

Application

All subsurface applications including:

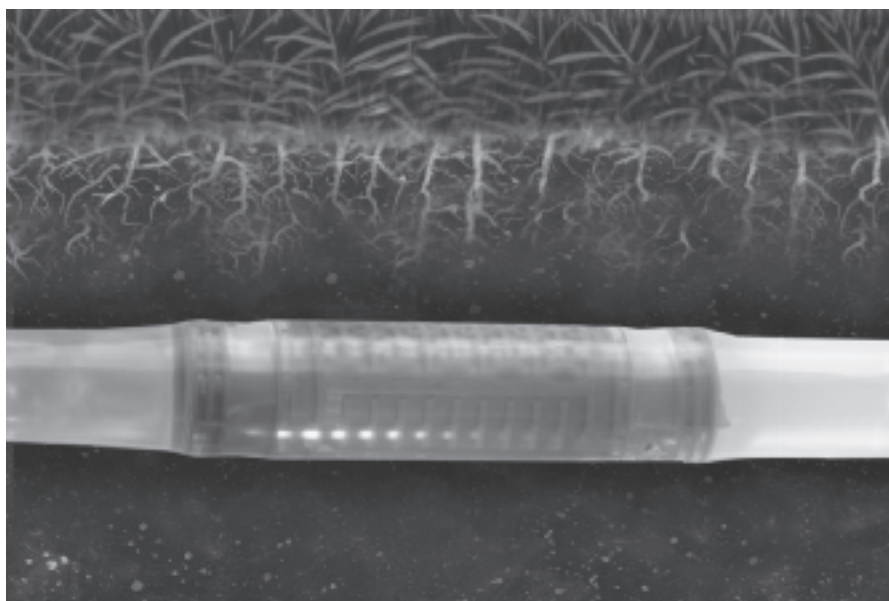
- Vineyards
- Orchards
- Row Crops

What is Subsurface Irrigation?

Traditional drip irrigation is found above the ground. Subsurface drip irrigation is simply drip irrigation buried below the surface of the ground. Any pipework conveying water underground runs the risk of root intrusion. Rootguard® technology combines Treflan® within the drip emitter to inhibit root growth. The herbicide is released at a uniform rate, maintaining sufficient concentration in the soil immediately around the dripper to deter roots from growing into the emitter. Most importantly, this gives year round protection regardless of whether the irrigation system is operated.

Storage

- It is important that the rolls of tube are installed below ground as close to the time of manufacture as possible. The TREFLAN® release rate is affected by the temperature, the higher the temperature the greater the release rate.
- When the rolls need to be stored prior to installation, they should be stored in a dry, well ventilated place out of direct sunlight. It is recommended that Rootguard® tube be installed as close as possible to the time of manufacture. Do not store for more than six months from the date of manufacture.



Clear tube shown for demonstration purposes only.

