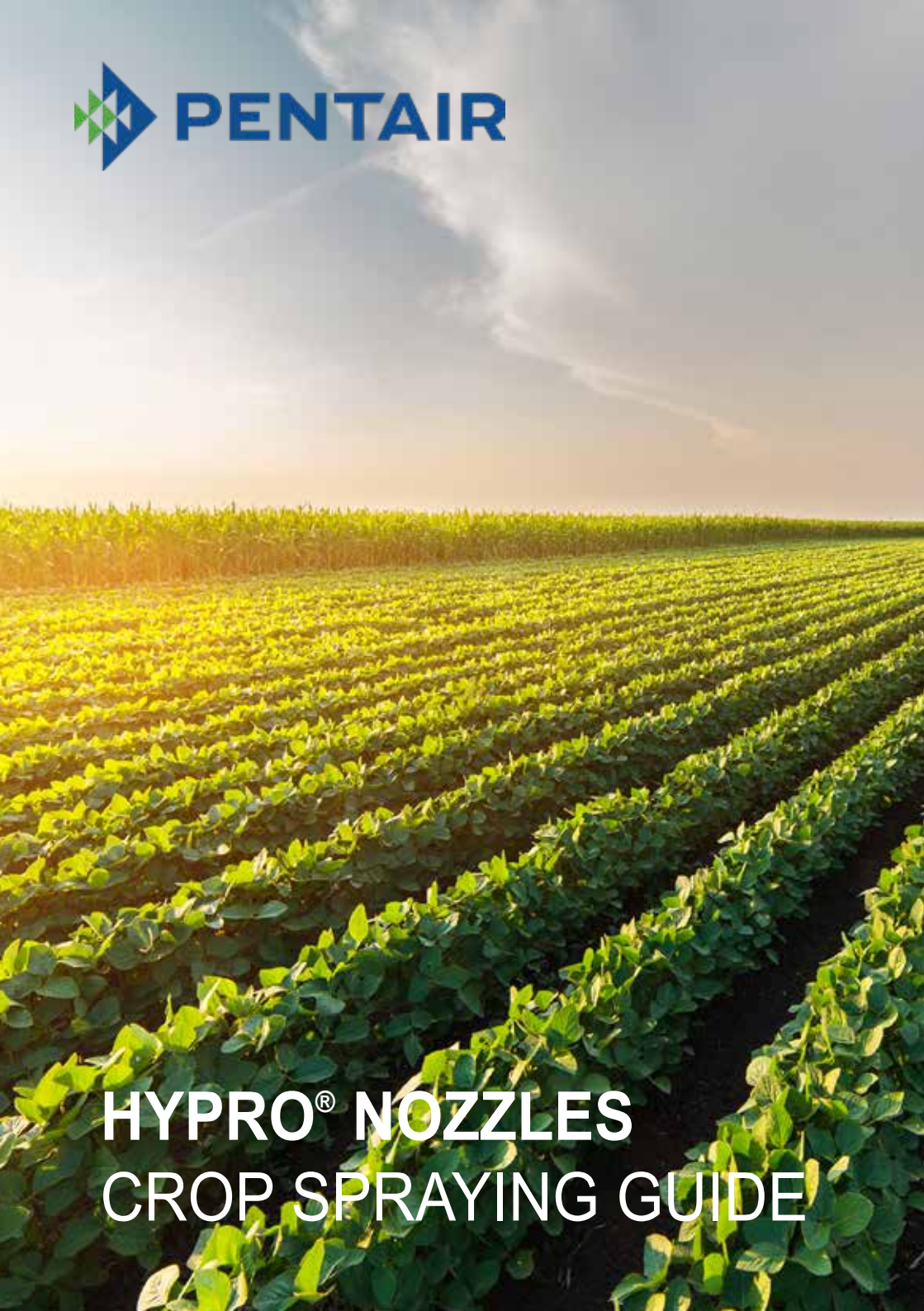


The background of the entire page is an aerial photograph of a vast agricultural field. The foreground and middle ground are filled with rows of green soybean plants, illuminated by the warm, golden light of a low sun, creating a strong lens flare effect. In the distance, a line of taller corn plants marks the horizon under a sky with soft, wispy clouds.

HYPRO[®] NOZZLES

CROP SPRAYING GUIDE

Hypro Spray Nozzles have been manufactured for 70+ years, initially under the Lurmark name and now the Hypro® brand which is owned by Pentair.

Pentair is also the leading international producer of pumps for agriculture sold under Hypro®, Shurflo® and Berkeley® brand names. Hypro nozzles, pumps and sprayer components are fitted by the world's premier manufacturers of agricultural sprayers.

Pentair is a \$4 billion company with 10,000 employees operating from 120 locations across 25 countries. We deliver a comprehensive range of smart, sustainable water solutions to homes, business and industry around the world. Our industry leading and proven portfolio of solutions enable our customers to access clean, safe water.



HYPRO EU LIMITED

Unit 9, Bourn Quarter, Wellington Way
Bourn, Cambridge CB23 7FW, UK

E-mail: hypro.service@pentair.com

HYPRO-EU.COM

This booklet is designed as a quick reference to help you select nozzles that will achieve efficient and effective spraying.

Because we are constantly improving our products and services, specifications may be subject to change from time to time.

