	350	318	269	269	233	233	206	194.4	175	175	175	175	175	167	146
400 ppm of N	667	500	400	364	308	308	267	267	235	222.2	200	200	200	200	200	190	167
450 ppm of N	750	563	450	409	346	346	300	300	265	250	225	225	225	225	225	214	188
500 ppm of N	833	625	500	455	385	385	333	333	294	277.8	250	250	250	250	250	238	208
					Litres of	water to	dilute a	complete	15 kg fer	tilizer ba	g (with ir	ijector at	1:100)				
25 ppm of N	360	480	600	660	780	780	900	900	1,020	1,080	1,200	1,200	1,200	1,200	1,200	1,260	1,440
50 ppm of N	180	240	300	330	390	390	450	450	510	540	600	600	600	600	600	630	720
75 ppm of N	120	160	200	220	260	260	300	300	340	360	400	400	400	400	400	420	480
100 ppm of N	90	120	150	165	195	195	225	225	225	270	150	300	300	300	300	315	360
150 ppm of N	60	80	100	110	130	130	150	150	170	180	200	200	200	200	200	210	240
200 ppm of N	45	60	75	83	98	98	113	113	128	135	150	150	150	150	150	158	180
250 ppm of N	36	48	60	66	78	78	90	90	102	108	120	120	120	120	120	126	144
300 ppm of N	30	40	50	55	65	65	75	75	85	90	100	100	100	100	100	105	120
350 ppm of N	26	34	43	47	56	56	64	64	73	77.1	86	86	86	86	86	90	103
400 ppm of N	23	30	38	41	49	49	56	56	64	67.5	75	75	75	75	75	78.8	90
450 ppm of N	20	27	33	37	43	43	50	50	57	60	67	67	67	67	67	70	80
500 ppm of N	18	24	30	33	39	39	45	45	51	54	60	60	60	60	60	63	72
								Conduc	tivity (m	S/cm)*							
50 ppm of N	0.86	0.65	0.45	0.42	0.53	0.39	0.37	0.31	0.39	0.32	0.35	0.26	0.31	0.31	0.20	0.28	0.16
75 ppm of N	1.29	0.98	0.68	0.63	0.80	0.59	0.56	0.47	0.59	0.48	0.53	0.39	0.47	0.47	0.30	0.42	0.24
100 ppm of N	1.72	1.30	0.9	0.84	1.06	0.78	0.74	0.62	0.78	0.64	0.70	0.52	0.62	0.62	0.40	0.56	0.32
200 ppm of N	3.44	2.60	1.8	1.68	2.12	1.56	1.48	1.24	1.56	1.28	1.40	1.04	1.24	1.24	0.80	1.12	0.64

<sup>\*</sup>Conductivity values are approximate. Use conductivity to verity fertilizer level at the injector end. Be sure to include your raw water conductivity in your calculations.

Water soluble formula: to calculate a fertilizer quantity for a desired ppm concentration

Fertilizer quantity (g) =

Desired concentration (ppm) x stock tank volume (litres) x Dilution factor

% active ingredient x 10

Example: for 200 ppm of 20-8-20 in a 20 L stock tank pail, with injector at 1:100:

 $200 \text{ ppm } \times 20 \text{ L} \times 100 / (20 \times 10) = 2000 \text{ g of fertilizer (or 2 kg)}!$ 

Liquid fertilizer formula: to calculate a liquid fertilizer quantity for a desired ppm concentration Quantity to dilute (ml) =

Desired concentration (ppm) x stock tank volume (litres) x Dilution factor % active ingredient x 10 x liquid density (kg/l)



#### SINGLE ELEMENT FERTILIZERS

We keep in stock all the fertilizers needed for the composition of your nutrient solutions, as well as a wide range of completely soluble fertilizers and we also distribute liquid form simple elements fertilizers. We will gladly share with you our suggestions for the composition of your fertilizer solutions, taking into account the specific needs of your crops and your water analysis. These suggestions are based on the results of mineral analysis or recommendations by various sources such as research centers, various publications, local experiences and our own in-house agronomists.

NUTRIENTS	FORMULATION	FORMAT	QUANTITY PER SKID	<u>ITEM #</u>
MACRO-ELEMENTS				
Ammonium nitrate	34-0-0	25 kg	40	100-01020112(114)
Ammonium sulfate	21-0-0	22.7 Kg	42	100-01020195
Calcium chloride	77% CaCl <sub>2</sub> 28% Ca	20 or 22.7 kg	42 ou 56	100-01020062(64)
Calcium nitrate	15.5-0-0 19 % Ca	25kg	42	<u>100-01020140</u>
Calcium nitrate Pure Cal	13-0-0 18 % Ca without NH <sub>4</sub>	25kg	40	<u>100-01020155</u>
Magnesium nitrate	10-0-0 9.6% Mg (16 % MgO)	25 kg	42	<u>100-01020148</u>
Magnesium sulfate (Epsom salt)	9.8 % Mg (16% MgO)	25 kg	40	<u>100-01020215</u>
Monoammonium phosphate	12-61-0	25 kg	40	<u>100-01020096</u>
Monopotassium phosphate	0-52-34	25 kg	40	<u>100-01020090(94)</u>
Nitric acid	67% HNO <sub>3</sub> (42° Bé) 14-0-0	29 kg	32	<u>100-01010055</u>
		72 kg <sup>New</sup>	9	<u>100-01010057</u>
Phosphoric acid	0-54-0 75% H <sub>3</sub> PO <sub>4</sub>	30 kg	32	<u>100-01010070</u>
Potassium bicarbonate	0-0-47	25 kg	40	<u>100-01020020</u>
Potassium chloride	0-0-62	25 kg	56	<u>100-01020105</u>
Potassium nitrate	13-0-46	25 kg	48	<u>100-01020160(162)</u>
Potassium sulfate	0-0-50	25 kg	42	<u>100-01020219(20)</u>
Sodium chloride	99% NaCl	20 kg	56	<u>100-01020070</u>
Urea 46%	46-0-0	25 kg	40	<u>100-01020245</u>
MICRO-ELEMENTS				
Aluminium sulfate		20 kg		<u>100-01020187</u>
Boric acid	17,5% B	1 kg or 25 kg		<u>100-01010010(23)</u>
Borax 15 %	15 % B	1 kg or 25 kg		<u>100-03010010(14)</u>
Chelated copper EDTA 15 %	15 % Cu	1 kg or 25 kg		<u>100-03010030(38)</u>
Chelated Iron DTPA 11%	11% Fe	1 kg or 25 kg		<u>100-03010060(73)</u>
Chelated Iron EDTA 13 %	13% Fe	1 kg or 25 kg		100-03010080(93)
Chelated Iron EDDHA 6 %	6 % Fe	1 kg or 25 kg		100-03010095(98)
Chelated Manganese EDTA 13%	13% Mn	1 kg or 25kg		<u>100-03010100(113)</u>
Chelated Zinc EDTA 15 %	15 % Zn	1 kg or 25 kg		100-03010200(205)
Copper sulfate	25 % Cu	1 kg or 22.7kg		<u>100-03010140(153)</u>
Iron sulfate	21 % Fe	1 kg or 22.7 kg		<u>100-01020200(205)</u>
Manganese sulfate	31,5% Mn	1 kg or 22.7kg		<u>100-03010160(170)</u>
Oligo elements – all-purpose mix <sup>New</sup>		10 kg		<u>100-03020050</u>
Sodium molybdate	46 % Mo	1 kg		100-03010120
Solubor	20% B	500 g		100-03010130
Zinc sulfate	35% Zn	1 kg or 22.7 kg		100-03010180(192)

- ❖ Note: sizes, formulations, quantity/skid and product codes are subject to change.
- All our fertilizers are conform to horticultural use norms (greenhouse grade, technical grade, Horticole grade).

## **LIQUID FERTILIZERS**

PRODUCT	AVAILABLE ELEMENT(S)	FORMAT	<u>ITEM #</u>
Boron	10% B	10 L	100-04000010
Calcium	6% Ca	10 L	100-04000020
Copper	5% Cu	10 L	100-04000030
Iron	5% Fe	10 L	100-04000040
Magnesium	4% Mg	10 L	100-04000060
Manganese	5% Mn	10 L	100-04000050
Molybdenum	2% Mo	10 L	100-04000070
Potassium hydroxide	45% KOH	5 kg	100-01020085
Potassium silicate	20% Si <sub>2</sub> O, 8% K <sub>2</sub> O	10 L	100-01020185
Zinc	7% Zn	10 L	100-04000075

## AMENDMENTS AND FERTILIZERS TO MODIFY THE pH

PRODUCT	AVAILABLE ELEMENT(S)	FORMAT	<u>ITEM #</u>
TO LOWER (♦) PH:			
Ammonium nitrate	34 % N	25 kg	<u>100-01020110</u>
Mono ammonium phosphate (MAP)	12 % N, 61 % P <sub>2</sub> O <sub>5</sub>	25 kg	<u>100-01020096</u>
Ammonium sulphate	21% N	22.7 kg	<u>100-01020195</u>
Aluminum sulphate		20 kg	<u>100-01020187</u>
Boric acid	17,5% B	1 kg	<u>100-01010010</u>
Citric Acid		25 kg	<u>100-01010040</u>
Iron sulphate	21 % Fe	1 kg	<u>100-01020200</u>
Nitric acid	67,2% - 68,2% HNO <sub>3</sub>	35 kg	<u>100-01010050</u>
Phosphoric acid	75% H <sub>3</sub> PO <sub>4</sub> , 54,3% P <sub>2</sub> O <sub>5</sub>	30 kg	<u>100-01010070</u>
TO INCREASE (个) PH:			
Hydrated lime		22,7 kg	<u>100-01020040</u>
Potassium bicarbonate	0-0-47	25 kg	100-01020020
Potassium hydroxide	45% KOH	5 kg	<u>100-01020085</u>

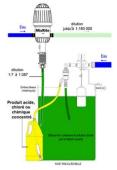
<sup>\*\*\*</sup> Please refer to the literature or agricultural advisor for more information about using these products.

For an acid pump, see "Fertilizer injection" section of this catalogue.

## Iwaki pump



## MIX RITE - WATCH GUARD injection system



## **ANALYSIS**

## MINERAL ANALYSIS FROM AGRI-FOOD (SGS) LABORATORIES



We offer a wide range of mineral analysis including:

we offer a wide range of filliferal analysis including.	
COMPLETE WATER	<u>195-01000010</u>
PH, CE, NH4, NO3, Na, P, K, Mg, Ca, Cl, sulphates, bicarbonate, Zn, Fe, Mn, Cu, B, Si, Mo.	<u>195-01000045</u>
pH, CE, NO3, NH4, P, K, Ca, Mg, Na, Cl, sulphates, Al, Zn, Cu, Fe, Mn, Mo.	195-01000030
SOIL ORGANIC BASIC I (standard analysis)	195-01000040
SOIL ORGANIC BASIC III (standard analysis)pH (and buffer solution), P, K, Mg, Ca, % Organic matter, rates of base saturation, CEC.	<u>195-01000035</u>
SOIL ANALYSIS OF FULL FIELD (Mehlich III, standard analysis)pH (and buffer solution), P, K, Mg, Ca, % Organic matter, rates of base saturation, CEC, Al, B, Cu, Fe, Mn, Zn.	<u>195-01000055</u>
COMPLETE FOLIAR ANALYSIS	195-01000020
TOTAL BACTERIAL COUNT Total and fecal coliforms.	<u>195-01000050</u>
<b>DNA MULTISCAN, 25 PATHOGENS</b> Best suited to monitor and detect the presence of 25 common plant pathogens in soil, water and plant tissue including Pythium, Phytophthora and Verticillium	<u>Upcoming</u>
DNA MULTISCAN, 66 PATHOGENS	

#### **PROCEDURE:**

**Step 1**: Contact us for an analysis application and the sampling protocol.

**Step 2**: Collect samples according to the sampling protocol.

Step 3: Send samples via DICOM with the number written on the application form for analysis.

Step 4: You will receive the results by the method chosen (Fax, mail or email) and we will retain a copy for future reference.

**Step 5**: A GHL agricultural adviser can help you interpret your results.

## **SUBSTRATES**

# COCONUT COIR PRODUCTS New

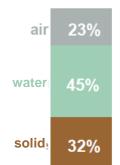




Material from by-product of coconut production Environmentally friendly and renewable substrate! Stable properties and slow material decomposition White poly bag (black inside), 4 mil, UV treated (3 years)

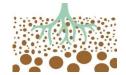
## DUAL TEK TECHNICAL COCO GROWSLAB





Washed (low salt and phenolic compounds, (EC <1,4 mS/cm) and with drain holes so ready to plant as soon as filled with water;

**Stratified structure** of substrate:



- Upper part made of fine material (peat) to promote good water retention capacity and good capillarity flow;
- Coarse material (chips) at bag bottom to maintain high root oxygenation and easy drainage.
- Optimal balance between water retention capacity and root oxygenation;
- Recommended for soilless vegetable cultivation.

DIMENSION ( Length X Width X Height filled with water)	EXPANDED WET (liters)	QTY/ SKID	# ITEM
50 x18 x 15 cm Washed	13.5 L	660	<u>120-0202002529</u>
50 x 24 x 15 cm Washed	18.0 L	440	120-0202002527
100 x 18 x 13 cm Washed	23.4 L	340	120-0202002520
100 x 18 x 15 cm Washed	27 L	300	120-0202002523

Options on request: - Other sizes (full skid)

- Pre-cut planting holes

#### MIX GRO STANDARD COCO GROWSLAB





18%

46% water

36% solid

When unwashed, substrate has to be conditioned with calcium nitrate and salt leached before plantation;

- A mix of fine (peat) and coarse (chip) particles, increasing water retention;
- Recommended for soilless vegetable cultivation with greater water need.

DIMENSION ( Length X Width X Height filled with water)	EXPANDED WET (liters)	QTY/ SKID	# ITEM
100 x 18 x 13 cm Unwashed	23.4 L	365	<u>120-0202002550</u>
100 x 18 x 15 cm Unwashed	27.0 L	315	Coming soon
100 x 18 x 13 cm Washed	23.4 L	365	<u>120-0202002570</u>
100 x 18 x 15 cm Washed	27.0 L	315	Coming soon

Options on request:

- Washed substrate
- Other sizes (full skid)
- Pre-cut drain holes and/or planting holes

## MIX AIR STANDARD COCO GROWSLAB





air

45%

water

solid

- When unwashed, substrate has to be conditioned with calcium nitrate and salt leached before planting;
- A mix of fine (peat) and coarse (chip) particles, increasing air retention;
- Recommended for soilless vegetable cultivation with more pronounced root oxygenation need.

DIMENSION Length X Width X Height filled with water )	VOLUME EXPANDED WET (liters)	QTY/ SKID	# ITEM
100 x 18 x 13 cm Unwashed	23.4 L	350	<u>120-0202002590</u>
100 x 18 x 15 cm Unwashed	27.0 L	300	Coming soon
100 x 18 x 13 cm Washed	23.4 L	350	<u>120-0202002600</u>
100 x 18 x 15 cm Washed	27.0 L	300	Coming soon

Options on request:

- Washed substrate
- Other sizes (full skid)
- Pre-cut drain holes and/or planting holes



<u>PRE-CUT GROW BAG</u> Possibility of cutting the bag according to your needs, additional charges apply.

#### PROCEDURE FOR ORDERING PRE-CUT COCO GROW BAGS:

**Step 1**: Contact your representative with the following information:

- -Coco mixture type (Dual teK, mix grO or mix aiR)
- -Washed or unwashed substrate
- -Bag dimentions (Lenght x Width x Height ) and total volume (in liters)
- -Bag quantity
- -Plantation holes dimensions and numbers
- -Distance between planting holes from bag side
- -Drainage holes site and number
- -Desired delivery date (plan many months in advance)

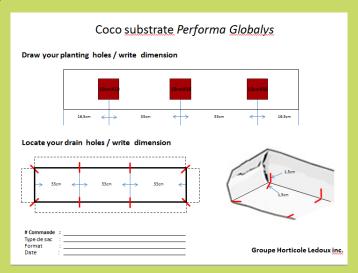
If necessary, your representative can help you define the types and dimensions that you need.

<u>Step 2</u>: Your representative will send you a quote and a perforation plan by fax or e-mail.

Step 3: Check, sign and return the perforation plan by fax to your representative to confirm the order.

<u>Step 4</u>: Your representative will advise you of the expected delivery time.

Example of perforation plan deisgned by GHL:



#### OTHER COCO FIBER PRODUCTS

OTHER COCOTIBERT RODCCIS						
PRODUCT CATEGORY	FIBER TYPE / INFO ON PRODUCT	PICTURE	DIMENSION (Length X Width X Height)	VOLUME EXPANDED WET (liters)	QTY/ SKID	# ITEM
Bulk bag	Coarse washed 100% chips	es de la	Coming soon	Approx. 4 ft3 dry *	28	120-0201002532
	Mix grO washed					<u>120-0201002534</u>
	Mix aiR washed					Coming soon
"Open top" bag	Dual teK	Photo à venir	28x27x23 cm	17.4 L	475	120-0202002615
GrowCube	Single block with plastic wrap		9x9x6.5 cm (2.5cm hole)	100 cubes/box 90 box/skid	9000	120-0201002458
Millenniumsoils Coir®  Drascov or VGROVE bx.	Double block with plastic wrap		10x15x6.5cm (2.5cm hole)	80 cubes/box 72 box/skid	5760	120-0201002460

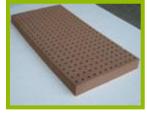
<sup>\*</sup> Volume can be smaller by approx. 5%, when broken in a dry state and mixed with other ingredients, even when wet.



## EQUIPMENT FOR PROPAGATION AND ROCK WOOL

## CUBE "OASIS LC-1 HORTICUBES®"

Propagation cube, especially popular for growing lettuce. The Oasis "# 5231 SC-1 Thin cut" is the most used for lettuce. Inert culture medium, clean and sterile to begin production without diseases and insects. Other sizes are also available.



Each sheet measures 9 5/8" x 20" x 11/2"

CUBE TYPE	DIMENSIONS	QTY / BOX	# ITEM
Oasis #5225 "1" Medium"	Cube: 7/8" x 7/8" x 1½" Center holes: 1 1/8"	20 sheets x 162 cubes, total 3240 cubes	120-04000025
Oasis #5231 "1" Thin-cut Medium"	Cube: 3/4" x 7/8" x 11/2" Center holes: 7/8"	20 sheets x 276 cubes, total 5520 cubes.	120-04000040
Oasis # 5240 "11/4" Medium"	Cube: 1" x 1 <sup>1</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> "  Center holes: : 1 <sup>1</sup> / <sub>4</sub> "	20 sheets x 104 cubes, total 2080 cubes	120-04000050
Oasis # 5245 "1½" Medium"	Cube: 1¾" x 1¾" x 1½" Center holes: 1¼"	20 sheets x 50 cubes, total 1000 cubes	120-04000060

## **ROCK WOOL ROOTING STRIPS**



SIZE OF CUBES L x W x H (cm))	DESCRIPTION	QTY/ BOX	ITEM#
3.6 x 3.6 x 4.0	A box contains 30 strips of 98 plugs. Each cube has a 0.6 cm x 1.5 cm hole.	2940	120-01010020

## **KIEM PLUG**



CYLINDER SIZE DIAMETER x H (cm)	DESCRIPTION	QTY TUBES/ BOX	ITEM#
2.0 x 2.5	White polystyrene plate (40cm x 60cm) with 240 rock wool tube per plate (13plates/box).	3120	<u>120-01010040</u>

## **GROWTH CUBES**





DIMENSIONS L x L x H (cm)	HOLE DIAMETER x H (cm)	QTY/ BOX	ITEM#	
7.5 x 7.5 x 6.5	4.2 x 4.0 (square)	384	120-01020030	
10 x 10 x 6.5	4.2 x 4.0 (round)	216	120-01020045	
10 x 10 x 6.5	2.7 x 3.5 (round)	216	120-01020042	
10 x 15 x 6.5 (double)	2.7 x 3.5 (round)	144	120-01020060	
For <b>coconut fiber cube</b> , see previous page				

## ROCK WOOL SLABS

## grodan J



DIMENSIONS L x L x H (cm)	QTY/ PKG	ITEM#
15 x 7.5 x 90	16	<u>120-01030010</u>
15 x 7.5 x 100	16	<u>120-01030020</u>
20 x 7.5 x 90	12	<u>120-01030030</u>
20 x 7.5 x 100	12	<u>120-01030040</u>
15 x 10 x 100	12	<u>120-01030080</u>
Depending on availability		

## **CLEANING AND DISINFECTION**

## WEST PENETONE CLEANING PRODUCTS



West Penetone products are manufactured in Montreal and are less expensive than many other sanitizers in use in greenhouses! Moreover, many are approved by the Canadian Food Inspection Agency (CFIA) and selected by Health Canada.