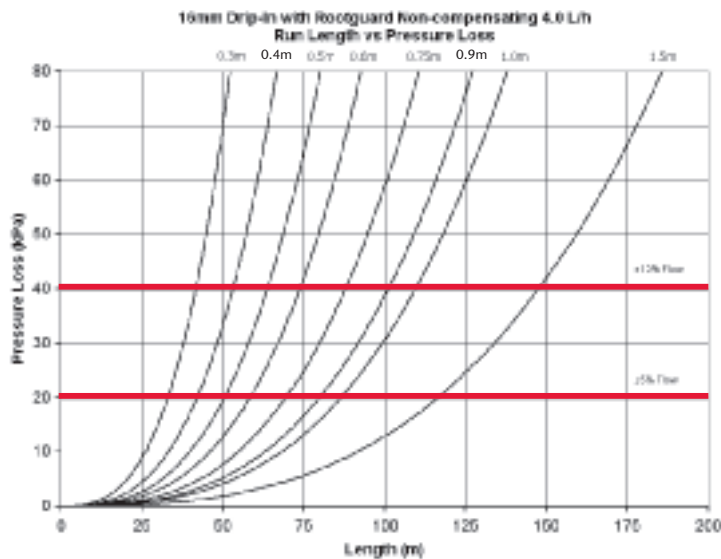
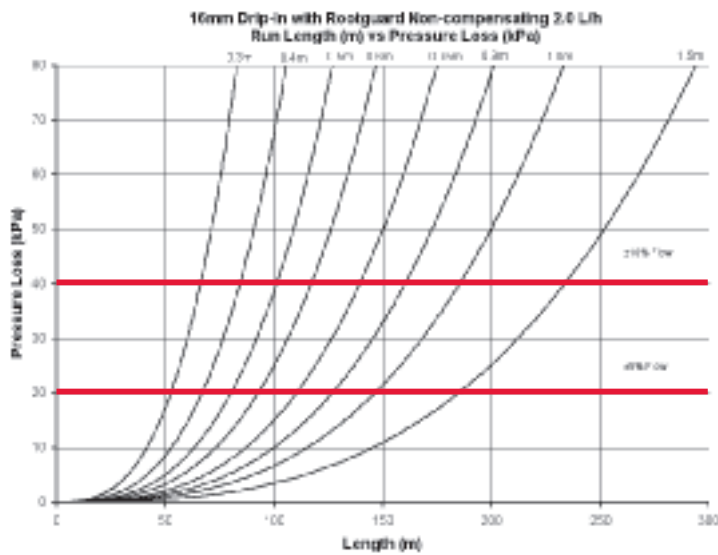
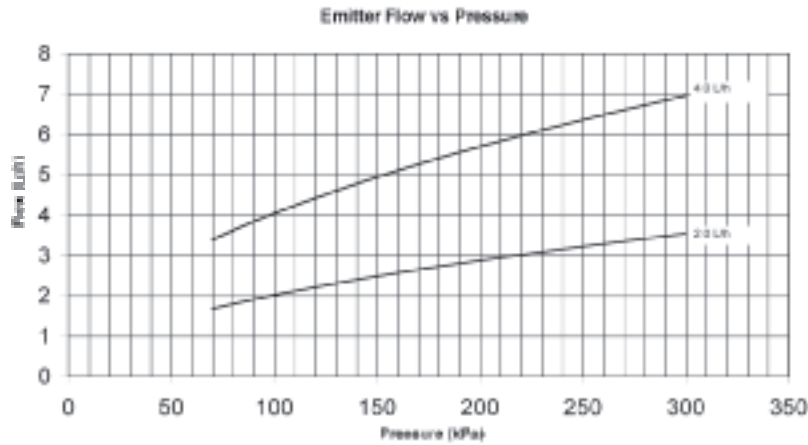
Features

- Conservation - Water and nutrients delivered directly to the root zone.
- Healthier, better quality plants - reduced risk of fungal disease.
- Less salt in the soil or the aquifer.
- Safe and efficient delivery of fertilisers.
- Longer life of the irrigation system protected from machines, vandalism, animals, UV and temperature fluctuations.
- Fewer weeds.
- Improved soil aeration.
- Dry soil surface so the operation of the irrigation system does not interfere with cultivating or harvesting.
- Water saving - No losses to evaporation, wind, run-off or misting.
- Lower maintenance costs.
- Labour savings.
- Available in Non-Compensated (2.0 L/h and 4.0 L/h), and Pressure Compensated (1.6L/h, 2.0 L/h, 2.4 L/h and 4.0 L/h) emitters.
- Australian made.
- Two outlet holes and large exit chamber reduces the risk of exit hole plugging.
- Available in 16mm and 20mm OD tubing, and 13mm ID tubing.
- Raised inlet on emitter helps to keep the emitter cleaner.
- Filtration requirement 120 micron or smaller.
- 10 year guarantee against root intrusion. (pro rata after 5 years)

Rootguard Reference Guide

Tube Size (mm)	Emitter Spacing - m								Emitter Flow Rate Lph			
	0.3	0.4	0.5	0.6	0.75	0.9	1.0	1.5	1.6	2.0	2.4	4.0
13 PC	✓	✓								✓		
16 Classic	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
16 PC	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
20 Classic	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
20 PC	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓

