



Nozzle Guide

2022

ORIGINAL
HARDI SPARE PARTS

nozzles.hardi.com



Contents

NOZZLE TECHNOLOGY

HARDI nozzles – precise, dependable and accountable	3
Nozzle research	4
Nozzle development	5

CHOOSING NOZZLES

Choosing nozzles	6
----------------------------	---

CALIBRATION OF FIELD CROP SPRAYERS

Calibration of field crop sprayers	9
--	---

HARDI ISO NOZZLES – FIELD SPRAYERS

HARDI ISO F-110	11
HARDI ISO LD-110	12
HARDI ISO MINIDRIFT	13
HARDI ISO NANODRIFT	14
HARDI ISO INJET	15
HARDI ISO MINIDRIFT DUO	16
HARDI DUOCAP	17
HARDI ISO F 80	18
HARDI QUINTASTREAM nozzles	19
1553 Solid stream nozzle	20

CALIBRATION OF MISTBLOWERS

Calibration of mistblowers	21
--------------------------------------	----

NOZZLES – ORCHARD SPRAYING

HARDI 1299 Hollow cone nozzles	22
1099 Solid stream nozzles	22
1553 cone nozzles	23

CALIBRATION OF HAND OPERATED SPRAYERS

Calibration of hand operated sprayers	24
---	----

NOZZLES – HAND OPERATED SPRAYERS

Adjustable nozzles	25
HC – Hollow cone nozzles	25
HARDI REFLEX nozzles	25

CALIBRATION FOR BAND SPRAYING

Calibration for band spraying	26
---	----

NOZZLES – BAND SPRAYING

HARDI Even spray nozzles	27
------------------------------------	----

END- AND EDGE-NOZZLE KIT

END-NOZZLE kit	28
EDGE-NOZZLE kit	29

EDGE-NOZZLES

1850	30
G – Giant EDGE-NOZZLES	30
1740	30

SPECIAL NOZZLES

4665 65°	31
4625 25°	31
4665 65°	31
4625 25°	31
Container rinsing nozzles	32
Tank cleaning nozzles	32
5066 Agitation nozzles	32

ISO NOZZLES

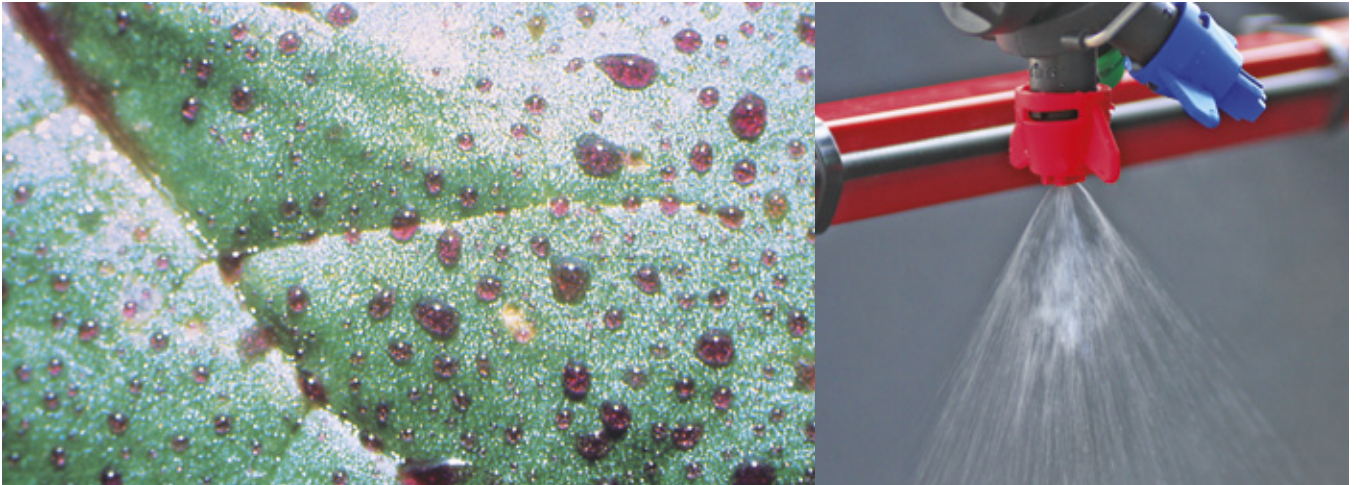
HARDI nozzles on all liquid systems	33
Conversion table for HARDI ISO nozzles	33

FILTERS AND FITTINGS

Filters	34
Fittings	34

BOOM FLUID SOLUTIONS

Boom fluid solutions	35
--------------------------------	----



HARDI nozzles – precise, dependable and accountable

HARDI has produced sprayers since 1957 – meeting the needs of all farmers and crops worldwide – a key goal that has demanded the world's best nozzles.

Today the same basic HARDI philosophy promotes the efficient, effective and responsible plant care that ensures quality food production.

The nozzle can dominate the sprayer performance.

All of the sprayer components are important for safe and effective use, but it is the nozzle that can have the major influence on the performance of the crop protection product that it will apply.

The nozzle controls

- The throughput (and therefore the dose)
- Quality of distribution
- Drop spectrum and coverage
- Distribution over the target
- Drop retention or reflection
- The degree of drift and downwind fall-out

All these functions are considered by HARDI to ensure that the spray liquid is deposited exactly where it is needed, in its most effective form, and is not wasted.

HARDI has combined both design and material selection to produce a range of nozzles that suit the broad demands of both crops and the vast array of agrochemical products available today. This has been the basis for HARDI's worldwide success.

Close co-operation between farmers, advisers, chemical companies, independent and regulatory bodies with HARDI's agronomists has been the backbone of this continuing success.

Quality in production ensures optimal field performance

HARDI's modern production facilities and technical abilities have resulted in the superior precision and durability of HARDI nozzles.

Quality control includes not just laboratory measurements but the use of HARDI nozzles in the field under commercial conditions. Every drop of spray needs to be both accounted for – and documented – in order to ensure the quality of food delivered onto the dining table, and it meets the demands of the public today.

HARDI quality nozzles meet these increasing demands with world leading research and development.

The application of plant protection products to crops involves issues now, which go beyond traditional considerations such as economy and efficiency. Now nozzle choice and performance also relate to broad issues of drift such as airborne losses, downwind fall-out and deposits on non-target surfaces within the treated area itself. All of these issues need to be carefully considered.

HARDI is world leading in the understanding of concept of spray accountability and it is this knowledge that underpins its world leadership in today's spraying. Today, HARDI has developed the world's largest ISO nozzle programmes for agriculture, horticulture (including most vegetables), viticulture as well as many more specialist needs. This nozzle guide will help you select the best nozzle for your needs, consider environmental aspects, and help you calibrate it for optimal use to ensure that you meet all of today's needs when using crop protection products.

Nozzle research

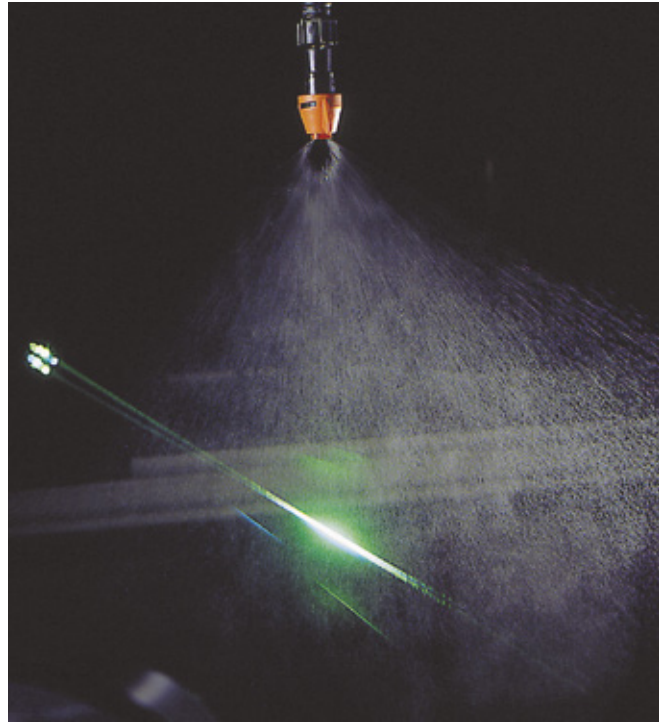
Fundamental research with nozzles by “HARDI agro-scientists” has been conducted in their own dedicated laboratories and those of independent Research Centres at many key institutions throughout the world. Sites where field research is conducted are very diverse – ranging from the temperate conditions of Northern Europe to the tropical crops of Australia.

Instrumentation used in HARDI's laboratories is at the leading edge in drop size analysis studies.

It is this broad – but intensive approach – which, when combined with state-of-the-art manufacturing techniques and computerized quality control programmes, guarantees that HARDI nozzles will meet the demands of better crop protection.

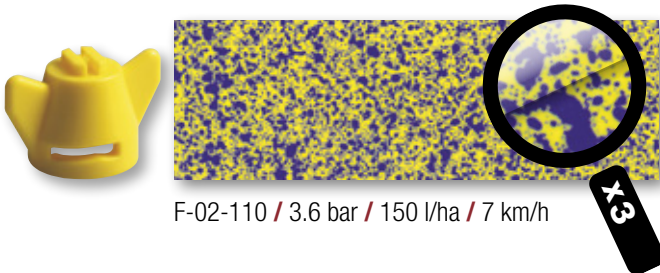
Measuring droplet sizes

The droplet spectrum is characterized by the average droplet size based on volume (VMD) and the range that indicates the uniformity of the atomization. A laser Phase Doppler Particle Analyser (Aerometrics, PDPA) supplies this information instantaneously and is used to constantly monitor in our laboratory the spray quality of our nozzles.



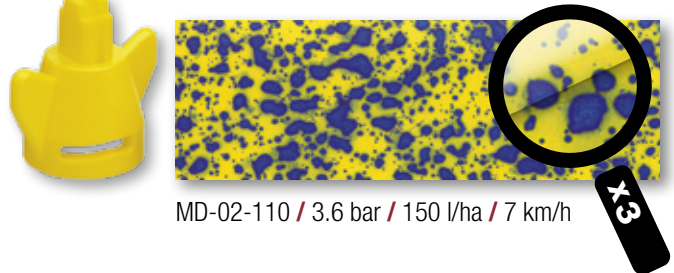
HARDI ISO 02 110° nozzle with the same capacity, pressure, speed and therefore application rate with different drop sizes and therefore different coverage.

HARDI FLATFAN nozzles



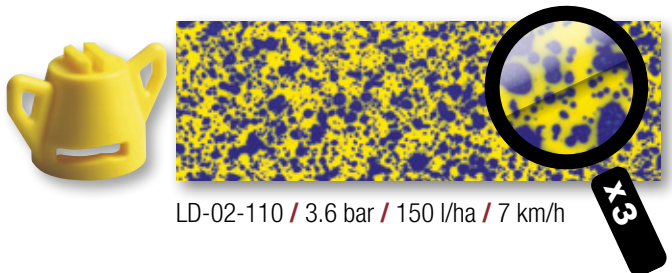
F-02-110 / 3.6 bar / 150 l/ha / 7 km/h

HARDI MINIDRIFT nozzles



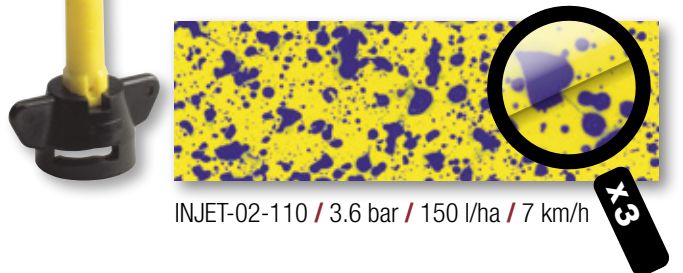
MD-02-110 / 3.6 bar / 150 l/ha / 7 km/h

HARDI LD LOWDRIFT nozzles

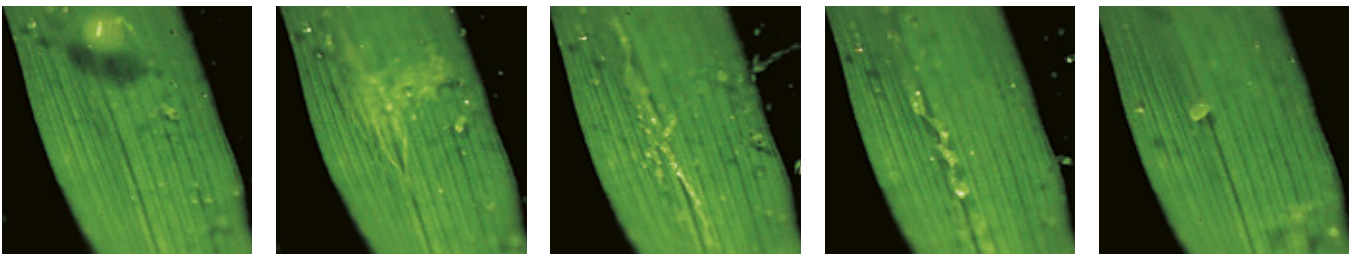


LD-02-110 / 3.6 bar / 150 l/ha / 7 km/h

HARDI INJET nozzles



INJET-02-110 / 3.6 bar / 150 l/ha / 7 km/h



Nozzle development

Changes in cropping practices, regulatory restraints and the introduction of new agrochemicals are just some of the forces that ensure new nozzle developments, which have and will continue to take place at HARDI. This activity closely involves our agronomists, engineers and specialist tool makers. Farmer's needs are recognized and met with HARDI nozzles designed to provide the precision he demands today.

Quality control

Samples of all HARDI nozzles are constantly monitored by Quality Control – using devices such as this state-of-the-art nozzle distribution table.

Wind Tunnel Studies

Airborne drift and downwind fallout are tested and documented in the controlled conditions of a wind tunnel for all HARDI nozzles. This leads to approvals as drift reducing equipment for buffer zones in many countries.

Together with field research this has given the HARDI nozzle range approvals in the UK, Holland and Germany to be used closer to waterways than previously allowed with traditional nozzles.

High Speed Video

Modern high-speed video techniques are used to investigate the droplets' behaviour on their way to the target and when impacting on a leaf. These tests are done with clean water and with actives to simulate in-field spraying.

Deposit tests

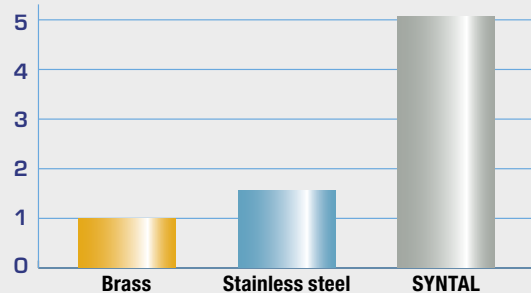
In UK fluorescent dye is used to test the exact amount of liquid that stays on the leaf after spraying. This is the key factor for the biological efficacy of the plant protection products.

Efficacy trials

Specialist field equipment is used at the Danish Weed Research Institute to test the efficacy of herbicide performance when using HARDI nozzles.

High Quality Materials

HARDI nozzles are produced from high quality SYNTAL plastic that ensures both precision and durability. Where highly abrasive compounds are to be sprayed, the selection of HARDI CERAMIC nozzles will maintain this same level of superior durability.



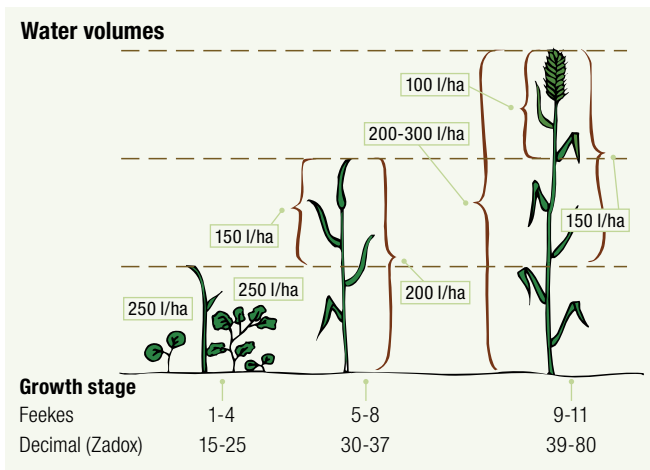
Durability relative to brass flat spray nozzle at the manufacturer's recommended pressure. (Kim Sintorn, Swedish University).

Choosing nozzles

A nozzle for every spray job

Choice of nozzle type and size may have to balance the need to ensure optimal biological effect with a consideration for wind drift, sprayer capacity – that influences field work rates – as well as forward speed.

Small droplets from STANDARD FLATFAN nozzles may offer an unsurpassed liquid distribution and an effective coverage of the target surface. HARDI TWIN sprayers can safely use these small standard nozzles even when weather conditions are not optimal.



The reduced number of very small droplets produced by LOWDRIFT nozzles makes them less sensitive to wind. Therefore, they can be used on conventional sprayers under sub-optimal conditions. In particular, they are popular used when spraying lower water volumes.

MINIDRIFT and INJET nozzles mix air with the spray liquid to coarsen the atomisation. Drift is substantially reduced with these nozzles so that field delays – through too high wind speeds – are minimised and timing is improved. The biological advantage gained through this better field timing may mask the use of coarser sprays. Their use has become critical to conventional spraying practice which has to try and meet both environmental needs without risking the effectiveness of the product to be applied.

Water volume rate has a big influence

Your working capacity will largely depend on the water volume rate. Why? Low volume rates mean that less filling time and transport are required. In fact a volume rate reduction of 25% increases your capacity by more than 10%. A big difference even in the short term! You do, however, need to pick the right nozzle and speed for the job. Lower spray pressure alone will mean that both coverage and deposit are reduced. Note that the application rate of a nozzle should be approximately +/-40% of the medium flow at 3.25 bar.

Droplet classification ISO 25358

Classification category	Symbol	Colour code	Approximate VMD
ULTRA COARSE	UC	Black	>580
EXTREMELY COARSE	XC	White	>490
VERY COARSE	VC	Blue	>390
COARSE	C	Green	>330
MEDIUM	M	Yellow	>220
FINE	F	Orange	>150
VERY FINE	VF	Red	<150

What about droplet size?