# \*\*\* Always clean before you sanitize or disinfect! \*\*\*

PRODUCT NAME	DESCRIPTION	ACTIVE INGREDIENT	DILU- TION	FOR- MAT	ITEM#
Foamchek	Low foaming acid cleaner			4 L	<u>170-09000417</u>
Toanienek	-Designed to clean irrigation lines -Removes calcium deposits and minerals as well as bio film	Phosphoric acid, non-ionic detergent	10 to 20	20 L	<u>170-09000420</u>
	-Sweet odour and blue color to see where it has been applied -Very efficient and inexpensive	and color.	mL/L	205 L	<u>170-09000423</u>
' '				1000 L	<u>170-09000422</u>
Ridstone	High-performance acid cleaner -For outdoor use, walls, floors, structure and water tanks -Removes calcium deposits and minerals as well as bio film -A low-concentration is sufficient to obtain the desired results -Non-volatile and low viscosity	Hydrofluoric acid, phosphoric acid, glycol ether and detergents.	10 to 50 mL/L	4L	<u>170-09000371</u>
Penblitz	High performance foaming alkaline cleaner	Sodium		4L	<u>170-09000345</u>
228M	-Containing no caustic soda or solvents, it displays a foaming action which allows its use in automated high-performance foam cleaning equipment, for tools, buildings, packaging lines, trucks etcEmits virtually no odours	metasilicate, sequestering organic, non-ionic detergents.	20 to 50 mL-L	20L	170-09000330
				205L	<u>170-09000340</u>
Bio-Eze 3	Foaming alkaline degreaser highly biodegradable	Detergents, sequestering organic ether glycol,	20 to 50 mL/L	4L	<u>170-09000460</u>
Order William No.	and certified EcoLogo <sup>M</sup> -Designed to remove food deposits on floors, walls and equipment			20L	<u>170-09000465</u>
EcoLogo*	-High-foaming, chlorine-free, phosphate free and non corrosive	ethanolamine.		205L	<u>170-09000470</u>
Special 10	Non-foaming chlorinated alkaline cleaner, safe on aluminum -Designed for cleaning of automatic washing systems for trays,	Phosphate, potassium	10 mL/L	20L	<u>170-09000415</u>
	tanks and pots -Safe on aluminum and other soft metals -Controls calcium deposits due to its high content of water softening agents  hydroxide, silicate, sodium hypochlorite.	10 IIIL/L	205L	<u>170-09000410</u>	
Adhere NC	Unchlorinated alkaline cleaner-gel -Forms a gel when dissolved in water, allowing it to adhere and coat surfaces -Ideal for vertical and inclined surfaces -Its adherence reduces the volume of solution to be applied (20-50% reduction) as well as the time and volume of water required for rinsing clean	Potassium hydroxide,	10 to 20	4L	<u>170-09000318</u>
*		detergent, EDTA	mL/L	20L	170-09000317

## WEST PENETONE SANITATION AND DISINFECTANT PRODUCTS



					reneione
PRODUCT NAME	DESCRIPTION	ACTIVE INGREDIENT	DILU- TION	FOR- MAT	ITEM#
Teramine NR /	Quaternary ammonium based disinfectant -Designed to sanitize equipment, pruning tools, pots, multi-cell, buildings, packaging lines and transport trucks	10% quaternary ammonium 1st		4 L	170-09000385
	-Requires no rinsing when used at 2 mL/L ratio. May leave a thin film that helps to maintain sterile surfaces	generation (N-alkyl dimethyl benzyl ammonium	2 mL/L	20 L	170-09000390
	-Odourless, chemically stable, non-corrosive, non-volatile, pH neutral -Remains for 30 days, harmless to metals and other materials -Approbation DIN: 02012294	chlorides)		205L	170-09000395
Bio-San	Quaternary ammonium based disinfectant, highly biodegradable and certified EcoLogo <sup>M</sup>	Quaternary		4L	<u>170-09000475</u>
STRIVILONA RANGE	-Designed to disinfect equipment, pruning tools, pots, multi-cells,	7 mL/L	20L	170-09000480	
EcoLogo*	-More resistant to hard water and faster than Teramine NR -Approbation DIN: 02309920	ammonium chlorides)	dimethyl benzyl nium chlorides)		<u>170-09000485</u>
Hyper San	Highly biodegradable liquid sanitizer/oxidizer -Designed to sanitize equipment, packaging lines and transport trucks -No foam, more efficient and resistant to hard water than Bio-San -Approbation: OMRI	Peroxyacetic acid (peracetic acid)	4 mL/L (normal treatment)	20 L	170-09000424
Foam-It	Foaming Sanitizer	Quaternary ammonium 5 <sup>th</sup>	10	4 L	<u>170-09000312</u>
	-Designed for use as as foot bath foam to protect access to growing areas, not slippery	generation (Di-	10 mL/L	20 L	<u>170-09000310</u>
	-More resistant to hard water and faster than Teramine NR	alkyl dimethyl benzyl ammonium chlorides)		205L	<u>170-09000313</u>
Dutrion (NSF)	Powerful treatment for drinking water (tablets) -Algaecide, bactericide, fungicide, virucidal -Effective with high organic matter loads and not affected by pH -Easy to apply and control, safe and very economical; -Not corrosive on equipment -Keep drinking water safe -Approbation: NSF / ANSI 60 #C0028762 – 02	10% chlorine dioxide	0.2 to 0.8 ppm	25 efferves -cent tablets	<u>170-09000518</u>
-Powder pouches A	Powerful treatment for drinking water (powder) -Powder pouches A + B for dilution -Same advantages as Dutrion, but in powder form (pouch A et pouch	10% chlorine dioxide	0.2 to 0.8	1M L*	<u>170-09000650</u>
NSF	-Same advantages as Dutrion, but in powder form (pouch A et pouch B to mix in a water tank) more economical to treat high volume of water, details on use procedure are on the next page -Approbation: NSF / ANSI 60 #C0028762 – 02	20% chlorine dioxide	ppm	2M L*	<u>170-09000665</u>

<sup>\*</sup>Water quantity (in M L= 1 000 000 litres) teated at 0.5 ppm by diluting an A powder bag + B powder bag of 2.5 or 5 kg each.

#### DOCUMENTATION ON USE OF WEST PENETONE PRODUCTS IN GREENHOUSE

Also available from your representative :

DESCRIPTION	PICTURE	LANGUAGE	# ITEM
Ligar manual on use of West Denotons musdouts	We will be a series of the ser	English	-
<u>User manual</u> on use of West Penetone products		French	-
Stratified master 2411 - 2611 USanitation table 11 New	TABLESIA SANTINES QUI communication de la comm	English	<u>170-09000015</u>
Stratified poster 24" x 36" "Sanitation table" New		French	<u>170-09000010</u>

## PROCEDURE USING CHLORINE DIOXIDE FOR WATER SUPPLYING TREATMENT





**DUTRION®** in tablet form has to be mixed with water to form a soluble chlorine dioxide gas solution. This solution is a safe and efficient sanitizer used in a wide variety of applications including many **drinking water** programs around the globe. There are directions for using this product for injection at a final concentration of **0.2 to 0.5 ppm of chlorine dioxide.** 

\*\*\* 1 tablet in 20L of water = 100 ppm of chlorine dioxide \*\*\*

# 1. STEP 1 and 2 : DILUTION AND INJECTION O.2 to O.5 ppm chlorine dioxide COVER and allow 30 minutes for reaction time. Then MIX to complete the reaction. Set the injector to obtain a 0.2 to 0.5 ppm final solution. See AQQUON steps 3 and 4 on next page for more details on

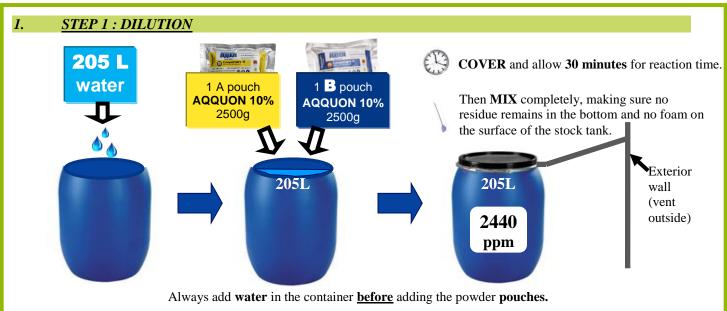


ppm

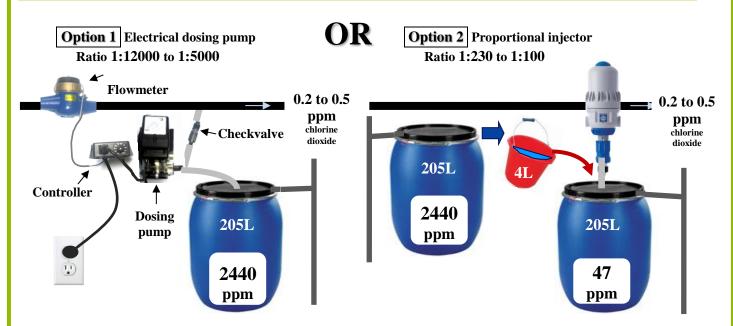


As does Dutrion, **AQQUON** in powder form has to be mixed with water to form a soluble chlorine dioxide gas solution. This solution is a safe and efficient sanitizer used in a wide variety of applications including many **drinking water** programs around the globe. There are directions for using this product for injection at a final concentration of **0.2** to **0.5** ppm of chlorine dioxide.

solution verification and storage.



#### 2. STEP 2 : INJECTION



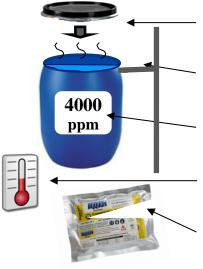
#### 3. STEP 3 : COLORIMETER VERIFICATION



Colorimeter is an instrument available at GHL. This instrument is easy to use, quick and efficient. Take a water sample (10 ml) to analyse the chlorine dioxide content in the water.

For more details, see sanitation solution and surfaces testers at next page.

#### 4. STEP 4 : STORAGE SOLUTION



Chlorine dioxide is a **soluble gas** so the tank has to be **covered** to optimize product stabiliy for a longer time period.

An **air drain hose** have to be installed and open to the outdoors to allow light **ventilation** at the liquid surface.

**The lower** the solution **concentration**, the more **stable** the solution. For better stability, a maximum concentration of 4,000 ppm of chlorine dioxide is recommended.

The solution is more **stable** at **low temperature s**(but >0°C). At 2,000 ppm in a covered tank at 20°C it stays **stable for at least 1 month.** 

Once a **pouch has been opened**, the powder must be **used immediately** (if not the humidity will alter the remaining powder in the pouch).

## CLEANING AND DISINFECTION

## **OTHER SANITATION PRODUCTS**

PRODUCT NAME	DESCRIPTION	INGREDIENT(S)	FORMAT	ITEM#
	Sanitizer. Please contact a representative to learn more about using this product.	Assets: 35% hydrogen peroxide Inert: 65% water	4 kg	<u>100-01020175</u>
			64 kg	<u>100-01020170</u>
			Kit Analysis 0-100ppm	<u>160-06050135</u>
		more. 65 % water	Kit Analysis 25-250ppm	160-06050140

## SANITATION SOLUTION AND SURFACES TESTERS

TESTED SUBSTANCE	PRODUCT NAME	PICTURE	DESCRIPTION	# ITEM
	Colorimeter for chlorine dioxide		Simple, quick, reliable and easy to use, this colorimeter measures the chlorine dioxide rate in water Water and dust proof, include the colorimeter, 3 sample cuvettes, 100 pouches of reagent kit, batteries and carrying case.  • Range: 0 to 3.79 ppm  • Display unit (resolution): 0.01 ppm  • Accuracy ± 0.02 ppm	<u>160-01000005</u>
CHLORINE	Glycine-Chlorine dioxide reagents		Replacement glycine and chlorine dioxide reagents for colorimeter. To detect glycine and chlorine dioxide. 100 tests/kit.	160-01000060
DIOXIDE (for DUTRION®	Free-chlorine dioxide reagents		Replacement free chlorine reagents for colorimeter. To detect chlorine. 100 tests/kit.	160-01000065
and AQQUON)  Titration kit – chlorine dioxide		<b>TO</b>	To check chlorine dioxide concentration.  Test by titration.	<u>170-09000530</u>
Test strips – chlorine dioxid			For chlorine dioxide concentration detection. 50 strips	<u>170-09000528</u>
PROTEINS	Pro-clean test swab		Quick and easy method to accurately monitor the cleanliness of <b>surfaces</b> and ensure the safety and quality of products. Pro-Clean detects protein residues on surfaces after cleaning and sanitizing.	170-09000445
QUATERNARY AMMONIUM (for FOAM IT and TERAMINE NR)	Test strips – Quaternary ammonium	Physician impers G1-10 impers G	For quaternary ammonium concentration detection.  10 strips	<u>170-09000450</u>

# HAND PRODUCT



PRODUCT NAME	DESCRIPTION	ACTIVE INGREDIENT	FORMAT	<u>ITEM #</u>
Pretom	Protection for hand for working with tomato plants Hand protecting lotion (chlorophyll and plant resin, especially tomatoes).	Lanoline, fragrance, citric acid, xantham gum, camphor	250 ml	<u>170-09000060</u>

## CLEANING AND DISINFECTION

## **KEY TO OPEN WEST PENETONE CONTAINERS**



PRODUCT NAME	PICTURE	DESCRIPTION	ITEM#
Key to open 20L plug	8	Key to easy plug opening on 20 litre West Penetone containers.	<u>170-09000290</u>
Key to open 205L plug	INVESTIGATION OFFICE	Key to easy plug opening on 205 litre West Penetone containers.	170-09000295

## WEST PENETONE SANITATION EQUIPMENT



PRODUCT NAME	PICTURE AND DESCRIPTION	ITEM#
Automatic foot bath foaming system	To use with FOAM-IT, this reliable machine produces a rich sanitizing foam on the floor. Designed to sanitize worker boots and forklift truck tires. Timer or photocell options are available.	<u>170-09000305</u>
Compact sprayer for cleaning and sanitation.	Many different models available.	Coming soon
Adaptor kits for tank and pressure washer (without gun and hose)	Gun and hose (not included)  Transparent hose (included) to chemical concentrate	Coming soon
Mobile atomizer	Light, practical and very useful, this portable fogger allows you to move around the greenhouse to apply the products you want where you want them. Highly manageable, it allows you to go in often inaccessible corners. It adjusts in height and can carry 20 to 40 gallons. Possibility of adding a 28 foot flexible extension.	<u>170-09000490</u>

# **SUPPLIES**

## TOMATO CLIPS AND OTHER CLIPS

We distribute a complete range of products to attach to your stand or transplanted seedlings.

PRODUCTS	PICTURE	QUANTITY/ BOX	ITEM#
Black 23 mm clips New improved model		11,000	<u>170-05010221</u>
Flexible stem reinforcing arch (flexible half-moon)	TAHA	20,000	<u>170-05010313</u>
Rigid stem reinforcing arch		8,800	<u>170-05010315</u>
(rigid half-moon)		10,200	<u>170-05010309</u>
Double J-hook (bunch holder / cluster support) New model	555	11,000	<u>170-05010273</u>
Hortensia 13 mm clip	a	1,000	<u>170-05010020</u>
Hortensia 16 mm clip	g ()	1,000	<u>170-05010040</u>
Hortensia 20 mm clip		1,000	<u>170-05010060</u>
Hortensia 25 mm clip	U. U.	1,000	<u>170-05010080</u>
Grafting clips 1.3 mm New size	New A A A A	250	<u>170-05010105</u>
Grafting clips 1.6 mm New size	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	250	<u>170-05010125</u>
Grafting clips 2.1 mm New size	(For grafting instructions, contact your	250	<u>170-05010145</u>
Grafting clips 2.7 mm New size	representative)	250	<u>170-05010162</u>

## METAL TOMATO STEM HOLDER

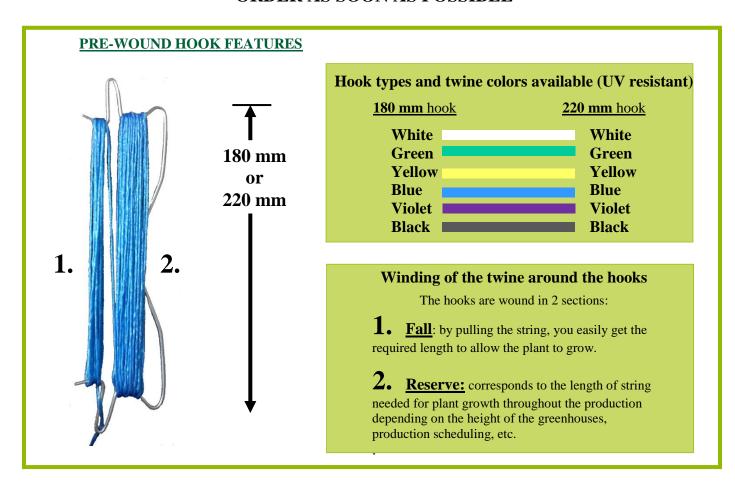
PRODUCT	PICTURE	SIZE	ITEM#
		13" x 16" (single row)	<u>170-18000240</u>
Metal holder for tomato plant		13" x 24" (double row)	<u>170-18000220</u>

## **PRE-WOUND HOOKS**

We manufacture custom pre-wound tomato hooks using quality UV resistant twine, wound to your specifications. Accurately, measured and consistently wound, based on your operational demands. Due to the individuality of this product please allow 4-8 weeks for delivery.