Rootguard® is a registered trademark of A.I. Innovations.
 Treflan® is a registered trademark of Dow Elanco.
 For further information on Drip-In™ with Rootguard® refer to the web sites www.toro.com.au and www.geoflow.com



±10% Flow variation on flat ground

±5% Flow variation on flat ground

16mm Drip-In with Rootguard Classic

Nom. Flow (Lph)	2.0	4.0
Exponent, x	0.592	1.245
Constant, k_p	0.52	0.507
Barb Factor k_b	0.90	0.90
Max ^m Pressure (kPa)	350	350

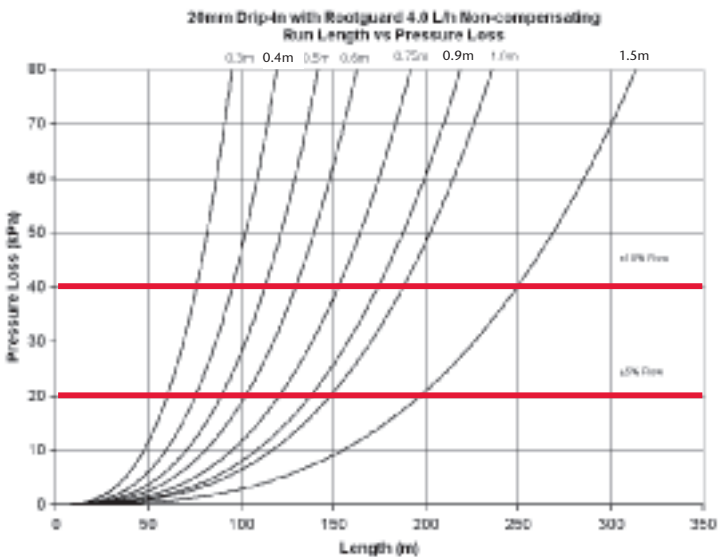
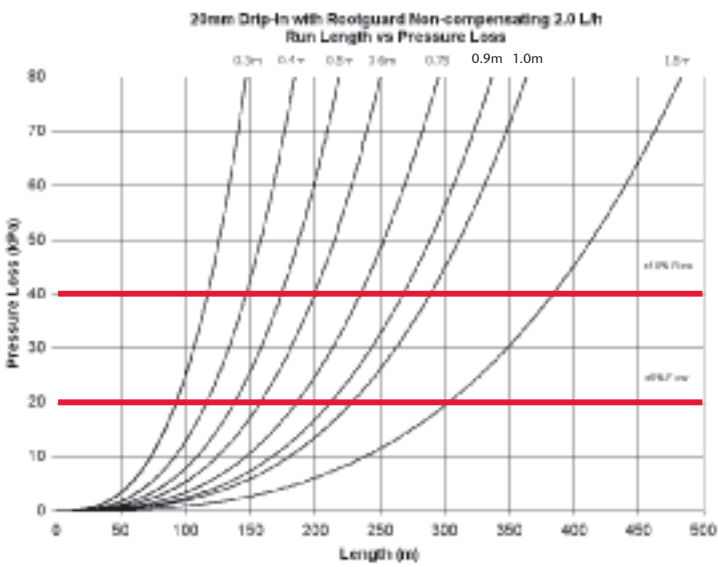
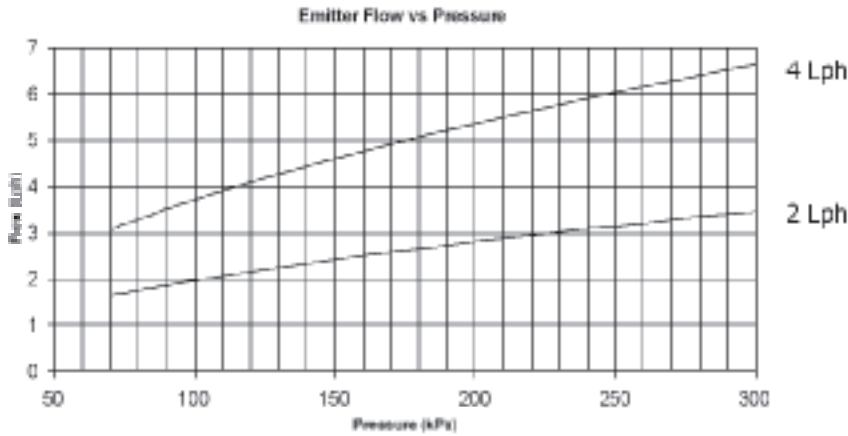
Tube Dimensions