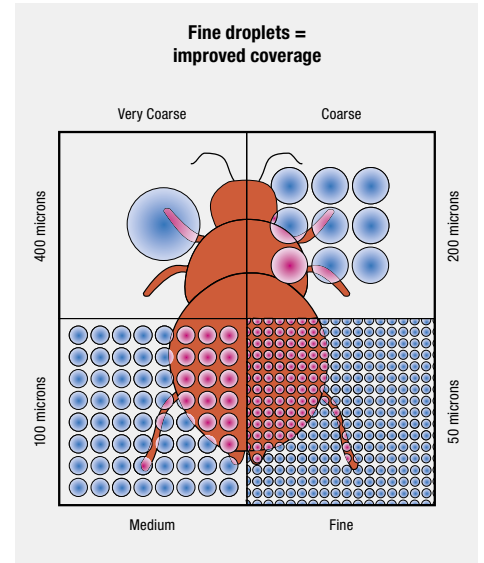
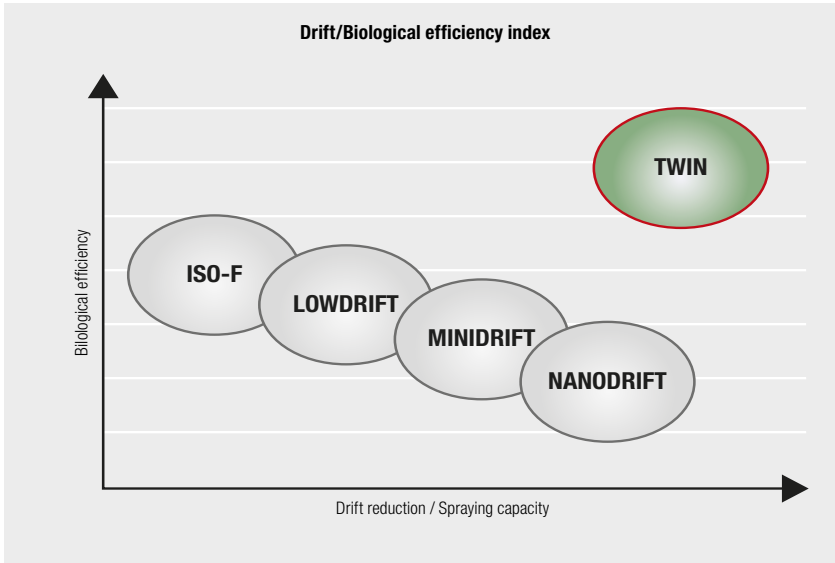
Droplet size is important, and your need will differ according to conditions and type of crop. HARDI nozzles followed BCPC/ASAE specifications with regard to droplet size classification, today the ISO 25358 takes over, there are now more classes. The data in this document is correct towards the new standard. There are 7 size classifications but for most types of farming only “fine”, “medium”, “coarse” and “very coarse” had been relevant. Today also the XC and UC classes are important in relation to drift reduction and spraying in buffer zones. The challenge is that no nozzle will give you all spraying options and that is why you sometimes have to compromise.

	bar	l/min		6	7	8	10	12	15	20	25
025-LIac	1.5	0.71	M	141	121	106	85	71	57	42	34
	2.0	0.82	M	163	140	122	98	82	65	49	39
	2.5	0.91	M	183	156	137	110	91	73	55	44
	3.0	1.00	M	200	171	150	120	100	80	60	48
	4.0	1.15	F	231	198	173	139	115	92	69	55
	5.0	1.29	F	258	221	194	155	129	103	77	62
SYNTAL-CT									371950 (12 pcs. 750626)		
SYNTAL-S									371946 (12 pcs. 750628)		

The VMD data is belonging to the used measuring equipment. So the VMD data is only an estimate. The borders between the different categories are defined by a certain nozzle which is standardized in the ISO 25358. HARDI will only give the categories as the VMD as a single measurement is not useful for farmers as a decision tool. On the nozzle flow tables in this product guide is a separate column to indicate the spray quality.

Make sure you have drift reduction nozzles

The new directive from EU states that a sprayer must be equipped with drift reduction nozzles. So if you have not already considered a MINIDRIFT nozzle, maybe now is the time. Standard equipment on a sprayer will soon be required anyway. Drift reduction nozzles work with very coarse droplets; this is the only way to reach a high drift reduction level.



Choosing nozzles

The tables on the next page can be used when choosing the right nozzle for a spray job. Important precondition for the tables:

- Always follow label recommendation for spray quality and volume rate – if nothing is stated, the tables on the next page can be used as a guideline.
- To minimise wind drift and maintain even liquid distribution, spraying pressure between 1.5 and 2.5 bar is recommended (NANODRIFT: 3 to 5 bar). Higher pressures with TWIN air assistance are also acceptable.
- Spraying against grass weeds or on other vertical targets – it is important to use a relative fine spray for a good coverage.
- Small dicot weeds need good coverage either through fine droplets or – if using a coarser spray – by compensating with a higher volume rate.
- Contact action mode needs finer droplets.
- Use medium sized droplets for chemicals that are transported in the plants
- For large dicot weeds – coarse atomisation can be used.
- Fungicide treatments are often less sensitive to spray quality; medium drops can be recommended. Remember that the volume rate must be adjusted to crop density and needs for penetration to more basal parts.
- Generally the water rate for conventional spraying should not be less than 150 l/ha and for TWIN not less than 80-100 l/ha for optimum efficacy at lower chemical doses.
- When mixing products or using products with more than one mode of action, adjust to the most demanding component of that product mix.

Spray quality and capacity for HARDI ISO 110° FLATFAN nozzles

HARDI ISO F-110 Standard FLATFAN nozzles							HARDI ISO LD-110 LOWDRIFT nozzles							HARDI ISO MINIDRIFT Air inclusion nozzles							HARDI ISO NANODRIFT Air inclusion nozzles													
Bar	1.5	2.0	2.5	3.0	4.0	5.0	Bar	1.5	2.0	2.5	3.0	4.0	5.0	Bar	1.5	2.0	2.5	3.0	4.0	5.0	Bar	1.5	2.0	2.5	3.0	4.0	5.0							
ISO size/colour	l/min						ISO size/colour	l/min						ISO size/colour	l/min						ISO size/colour	l/min												
0075-Pink	0.21	0.24	0.27	0.30	0.35	0.39	01-Orange	0.28	0.33	0.37	0.40	0.46	0.52	015-Green	0.42	0.49	0.55	0.60	0.69	0.77	02-Yellow	0.57	0.65	0.73	0.80	0.92	1.03	025-Lilac	0.71	0.82	0.91	1.00	1.15	1.29
01-Orange	0.28	0.33	0.37	0.40	0.46	0.52	015-Green	0.42	0.49	0.55	0.60	0.69	0.77	02-Yellow	0.57	0.65	0.73	0.80	0.92	1.03	025-Lilac	0.71	0.82	0.91	1.00	1.15	1.29	03-Blue	0.85	0.98	1.10	1.20	1.39	1.55
015-Green	0.42	0.49	0.55	0.60	0.69	0.77	02-Yellow	0.57	0.65	0.73	0.80	0.92	1.03	025-Lilac	0.71	0.82	0.91	1.00	1.15	1.29	03-Blue	0.85	0.98	1.10	1.20	1.39	1.55	04-Red	1.12	1.29	1.44	1.58	1.82	2.04
02-Yellow	0.57	0.65	0.73	0.80	0.92	1.03	025-Lilac	0.71	0.82	0.91	1.00	1.15	1.29	03-Blue	0.85	0.98	1.10	1.20	1.39	1.55	04-Red	1.12	1.29	1.44	1.58	1.82	2.04	05-Brown	1.39	1.61	1.80	1.97	2.28	2.55
025-Lilac	0.71	0.82	0.91	1.00	1.15	1.29	03-Blue	0.85	0.98	1.10	1.20	1.39	1.55	04-Red	1.12	1.29	1.44	1.58	1.82	2.04	05-Brown	1.39	1.61	1.80	1.97	2.28	2.55							
03-Blue	0.85	0.98	1.10	1.20	1.39	1.55	04-Red	1.12	1.31	1.46	1.60	1.85	2.07	05-Brown	1.41	1.63	1.83	2.00	2.31	2.58														
04-Red	1.12	1.31	1.46	1.60	1.85	2.07	05-Brown	1.41	1.63	1.83	2.00	2.31	2.58																					
05-Brown	1.41	1.63	1.83	2.00	2.31	2.58																												
06-Grey	1.70	1.96	2.19	2.40	2.77	3.10																												
08-White	2.26	2.61	2.92	3.20	3.70	4.13																												
10-Light blue	2.83	3.27	3.65	4.00	4.62	5.16																												

Spray quality: Fine Coarse

Medium Very coarse



Conventional sprayers

Spray quality	Normal spraying conditions – forward speed 6-8 km/h						Normal spraying conditions – forward speed 8-10 km/h						Windy, but cannot postpone – forward speed 5-6 km/h						
	FLATFAN			LOWDRIFT			MINIDRIFT INJET	FLATFAN			LOWDRIFT			MINIDRIFT INJET	FLATFAN		LOWDRIFT		MINIDRIFT INJET
	F	M	C	M	C	VC	F	M	C	M	C	VC	M	C	M	C	VC		
Herbicides		👉	👉	👉	👉	👉				👉	👉	👉			👉	👉	👉		
Soil applied		100-200 l/ha	200 l/ha	100-200 l/ha	100-200 l/ha	100-200 l/ha					150-200 l/ha	100-200 l/ha				175-200 l/ha	100-200 l/ha		
Grass weeds	👎	👉		👉						👉					👉				
Broadleaf weeds up to 2 cm across	👎	👉	👎	👉	👎				👉	👉	👉			👉	👉				
Broadleaf weeds more than 2 cm across	👎	👉	👎	👉	👎				👉	👉	👉			👉	👉	👉	👉		
Glyphosate		👉	👎	👉	👎				👉	👉	👉			👉	👉	👉	👉		
100-150 l/ha		100-150 l/ha		100-150 l/ha						150-200 l/ha	150-200 l/ha				175-200 l/ha	150-200 l/ha	150-200 l/ha		
Fungicides	👎	👉		👉					👉					👉					
Contact	👎	150-300 l/ha		150-300 l/ha															
Systemic		👉	👎	👉	👎				👉	👉	👉			👉	👉	👉	👉		
150-300 l/ha		150-300 l/ha		150-300 l/ha					200-300 l/ha	175-250 l/ha					175-300 l/ha				
Insecticides	👎	👉		👉					👉					👉					
Contact	👎	150-250 l/ha		150-250 l/ha															
Systemic		👉	👎	👉	👎				👉	👉	👉			👉	👉	👉	👉		
100-200 l/ha		100-200 l/ha		100-200 l/ha					200-250 l/ha	175-250 l/ha					175-250 l/ha				

TWIN air-assisted sprayers

Spray quality	Normal spraying conditions – forward speed 8-10 km/h						Normal spraying conditions – forward speed 12-15 km/h						Windy spraying conditions – forward speed 10-12 km/h						
	FLATFAN			LOWDRIFT			MINIDRIFT INJET	FLATFAN			LOWDRIFT			MINIDRIFT INJET	FLATFAN		LOWDRIFT		MINIDRIFT INJET
	F	M	C	M	C	VC	F	M	C	M	C	VC	M	C	M	C	VC		
Herbicides		👉	👉	👉	👉	👉		👉	👉		👉	👉	👉	👉	👉	👉	👉		
Soil applied		100-200 l/ha	200 l/ha	100-150 l/ha	100-200 l/ha			100-150 l/ha	100-250 l/ha		100-200 l/ha	100-200 l/ha			150-200 l/ha		100-200 l/ha		
Grass weeds	👉	👉		👉			👎	👉		👉				👉		👉			
100-150 l/ha	100-200 l/ha		150-200 l/ha				150-200 l/ha		150-200 l/ha					150-200 l/ha					
Broadleaf weeds up to 2 cm across	👉	👉	👎	👉	👎		👎	👉	👎	👉	👎			👉	👉	👉	👉		
80-150 l/ha	100-200 l/ha		150-200 l/ha				150-200 l/ha		150-200 l/ha					150-200 l/ha					
Broadleaf weeds more than 2 cm across	👉	👉	👎	👉	👎		👎	👉	👎	👉	👎			👉	👉	👉	👉		
80-150 l/ha	100-200 l/ha		150-200 l/ha				150-200 l/ha		150-250 l/ha					175-250 l/ha	150-200 l/ha	150-200 l/ha	200-250 l/ha		
Glyphosate	👉	👉	👎	👉	👎				👉	👉	👉			👉	👉	👉	👉		
80-120 l/ha	100-150 l/ha		100-150 l/ha						100-150 l/ha	100-150 l/ha	150-200 l/ha			100-150 l/ha	150-200 l/ha	150-200 l/ha	150-200 l/ha		
Fungicides	👉	👉		👉			👎	👉		👉				👉					
Contact	100-200 l/ha	100-200 l/ha		150-200 l/ha				150-200 l/ha		150-200 l/ha					150-200 l/ha				
Systemic	👉	👉	👎	👉	👎			👉	👎	👉	👎			👉	👉	👉	👉		
80-120 l/ha	100-200 l/ha		150-200 l/ha					150-200 l/ha	150-200 l/ha					150-200 l/ha					
Insecticides	👉	👉		👉			👎	👉		👉				👉					
Contact	100-200 l/ha	100-200 l/ha		150-200 l/ha				150-200 l/ha		150-200 l/ha					150-200 l/ha				
Systemic	👉	👉	👎	👉	👎			👉	👎	👉	👎			👉	👉	👉	👉		
80-200 l/ha	100-200 l/ha		100-200 l/ha					100-200 l/ha	100-200 l/ha					100-200 l/ha					

👉 Best choice

👎 Useful alternative

👎 Under optimum spraying conditions when fine atomisation can be used with no drift hazard

INJET

The very coarse atomisation from INJET nozzles often requires higher water volume rates to compensate for poor coverage

Spray quality:



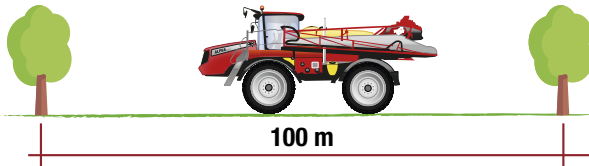


Calibration of field crop sprayers

Precise, safe, applications in the field demand that the sprayer is effectively calibrated. Calibration must always be done with clean water and before the use of any crop protection product. Follow these three steps to calibrate your sprayer:

1 Check driving speed

- Half-fill the spray tank with water.
- Mark out 100 m – note time to drive the distance.



Example

If it takes 50 seconds to drive 100 metres, the spraying speed is 7.2 km/hour.

Driving speed formula

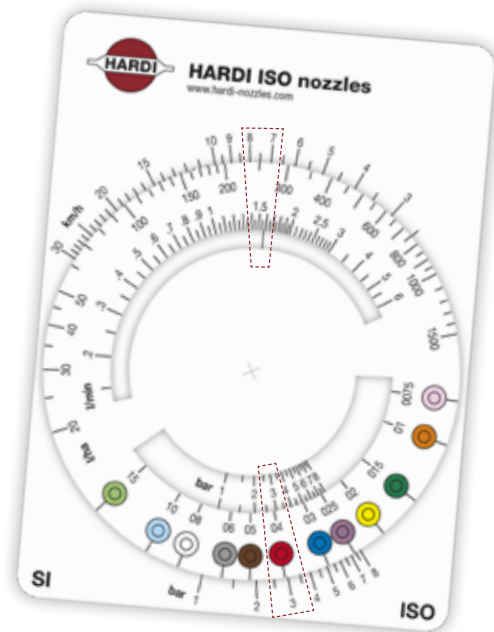
$$\frac{\text{Distance driven (m)} \times 3.6}{\text{Time (sec.)}} = \text{Km/h}$$

2 Select volume rate, nozzle and pressure

- For easy selection of nozzles and pressure, use the HARDI calibration disk (order No. 285802).

Example

Volume rate.....250 l/ha Pressure.....2.90 bar
 Driving speed.....7.5 km/h Nozzle flow.....1.56 l/min
 Nozzle.....ISO F-04-110



3 Check nozzle output

- If actual output is not equal to desired output: Readjust pressure (alternatively, change nozzle or driving speed)
- If output has increased more than 10% from table value, change all nozzles.

Calibration formulas

When calibrating, it is the perfect time to check the spray distribution across your boom.

Here you have clean water in the whole system and a great opportunity to inspect your sprayer for any leaks, blockages, etc.

Driving speed formula

$$\frac{\text{Distance driven (m)} \times 3.6}{\text{Time (sec.)}} = \text{km/h}$$

Nozzle output

$$\frac{\text{Nozzle spacing (m)} \times \text{l/ha} \times \text{km/h}}{600} = \text{l/min (per nozzle)}$$

Pressure adjustment

$$\left(\frac{\text{New output (l/min)}}{\text{Known output (l/min)}} \right)^2 \times \text{Known pressure (bar)} = \text{new pressure (bar)}$$

Application volume

$$\frac{600 \times \text{l/min (per nozzle)}}{\text{Nozzle spacing (m)} \times \text{km/h}} = \text{l/ha}$$



Cleaning of nozzles

An even distribution across your boom is critical to the performance of the product you are applying. Dirty and/or blocked nozzles are the most frequently reported problem affecting distribution. Cleaning nozzles is best done using water and a soft brush such as a toothbrush. Never use tools like screwdrivers or nails – they will certainly damage the nozzle and its ability to evenly distribute the sprayed liquid.

A soft brush for nozzle cleaning is included as a part of the HARDI calibration set.

HARDI calibration set (81859600)

When did you last check the output from your nozzles?

1. After every week of spraying, check minimum 2 nozzles per boom section
2. If the flow from one or more of these nozzles has increased more than 15% compared to a new nozzle, change all nozzles.

Water sensitive paper

An important tool to check the spray quality and deposition in the field. Buy it at your HARDI dealer.

Water sensitive paper 25 x 75 mm 50 pcs. 893211

Liquid fertilizer

Liquid fertilizers may be of a higher liquid density than water and almost all normal spray solutions. The density correction table below states the increased pressure that will be needed to reach the required output with such liquids.

Example

The nozzle has an output of 2.03 l/min at 3 bar. If the density of the liquid fertilizer is 1.2 g/cm³ you have to multiply the calibration pressure – found when checking the nozzle flow with water – with the density factor. This gives an adjusted pressure of 3.6 bar. The value can be found in the table at 3 bar (calibrated pressure) and a density of 1.2 g/cm³.