Popular Nozzle Types 2

Nozzle for Targets 4

Nozzle Selection Through the Spraying Year 6

GuardianAIR 110° Air-Induction Nozzles 8

GuardianAIR Twin 110° Air-Induction Nozzles 9

Ultra Lo-Drift 120° Air-Induction Nozzles 10

Ultra Lo-Drift MAX 130° Air-Induction Nozzles 11

3D Inclined Nozzles 12

NEW 3D Ninety Inclined Nozzles 13

ESI Liquid Fertiliser Nozzles 14

Nozzle Caps 15

Conversions and Formulae 16

Popular Nozzle Types

The following popular nozzle types cover many of the most common agricultural spraying requirements:



GuardianAIR™ 110° Air-induction Nozzles (see p8)

An inclined air induction nozzle that balances drift reduction with spray coverage and evens out front and rear target coverage. Suitable for cereals, oilseed rape and other combinable crops. Effective down to 100 l/ha of water.



50-75% drift reduction
up to 1.5 bar



Up to 75% drift reduction



GuardianAIR Twin 110° Air-induction Nozzles (see p9)

Twin 30° forward and rear inclines, with similar spray quality to GuardianAIR. Ideal for good coverage of ear sprays, oilseed fungicides and for desiccation. Includes an integral easy twist Snaplock cap.



50-75% drift reduction
up to 3 bar



Up to 50% drift reduction



Ultra Lo-Drift 120° Nozzles (see p10)

A compact drift reducing nozzle with coarse, air-filled droplets and a thick spray plume. Suitable for soil-active or translocated foliar sprays on larger targets.



90% drift reduction up to
5 bar (04 & 05 sizes)



Up to 90% drift reduction



Ultra Lo-Drift MAX 130° Nozzles (see p11)

Extremely coarse air-filled droplets. 95% drift reduction across pressures and speeds, suitable where drift reduction is absolutely critical. Awaiting drift approval.



3D 100° Inclined Nozzles (see p12)

An inclined spray ideal for covering vertical targets such as soil clods, small grass weeds and getting spray into crop canopies. Eliminates the smallest droplets to reduce drift without compromising coverage. Suitable for PWM systems.



50% drift reduction up to 1 bar



NEW 3D Ninety Inclined Nozzles (see p13)

A drift reducing, steeply inclined spray. Proven for pre-emergence herbicides applied at higher water volumes. 90% drift reduction right up to 5 bar pressure. Features a pre-orifice design suitable for PWM systems and an easy twist Snaplock cap.



90% drift reduction up to 5 bar



ESI Liquid Fertiliser Nozzles (see p14)

One of the most compact liquid fertiliser nozzles on the market. A unique jet array and stabilising diffuser creates 6 solid streams for excellent distribution of fertiliser and minimal crop scorch. Feature ceramic metering.

For details of LERAP and JKI drift reduction classification criteria for different nozzle sizes (e.g. the speed, height, pressure) refer to the official drift authority websites.



Lo-Drift 110° Nozzles

The original drift reducing nozzle that features a pre-orifice design but no air induction. Coarser than a conventional flat fan nozzle, producing half the drift. Part numbers: LD110-015 to LD110-08.



Hypro Flat Fan VP 110° & 80° Nozzles

For use between 1 and 5 bar, ideal for automatic rate control systems. Wide range of flow rates from 015 up to 15 (110°) or 06 (80°). Mixed drop spectrum, used for a wide range of targets. Part numbers: VP110-015 to VP110-15.



Hi-Flow Nozzles 140° Nozzles

A wide angle nozzle that generates an extremely coarse spray, available in a range of high flow rates up to 24 l/min. Typically used to apply fertiliser in tank mixtures. Part numbers: HF140-08 to HF140-60.



Hypro XT Nozzles for Boomless Spraying

Throw a very coarse spray swath up to 4.9 metres. This extends the reach of a spray boom or replaces it completely. Ideal for use in forests, amenity or pasture where there are obstructions to spraying. Part nos: XT010 to XT215.



Hypro TwinCap

Accommodates any two flat fan nozzles back-to-back in one bayonet cap to increase the spray volume without coarsening spray quality. 30° inclines help to direct spray into crop canopies. Part number: 152607TC.



Hypro Full Cone (FCX) 90° Nozzles

Full cone pattern suitable for spot spraying with knapsack sprayers. Medium fine spray. Part numbers: 30FCX02 to 30FCX08.



Hypro Hollow Cone (HCX) 80° Nozzles

Hollow cone pattern. Fine or very fine spray quality over 3-10 bar pressures. Part numbers: 30HCX2 to 30HCX18.



Disc (DC) and Core (CR) 80° - 90° Nozzles

Finely atomised droplets in a hollow cone pattern, suitable for contact acting chemicals. Designed for band spraying or misting spray applications.



PoliJet (AN) and Deflectip (DT) Anvil 55°- 130° Nozzles

Uniform spray distribution and fewer nozzle blockages. A choice of angle and flow options for spraying different swath widths, ideal for knapsack spraying. Part numbers: 30AN0.6 to 30AN2.4 and 30DT0.5 to 30DT20.

Nozzle tips shown are designed to fit ISO standard caps (see page 15). Nozzles are manufactured from polyacetal engineering polymer. For more details of Hypro nozzles, pumps and sprayer components see the catalogue: www.pentair.com/content/dam/extranet/web/nam/hypro/catalogs/hyp01-hypro-spray-pumps-cat.pdf

Nozzles for Targets

To get the best chemical performance at the key spray timings, it is essential to choose the nozzle that gives good target coverage, considering both the spray quality and spray incline.