Nom. Diam (mm)	ID (mm)	OD (mm)	Coil Length (m)
16	14	16	450

Ordering Information

16mm Drip-In with ROOTGUARD® - Coil Length 450 metres

Flowrate	0.3 m	0.4 m	0.5 m	0.6 m	0.75 m	0.9 m	1.0 m	1.5 m
2.0 L/h	DGN1620030	DGN1620040	DGN1620050	DGN1620060	DGN1620075	DGN1620090	DGN1620100	DGN1620150
4.0 L/h	DGN1640030	DGN1640040	DGN1640050	DGN1640060	DGN1640075	DGN1640090	DGN1640100	DGN1640150



±10% Flow variation on flat ground

±5% Flow variation on flat ground

20mm Drip-In Classic with Rootguard		
Nom. Flow (Lph)	2.0	4.0
Exponent, x	0.507	0.529
Constant, k_p	0.6114	1.092
Barb Factor k_b	0.35	0.35
Max ^m Pressure (kPa)	350	350

Tube Dimensions			
Nom. Diam (mm)	ID (mm)	OD (mm)	Coil Length (m)
20	18	20	300

Ordering Information

20mm Drip-In with Rootguard® - Coil length 300 metres

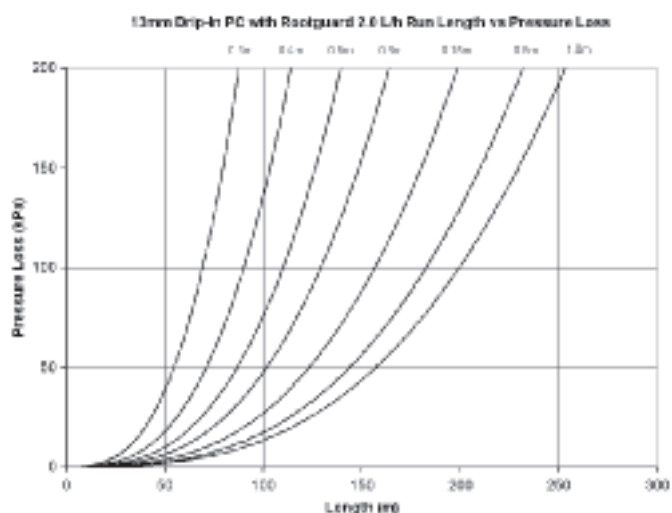
Flow rate	0.3 m	0.4 m	0.5 m	0.6 m	0.75 m	0.9 m	1.0 m	1.5 m
2.0 L/h	DGN2020030	DGN2020040	DGN2020050	DGN2020060	DGN2020075	DGN2020090	DGN2020100	DGN2020150
4.0 L/h	DGN2040030	DGN2040040	DGN2040050	DGN2040060	DGN2040075	DGN2040090	DGN2040100	DGN2040150

Application

Designed to be buried, this subsurface drip tube is made to suit Australian standard 13mm barbed fittings. The pressure compensating emitter makes it useful in undulating terrain or where longer runs are required.

Features

- Suits standard 13mm barbed fittings.
- Tube comes standard in black polyethelene with a red stripe.
- For non-potable applications, tube is also available in Lilac and red stripe.
- Most Australian States require a Reduced Pressure Zone device to be installed, check with local water Authorities.
- 10 year (pro-rated) warranty against root intrusion.



Tube Dimensions				
Nom. Diam (mm)	ID (mm)	OD (mm)	Coil Length (m)	Max ^m Pressure (kPa)
13	12.9	15.4	100,200	300

Maximum Recommended Run Length (m)*		
Inlet Pressure (kPa)	Spacing (m)	
	0.30	0.40
150	50	66
200	65	85
250	72	98
300	80	110
Nominal Flow (Lph)	2.0	2.0

* Based on minimum pressure of 100 kPa. All run lengths calculated on flat ground.

