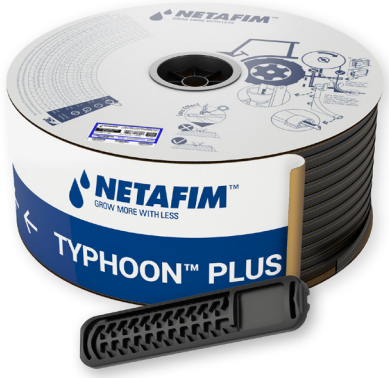
Typhoon™ Plus

Integral non-pressure-compensated high clogging resistance dripper, for semi-permanent applications.

→ 12125 - 12150 - 12180 - 16080 - 16100 - 16125
16150 - 16180 - 22080 - 22100 - 22135 - 22150
22180 - 25135 - 25150



High clogging resistance

Wide filtration area

Wide water passages

Benefits & Features

→ **High clogging resistance**
Even with challenging water quality, with self-cleaning labyrinth that flushes debris, throughout operation.

→ **Wide filtration area**
Ensures optimal performance even under harsh water conditions, preventing the entrance of sediment into the labyrinths.

→ **Wide water passages**
TurbuNext™ labyrinth ensures wide water passages, large deep and wide cross-section that improves clogging resistance.

→ **ReGen™ (optional*)**
Dripline with ReGen™, the highest quality recycled dripline, successfully addressing the supply chain sustainability needs of today's growers.

→ **InsectShield™ (optional**)**
Innovative dripline capable of protecting itself against insect bites without using toxic components, based on essential oils integrated into the pipe resin during manufacturing.

**Please note that this option is available only in countries where it is approved by regulatory authorities. Please contact your Netafim™ local representative to check availability.

Specifications

- Maximum operating pressure according to driplines wall thickness and diameter. See tables below.
- Recommended filtration: depending on dripper flow rate. Filtration method selected based on the kind and concentration of dirt particles contained in the water. Wherever sand exceeding 2 ppm exists in the water, a Hydrocyclone should be installed before the main filter. Where sand/silt/clay solids exceed 100 ppm, pre treatment it should be applied following Netafim™ expert instructions.
- TurbuNext™ labyrinth with superior performance.
- Weldable into thin wall driplines (0.20, 0.25, 0.31, 0.38, 0.45 mm).
- Injected dripper, very low CV.
- High UV resistant. Resistant to standard nutrients used in agriculture.
- Compliance ISO 9261 international standards.
- Typhoon™ Plus ReGen™ products are put through a full quality inspection process, delivering to the market the toughest driplines without compromising on quality.

*ReGen™ is currently available in few markets, and we are in the process of making it available in all the markets.
Please consult your local Netafim™ representative for availability.

→ Drippers technical data

Flow rate* (l/h)	Max. working pressure (bar)**	Water passages dimensions width-depth-length (mm)	Filtration area (mm²)	Constant K	Exponent X	Recommended filtration (micron)/(mesh)
0.50	1.0 up to 3.0	0.45 x 0.45 x 34	21	0.177	0.45	130/120
0.70		0.52 x 0.51 x 34	22	0.247	0.45	130/120
1.00		0.60 x 0.59 x 34	24	0.355	0.45	200/80
1.60		0.66 x 0.63 x 18	26	0.567	0.45	200/80
2.20		0.77 x 0.72 x 18	26	0.780	0.45	200/80

*Flow rate at 1.0 bar pressure ** According to driplines diameter and wall thickness

→ Driplines technical data

Model	Inside diameter (mm)	Wall thickness (mm)	Outside diameter (mm)	Max. working pressure (bar)	Max. flushing pressure (bar)	KD
12125	11.80	0.31	12.42	2.5	2.9	0.20
12150	11.80	0.38	12.56	3.0	3.5	0.20
12180	11.80	0.45	12.70	3.2	3.7	0.20
16080	16.20	0.20	16.60	1.2	1.4	0.10
16100	16.20	0.25	16.70	1.4	1.6	0.10
16125	16.20	0.31	16.82	1.8	2.1	0.10
16150	16.20	0.38	16.96	2.2	2.5	0.10
16180	16.20	0.45	17.10	2.5	2.9	0.10
22080	22.20	0.20	22.60	1.0	1.2	0.02
22100	22.20	0.25	22.70	1.1	1.3	0.02
22135	22.20	0.34	22.88	1.5	1.7	0.02
22150	22.20	0.38	22.96	1.8	2.1	0.02
22180	22.20	0.45	23.10	2.1	2.4	0.02
25135	25.00	0.34	25.68	1.2	1.4	0.01
25150	25.00	0.38	25.76	1.4	1.6	0.01

→ Driplines package data (on carton coil)