Minimal custom order: 500 hooks

## \*\*\*ORDER AS SOON AS POSSIBLE\*\*\*









## TOMATO HOOKS

PRODUCTS	PICTURE	DESCRIPTION	LENGHT	ITEM#
DOUBLE tomato hooks	M	<ul><li> Made of heavy gauge galvanized steel</li><li> Can hold enough twine for the duration of the</li></ul>	180 mm (approx.)	170-05020043
		<ul> <li>crop</li> <li>Always cut to the right length based on your requirements.</li> <li>Easy to hang on the support;</li> <li>Reusable</li> </ul>	220 mm (approx.)	170-05020054
	2		180 mm (approx.)	<u>170-05020057</u>
SINGLE tomato hook		Similar to the double tomato hook but without the "Fall" part.	220 mm (approx.)	<u>170-05020055</u>

## **STACKING TWINES**

PRODUCTS	PICTURE	DESCRIPTION	FORMAT	COLOR	ITEM#
Performa Globalys 1,000 m/kg twine, UV 2%	TEFORMA GLORALS Fulls tomats Simple trees Superior trees Superior	<ul> <li>U.V.resistant treated;</li> <li>Flexible and strong;</li> <li>Specially designed for growing tomatoes;</li> <li>1200m/kg is more economical than 1000m/kg.</li> </ul>	5,000 metres (5 kg)	White Blue	170-05030106 170-05030095
				Green Yellow	<u>170-05030195</u> <u>170-05030206</u>
Performa Globalys 1,200 m/kg twine, UV 2%	PERFORMA GLORALIS Facilis tomats Fac		6,000 metres (5 kg)	☐ White ■ Blue	170-05030090 170-05030092
				Green Yellow	170-05030092 170-05030093 170-05030094
				Fuchsia (violet)	170-05030091
Performa Globalys 1,200 m/kg twine, UV 1.5% <sup>New</sup>			9,600metres (8 kg)	White Blue Green Yellow	170-05030107 170-05030171 170-05030196 170-05030207
Guelph P1500 1,000 m/kg twine	D	<ul> <li>Style polypropylene tape;</li> <li>Treated U.V. resistant 1 year;</li> <li>Flexible and strong;</li> <li>Used for growing tomatoes.</li> </ul>	6,600 metres (6.6 kg)	☐ White ☐ Blue ☐ Green ☐ Yellow ☐ Beige	170-05030030 170-05030032 170-05030033 170-05030034 170-05030031
Guelph P2000 1,340 m/kg twine	8	<ul> <li>Like P1500 but thinner;</li> <li>Used for growing cucumbers and peppers.</li> </ul>	7,638 metres (5.7 kg)	☐ White	<u>170-05030035</u>
Biodegradable twine	Will said of a Property of the Art State	Biodegradable. Jute	2,893 metres (4.5 kg)	Beige	170-05030045

## FRUIT TRAYS (INSERT / TRAY LINERS)

Fruit trays for boxes of 15 pounds of TOMATOES available:

PICTURE	<b>DESCRIPTION</b>	(OTYBOX*) ITEM # in BLUE	( <u>OTY/BOX*) ITEM # in</u> BLACK
	Cell 16 – upcoming info	-	(700) 170-06000004
	Cell 18 – 403 g (14.4 oz)	(700) 170-06000005	(700) <b>170-06000007</b>
	Cell 20 – 340 g (12.2 oz)	(700) 170-06000011	(700) <b>170-06000015</b>
	Cell 22 – 310 g (10.9 oz)	(700) 170-06000020	(700) <b>170-06000022</b>
	Cell 25 – 270 g (9.5 oz)	(700) <b>170-06000031</b>	(700) 170-06000035
	Cell 28 – 240 g (8.8 oz)	(700) 70-06000040	(700) <b>170-06000042</b>
	Cell 30 – 225 g (7.9 oz)	<u>(700)</u> <b>170-06000054</b>	(700) 170-06000053
	Cell 32 – 210 g (7.4 oz)	(700) <b>170-06000061</b>	(700) 170-06000062
	Cell 35 – 195 g (6.9 oz)	(700) <b>170-06000071</b>	<u>(700) 170-06000073</u>
000000000	Cell 37 – 185 g (6.5 oz)	(700) 170-06000081	-
	Cell 39 – 175 g (6.2 oz)	(700) 170-06000089	(700) <b>170-06000094</b>
	Cell 42 – 160 g (5.6 oz)	<u>(700)</u> <b>170-06000103</b>	(700) <b>170-06000102</b>
	Cell 45 – 150 g (5.3 oz)	(500) <b>170-06000111</b>	(700) <b>170-06000113</b>
	Cell 48 – 140 g (4.9 oz)	(500) <b>170-06000121</b>	(700) <b>170-06000125</b>
	Cell 52 – 130 g (4.6 oz)	(500) <b>170-06000131</b>	(700) <b>170-06000135</b>
	Cell 56 – 105 g (3.7 oz)	(500) 170-06000141	-
	Cell 66 – 105 g (3.7 oz)	(500) <b>170-06000151</b>	- 11 4 1700 h

\*Eventually, all trays will be in 700 boxes.

## **PLASTIC TOMATO BOX**

We offer an efficient method for protecting and transporting fruits, vegetables, plants and nursery items. Made of high quality plastic, impact resistant, durable, reusable, easily cleaned and sanitized, these containers are an economical improvement over single-use corrugated cartons and are ideal for moist environments. These plastic containers are fully recyclable at the end of their service life.

PRODUCTS	PICTURE	DESCRIPTION	ITEM#
Plastic tomato box (15 lbs)		24" x 16" plastic box. Low profile design. Smooth surfaces for easy cleaning. Radius corners prevent plant damage. Offered in black or green. Other dimensions and colors available. Weight: 1.65 lbs. (120 boxes/skid).	<u>170-07010060</u>

## **GREENHOUSE COVERINGS**

## KLERK'S-HYPLAST POLYETHYLENE

Produces a very high quality environment, suitable for all types of structures and crops. Klerk's-Hyplast: a new name but still the same superior product!





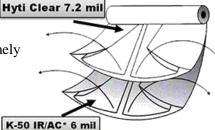
## K 50 CLEAR / 6 mil - 4 years

- Resistant to ultraviolet rays and produces a diffuse light;
- Contains an anti-dust additive "to repel dust and dirt".



## Hyti CLEAR / 7.2 mil – 4 years

- Resistant to ultraviolet rays and produces a diffuse light;
- Contains an anti-dust additive "to repel dust and dirt";
- Designed for the northern latitudes where ice sheets become extremely heavy and abrasive, or anywhere extra structural strength is needed





## K 50 IR AC / 6 mil – 4 years

- Proven anti-condensation formula:
- Infrared resistance increases energy savings.



## **K 50 BLANC** / 6 mil – 4 years

55% opacity, 45% light transmission.



## K 50 BLANC / 4 mil – 1 year

55% opacity, 45% light transmission.



#### **DIMENSIONS\*:**

Available width: 8' - 20' - 24' - 25' - 28' - 32' - 36' - 40' - 42' - 44' (white) -48' - 50'

Other widths are available in even numbers, 2 on the same roll: 4'-10'-12'-12.5'-14'-16'-18'-21'

Length: minimum 50', increasing by 5' multiples.\*Other dimensions available on request, availability to be verified with your representative.



#### **POLY ORDER PROCEDURE:**

Step 1: Contact your representative with your requirements (quantity, size and date of delivery).

Step 2: Your representative will send you a quote by fax or email.

Step 3: Sign and return the quote by fax to your representative to confirm the order.

**Step 4:** Your representative will advise of the expected delivery time.

TECHNICAL INFO ON DIFFERENT KLERK'S PRODUCTS					
TECHNICIE IN	K-50 Clear film	Hyti Clear film	K-50 IR/AC film		
Film characteristics		<u> </u>			
Single or Triple Layer	Triple Layer	Triple Layer	Triple Layer		
UV Protection	4 years	4 years	4 years		
Thickness	6 mil (0.150mm)	7,2 mil (0.180 mm)	6 mil (0.150mm)		
Anti-condensation	No	No	Yes		
Total light transmission (%)	92 %	88 %	88 %		
Diffuse light transmission (%)	Less than 20 %	23 %	52 %		
Direct light transmission (%)	80 % +	65 % +	36 %		
Thermicity (%)	40.3 %	40 %	17.3 %		
Resistance characteristics					
Dard impact* (grams ± 10%)	700 g	800 g	600 g		
Tensile at break** MD (Mpa ± 10%)	26 Mpa	23 Mpa	25 Mpa		
Tensile at break ** TD (Mpa ± 10%	27 Mpa	23 Mpa	26 Mpa		
Elongation at break*** MD (% ± 10%)	530 %	550 %	500 %		
Elongation at break*** TD (% ± 10%)	680 %	700 %	700 %		
Tear strength MD**** (g/u ± 10%)	11 g/u	Upcoming info	11 g/u		
Tear strength TD**** $(g/u \pm 10\%)$	23 g/u	Upcoming info	23 g/u		

\*Dard impact: amount of energy it takes to cause film to fail.

Machine Direction (MD) - direction of the film as it is being blown: the length of the film / Transverse Direction (TD) - width of the film

<sup>\*\*</sup>Tensile at break: amount of tension it takes to stretch film to it's breaking point

<sup>\*\*\*</sup>Elongation at break: increase in length film can endure before breaking

<sup>\*\*\*\*</sup>Tear strength: amount of force to cause to tear film

#### TIPS FOR INSTALLATION OF KLERK'S POLYETHYLENE

Please consult these pages before proceeding!

## 5. LAYER DISPOSITION :



## 6. <u>THE INFLUENCE OF CLIMATE ON THE INSTALLATION OF POLYETHYLENE WITH ANTI-</u> CONDENSATION (IRAC):

The installation of polyethylene in summer is ideal and recommended. The anti-condensation is provided by a chemical agent that is applied between the 3 layers that make up each sheet during manufacturing. There is a risk that this agent may not have had time to settle in cold conditions and smudging may occur. Smudging will reduce the anti-drip qualities of the product and also affect light transmission. To minimize this situation it is advisable to gradually increase the temperature inside of the greenhouse after installation. This will allow a more controlled migration of the additive from the core of each sheet to the surface where it can bind and play its role. The manufacturer does not provide information as to the precise definition of cold because other factors should also be considered i.e. sunlight, humidity, and temperature of the film itself. To our knowledge the action of cold on the plastic as described above is similar for all types of anti-drip products on the market.

#### **Installation procedure**:

- -Install preferably early in the morning when low wind and temperature between 15-21°C (59-70°F).
- -If installation is performed under low temperature, the film may creep (stretch) as temperature rises, then flap in the wind and age prematurely. Film should be re-tensioned when outdoor temperature rises.
- -The film should be "tight if it is warm outside" and "only lay on the structure if it is cold outside".
- -When the installation is done under cold conditions, gradually increases greenhouse inside temperature to reduce anti-condensation additives smudging (milky white) risk that can reduce anti-drip quality.
- -Remove any wrinkles that can cause water runoff at the wrong places. Anti-condensation additive reduces water droplet adhesion to poly surface (air-contained water condensation on cold greenhouse surface), allowing water to roll to ground or gutter.

#### 7. HOW TO MAXIMIZE THE LIFE OF POLYETHYLENE

#### Points of contact between the polyethylene film and structures:

Where the film comes in contact with the structure, it is necessary to protect it with a layer of opaque white vinyl-acrylic paint or white tape on the metal. This protective layer must completely cover the supports (hoops, braces or joists) to reduce their temperature and prevent degradation of the film at these locations.

#### **Film Tension:**

In the documentation provided by the manufacturer, it is mentioned that the polyethylene must be installed at a temperature above 15°C. If installation is performed under lower temperatures, there is a risk of polyethylene creep (stretch) when the temperature will rise. It may then be flapping in the wind and aging prematurely. Following installation in cold weather, it might be desirable to retension the film in the spring.

#### **Chemical attack:**

Sulphur affects the life of the polyethylene and may result in cancellation of the warranty provided. It is important to note that pine and fir woods have a negative influence on the life of polyethylene.

#### Management of air pressure between the two films of polyethylene:

Managing the pressure of air flowing between the 2 layers of polythene is very important to maximize the lifetime of polyethylene. A double layer of polythene too heavily inflated will cause a stretch (creep) of polythene while a lack of pressure will cause a loss of efficiency of the double layer of polythene and increase the risk of lacerations caused by the wind. To adjust the air pressure of the double layer of polythene, a pressure relief valve should be installed to regulate the pressure according to the following guidelines: The pressure gauge DWYER MARK III can take readings of air pressure between the roofs and adjust the valves to release air

pressure. In summer: 0.2 inch water column In winter: 0.45 inch water column

## PRESSURE GAUGE (AIR PRESSURE BETWEEN THE FILMS)

PRODUCT	PICTURE	DESCRIPTION	ITEM#
Pressure gauge DWYER MARK III	3-1-2-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Gauge which allows the lowering of pressure in the summer to avoid plastic deformation due to stretching by the heat. Recommendation of pressure between the 2 films $Summer = 0.2$ ", $Winter = 0.45$ "	<u>170-08010050</u>

## **POLY TAPE**

PRODUCT	PICTURE	DESCRIPTION	LENGTH	WIDTH	ITEM#
Poly tape	8	This acrylic, UV-resistant tape is ideal for making repairs on your	48'	2" 4" 6"	170-08010101 170-08010111 170-08010121
		greenhouse coverings.		10"	<u>170-08010130</u>

## SHADING AND ANTI-CONDENSATION ADDITIVE

PRODUCTS	PICTURE	DESCRIPTION	ON			FORMAT	ITEM#
Shading Eclipse LD	Ecl.pse LD	Resistant to lead by frost action. rain. Easy to ap Preferably treat	ching by rain an Opaque during ply to all types the morning, or	and disappear dry weather and materian a clean are btain the decoration of the decor	use's temperature.  urs naturally in the fall er, translucent during als of greenhouse.  nd dry surface. Adapt esired intensity:: ne 20kg pail ers approx.: m² or 4,306 ft² m² or 5,382 ft² m² or 6,458 ft² m² or 11,840 ft² m² or 25,833 ft²	20 kg	<u>170-08000230</u>
Shading TransPAR	Transparent shaday bad	Is permeable to not reflecting th	PAR (photosyr e infrared long	thetically a or heat wa	active radiation). By ves, it reduces the of sun-loving plants  One 15kg pail covers approx.  333 m <sup>2</sup> or 3,584 ft <sup>2</sup> 434 m <sup>2</sup> or 4,671 ft <sup>2</sup> 500 m <sup>2</sup> or 5,382 ft <sup>2</sup>	15 kg	170-08000225
Cleaner LDnet	LDNet	One spray is enough to rid the greenhouse of the shading before the arrival of the first frosts of autumn.  No need to brush.			15 kg	<u>170-08000235</u>	
Drop Stop New	<b>Drop Stop</b>	Highly concentrated, transparent liquid gel. To applied on the inside of the greenhouse to avoir water condensation on film.			2 L	<u>170-08000220</u>	
Optifuse New	COMPANIES.	Diffusing coating for greenhouses. Diffused light = homogeneous light distribution! Optifuse has an effect on the climate within the greenhouse.			15 kg	upcoming	
Shading cloths	a representative to le	wide: 6', 8', 12' etc.), high quali	', 20' 26' 32', w ty, cut on reque	vith or with st. Product	10%, 60%, 70%, 80%, 90 nout grommets, taping, tion time: approx. 4 wee	seaming,	140-01060010

<sup>\*</sup> Please consult a representative to learn more about the application of this product

## **GROUND COVER**

PRODUCTS	PICTURE	DESCRIPTION	DIMENSIONS*	ITEM#			
BLACK GRE	BLACK GREEN-LINED GEOTEXTILE						
Black green-lined permeable		Ground cover of woven polypropylene (100 g/m2) for production nurseries and garden	1.22 m x 100 m (4' x 328')	<u>170-01000210</u>			
		centers. Installs directly on the ground to prevent the growth of weeds. Provides increased protection against UV rays (3%	3.66 m x 100 m (12' x 328')	170-01000240			
geotextile		additive) and resists tears and punctures. Permeable.	4.57m x 100m (15' x 328')	<u>170-01000260</u>			
WHITE GRE	EN-LINED GEO	OTEXTILE OTEXTILE					
White green-lined permeable geotextile		Its white color reflects light for plants in the greenhouse! Ground cover of woven polypropylene (100 g/m2) for vegetable greenhouse production. Installs directly on the	3.66 m x 100 m (12' x 328')	<u>170-01000245</u>			
		ground to prevent the growth of weeds. Offers increased protection against UV rays (3% additive) and resists tears and punctures. Permeable.	4.57m x 100m (15' x 328')	<u>170-01000265</u>			
OPAQUE BL	ACK AND WH	TE GROUND COVER					
Black and white ground		Large ground cover in white and black co- extruded 4 mil polyethylene. The black side prevents weeds and the white side reflects the light towards the plants. UV treated 12 months. Waterproof.	40' x 190'	140-02020085			
cover		New Now also available in 5 mil thick and UV treated 18 months!	24' x 150'	140-02020083			
COEXTRUDED NFT BLACK AND WHITE FILM							
Coextruded NFT black		Narrow, thick bands of black and white co- extruded polyethylene. Sold in full rolls only.	24" x 1,000' (5.5 mil)	140-02020100			
and white film		The number of units is based on the weight of the roll. UV treated 12 months. Waterproof.	30" x 1,000' (6.0 mil)	140-02020120			

<sup>\*\*</sup> Dimensions subject to change, please check availability with a representative before placing your order.

## **GROUND COVER ANCHOR**

PRODUCT	PICTURE	DESCRIPTION	QTY/ BAG	ITEM#
Ground cover anchor		"U" shaped anchor, 6" long. Ideal to retain a geotextile on the ground. "11 gauge". Install anchors at 4" intervals.	50	<u>170-01000208</u>

## **MEASURING INSTRUMENTS**

## TEMPERATURE AND HUMIDITY MEASURING INSTRUMENTS

PRODUCTS	PICTURE	DESCRIPTION	ACCURACY	RANGE	ITEM#
TEMPERATUR	RE AND HUM	IDITY MONITOR AND RECORDE	<u>R</u>		
Oakton temperature Monitor	OAKION Part No.	<ul> <li>Monitor data capture for long periods, very ECONOMICAL;</li> <li>Memory of 16,000 data taken at 10 seconds to 2 hours intervals;</li> <li>Waterproof housing;</li> </ul>	±0.6°C	-30 to 50°C	Monitor only: 160-01060100 Monitor+software +cable kit: 160-01060120
Oakton temperature and humidity monitor	TZ3 SO OAKION	<ul> <li>Reading min / max line;</li> <li>Selectable alarms;</li> <li>Transfer data to software to analyze and translate them into graphicals (visual display software included).</li> </ul>	T°: ±0.6°C Humidity: ±3% if <90% ±6% if >90%	T°: - 30 to 50°C Humidity: 0-100%	Monitor only: 160-01060160 Monitor+software +cable kit: 160-01060200
DRY AND WET	BULB HYGI	ROMETER			
Dry and wet bulb hygrometer	b Additional wick and instructions included; • Very good accuracy:				<u>160-08020070</u>
<b>THERMOMET</b>	<u>ER</u>				
"Farmtek" min-max thermometer	Contraction (	<ul> <li>Lets you know the minimum and ma temperature;</li> <li>Shows the current temperature;</li> <li>Resets with a magnet;</li> <li>Economical.</li> </ul>	ximum	-40 to 48°C	<u>160-07020040</u>
Oakton infra-red thermometer		<ul> <li>Contactless temperature readings;</li> <li>Accurate laser pointing;</li> <li>C and F selection;</li> <li>Quick respond.</li> </ul>		-30 to 200°C	<u>160-07020100</u>
Digital minimum- maximum SOIL thermometer		<ul> <li>Waterproof housing;</li> <li>Stainless steel probe;</li> <li>Highly resistant to heat;</li> <li>Includes protective envelope for the</li> <li>° C and ° F selection</li> </ul>	e probe;	10 to 200°C	<u>160-07020005</u>
Precision thermometer		<ul> <li>Mercury filled, yellow backing with fused markings.</li> <li>24" long</li> <li>±0,1°C</li> </ul>	h permanently	-1 to 101°C	<u>160-07020050</u>

## PH AND ELECTRICAL CONDUCTIVITY MEASURING INSTRUMENTS



PRODUCTS	PICTURE	DESCRIPTION	RANGE	DISPLAY UNIT (resolution)	ITEM#
EC METER (N	MEASURING :	ELECTRICAL CONDUCTIVITY			
Oakton "ECO TESTR" pocket EC meter		<ul> <li>Convenient size, waterproof casing and dust resistant;</li> <li>Replaceable probe;</li> <li>Easy calibration;</li> <li>Turns off after 8.5 minutes if not used;</li> <li>Temperature compensation system.</li> </ul>	EC : 0-19.99 mS/cm	EC : 0.10 mS/cm	<u>160-06020100</u>
Oakton "CON 400" portable EC meter		<ul> <li>Ergonomic, waterproof case, dustproof, easy to clean and it floats;</li> <li>Temperature reading integrated with automatic compensation;</li> <li>Memory can store more than 50 real-time data (indicating the date and time).</li> </ul>	EC: 0-199.9 mS/cm in 5 ranges	EC: 0.01 μS/cm 0.1 μS/cm 1 μS/cm 0.01 mS/cm 0.1 mS/cm	<u>160-06020160</u>
pH METER					
Oakton ''#10'' pocket pH meter		<ul> <li>Convenient size, waterproof casing and dust resistant;</li> <li>Replaceable probe with double junction (greater precision and longer life);</li> <li>Auto calibration (1 to 3 pts);</li> <li>Specific error messages;</li> <li>Temperature compensation function and automatic shut off.</li> </ul>	pH: 0.0-14.0	рН : 0.1	<u>160-06010100</u>
Oakton "pH 300" portable pH meter	25	<ul> <li>Ergonomic, waterproof case, dustproof, easy to clean and it floats;</li> <li>Easy calibration of pH (up to 5 points);</li> <li>Stores and recalls 16 sets of readings with T°;</li> <li>Selectable Manual or Automatic Temperature Compensation;</li> <li>Reads pH, mV or relative mV and T° in °C.</li> </ul>	pH : 0-14 °C : 0-100°C	pH : 0.01 °C : 0.5°C	<u>160-06010150</u>
COMBINED I	EC/PH/TEMPI	ERATURE METER			
Oakton "pH/CON 300" portable pH/EC/T° meter	255 235 235 235 235 235 235 235 235 235	<ul> <li>Ergonomic, waterproof case, dustproof, easy to clean and it floats;</li> <li>Simultaneous temperature display, easy calibration of EC and pH (several points);</li> <li>Automatic compensation for temperature;</li> <li>Scale selection for measuring salinity and recognition of the self-calibration solution.</li> </ul>	pH:-2.00- 16.00 CE:0 to 199.9 mS/cm in 4 ranges T°:0.0- 100.0°C	pH: 0,01 CE: 0,01 μS/cm 0,1 μS/cm 1 μS/cm 0,01 mS/cm 0,1 mS/cm T:0.1°C	On request
SOFT CARRY	ING CASE FO	OR OAKTON TESTERS			
Soft case for 2 pocket testers		Soft carrying case for 2 Oakton pocket testers. One side is transparent. Can be attached to person's belt.	-		<u>160-06050400</u>
Soft case for 1 portable tester		Soft carrying case for 1 Oakton portable tester. Can be attached to person's belt.	-		160-06050420

Other Oakton measuring instruments are also available. For inquires, contact your representative!