Bar	l/ha				
	1.10	1.15	1.20	1.30	1.40
1.0	1.1	1.2	1.2	1.3	1.4
1.5	1.7	1.7	1.8	2.0	2.1
2.0	2.2	2.3	2.4	2.6	2.8
2.5	2.8	2.9	3.0	3.3	3.5
3.0	3.3	3.5	3.6	3.9	4.2

Nozzle flow

If your water volume rate and spraying speed are known, use this table to identify the flow rate that will be required by the nozzle. The nozzle flow rate (litres/minute) selected from this table can be used together with the nozzle tables on the following pages to identify a suitable nozzle.

km/h	l/ha															
	25	50	75	100	125	150	175	200	250	300	350	400	450	500	550	600
3				0.25	0.31	0.38	0.44	0.50	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50
4			0.25	0.33	0.42	0.50	0.58	0.67	0.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00
5		0.21	0.31	0.42	0.52	0.63	0.73	0.83	1.04	1.25	1.46	1.67	1.88	2.08	2.29	2.50
6		0.25	0.38	0.50	0.63	0.75	0.88	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
7		0.29	0.44	0.58	0.73	0.88	1.02	1.17	1.46	1.75	2.04	2.33	2.63	2.92	3.21	3.50
8		0.33	0.50	0.67	0.83	1.00	1.17	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00
9		0.38	0.56	0.75	0.94	1.13	1.31	1.50	1.88	2.25	2.63	3.00	3.38	3.75	4.13	4.50
10	0.21	0.42	0.63	0.83	1.04	1.25	1.46	1.67	2.08	2.50	2.92	3.33	3.75	4.17	4.58	5.00
12	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00		
15	0.31	0.63	0.94	1.25	1.56	1.88	2.19	2.50	3.13	3.75	4.38	5.00				
20	0.42	0.83	1.25	1.67	2.08	2.50	2.92	3.33	4.17	5.00						



HARDI ISO F-110

Standard FLATFAN nozzles

All-round FLATFAN nozzle. Recommended for all types of pesticide application where optimum coverage is demanded. This nozzle will give you excellent and uniform liquid distribution at boom heights from 35 to 70 cm (50 cm recommended to take care of uneven terrain or boom movements).

- ISO – flow, colour and outer dimensions
- Working pressure – 1.5 to 5 bar
- Recommended for TWIN sprayers
- SYNTAL – precision moulded thermoplastic
- CERAMIC – extremely high durability
- COLORTIPS – for safe and easy handling

		bar	l/min		6	7	8	10	12	15	20	25
0075-Pink	1.5	0.21	F	42	36	32	25	21	17	13	10	
	2.0	0.24	F	49	42	37	29	24	20	15	12	
	2.5	0.27	F	55	47	41	33	27	22	16	13	
	3.0	0.30	F	60	51	45	36	30	24	18	14	
	4.0	0.35	F	69	59	52	42	35	28	21	17	
	5.0	0.39	F	77	66	58	46	39	31	23	19	
SYNTAL-CT				371964 (12 pcs. 750634)								
SYNTAL-S				371963 (12 pcs. 750635)								

		bar	l/min		6	7	8	10	12	15	20	25
01-Orange	1.5	0.28	F	57	48	42	34	28	23	17	14	
	2.0	0.33	F	65	56	49	39	33	26	20	16	
	2.5	0.37	F	73	63	55	44	37	29	22	18	
	3.0	0.40	F	80	69	60	48	40	32	24	19	
	4.0	0.46	F	92	79	69	55	46	37	28	22	
	5.0	0.52	F	103	89	77	62	52	41	31	25	
SYNTAL-CT				371764 (12 pcs. 755627)								
SYNTAL-S				371706 (12 pcs. 755643)								

		bar	l/min		6	7	8	10	12	15	20	25
015-Green	1.5	0.42	M	85	73	64	51	42	34	25	20	
	2.0	0.49	F	98	84	73	59	49	39	29	24	
	2.5	0.55	F	110	94	82	66	55	44	33	26	
	3.0	0.60	F	120	103	90	72	60	48	36	29	
	4.0	0.69	F	139	119	104	83	69	55	42	33	
	5.0	0.77	F	155	133	116	93	77	62	46	37	
SYNTAL-CT				371765 (12 pcs. 755628)								
SYNTAL-S				371707 (12 pcs. 755646)								
				CERAMIC-CT .. 371772 (12 pcs. 755635)								
				CERAMIC-S ... 371738 (12 pcs. 755667)								

		bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	1.5	0.57	M	113	97	85	68	57	45	34	27	
	2.0	0.65	M	131	112	98	78	65	52	39	31	
	2.5	0.73	F	146	125	110	88	73	58	44	35	
	3.0	0.80	F	160	137	120	96	80	64	48	38	
	4.0	0.92	F	185	158	139	111	92	74	55	44	
	5.0	1.03	F	207	177	155	124	103	83	62	50	
SYNTAL-CT				371766 (12 pcs. 755629)								
SYNTAL-S				371708 (12 pcs. 755649)								
				CERAMIC-CT .. 371773 (12 pcs. 755636)								
				CERAMIC-S 371739 (12 pcs. 755670)								

		bar	l/min		6	7	8	10	12	15	20	25
025-Lilac	1.5	0.71	M	141	121	106	85	71	57	42	34	
	2.0	0.82	M	163	140	122	98	82	65	49	39	
	2.5	0.91	M	183	156	137	110	91	73	55	44	
	3.0	1.00	M	200	171	150	120	100	80	60	48	
	4.0	1.15	F	231	198	173	139	115	92	69	55	
	5.0	1.29	F	258	221	194	155	129	103	77	62	
SYNTAL-CT				371950 (12 pcs. 750626)								
SYNTAL-S				371946 (12 pcs. 750628)								

= Spray quality: ■ Ultra Coarse (UC), □ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

		bar	l/min		6	7	8	10	12	15	20	25
03-Blue	1.5	0.85	M	170	145	127	102	85	68	51	41	
	2.0	0.98	M	196	168	147	118	98	78	59	47	
	2.5	1.10	M	219	188	164	131	110	88	66	53	
	3.0	1.20	M	240	206	180	144	120	96	72	58	
	4.0	1.39	M	277	238	208	166	139	111	83	67	
	5.0	1.55	M	310	266	232	186	155	124	93	74	
SYNTAL-CT				371767 (12 pcs. 755630)								
SYNTAL-S				371709 (12 pcs. 755652)								
				CERAMIC-CT .. 371774 (12 pcs. 755637)								
				CERAMIC-S 371740 (12 pcs. 755673)								

		bar	l/min		6	7	8	10	12	15	20	25
04-Red	1.5	1.13	M	226	194	170	136	113	91	68	54	
	2.0	1.31	M	261	224	196	157	131	105	78	63	
	2.5	1.46	M	292	250	219	175	146	117	88	70	
	3.0	1.60	M	320	274	240	192	160	128	96	77	
	4.0	1.85	M	370	317	277	222	185	148	111	89	
	5.0	2.07	M	413	354	310	248	207	165	124	99	
SYNTAL-CT				371768 (12 pcs. 755631)								
SYNTAL-S				371710 (12 pcs. 755655)								
				CERAMIC-CT .. 371775 (12 pcs. 755638)								
				CERAMIC-S 371741 (12 pcs. 755676)								

		bar	l/min		6	7	8	10	12	15	20	25
05-Brown	1.5	1.41	C	283	242	212	170	141	113	85	68	
	2.0	1.63	C	327	280	245	196	163	131	98	78	
	2.5	1.83	M	365	313	274	219	183	146	110	88	
	3.0	2.00	M	400	343	300	240	200	160	120	96	
	4.0	2.31	M	462	396	346	277	231	185	139	111	
	5.0	2.58	M	516	443	387	310	258	207	155	124	
SYNTAL-CT				371769 (12 pcs. 755632)								
SYNTAL-S				371711 (12 pcs. 755658)								
				CERAMIC-CT .. 371776 (12 pcs. 755639)								
				CERAMIC-S 371742 (12 pcs. 755679)								

		bar	l/min		6	7	8	10	12	15	20	25
06-Grey	1.5	1.70	C	339	291	255	204	170	136	102	81	
	2.0	1.96	C	392	336	294	235	196	157	118	94	
	2.5	2.19	C	438	376	329	263	219	175	131	105	
	3.0	2.40	C	480	411	360	288	240	192	144	115	
	4.0	2.77	C	554	475	416	333	277	222	166	133	
	5.0	3.10	C	620	531	465	372	310	248	186	149	
SYNTAL-CT				371770 (12 pcs. 755633)								
SYNTAL-S				371712 (12 pcs. 755661)								
				CERAMIC-CT .. 371777 (12 pcs. 755640)								
				CERAMIC-S 371743 (12 pcs. 755682)								

		bar	l/min		6	7	8	10	12	15	20	25
08-White	1.5	2.26	VC	453	388	339	272	226	181	136	109	
	2.0	2.61	C	523	448	392	314	261	209	157	125	
	2.5	2.92	C	584	501	438	351	292	234	175	140	
	3.0	3.20	C	640	549	480	384	320	256	192	154	
	4.0	3.70	C	739	633	554	443	370	296	222	177	
	5.0	4.13	C	826	708	620	496	413	330	248	198	
SYNTAL-CT				371771 (12 pcs. 755634)								
SYNTAL-S				371713 (12 pcs. 755664)								

		bar	l/min		6	7	8	10	12	15	20	25
10-Light blue	1.5	2.83	VC	566	485	424	339	283	226	170	136	
	2.0	3.27	VC	653	560	490	392	327	261	196	157	
	2.5	3.65	VC	730	626	548	438	365	292	219	175	
	3.0	4.00	VC	800	686	600	480	400	320	240	192	
	4.0	4.62	C	924	792	693	554	462	370	277	222	
	5.0	5.16	C	1033	885	775	620	516	413	310	248	
SYNTAL-CT				371970 (12 pcs. 750636)								
SYNTAL-S				371966 (12 pcs. 750638)								

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.

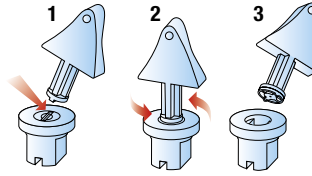


HARDI ISO LD-110

LOWDRIFT nozzles

LOWDRIFT nozzles are recommended when optimum spraying conditions cannot be achieved (risk of drift) and spraying cannot be postponed. This nozzle will give you excellent and uniform liquid distribution at boom heights from 35 to 70 cm (50 cm recommended to take care of uneven terrain or boom movements).

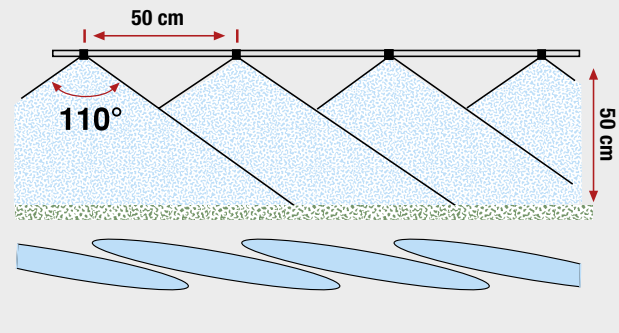
- ISO – Flow, colour and outer dimensions
- Working pressure – 1.5 to 5 bar
- Restrictor designed for minimum chemical residues
- SYNTAL – precision moulded thermoplastic
- CERAMIC – extremely high durability
- COLORTIPS – for safe and easy handling



Turn-&-Clean with the HARDI key – easily removable restrictor.

Boom distribution

To ensure that the boom distribution is not disturbed by interference, the nozzles are set at an angle of 8° to the boom. This feature is built into all HARDI COLOR TIP and SNAP-FIT caps. This angle has to be set manually if single nozzles are used.



	bar	l/min		6	7	8	10	12	15	20	25
01-Orange	1.5	0.28	M	57	48	42	34	28	23	17	14
	2.0	0.33	M	65	56	49	39	33	26	20	16
	2.5	0.37	M	73	63	55	44	37	29	22	18
	3.0	0.40	M	80	69	60	48	40	32	24	19
	4.0	0.46	M	92	79	69	55	46	37	28	22
	5.0	0.52	F	103	89	77	62	52	41	31	25
SYNTAL-CT 371837 (12 pcs. 755708)				CERAMIC-CT .. 371842 (12 pcs. 755713)							
SYNTAL-S 371817 (12 pcs. 755698)				CERAMIC-S 371822 (12 pcs. 755703)							

	bar	l/min		6	7	8	10	12	15	20	25
015-Green	1.5	0.42	M	85	73	64	51	42	34	25	20
	2.0	0.49	M	98	84	73	59	49	39	29	24
	2.5	0.55	M	110	94	82	66	55	44	33	26
	3.0	0.60	M	120	103	90	72	60	48	36	29
	4.0	0.69	M	139	119	104	83	69	55	42	33
	5.0	0.77	M	155	133	116	93	77	62	46	37
SYNTAL-CT 371838 (12 pcs. 755709)				CERAMIC-CT 371843 (12 pcs. 755714)							
SYNTAL-S 371818 (12 pcs. 755699)				CERAMIC-S 371823 (12 pcs. 755704)							

	bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	1.5	0.57	M	113	97	85	68	57	45	34	27
	2.0	0.65	M	131	112	98	78	65	52	39	31
	2.5	0.73	M	146	125	110	88	73	58	44	35
	3.0	0.80	M	160	137	120	96	80	64	48	38
	4.0	0.92	M	185	158	139	111	92	74	55	44
	5.0	1.03	M	207	177	155	124	103	83	62	50
SYNTAL-CT 371839 (12 pcs. 755710)				CERAMIC-CT .. 371844 (12 pcs. 755715)							
SYNTAL-S 371819 (12 pcs. 755700)				CERAMIC-S 371824 (12 pcs. 755705)							

	bar	l/min		6	7	8	10	12	15	20	25
025-Lilac	1.5	0.71	C	141	121	106	85	71	57	42	34
	2.0	0.82	C	163	140	122	98	82	65	49	39
	2.5	0.91	M	183	156	137	110	91	73	55	44
	3.0	1.00	M	200	171	150	120	100	80	60	48
	4.0	1.15	M	231	198	173	139	115	92	69	55
	5.0	1.29	M	258	221	194	155	129	103	77	62
SYNTAL-CT 371958 (12 pcs. 750630)											
SYNTAL-S 371957 (12 pcs. 750632)											

	bar	l/min		6	7	8	10	12	15	20	25
03-Blue	1.5	0.85	C	170	145	127	102	85	68	51	41
	2.0	0.98	C	196	168	147	118	98	78	59	47
	2.5	1.10	C	219	188	164	131	110	88	66	53
	3.0	1.20	C	240	206	180	144	120	96	72	58
	4.0	1.39	M	277	238	208	166	139	111	83	67
	5.0	1.55	M	310	266	232	186	155	124	93	74
SYNTAL-CT 371840 (12 pcs. 755711)				CERAMIC-CT .. 371845 (12 pcs. 755716)							
SYNTAL-S 371820 (12 pcs. 755701)				CERAMIC-S 371825 (12 pcs. 755706)							

	bar	l/min		6	7	8	10	12	15	20	25
04-Red	1.5	1.13	C	226	194	170	136	113	91	68	54
	2.0	1.31	C	261	224	196	157	131	105	78	63
	2.5	1.46	C	292	250	219	175	146	117	88	70
	3.0	1.60	C	320	274	240	192	160	128	96	77
	4.0	1.85	C	370	317	277	222	185	148	111	89
	5.0	2.07	M	413	354	310	248	207	165	124	99
SYNTAL-CT 371841 (12 pcs. 755712)				CERAMIC-CT .. 371846 (12 pcs. 755717)							
SYNTAL-S 371821 (12 pcs. 755702)				CERAMIC-S 371826 (12 pcs. 755707)							

	bar	l/min		6	7	8	10	12	15	20	25
05-Brown	1.5	1.41	C	283	242	212	170	141	113	85	68
	2.0	1.63	C	327	280	245	196	163	131	98	78
	2.5	1.83	C	365	313	274	219	183	146	110	88
	3.0	2.00	C	400	343	300	240	200	160	120	96
	4.0	2.31	C	462	396	346	277	231	185	139	111
	5.0	2.58	C	516	443	387	310	258	207	155	124
SYNTAL-CT 371894 (12 pcs. 755815)				CERAMIC-CT .. 371897 (12 pcs. 755816)							
SYNTAL-S 371893 (12 pcs. 755817)				CERAMIC-S 371896 (12 pcs. 755818)							

= Spray quality: ■ Ultra Coarse (UC), ■ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



HARDI ISO MINIDRIFT

Air inclusion nozzles

The HARDI MINIDRIFT nozzles can be used for spraying at sub-optimal weather conditions, when spraying cannot be postponed. The MINIDRIFT nozzle will at low pressures reduce drift to a minimum.

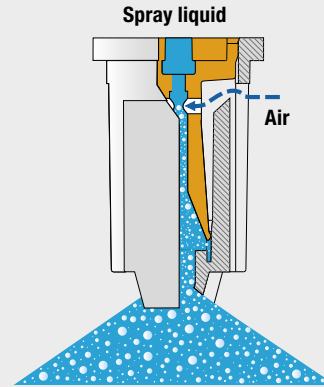
This nozzle will give you excellent and uniform liquid distribution at boom heights from 40 to 90 cm.

The droplet spectrum is coarse to very coarse; safe for drift control but without risking poor coverage and deposition on leaves. The venturi can easily be removed for cleaning the nozzle.