Model	Wall thickness (mm)	Distance between drippers (m)	Coil length (m)	Average* coil weight (kg)	Coils per pallet (units)	Coils in a 40 feet container (units)	Total in a 40 feet container (m)
12125	0.31	0.15 to 0.25	1200	13.4	16	640	768000
		0.30 to 1.00	1300	14.5			832000
12150	0.38	0.15 to 0.25	1100	15.1	16	640	704000
		0.30 to 1.00	1100	15.1			704000
12180	0.45	0.15 to 0.25	650	12.3	16	640	416000
		0.15 to 0.25	700	13.0			448000
16080	0.20	0.15 to 0.25	2400	23.4	16	640	1536000
		0.30 to 1.00	2500	24.4			1600000
16100	0.25	0.15 to 0.25	1900	23.2	16	640	1216000
		0.30 to 1.00	2000	24.5			1280000
16125	0.31	0.15 to 0.25	1350	20.6	16	640	864000
		0.30 to 1.00	1600	24.4			1024000
16150	0.38	0.15 to 0.25	1200	22.5	16	640	768000
		0.30 to 1.00	1300	24.4			832000
16180	0.45	0.15 to 0.25	1100	20.6	16	640	704000
		0.30 to 1.00	1200	22.5			768000
22080	0.20	0.15 to 0.25	1500	20.0	16	640	960000
		0.30 to 1.00	1700	22.7			1088000
22100	0.25	0.15 to 0.25	1200	20.0	16	640	768000
		0.30 to 1.00	1500	25.0			960000
22135	0.34	0.15 to 0.25	1100	25.1	16	640	704000
		0.30 to 1.00	1100	25.1			704000
22150	0.38	0.15 to 0.25	1000	25.5	16	640	640000
		0.30 to 1.00	1000	25.5			640000
22180	0.45	0.15 to 0.25	800	24.3	16	640	512000
		0.30 to 1.00	900	27.3			576000
25135	0.34	0.15 to 0.25	900	23.3	16	640	576000
		0.30 to 1.00	1000	25.8			640000
25150	0.38	0.15 to 0.25	900	26.0	16	640	576000
		0.30 to 1.00	900	26.0			576000

* Calculated weight average. For further details see “Average Coil Weight Disclaimer”.

Drippers flow rate vs working pressure

In order to calculate the right flow rate of each dripper, under different working pressures, we use the following formula:
$Q = K * P^X$

Where:
Q = Dripper flow rate (liters/hour)
K = Constant (each dripper has his singular constant and must be defined by the dripper producer)
P = Real working pressure (meter)
X = Exponent (each dripper has its singular exponent and must be declared and defined by the dripper producer)

*ISO 9261 require from the manufacturer to declare the constant K and dripper exponent

Non-pressure-compensated drippers provide flow adequate to the pressure it is exposed to, according to the formula presented above. In order to simplify the calculations and understandings of the linkage between the flow and the pressure, a table with the flow rates at different working pressures is presented here for each of the drippers presented in this document.

Flow rate (l/h) vs pressure (bar)

In all driplines models

Flow rate* (l/h)	Pressure (bar)									
	0.4	0.7	1.0	1.3	1.6	1.9	2.2	2.5	2.8	3.0
0.50	0.33	0.42	0.50	0.56	0.62	0.67	0.71	0.75	0.79	0.82
0.70	0.46	0.59	0.70	0.78	0.86	0.93	0.99	1.05	1.11	1.14
1.00	0.66	0.85	1.00	1.13	1.24	1.34	1.43	1.51	1.59	1.64
1.60	1.06	1.36	1.60	1.80	1.97	2.13	2.28	2.41	2.54	2.62
2.20	1.46	1.87	2.20	2.47	2.72	2.93	3.13	3.32	3.49	3.60

*Nominal flow rate at 1.0 bar pressure

Max. lateral length

Flow Variation (FV) expresses the flow variation between the dripper “sensing” the highest pressure and the one “sensing” the lowest pressure in an irrigation block (zone).

These drippers will not always be the first and last drippers on the dripline.
$FV\ \% = (Q_{max} - Q_{min}) / Q_{max} * 100$

*International standards define 10% flow variation to be considered as uniform irrigation.

In order to calculate the maximum run lengths that can be planned for specific dripline (considering all the hydraulic factors influencing the flow within the same dripline), we use a calculation software that was developed by Netafim™ based on Darcy-Waisbach formulas + years of design experience and cooperation with academic institutes.

All the tables presented in this document are for initial reference only; the exact run length of the driplines is obtained from design software that considers various hydraulic factors in the entire system.

There might be small variance between the different software’s in the market due to the calculation method and assumptions each software is using. For an initial estimate of the dripline length, the data that is presented in this document (within the tables shown) is sufficiently accurate.