## PH AND EC METER CALIBRATION SOLUTIONS

PRODUCTS	PICTURE	DESCRIPTION	<u>ITEM #</u>
EC METER CALIB	RATION SO	<u>LUTION</u>	
5mS/cm calibration solution (500 ml)	Ť	Liquid solution at 5 mS / cm (variation of $\pm$ 0.05) at 25°C Color transparent, necessary to calibrate a pH meter. For calibration instructions, consult your representative.	<u>170-03010015</u>
PH METER CALIB	BRATION SO	<u>LUTIONS</u>	
pH 4 calibration solution (500 ml)	Ė	Liquid solution at pH 4 (pink) and pH 7 (green) at 25°C, necessary to calibrate a pH meter. Must always be at the same temperature (25°C)	<u>170-03010020</u>
pH 7 calibration solution (500 ml)	É	when calibrating instruments.	<u>170-03010040</u>
<b>CLEANING SOLU</b>	TION FOR P	H METER	
Cleaning solution for PH sensor (500 ml)		Cleaning solution for pH meter. Used to remove accumulations of material, thereby maintaining the sensitivity of the electrode and obtaining accurate readings.	<u>160-06050440</u>
STORAGE SOLUT	ION FOR PH	METER	
Storage solution for PH probe (500 ml)		Storage Solution for pH meter electrodes. Keeps the electrode bulb moist, allowing more accurate and quick readings. Complete storage solution able to fully accommodate the electrode and insert the device when not in use. Helps extend the life of the electrodes and maintain an accurate reading.	<u>160-06050460</u>

## LIGHT MEASUREMENT INSTRUMENT

PRODUCT	PICTURE	DESCRIPTION	ITEM#
Lux meter	9,0	<ul> <li>Lux meter from 0 to 50 000 Lux / FC;</li> <li>Economical;</li> <li>4 reading ranges.</li> </ul>	<u>160-06050175</u>

## **DIGITAL SCALE**

PRODUCTS	PICTURE	MAXIMUM CAPACITY	RANGE (RESOLUTION)	ITEM#
SK 0500 digital scale		500 grams (0.5kg)	0.1 grams	<u>160-18020005</u>
SK 5000 digital scale		5000 grams (5kg)	1 gram	<u>160-18020015</u>

## **FERTILIZER INJECTION**

#### OAKTON pH AND SALINITY CONTROLLER

- Controls the injection of ertilizer (CE) and acid (pH);
- NFT solution, stock tank;
- Features self-diagnostic and sensor integrated temperature;

рН СС	ONTROLLER	CONDUCTIVITY CONTROLLER		
Scale	0.00 - 14.00  pH	Scale	0 – 19.99 mS	
Accuracy	± 0.01 pH	Accuracy	2% of scale	
Resolution	0.01 pH	Resolution	0.01 mS	

Mountable enclosure available. Quick and easy installation. PH and conductivity probes not included. Choice of sensors for mounting on pipe or tank. 120 volt output for metering pump pH, EC and alarm. Waterproof NEMA-4 and CSA approved double insulated circuits. Safety Timer. Digital (easy reading). Integrated temperature sensor. Password protected. Output 4 to 20 mA. Dimensions: 15 "H (38cm) x 12" L. (30.5 cm) x 10 "D. (25.5 cm). Voltage: 115 Volts, 60 Hz, 5 amps.



pH controller (without the probe)	160-01010000
EC controller (without the probe)	
EC probe	
pH probe	
Box assembly	
DUA USSULINI	<u>100-01010025</u>

#### BELLOWS (GORMAN RUPP) METERING PUMP





Economical metering pump. Resistant material to high acid rate. Ideal for use with a pH or EC controller. Adjustable flow. Reliable for many years and spare parts easy to get. 1% accuracy and positive moving. Multiple configurations available.

#### PROMINENT METERING PUMP



Solenoid-driven diaphragm metering pump delta® with regulated solenoid drive(optoDrive®). Maximum injection ratio of 1: 2000 at 90 psi . Do not include tank, installation, probe and pump support (if needed). Include injection point, power supply (transfo in DC) and a max of 30 ft of PVC pipe for injection.

## **ProMinent®**

For low flow injection of products such as **acid** or **chlorine dioxide**.



Prominent metering pump on 2" pipe	160-04010080
Prominent metering pump on 2½" pipe	
Prominent metering pump on 3" pipe	
Prominent metering pump on 4" pipe	
Prominent metering pump on 6" pipe	

## IWAKI METERING PUMP





Non-metallic centrifugal pump. Save and ideal for PURE ACID transfert. Compact, quiet and highly efficient it's ideal in almost every process, wither it be recirculation or transfer application. It is resistant to pure nitric acid and / or phosphoric! ½" NPT input and output. Motr115 Volts 50/60Hz. Tolerance of voltage variation without overheating. Fluoroplastic or propylene coating. Magnetically driven. Balancing holes to minimize axial thrust. Automatic bearings lubrication, significant reduction of hydraulic nois. High lubricity fluoropolymer bearings, minimize mechanical losses and double bearing system, permitting continual cooling and washing of the front and rear bearings thus extending the bearing life.

#### FERTILIZER INJECTION

#### MIX RITETM PROPORTIONAL INJECTORS



Here is a line of water-activated fertilizer injectors that allow precise injection of soluble fertilizers, growth regulators or pesticides.

They operate with very low pressure and are not affected by variations in flow or pressure.

- The injector is powered by water flow;
- Easy installation, operation and maintenance;
- Adjusting the ratio of injection is easy;
- The body of the injector is made of durable plastic with ultra-violet protection and is also resistant to many aggressive chemicals;
- Can be installed permanently or as a mobile unit;
- The Mix-Rite TM is virtually maintenance free. If necessary the body of the unit unscrews into two parts to give free access to all parts.

#### MIX RITETM MODELS

PRODUITS	РНОТО	DÉBIT D'EAU	INSTALLATION	RATIO D'INJEC- TION	PRESSION DE FONCTION- NEMENT	DIMENSION	# ITEM
Mix Rite 2.5		0.088-11 gpm 20-2,500 litres/h	- ¾" MPT connectors; -Includes 1 plastic wall mounting bracket, 1 spare seal kit and silicone.	0.3-2% (1:50 to 1:333)	2.9-120 PSI (0.2-8 bar)	56x18.5cm 22''x7.27'' 1.92 kg 4.22 lbs	Manual ON/OFF 571CW: 160-04010007 "Air release" 570CW: 160-04010005
Mix Rite TF3 New	<b>1</b> 00·	0,088-14 gpm 20-3200 litres/h	- 1" MPT connectors; -Includes 1 plastic wall mounting bracket, 1 spare seal kit and silicone.	0,2-2% (1:50 à 1:500)	2,9-120 PSI (0,2-8 bar)	48,4x16cm 19"x6,2" 1,92 kg 4,22 lbs	Manuel ON/OFF: 160-04010001
Mix Rite TF5	00.	0.88-22 gpm 200-5,000 litres/h	- 1" MPT connectors; -Includes 2 plastic wall mounting brackets, 1 spare seal kit and siliconeVertical installation legs are optional.	0.2-2% (1:50 to 1:500)	14.7-120 PSI (1-8 bar)	6.0 kg 13.2 lbs	Manuel ON/OFF: 160-04010002
Mix Rite TF10	00.	2-45 gpm 500- 10,000 litres/h	- 1½" MPT connectors; - Includes 2 plastic wall mounting brackets, 1 spare seal kit and silicone Vertical installation legs are optional.	0.2-2% (1:50 to 1:500)	14.7-120 PSI (1-8 bar)	7.38 kg 16.23 lbs	Manuel ON/OFF: 160-04010003
Mix Rite TF25	000	9-110 gpm 2,000- 25,000 litres/h	- 2" MPT connectors; - Includes vertical installation legs, 2 plastic wall mounting brackets and stand bases, 1 spare seal kit and silicone.	0.3-2.5% (1:40 to 1:333)	14.7-120 PSI (1-8 bar)	21.1 kg 46.42 lbs	Manuel ON/OFF: 160-04010004

#### FERTILIZER INJECTION

#### REPLACEMENT PARTS KIT FOR MIX RITETM

You have a MixRite for many years? \*\*\*New\*\*\*: **Replacement part** kit are now available at **very** 

competitive	price	at GHL!
competitive	PIICC	at OHE.

PRODUCTS	PICTURE	Part #	Matching Mix Rite model(s)t	Injection ratio	# ITEM
I in sool kit		#22-41-42	2502	0.2-2%	<u>160-03090115</u>
Lip seal kit		#22-41-42	TF3	0.2-270	
Chemical piston kit	0	#4-22	2502	0.2-2%	<u>160-03090120</u>
Chemical check valve kit			2502		160-03090110
	<b>0 4</b> 0 <b>6</b> 0	#14-19-20-21-30-	TF3	All	
Chemical check valve kit		45-47	TF5	All	160-03090105
			TF10		100-03070103
Plastic spring kit	g6 g6	#27	2502	All	<u>160-03090125</u>
O-ring lub and sealer		-	All	All	<u>160-03090010</u>
Transparent P.E. tube. 4.5'' long	0	-	2502	All	<u>160-04010009</u>

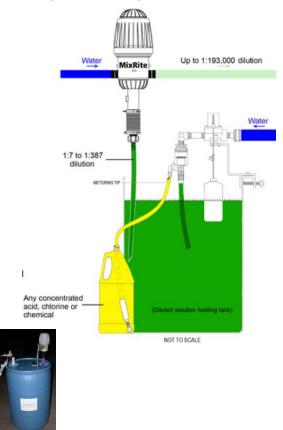
Other replacement parts also available on request

#### MIX RITE<sup>TM</sup> – WATCH GUARD ACID INJECTION SYSTEM

Automatically activates to keep reservoir full of diluted solution! Reduce dangerous handling!



- -Attached to a standard water supply, Watch Guard System automatically activates and keeps the reservoir filled (mounted float valve);
- -Effective with acid, chlorine ans most any chemical;
- -Reduce dangerous handling!
- -The combination of the two products (Watch Guard 440.23BT.acid and MixRite) allows to reach dilution rate from 1:350 (2857 ppm) to 1:193000 (5ppm);
- -Simple to mount on any drum, tot or other reservoir!
- -Very economical!



Watch Guard reservoir float system on/off (440.23BT.ACID) .....

160-03090500

## IRRIGATION CONTROLLER

#### STERLING CONTROLLER 8M

Improve your productivity with this powerful and programmer-friendly unit. The STERLING 8M programmer is the solution for commercial applications requiring great flexibility in the management of irrigation or misting. Combined with a tension meter and its independent probe, the STERLING 8M is the ultimate tool for an optimal automated irrigation in greenhouse culture!

#### **CHARACTERISTICS:**

- Controller is simple, reliable and flexible
- 8 stations operating (4 to 36 station models on request)
- 6 independent programs that can run simultaneously
- Up to 9 cycles by date, by program or irrigation cycles
- Adjustable timer from 1 minute to 24 by hours or 1 second to 24 minutes.
- 6 programs can be activated by an external sensor dedicated to connecting a tension metre sensor (measuring soil moisture) for maximum efficiency of irrigation or thermostat (to operate the irrigation in order to protect the crop from frost)
- Modulating water supply (1 to 255%) adjusts watering simultaneously at all stages of a program
- Waterproof metal housing, lockable and spacious with internal wiring connectors for proper installation;
- Memory back-up that retains the programs during a power outage (lithium battery included);
- Possibility to install a remote control and lightning protection (sold separately);
- Power: 120 VAC @ 50/60 Hz Primary, Secondary: 24VAC @ 40VA, 1.5A (internal transformer);
- Surge protected
- French version of the operating manual available on request.

## TENSIOMETER IRROMETER CO.

- For optimal irrigation management
- Measures the voltage of a substrate (water availability) on a window from 0 to 16 kPa. This sensor requires an electronic interface (control computer or controller) for an accurate reading of the tension of the substrate.
- When using the combined STERLING + tensiometer + stand-alone controller, you can set the STERLING to wait for a desired tension before irrigation begins to limit the cracking of tomatoes and promote deeper roots.

Tensiometer + RSU cal. 0-16 KPa black block	. <u>160-06030300</u>
Tensiometer controller	160-06030330
Syringe pump to remove air	160-06030060







## RAINBIRD DIGITAL IRRIGATION CONTROLLER



#### **APPLICATIONS:**

Improve your productivity with these user-friendly programs. The ESP and ESP LX Modular Controller are the solution for small size residential and commercial applications.

#### **CHARCACTERISTICS:**

- Different models offer the possibility of irrigation from 4 to 32 stations
- Cycle time: 7 days week even days, odd days + / 31 customizable fixed days without watering
- Modulating water supply (from 0 to 200%) adjusts watering times for all stations
- Terminals dedicated to connecting a sphygmomanometer or a rain sensor for maximum efficiency of irrigation
- Large LCD screen for easy programming
- Memory that retains the program during a power failure and protection against power surges
- Advanced diagnostic functions, prevent users from programming errors, preventing station start-up and circuit breaker indicating a short-circuited or overloaded station while continuing irrigation of operational stations
- Spacious lockable housing, with internal wiring for a clean and professional installation
- Power: 120VAC @ 60Hz Primary, Secondary: 24 VAC (internal transformer)
- Ability to power two 24 VAC 7A solenoids per station plus a master valve.

PRODUCTS	PICTURE	DESCRIPTION	SPECIFICATIONS	ITEM#
ESP-4M controller (4 stations)	Hart China	Basic controller, allowing the addition of 3 expansion modules of 3 zones.	<ul><li>-3 independent irrigation programs;</li><li>-4 starts per program (total:</li></ul>	<u>160-01040010</u>
ESP-SM3 module (+3 stations)	CONTRACT CO	Expansion module adds 3 stations to the ESP-4M controller.	12); -Watering time 0 to 6 hours for all stations.	<u>160-01040015</u>
ESPLXM controller (8 stations)	SPLAX MODULAN	Basic controller, allowing the addition of 4 expansion modules of 4 or 8 zones	<ul><li>-4 independent irrigation programs;</li><li>-8 starts per day, per</li></ul>	<u>160-01040021</u>
ESPLXMSM4 module (+ 4 stations)		Expansion module adds 4 stations to the ESPLXM controller.	program (total: 32); -Watering time 0 to 12 hours for all stations.	<u>160-01040031</u>
ESPLXMSM8 module (+ 8 stations)		Expansion module adds 8 stations to the E ESPLXM controller.	(adjusted by jumping from 1 minute to 120 minutes, then rest for 10 minutes).	<u>160-01040032</u>

#### **ADDITIONAL ACCESSORIES:**

Tensiometer	See previous page
Electric solenoid valves	See next page
Electric PVC/PVC wire	See next page

Let us help you decide on the model.



## **ELECTRIC SOLENOID VALVES**

PVC construction. Available in 24 V or 110V 3 / 4"to 3".

PRODUCT	PICTURE	SPECIFICATIONS	ITEM#
34" FPT 24 Volt electric valve		Jain Irrigation Systems Ltd. Right	150-08020012
34" FPT 24 Volt electric valve	L	RAIN BIRD. Right, DV series	<u>150-08020010</u>
1" FPT 24 Volt electric valve		RAIN BIRD. Right, DV series	<u>150-08020030</u>
1" FPT 24 Volt electric valve		RAIN BIRD. Angle, DVA series	<u>150-08020040</u>
1" FPT 24 Volt electric valve		RAIN BIRD. Flow control, DVF series	150-08020050
1½" FPT 24 Volt electric valve		RAIN BIRD. Right and angle, PGA series	<u>150-08020060</u>
2" FPT 24 Volt electric valve		RAIN BIRD. Angle, PGA series	<u>150-08020080</u>

The DC series valves are available as well as other models in the Rain Bird range. (Price on request).

## **ELECTRIC WIRE PVC/PVC**

Low voltage electric wire with protective cover, multiple drivers for 24-volt solenoid valves and other equipment. Each driver is a different color. The wire is sold by the yard or roll.



ARMS	LENGTH	ITEM#
18/2 unshielded	300 m	<u>180-02000450</u>
18/3 unshielded	300 m	<u>180-02000460</u>
18/4 unshielded	300 m	<u>180-02000470</u>
18/6 unshielded	300 m	<u>180-02000490</u>
18/7 unshielded	300 m	<u>180-02000495</u>
18/8 shielded	300 m	<u>180-02000500</u>
18/9 unshielded	300 m	<u>180-02000510</u>
18/10 unshielded	300 m	<u>180-02000520</u>
22/2 shielded	300 m	<u>180-02000540</u>
22/2 unshield	300 m	<u>180-02000545</u>

Other types of wire are also available.

## **CLIMATE CONTROL AND AUTOMATION**

#### **ARGUS**

Integrated control systems which are specially designed to facilitate you production growth. This intergrated control system is used in the manipulation of specialized equipment within your greenhouse:

- Temperature control
- Evaporation control
- Humidification or dehumidification control
- CO<sub>2</sub>, light intensity, shading control
- Irrigation, misting, fertilizer injection control
- Heating control
- Roof or side opening control, etc.

Distributed and supported by GHL for more than 10 years Contact us for more info on ARGUS system.