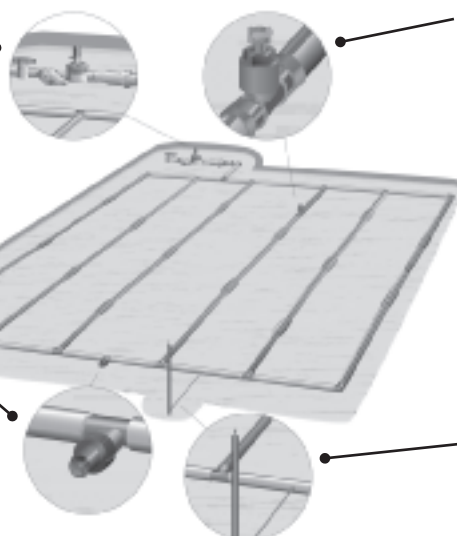
Typical Subsurface Drip System

Drip Zone Valve Assembly

- Place the assembly before each drip zone.
- Assembly to include ball valve, Y-filter, control valve, pressure regulator and necessary fittings.

Automatic Line Flushing Valve

- Provides for system flushing each time the system is started.
- Install at furthest point from the water source.
- Install in valve box with gravel bed capable of absorbing about 4 litres of water.



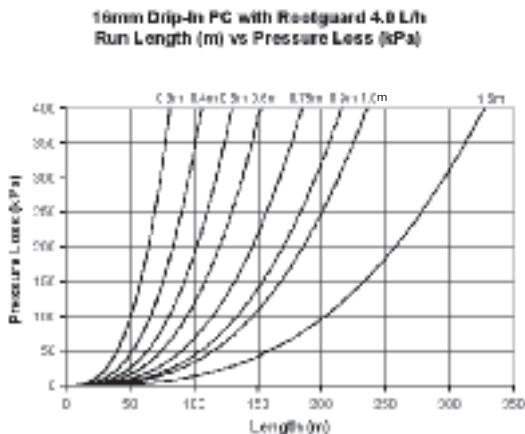
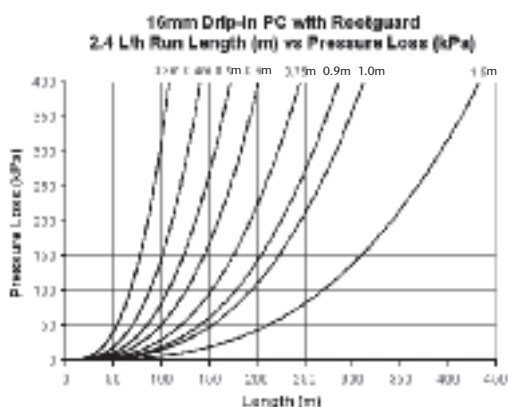
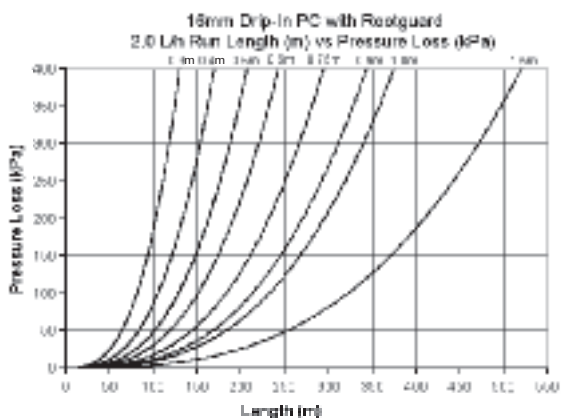
Air/Vacuum Relief Valves

- Essential to provide vacuum relief within the irrigation system. (Part Number 101VB15)
- Recommended on all high points of an irrigation system to provide vacuum relief at system shutdown.