PRE-EMERGENCE HERBICIDES

Good coverage over soil clods helps prevent weed escape. The absence of a crop can exacerbate spray drift for these applications.



Recommended nozzles:

3D Nozzle: Optimised incline for pre-emergence use and drift reducing compared to a flat fan. Suitable for 60 -75 cm boom heights. Alternate inclines forward and back at 2-3 bar for best results. Page 12.



3D Ninety: The steep incline directs spray for optimum soil coverage. Proven to be equivalent to the 3D Nozzle when used at higher water volumes. Offers 90% drift reduction. Alternate forward and back. Page 13.



EARLY POST-EMERGENCE HERBICIDES

It is important to get enough spray onto the leaves of small weeds. An inclined spray helps achieve spray coverage on small grasses. Choose the water volume and pressure that gives medium fine spray.



Recommended nozzle:

3D Nozzle: Alternate the inclines forward and back at 2-3 bar for optimum coverage on small grass weeds. Drift reducing and suitable for use at 60-75 cm. Page 12.



LIQUID FERTILIZER APPLICATION

Accurate placement of fertiliser along the boom is essential. Use a compact stream nozzle that will easily fits onto a multi-turret nozzle body for convenience and reduced risk of damage.



Recommended nozzle:

FastCap ESI: 6 jets are the optimum to achieve good fertiliser distribution whilst minimising the risk of blockage. Stable streams help reduce the likelihood of crop scorch. Set at 50 cm above crop height. Page 14.



CEREAL FUNGICIDE IN TANK MIX WITH HERBICIDE/PGR

At this busy time of year minimise spray drift for maximum spray days, but not at the expense of good spray coverage! An all-rounder nozzle is ideal for this timing with a medium spray quality that performs well at lower water volumes.



Recommended nozzle:

GuardianAIR: A proven drift-reducing option. Excellent spray coverage at 3 bar and 100 l/ha water. The small rear incline compensates for forward motion and directs spray downwards to leaves, stem bases and weeds. Page 8.



OILSEED RAPE AND PULSE FUNGICIDES AND DESICCANTS

Getting coverage into the canopy is important for these applications. Where timing is important, using a drift-reducing nozzle helps maximise spraying days, for example with sclerotinia protectant sprays.



Recommended nozzles:

3D Nozzle: Alternate the incline direction along the boom to improve penetration into the canopy, the best choice for contact desiccants. Page 12.



3D Ninety Nozzle: 90% drift reduction for the widest spray window. Alternate the incline direction to direct spray into the canopy. Page 13.



EAR SPRAY FUNGICIDES

Good spray coverage over both sides of the ear is important for effective disease protection. Choose a drift-reducing nozzle to help widen the spraying window and optimise timing.



Recommended nozzles:

GuardianAIR Twin: Twin 30° air inclusion sprays cover the front and back of the ear. Apply 100 l/ha water at 3 bar to maximise spray days and optimise coverage. Page 9.



3D Nozzle: Alternate the incline along the boom for '3D' coverage of the ear. Page 12.



Nozzle Selection Through the Year

Always refer to the product label or the latest application advice from the agrochemical manufacturer when selecting spray quality. Nozzle suggestions are based on the categories published in the UK AHDB Nozzle Selection Chart: <https://eioperator.com/wp-content/uploads/2019/05/nozzle-selection-chart-2010-2014.pdf>.

CROP STAGE AND CHEMICAL TYPE		TARGET	APPLICATION CHALLENGE
AUTUMN	Soil acting pre or early post-emergence herbicides	Soil	Even coverage of soil clods
	Insecticides	Small OSR or cereal plants	Small target area
	Post-emergence herbicides	Small grasses (less than 3 leaves)	Small target area, weeds may be shaded
SPRING	Post-emergence herbicides	Grasses (more than 3 leaves)	Vertical target orientation
	Post-emergence herbicides	Broad-leaved weeds (up to 2 cm across)	Small target area, weeds may be shaded
	Post-emergence herbicides	Broad-leaved weeds (2 - 5 cm across)	Weeds may be shaded
	Post-emergence herbicides	Broad leaved weeds (more than 5 cm across)	Penetration into crop canopy
	Eyespot fungicides and plant growth regulators	Crop stem and lower leaves	Penetration to base of crop
	Cereal fungicides T0, T1, T2	Crop leaves and leaf axils	Penetration into crop canopy
	OSR foliar fungicides	Crop leaves	Coverage from top to base
SUMMER	Potato blight fungicides	Crop leaves and stems	Keep water rates up for good coverage
	Ear fungicides and aphicides T3	Crop ear	Contact action important
	Desiccation with contact acting herbicide	Crop leaves and stems	Keep water rates up for good spray coverage
	Glyphosate	Larger weeds and crop desiccation	Not over-wetting leaf

Guidelines for air induction nozzles are given for applications at 3 bar pressure and 10-16 kph. At these pressures finer air induction nozzles such as GuardianAIR and GuardianAIR Twin typically reduce drift by 50%, whilst coarser air induction nozzles such as Ultra Lo-Drift and 3D Ninety reduce it by more than 90%. When using Flat Fan nozzles choose a pressure that gives a medium spray.