#### **THERMOSTATS**

PRODUCTS	PICTURE	APPLICATIONS FEATURES		ITEM#				
<b>ENVIRONMEN</b>	ENVIRONMENTAL THERMOSTAT (CR2095)							
Environmental thermostat (CR2095)	<b>Duro</b> stat	<ul><li> Heating system;</li><li> Ventilation system.</li></ul>	<ul> <li>Temperature sensor stainless steel</li> <li>Resistant to mould and moisture</li> <li>Differential: 3.5 of or 1.9°C</li> <li>Scale: 30°F-110°F or 0°C-43°C</li> <li>120 V (16 A) and 240 V (8 A)</li> <li>transparent and waterproof cover.</li> </ul>	<u>160-07010040</u>				
DUAL THERMOSTAT (T15-2)								
Dual thermostat (T15-2)	The state of the s	•2 fan speeds; •2 heating levels; •Manages high and low temperature.	<ul> <li>2 thermostats in one housing;</li> <li>Sensors in stainless steel;</li> <li>Scale: 40-100°F or 5°C-37°C;</li> <li>Differential: 2.5°F or 1.4 oC;</li> <li>120 V (12 A) and 240 V (10 A).</li> </ul>	<u>160-07010030</u>				
DICITAL PROC	RAMMARIE THE	TDMOSTAT						

#### DIGITAL PROGRAMMABLE THERMOSTAT

On request

#### **TIMER SWITCH**

We offer a wide variety of electromechanical and electronic timers. For more information, please contact us

#### **HUMIDISTATS**

PRODUCTS	PICTURE	APPLICATIONS	CHARACTERISTICS	ITEM#
Humidistat (W42AA-1C)	76.57	Control humidification & dehumidification.	<ul> <li>10 to 90 % RH (±4%);</li> <li>Maximum temperature operation: 38°C;</li> <li>125VA to 120/240 VAC.</li> </ul>	<u>160-08010040</u>

## **CO<sub>2</sub> GENERATOR AND MONITOR**

## JOHNSON CO<sub>2</sub> GENERATOR

This generator provides steady, reliable and safe CO2. Available in propane or natural gas.

#### **Specifications**

- \* Natural gas or propane
- \* BTU see chart below
- \* 24 volts, gas valve
- \* Size of connection to the gas supply 3/8"
- \* Flame extinguishing safeguard
- \* The values of CO<sub>2</sub> generation with propane are slightly lower than natural gas.



PROPANE			GAZ	Z NATURE	L
Gas pressure Water column	Entry	Ft²/box	Gas pressure Water column	Entry	Ft²/box
11	60,000	4800	5	63,800	4250
9	54,500	4320	4	57,500	3850
7	47,800	3820	3	50,200	3350
5	40,400	3220	2	40,400	2700
3	31,300	2500	1	28,475	1900
1	18,100	1440			

Note: This information was obtained from Johnson Gas Company

## CO AND CO<sub>2</sub> GAS MONITOR



PRODUCTS	PICTURE	DESCRIPTION	ITEM#
CO GREYSTO	NE MONITO	<u>PR</u>	
Greystone CO gas monitor model CMD5B21112CC	© GRANIONE	<ul> <li>Treated against moisture;</li> <li>Electrochemical sensor measuring CO (carbon monoxide);</li> <li>Detection range 0-300 ppm ± 5 ppm at 5%, response time: &lt;35 secondes (for 90% change), 2 relays and one audible alarm;</li> <li>Output: 4-20mA, 24Vac 50/60HZ(input), 0-5 or 0-10Vdc;</li> <li>Typical coverage area: 700 m²(7500ft²) or 15m(50ft) radius;</li> <li>LCD screen 1.1"W x 0.5"H, 1ppm CO resolution and 5-year warranty.</li> </ul>	160-02000317
CO <sub>2</sub> GREYSTO	ONE MONITO	<u>DR</u>	
Greystone CO <sub>2</sub> gas monitor model CDD4A101CC	minim	<ul> <li>New model with improved waterproof properties;</li> <li>Can be used for efficient CO<sub>2</sub> generator control, CO<sub>2</sub> (carbon dioxide) level measured by infrared sensor, detection range 0-2000 ppm, programmable up to 7500 ppm, ±75ppm@1000ppm@22°C compared to calibration gas;</li> <li>Response time: 2 minutes (for 90% of change), alarm relay;</li> <li>Output: 4-20mA, 24Vac 50/60HZ(input), 0-5 or 0-10Vdc;</li> <li>Typical coverage area: 100 m²(1000ft²)</li> <li>LCD screen 1.4''W x 0.6''H, resolution of 1ppm CO2 and 5 years warranty.</li> </ul>	160-02000320
CO <sub>2</sub> GREYSTO	ONE MONITO	OR PROTECTION CASE	
Greystone CO <sub>2</sub> gas monitor protection case	-	Protect interior circuit of GREYSTONE CO2 monitor against insects and dust.	<u>160-02000321</u>

## **MONITORING AND SECURITY SYSTEM**

## SENSAPHONE SERIES 400 & 800 SENSAPHONE® 400 & 800

Commercial features including a new look, durability, keyboard security requiring the use of a password to access the system.



This unit will warm you of:

- Increased or decreased temperature
- Power outages
- Abnormally high noise levels
- Fire and smoke

With some inexpensive accessories, the Sensaphone will also detect:

- Intrusions
- Leaks and flooding
- Temperature gaps

PRODUCTS	PICTURE	DESCRIPTION	<u>ITEM #</u>
SENSAPHON	E SERIES 400		
Sensaphone series 400	ADDITIONS SO	<ul> <li>Can be connected to 4 accessories (sensors);</li> <li>When an alarm is triggered, it can call 4 different numbers.</li> </ul>	<u>160-21000105</u>
<b>SENSAPHON</b>	E SERIES 800		
Sensaphone series 800	250/42/02/9/9/R	<ul> <li>Can be connected to 8 accessories (sensors);</li> <li>When an alarm is triggered, it can call 8 different numbers.</li> </ul>	<u>160-21000115</u>
SENSAPHON	E ACCESSORIES		
Remote temperature sensor	PART & FEG-BRE MEMOTE TOP SCHOOL	Connects to the Sensaphone to detect changes in temperature.	Waterproof, with short wire:  160-21000035  Wireless, for dry areas: 160-21000160
• Infrared m	ories are also availab otion detector eading communicator	ble on request:	

- Water level sensor
- Thermal alarm
- Optical detector

## **IRRIGATION**

#### THIN WALL DRIP TAPE





"Chapin Twin wall TM," type double wall hose. Designed for watering in the greenhouse, table and crops and irrigation of outdoor crops. Made of low-

THICK WALLS	SPACING OF HOLES	FLOW (GPM/100')	LENGTH/ ROLL	<u>ITEM #</u>
6 mil	8"	0.50 gpm	5000'	<u>150-01060050</u>
6 mil	12"	0.50 gpm	5000'	<u>150-01060060</u>
8 mil	2"	1.50 gpm	3750'	<u>150-01060070</u>
8 mil	4"	1.00 gpm	3750'	<u>150-01060090</u>
8 mil	8"	0.50 gpm	3750'	<u>150-01060110</u>
8 mil	12"	0.50 gpm	3750'	<u>150-01060130</u>
10 mil	2"	1.50 gpm	3000'	<u>150-01060140</u>
10 mil	4"	1.00 gpm	3000'	<u>150-01060160</u>
	Other mod	dels available on r	equest.	

density polyethylene, they are available in thicknesses of 4 to 15mm. The thickness required is determined by the type of application. For example, for non-woody plants produced in greenhouses, we suggested 4 or 8 mm. For outdoor production, we would recommend 10 or 15 mm. A 200 mesh filter should be used ahead of the system. It is also called as collapsible hose, as once pressurized it becomes round and collapses on depressurizing. Being a flat tube it can be supplied on reels containing several thousand feet. Turbulent flow-path that makes it a clog-resistant drip tape.

A 150-200 mesh filter has to be installed before drip tape. An operation pressure of 10 PSI is recommanded.

\* mil = wall thickness in thousand of an inch

## **DRIP LOCK FITTINGS**

These poly fittings are designed for use with drip tape. The « Drip-lock » end is designed to be fixed to drip tape.

PRODUCT	PICTURE	ITEM#
Drip-lock x 0.250 barb		<u>190-04000005</u>
Drip-lock x union	=	<u>190-04000080</u>
Drip-lock x swivel ¾'' FHT with filter		<u>190-04000040</u>
Valve 5/8 on x 0.250 barb	411	<u>190-04000020</u>
Drip-lock x threaded end cap		<u>190-04000065</u>
Drip-lock x discharge valve		<u>190-04000085</u>
Drip-lock x ½" MPT	·	<u>190-04000015</u>
Drip-lock x 0.350" compression		<u>190-04000010</u>
Drip-lock x tee	<u></u>	<u>190-04000075</u>
Drip-lock x elbow		<u>190-04000070</u>

#### THICK WALL DRIP TAPE

Thick wall drip tape is offered on request.



#### IRRIGATION







## STICKS AND DRIPPER FOR POLYETHYLENE TUBING

PRODUCTS	PICTURE	DESCRIPTION	REQUIRED MICROTUBING	QTY/ BAG	ITEM#
SPRAY STAKE					
Purple spray stake	1	Nursery pots; Different rates available; Open and closed positions.	125-187 tubing	250 - -	150-02020075 (dripper) 150-02030035 (stake) 150-02030033 (elbow)
P-Stick (for pot)		Watering pot; Watering in half-moon;	Spaghetti tubing (0.05-0.06-0.076)	100	<u>150-02030020</u>
N-Stick (for nursery pot)	İ	Durable and easy installation; Open and closed positions.	125-187 tubing	100	<u>150-02030025</u>
Trickle-Stick		Direct spray watering Easy installation; Open and closed positions.	Spaghetti tubing (0.05-0.06-0.076)	100	<u>150-02030070</u>
<b>DRIPPER STAKE</b>					
Angle barbed stake		<ul><li> Drip irrigation for pots;</li><li> Installs with a pressure compensating dripper.</li></ul>	125-187 tubing 160-220 tubing	250	<u>150-02030030</u>
Angle arrow dripper 2L/h short (3"3/4)  Angle arrow dripper 2L/h long (6"3/8)	F	<ul> <li>Drip irrigation for pot;</li> <li>Installs with a pressure compensating dripper when there is a multi-outlet adaptor.</li> </ul>	125-187 tubing	100	150-02020215 150-09000285 150-02020220
V model for spaghetti	1	<ul><li> Drip irrigation for pot;</li><li> Can be screwed onto the tubing.</li></ul>	Spaghetti tubing (0.05-0.06-0.076)	100	<u>150-02030010</u>
5" grey stick	/	<ul><li> Drip irrigation for pot;</li><li> Simple and economical.</li></ul>	160-220 tubing	100	<u>150-02030040</u>
Angle barbed stake 6", 45° with drop break	1	Angle barbed stake less accurate when standing angled in a pot but very economical.	125-187 tubing 160-220 tubing	100	<u>150-09000298</u>
WEIGHT DRIPPE	R FOR HAN	GING BASKETS			
SimLine EZ close white weight		New design allowing quick water closure.	125-187 tubing	25	<u>150-08020520</u>
Orange plastic weight (on/off)		Plastic weight that allows closure of the water once the basket is removed.	125-187 tubing	25	<u>150-08020560</u>
Metal weight (zinc and aluminium alloy)		<ul><li>Durable and resistant weight;</li><li>Does not have closure system.</li></ul>	125-187 tubing	100	<u>150-10000370</u>
New model that replace On/off metal weight for spaghetti of Chapin  Tube twist weight on/off .060 30"		<ul> <li>New slender design makes ite easy to pull out the pot;</li> <li>"Twist-on/twist-off" action makes it easy to turn the weignths on without damaging the tube.         Weight also available on request with PC dripper</li> </ul>	Each weight include 30" of precut spaghetti tubing (0,06). (Other length available on request)	-	<u>150-01020130</u>

\*\*\* Several spike models are available depending on crops and the system already in place. Our representatives will advise you accordingly



## PRESSURE COMPENSATING DRIPPERS







Pressure compensating drippers are used to maintain uniformity along line of irrigation and to avoid water dripping after system closing. Your representative can help you choose the right dripper.

These products need a filter of least 120 mesh and works at a 35 PSI optimal pressure (minimum 10 PSI).

PRODUCT	PICTURE	DRIPPER COLOR	REQUIRED MICROTUBING	QTY/ BAG	ITEM#
Woodpecker Netafim dripper (WPCJ) 2L/h (0.5 gph)	-	Orange and/or black	125-187 tubing	250	<u>150-02010080</u>
PSI dripper 2L/h (0.5 gph)		Brown		50	<u>150-02020065</u>
PSI dripper 4L/h (1.0 gph)		Brown and black	160-220 tubing	50	<u>150-02020085</u>
PSI dripper 8L/h (2.0 gph)	70	Brown and green		100	<u>150-02020095</u>

#### MULTI-OUTLET ADAPTOR FOR DRIPPER



PRODUCT	PICTURE	RECOMMENDED DRIPPER	REQUIRED MICROTUBING	QTY/ BAG	ITEM#
1 way adapter		PSI 2L/h dripper		-	<u>150-01030000</u>
2-way manifold	1	PSI 4L/h dripper	Tube 125-187	50	<u>150-06010020</u>
4-way manifold	**	PSI 8L/h dripper	tubing	25	<u>150-06010025</u>
4-way manifold (Stackable to give 8 ways)	-#	PSI 8L/h dripper		50	<u>150-02020040</u>

#### **PUNCH**



PRODUCT	DESCRIPTION	ITEM#
PSI punch handle	Needs a PSI punch	<u>150-09000355</u>
2.5 mm PSI punch	For Woodpecker dripper	<u>150-09000360</u>
3.0 mm PSI punch	For PSI dripper and Dan modular	<u>150-09000370</u>
3.6 mm PSI punch	For 0.250 barb (drip tape)	<u>150-09000373</u>
Spaghetti handle and punch	For spaghetti tubing	<u>150-09000315</u>

## POLYETHYLENE (PE) MICRO TUBING



PRODUCT	INTERIOR DIAMETER	EXTERIOR DIAMETER	FEET /ROLL	ITEM#
125-187 tubing	0.125" (3.18 mm)	0.187" (4.75 mm)	1000'	<u>150-01020005</u>
123-107 tubing	0.123 (3.10 mm)	0.107 (1.73 1111)	3000'	<u>150-01020010</u>
<b>125-197 tubing WHITE*</b>	0.125" (3.18 mm	0.197" (5.00 mm)	1000'	<u>150-01020021</u>
160-220 tubing	0.160" (4.06 mm)	0.220" (5.59 mm)	1000'	<u>150-01020015</u>
4/7 tubing	0.158" (4.00 mm)	0.276" (7.00 mm)	1000' (sold by feet)	<u>150-01020060</u>
E50 spaghetti	0.050" (1.27 mm)	0.128" (3.25 mm)	2500' / roll	<u>150-01010010</u>
E76 spaghetti	0.076" (1.93 mm)	0.128" (3.25 mm)	2500' / roll	<u>150-01010030</u>

Optional pre-assembly is also available, with pressure regulator and tubing in several lengths.

#### **MICRO-ADAPTORS FOR IRRIGATION LINE**

PRODUCT	PICTURE	QTY/ BAG	ITEM#
Barb. X barb. connector for 125-187 tubing	***	100	<u>150-05000050</u>
125- T threaded x threaded x barb. connector for 125-187 tubing	+	-	<u>150-05000010</u>
Goof plug, 5/7 mm for repair	<b>←</b>	100	<u>150-05000040</u>

<sup>\*</sup>White "Super Flex" tube is especially recommended to use with SimLine EZ close white weight.

#### **CAPILLARY MAT**



## AQUAMAT™



This new generation of capillary mat is actually a revolutionary irrigation system which allows optimal watering of plants while saving on cost of labour, water, fertilizer, electricity and production time. Your plants will benefit from more consistent irrigation conditions. Custom sizes in widths of 3, 4, 5, 6, 7 and 11 feet.

This product is composed of four distinct layers: ground cover anti-root polypropylene, textile anti-evaporative light and low-density textile for distribution of the water layer (reservoir), waterproof polyethylene film 6 mm thick.





Similar to Aquamat, this has heating tubes for hot water flow. This mat is used to stimulate root growth and reduce heating costs.



#### BIOTHERM HEATING BIOTHERM®

« BioTherm® » heating mat system and biotherme type system are available on special request. For more details, contact your representative.

BioTherm system ..... On request

#### WOBBLER SPRINKLER IRRIGATION

# Senninger Irrigation Inc.

#### **Characteristics:**

- ½" NPT hose connector (can be ¾" NPT for Wobbler);
- Uniform circular coverage, large diameter irrigation;
- For installation, a tee, a 1.5' or 3' nipple and a femal adaptor are necessary;
- Mini-Wobbler offers a smaller spray diameter but is more uniform;

## • A stake has to be installed near nipple to support; • Wobbler flow rate: 0.78 – 8.25 gpm. Operation pressure: 10 - 35 psi; • Mini-Wobbler flow rate: 0.42 – 2.18 gpm. Operation pressure: 15 - 25 psi. **Specifications:**

				I KESSIOI	1 (1 D1)		
MODEL		10	15	20	25	30	35
The Wobbler®:	Wobbler standard #7 "jet lime ('	7/64'')" <u>15(</u>	<u>)-03000410 :</u>				
The wobbier:	Flow gpm:	1.06	1.30	1.50	1.68	1.84	1.99
	Diameter 1.5' height (feet):	36.5	41.5	43.5	45.0	45.5	46.5
	Wobbler standard #13 jet "white	e" (13/64")	150-030004	<u> 15 :</u>			
	Flow gpm:	3.80	4.65	5.38	6.01	6.59	7.12
(Standard ou Low angle	Diameter 1.5' height (feet):	44.5	49.5	50.5	51.0	51.5	52.0
	Mini-Wobbler #5 jet "beige" (5/6	64") <u>150-03</u>	<u> 3000290 :</u>				
	Flow gpm:	-	0.64	0.75	0.84	-	-
	Diameter 1.5' height (feet):	-	31.0	33.5	35.0	-	-
	Diameter 3' height (feet):	-	36.5	39.5	39.5	-	-
The <b>mini-Wobbler</b> ®:	Mini-Wobbler #7 jet "lime" (7/64") <u>150-03000320 :</u>						
THE HIMI-WODDIEL .	Flow gpm:	-	1.30	1.51	1.69	-	-
(E. S.)	Diameter 1.5' height (feet):	-	35.0	37.5	38.5	-	-
	Diameter 3' height (feet):	-	41.0	43.0	43.0	-	-
	Mini-Wobbler #8 jet "lavender"	(1/8") <u>150</u> -	<u>-03000280 :</u>				
	Flow gpm:	-	1.67	1.95	2.18	-	-
	Diameter 1.5' height (feet):	-	35.5	38.5	39.0	-	-
	Diameter 3' height (feet):	-	41.5	43.0	43.5	-	-

<sup>\*</sup> Your representative will give you an irrigation plan that meets your needs using software specially designed for this purpose.