- Air inclusion nozzle
- Working pressure – 1 to 6 bar
- ISO – flow, colours, sizes and nomenclature
- Application rates from 60 to 430 l/ha (at 8 km/h)
- SYNTAL – precision moulded thermoplastic

Air inclusion nozzles

- Two big air inlets reduce the risk of clogging.
- Compact design reduces impact damage.
- Meets full ISO specifications.



	bar	l/min		6	7	8	10	12	15	20	25
015-Green	1.5	0.42	C	85	73	64	51	42	34	25	20
	2.0	0.49	C	98	84	73	59	49	39	29	24
	2.5	0.55	C	110	94	82	66	55	44	33	26
	3.0	0.60	C	120	103	90	72	60	48	36	29
	4.0	0.69	M	139	119	104	83	69	55	42	33
	5.0	0.77	M	155	133	116	93	77	62	46	37
	6.0	0.85	M	170	145	127	102	85	68	51	41
SYNTAL-CT372121 (12 pcs. 75083100)											
SYNTAL-S372111 (12 pcs. 75082100)											

	bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	1.5	0.57	VC	113	97	85	68	57	45	34	27
	2.0	0.65	C	131	112	98	78	65	52	39	31
	2.5	0.73	C	146	125	110	88	73	58	44	35
	3.0	0.80	C	160	137	120	96	80	64	48	38
	4.0	0.92	C	185	158	139	111	92	74	55	44
	5.0	1.03	M	207	177	155	124	103	83	62	50
	6.0	1.13	M	226	194	170	136	113	91	68	54
SYNTAL-CT372122 (12 pcs. 75083200)											
SYNTAL-S372112 (12 pcs. 75082200)											

	bar	l/min		6	7	8	10	12	15	20	25
025-Lilac	1.5	0.71	VC	141	121	106	85	71	57	42	34
	2.0	0.82	VC	163	140	122	98	82	65	49	39
	2.5	0.91	C	183	156	137	110	91	73	55	44
	3.0	1.00	C	200	171	150	120	100	80	60	48
	4.0	1.15	C	231	198	173	139	115	92	69	55
	5.0	1.29	M	258	221	194	155	129	103	77	62
	6.0	1.41	M	283	242	212	170	141	113	85	68
SYNTAL-CT372123 (12 pcs. 75083300)											
SYNTAL-S372113 (12 pcs. 75082300)											

	bar	l/min		6	7	8	10	12	15	20	25
03-Blue	1.5	0.85	VC	170	145	127	102	85	68	51	41
	2.0	0.98	VC	196	168	147	118	98	78	59	47
	2.5	1.10	VC	219	188	164	131	110	88	66	53
	3.0	1.20	C	240	206	180	144	120	96	72	58
	4.0	1.39	C	277	238	208	166	139	111	83	67
	5.0	1.55	C	310	266	232	186	155	124	93	74
	6.0	1.70	M	339	291	255	204	170	136	102	81
SYNTAL-CT372124 (12 pcs. 75083400)											
SYNTAL-S372114 (12 pcs. 75082400)											

	bar	l/min		6	7	8	10	12	15	20	25
04-Red	1.0	0.92	VC	185	158	139	111	90	74	55	44
	1.5	1.13	VC	226	194	170	136	113	91	68	54
	2.0	1.31	VC	261	224	196	157	131	105	78	63
	2.5	1.46	VC	292	250	219	175	146	117	88	70
	3.0	1.60	VC	320	274	240	192	160	128	96	77
	4.0	1.85	C	370	317	277	222	185	148	111	89
	5.0	2.07	C	413	354	310	248	207	165	124	99
	6.0	2.26	C	453	388	339	272	226	181	136	109
SYNTAL-CT372125 (12 pcs. 75083500)											
SYNTAL-S372115 (12 pcs. 75082500)											

	bar	l/min		6	7	8	10	12	15	20	25
05-Brown	1.0	1.15	VC	231	148	173	139	115	92	69	56
	1.5	1.41	VC	283	242	212	170	141	113	85	68
	2.0	1.63	VC	327	280	245	196	163	131	98	78
	2.5	1.83	VC	365	313	274	219	183	146	110	88
	3.0	2.00	VC	400	343	300	240	200	160	120	96
	4.0	2.31	C	462	396	346	277	231	185	139	111
	5.0	2.58	C	516	443	387	310	258	207	155	124
	6.0	2.83	C	566	485	424	339	283	226	170	136
SYNTAL-CT372126 (12 pcs. 75083600)											
SYNTAL-S372116 (12 pcs. 75082600)											

= Spray quality: ■ Ultra Coarse (UC), □ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



HARDI ISO NANODRIFT

Air inclusion nozzles

The HARDI NANODRIFT nozzles should be used when high drift reduction is required. The NANODRIFT nozzle will at low pressures reduce drift to a minimum. The droplet spectrum is coarse to very coarse; safe for drift control but without risking poor coverage and deposition on leaves.

The NANODRIFT is available in 8 sizes and a working pressure of 1.0 to 6.0 bar, this nozzle is the ideal solution when higher volume rates are required.

The common used size of HARDI NANODRIFT nozzles are approved at the German Julius Kuehn Institute (JKI) and will be registered in the drift reduction technology scheme. The Julius Kuehn drift reduction level is the highest worldwide and the registration is used in several countries in Europe.

- Air inclusion nozzle
- Working pressure – 1.0 to 6.0 bar
- ISO – flow, colors, sizes and nomenclature
- Application rates from 85 to 850 l/ha (at 8 km/h)
- SYNTAL – precision molded thermoplastic

NANODRIFT 02	approved 1.5 to 6.0 bar maximum drift reduction 75 %
NANODRIFT 025	approved 1.5 to 6.0 bar maximum drift reduction 75 %
NANODRIFT 03	approved 1.0 to 6.0 bar maximum drift reduction 90 %
NANODRIFT 04	approved 1.0 to 6.0 bar maximum drift reduction 90 %*
NANODRIFT 05	approved 1.0 to 6.0 bar maximum drift reduction 90 %

*expected soon

	bar	l/min		6	7	8	10	12	15	20	25
02 - Yellow	1,5	0,57	XC	114	98	86	68	57	46	34	27
	2,0	0,65	VC	130	111	98	78	65	52	39	31
	3,0	0,80	VC	160	137	120	96	80	64	48	38
	4,0	0,92	VC	184	158	138	110	92	74	55	44
	5,0	1,03	C	206	177	155	124	103	82	62	49
	6,0	1,13	C	226	194	170	136	113	90	68	54
SYNTAL-CT				37222300							
SYNTAL-S				37227300							

025 - Lilac	1,5	0,71	XC	142	122	107	85	71	57	43	34
	2,0	0,82	VC	164	141	123	98	82	66	49	39
	3,0	1,00	VC	200	171	150	120	100	80	60	48
	4,0	1,15	VC	230	197	173	138	115	92	69	55
	5,0	1,29	C	258	221	194	155	129	103	77	62
	6,0	1,41	C	282	242	212	169	141	113	85	68
SYNTAL-CT				37222400							
SYNTAL-S				37227400							

03 - Blue	1,0	0,70	UC	140	120	105	84	70	56	42	34
	2,0	0,99	VC	198	170	149	119	99	79	59	48
	3,0	1,21	VC	242	207	182	145	121	97	73	58
	4,0	1,40	VC	280	240	210	168	140	112	84	67
	5,0	1,57	VC	314	269	236	188	157	126	94	75
	6,0	1,72	VC	344	295	258	206	172	138	103	83
SYNTAL-CT				37222500							
SYNTAL-S				37227500							

04 - Red	1,0	0,92	UC	185	158	138	111	92	74	55	44
	2,0	1,31	VC	262	225	197	157	131	105	79	63
	3,0	1,60	VC	320	274	240	192	160	128	96	77
	4,0	1,85	VC	370	317	278	222	185	148	111	89
	5,0	2,07	VC	414	355	311	248	207	166	124	99
	6,0	2,27	VC	454	389	341	272	227	182	136	109
SYNTAL-CT				37222600							
SYNTAL-S				37227600							

	bar	l/min		6	7	8	10	12	15	20	25
05 - Brown	1,0	1,15	UC	230	197	173	138	115	92	69	55
	2,0	1,63	VC	326	279	245	196	163	130	98	78
	3,0	2,00	VC	400	343	300	240	200	160	120	96
	4,0	2,31	VC	462	396	347	277	231	185	139	111
	5,0	2,58	VC	516	442	387	310	258	206	155	124
	6,0	2,83	VC	566	485	425	340	283	226	170	136
SYNTAL-CT				37222700							
SYNTAL-S				37227700							

06 - Grey	1,0	1,39	UC	278	238	209	167	139	111	83	67
	2,0	1,96	XC	392	336	294	235	196	157	118	94
	3,0	2,40	VC	480	411	360	288	240	192	144	115
	4,0	2,77	VC	554	475	416	332	277	222	166	133
	5,0	3,10	VC	620	531	465	372	310	248	186	149
	6,0	3,39	VC	678	581	509	407	339	271	203	163
SYNTAL-CT				37222800							
SYNTAL-S				37227800							

08 - White	1,0	1,85	UC	370	317	278	222	185	148	111	89
	2,0	2,61	XC	522	447	392	313	261	209	157	125
	3,0	3,20	VC	640	549	480	384	320	256	192	154
	4,0	3,70	VC	740	634	555	444	370	296	222	178
	5,0	4,13	VC	826	708	620	496	413	330	248	198
	6,0	4,53	VC	906	777	680	544	453	362	272	217
SYNTAL-CT				37222900							
SYNTAL-S				37227900							

10 - Light blue	1,0	2,31	UC	462	396	347	277	231	185	139	111
	2,0	3,27	XC	654	561	491	392	327	262	196	157
	3,0	4,00	XC	800	686	600	480	400	320	240	192
	4,0	4,62	VC	924	792	693	554	462	370	277	222
	5,0	5,16	VC	1032	885	774	619	516	413	310	248
	6,0	5,66	VC	1132	970	849	679	566	453	340	272
SYNTAL-CT				37223000							
SYNTAL-S				37228000							

= Spray quality: ■ Ultra Coarse (UC), □ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



HARDI ISO INJET

Air inclusion nozzles

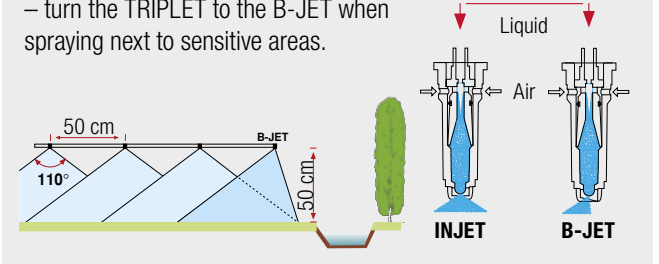
The HARDI INJET nozzles can be used for spraying at sub-optimal weather conditions, or when spraying cannot be postponed. The HARDI INJET nozzles are recommended for most pesticide applications where reduced risk of drift is demanded.

The HARDI INJET & B-JET nozzles can be mounted using the 334083 ISO/INJET cap.

- Air inclusion nozzles with greater drift reduction
- ISO flow, colours and nomenclature
- Application rates from 60-600 l/ha (at 8 km/h)
- Pressure range – 3-8 bar
- B-Jet border nozzle for precise application near sensitive areas
- Available in SYNTAL and CERAMIC materials

HARDI B-JET

HARDI B-JET makes a half spray swath – turn the TRIPLET to the B-JET when spraying next to sensitive areas.



	bar	l/min		6	7	8	10	12	15	20	25
01-Orange	3.0	0.40	VC	80	69	60	48	40	32	24	19
	4.0	0.46	VC	92	79	69	55	46	37	28	22
	5.0	0.52	VC	103	89	77	62	52	41	31	25
	6.0	0.57	C	113	97	85	68	57	45	34	27
	7.0	0.61	C	122	105	92	73	61	49	37	29
	8.0	0.65	C	131	112	98	78	65	52	39	31
SYNTAL-S				371926 (12 pcs. 75078800)							

	bar	l/min		6	7	8	10	12	15	20	25
015-Green	3.0	0.60	VC	120	103	90	72	60	48	36	29
	4.0	0.69	VC	139	119	104	83	69	55	42	33
	5.0	0.77	VC	155	133	116	93	77	62	46	37
	6.0	0.85	VC	170	145	127	102	85	68	51	41
	7.0	0.92	VC	183	157	137	110	92	73	55	44
	8.0	0.98	C	196	168	147	118	98	78	59	47
SYNTAL-S				371872 (12 pcs. 75081500)							

	bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	3.0	0.80	VC	160	137	120	96	80	64	48	38
	4.0	0.92	VC	185	158	139	111	92	74	55	44
	5.0	1.03	VC	207	177	155	124	103	83	62	50
	6.0	1.13	VC	226	194	170	136	113	91	68	54
	7.0	1.22	VC	244	209	183	147	122	98	73	59
	8.0	1.31	VC	261	224	196	157	131	105	78	63
SYNTAL-S				371873 (12 pcs. 75081600)							
SYNTAL-SB-JET				371930 (2pcs. 750620)							

	bar	l/min		6	7	8	10	12	15	20	25
025-Lilac	3.0	1.00	VC	200	171	150	120	100	80	60	48
	4.0	1.15	VC	231	198	173	139	115	92	69	55
	5.0	1.29	VC	258	221	194	155	129	103	77	62
	6.0	1.41	VC	283	242	212	170	141	113	85	68
	7.0	1.53	VC	306	262	229	183	153	122	92	73
	8.0	1.63	VC	327	280	245	196	163	131	98	78
SYNTAL-S				371874 (12 pcs. 75081700)							
SYNTAL-S B-JET				371877 (2 pcs. 755806)							

= Spray quality: ■ Ultra Coarse (UC), □ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

	bar	l/min		6	7	8	10	12	15	20	25
03-Blue	3.0	1.20	VC	240	206	180	144	120	96	72	58
	4.0	1.39	VC	277	238	208	166	139	111	83	67
	5.0	1.55	VC	310	266	232	186	155	124	93	74
	6.0	1.70	VC	339	291	255	204	170	136	102	81
	7.0	1.83	VC	367	314	275	220	183	147	110	88
	8.0	1.96	VC	392	336	294	235	196	157	118	94
SYNTAL-S				371875 (12 pcs. 75081800)							
SYNTAL-S B-JET				371870 (2 pcs. 755799)							

	bar	l/min		6	7	8	10	12	15	20	25
04-Red	3.0	1.60	VC	320	274	240	192	160	128	96	77
	4.0	1.85	VC	370	317	277	222	185	148	111	89
	5.0	2.07	VC	413	354	310	248	207	165	124	99
	6.0	2.26	VC	453	388	339	272	226	181	136	109
	7.0	2.44	VC	489	419	367	293	244	196	147	117
	8.0	2.61	VC	523	448	392	314	261	209	157	125
SYNTAL-S				371876 (12 pcs. 75081900)							
SYNTAL-S B-JET				371871 (2 pcs. 755800)							

	bar	l/min		6	7	8	10	12	15	20	25
05-Brown	3.0	2.00	VC	400	343	300	240	200	160	120	96
	4.0	2.31	VC	462	396	346	277	231	185	139	111
	5.0	2.58	VC	516	443	387	310	258	207	155	124
	6.0	2.83	VC	566	485	424	339	283	226	170	136
	7.0	3.06	VC	611	524	458	367	306	244	183	147
	8.0	3.27	VC	653	560	490	392	327	261	196	157
SYNTAL-S				371927 (12 pcs. 75078900)							

	bar	l/min		6	7	8	10	12	15	20	25
06-Grey	3.0	2.40	VC	480	411	360	288	240	192	144	115
	4.0	2.77	VC	554	475	416	333	277	222	166	133
	5.0	3.10	VC	620	531	465	372	310	248	186	149
	6.0	3.39	VC	679	582	509	407	339	272	204	163
	7.0	3.67	VC	733	628	550	440	367	293	220	176
	8.0	3.92	VC	784	672	588	470	392	314	235	188
SYNTAL-S				371928 (12 pcs. 7507900)							

	bar	l/min		6	7	8	10	12	15	20	25
08-White	3.0	3.20	VC	640	549	480	384	320	256	192	154
	4.0	3.70	VC	739	633	554	443	370	296	222	177
	5.0	4.13	VC	826	708	620	496	413	330	248	198
	6.0	4.53	VC	905	776	679	543	453	362	272	217
	7.0	4.89	VC	978	838	733	587	489	391	293	235
	8.0	5.23	VC	1045	896	784	627	523	418	314	251
SYNTAL-S				371929 (12 pcs. 75079100)							

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



HARDI ISO MINIDRIFT DUO

Air inclusion nozzle

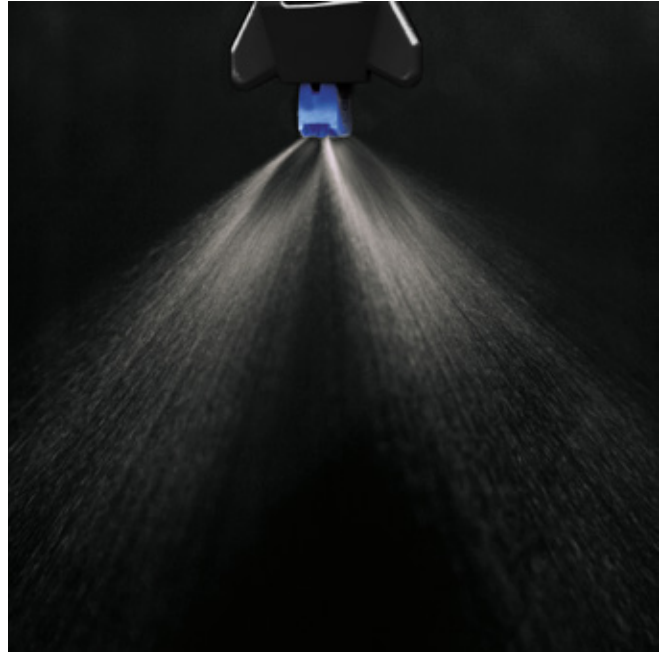
The HARDI MINIDRIFT DUO nozzle can be used for spraying at sub-optimal weather conditions, when spraying cannot be postponed. The MINIDRIFT DUO nozzle will at low pressures reduce drift to a minimum.

This compact flat spray air injector nozzle offers droplet spectrum from medium to very coarse; safe for drift control but without risking poor coverage and deposition on leaves. The two angled fans increase the number of droplets and impacts on target compared to normal air injector nozzles.

A good coverage on dense foliage and vertical targets. The injector can easily be removed for cleaning the nozzle.

The HARDI MINIDRIFT DUO nozzles can be mounted using the 334083 ISO cap.

- Working pressure – 1.5 to 6 bar ISO flow, colours, sizes and nomenclature
- 30° forward and backward angle
- Application rates from 125 to 420 l/ha (at 8 km/h)
- SYNTAL – precision moulded thermoplastic



	bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	1.5	0.57	VC	113	97	85	68	57	45	34	27
	2.0	0.65	C	131	112	98	78	65	52	39	31
	2.5	0.73	C	146	125	110	88	73	58	44	35
	3.0	0.80	C	160	137	120	96	80	64	48	38
	4.0	0.92	C	185	158	139	111	92	74	55	44
	5.0	1.03	M	207	177	155	124	103	83	62	50
6.0	1.13	M	226	194	170	136	113	91	68	54	
SYNTAL-S	37218400										

	bar	l/min		6	7	8	10	12	15	20	25
025-Lilac	1.5	0.71	VC	141	121	106	85	71	57	42	34
	2.0	0.82	VC	163	140	122	98	82	65	49	39
	2.5	0.91	C	183	156	137	110	91	73	55	44
	3.0	1.00	C	200	171	150	120	100	80	60	48
	4.0	1.15	C	231	198	173	139	115	92	69	55
	5.0	1.29	M	258	221	194	155	129	103	77	62
6.0	1.41	M	283	242	212	170	141	113	85	68	
SYNTAL-S	37218500										

	bar	l/min		6	7	8	10	12	15	20	25
03-Blue	1.5	0.84	VC	168	144	126	101	84	72	63	56
	2.0	0.97	VC	194	166	146	116	97	83	73	65
	2.5	1.08	C	216	185	162	130	108	93	81	72
	3.0	1.19	C	238	204	179	143	119	102	89	79
	4.0	1.37	M	274	235	206	164	137	117	103	91
	5.0	1.53	M	310	266	232	186	155	124	93	74
6.0	1.68	M	336	288	252	202	168	144	126	112	
SYNTAL-S	37218100										

	bar	l/min		6	7	8	10	12	15	20	25
04-Red	1.5	1.12	VC	224	192	168	134	112	96	84	75
	2.0	1.29	C	258	221	194	155	129	111	97	86
	2.5	1.44	C	288	247	216	173	144	123	108	96
	3.0	1.58	C	316	271	237	190	158	135	119	105
	4.0	1.82	M	364	312	273	218	182	156	137	121
	5.0	2.04	M	408	350	306	245	204	175	153	136
6.0	2.23	M	446	382	335	268	223	191	167	149	
SYNTAL-S	37218200										

	bar	l/min		6	7	8	10	12	15	20	25
05-Brown	1.5	1.39	VC	278	238	209	167	139	119	104	93
	2.0	1.61	C	322	276	242	193	161	138	121	107
	2.5	1.80	C	360	309	270	216	180	154	135	120
	3.0	1.97	C	394	338	296	236	197	169	148	131
	4.0	2.28	M	456	391	342	274	228	195	171	152
	5.0	2.55	M	510	437	383	306	255	219	191	170
6.0	2.79	M	558	478	419	335	279	239	209	186	
SYNTAL-S	37218300										

= Spray quality:
 ■ Ultra Coarse (UC),
 □ Extremely Coarse (XC),
 ■ Very Coarse (VC),
 ■ Coarse (C),
 ■ Medium (M),
 ■ Fine (F),
 ■ Very Fine (VF).