FLAT FAN		AIR INDUCTION			PRE-ORIFICE
MEDIUM		FINER		COARSER	VERY COARSE
					
VP	3D Nozzle 37.5° Incline	GuardianAIR 10-13° Incline	GuardianAIR Twin 30° Inclines	Ultra Lo-Drift	3D Ninety 55° Incline
✓	✓✓✓	✓	✓✓	✓	✓✓✓
✓✓✓	✓✓✓	✓✓	✓✓	-	-
✓✓	✓✓✓	-	✓	-	-
✓✓	✓✓✓	✓✓	✓✓	-	-
✓✓✓	✓✓✓	✓		-	-
✓✓✓	✓✓✓	✓✓	✓✓	-	-
✓✓✓	✓✓	✓✓✓	✓✓	-	✓
✓✓✓	✓✓	✓✓✓	✓✓	-	✓
✓✓✓	✓✓	✓✓✓	✓✓	✓	✓✓
✓✓	✓✓✓	✓✓	✓✓	-	✓✓✓
✓✓	✓✓✓	-	✓	-	✓✓✓
✓✓	✓✓✓	✓✓	✓✓✓	-	-
✓✓	✓✓✓	✓	✓	-	-
✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓

Best for efficacy

✓✓✓

Urgent spraying only

✓

Acceptable efficacy

✓✓

Not the most suitable

-

GuardianAIR 110° Air-Induction Nozzles

An inclined air induction nozzle that balances drift reduction with spray coverage and evens out front and rear target coverage. Suitable for cereals, oilseed rape and other combinable crops. Effective down to 100 l/ha of water. For optimum spray coverage use at 3 bar.



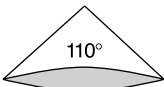
	PART NUMBER (REC FILTER MESH#)	PRESS. BAR	FLOW L/MIN	APPLICATION RATES L/HA AT KM/H						LERAP RATING
				8KPH	10KPH	12KPH	14KPH	16KPH	18KPH	
Green	GA110-015 (100#)	1.0	0.346	52	42	35	30	26	23	*** 1-1.25 bar
		2.0	0.490	73	59	49	42	37	33	
		3.0	0.600	90	72	60	51	45	40	
		4.0	0.693	104	83	69	59	52	46	
		5.0	0.775	116	93	77	66	58	52	
Yellow	GA110-02 (100#)	1.0	0.462	69	55	46	40	35	31	*** 1-1.25 bar
		2.0	0.653	98	78	65	56	49	44	
		3.0	0.800	120	96	80	69	60	53	
		4.0	0.924	139	111	92	79	69	62	
		5.0	1.033	155	124	103	89	77	69	
Lilac	GA110-025 (100#)	1.0	0.577	87	69	58	49	43	38	*** 1-1.5 bar
		2.0	0.816	122	98	82	70	61	54	
		3.0	1.000	150	120	100	86	75	67	
		4.0	1.155	173	139	115	99	87	77	
		5.0	1.291	194	155	129	111	97	86	
Blue	GA110-03 (100#)	1.0	0.693	104	83	69	59	52	46	*** 1-1.5 bar
		2.0	0.980	147	118	98	84	73	65	
		3.0	1.200	180	144	120	103	90	80	
		4.0	1.386	208	166	139	119	104	92	
		5.0	1.550	232	186	155	133	116	103	
Red Brown	GA110-035 (100#)	1.0	0.808	121	97	81	69	61	54	*** 1-1.5 bar
		2.0	1.143	171	137	114	98	86	76	
		3.0	1.400	210	168	140	120	105	93	
		4.0	1.616	242	194	162	139	121	108	
		5.0	1.807	271	217	181	155	136	120	
Red	GA110-04 (50#)	1.0	0.924	139	111	92	79	69	62	*** 1-1.5 bar
		2.0	1.306	196	157	131	112	98	87	
		3.0	1.600	240	192	160	137	120	107	
		4.0	1.848	277	222	185	158	139	123	
		5.0	2.066	310	248	207	177	155	138	
Brown	GA110-05 (50#)	1.0	1.155	173	139	115	99	87	77	*** 1-1.5 bar
		2.0	1.633	245	196	163	140	122	109	
		3.0	2.000	300	240	200	171	150	133	
		4.0	2.309	346	277	231	198	173	154	
		5.0	2.582	387	310	258	221	194	172	



3 Star, 75% drift reduction



Up to 75% drift reduction.



Spray quality is categorised as ‘smaller droplet air induction’ by AHDB at 3 bar and is similar across different nozzle sizes when used at the same pressure.

Application rates shown on this chart are based on tests at 3 bar and 50 cm nozzle spacing.

ORDERING: Use part numbers shown in column 2. For version including a cap, seal and filter (TS02-50# or TS02-100#) prefix with FC-, e.g. FC-GA110-03.

GuardianAIR Twin 110° Air-Induction Nozzles



Twin 30° forward and rear inclines, with similar spray quality to GuardianAIR. Ideal for good coverage of ear sprays, oilseed fungicides and for desiccation. Includes an integral easy twist Snaplock cap. For optimum spray coverage use at 3 bar.