PRESSION (PSI)

#### IRRIGATION

## MIRCRO-SPRINKLER FOR IRRIGATION AND MISTING





It is now possible to obtain a droplet as fine as 90 microns with 60 PSI! Dan products offer an array of jets to suit all irrigation needs. This upsidedown sprinkler system can save you time and labor with a high uniformity watering result. 30 PSI pressure and 120 mesh filter are recommended for spray irrigation. Please consult our representatives for a list of nozzles to meet your specific watering, wetting or misting needs







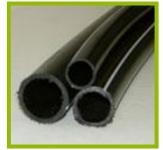






	Jain Irr	igation Systems Ltd.	Point Sewest Integrition
PRODUCT	PICTURE	QTY/BAG	ITEM#
DAN MODULAR FOR SPRAY IR	RIGATION		
Dan bridge	G	50	<u>150-10000170</u>
Antimist dan	-	50	Blue(0.059"):150-10000020 Yellow(0.055"):150-10000030 Orange(0.046"):150-10000040 Green(0.037"):150-10000050
Dan spinner	<b>+</b> 4	50	Black(wing):150-10000300 Black(round):150-10000310 Orange(oblong):150-10000320 Green(kiwi):150-10000330
Dan spreader		50	Yellow(flat): <u>150-10000340</u> Violet(mist): <u>150-10000350</u> Red(180°) <u>150-10000355</u>
Dan nozzle	8	50	Blue(0.076"): <u>150-10000230</u> Yellow(0.068"): <u>150-10000260</u> Orange(0.059"): <u>150-10000270</u> Green(0.056"): <u>150-10000280</u> Grey(0.046"): <u>150-10000250</u> Violet(0.032"): <u>150-10000290</u>
DAN MODULAR FOR MISTING	1	l e	
Dan 2-way cross (misting/cooling)		50	<u>150-10000075</u>
Dan 4-way cross (propagation)	*	50	<u>150-10000090</u>
Dan fogger 45° angle	<b>***</b>	50	<u>150-10000190</u>
Dan fogger	1	50	Blue(1.8gph): <u>150-10000200</u> Orange(3.6gph): <u>150-10000210</u>
			Red(5.4gph):150-10000220
COMMON ITEMS FOR SPRAY II	RRIGATIO	N AND M	
COMMON ITEMS FOR SPRAY II  Dan barb connector for 4/7 tubing	RRIGATIO	<b>N AND M</b>	
	410 M		ISTING
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly	410 M	100	150-10000070 150-10000100
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb	RRIGATIO	100 50	150-10000070 150-10000100 Grommet: 150-09000450 150-10000110
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet	410 M	100 50 50	150-10000070  150-10000100 Grommet:150-09000450  150-10000110 Grommet:150-09000450  150-10000160  150-10000180
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base	410 M	100 50 50 50	150-10000070  150-10000100 Grommet:150-09000450  150-10000110 Grommet:150-09000450  150-10000160
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb	410 M	50 50 50 50 50	150-10000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000180  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI):
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak	410 M	50 50 50 50 50 50	150-1000070  150-10000100 Grommet:150-09000450  150-10000110 Grommet:150-09000450  150-10000160  150-10000180  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing	410 M	50 50 50 50 50 50	150-1000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000180  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140  150-08010055
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan  4/7 tubing	410 M	50 50 50 50 50 50	150-10000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000180  Spray irrigation (ope.20PSI-clo.8PSI)
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan	410 M	50 50 50 50 50 50 - 50 -	150-1000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000180  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140  150-08010055  150-10000060  Handle: 150-09000355 Punch: 150-09000370
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan  4/7 tubing	410 M	100 50 50 50 50 50 - 50 - feet	150-10000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000180  Spray irrigation (ope. 20PSI-clo.8PSI)  "Black" 150-10000130 Misting(open 48PSI-close 35PSI):  "Blue" 150-10000140  150-08010055  150-10000060  Handle: 150-09000375 Punch: 150-01020060
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan  4/7 tubing  5½" plastic weight for hanging tube	410 M	50 50 50 50 50 50 - 50 - feet 25	150-10000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000160  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140  150-08010055  150-10000060  Handle: 150-09000355 Punch: 150-01020060  150-08020500
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan  4/7 tubing  5½" plastic weight for hanging tube  32 mm aluminium tube	410 M	50 50 50 50 50 50 - 50 - feet 25	150-10000070  150-10000100 Grommet:150-09000450  150-10000110 Grommet:150-09000450  150-10000160  150-10000180  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140  150-08010055  150-10000060  Handle:150-09000370  150-01020060  150-08020500  150-01050030
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan  4/7 tubing  5½" plastic weight for hanging tube  32 mm aluminium tube  Polyethylene tubing  Dripline support hook  3/32 galvanised steel cable	410 M	50 50 50 50 50 50 - 50 - feet 25 feet	150-10000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000160  Spray irrigation (ope. 20PSI-clo. 8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140  150-08010055  150-10000060  Handle: 150-09000355 Punch: 150-09000370  150-01020060  150-08020500  150-01050030  See next page  34": 150-09000200 1": 150-09000210
Dan barb connector for 4/7 tubing  Dan 3/8" tapered butterfly & grommet  Dan 3/8" tapered butterfly x 4/7 barb & grommet  Dan male ½" base  Dan butterfly x barb  Dan anti-leak  Shut-off valve for 4/7 tubing  Dan sprinkler/fogger plug  Handle + 3.0mm punch for Dan  4/7 tubing  5½" plastic weight for hanging tube  32 mm aluminium tube  Polyethylene tubing  Dripline support hook	410 M	50 50 50 50 50 50 50 50 feet 25 feet	150-10000070  150-10000100 Grommet: 150-09000450  150-10000110 Grommet: 150-09000450  150-10000160  150-10000160  Spray irrigation (ope.20PSI-clo.8PSI) "Black" 150-10000130 Misting(open 48PSI-close 35PSI): "Blue" 150-10000140  150-08010055  150-10000060  Handle: 150-09000355 Punch: 150-09000370  150-01020060  150-08020500  150-01050030  See next page  34": 150-09000200 1": 150-09000210 1/2": 150-09000220

#### **POLYETHYLENE TUBING (CARLON)**



DIAMETER (common name)	INTERIOR DIAMETER	EXTERIOR DIAMETER	MAXIMUM PRESSURE	LENGTH/ ROLL	ITEM#
1/2"	5/8''	3/4''	75 PSI	400'	<u>150-01030040</u>
3/4"	N/D	N/D	40 PSI	500'	<u>150-01030030</u>
3/4"	13/16"	1"	75 PSI	400'	<u>150-01030050</u>
1"	1"	11/4"	75 PSI	300'	<u>150-01030062</u>
11/4"	15/16"	1%/16"	75 PSI	300'	<u>150-01030080</u>
11/2"	1%;"	17/8''	75 PSI	250' (sold by feet)	<u>150-01030100</u>
2''	2''	27/16"	75 PSI	250' (sold by feet)	<u>150-01030120</u>
	For micro-tub	ping, see page 50.	Other sizes ava	ilable on demand	

## PERMA-LOC HOSE FITTINGS FOR IRRIGATION LINE

Several fittings are available to facilitate the assembly of the irrigation system. The most common are listed below. These fittings work at **40 PSI maximum pressure.** 

PRODUCT	PICTURE	ITEM#
34" FHT automatic flush valve – low flow, easy-loc		150-08100045 with 150-01030005 or 150-01030015
<sup>3</sup> / <sub>4</sub> '' FHT automatic flush valve – high flow, easy-loc		150-08100055 with 150-01030005 or 150-01030015
<sup>3</sup> / <sub>4</sub> " FPT automatic flush valve – high flow, easy-loc		150-08100050 Needs a ¾''MPT adaptor
Perma-Loc ½" hose coupling valve, easy-loc		<u>150-08010060</u>
Perma-Loc ¾" hose coupling valve, easy-loc	a de	<u>150-08010130</u>
Perma-Loc ½" hose coupling valve, easy-loc x ½" MPT		<u>150-08010065</u>
Perma-Loc 1/2" hose coupling, easy-loc		<u>150-03000325</u>
Perma-Loc ½" tee, easy-loc	-	<u>150-03000365</u>
Perma-Loc ½" elbow, easy-loc		<u>150-02020055</u>
Perma-Loc 1/2" adaptor, easy-loc x 1/2" MPT		<u>150-01030002</u>
Perma-Loc ½" adaptor, easy-loc x ¾" MPT		<u>150-01030004</u>
Perma-Loc ½" adaptor, easy-loc x ¾" MHT (series 600)		150-01030005
Perma-Loc 3/4" adaptor, easy-loc x 3/4" MHT (series 800)		<u>150-01030015</u>
Perma-Loc ½" adaptor, easy-loc x ¾" FHT swivel (series 600)		<u>150-01300005</u>
Perma-Loc ¾" adaptor, easy-loc x ¾" FHT swivel (series 800)		<u>150-01300000</u>
¾" FHT plug		<u>150-02020045</u>
¾" FPT cap		<u>190-003448-007</u>

#### TRADITIONAL AND QUICK ATTACH CLAMP

PRODUCT	CLAMP DIMENSION	NUMBER	MATCHING PE TUBING	PICTURE	ITEM#	
<sup>7</sup> / <sub>32</sub> " to <sup>5</sup> / <sub>8</sub> " standard stainless steel clamp	0.219" to 0.625"	#4	1/4''		<u>190-07020053</u>	
3/8" to 25/32" standard stainless steel clamp	0.375" to 0.781"	#6	1/2''		<u>190-07020030</u>	
$\frac{9}{16}$ " to $1\frac{1}{16}$ " standard stainless steel clamp	0.562" to 1.062"	#10	3/4''	60	<u>190-07020055</u>	
<sup>9</sup> / <sub>16</sub> " to 1 <sup>1</sup> / <sub>4</sub> " standard stainless steel clamp	0.562" to 1.250"	#12	3/4''	月日	<u>190-07020058</u>	
<sup>11</sup> / <sub>16</sub> " x 1 <sup>1</sup> / <sub>4</sub> " standard stainless steel clamp	0.688" to 1.250"	#12	1''		<u>190-07020060</u>	
$1\frac{1}{16}$ " to 2" standard stainless steel clamp	1.062" to 2.000"	#24	11/4''		<u>190-07020070</u>	
1 <sup>9</sup> / <sub>16</sub> " to 2½" standard stainless steel clamp	1.562" to 2.500"	#32	1½"		190-07020080	
1 <sup>13</sup> / <sub>16</sub> " to 2 <sup>3</sup> / <sub>4</sub> " standard stainless steel clamp	1.812" to 2.750"	#36	2''		<u>190-07020090</u>	
2½" to 3½" standard stainless steel clamp	2.500" to 3.500"	#48	21/2"		<u>190-07020095</u>	
3¾" standard stainless steel clamp	3.500"	#60	3"		<u>190-07020097</u>	
½" quick attach clamp				_	<u>190-07030020</u>	
<sup>3</sup> / <sub>4</sub> " quick attach clamp					<u>190-07030030</u>	
1" quick attach clamp					<u>190-07030040</u>	
1 <sup>1</sup> / <sub>4</sub> " quick attach clamp		<u>190-07030050</u>				
1½" quick attach clamp		<u>190-07030060</u>				
2" quick attach clamp						
Quick attach clamp pliers					<u>190-07040050</u>	

#### **HOSE/PIPE FITTINGS (FOR CARLON AND PVC PIPES)**

A full range of fittings, for Poly and PVC pipes are available. We maintain inventory of sizes 1/2" to 1"; other sizes are available upon request. We have in stock many connections that are not available in hardware stores, and at competitive prices.

## \*\*\* WE NOW KEEP IN STOCK ONLY **GREY** FITTINGS \*\*\*

In the greenhouse, the use of grey connectors avoids the creation of algae in the pipes. White fitting are still available on request.

See the description of the types of connections used: "INSERT", "MPT", "FPT", "MHT", "FHT" and "SLP"

CONNECTION TYPE	DESCRIPTION
"INSERT" or "INS"	Means fixed under pressure (insert) in carlon. (polyethylene tubing)
"MPT" and "FPT"	Means male or female pipe thread.
"MHT" and "FHT"	Means male or female hose thread.
"SLP" or "SL"	Means connector is glued. (Used in PVC pipe only)

For all connections (for Poly or PVC) you must specify diameter required and the type of connection. However, for ordering "T" fittings be careful to give the right position measurement:

"tee" fitting: (see example below)

- 1- "A" is the first number
- 2- "B" is the second number
- 3- "C" is the third number



## <u>ILLUSTRATION OF HOSE/PIPE FITTINGS (FOR CARLON AND PVC PIPES)</u> There are some examples of available fittings :

TÉ	ELBOW	
12	п	EEDOTT
Glued tee		Glued 90° elbow
Glued reducing tee		Glued reducing 90° elbow
Glued x female threaded tee		Glued x female threaded 90° elbow
Glued reducing x female threaded tee		Glued reducing x female threaded 90° elbow
Female threaded tee		Female threaded 90° elbow
Glued reducing x insert tee		Spigot x glued 90° elbow
Insert tee		Glued x male threaded 90° elbow
Reducing insert tee		Spigot x female threaded 90° elbow
Insert x female threaded tee		Male threaded x female threaded 90° elbow
Reducing insert x female threaded tee		Glued 11.25° elbow
Insert x male threaded tee		Glued 15° elbow
CROSS		Glued 22.5° elbow
Glued cross		Glued 30° elbow
Glued reducing cross		Glued 55° elbow
Insert cross		Spigot x glued 45° elbow
Y		Insert 90° elbow
Glued Y		Insert reducing 90° elbow
Glued double Y		Insert x female threaded 90° elbow
CAP & PLUG		Insert reducing x female threaded 90° elbow
Glued cap		Insert x male threaded 90° elbow
Female threaded cap		Insert reducing x male threaded 90° elbow
Spigot plug		UNION
Male threaded plug		Glued union
Insert plug		Female threaded union

COUPLING				
Glued coupling				
Glued reducing coupling				
Female threaded coupling				
Insert coupling				
Insert reducing coupling				
NIPPLE				
Male threaded nipple				
ADAPTER				
Glued x female threaded adapter				
Glued x male threaded adapter	The second second			
Male threaded x female threaded adapter				
Spigot x female threaded adapter				
Spigot x male threaded adapter				
Spigot x insert adapter				
Glued x insert adapter				
Male threaded x insert adapter				
BUSHING				
Glued x female threaded bushing				
Glued x male threaded busing				
Spigot x glued bushing				
Spigot x female threaded bushing				
Spigot x male threaded bushing				
Female threaded x insert bushing				
PIPE				
PVC grey or white pipe $^{1}/_{2}$ "- $^{3}/_{4}$ "-1"- $^{1}/_{4}$ "- $^{1}/_{2}$ "-2"- $^{2}/_{2}$ "etc.				

Glued or threaded  $\underline{unions}$  are generally available with  $\underline{Viton}$  seal (acid and high temperature

resistant) or Buna-N seal.

#### **PUMPS**

\*\*\* Several models are available. Ask your representative for more information. \*\*\*

## **FILTERS**





We have a wide range of filters that can meet all needs. Strainers have the advantage of being less expensive while disk filters collect more dirt (larger filtration area) and are more durable.

ТҮРЕ	IMAGE	PIPE DIAMETER	FLOW (GPM)*	FILTER	ITEM#
	-			75 mesh (white)	<u>150-06010027</u>
	-112	34" MPT	0-13	100 mesh (blue)	<u>150-06010029</u>
	1111			150 mesh	<u>150-06010550</u>
**	N.	1" MPT	0-12	150 mesh	<u>150-06010555</u>
Screen stainless steel	Circi (	Replacement screen: 150 mesh ¾" & 1"			<u>150-06010560</u>
with flush valve	THE STATE OF THE S	1 ½ " MPT	0-55	150 mesh	<u>150-06010565</u>
	14	2''' MPT	0-110	150 mesh	<u>150-06010570</u>
		Replacement	screen: 150	mesh 1½" & 2"	<u>150-06010575</u>
_		- 4			

Disc









Several models available on request. Please consult a representative for more details.

#### **BALL VALVE**

PRODUCTS	PICTURE	<u>DESCRIPTION</u>
Ball valve		
True union ball valve		We have a complete range of PVC valves available from ½" to 4".
Check valve		

<sup>\*</sup> For more details on the sale of each filter, please consult the product data sheets. Notes: On special order, 40, 80 and 200 mesh are available.

## **PRESSURE REGULATORS**

Operates without restriction until the pressure reaches the desired setting. No adjustment required. Construction PVC / stainless steel, simplifies the installation of irrigation system.

INPUT/OUTPUT DIAMETER	MAXIMUM PRESSURE	FLOWRATE "SERIES "TO WORK WELL"		ITEM#
	6 PSI	0.5 to 5 gpm	PMR-LF	<u>150-07000040</u>
	10 PSI	0.5 to 5 gpm	PMR-LF	<u>150-07000045</u>
	10 F31	4 to 16 gpm	PMR-MF	<u>150-07000050</u>
	12 PSI	0.1 to 8 gpm	PMR-LF	<u>150-07000125</u>
34" <b>FPT</b>	12 F31	3.5 to 20 gpm	PRV ¾	<u>150-07000070</u>
	15 PSI	0.5 to 5 gpm	PRV ¾	<u>150-07000075</u>
% FF1		0.5 to 5 gpm	PRV ¾	<u>150-07000080</u>
	20 PSI	2 to 20 gpm	PMR-MF	<u>150-07000090</u>
		3.5 to 20 gpm	PRV ¾	<u>150-07000100</u>
	25 PSI	0.5 to 5gpm	PRV ¾	<u>150-07000110</u>
	35 PSI	0.1 to 8 gpm	PMR-LF	<u>150-07000122</u>
	33 F31	3.5 to 20 gpm	PRV ¾	<u>150-07000120</u>
1" FPT	6 PSI	4 to 16 gpm	PMR-MF	<u>150-07000130</u>
	10 PSI	4 to 10 gpiii	FIVIK-IVIF	<u>150-07000140</u>
	15 PSI		PMR-MF	<u>150-07000150</u>
	20 PSI	2 to 20 gpm		<u>150-07000095</u>
	35 PSI			<u>150-07000170</u>
	6 PSI			<u>150-07000180</u>
	10 PSI		DD HE	<u>150-07000190</u>
11/U <b>X</b> 1U <b>ED</b> T	15 PSI	10 to 22 amm		<u>150-07000200</u>
11/4" X 1" FPT	20 PSI	10 to 32 gpm	PR-HF	<u>150-07000160</u>
	40 PSI			<u>150-07000202</u>
	50 PSI			150-07000205
	12 PSI			<u>150-07000210</u>
1 1/U EDT	20 PSI	7 . 40	DDX/ 1.1/	<u>150-07000220</u>
1 ½" FPT	25 PSI	7 to 40 gpm	PRV 1 ½	150-07000230
	35 PSI			150-07000240
	12 PSI			150-07000250
2" FPT	20 PSI	15 to 80 gpm	PRV 4S	150-07000260
	35 PSI			150-07000270

PMR-LF/PMR MF/PR-HF SERIES PRV 3/4 SERIES

PRV 1 1/2 SERIES

**PRV 4S SERIES** 









## DRAMM MANUAL WATERING TOOLS | DRAMM

PRODUCTS	PICTURE	DESCRIPTION	ITEM#
1000PL water breaker® nozzle (red)		Manufactured to irrigate small pots, trays and seedlings. It has 1000 micro holes that create an extra-gentle stream that does not affect fresh soil or fragile plants. Made of ABS plastic and stainless steel. 7 to 40 PSI.	<u>150-03000330</u>
750PL fine low flow water breaker® nozzle (yellow)		Designed by producer demand, this is the new yellow nozzle manufactured to provide a precise and gentle spray. It has 750 micro holes that are the same size as the 1000PL.	<u>150-03000333</u>
400 ALC aluminium water breaker® nozzle		This model of nozzle provides fast watering without damage to plants and soil. It has 400 holes that are slightly larger than the 1000PL and 750PL. The nozzle is made of an aluminum and copper composite. This model has existed since 1945.	<u>150-03000335</u>
Fogg-it nozzle		Fogg-It nozzle is designed to water fragile plants, delicate seedlings, plant cuttings or to raise humidity around wilting plants. This nozzle has 3 mist jets which create a conical spray pattern. Made from solid brass and 3/4 FHT.	0.5 gpm <u>150-03000050</u> 1 gpm <u>150-03000055</u> 2 gpm <u>150-03000060</u> 4 gpm <u>150-03000065</u>
Handi-reach ™ watering handle		Ergonomically designed for increased comfort while spraying. They are available in 16, 24, 30, 36 and 48 inches long. They are made of extruded aluminum, with a comfortable grip. Ends are ¾ FHT and ¾ MHT.	<u>150-03000336</u>
Handi-reach <sup>TM</sup> hanging basket watering handle		Hanging Basket Handles offer a 90° curve at the top of the handle so you can water directly into a hanging basket. Available in 36 and 48-inch lengths, Made from extruded aluminum tubing, forged brass hose couplings and a comfort hand grip. comfortable. Ends are ¾ FHT and ¾ MHT.	On request
3/4" M/F PSI mini shut-off valve (ergonomic)	THE CO	Can be installed at the watering handle end to open and close water flow. It says "ergonomical" because it can easily be closed with right thumb.	Hose threaded:  150-08010115  Pipe threaded:  150-08010110
Touch 'N flow pro <sup>TM</sup> trigger valve		The Touch 'N Flow Pro Trigger Valve offers durability and high flow in a trigger valve. With 11 gpm output and a long life, the 65 TNF Pro allows for flexibility when watering.	<u>160-16000135</u>

## **ARTIFICIAL LIGHTING**

## P.L. LIGHT SYSTEMS LAMPS



GHL distribute P.L. Light systems, supplemental lighting systems for the horticultural industry. We offer a complete range of innovative fixtures, lamps and reflectors for optimized light distribution in a variety of technologies including LED, High Pressure Sodium (HPS), Metal Halide (MH), and Hybrid Systems.