Non-pressure-compensated drippers of Netafim™ will provide different flow according to the real working pressure, therefore, the influencing factors will be: the pressure that each dripper in the dripline is exposed to, and the allowed flow variation the dripline is designed to, which in most cases is defined as 10% difference in flow, according to the international standards, and / or any other limitation that the customer / planner will prefer to design while considering the crop needs and area topography.

The following tables are only displayed at one inlet pressure for each dripline, since in non-pressure-compensated drippers the flow varies according to the pressure. There might be differences in run lengths with different inlet pressures; however for an initial estimate of the dripline length, the data that is presented in this document (within the tables shown) is sufficiently accurate.

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 12125/12150/12180 • ID 11.8 mm • Kd 0.20 • Flow rate 0.50 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	80	98	112	122	129	135	139	144	147
Uphill	1%	90	116	137	155	170	182	194	204	213
Flat terrain	0	102	136	166	194	220	244	266	288	309
Downhill	-1%	110	152	191	228	264	299	333	366	400
	-2%	120	170	219	267	314	362	410	457	506

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 12125/12150/12180 • ID 11.8 mm • Kd 0.20 • Flow rate 0.70 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	68	85	98	108	116	123	128	133	136
Uphill	1%	75	97	115	131	144	157	167	176	186
Flat terrain	0	82	110	134	157	178	197	215	233	250
Downhill	-1%	87	120	150	179	206	232	258	284	308
	-2%	94	132	168	204	238	272	306	340	375

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 12125/12150/12180 • ID 11.8 mm • Kd 0.20 • Flow rate 1.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	56	71	83	93	101	108	114	119	123
Uphill	1%	60	79	94	108	119	130	140	149	158
Flat terrain	0	65	87	107	125	141	156	171	185	198
Downhill	-1%	68	93	116	138	158	178	197	216	234
	-2%	72	101	127	153	178	202	227	251	275

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 12125/12150/12180 • ID 11.8 mm • Kd 0.20 • Flow rate 1.60 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	43	56	66	75	82	89	94	99	104
Uphill	1%	45	60	72	83	93	102	110	117	124
Flat terrain	0	48	65	79	93	105	116	126	138	147
Downhill	-1%	50	68	84	99	113	127	141	154	166
	-2%	52	72	90	108	124	141	157	173	188

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 12125/12150/12180 • ID 11.8 mm • Kd 0.20 • Flow rate 2.20 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	36	47	56	63	70	76	82	86	91
Uphill	1%	37	50	60	69	77	85	93	99	105
Flat terrain	0	39	53	64	76	85	95	104	113	120
Downhill	-1%	40	55	68	80	91	102	113	122	133
	-2%	41	57	72	85	98	111	123	135	147

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 16080/16100/16125/16150/16180 • ID 16.2 mm • Kd 0.10 • Flow rate 0.50 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	117	134	144	150	154	158	159	161	162
Uphill	1%	146	180	205	225	241	253	264	272	279
Flat terrain	0	180	239	291	338	382	424	462	500	536
Downhill	-1%	209	292	372	449	525	601	676	752	827
	-2%	241	352	464	198	179	172	167	165	163

*Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 16080/16100/16125/16150/16180 • ID 16.2 mm • Kd 0.10 • Flow rate 0.70 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	103	121	133	141	146	151	154	156	159
Uphill	1%	123	154	178	198	214	227	238	248	256
Flat terrain	0	145	193	235	274	309	342	374	404	433
Downhill	-1%	163	227	286	344	400	456	510	565	619
	-2%	184	265	345	425	506	195	181	175	170

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 16080/16100/16125/16150/16180 • ID 16.2 mm • Kd 0.10 • Flow rate 1.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	88	106	119	128	135	141	145	148	151
Uphill	1%	101	128	150	168	183	196	208	219	227
Flat terrain	0	115	153	186	217	245	272	297	320	344
Downhill	-1%	126	174	218	261	301	342	381	419	458
	-2%	139	197	254	310	365	421	478	224	194

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 16080/16100/16125/16150/16180 • ID 16.2 mm • Kd 0.10 • Flow rate 1.60 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	70	87	99	110	117	124	129	134	138
Uphill	1%	77	100	118	134	147	159	170	179	188
Flat terrain	0	85	113	138	161	182	202	220	239	255
Downhill	-1%	91	124	155	184	212	239	265	291	316
	-2%	98	137	174	211	246	281	316	351	386