	PART NUMBER (REC FILTER MESH#)	PRESS. BAR	FLOW L/MIN	APPLICATION RATES L/HA AT KM/H						LERAP RATING
				8KPH	10KPH	12KPH	14KPH	16KPH	18KPH	
Yellow	GAT110-02 (100#)	2.0	0.653	98	78	65	56	49	44	** 2.0-2.25 bar
		3.0	0.800	120	96	80	69	60	53	
		4.0	0.924	139	111	92	79	69	62	
		5.0	1.033	155	124	103	89	77	69	
Lilac	GAT110-025 (100#)	2.0	0.816	122	98	82	70	61	54	** 2.0-2.25 bar
		3.0	1.000	150	120	100	86	75	67	
		4.0	1.155	173	139	115	99	87	77	
		5.0	1.291	194	155	129	111	97	86	
Blue	GAT110-03 (100#)	2.0	0.980	147	118	98	84	73	65	** 2.0-3.0 bar
		3.0	1.200	180	144	120	103	90	80	
		4.0	1.386	208	166	139	119	104	92	
		5.0	1.550	232	186	155	133	116	103	
Red Brown	GAT110-035 (100#)	2.0	1.143	171	137	114	98	86	76	** 2.0-2.5 bar
		3.0	1.400	210	168	140	120	105	93	
		4.0	1.616	242	194	162	139	121	108	
		5.0	1.807	271	217	181	155	136	120	
Red	GAT110-04 (50#)	2.0	1.306	196	157	131	112	98	87	* 2.0-3.0 bar
		3.0	1.600	240	192	160	137	120	107	
		4.0	1.848	277	222	185	158	139	123	
		5.0	2.066	310	248	207	177	155	138	
Brown	GAT110-05 (50#)	2.0	1.633	245	196	163	140	122	109	** 2.0-3.0 bar
		3.0	2.000	300	240	200	171	150	133	
		4.0	2.309	346	277	231	198	173	154	
		5.0	2.582	387	310	258	221	194	172	
Grey	GAT110-06 (50#)	2.0	1.960	294	235	196	168	147	131	** 2.0-3.0 bar
		3.0	2.400	360	288	240	206	180	160	
		4.0	2.771	416	333	277	238	208	185	
		5.0	3.098	465	372	310	266	232	207	
White	GAT110-08 (50#)	2.0	2.613	392	314	261	224	196	174	** 2.0-3.0 bar
		3.0	3.200	480	384	320	274	240	213	
		4.0	3.695	554	443	370	317	277	246	
		5.0	4.131	620	496	413	354	310	275	



Up to 2 Star, 50-75% drift reduction



Up to 50% drift reduction.



Spray quality is categorised as 'smaller droplet air induction' by AHDB at 3 bar and is similar across different nozzle sizes when used at the same pressure.

Application rates shown in this chart are based on tests at 3 bar and 50 cm nozzle spacing.

ORDERING: Use part numbers shown in column 2. Includes cap, seal and filter (TS02-50# or TS02-100#).

Spare Seal: 65-BS205.

Ultra Lo-Drift 120° Nozzles

A compact drift reducing nozzle with coarse, air-filled droplets and a thick spray plume. For spraying in the widest weather window. Suitable for soil-active or translocated foliar sprays on larger targets (e.g. glyphosate, cereal fungicides). Avoid for smaller targets and contact acting chemicals.



	PART NUMBER (REC FILTER MESH#)	PRESS. BAR	FLOW L/MIN	APPLICATION RATES L/HA AT KM/H						LERAP RATING
				8KPH	10KPH	12KPH	14KPH	16KPH	18KPH	
Green	ULD120-015 (100#)	2.0	0.490	73	59	49	42	37	33	
		3.0	0.600	90	72	60	51	45	40	
		4.0	0.693	104	83	69	59	52	46	
		5.0	0.775	116	93	77	66	58	52	
Yellow	ULD120-02 (100#)	2.0	0.653	98	78	65	56	49	44	
		3.0	0.800	120	96	80	69	60	53	
		4.0	0.924	139	111	92	79	69	62	
		5.0	1.033	155	124	103	89	77	69	
Lilac	ULD120-025 (100#)	2.0	0.816	122	98	82	70	61	54	
		3.0	1.000	150	120	100	86	75	67	
		4.0	1.155	173	139	115	99	87	77	
		5.0	1.291	194	155	129	111	97	86	
Blue	ULD120-03 (100#)	2.0	0.980	147	118	98	84	73	65	
		3.0	1.200	180	144	120	103	90	80	
		4.0	1.386	208	166	139	119	104	92	
		5.0	1.550	232	186	155	133	116	103	
Red	ULD120-04 (50#)	2.0	1.306	196	157	131	112	98	87	**** 2.0-5.0 bar
		3.0	1.600	240	192	160	137	120	107	
		4.0	1.848	277	222	185	158	139	123	
		5.0	2.066	310	248	207	177	155	138	
Brown	ULD120-05 (50#)	2.0	1.633	245	196	163	140	122	109	**** 2.0-5.0 bar
		3.0	2.000	300	240	200	171	150	133	
		4.0	2.309	346	277	231	198	173	154	
		5.0	2.582	387	310	258	221	194	172	
Grey	ULD120-06 (50#)	2.0	1.960	294	235	196	168	147	131	
		3.0	2.400	360	288	240	206	180	160	
		4.0	2.771	416	333	277	238	208	185	
		5.0	3.098	465	372	310	266	232	207	
White	ULD120-08 (50#)	2.0	2.613	392	314	261	224	196	174	
		3.0	3.200	480	384	320	274	240	213	
		4.0	3.695	554	443	370	317	277	246	
		5.0	4.131	620	496	413	354	310	275	



4 Star, 90% drift reduction



Up to 90% drift reduction.



Spray quality is categorised as 'larger droplet air induction' by AHDB at 3 bar.

Application rates shown on this chart are based on tests at 3 bar and 50 cm nozzle spacing.

ORDERING: Use part numbers shown in column 2. For version including a cap, seal and filter (TS02-50# or TS02-100#) prefix with FC-, e.g. FC-ULD120-04.