Please contact your representative for more info



### **VENTILATION AND HEATING**

#### PERFORMA GLOBALYS HAF FAN



The HAF fans are becoming increasingly popular. Resent research shows that this type of circulation system may be superior to most other types of air movement systems.



It improves:

- Temperature uniformity;
- Reduces loss of heat;
- Disperses moisture;
- Improves the distribution of CO<sub>2</sub> in the immediate environment of plants;
- In short, it makes a more uniform environment.

Available in 20" diameter, with motor (1/10hp) at 115 volts (0.5/1amp). Each unit comes standard with a power cord, suspension arm and a fan cage. Minimal installation and energy cost.

Volume discount available.

Ask your GHL representative for guidance in choosing the appropriate lay-out for your specific needs.

#### INLINE DUCT BLOWERS VORTEX POWERFAN





#### Fan characteristics:

- Available in dimensions of 4" to 12" in diameter;
- Motor 115 Volts AC 60Hz, balanced ball bearing, self-lubricating and maintenance-free;
- Silent operation and no vibration;
- High quality steel construction;
- Mounting bracket of galvanized steel for vertical or horizontal installation;
- Optional speed controler;
- Powder coated texture:
- Power cord included.

#### Examples of installation in greenhouse:



- As blower to inflate polyethylenes (adapter and optional speed controller sold separately);



- As exhaust fan to dehumidify the air in the greenhouse (cap sold separately);

etc.

## VTX series - Specifications

Models Di	ameter	CFM* speed	Weight* (pounds)	" Max Watts	Max Amp.	R.P.M
VTX400	4"	175	7,4	80	0,65	2500
VTX500	5"	204	7,0	80	0,65	2500
VTX600L	6"	235	6,8	80	0,65	2500
VTX600	6"	452	10,8	130	1,10	2800
VTX800L	8"	591	12,0	150	1,60	2550
VTX800	8"	747	12,2	260	2,20	2750
VTX1000	10"	790	12,4	260	2,20	2750
VTX1200L	12"	820	14,4	260	2,20	2750
VTX1200	12"	1140	14,6	280	3,20	2400

\* At 0" static pressure

\*\* The weight doesn't include mounting brackets

#### POLYETHYLENE VENTILATION/HEATING TUBE

PRODUCTS	PICTURE	DESCRIPTION	INFLATED TUBE DIAMETER	FLAT TUBE DIAMETER	ITEM#
Polyethylene ventilation tube		Polyethylene pipe for ventilation (Fan- jet) or hot air heating. 4 mil. Treated U.V. 12 months. Non- perforated	4 3/4" 6" 10" 12" 14" 16" 18" 24"	6" 9" 16" 19" 22" 25" 29" 38" 47"	140-03000018 140-03000010 140-03000020 140-03000030 140-03000040 140-03000050 140-03000070 140-03000080

<sup>\*</sup>Volume discount available. A complet roll is approximately 1000' long.

#### POLYETHYLENE VENTILATION TUBE PERFORATION

Possibility of puncturing the tubes according to your needs, additional charges apply.

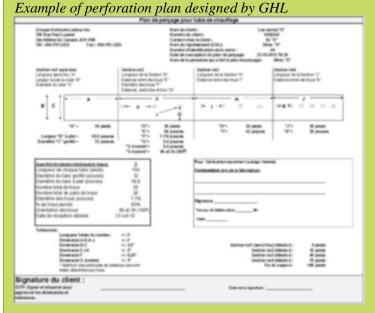
#### PROCEDURE FOR ORDERING PUCTURED HEATING TUBE:

**Step 1:** Contact your representative with the following information.

- -Use (Fan-Jet venting or heating))
- -Tubes diameter
- -Tubes quantity
- -Tubes length
- -Desired hole diameter (1", 1%" or  $2\frac{1}{4}$ ")
- -Hole orientation (eg. 9:00 & 3:00, 10:00 & 2:00 etc.)
- -Desired delivery date

If necessary, your representative can help you define the dimensions that you need.

**Step 2:** Your representative will send you a quote and a perforation plan by fax or email.



Step 3: Check, sign and return the perforation plan by fax to your representative to confirm the order.

<u>Step 4</u>: Your representative will advise you of the expected delivery time.

#### PRESSURE LOSS (PSI) THROUGH VALVES AND FITTINGS

(Equivalent length in feet of steel pipe)

Minimum size	Valve	Angle valve	Sprinkler angle valve	Gate valve	T side output	T right output	Std elbow	45° elbow
1/2	17	9	2	0.4	4	1	2	1
3/4	22	12	3	0.5	5	2	3	1
1	27	15	4	0.6	6	2	3	2
1 1/4	38	18	5	0.8	8	3	4	2
1 1/2	45	22	6	1.0	10	3	5	2
2	58	28	7	1.2	12	4	6	3
2 1/2	70	35	9	1.4	14	5	7	3
3	90	45	11	1.8	18	6	8	4
4	120	60	15	2.3	23	7	11	5
6	170	85	20	3.3	33	12	17	8

#### PRESSURE LOSS (PSI) THROUGH COPPER AND BRONZE FITTINGS

					Equivaler	nt in length	of tubin	g					
Minimum			(	Copper		Bronze							
size	90° elbow	45° elbow	Т	T side output	90 <sup>0</sup> large angle elbow	180 <sup>0</sup> large angle elbow	90° elbow	45° elbow	Т	T side output	Comp stop		
3/8	1/2	1/2	1/2	1	1/2	1/2	1	1/2	1/2	2	9		
1/2	1/2	1/2	1/2	1	1/2	1	1	1	1/2	2	13		
5/8	1/2	1/2	1/2	2	1	1	2	1	1/2	3	17		
3/4	1	1/2	1/2	2	1	2	2	1	1/2	3	21		
1	1	1	1/2	3	2	2	4	2	1/2	5	30		
1 1/4	2	1	1/2	4	2	3	5	2	1	7	-		
1 1/2	2	2	1	5	2	4	8	3	1	9	-		
2	2	2	1	7	3	8	11	5	2	12	-		
2 1/2	2	3	2	9	4	16	14	8	2	16	-		
3	3	4	-	-	5	20	18	11	2	20	-		
3 1/2	4	-	-	-	7	24	24	14	2	31	-		
4	-	-	-	-	8	28	28	17	2	37	-		
5	-	-	-	-	10	37	41	22	2	48	-		
6	-	-	-	-	13	47	52	28	2	61	-		

## PRESSURE LOSS (PSI) THROUGH CHECK VALVE

(Pressure loss in PSI depending on flow)

G.P.M			Valve di	mension			G.P.M			Valve di	imension		
flow	1/2	3/4	1	1 1/4	1 1/2	2	flow.	1 1/4	1 1/2	2	2 1/2	3	4
2	0.2						46	2.1	1.1	0.4			
3	0.5						48	2.2	1.2	0.5			
6	1.0	0.3					50	2.4	1.3	0.5			
8	1.7	0.5					55	2.9	1.5	0.6			
10	2.6	0.8	0.3				60	3.4	1.8	0.7			
12	3.6	1.1	0.5				65	3.9	2.0	0.8			
14	4.8	1.5	0.6				70	4.5	2.4	0.9	0.4		
16		2.0	0.9				75		2.7	1.0	0.5		
18		2.4	1.0				80		3.0	1.2	0.6		
20		3.0	1.2	0.4			90		3.7	1.5	0.7		
22		3.5	1.4	0.5			100		4.6	1.8	0.9	0.4	
24		4.1	1.7	0.6			120			2.5	1.2	0.5	
26		4.8	2.0	0.7	0.4		140			3.3	1.6	0.7	
28			2.2	0.8	0.5		160			4.3	2.1	0.9	0.3
30			2.5	0.9	0.5		180			5.3	2.6	1.1	0.4
32			2.9	1.1	0.6		200			6.5	3.1	1.4	0.5
34			3.2	1.2	0.6		250				4.7	2.1	0.7
36			3.6	1.3	0.7		300				6.6	2.9	1.0
38			3.9	1.5	0.8		350					3.8	1.3
40			4.3	1.6	0.8	0.3	400					4.9	1.7
42			4.7	1.7	0.9	0.3	450						2.1
44				1.9	1.0	0.4	500						2.6

#### PRESSURE LOSS FOR POLYETHYLENE TUBING (for 100' length)

Pipe size	1/2	<u>,</u> ,,	3/4	,,	1	,,	1 !	/4''	1 5	/ <sub>2</sub> ''	2	,,	2 ½	/2"
Interior diameter	0.6	22''	0.83	24''	1.0	49''	1.3	80''	1.6	10''	2.0	67''	2.4	69''
Flow	Velocity	Pressure	Velocity	Pressure	Velocity	Pressure								
(GPM)	(FPS)	loss (PSI)	(FPS)	loss (PSI)	(FPS)	loss (PSI)								
1	1.05	0.49	0.60	0.12	0.37	0.04	0.21	0.01	0.16	0.00	0.10	0.00	0.07	0.00
2	2.11	1.76	1.20	0.45	0.74	0.14	0.43	0.04	0.31	0.02	0.19	0.01	0.13	0.00
3	3.16	3.73	1.80	0.95	1.11	0.29	0.64	0.08	0.47	0.04	0.29	0.01	0.20	0.00
4	4.22	6.35	2.40	1.62	1.48	0.50	0.86	0.13	0.63	0.06	0.38	0.02	0.27	0.01
5	5.27	9.60	3.00	2.44	1.85	0.76	1.07	0.20	0.79	0.09	0.48	0.03	0.33	0.01
6	6.33	13.46	3.61	3.43	2.22	1.06	1.29	0.28	0.94	0.13	0.57	0.04	0.40	0.02
7	7.38	17.91	4.21	4.56	2.60	1.41	1.50	0.37	1.10	0.18	0.67	0.05	0.47	0.02
8	8.44	22.93	4.81	5.84	2.97	1.80	1.71	0.47	1.26	0.22	0.76	0.07	0.54	0.03
9	9.49	28.52	5.41	7.26	3.34	2.24	1.93	0.59	1.42	0.28	0.86	0.08	0.60	0.03
10	10.55	34.67	6.01	8.82	3.71	2.73	2.14	0.72	1.57	0.34	0.95	0.10	0.67	0.04
11	11.60	41.36	6.61	10.53	4.08	3.25	2.36	0.86	1.73	0.40	1.05	0.12	0.74	0.05
12	12.65	48.60	7.21	12.37	4.45	3.82	2.57	1.01	1.89	0.48	1.15	0.14	0.80	0.06
13	13.71	56.36	7.81	14.34	4.82	4.43	2.79	1.17	2.05	0.55	1.24	0.16	0.87	0.07
14	14.76	64.65	8.41	16.45	5.19	5.08	3.00	1.34	2.20	0.63	1.34	0.19	0.94	0.08
15	15.82	73.47	9.01	18.70	5.56	5.78	3.21	1.52	2.36	0.72	1.43	0.21	1.00	0.09
16	16.87	82.79	9.61	21.07	5.93	6.51	3.43	1.71	2.52	0.81	1.53	0.24	1.07	0.10
17	17.93	92.63	10.22	23.57	6.30	7.28	3.64	1.92	2.68	0.91	1.62	0.27	1.14	0.11
18	18.98	102.97	10.82	26.21	6.67	8.10	3.86	2.13	2.83	1.01	1.72	0.30	1.20	0.13
19			11.42	28.97	7.04	8.95	4.07	2.36	2.99	1.11	1.81	0.33	1.27	0.14
20			12.02	31.85	7.42	9.84	4.28	2.59	3.15	1.22	1.91	0.36	1.34	0.15
21			12.62	34.87	7.79	10.77	4.50	2.84	3.31	1.34	2.01	0.40	1.41	0.17
22			13.22	38.00	8.16	11.74	4.71	3.09	3.46	1.46	2.10	0.43	1.47	0.18
23			13.82	41.26	8.53	12.75	4.93	3.36	3.62	1.59	2.20	0.47	1.54	0.20
24			14.42	44.65	8.90	13.79	5.14	3.63	3.78	1.72	2.29	0.51	1.61	0.21
25			15.02	48.15	9.27	14.87	5.36	3.92	3.94	1.85	2.39	0.55	1.67	0.23
26			15.62	51.78	9.64	16.00	5.57	4.21	4.09	1.99	2.48	0.59	1.74	0.25
27			16.22	55.53	10.01	17.15	5.78	4.52	4.25	2.13	2.58	0.63	1.81	0.27
28			16.83	59.40	10.38	18.35	6.00	4.83	4.41	2.28	2.67	0.68	1.87	0.28
29			17.43	63.39	10.75	19.58	6.21	5.16	4.56	2.43	2.77	0.72	1.94	0.30
30			18.03	67.50	11.12	20.85	6.43	5.49	4.72	2.59	2.86	0.77	2.01	0.32
35					12.98	27.74	7.50	7.30	5.51	3.45	3.34	1.02	2.34	0.43
40					14.83	35.52	8.57	9.35	6.30	4.42	3.82	1.31	2.68	0.55
45					16.68	44.18	9.64	11.63	7.08	5.49	4.30	1.63	3.01	0.69
50					18.54	53.70	10.71	14.14	7.87	6.68	4.77	1.98	3.35	0.83
55							11.78	16.87	8.66	7.97	5.25	2.36	3.68	0.99
60							12.85	19.82	9.44	9.36	5.73	2.77	4.02	1.17
65							13.93	22.98	10.23	10.86	6.21	3.22	4.35	1.36
70							15.00	26.36	11.02	12.45	6.68	3.69	4.69	1.55
75	<u> </u>		<u> </u>		L	harafora th	16.07	29.96	11.81	14.15	7.16	4.19	5.02	1.77

Pipe size	3	,,	4"			
Interior						
diameter		58''	4.02			
Flow	Velocity (FPS)	Pressure loss	Velocity (FPS)	Pressure loss		
(GPM)	(143)	(PSI)	(143)	(PSI)		
20	0.87	0.05	0.50	0.01		
25	1.08	0.08	0.63	0.02		
30	1.30	0.11	0.76	0.03		
35	1.52	0.15	0.88	0.04		
40	1.73	0.19	1.01	0.05		
45	1.95	0.24	1.13	0.06		
50	2.17	0.29	1.26	0.08		
55	2.38	0.35	1.38	0.09		
60	2.60	0.41	1.51	0.11		
65	2.82	0.47	1.64	0.13		
70	3.03	0.54	1.76	0.14		
75	3.25	0.61	1.89	0.16		
80	3.47	0.69	2.01	0.18		
85	3.68	0.77	2.14	0.21		
90	3.90	0.86	2.27	0.23		
95	4.12	0.95	2.39	0.25		
100	4.33	1.05	2.52	0.28		
110	4.77	1.25	2.77	0.33		
120	5.20	1.47	3.02	0.39		
130	5.63	1.70	3.27	0.45		
140	6.07	1.95	3.52	0.52		
150	6.50	2.22	3.78	0.59		
160	6.94	2.50	4.03	0.67		
170	7.37	2.79	4.28	0.74		
180	7.80	3.11	4.53	0.83		
190	8.24	3.43	4.78	0.92		
200	8.67	3.78	5.03	1.01		
220	9.54	4.50	5.54	1.20		
240	10.40	5.29	6.04	1.41		
260	11.27	6.14	6.54	1.64		
280	12.14	7.04	7.05	1.88		
300	13.00	8.00	7.55	2.13		
320	13.87	9.02	8.05	2.40		
340	14.74	10.09	8.56	2.69		
360	15.60	11.21	9.06	2.99		
380	16.47	12.40	9.57	3.30		
400	17.34	13.63	10.07	3.63		
450	19.51	16.95	11.33	4.52		
500			12.59	5.49		

Dark zone indicates that velocity is more than 5' per second therefore this pipe size has to be used with caution. Velocity equation: V = 0.408 x flow (gpm) / (interior diameter (inch))<sup>2</sup>. Material coefficient for polyethylene is: 140 Pressure loss by friction in PSI for 100' of pipe equation:

Pressure loss =  $0.433 \times (0.2083 \times (100/\text{material coefficient})^{1.852} \times \text{flow (gpm)}^{1.852}/\text{interior diameter (inch)}^{4.866}$ 