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



HARDI DUOCAP

Double-up your application

HARDI DUOCAP gives you higher volume rate while still maintaining proper droplet size. Fitted with two F or LD nozzles HARDI DUOCAP will give Fine to Medium spray, suitable for fungicide spraying.

Two different nozzles can be used. A Standard and a MINIDRIFT nozzle will give you the dual benefit of having Fine droplets, ensuring good coverage in the top of the crop and Coarse droplets, penetrating to the lower and more dense areas.

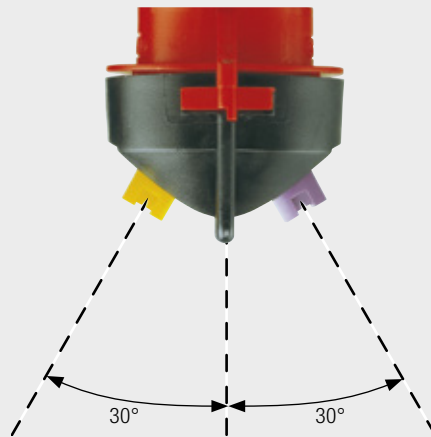
HARDI DUOCAP fitted with two MINIDRIFT nozzles will give superior penetration into dense crops like Potatoes and Soybeans.

- Improved coverage
- Angled spray ensures penetration i dense crops
- Can hold all ISO nozzles
- 30° forward and backward angle

l/min (2 nozzles)	l/ha at km/h							
	6	7	8	10	12	15	20	25
0.75	150	129	113	90	75	60	45	36
1.00	200	171	150	120	100	80	60	48
1.25	250	214	188	150	125	100	75	60
1.50	300	257	225	180	150	120	90	72
1.75	350	300	263	210	175	140	105	84
2.00	400	343	300	240	200	160	120	96
2.25	450	386	338	270	225	180	135	108
2.50	500	429	375	300	250	200	150	120
2.75	550	471	413	330	275	220	165	132
3.00	600	514	450	360	300	240	180	144
3.25	650	557	488	390	325	260	195	156
3.50	700	600	525	420	350	280	210	168
3.75	750	643	563	450	375	300	225	180
4.00	800	686	600	480	400	320	240	192
4.25	850	729	638	510	425	340	255	204
4.50	900	771	675	540	450	360	270	216
4.75	950	814	713	570	475	380	285	228
5.00	1000	857	750	600	500	400	300	240
5.25	1050	900	788	630	525	420	315	252
5.50	1100	943	825	660	550	440	330	264
5.75	1150	986	863	690	575	460	345	276
6.00	1200	1029	900	720	600	480	360	288

Calibration

If two ISO nozzles of the same size are used, they will apply the same volume as one ISO nozzle of the double size (use the application table of the double sized nozzle). If two nozzles of different sizes are used, the l/min at the chosen pressure for both nozzles must be added together, and the table below can be used to find the application volume.



The HARDI DUOCAP is delivered complete with 3 O-rings, and 3 plastic parts (note: nozzles are not included).



HARDI DUOCAP 28063000





HARDI ISO F 80 FLATFAN nozzles

This nozzle has an 80° spray angle. On boom sizes from 24 to 36 m the boom height is often higher than 50 cm above the target. 80° nozzles provide good coverage with reduced drift risk at these higher boom heights and are also adaptable to band spraying.

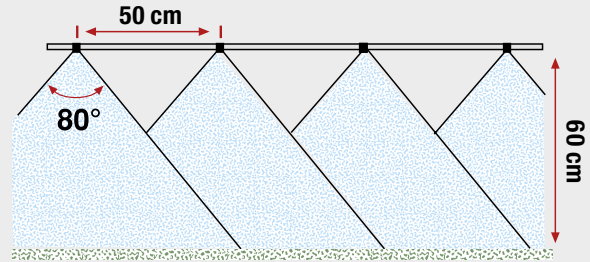
The 80° nozzle is suitable for big booms or row crop / band spraying with either low boom or nozzles at droplegs.

- ISO – flow, colour and outer dimensions
- Spray angle – 80°
- Working pressure – 1.5 to 5 bar
- SYNTAL – precision moulded thermoplastic
- CERAMIC – extremely high durability

For use in cotton, sugar cane, sugar beets etc.

The 80° nozzles can be fitted on HARDI sprayers using the ISO/INJET cap.

ISO/INJET cap 334083



	bar	l/min		6	7	8	10	12	15	20	25
01-Orange	1.5	0.28	-	57	48	42	34	28	23	17	14
	2.0	0.33	-	65	56	49	39	33	26	20	16
	2.5	0.37	-	73	63	55	44	37	29	22	18
	3.0	0.40	-	80	69	60	48	40	32	24	19
	4.0	0.46	-	92	79	69	55	46	37	28	22
	5.0	0.52	-	103	89	77	62	52	41	31	25
SYNTAL-S 371931 (12 pcs. 750640)											

	bar	l/min		6	7	8	10	12	15	20	25
015-Green	1.5	0.42	-	85	73	64	51	42	34	25	20
	2.0	0.49	-	98	84	73	59	49	39	29	24
	2.5	0.55	-	110	94	82	66	55	44	33	26
	3.0	0.60	-	120	103	90	72	60	48	36	29
	4.0	0.69	-	139	119	104	83	69	55	42	33
	5.0	0.77	-	155	133	116	93	77	62	46	37
SYNTAL-S 371932 (12 pcs. 750641) CERAMIC-S ... 371906 (12 pcs. 750609)											
CERAMIC-CT .. 371920 (12 pcs. 750602)											

	bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	1.5	0.57	-	113	97	85	68	57	45	34	27
	2.0	0.65	-	131	112	98	78	65	52	39	31
	2.5	0.73	-	146	125	110	88	73	58	44	35
	3.0	0.80	-	160	137	120	96	80	64	48	38
	4.0	0.92	-	185	158	139	111	92	74	55	44
	5.0	1.03	-	207	177	155	124	103	83	62	50
SYNTAL-S 371933 (12 pcs. 750642) CERAMIC-S 371907 (12 pcs. 750610)											
CERAMIC-CT .. 371921 (12 pcs. 750603)											

	bar	l/min		6	7	8	10	12	15	20	25
03-Blue	1.5	0.85	-	170	145	127	102	85	68	51	41
	2.0	0.98	-	196	168	147	118	98	78	59	47
	2.5	1.10	-	219	188	164	131	110	88	66	53
	3.0	1.20	-	240	206	180	144	120	96	72	58
	4.0	1.39	-	277	238	208	166	139	111	83	67
	5.0	1.55	-	310	266	232	186	155	124	93	74
SYNTAL-S 371934 (12 pcs. 750643) CERAMIC-S 371908 (12 pcs. 750611)											
CERAMIC-CT .. 371922 (12 pcs. 750604)											



= Spray quality: ■ Ultra Coarse (UC), □ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



HARDI QUINTASTREAM nozzles

Liquid fertilizer nozzles

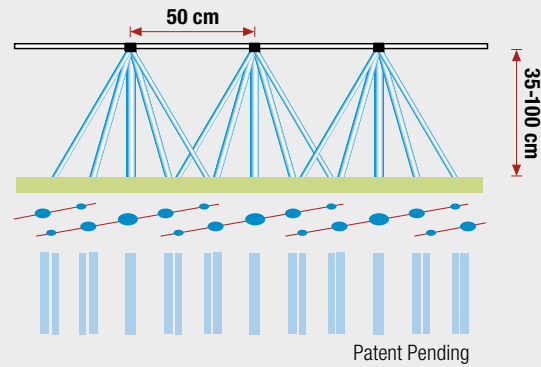
Five (5) streams of liquid are distributed at different angles and flows by each QUINTASTREAM nozzle. Highest flow is from the middle stream and lowest in the outer, overlapping streams.

- The fastest way to convert your sprayer into a high precision fertilizer applicator
- 5 solid streams that minimise crop scorching
- Particularly important for wide booms at fast speeds
- ISO standard for easy calibration
- Turn and Clean key for restrictor removal
- Boom height 35-100 cm

Uniquely, this – patent pending – system allows for boom movements that do not influence distribution.

HARDI QUINTASTREAM can be mounted using the filter casing without gasket:

Nozzle filter 725737



	bar	l/min		6	7	8	10	12	15	20	25
015-Green	1.5	0.42	-	85	73	64	51	42	34	25	20
	2.0	0.49	-	98	84	73	59	49	39	29	24
	2.5	0.55	-	110	94	82	66	55	44	33	26
	3.0	0.60	-	120	103	90	72	60	48	36	29
	4.0	0.69	-	139	119	104	83	69	55	42	33
	5.0	0.77	-	155	133	116	93	77	62	46	37
COLORTIP 372011 (6 pcs. 750680)			SINGLE 372002 (6 pcs. 750671)								

	bar	l/min		6	7	8	10	12	15	20	25
02-Yellow	1.5	0.57	-	113	97	85	68	57	45	34	27
	2.0	0.65	-	131	112	98	78	65	52	39	31
	2.5	0.73	-	146	125	110	88	73	58	44	35
	3.0	0.80	-	160	137	120	96	80	64	48	38
	4.0	0.92	-	185	158	139	111	92	74	55	44
	5.0	1.03	-	207	177	155	124	103	83	62	50
COLORTIP 372012 (6 pcs. 750681)			SINGLE 372003 (6 pcs. 750672)								

	bar	l/min		6	7	8	10	12	15	20	25
03-Blue	1.5	0.85	-	170	145	127	102	85	68	51	41
	2.0	0.98	-	196	168	147	118	98	78	59	47
	2.5	1.10	-	219	188	164	131	110	88	66	53
	3.0	1.20	-	240	206	180	144	120	96	72	58
	4.0	1.39	-	277	238	208	166	139	111	83	67
	5.0	1.55	-	310	266	232	186	155	124	93	74
COLORTIP 372013 (6 pcs. 750682)			SINGLE 372004 (6 pcs. 750673)								

	bar	l/min		6	7	8	10	12	15	20	25
04-Red	1.5	1.13	-	226	194	170	136	113	91	68	54
	2.0	1.31	-	261	224	196	157	131	105	78	63
	2.5	1.46	-	292	250	219	175	146	117	88	70
	3.0	1.60	-	320	274	240	192	160	128	96	77
	4.0	1.85	-	370	317	277	222	185	148	111	89
	5.0	2.07	-	413	354	310	248	207	165	124	99
COLORTIP 372014 (6 pcs. 750683)			SINGLE 372005 (6 pcs. 750674)								

	bar	l/min		6	7	8	10	12	15	20	25
05-Brown	1.5	1.41	-	283	242	212	170	141	113	85	68
	2.0	1.63	-	327	280	245	196	163	131	98	78
	2.5	1.83	-	365	313	274	219	183	146	110	88
	3.0	2.00	-	400	343	300	240	200	160	120	96
	4.0	2.31	-	462	396	346	277	231	185	139	111
	5.0	2.58	-	516	443	387	310	258	207	155	124
COLORTIP 372015 (6 pcs. 750684)			SINGLE 372006 (6 pcs. 750675)								

	bar	l/min		6	7	8	10	12	15	20	25
06-Grey	1.5	1.70	-	339	291	255	204	170	136	102	81
	2.0	1.96	-	392	336	294	235	196	157	118	94
	2.5	2.19	-	438	376	329	263	219	175	131	105
	3.0	2.40	-	480	411	360	288	240	192	144	115
	4.0	2.77	-	554	475	416	333	277	222	166	133
	5.0	3.10	-	620	531	465	372	310	248	186	149
COLORTIP 372016 (6 pcs. 750685)			SINGLE 372007 (6 pcs. 750676)								

	bar	l/min		6	7	8	10	12	15	20	25
08-White	1.5	2.26	-	453	388	339	272	226	181	136	109
	2.0	2.61	-	523	448	392	314	261	209	157	125
	2.5	2.92	-	584	501	438	351	292	234	175	140
	3.0	3.20	-	640	549	480	384	320	256	192	154
	4.0	3.70	-	739	633	554	443	370	296	222	177
	5.0	4.13	-	826	708	620	496	413	330	248	198
COLORTIP 372017 (6 pcs. 750686)			SINGLE 372008 (6 pcs. 750677)								

	bar	l/min		6	7	8	10	12	15	20	25
10-Light blue	1.5	2.83	-	566	485	424	339	283	226	170	136
	2.0	3.27	-	653	560	490	392	327	261	196	157
	2.5	3.65	-	730	626	548	438	365	292	219	175
	3.0	4.00	-	800	686	600	480	400	320	240	192
	4.0	4.62	-	924	792	693	554	462	370	277	222
	5.0	5.16	-	1033	885	775	620	516	413	310	248
COLORTIP 372018 (6 pcs. 750687)			SINGLE 372009 (6 pcs. 750678)								

	bar	l/min		6	7	8	10	12	15	20	25
10-Light blue	1.5	4.24	-	849	727	636	509	424	339	255	204
	2.0	4.90	-	980	840	735	588	490	392	294	235
	2.5	5.48	-	1095	939	822	657	548	438	329	263
	3.0	6.00	-	1200	1029	900	720	600	480	360	288
	4.0	6.93	-	1386	1188	1039	831	693	554	416	333
	5.0	7.75	-	1549	1328	1162	930	775	620	465	372
COLORTIP 372019 (6 pcs. 750688)			SINGLE 372010 (6 pcs. 750679)								

NOTE: Remember to adjust the pressure according to the density of the liquid fertilizer. See page 9.



1553 Solid stream nozzle

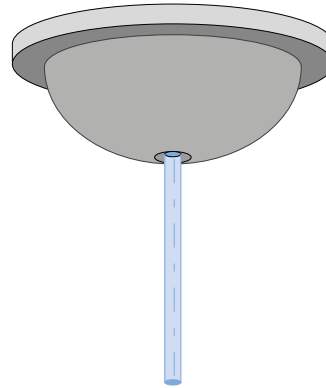
Liquid fertilizer

HARDI 1553 Cone nozzles are used without swirl plates for solid stream and with swirl plates for hollow cone and full cone spraying.

Use the solid stream for liquid fertilizer on boom sprayers.

- For application of liquid fertilizer at 25 cm nozzle spacing, with a minimum risk of scorching
- Flow rates from 0.29-22 l/min (at 1-10 bar)
- SYNTAL – precision moulded thermoplastic: precise, resistant and durable

NOTE: Remember to adjust the pressure according to the density of the liquid fertilizer. See page 20.



Bar	l/min											
	1553-8	1553-10	1553-12	1553-14	1553-16	1553-18	1553-20	1553-22	1553-24	1553-30	1553-35	1553-40
1.0	0.29	0.42	0.65	0.85	1.12	1.39	1.71	2.03	2.37	3.61	5.18	7.01
1.5	0.36	0.51	0.79	1.04	1.37	1.70	2.09	2.48	2.90	4.42	6.34	8.59
2.0	0.41	0.59	0.92	1.20	1.58	1.96	2.42	2.87	3.35	5.10	7.32	9.92
3.0	0.50	0.72	1.12	1.46	1.94	2.40	2.96	3.51	4.10	6.25	8.97	12.15
5.0	0.65	0.93	1.45	1.89	2.50	3.10	3.82	4.53	5.29	8.07	11.58	15.68
6.0	0.71	1.02	1.59	2.07	2.74	3.40	4.18	4.96	5.79	8.84	12.69	17.18
10.0	0.92	1.32	2.05	2.67	3.54	4.38	5.40	6.41	7.48	11.41	16.38	22.17
15.0	1.13	1.61	2.51	3.27	4.33	5.37	6.62	7.85	9.16	13.98	20.06	27.16
25.0	1.45	2.08	3.24	4.23	5.59	6.93	8.54	10.13	11.83	18.05	25.89	35.06
No. 12 pcs.	370016 750256	370027 755031	370031 755382	370042 755064	370053 755385	370064 755065	370075 755097	370086 755066	370097 755123	370101 750257	370112 755067	370123 755068



Calibration of mistblowers

To ensure precise and safe applications in the field, effective calibration is essential. Calibration must always be done with clean water and before the use of any crop protection product. Follow this guide to calibrate your hand sprayer.

1 Calibration of forward speed

- See page 9: Calibration of field sprayers (note that the tractor PTO should be 540 rpm, which will allow the blower to operate at its maximum capacity)

2 Calculation of nozzle size and pressure

- After determining your forward speed and choosing your application rate according to the recommendations on the chemical container, the total nozzle capacity can be calculated on the following formula (based on driving in each row):

$$\frac{\text{Row spacing (m)} \times \text{l/ha} \times \text{km/h}}{600} = \text{total l/min}$$

Example

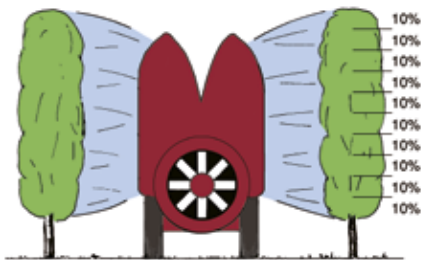
Row spacing: 5 m
Application rate: 600 l/ha
Forward speed: 4 km/h

$$\frac{5 \text{ (m)} \times 600 \text{ l/ha} \times 4 \text{ km/h}}{600} = 20 \text{ l/min}$$

The total nozzle capacity is 20 l/min. This amount has to be divided between all the nozzles on the mistblower. Two examples are described below:

(A) Nozzle calibration when equal output from each nozzle is desired

From the drawing you can see that the output from each of the 20 nozzles are the same, because the foliage to be sprayed is evenly distributed. This is calculated as follows:



$$\frac{\text{total l/min}}{\text{number of nozzles}} = \text{capacity of single nozzle in l/min}$$

Example

$$\frac{20 \text{ l/min}}{20 \text{ nozzles}} = 1 \text{ l/min}$$

In the 1299 nozzle chart you will find the nozzle closest to the desired output at a suitable pressure – Orange nozzle at 6 bar has a capacity of 1.07 l/min.