Ultra Lo-Drift MAX 130° Nozzles



Extremely coarse air-filled droplets. 95% drift reduction across pressures and speeds, suitable where drift reduction is absolutely critical.
Avoid for smaller targets and contact acting chemicals.

	PART NUMBER (REC FILTER MESH#)	PRESS. BAR	FLOW L/MIN	APPLICATION RATES L/HA AT KM/H					
				8KPH	10KPH	12KPH	14KPH	16KPH	18KPH
Yellow	ULDM130-02 (100#)	2.0	0.653	98	78	65	56	49	44
		3.0	0.800	120	96	80	69	60	53
		4.0	0.924	139	111	92	79	69	62
		5.0	1.033	155	124	103	89	77	69
Lilac	ULDM130-025 (100#)	2.0	0.816	122	98	82	70	61	54
		3.0	1.000	150	120	100	86	75	67
		4.0	1.155	173	139	115	99	87	77
		5.0	1.291	194	155	129	111	97	86
Blue	ULDM130-03 (100#)	2.0	0.980	147	118	98	84	73	65
		3.0	1.200	180	144	120	103	90	80
		4.0	1.386	208	166	139	119	104	92
		5.0	1.550	232	186	155	133	116	103
Red	ULDM130-04 (50#)	2.0	1.306	196	157	131	112	98	87
		3.0	1.600	240	192	160	137	120	107
		4.0	1.848	277	222	185	158	139	123
		5.0	2.066	310	248	207	177	155	138
Brown	ULDM130-05 (50#)	2.0	1.633	245	196	163	140	122	109
		3.0	2.000	300	240	200	171	150	133
		4.0	2.309	346	277	231	198	173	154
		5.0	2.582	387	310	258	221	194	172
Grey	ULDM130-06 (50#)	2.0	1.960	294	235	196	168	147	131
		3.0	2.400	360	288	240	206	180	160
		4.0	2.771	416	333	277	238	208	185
		5.0	3.098	465	372	310	266	232	207
White	ULDM130-08 (50#)	2.0	2.613	392	314	261	224	196	174
		3.0	3.200	480	384	320	274	240	213
		4.0	3.695	554	443	370	317	277	246
		5.0	4.131	620	496	413	354	310	275

Application rates shown on this chart are based on tests at 3 bar and 50 cm nozzle spacing.

The ASABE spray classification is Ultra Coarse across the above pressures.

Submitted for official drift approvals, results are pending.

ORDERING: Use part numbers shown in column 2. For version including a cap, seal and filter (TS02-50# or TS02-100#) prefix with FC-, e.g. FC-ULDM130-04.



3D 100° Nozzles

An inclined spray that is ideal for coverage of vertical targets such as soil clods, small grass weeds and getting spray into crop canopies. Orientate spray incline forward and backward. Eliminates the smallest droplets to reduce drift without compromising coverage.



	PART NUMBER (REC FILTER MESH#)	PRESS. BAR	FLOW L/MIN	APPLICATION RATES L/HA AT KM/H						LERAP RATING
				8KPH	10KPH	12KPH	14KPH	16KPH	18KPH	
Yellow	3D100-02 (100#)	1.0	0.462	69	55	46	40	35	31	
		1.5	0.566	85	68	57	48	42	38	
		2.0	0.653	98	78	65	56	49	44	
		3.0	0.800	120	96	80	69	60	53	
Lilac	3D100-025 (100#)	1.0	0.577	87	69	58	49	43	38	* 0.75-1.0 bar
		1.5	0.707	106	85	71	61	53	47	
		2.0	0.816	122	98	82	70	61	54	
		3.0	1.000	150	120	100	86	75	67	
Blue	3D100-03 (100#)	1.0	0.693	104	83	69	59	52	46	** 0.75-1.0 bar
		1.5	0.849	127	102	85	73	64	57	
		2.0	0.980	147	118	98	84	73	65	
		3.0	1.200	180	144	120	103	90	80	
Red Brown	3D100-035 (100#)	1.0	0.808	121	97	81	69	61	54	** 0.75-1.0 bar
		1.5	0.990	148	119	99	85	74	66	
		2.0	1.143	171	137	114	98	86	76	
		3.0	1.400	210	168	140	120	105	93	
Red	3D100-04 (50#)	1.0	0.924	139	111	92	79	69	62	** 0.75-1.0 bar
		1.5	1.131	170	136	113	97	85	75	
		2.0	1.306	196	157	131	112	98	87	
		3.0	1.600	240	192	160	137	120	107	
Brown	3D100-05 (50#)	1.0	1.155	173	139	115	99	87	77	** 0.75-1.0 bar
		1.5	1.414	212	170	141	121	96	94	
		2.0	1.633	245	196	163	140	122	109	
		3.0	2.000	300	240	200	171	150	133	
Grey	3D100-06 (50#)	1.0	1.386	208	166	139	119	104	92	** 0.75-1.5 bar
		1.5	1.697	255	204	170	145	127	113	
		2.0	1.960	294	235	196	168	147	131	
		3.0	2.400	360	288	240	206	180	160	
White	3D100-08 (50#)	1.0	1.848	277	222	185	158	139	123	** 0.75-3.0 bar
		1.5	2.263	339	272	226	194	170	151	
		2.0	2.613	392	314	261	224	196	174	
		3.0	3.200	480	384	320	274	240	213	



Up to 2 Star,
50-75% drift
reduction

BCPC CODING

FINE

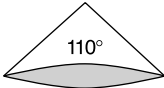
MEDIUM

COARSE

VERY COARSE

Application rates shown on this chart are based on tests at 3 bar and 50 cm nozzle spacing.
Spray distribution is optimised at boom heights of 50-75 cm above the target.