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 16080/16100/16125/16150/16180 • ID 16.2 mm • Kd 0.10 • Flow rate 2.20 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	59	74	86	96	104	111	117	122	126
Uphill	1%	64	83	99	113	125	136	146	155	163
Flat terrain	0	69	92	113	132	149	165	180	194	209
Downhill	-1%	73	99	124	147	168	189	209	229	248
	-2%	78	108	136	164	190	216	242	268	293

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 22080/22100/22135/22150/22180 • ID 22.2 mm • Kd 0.02 • Flow rate 0.50 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	149	157	161	164	165	166	166	167	167
Uphill	1%	220	254	275	289	299	306	311	316	318
Flat terrain	0	327	427	515	595	670	740	806	870	931
Downhill	-1%	430	608	785	964	403	365	350	340	335
	-2%	211	171	164	162	160	159	158	158	157

*Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 22080/22100/22135/22150/22180 • ID 22.2 mm • Kd 0.02 • Flow rate 0.70 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	139	151	157	160	162	164	165	166	166
Uphill	1%	192	227	251	268	280	290	297	302	307
Flat terrain	0	264	345	416	482	542	599	652	704	753
Downhill	-1%	330	461	588	716	842	971	425	380	361
	-2%	405	194	172	166	163	161	160	159	159

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 22080/22100/22135/22150/22180 • ID 22.2 mm • Kd 0.02 • Flow rate 1.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	126	141	149	154	158	160	162	163	164
Uphill	1%	163	197	222	240	254	266	276	284	290
Flat terrain	0	209	274	330	382	430	475	518	559	597
Downhill	-1%	250	345	436	526	614	702	790	879	969
	-2%	296	427	206	179	170	167	164	162	161

*Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 22080/22100/22135/22150/22180 • ID 22.2 mm • Kd 0.02 • Flow rate 1.60 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	107	124	135	143	148	151	154	157	159
Uphill	1%	129	160	183	202	217	230	242	250	259
Flat terrain	0	155	203	245	284	319	353	384	415	444
Downhill	-1%	177	241	302	360	418	474	530	585	640
	-2%	201	284	366	449	232	190	178	173	169

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 22080/22100/22135/22150/22180 • ID 22.2 mm • Kd 0.02 • Flow rate 2.20 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	94	111	123	132	139	144	147	150	153
Uphill	1%	109	137	158	176	191	204	215	225	234
Flat terrain	0	127	166	200	232	260	288	314	338	363
Downhill	-1%	141	191	237	282	325	367	409	450	490
	-2%	157	219	279	339	398	459	519	198	185

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 25135/25150 • ID 25.0 mm • Kd 0.01 • Flow rate 0.50 l/h • Inlet pressure 1.0 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	109	110	111	112	112	113	112	113	113
Uphill	1%	192	206	212	216	218	220	221	221	222
Flat terrain	0	393	512	616	712	800	883	962	1038	1110
Downhill	-1%	633	238	224	218	215	214	212	212	211
	-2%	108	106	105	105	104	104	104	104	104

*Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 25135/25150 • ID 25.0 mm • Kd 0.01 • Flow rate 0.70 l/h • Inlet pressure 1.0 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	107	110	110	111	112	112	112	113	113
Uphill	1%	178	195	204	210	214	216	218	220	220
Flat terrain	0	318	414	498	575	647	714	778	840	898
Downhill	-1%	471	682	242	228	221	218	215	214	213
	-2%	111	107	106	106	105	104	105	104	104

*Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 25135/25150 • ID 25.0 mm • Kd 0.01 • Flow rate 1.00 l/h • Inlet pressure 1.0 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	103	107	109	111	111	111	111	112	112
Uphill	1%	159	180	192	201	206	209	213	214	216
Flat terrain	0	252	328	395	457	514	567	618	666	713
Downhill	-1%	346	492	639	261	238	228	223	220	218
	-2%	120	110	108	107	106	105	105	104	104

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 25135/25150 • ID 25.0 mm • Kd 0.01 • Flow rate 1.60 l/h • Inlet pressure 1.0 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	94	102	105	108	109	110	110	111	112
Uphill	1%	134	156	172	183	190	197	201	204	207
Flat terrain	0	187	244	294	339	381	421	458	494	529
Downhill	-1%	237	331	422	514	606	699	259	243	234
	-2%	295	123	113	110	108	107	106	105	105

Max. lateral length (meters) at different slopes - 10% flow variation

Typhoon™ Plus • 25135/25150 • ID 25.0 mm • Kd 0.01 • Flow rate 2.20 l/h • Inlet pressure 1.0 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
	2%	87	97	102	105	107	108	109	110	110
Uphill	1%	116	139	155	167	176	183	189	194	198
Flat terrain	0	153	199	239	277	311	344	374	404	432
Downhill	-1%	185	256	324	391	457	524	590	658	289
	-2%	222	322	124	115	112	109	108	107	106

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