We recommend that you double-check the nozzle output with a measuring jug (with clean water in the sprayer). You can do this by disconnecting the blower and directing the water into the jug, using a hose.

If exactly 1 l/min is desired, the pressure can be adjusted with the pressure adjustment formula:

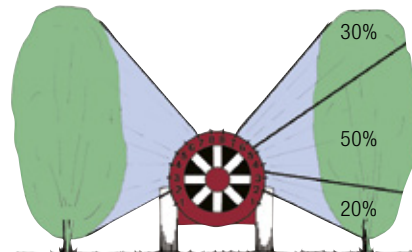
$$\left(\frac{\text{New output (l/min)}}{\text{Known output (l/min)}} \right)^2 \times \text{Known pressure (bar)} = \text{New pressure (bar)}$$

Example

$$\left(\frac{1.00 \text{ l/min}}{1.07 \text{ l/min}} \right)^2 \times 6 \text{ bar} = 5.24 \text{ bar}$$

(B) Nozzle calibration when nozzle output must be adapted to the crop

The drawing shows 8 nozzles pointing to each side. We can use the same example as in (A), with a row spacing of 5 metres, forward speed of 4 km/h and desired application rate of 600 l/ha.



In this case nozzles 1 and 8 are shut off
2 and 3 apply 20 % = 4 l/min (each nozzle applies 1 l/min)
4 and 5 apply 50 % = 10 l/min (each nozzle applies 2.5 l/min)
6 and 7 apply 30 % = 6 l/min (each nozzle applies 1.5 l/min)

Chosen from the flow table on page 22 giving the following combination at 6 bar:

Nozzle 2 and 3: 1299-14 orange (1.07 l/min)

Nozzle 4 and 5: 1299-20 blue (2.68 l/min)

Nozzle 6 and 7: 1299-16 red (1.51 l/min)

This yields a total of 21.08 l/min. The pressure needs to be adjusted according to the pressure adjustment formula to get the correct volume of 20 l/min. A pressure of 5.4 bar is chosen.

Example

$$\left(\frac{20.00 \text{ l/min}}{21.08 \text{ l/min}} \right)^2 \times 6 \text{ bar} = 5.4 \text{ bar}$$



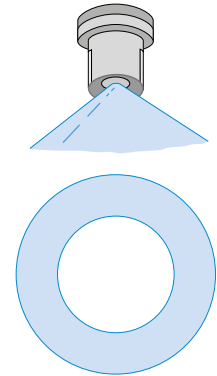
HARDI 1299 Hollow cone nozzles

Orchard spraying

These nozzles are superior in fine droplet delivery for optimal coverage of plant protection compounds. The high durability of the ceramic material makes this nozzle extensively used in orchard / mistblower applications at high working pressure or when applying abrasive materials.

- High efficiency nozzles
- Best choice for orchard applications
- Flow rates from 0.21-4.24 (at 3-15 bar)
- Working pressure from 3 to 25 bar
- CERAMIC – superior durability at high working pressure

Useful on droplegs for under leaf spraying where turbulence is required for good coverage. Also used on hand-held sprayers for insecticide and fungicide application and for band spraying.



	bar		l/min
01-Orange	3.0	F	0.76
	5.0	VF	0.98
	6.0	VF	1.07
	8.0	VF	1.24
	10.0	VF	1.39
	15.0	VF	1.70
1299-14	371511		
02-Yellow	3.0	F	0.57
	5.0	VF	0.74
	6.0	VF	0.81
	8.0	VF	0.94
	10.0	VF	1.05
	15.0	VF	1.28
1299-12	371510		
03-Blue	3.0	M	1.90
	5.0	M	2.45
	6.0	F	2.68
	8.0	F	3.10
	10.0	F	3.46
	15.0	F	4.24
1299-20	371514		
05-Brown	3.0	VF	0.37
	5.0	VF	0.48
	6.0	VF	0.53
	8.0	VF	0.61
	10.0	VF	0.68
	15.0	VF	0.83
1299-10	371509		
08-White	3.0	VF	0.21
	5.0	VF	0.27
	6.0	VF	0.30
	8.0	VF	0.34
	10.0	VF	0.38
	15.0	VF	0.47
1299-06	371507		
015-Green	3.0	F	1.37
	5.0	F	1.77
	6.0	F	1.94
	8.0	F	2.24
	10.0	VF	2.50
	15.0	VF	3.07
1299-18	371513		
025-Lilac	3.0	VF	0.29
	5.0	VF	0.37
	6.0	VF	0.41
	8.0	VF	0.47
	10.0	VF	0.52
	15.0	VF	0.64
1299-08	371508		
04-Red	3.0	F	1.08
	5.0	F	1.39
	6.0	F	1.52
	8.0	VF	1.76
	10.0	VF	1.97
	15.0	VF	2.41
1299-16	371512		
06-Grey	3.0	F	1.16
	5.0	F	1.50
	6.0	F	1.64
	8.0	F	1.90
	10.0	VF	2.12
	15.0	VF	2.60
1299-17	371972		
Black	3.0	F	1.55
	5.0	F	2.00
	6.0	F	2.19
	8.0	F	2.53
	10.0	F	2.83
	15.0	VF	3.46
1299-19	371973		

= Spray quality: ■ Ultra Coarse (UC), □ Extremely Coarse (XC), ■ Very Coarse (VC), ■ Coarse (C), ■ Medium (M), ■ Fine (F), ■ Very Fine (VF).

The nozzles are available both as single nozzles (S) and as COLORTIPS (CT), where the nozzle is integrated in the SNAP-FIT.



1099 Solid stream nozzles

CERAMIC nozzle, Orchard spraying

This nozzle disperses the spray liquid in a concentrated stream. Its main use is calibration of flows, often in connection with other nozzle components.

The capacity can be changed by placing the nozzle with or against the direction of flow.



Bar	l/min															
	1099-8	1099-10	1099-12	1099-15	1099-18	1099-20	1099-23	1099-30								
2.0	0.54	0.43	0.91	0.65	1.14	0.94	1.88	1.42	2.54	1.98	3.09	2.46	3.98	3.18	6.43	5.18
5.0	0.83	0.68	1.38	1.01	1.78	1.47	2.89	2.23	4.03	3.13	4.86	3.92	6.40	5.03	10.47	8.45
8.0	1.04	0.86	1.71	1.28	2.25	1.86	3.59	2.82	5.10	3.96	6.13	4.98	8.17	6.37	13.44	10.86
10.0	1.15	0.95	1.89	1.42	2.51	2.07	3.99	3.15	5.70	4.43	6.85	5.58	9.17	7.12	15.13	12.23
15.0	1.39	1.16	2.27	1.74	3.06	2.53	4.82	3.85	6.98	5.42	8.37	6.87	11.31	8.72	18.77	15.19
20.0	1.59	1.34	2.59	2.00	3.52	2.92	5.51	4.44	8.06	6.26	9.65	7.95	13.13	10.07	21.87	17.71
30.0	1.92	1.63	3.11	2.44	4.30	3.56	6.65	5.43	9.88	7.67	11.80	9.78	16.20	12.33	27.13	21.99
50.0	2.43	2.09	3.91	3.13	5.52	4.58	8.44	6.99	12.76	9.90	15.20	12.68	21.12	15.92	35.59	28.89
No	371309		371310		371311		371312		371313		371314		371315		371884	



1553 cone nozzles

Orchard spraying

HARDI 1553 Cone nozzles are used with one of the four available swirl plates for hollow cone and full cone spraying. The hollow cone nozzle can be used for pesticide application on boom sprayers, mistblowers or knapsack sprayers. The HARDI 1553 cone nozzle can also be used without swirl plates for solid stream application (see page 20).

Drop sizes

The difference between the 4 swirl plates is the droplet size. The blue swirl plate has a very fine droplet spectrum, the grey a fine droplet spectrum and the black swirl plate a medium droplet spectrum. The white swirl plate has a medium droplet spectrum and is giving a full cone spray.

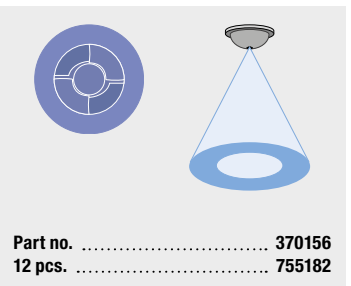
Large drop adaptor

A large drop adaptor is available for the grey swirl plate. This adaptor changes the droplet spectrum to very large droplets.

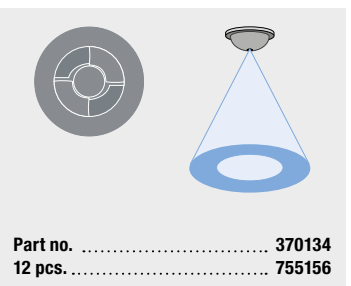
Large drop adaptor 371077



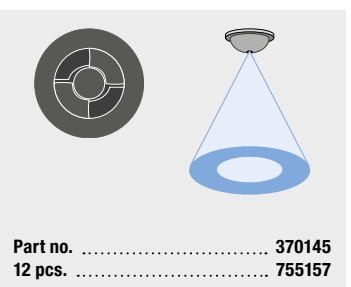
Bar	l/min											
	1553-8	1553-10	1553-12	1553-14	1553-16	1553-18	1553-20	1553-22	1553-24	1553-30	1553-35	1553-40
2.0	0.20	0.25	0.31	0.36	0.44	0.49	0.54	0.57	0.61	0.72	0.80	0.85
3.0	0.24	0.31	0.38	0.44	0.54	0.60	0.66	0.70	0.75	0.88	0.98	1.04
5.0	0.32	0.40	0.49	0.57	0.70	0.77	0.85	0.90	0.96	1.14	1.26	1.34
6.0	0.35	0.43	0.54	0.62	0.76	0.85	0.94	0.99	1.06	1.25	1.39	1.47
8.0	0.40	0.50	0.62	0.72	0.88	0.98	1.08	1.14	1.22	1.44	1.60	1.70
10.0	0.45	0.56	0.69	0.80	0.98	1.10	1.21	1.27	1.36	1.61	1.79	1.90
15.0	0.55	0.68	0.85	0.99	1.20	1.34	1.48	1.56	1.67	1.97	2.19	2.33
20.0	0.64	0.80	0.98	1.14	1.40	1.54	1.70	1.80	1.92	2.28	2.52	2.68
25.0	0.71	0.88	1.10	1.27	1.56	1.73	1.91	2.02	2.16	2.55	2.83	3.01
No.	370016	370027	370031	370042	370053	370064	370075	370086	370097	370101	370112	370123
12 pcs.	750256	755031	755382	755064	755385	755065	755097	755066	755123	750257	755067	755068



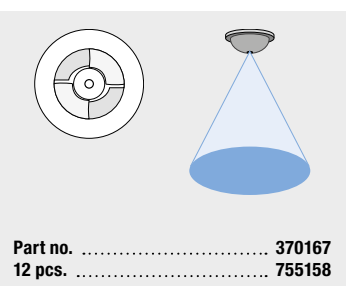
Bar	l/min											
	1553-8	1553-10	1553-12	1553-14	1553-16	1553-18	1553-20	1553-22	1553-24	1553-30	1553-35	1553-40
2.0	0.20	0.25	0.31	0.36	0.44	0.49	0.54	0.57	0.61	0.72	0.80	0.85
3.0	0.24	0.31	0.38	0.44	0.54	0.60	0.66	0.70	0.75	0.88	0.98	1.04
5.0	0.32	0.40	0.49	0.57	0.70	0.77	0.85	0.90	0.96	1.14	1.26	1.34
6.0	0.35	0.43	0.54	0.62	0.76	0.85	0.94	0.99	1.06	1.25	1.39	1.47
8.0	0.40	0.50	0.62	0.72	0.88	0.98	1.08	1.14	1.22	1.44	1.60	1.70
10.0	0.45	0.56	0.69	0.80	0.98	1.10	1.21	1.27	1.36	1.61	1.79	1.90
15.0	0.55	0.68	0.85	0.99	1.20	1.34	1.48	1.56	1.67	1.97	2.19	2.33
20.0	0.64	0.80	0.98	1.14	1.40	1.54	1.70	1.80	1.92	2.28	2.52	2.68
25.0	0.71	0.88	1.10	1.27	1.56	1.73	1.91	2.02	2.16	2.55	2.83	3.01
No.	370016	370027	370031	370042	370053	370064	370075	370086	370097	370101	370112	370123
12 pcs.	750256	755031	755382	755064	755385	755065	755097	755066	755123	750257	755067	755068



Bar	l/min											
	1553-8	1553-10	1553-12	1553-14	1553-16	1553-18	1553-20	1553-22	1553-24	1553-30	1553-35	1553-40
2.0	0.20	0.25	0.31	0.36	0.44	0.49	0.54	0.57	0.61	0.72	0.80	0.85
3.0	0.24	0.31	0.38	0.44	0.54	0.60	0.66	0.70	0.75	0.88	0.98	1.04
5.0	0.32	0.40	0.49	0.57	0.70	0.77	0.85	0.90	0.96	1.14	1.26	1.34
6.0	0.35	0.43	0.54	0.62	0.76	0.85	0.94	0.99	1.06	1.25	1.39	1.47
8.0	0.40	0.50	0.62	0.72	0.88	0.98	1.08	1.14	1.22	1.44	1.60	1.70
10.0	0.45	0.56	0.69	0.80	0.98	1.10	1.21	1.27	1.36	1.61	1.79	1.90
15.0	0.55	0.68	0.85	0.99	1.20	1.34	1.48	1.56	1.67	1.97	2.19	2.33
20.0	0.64	0.80	0.98	1.14	1.40	1.54	1.70	1.80	1.92	2.28	2.52	2.68
25.0	0.71	0.88	1.10	1.27	1.56	1.73	1.91	2.02	2.16	2.55	2.83	3.01
No.	370016	370027	370031	370042	370053	370064	370075	370086	370097	370101	370112	370123
12 pcs.	750256	755031	755382	755064	755385	755065	755097	755066	755123	750257	755067	755068



Bar	l/min											
	1553-8	1553-10	1553-12	1553-14	1553-16	1553-18	1553-20	1553-22	1553-24	1553-30	1553-35	1553-40
2.0	0.20	0.25	0.31	0.36	0.44	0.49	0.54	0.57	0.61	0.72	0.80	0.85
3.0	0.24	0.31	0.38	0.44	0.54	0.60	0.66	0.70	0.75	0.88	0.98	1.04
5.0	0.32	0.40	0.49	0.57	0.70	0.77	0.85	0.90	0.96	1.14	1.26	1.34
6.0	0.35	0.43	0.54	0.62	0.76	0.85	0.94	0.99	1.06	1.25	1.39	1.47
8.0	0.40	0.50	0.62	0.72	0.88	0.98	1.08	1.14	1.22	1.44	1.60	1.70
10.0	0.45	0.56	0.69	0.80	0.98	1.10	1.21	1.27	1.36	1.61	1.79	1.90
15.0	0.55	0.68	0.85	0.99	1.20	1.34	1.48	1.56	1.67	1.97	2.19	2.33
20.0	0.64	0.80	0.98	1.14	1.40	1.54	1.70	1.80	1.92	2.28	2.52	2.68
25.0	0.71	0.88	1.10	1.27	1.56	1.73	1.91	2.02	2.16	2.55	2.83	3.01
No.	370016	370027	370031	370042	370053	370064	370075	370086	370097	370101	370112	370123
12 pcs.	750256	755031	755382	755064	755385	755065	755097	755066	755123	750257	755067	755068



Calibration of hand operated sprayers

To ensure precise and safe applications in the field, effective calibration is essential. Calibration must always be done with clean water and before the use of any crop protection product. Follow this guide to calibrate your hand sprayer.

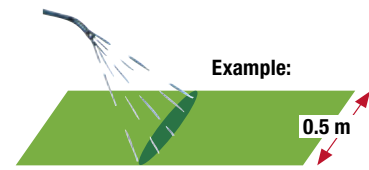
1 Add clean water to the clean sprayer



2 Check that sprayer operates correctly and safely



3 Use correct nozzle height and measure swath width



4 Practise spraying at comfortable walking speed and with correct nozzle height



5 Fill up with clean water



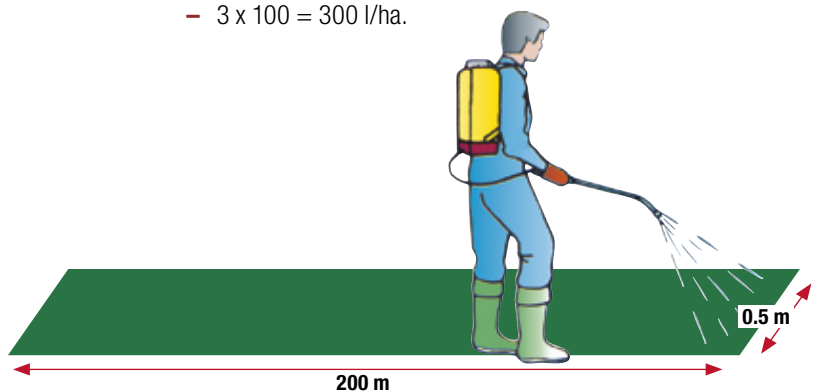
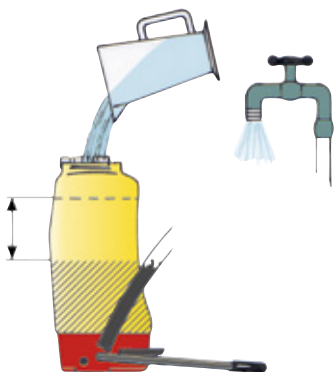
6 Spray 100 m²

Swath width, m	Spraying distance, m
0.5	200
0.7	143
1.0	100
1.2	83
1.5	67

7 To find application rate (litres/ha) multiply the amount of spray missing in the tank by 100. (Measure when refilling).

Example:

- 100 m² = 1/100 ha.
- If 3 litres were used to spray 100 m², you are applying:
- 3 x 100 = 300 l/ha.



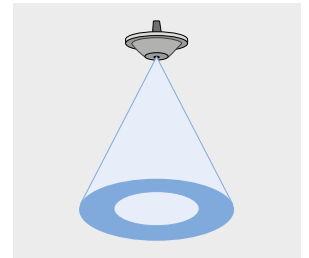


HC – Hollow cone nozzles

This nozzle is designed for knapsack sprayers. The restrictor and the nozzles are clicked together to avoid losing parts when taken apart for cleaning.