ORDERING: Use part numbers shown in column 2. Also available in 015 size. For version including a Snaplock cap, seal and filter (TS02-50# or TS02-100#) prefix with FC-, e.g. FC-3D100-03.



Equivalent to 110° when
incline is taken into account

NEW 3D NINETY 90° Nozzles



A drift reducing, steeply inclined spray that should be alternated forward/backward along the boom. Proven for pre-emergence herbicides and broad-leaf crop fungicides applied at higher water volumes. 90% drift reduction right up to 5 bar pressure. Features a pre-orifice design suitable for use with PWM systems and an easy twist Snaplock cap.

	PART NUMBER (REC FILTER MESH#)	PRESS. BAR	FLOW L/MIN	APPLICATION RATES L/HA AT KM/H						LERAP RATING
				8KPH	10KPH	12KPH	14KPH	16KPH	18KPH	
Blue	FC-3DN90-03	2.0	1.070	161	128	107	92	80	71	**** (90%)
		3.0	1.200	180	144	120	103	90	80	
		4.0	1.380	207	166	138	118	104	92	
		5.0	1.510	227	181	151	129	113	101	
Red Brown	FC-3DN90-035	2.0	1.212	182	145	121	104	91	81	**** (90%)
		3.0	1.400	210	168	140	120	105	93	
		4.0	1.580	237	190	158	135	119	105	
		5.0	1.750	263	210	175	150	131	117	
Red	FC-3DN90-04	2.0	1.420	213	170	142	122	107	95	**** (90%)
		3.0	1.600	240	192	160	137	120	107	
		4.0	1.870	281	224	187	160	140	125	
		5.0	2.010	302	241	201	172	151	134	
Brown	FC-3DN90-05 (50#)	2.0	1.731	260	208	173	148	130	115	**** (90%)
		3.0	2.000	300	240	200	171	150	133	
		4.0	2.217	333	266	222	190	166	148	
		5.0	2.453	368	294	245	210	184	164	
Grey	FC-3DN90-06 (50#)	2.0	2.100	315	252	210	180	158	140	**** (90%)
		3.0	2.400	360	288	240	206	180	160	
		4.0	2.720	408	326	272	233	204	181	
		5.0	2.970	446	356	297	255	223	198	
White	FC-3DN90-08 (50#)	2.0	2.690	404	323	269	231	202	179	**** (90%)
		3.0	3.200	480	384	320	274	240	213	
		4.0	3.470	521	416	347	297	260	231	
		5.0	3.810	572	457	381	327	286	254	



4 Star, 90%
drift reduction
up to 5 bar

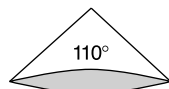
BCPC CODING

FINE

MEDIUM

COARSE

VERY COARSE



Equivalent to 110° when
incline is taken into account

Application rates shown on this chart are based on tests at 3 bar and 50 cm nozzle spacing.

Spray distribution is optimised at boom heights of 50 cm above the target.

ORDERING: Use part numbers shown in column 2.

Includes integrap Snaplock cap and seal. Spare Seal: 10BG-2270-0150.

Branded 'Syngenta' and developed in partnership.



BAYONET EXTENDER

Extends the bayonet stem by 28 mm where necessary to avoid spraying onto boom components. Pt no: CAP-EXT-BAG10

ESI Liquid Fertilizer Nozzles

One of the most compact liquid fertilizer nozzles on the market. A unique jet array and stabilising diffuser creates 6 solid streams for excellent distribution of fertilizer and minimal crop scorch. All sizes now incorporate a ceramic metering orifice.



PART NUMBER		PRESS. BAR	FLOW L/MIN	8KPH	APPLICATION RATES L/HA AT KM/H				
				10KPH	12KPH	14KPH	16KPH	18KPH	
Green	FC-ESI-110015	1.0	0.346	52	42	35	30	26	23
		2.0	0.490	73	59	49	42	37	33
		3.0	0.600	90	72	60	51	45	40
		4.0	0.693	104	83	69	59	52	46
Yellow	FC-ESI-11002	1.0	0.462	69	55	46	40	35	31
		2.0	0.653	98	78	65	56	49	44
		3.0	0.800	120	96	80	69	60	53
		4.0	0.924	139	111	92	79	69	62
Blue	FC-ESI-11003	1.0	0.693	104	83	69	59	52	46
		2.0	0.980	147	118	98	84	73	65
		3.0	1.200	180	144	120	103	90	80
		4.0	1.386	208	166	139	119	104	92
Red	FC-ESI-11004	1.0	0.924	139	111	92	79	69	62
		2.0	1.306	196	157	131	112	98	87
		3.0	1.600	240	192	160	137	120	107
		4.0	1.848	277	222	185	158	139	123
Brown	FC-ESI-11005	1.0	1.155	173	139	115	99	87	77
		2.0	1.633	245	196	163	140	122	109
		3.0	2.000	300	240	200	171	150	133
		4.0	2.309	346	277	231	198	173	154
Grey	FC-ESI-11006	1.0	1.386	208	166	139	119	104	92
		2.0	1.960	294	235	196	168	147	131
		3.0	2.400	360	288	240	206	180	160
		4.0	2.771	416	333	277	238	208	185
White	FC-ESI-11008	1.0	1.848	277	222	185	158	139	123
		2.0	2.613	392	314	261	224	196	174
		3.0	3.200	480	384	320	274	240	213
		4.0	3.695	554	443	370	317	277	246
Light Blue	FC-ESI-11010	1.0	2.309	346	277	331	198	173	154
		2.0	3.266	490	392	327	280	245	218
		3.0	4.000	600	480	400	343	300	267
		4.0	4.619	693	554	462	396	346	308
Light Green	FC-ESI-11015	1.0	3.464	520	416	346	297	260	231
		2.0	4.899	735	588	490	420	367	327
		3.0	6.000	900	720	600	514	450	400
		4.0	6.928	1039	831	693	594	520	462
Black	FC-ESI-11020	1.0	4.620	690	550	460	400	350	310
		2.0	6.532	980	784	653	560	490	435
		3.0	8.000	1200	960	800	686	600	533
		4.0	9.238	1386	1109	924	792	693	616