Operation Indicator

- A visual indicator that pops-up during each subsurface irrigation cycle. (Part Number DL-MP9, Drip Tube Operation Indicator)

Ordering Information	
Code	Description
DGC1320030-100	13mm Drip-In™ PC with Rootguard® 2.0 L/h , 0.3m spacing, 100m roll
DGC1320040-100	13mm Drip-In™ PC with Rootguard® 2.0 L/h, 0.4m spacing, 100m roll
DGC1320030-200	13mm Drip-In™ PC with Rootguard® 2.0 L/h, 0.3m spacing, 200m roll
DGC1320040-200	13mm Drip-In™ PC with Rootguard® 2.0 L/h, 0.4m spacing, 200m roll
GLC1320030-200	13mm Lilac Drip-In™ PC with Rootguard®, 2.0 Lph, 0.3m spacing, 200m roll
GLC1320040-200	13mm Lilac Drip-In™ PC with Rootguard®, 2.0 Lph, 0.4m spacing, 200m roll



16mm Drip-In PC with Rootguard - Recommended Maximum Run Length (m)

Inlet Pressure (kPa)	Spacing (m)																							
	0.3		0.4		0.5		0.6		0.75		0.9		1.0		1.5									
	Length (m)																							
150	58	48	36	76	63	47	92	77	58	108	90	68	130	109	82	152	126	96	166	138	104	230	190	144
200	74	61	46	95	80	60	117	97	73	137	113	86	165	138	104	193	160	121	211	175	132	292	242	184
250	85	70	53	110	91	69	134	111	84	157	131	98	190	158	119	222	184	139	242	201	152	335	278	211
300	93	77	58	121	100	76	148	123	93	173	144	109	210	174	132	245	203	154	266	222	167	370	308	232
350	100	83	63	130	108	82	159	132	100	187	156	117	226	188	142	264	220	166	288	239	181	400	332	251
400	107	89	67	139	115	87	169	141	106	199	165	125	241	200	151	281	233	177	307	255	193	425	354	267
Nom. Flow L/h	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0

Based on minimum pressure of 100 kPa. All run lengths calculated on flat ground.

16mm Drip-In PC with Rootguard

Nom. Flow (Lph)	2.0	2.4	4.0
Exponent*, x	0	0	0
Constant, k _p	1.82	2.25	3.67
Barb factor, k _b	2.07	2.07	2.07

Tube Dimensions

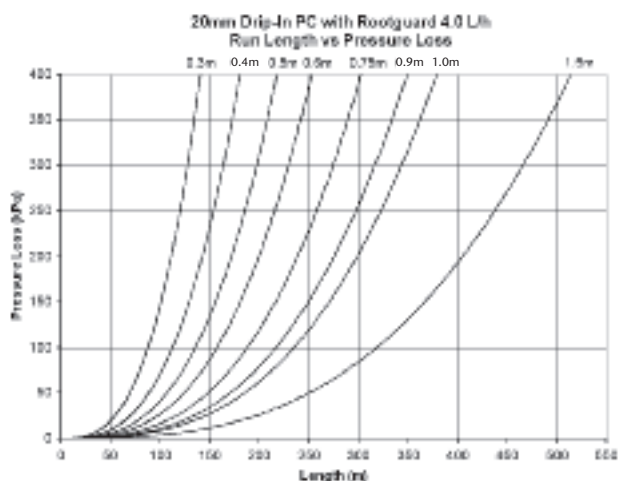
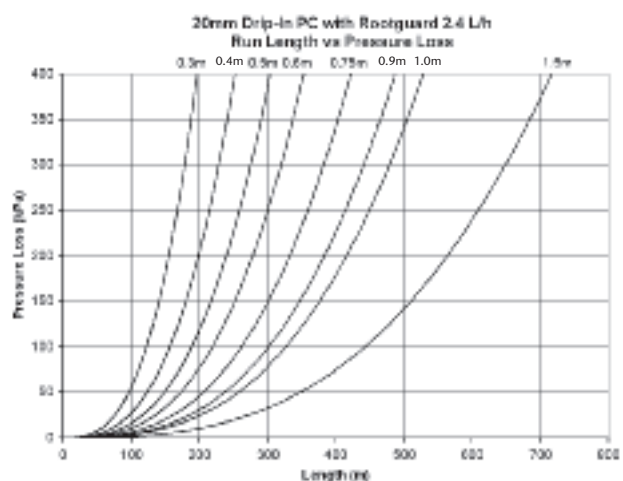
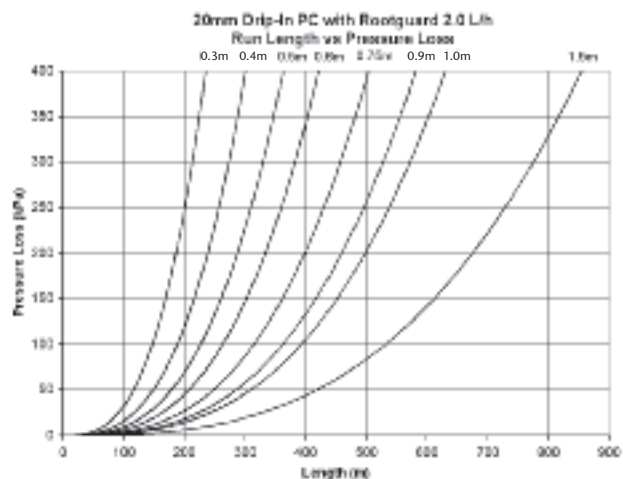
Nom. Diam (mm)	ID (mm)	OD (mm)	Coil Length (m)	Max ^m Pressure (kPa)
16	14	16	450	350