- Very wide spray angle
- One piece construction
- SYNTAL

bar	Yellow	Grey
	l/min	
1.0	0.46	1.39
1.5	0.57	1.70
2.0	0.65	1.96
2.5	0.73	2.19
3.0	0.80	2.40
4.0	0.92	2.77
No.	371694	371696

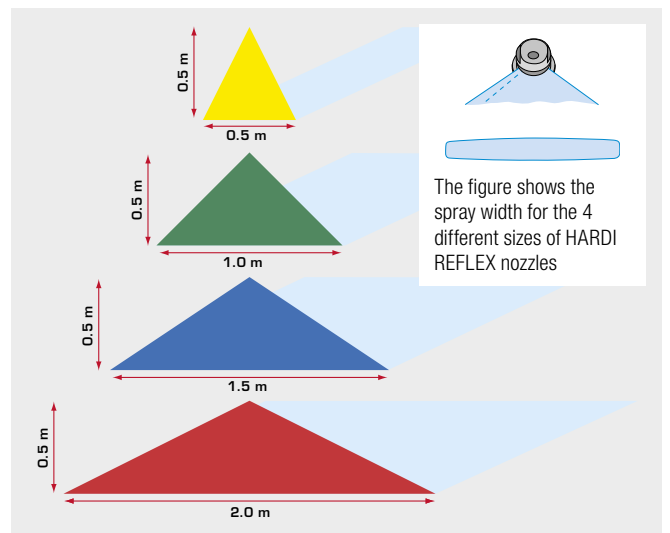


HARDI REFLEX nozzles

These nozzles are designed so the application volume is the same for all sizes at 1 bar and a normal walking speed (1 m/s), only the spray width changes.

- Spray width from 0.5 to 2 m
- Even distribution across the swath
- 200 l/ha at 1 bar
- SYNTAL

bar	Yellow	Grey	Blue	Red
	l/min			
1.0	0.60	1.20	1.80	2.40
No.	372020	372021	372022	372023



Adjustable nozzles

These nozzles can be used on knapsack sprayers or spray guns, where you want to change the characteristics of the spray cone, and the demands for precision is less important.

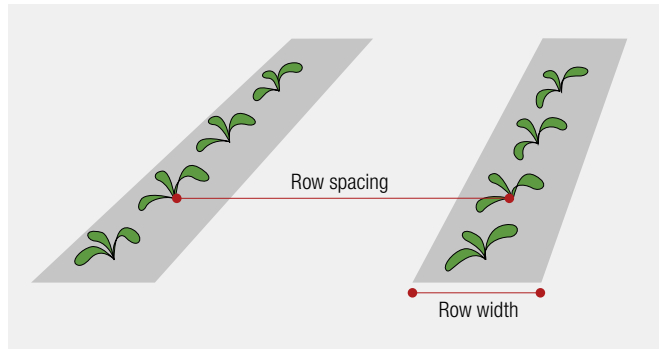
- Adjustable by turning the tip
- From solid stream to hollow cone
- Available with M18 thread
- SYNTAL

Bar	l/min		Spray angle
1.5	0.69	1.25	80°
2.0	0.71	1.40	85°
3.0	0.88	1.65	90°
4.0	0.95	1.85	90°
5.0	1.10	2.18	95°
No	755835		

Calibration for band spraying

In many crops, band spraying provides an efficient way of reducing chemical consumption. HARDI produces both conventional and air assisted special sprayers for row crops.

To ensure precise and safe applications in the field, effective calibration is essential. Calibration must always be done with clean water and before the use of any crop protection product. Follow this guide to calibrate your hand sprayer.



1 Calibration of forward speed

– See 9 – calibration of field sprayers

2 l/ha in band

Label recommendations usually state total l/ha rates, also called broadcast rates. When band spraying we only want to apply this broadcast rate in the bands, so instead we will here call it: l/ha in band.

3 Calculation of nozzle capacity

$$\frac{\text{l/ha in band} \times \text{band width (m)} \times \text{km/h}}{600} = \text{l/min per band}$$

If 200 l/ha are to be applied at 6 km/h in a 0.2 m wide band, the necessary output will be: 0.4 l/min/ per band. If, for instance, 1 nozzle per band is used, every nozzle should apply 0.4 l/min. Nozzles and pressures can then be found in the relevant tables.

4 Calculation of total required volume of spray mix

$$\frac{\text{Area of field (ha)} \times \text{l/ha in band} \times \text{band width (m)}}{\text{Row spacing (m)}} = \text{Spray mix (total l/field)}$$

If the row spacing is 0.5 m; band width 0.2 m; field 5 ha; and l/ha in band = 200 l/ha – the total required volume will be:

$$\frac{5 \times 200 \times 0.2}{0.5} = 400 \text{ l}$$

5 Calculation of amount of chemical per tank

$$\frac{\text{Litres of water in tank} \times \text{chemical dose desired (l/ha)}}{\text{l/ha in band}} = \text{Litres of chemical per tank}$$

If the tank holds 400 l, and 2 l of chemical products are required per ha when 200 l/ha in band is applied, the following calculation should be used:

$$\frac{400 \times 2}{200} = 4 \text{ l chemical product per tank}$$

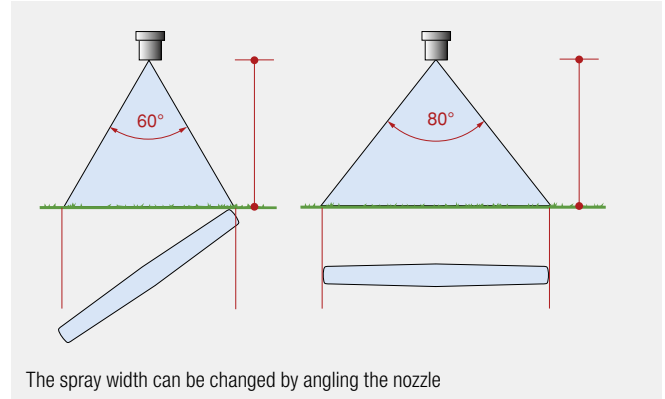


HARDI Even spray nozzles

HARDI 4680E 80° Even spray nozzles – SYNTAL

Because of the even spray distribution from this nozzle, it is especially well suited for row and inter-row spraying. It is used on hand operated sprayers or on a spray boom where chemicals need to be applied over a narrow area.

- Even distribution is ideal for band spraying
- Use the 4680E on hand operated sprayers, when only one nozzle is used
- Application range: 0.22-3.98 l/min
- Pressure range 1.5-5 bar

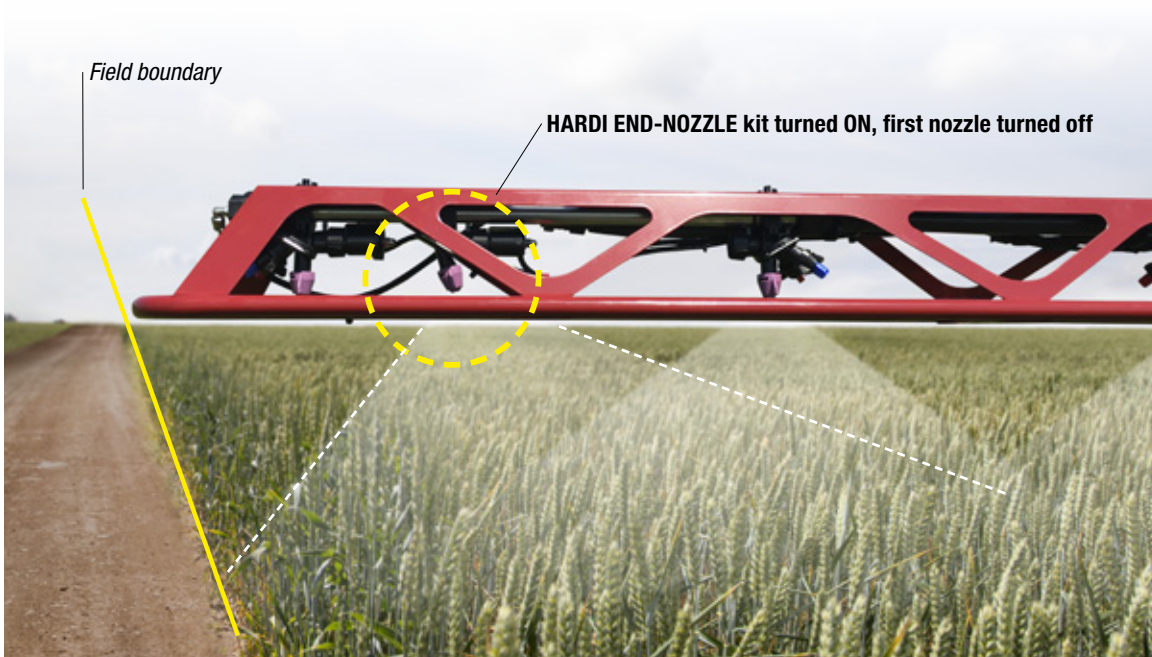


Bar	l/min								
	4680E-7E	4680E-9E	4680E-11E	4680E-13E	4680E-15E	4680E-21E	4680E-25E	4680E-27E	4680E-37E
1.5	0.22	0.30	0.43	0.61	0.82	1.23	1.52	1.86	3.03
2.0	0.25	0.35	0.50	0.70	0.95	1.42	1.75	2.15	3.50
2.5	0.28	0.39	0.56	0.78	1.06	1.59	1.94	2.39	3.89
3.0	0.31	0.43	0.61	0.86	1.16	1.74	2.14	2.63	4.29
4.0	0.35	0.49	0.71	0.99	1.34	2.01	2.47	3.04	4.95
5.0	0.40	0.55	0.79	1.11	1.50	2.25	2.77	3.40	5.53
No.	371576	371577	371578	371579	371580	371581	371582	371583	371585

END-NOZZLE kit

The END-NOZZLE kit takes care that no spray is placed outside the field boundary

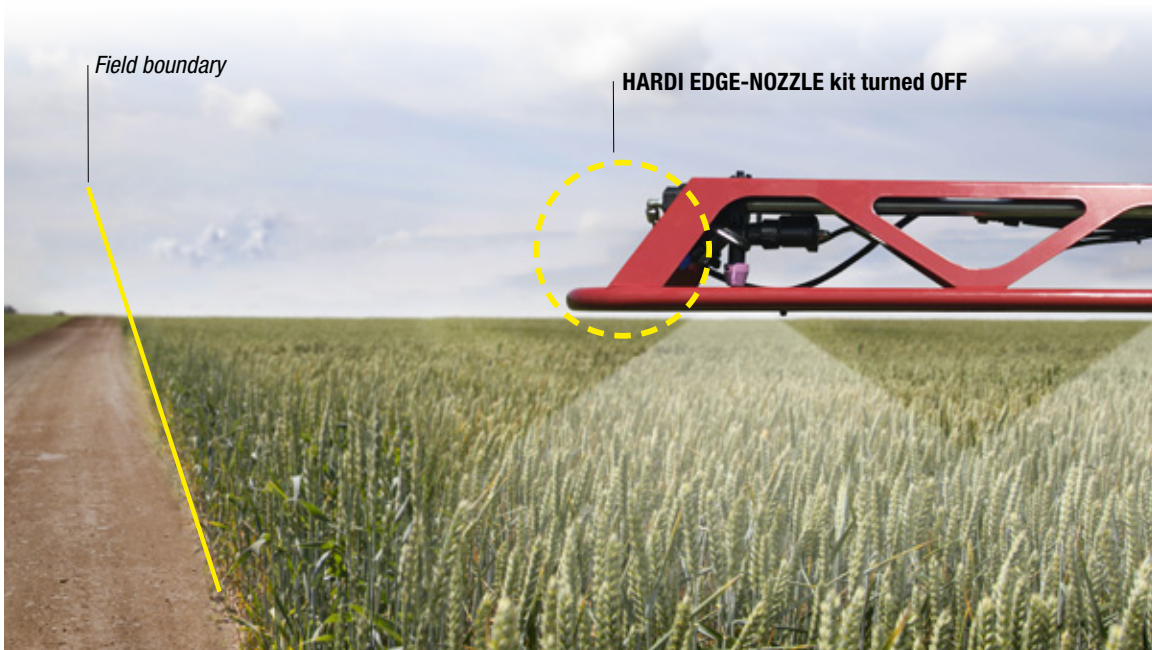
- Angled single nozzle holder is added on the boom tube the activation is done by 2 high-quality solenoid valves
- Assembled on both boom ends
- If the END-NOZZLE is activated the last nozzle is switched off
- Activation with softkey function on the UT screen F1-F4
- Available for MEGA und NAVIGATOR VPZ and DELTA FORCE, COMMANDER, AEON



EDGE-NOZZLE kit

Extension to spray 50 cm extra – for example on curved headlands

- Extra nozzle at the boom end – spraying in an 45° angle
- Single nozzle holder is added on the boom tube the activation is done by a high-quality solenoid valve
- Assembled on both boom ends
- Available for MEGA und NAVIGATOR VPZ and DELTA FORCE





EDGE-NOZZLES

Off-centre SYNTAL spray nozzle. These nozzle types give an asymmetric spray pattern and disperse the product at a certain distance from the nozzle. If fitted to the end of a boom, they give extra spray width. They are ideal for applications such as fence line spraying. These nozzles can also be fitted on the frame of the spray tank when not using a boom for under tree spraying in vineyards and orchards.



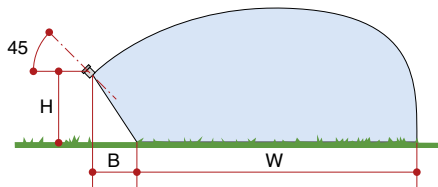
1850 EDGE-NOZZLES 3/8"

- Off-centre spray nozzle
- 3/8"
- Pressure range: 1 to 6 bar
- Spray width up to 3.5 m
- SYNTAL precision moulded thermoplastic

This nozzle is mounted on the end of the boom tube using:

1850 Mounting kit 730076

Example of spraying width at 3 bar



cm	G-150	G-200	G-250	G-300	G-350	G-400
W	155	195	250	280	295	345
B	50	45	35	35	30	30
H	50	50	50	50	50	50

	G-150	G-200	G-250	G-300	G-350	G-400
No.	370366	370377	370381	370392	370403	370414



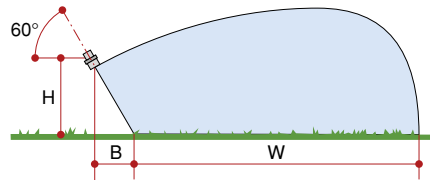
1740 EDGE-NOZZLES 1/2"

- Off-centre spray nozzle
- 1/2"
- Pressure range: 1 to 6 bar
- Spray width up to 5.2 m
- SYNTAL precision moulded thermoplastic

This nozzle is mounted on the end of the boom tube using:

1740 Mounting kit 72023300

Example of spraying width at 3 bar



cm	G-500	G-600	G-700	G-800
W	450	480	510	520
B	11	16	16	17
H	50	50	50	50

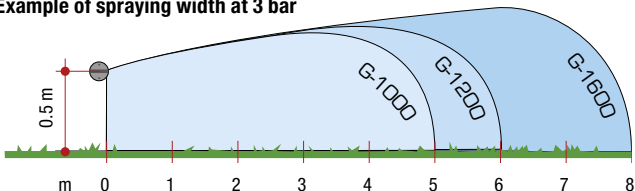
	G-500	G-600	G-700	G-800
No.	370425	370436	370447	370451



G – Giant EDGE-NOZZLES

- Off-centre spray nozzle
- Pressure range: 1.5 to 5 bar
- Spray width up to 8 m
- SYNTAL precision moulded thermoplastic

Example of spraying width at 3 bar



This nozzle is mounted on the end of the boom using a special mounting kit – ask your HARDI dealer.

	G-1200 White	G-1600 Blue
No.	371557	371558

Special nozzles

HARDI can supply a range of nozzles for special applications such as tank and container cleaning.
If you do not find what you need in this product guide, please contact your HARDI dealer.



4665 65° Flat spray nozzles

- Recommended pressure range: 1.5 to 5 bar
- Recommended boom height above target: 70 to 80 cm.
- SYNTAL

This nozzle provides an elliptical spray pattern (FlatFan) with a 65° angle. A uniform distribution is obtained, with correct overlap between spray patterns from adjacent nozzles.

This nozzle has additional applications for industrial purposes.

Bar	l/min						
	4665-10	4665-12	4665-14	4665-16	4665-20	4665-24	4665-30
1.5	0.33	0.48	0.64	0.84	1.11	1.47	2.08
2.0	0.38	0.55	0.74	0.97	1.28	1.70	2.40
3.0	0.47	0.67	0.91	1.19	1.57	2.08	2.94
4.0	0.54	0.78	1.04	1.38	1.82	2.40	3.40
5.0	0.60	0.87	1.17	1.53	2.02	2.69	3.79
10.0	0.85	1.23	1.65	2.17	2.86	3.80	5.37
No.	370285	370296	370307	370311	370322	370333	370344



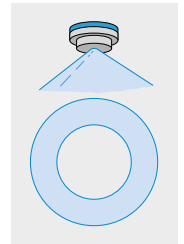
4665 65° Flat spray nozzles

- Pressure range: 2 to 5 bar
- Hollow Cone nozzle
- Very Fine droplets
- SYNTAL

This nozzle consists of a synthetic tip and a blue swirl plate (370156). The droplet spectrum is very fine.

The low capacity and extremely fine atomization make this nozzle useful for special purposes such as adjustment of air temperature and humidity in hot climates.

Bar	l/min	
	5131	
2.0	0.20	
3.0	0.25	
4.0	0.28	
5.0	0.32	
No.	370963	



4625 25° Flat spray nozzles

- Pressure range: 2 to 25 bar
- SYNTAL

This nozzle provides an elliptical spray pattern (FLATFAN) with a 25° angle. The narrow spray angle results in a high impact spray, which is well suited for cleaning as well as for spraying trees and bushes, where a long range is very useful.



Bar	l/min					
	4625-20	4625-24	4625-30	4625-36	4625-46	4625-54
2.0	1.50	2.00	2.60	3.90	5.50	6.20
4.0	2.12	2.82	3.68	5.25	7.78	8.76
6.0	2.60	3.46	4.50	6.75	9.53	10.74
10.0	3.35	4.47	5.81	8.72	12.30	13.86
25.0	5.30	7.07	9.19	13.79	19.45	21.92
No.	370506	370517	370521	370532	370543	370554



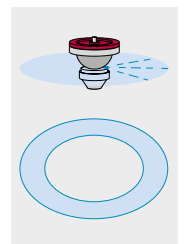
4625 25° Flat spray nozzles

- Pressure range: 1 to 10 bar
- SYNTAL

Deflector spray nozzle of synthetic material. This nozzle type produces a round spray pattern (360°).

The speed of the droplets is low, producing a slowly dispersing cloud. The atomization and dispersion are optimal between 1 to 5 bar. Useful for raising humidity in greenhouses etc.