Application rates shown in this chart are based on tests at 3 bar, 50cm nozzle spacing and 50cm boom height. Flow rates are based on water, for liquids with different specific gravity use the instructions on page 16 to help select the correct nozzle size.

ORDERING: Use part numbers shown in column 2. Replacement seal part number: 65-BS205.



BAYONET FASTCAPS For use with EF3 nozzle bodies.

	Flat Fan: GA, ULD, 3D, LD, VP, F, E		Cone: FCX, HCX, Disc & Core
	With Seal	Snaplock™	With Seal
Orange	CAP00-01	CAP11-01	
Green	CAP00-015	CAP11-015	
Yellow	CAP00-02	CAP11-02	
Lilac	CAP00-025	CAP11-025	
Blue	CAP00-03	CAP11-03	
Red Brown	CAP00-035	CAP11-035	
Red	CAP00-04	CAP11-04	
Brown	CAP00-05	CAP11-05	
Grey	CAP00-06	CAP11-06	
White	CAP00-08	CAP11-08	
Light Blue	CAP00-10	CAP11-10	
Light Green	CAP00-15	CAP11-15	
Black	CAP00-20	CAP11-20	CAP04-20



CAPS FOR FLAT FANS

Part no. example: CAP00-03
includes seal.



CAPS FOR CONE SPRAYS

Part no. example: CAP04-05
includes seal.



SNAPLOCK™ CAP

Easy twist, colour coded. Fits standard EF3 nozzle bodies. Packs include seals.
Part no. example: CAP11-03.



TWIN CAP

Inclines two nozzles by 30°. Includes seals.
Part no: 152607TC



BAYONET EXTENDER

Extends the bayonet stem by 28 mm to avoid spraying onto boom components with inclined nozzles.
Part no: CAP-EXT-BAG10



CAP ADAPTORS

For Hardi (Pt no. 9950-0024) or Jacto (Part no. 9950-0027) nozzle bodies. 10 packs including seals.

Other Caps and Cap Accessories	Part Number
EPDM standard seal	2270-0150
Viton standard seal	22W11MF64V
Fastcap - DT (no offset) & seal (black)	CAP30-20

Conversions & Formulae

NOZZLE OUTPUT FOR OVERALL SPRAYING

$$\text{Litres/min per nozzle} = \frac{\text{L/Ha} \times \text{km/hr} \times \text{nozzle spacing (m)}}{600}$$

NOZZLE OUTPUT FOR BAND SPRAYING

$$\text{Litres/min per nozzle} = \frac{\text{L/Ha} \times \text{km/hr} \times \text{band width (m)}}{600}$$

CORRECTION FOR SPECIFIC GRAVITY OF SPRAYED LIQUID

Application rates shown in the nozzle charts in this guide are based on tests with plain water. Calculating a Correction Factor allows you to use the tables to select a nozzle for liquids that have a different specific gravity (S.G.) to water (e.g. liquid fertilizer):

$$\text{Correction Factor} = \sqrt{\frac{1}{\text{S.G.}}}$$

Use the Correction Factor to calculate a Reference Application Rate:

$$\text{Reference Application Rate l/ha} = \frac{\text{Target Application Rate in L/Ha}}{\text{Correction factor}}$$

Use this Reference Application Rate to select a nozzle from the charts on pages 14-28. These settings will then apply the Target Application Rate of the higher S.G. fluid.

Example: When aiming to supply 240 l/ha of spray liquid with a specific gravity of 1:28 the correction factor calculates to 0.88:

$$\frac{240 \text{ l/ha}}{0.88} = 273 \text{ (use this figure to select the nozzle, and it will apply 240 l/ha)}$$

USEFUL CONVERSIONS

	MULTIPLY BY	TO OBTAIN
Centimetres (cm)	x 0.3937	inches
Metres (m)	x 3.281	feet
Kilometres (km)	x 0.6214	miles
Hectares (Ha)	x 2.471	acres
Millilitres (ml)	x 0.035	fluid ounces
Litres (l)	x 0.22	Imperial gallons
Litres (l)	x 0.264	US Gallons
Bar	x 14.5	psi

To convert litres/hectare to gallons/acre divide by 11.3 (imperial)



HYPRO EU LIMITED

Unit 9, Bourn Quarter, Wellington Way

Bourn, Cambridge CB23 7FW, UK

E-mail: hypro.service@pentair.com

HYPRO-EU.COM





CLEANLOAD NEXUS

The **Closed Transfer Coupler** for easyconnect caps

- Fast
- Effective
- Simple
- Safer

www.cleanloadnexus.com



EASY
CONNECT