Ordering Information

16mm Drip-In PC with Rootguard® - Coil Length 450 metres

Flowrate	0.3 m	0.4 m	0.5 m	0.6 m	0.75 m	0.9 m	1.0 m	1.5 m
2.4 L/h	DGC1624030	DGC1624040	DGC1624050	DGC1624060	DGC1624075	DGC1624090	DGC1624100	DGC1624150
4.0 L/h	DGC1640030	DGC1640040	DGC1640050	DGC1640060	DGC1640075	DGC1640090	DGC1640100	DGC1640150

* Customised spacings are available on request.



20mm Drip-In PC with Rootguard - Recommended Maximum Run Length (m)

Inlet Pressure (kPa)	Spacing (m)																							
	0.3			0.4			0.5			0.6			0.75			0.9			1.0			1.5		
150	105	87	63	135	112	80	162	135	97	188	156	112	224	186	134	258	215	154	279	232	167	378	315	225
200	133	111	80	170	142	102	205	171	122	238	198	142	284	236	170	327	272	196	355	295	212	479	400	288
250	153	127	91	195	163	117	235	196	141	273	227	164	326	272	195	376	313	225	408	339	244	552	460	331
300	168	140	100	215	180	129	259	216	155	301	251	180	360	300	215	415	346	249	449	375	270	609	509	366
350	181	151	109	232	194	139	279	234	167	325	271	194	387	324	233	447	373	268	485	405	291	657	549	394
400	193	161	115	247	206	148	297	248	178	345	289	207	412	345	248	475	398	286	516	432	310	699	586	420
Nom. Flow Lph	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0	2.0	2.4	4.0

Based on minimum pressure of 100kPa. All run lengths calculated on flat ground.

20mm Drip-In PC with Rootguard			
Nom. Flow (Lph)	2.0	2.4	4.0
Exponent*, x	0.05	0	0.0256
Constant, k _p	1.625	2.426	3.764
Barb factor, k _b	0.75	0.75	0.75

* Exponent determined within 100-400 kPa.

Tube Dimensions				
Nom. Diam (mm)	ID (mm)	OD (mm)	Coil Length (m)	Max ^m Pressure (kPa)
20	18	20	300	400

Ordering Information

20mm Drip-In PC with Rootguard® - Coil Length 300 metres

Flow rate	0.3 m	0.4 m	0.5 m	0.6 m	0.75 m	0.9 m	1.0 m	1.5 m
2.4 L/h	DGC2024030	DGC2024040	DGC2024050	DGC2024060	DGC2024075	DGC2024090	DGC2024100	DGC2024150
4.0 L/h	DGC2040030	DGC2040040	DGC2040050	DGC2040060	DGC2040075	DGC2040090	DGC2040100	DGC2040150