Bar	l/min		
	3600-30	3600-35	3600-40
1	1.34	1.63	1.98
1.5	1.65	1.99	2.42
2.0	1.90	2.30	2.80
3.0	2.33	2.82	3.43
4.0	2.68	3.26	3.96
5.0	3.00	3.64	4.43
6.0	3.29	3.98	4.85
8.0	3.80	4.60	5.60
10.0	4.25	5.14	6.26
No.	703054	703065	703076



Container rinsing nozzles



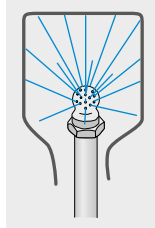
- Multi hole rinsing nozzle
- 40 solid streams
- Pressure range: 1.5 to 5 bar
- SYNTAL



- Rotary rinsing nozzle
- Rotary spray swaths
- Pointed top for easy foil opening
- SYNTAL

These nozzles are mainly used for washing out residues in chemical containers and bags. Can also be used for some irrigation purposes. Tests have shown that the most efficient way of cleaning chemical containers is by using these rinsing nozzles.

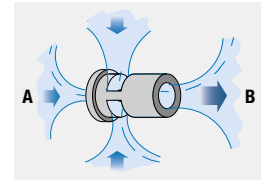
Bar	l/min	
	Multi hole	Rotary
1.5	14.2	-
2.0	16.4	-
3.0	20.1	-
4.0	23.2	-
5.0	25.9	-
No.	371552	72317300



5066 Agitation nozzles



- Pressure range: 1 to 15 bar
- SYNTAL



This nozzle type is used for tank agitation.

The venturi effect of the nozzle increases the agitation **B** several times in relation to the liquid passing through the calibrated part of the nozzle **A**.

Useful for a fast and continuous mixing of for example pesticides in suspension.

Bar	l/min							
	5066-1.5		5066-2.0		5066-2.5		5066-3.0	
	A	B	A	B	A	B	A	B
1	1.20	7.35	1.84	9.12	3.04	11.74	5.09	15.13
1.5	1.47	9.01	2.25	11.17	3.72	14.38	6.24	18.53
2.0	1.70	10.40	2.60	12.90	4.30	16.60	7.20	21.40
3.0	2.08	12.74	3.18	15.80	5.27	20.33	8.82	26.21
5.0	2.69	16.44	4.11	20.40	6.80	26.25	11.38	33.84
6.0	2.94	18.01	4.50	22.34	7.45	28.75	12.47	37.07
10.0	3.80	23.26	5.81	28.85	9.62	37.12	16.10	47.85
15.0	4.66	28.48	7.12	35.33	11.78	45.46	19.72	58.61
No.	370462		370473		370484		370495	

Tank cleaning nozzles

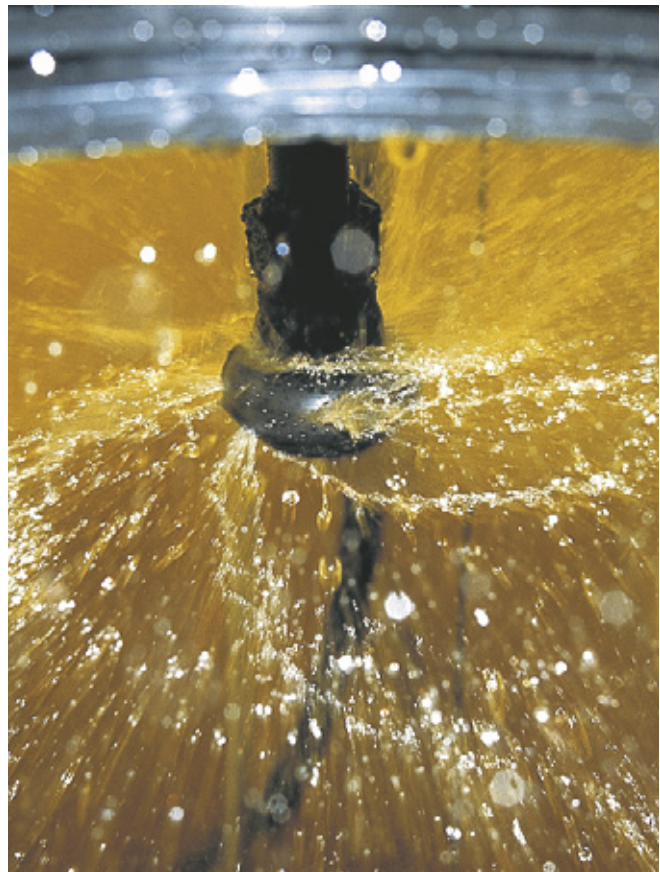
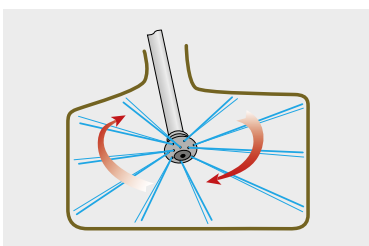


- Rotating nozzle for tank cleaning
- 8 solid streams at high velocity
- SYNTAL

This nozzle is made for cleaning the insides of sprayer tanks. The different angle of the 8 solid streams ensures a excellent rinsing of the entire inside surface of the sprayer tank.

HARDI recommends the use of a cleaning agent to ensure sufficient cleaning of the tank.

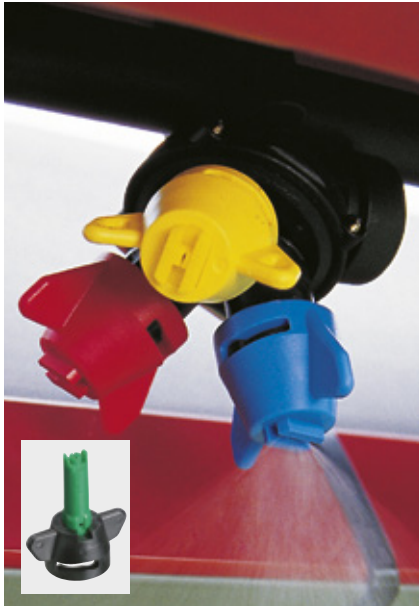
Bar	l/min
	Tank cleaning nozzle
5	83
10	117
No.	728014





HARDI nozzles on all liquid systems

HARDI ISO nozzles fulfil ISO (International Standards Organization) standards regarding flow, numbers, colours and outer dimensions. This ensures that it is easy to fit HARDI ISO nozzles on all sprayer brands. You can see below the fittings, which allow you to adapt HARDI ISO nozzles to your sprayer.



On sprayers with HARDI SNAP-FIT systems, the HARDI COLORTIPS (CT) are recommended for safe and easy handling.

For INJET and MINIDRIFT nozzles use a black nozzle cap.

Black nozzle cap 334083



On sprayers with TeeJet or compatible systems use Single nozzles (S) and the 334862 black cap.

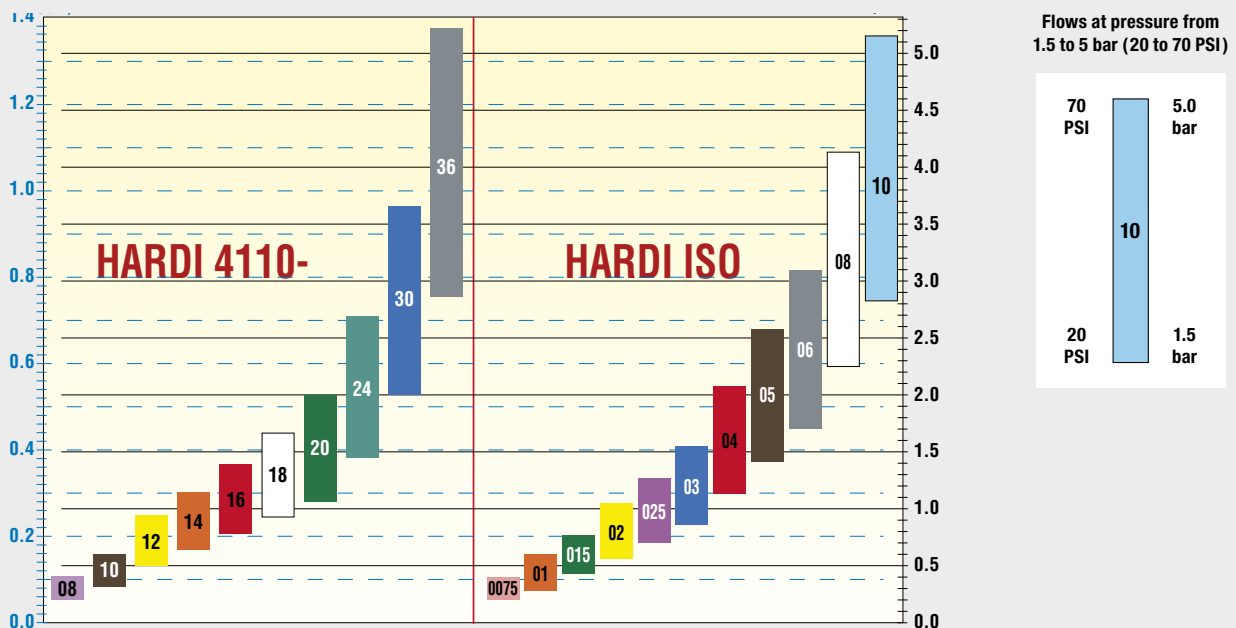
The same cap is used for INJET and MINIDRIFT nozzles. (Gasket: 242222).

Black cap 334862
Gasket 242222



On all other systems use the ISO cap delivered with your sprayer together with Single nozzles (S) or INJET (INJET require a special 10 mm cap).

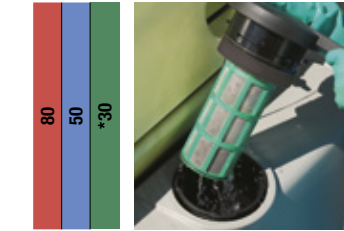
Conversion table for HARDI ISO nozzles



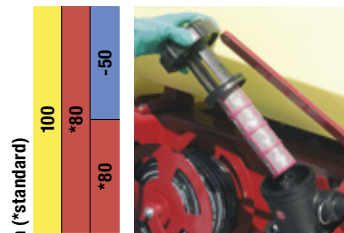
Filters

The HARDI filter range ensures optimal filtration of spray liquid on its way from the tank to the nozzles.

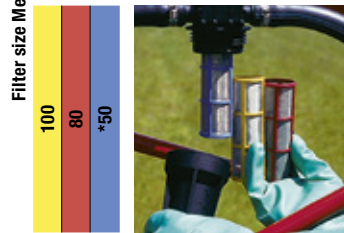
The filtration system is a 4-step process:



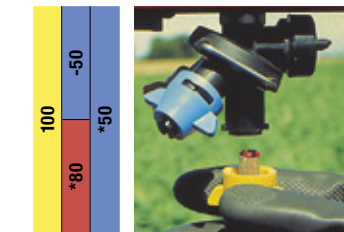
1. EasyClean filter
Top mounted suction or EasyClean filter with a standard size of 30 mesh.



2. Self-cleaning or ClyoneFilter
In this filter a by-pass system ensures that the filter screen is always clean. The standard size is 80 mesh.



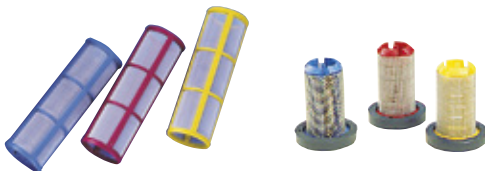
3. In-line filters
These filters reduce nozzle filter blockages and make filter cleaning quicker.



4. Nozzle filters
These filters make sure that particles that would block the nozzles are captured. With these the total filtration process is completed.

Flat spray nozzle size
From 0075 to 02
From 025 to 03
04 or bigger

- Available in 50, 80 and 100 mesh.
- It is essential that the filters are chosen according to the nozzles used.
- In-line filter complete with housing etc. – ready to fit!



	Mesh	30	50	80	100
	mm	0.58	0.30	0.18	0.15

Fittings

TRIPLET provides ease of switching between different nozzle types and sizes.

No. 725078



For mounting special nozzles such as the large drop flat spray nozzle and hollow cone nozzles, use the 322068 adaptor piece together with 3/8" union nuts.

Adaptor piece 322068



ISO and INJET nozzles use the white 3/8" union nut 321517

Black HARDI SNAP-FIT cap 334083

Black TeeJet cap 334862

Gasket 242222

In-line filter complete with housing etc. – ready to fit!

Hose	Mesh		
	50	80	100
1/2"	845205	845206	845207
3/4"	845208	845209	845210

Mesh	1 pcs	1 pcs	1 pcs	1 pcs	12 pcs	12 pcs
30	72278800	615415	-	-	-	-
50	72278900	615416	635681	615443	750229	755410
80	72279000	615417	635397	615444	750228	755215
100	-	-	635677	615445	750234	755411

Boom fluid solutions

HARDI has in the range different nozzle tubes and nozzle holders, all build for a long lifetime using reliable material either stainless steel or POM Syntal plastics. By using high quality tools, long experience and a high level of assembly skills our boom fluid systems are extremely reliable.

TRIPLET



Provides an easy switching between different nozzles and size.

The TRIPLET nozzle holder can be easily switch off, as there is a closed position between each nozzle. The TRIPLET nozzle holder is standard on all HARDI booms.

PENTALET



Provides an easy switching between different nozzles and size.

The PENTALET nozzle holder can be easily switch off, as there is a closed position between each nozzle.

AutoSelect Duo



- Pressure circulation – fast priming no residues
- 4 robust stepper motors as section valves
- 9 or 13 sections
- Stainless steel nozzle tubes
- 2 + 2 nozzle holder
- Fast reaction – pneumatic opening of nozzles
- Application map on section on/off
- Nozzle change on the go A, B, A+B

HARDI EFC operating unit



- Robust motor driven section valves
- Mechanical non-drip 0.8 bar opening
- TRIPLET or PENTALET manual nozzle change
- Application map on section on/off
- Optional BoomPrime low pressure circulation – priming
- Optional AutoSectionControl

PrimeFlow

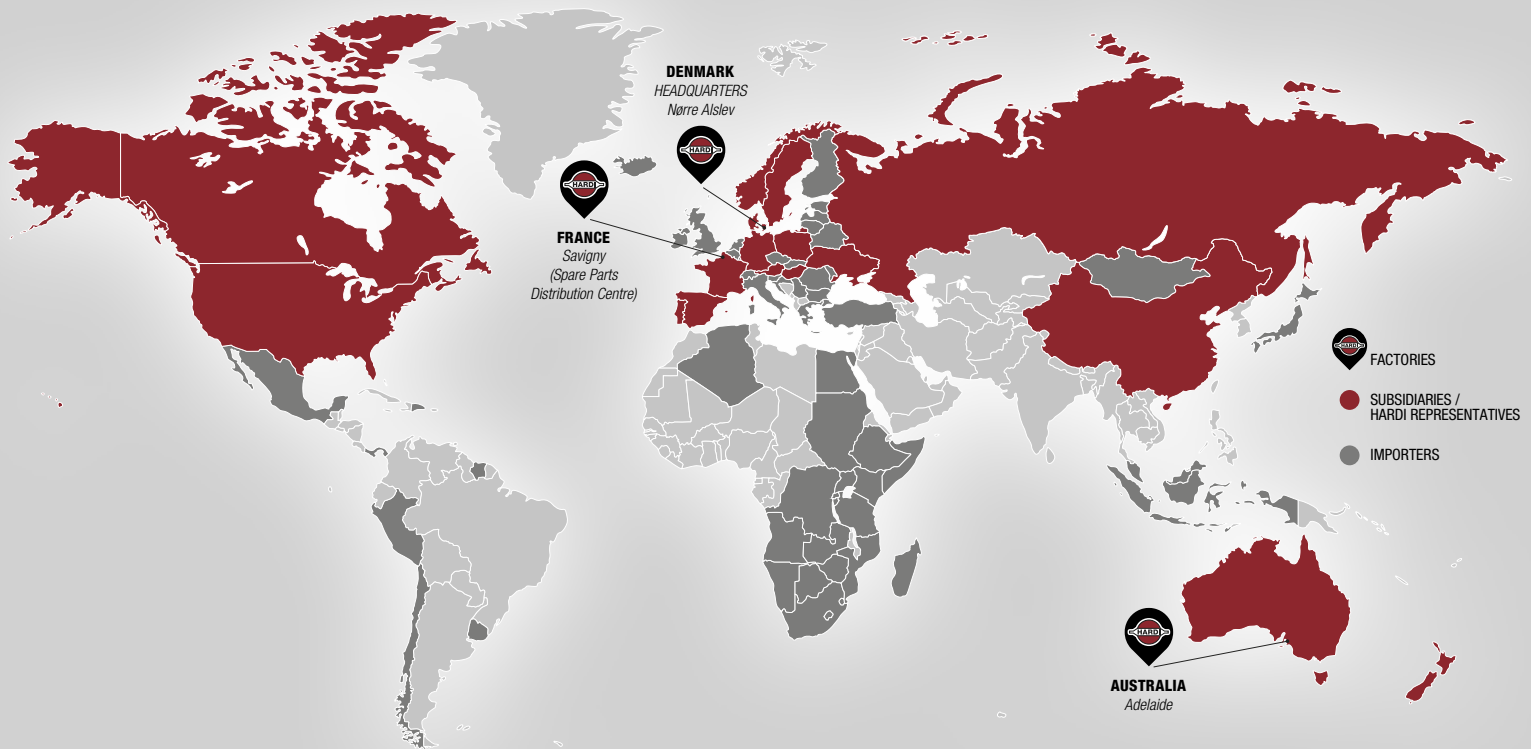


- Pressure circulation – fast priming no residues
- Electric driven stepper motors switching on/off
- Robust stepper motors on each nozzle
- 13 sections
- Stainless steel nozzle tubes
- PENTALET nozzle holder on trailer, TRIPLET nozzle holder on MEGA
- Build in diagnostic
- Optional – high precision – Single nozzle on/off
- Could work with application maps on nozzle level

ActiveAir



- Pressure circulation – fast priming no residues
- Solenoid valves as section valve
- 9 or 13 sections
- Stainless steel nozzle tubes
- PENTALET nozzle holder
- Fast reaction – pneumatic opening of nozzles
- Application map on section on/off



HARDI INTERNATIONAL A/S

With over 60 years' experience behind us, HARDI INTERNATIONAL A/S remains a global trendsetter for application of crop protection products. Headquartered in Denmark, we are present in more than 100 countries through a network of subsidiaries, agents and importers.

HARDI INTERNATIONAL A/S is known for the quality, design and performance of our machines. By always putting the customer at the centre of our innovative solutions, we strive to shape the future in plant protection. Our increasingly intelligent products are capable of delivering exact doses and targeted applications with minimal drift and waste – to the benefit of the farmer and the environment.

We believe in a future where our products will be able to take care of plants one by one.



HARDI reserves the right to change the specifications without notice. Illustrations shown may include optional extras and accessories.



HARDI INTERNATIONAL A/S

Herthadalvej 10 · 4840 Nørre Alslev · Denmark · Tel: +45 54 46 48 00 · Fax: +45 54 46 48 12
 Email: info@hardi.com · www.hardi.com