#### PRESSURE LOSS FOR PVC SCHEDULE 40 (for 100' length)

Pipe size	1/3	<u>,</u> ,,	3/4	,,,	1	,,	1 1	/ <sub>4</sub> ''	1 1	/ <sub>2</sub> ''	2	,,	2 ½	/2"
Interior diameter	0.6	22''	0.8	24''	1.0	49''	1.3	80''	1.6	10''	2.0	67''	2.4	69''
Flow	Velocity	Pressure	Velocity	Pressure	Velocity	Pressure	Velocity	Pressure	Velocity	Pressure	Velocity	Pressure	Velocity	Pressure
(GPM)	(FPS)	loss (PSI)	(FPS)	loss (PSI)	(FPS)	loss (PSI)	(FPS)	loss (PSI)	(FPS)	loss (PSI)	(FPS)	loss (PSI)	(FPS)	loss (PSI)
1	1.05	0.43	0.60	0.11	0.37	0.03	0.21	0.01	0.16	0.00	0.10	0.00	0.07	0.00
2	2.11	1.55	1.20	0.39	0.74	0.12	0.43	0.03	0.31	0.02	0.19	0.00	0.13	0.00
3	3.16	3.28	1.80	0.84	1.11	0.26	0.64	0.07	0.47	0.03	0.29	0.01	0.20	0.00
4	4.22	5.59	2.40	1.42	1.48	0.44	0.86	0.12	0.63	0.05	0.38	0.02	0.27	0.01
5	5.27	8.45	3.00	2.15	1.85	0.66	1.07	0.17	0.79	0.08	0.48	0.02	0.33	0.01
6	6.33	11.85	3.61	3.02	2.22	0.93	1.29	0.25	0.94	0.12	0.57	0.03	0.40	0.01
7	7.38	15.76	4.21	4.01	2.60	1.24	1.50	0.33	1.10	0.15	0.67	0.05	0.47	0.02
8	8.44	20.18	4.81	5.14	2.97	1.59	1.71	0.42	1.26	0.20	0.76	0.06	0.54	0.02
9	9.49	25.10	5.41	6.39	3.34	1.97	1.93	0.52	1.42	0.25	0.86	0.07	0.60	0.03
10	10.55	30.51	6.01	7.77	3.71	2.40	2.14	0.63	1.57	0.30	0.95	0.09	0.67	0.04
11	11.60	36.40	6.61	9.26	4.08	2.86	2.36	0.75	1.73	0.36	1.05	0.11	0.74	0.04
12	12.65	42.77	7.21	10.88	4.45	3.36	2.57	0.89	1.89	0.42	1.15	0.12	0.80	0.05
13	13.71	49.60	7.81	12.62	4.82	3.90	2.79	1.03	2.05	0.48	1.24	0.14	0.87	0.06
14	14.76	56.90	8.41	14.48	5.19	4.47	3.00	1.18	2.20	0.56	1.34	0.16	0.94	0.07
15	15.82	64.65	9.01	16.45	5.56	5.08	3.21	1.34	2.36	0.63	1.43	0.19	1.00	0.08
16	16.87	72.86	9.61	18.54	5.93	5.73	3.43	1.51	2.52	0.71	1.53	0.21	1.07	0.09
17	17.93	81.52	10.22	20.75	6.30	6.41	3.64	1.69	2.68	0.80	1.62	0.24	1.14	0.10
18	18.98	90.62	10.82	23.06	6.67	7.12	3.86	1.88	2.83	0.89	1.72	0.26	1.20	0.11
19			11.42	25.49	7.04	7.87	4.07	2.07	2.99	0.98	1.81	0.29	1.27	0.12
20			12.02	28.03	7.42	8.66	4.28	2.28	3.15	1.08	1.91	0.32	1.34	0.13
21			12.62	30.68	7.79	9.48	4.50	2.50	3.31	1.18	2.01	0.35	1.41	0.15
22			13.22	33.44	8.16	10.33	4.71	2.72	3.46	1.28	2.10	0.38	1.47	0.16
23			13.82	36.31	8.53	11.22	4.93	2.95	3.62	1.39	2.20	0.41	1.54	0.17
24			14.42	39.29	8.90	12.14	5.14	3.20	3.78	1.51	2.29	0.45	1.61	0.19
25			15.02	42.38	9.27	13.09	5.36	3.45	3.94	1.63	2.39	0.48	1.67	0.20
26			15.62	45.57	9.64	14.08	5.57	3.71	4.09	1.75	2.48	0.52	1.74	0.22
27			16.22	48.87	10.01	15.10	5.78	3.97	4.25	1.88	2.58	0.56	1.81	0.23
28			16.83	52.27	10.38	16.15	6.00	4.25	4.41	2.01	2.67	0.60	1.87	0.25
29			17.43	55.78	10.75	17.23	6.21	4.54	4.56	2.14	2.77	0.64	1.94	0.27
30			18.03	59.40	11.12	18.35	6.43	4.83	4.72	2.28	2.86	0.68	2.01	0.28
35					12.98	24.41	7.50	6.43	5.51	3.04	3.34	0.90	2.34	0.38
40					14.83	31.26	8.57	8.23	6.30	3.89	3.82	1.15	2.68	0.49
45					16.68	38.88	9.64	10.24	7.08	4.83	4.30	1.43	3.01	0.60
50					18.54	47.26	10.71	12.44	7.87	5.88	4.77	1.74	3.35	0.73
55							11.78	14.84	8.66	7.01	5.25	2.08	3.68	0.88
60							12.85	17.44	9.44	8.24	5.73	2.44	4.02	1.03
65							13.93	20.23	10.23	9.55	6.21	2.83	4.35	1.19
70							15.00	23.20	11.02	10.96	6.68	3.25	4.69	1.37
75							16.07	26.36	11.81	12.45	7.16	3.69	5.02	1.55

Dimension du tuyau	3	,,	4	,,
Diamètre				
intérieur	3.00	58''	4.02	26''
Débit	Velocity	Pressure	Velocity	Pressure
(GPM	(FPS)	loss (PSI)	(FPS)	loss (PSI)
20	0.87	0.05	0.50	0.01
25	1.08	0.05	0.63	0.01
30	1.30	0.07	0.03	0.02
35	1.52	0.10	0.70	0.03
40	1.73	0.17	1.01	0.04
45	1.95	0.21	1.13	0.06
50	2.17	0.21	1.26	0.07
55	2.38	0.30	1.38	0.08
60	2.60	0.36	1.51	0.10
65	2.82	0.41	1.64	0.11
70	3.03	0.48	1.76	0.13
75	3.25	0.54	1.89	0.14
80	3.47	0.61	2.01	0.16
85	3.68	0.68	2.14	0.18
90	3.90	0.76	2.27	0.20
95	4.12	0.84	2.39	0.22
100	4.33	0.92	2.52	0.25
110	4.77	1.10	2.77	0.29
120	5.20	1.29	3.02	0.34
130	5.63	1.50	3.27	0.40
140	6.07	1.72	3.52	0.46
150	6.50	1.95	3.78	0.52
160	6.94	2.20	4.03	0.59
170	7.37	2.46	4.28	0.66
180	7.80	2.73	4.53	0.73
190	8.24	3.02	4.78	0.81
200	8.67	3.32	5.03	0.89
220	9.54	3.96	5.54	1.06
240	10.40	4.66	6.04	1.24
260	11.27	5.40	6.54	1.44
280	12.14	6.20	7.05	1.65
300	13.00	7.04	7.55	1.88
320	13.87	7.94	8.05	2.11
340	14.74	8.88	8.56	2.37
360	15.60	9.87	9.06	2.63
380	16.47	10.91	9.57	2.91
400	17.34	12.00	10.07	3.20
450	19.51	14.92	11.33	3.98
500			12.59	4.83

Dark zone indicates that velocity is more than 5' per second therefore this pipe size has to be used with caution. Velocity equation: V = 0.408 x flow (gpm) / (interior diameter (inch))<sup>2</sup>. Material coefficient for PVC schedule 40 pipe: 150

Pressure loss by friction in PSI for 100' of pipe equation:

Pressure loss = 0.433 x (0.2083 x (100/material coefficient)<sup>1.852</sup> x flow (gpm)<sup>1.852</sup>/interior diameter (inch)<sup>4.866)</sup>

#### PRESSURE LOSS FOR PVC SCHEDULE 80 (for 100' length)

Pipe size	1/2	,,,	3/4	;,,	1	,,	1 1	/ <sub>4</sub> ''	1 !	/ <sub>2</sub> ''	2	,,	2 ½	/ <sub>2</sub> ''
Interior diameter	0.54	46''	0.74	42''	0.9:	57''	1.2	78''	1.:	5''	1.9	39''	2.3	23"
Flow (GPM)	Velocity (FPS)	Pressure loss (PSI)												
1	1.37	0.81	0.74	0.18	0.45	0.05	0.25	0.01	0.18	0.01	0.11	0.00	0.08	0.00
2	2.74	2.92	1.48	0.66	0.89	0.19	0.50	0.05	0.36	0.02	0.22	0.01	0.15	0.00
3	4.11	6.19	2.22	1.39	1.34	0.40	0.75	0.10	0.54	0.05	0.33	0.01	0.23	0.01
4	5.47	10.54	2.96	2.37	1.78	0.69	1.00	0.17	0.73	0.08	0.43	0.02	0.30	0.01
5	6.84	15.94	3.71	3.58	2.23	1.04	1.25	0.25	0.91	0.12	0.54	0.03	0.38	0.01
6	8.21	22.34	4.45	5.02	2.67	1.46	1.50	0.36	1.09	0.16	0.65	0.05	0.45	0.02
7	9.58	29.72	5.19	6.68	3.12	1.94	1.75	0.47	1.27	0.22	0.76	0.06	0.53	0.03
8	10.95	38.05	5.93	8.55	3.56	2.48	2.00	0.61	1.45	0.28	0.87	0.08	0.60	0.03
9	12.32	47.33	6.67	10.64	4.01	3.08	2.25	0.75	1.63	0.35	0.98	0.10	0.68	0.04
10	13.69	57.53	7.41	12.93	4.45	3.75	2.50	0.92	1.81	0.42	1.09	0.12	0.76	0.05
11	15.05	68.63	8.15	15.43	4.90	4.47	2.75	1.09	1.99	0.50	1.19	0.14	0.83	0.06
12	16.42	80.63	8.89	18.13	5.35	5.26	3.00	1.29	2.18	0.59	1.30	0.17	0.91	0.07
13			9.63	21.02	5.79	6.09	3.25	1.49	2.36	0.68	1.41	0.20	0.98	0.08
14			10.37	24.12	6.24	6.99	3.50	1.71	2.54	0.78	1.52	0.23	1.06	0.09
15			11.12	27.40	6.68	7.94	3.75	1.94	2.72	0.89	1.63	0.26	1.13	0.11
16			11.86	30.88	7.13	8.95	4.00	2.19	2.90	1.01	1.74	0.29	1.21	0.12
17			12.60	34.55	7.57	10.02	4.25	2.45	3.08	1.12	1.84	0.32	1.29	0.13
18			13.34	38.41	8.02	11.14	4.50	2.73	3.26	1.25	1.95	0.36	1.36	0.15
19			14.08	42.45	8.46	12.31	4.75	3.01	3.45	1.38	2.06	0.40	1.44	0.16
20			14.82	46.69	8.91	13.53	5.00	3.31	3.63	1.52	2.17	0.44	1.51	0.18
21			15.56	51.10	9.36	14.81	5.25	3.63	3.81	1.66	2.28	0.48	1.59	0.20
22			16.30	55.70	9.80	16.15	5.50	3.95	3.99	1.81	2.39	0.52	1.66	0.22
23			17.04	60.48	10.25	17.53	5.75	4.29	4.17	1.97	2.50	0.56	1.74	0.23
24			17.79	65.44	10.69	18.97	6.00	4.64	4.35	2.13	2.60	0.61	1.81	0.25
25			18.53	70.58	11.14	20.46	6.25	5.01	4.53	2.30	2.71	0.66	1.89	0.27
26			19.27	75.89	11.58	22.00	6.49	5.39	4.71	2.47	2.82	0.71	1.97	0.29
27					12.03	23.60	6.74	5.78	4.90	2.65	2.93	0.76	2.04	0.32
28					12.47	25.24	6.99	6.18	5.08	2.83	3.04	0.81	2.12	0.34
29					12.92	26.93	7.24	6.59	5.26	3.02	3.15	0.87	2.19	0.36
30					13.36	28.68	7.49	7.02	5.44	3.22	3.26	0.92	2.27	0.38
35					15.59	38.16	8.74	9.34	6.35	4.28	3.80	1.23	2.65	0.51
40					17.82	48.86	9.99	11.96	7.25	5.49	4.34	1.57	3.02	0.65
45							11.24	14.87	8.16	6.82	4.88	1.96	3.40	0.81
50							12.49	18.08	9.07	8.29	5.43	2.38	3.78	0.99
55							13.74	21.57	9.97	9.89	5.97	2.84	4.16	1.18
60							14.99	25.34	10.88	11.62	6.51	3.33	4.54	1.38
65							16.24	29.39	11.79	13.48	7.05	3.87	4.91	1.60
70							17.49	33.71	12.69	15.46	7.60	4.43	5.29	1.84
75		- 4141-	<u> </u>				18.74	38.31	13.60	17.57	8.14	5.04	5.67	2.09

Dimension du tuyau	3	,,	4	,,
Diamètre				
intérieur	2.9	9"	3.82	26''
Débit	Velocity	Pressure	Velocity	Pressure
(GPM	(FPS)	loss	(FPS)	loss
20	0.07	(PSI)	0.56	(PSI)
20	0.97	0.06	0.56	0.02
25	1.21	0.09	0.70	0.02
30	1.46 1.70	0.13 0.17	0.84 0.98	0.03
40	1.70	0.17	1.11	0.04
			1.11	
45 50	2.18	0.28 0.34	1.25	0.07 0.09
55	2.43	0.34	1.59	0.09
60	2.07	0.40	1.67	0.10
65	3.15	0.47	1.81	0.12
70	3.40	0.63	1.95	0.14
75	3.64	0.63	2.09	0.16
80	3.88	0.71	2.09	0.18
85	4.12	0.90	2.23	0.21
90	4.37	1.00	2.51	0.26
95	4.61	1.10	2.65	0.29
100	4.85	1.21	2.79	0.29
110	5.34	1.44	3.07	0.31
120	5.82	1.70	3.34	0.30
130	6.31	1.97	3.62	0.51
140	6.79	2,26	3.90	0.59
150	7.28	2.57	4.18	0.67
160	7.76	2.89	4.46	0.75
170	8.25	3.23	4.74	0.84
180	8.73	3.60	5.02	0.93
190	9.22	3,97	5.30	1.03
200	9.70	4.37	5.57	1.13
220	10.67	5.21	6.13	1.35
240	11.64	6.13	6.69	1.59
260	12.61	7.10	7.25	1.84
280	13.58	8.15	7.80	2.12
300	14.55	9.26	8.36	2.40
320	15.52	10.44	8.92	2.71
340	16.49	11.68	9.48	3.03
360	17.46	12.98	10.03	3.37
380	18.44	14.35	10.59	3.73
400	19.41	15.78	11.15	4.10
450			12.54	5.10
500			13.94	6.19

Dark zone indicates that velocity is more than 5' per second therefore this pipe size has to be used with caution. Velocity equation: V = 0.408 x flow (gpm) / (interior diameter (inch))<sup>2</sup>. Material coefficient for PVC schedule 80 pipe: 150 Pressure loss by friction in PSI for 100' of pipe equation:

Pressure loss = 0.433 x (0.2083 x (100/material coefficient)<sup>1.852</sup> x flow (gpm)<sup>1.852</sup>/interior diameter (inch)<sup>4.866)</sup>

## **COMMON CONVERSION FACTORS**

LENGTH	1 meter = 3.281 feet	1 foot= 0.3043 meters		
LENGIH	1 centimeter = 0.394 inches	1  inch = 2.54  centimeters		
SURFACE	$1 \text{ m}^2 = 10.7643 \text{ ft}^2$	$1 \text{ft}^2 = 0.093 \text{ m}^2$		
SURFACE	1 hectare $(10,000\text{m}^2) = 107 643 \text{ ft}^2 (2.471 \text{ acres})$	1 acre = $43 614 \text{ ft}^2 (0.405 \text{ hectares})$		
WEIGHT	1  kg  (1000g) = 2.21bs	1  lb = 0.45  kg		
WEIGHT	1g = 0.0353 onces	16 onces (pound) = $453.25g$		
	1 litre = 0.264 gallon US liq.	1 gallon US liq = 3.785 L		
VOLUME	1 gallon imp. = 1.2 gallon US	1 gallon US = $0.83$ gallon imp.		
VOLUME	$1 \text{m}^3 = 35.31 \text{ ft}^3$	1 ft <sup>3</sup> = 28.3 litres ou $0.028$ m <sup>3</sup>		
	$1 \text{m}^3$ of wate r= 1000 L of water	1 L of water = $0.001 \text{ m}^3$		
FLOW	1L/h = 0.0044 gallon/min	1 gallon/min = 227.12 L/h		
PPM (parts per million)	1 PPM = 1g / 1000 litres	1g/ L = 1000 ppm		
FC (described and all all all all	1 mS/cm (micro Siemens) = 1000 μS/cm (milli Si	emens)		
EC (electrical conductivity)	$1 \mu mhos/cm = 1 \mu S/cm$	1 mmhos/cm = 1  mS/cm		
WATER PRESSURE	1 foot of column @ $4^{\circ}$ C = 0.433 PSI	$1 \text{ PSI} = 2.306 \text{ feet of column } @ 4^{\circ}\text{C}$		
PHOSPHORUS	$P = P_2O_5 \times 0.4368$	$P_2O_5 = P \times 2.289$		
POTASSIUM	$K = K_2O \times 0.8301$	$K_2O = K \times 1.205$		

#### **SPAGHETTI TUBING CHART**

Water flow at the end of spaghetti 0.050" (interior diameter) in gallon per minute (GPM)

				Tube	length (ir	ich)			
	PSI	12"	18"	24"	30"	36"	42"	48"	60"
	3	0.0372	0.0275	0.0222	0.0188	0.0164	0.0147	0.0132	0.0112
	4	0.0435	0.0329	0.0268	0.0230	0.0202	0.0182	0.0166	0.0142
	5	0.0515	0.0385	0.0315	0.0270	0.0235	0.0212	0.0192	0.0165
	6	0.0575	0.0435	0.0355	0.0305	0.0267	0.0240	0.0218	0.0137
	7	0.0635	0.0480	0.0395	0.0337	0.0297	0.0267	0.0243	0.0208
	8	0.0695	0.0525	0.0435	0.0373	0.0328	0.0295	0.0270	0.0232
	9	0.0745	0.0565	0.0465	0.0402	0.0355	0.0320	0.0292	0.0250
	10	0.0790	0.0610	0.0500	0.0435	0.0385	0.0345	0.0318	0.0273
	11	0.0835	0.0640	0.0535	0.0460	0.0410	0.0372	0.0340	0.0294
	12	0.0890	0.0685	0.0570	0.0490	0.0435	0.0393	0.0360	0.0310
(PSI)	13	0.0950	0.0730	0.0600	0.0515	0.0457	0.0412	0.0377	0.0325
E :	14	0.0980	0.0755	0.0630	0.0545	0.0485	0.0438	0.0403	0.0348
Water pressure	15	0.1020	0.0790	0.0660	0.0570	0.0505	0.0467	0.0422	0.0365
ess	16	0.1120	0.0840	0.0695	0.0600	0.0530	0.0475	0.0435	0.0375
pr	17	0.1125	0.0865	0.0720	0.0625	0.0555	0.0505	0.0463	0.0400
ter	18	0.1170	0.0900	0.0750	0.0650	0.0580	0.0525	0.0480	0.0417
×a.	19	0.1180	0.0920	0.0775	0.0675	0.0600	0.0545	0.0503	0.0437
	20	0.1220	0.0950	0.0800	0.0695	0.0615	0.0560	0.0518	0.0450
	21	0.1260	0.0980	0.0825	0.0720	0.0640	0.0580	0.0535	0.0465
	22	0.1320	0.1025	0.0850	0.0740	0.0665	0.0600	0.0555	0.0480
	23	0.1350	0.1050	0.0880	0.0765	0.0685	0.0622	0.0572	0.0498
	24	0.1380	0.1080	0.0905	0.0790	0.0705	0.0642	0.0595	0.0520
	25	0.1430	0.1120	0.0930	0.0810	0.0722	0.0660	0.0605	0.0530
	26	0.1475	0.1150	0.0960	0.0835	0.0745	0.0680	0.0625	0.0545
	27	0.1520	0.1175	0.0990	0.0860	0.0770	0.0700	0.0640	0.0555
	28	0.1570	0.1220	0.1020	0.0870	0.0780	0.0710	0.0650	0.0565
	29	0.1580	0.1230	0.1030	0.0900	0.0810	0.0735	0.0680	0.0590
	30	0.1590	0.1250	0.1060	0.0920	0.0830	0.0755	0.0700	0.0615

## **USEFUL FORMULAS**

Water soluble fertilizer: to calculate a fertilizer quantity for a desired concentration (in ppm)	Fertilizer quantity (g) = $\frac{\text{Desired concentration (ppm)} \text{ x stock tank volume (litres) x dilution factor}}{\%}$ active ingredient x 10 Example: for 200 ppm of nitrogen of 20-8-20 in a 20L stock tank pail, with injector at 1:100: 200 ppm x 20L x 100 / (20 x 10) = 2,000 g of fertilizer (or 2 kg)
Liquid fertilizer: to calculate a liquid fertilizer quantity for a desired concentration (in ppm)	Quantity to dilute (ml) = Desired concentration (ppm) x stock tank volume (litres) x Dilution factor % active ingredient x 10 x liquid density (kg/l)  Example: for 200 ppm of nitrogen of 20-2-20 LIQUID at 0.250kg/l density in a 20L stock tank pail, with injector 1:100: 200 ppm x 20 L x 100 / (20 x 10 x 0.250) = 8,000 ml of fertilizer (or 8 L)
Concentration: (in ppm) according to a diluted fertilizer quantity	Concentration (ppm) = Fertilizer quantity (g) x % active ingredient x 10  Stock tank volume (litres) x dilution factor  Example: if we have 2,000 g of 20-8-20 in a 20L stock tank pail with injector at 1:100:  2000 g x 20 x 10 / (20 L x 100) = 200 ppm of nitrogen

For more useful greenhouse formulas and online calculators, please go to

"GREENHOUSE CALCULATION TOOLS"

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