LEADING IN DRIFT REDUCING NOZZLE TECHNOLOGY

Agricultural Spray Nozzles and Accessories

Catalogue L 2014

Lechler agricultural spray nozzles – for your success and for the good of the environment

Modern plant protection amounts to more than the mere use of environmentally compatible products. Each droplet should land as precisely as possible on the target surface, and coverage should be as uniform as possible. Otherwise, optimal pest control cannot be achieved. Losses due to droplet drift, bounce and evaporation need to be avoided – for the sake of the environment.

All this entails particularly stringent criteria for spraying technology and, in particular, for agricultural spray nozzles. Nozzles are now expected to offer a level of precision that no one would have believed just a few years ago – and Lechler has risen to the challenge with gusto.

Not for naught we are one of the world's leading producers of precision nozzles. Many of our product innovations have emerged as trend setters for plant protection and liquid fertilizer technology – and we intend to keep things that way.

From the very start, we precisely and objectively define the functions and characteristics of our high-precision nozzles – all on the basis of ingenious measurement techniques and our own time-tested documentation system.

State-of-the-art engineering and simulating techniques guarantee the high utility value of our practice-oriented products.

With Lechler nozzles, one jet of spray is exactly like the next, because we take great pains to achieve identicality. Start-to-finish quality control, from material reception to product design, production and delivery, has always been a matter of course at Lechler.

Naturally, we are certified in accordance with DIN ISO 9001:2008.

Agricultural spray nozzles by Lechler satisfy the standards stipulated by the German Federal Research Center for cultivated plants (JKI), and all the requirements of the German plant protection law, European EN-Norms and international ISO-standards. Knowing this, major equipment manufacturers count themselves among our customers.

Our practice-oriented approach to the design of agricultural spray nozzles is based on a constant interchange of know-how between ourselves and the competent testing authorities, sprayer manufacturers, chemical industry and fertilizer industry. Success often has lots of fathers.

Let this catalogue show you the merits of our comprehensive line of agricultural spray nozzles and accessories. If you have any questions – we'll be happy to take your call!

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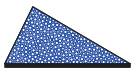
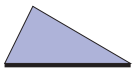
Selection guides for Lechler agricultural spray nozzles

Selection guide for broadcast spraying

		ID3 (Page 6-7)	IDK/IDKN (Page 8-9)	IDKT (Page 14-15)	PRE (Page 10)	AD (Page 11)	LU (Page 12)	SC / ST (Page 13)
								
Spray geometry								
Recommended pressure range (bar)		2-**4-8**	1*-/**1,5-3**-6	1**-/**1,5-3**-6	**1,5-8**	**1,5-3**-6	**1,5-2,5**-5	**2-3**-5
Drift potential		extremely low	very low	very low	extremely low	low	low/medium	medium
Herbicides	soil incorporated	●●	●●	●●	●●	●●	●●	●
	pre-emerge	●●	●●	●●	●●	●●	●●	●
	post-emerge (systemic)	●●	●●	●●	-	●●	●●	●
	post-emerge (contact)	●	●	●●	-	●	●●	●
Fungicides	contact	●	●	●●	-	●	●●	●
	systemic	●●	●●	●●	-	●●	●●	●
Insecticides	contact	●	●	●●	-	●	●●	●
	systemic	●●	●●	●●	-	●●	●●	●
Liquid fertilizer		●● (2-4)	●● (1*/1,5-2,5)	○ (1**/1,5-4)	●● (1,5-4)	● (1,5-2,5)	○ (1,5-2,0)	○ (2)
Growth regulators		●●	●●	-	-	●●	●●	●
Irrigation (via boom)		●●	●●	●●	●●	●●	●	●

Heed label of chemical company Nozzle size: * IDK-04/-05/-06 ** IDKT-03/-04/-05/-06 IDKN-03/-04

Selection guide for banding/row spraying – arable crops and speciality crops

		IS (Page 28)	IDKS (Page 29)	OC (Page 30)	E (Page 32)	TR (Page 23)
						
Spray geometry						
Recommended pressure range (bar)		2-**4-8**	1*/**1,5-3**-6	**1,5-2,5**-5	**1-3**-4	**3-8**
Drift potential		extremely low	very low	medium	medium	high
Herbicides	soil incorporated	●●	●●	●●	●	○
	pre-emerge	●●	●●	●●	●	○
	post-emerge (systemic)	●●	●●	●●	●	○
	post-emerge (contact)	●	●	●●	●	●●
Fungicides	contact	●	●	●●	●	●●
	systemic	●●	●●	●●	●	●
Insecticides	contact	●	●	●●	●	●●
	systemic	●●	●●	●●	●	●
Liquid fertilizer		●● (2,0-3,5)	●● (1*/1,5-2,5)	○ (1,5-2,0)	○ (1-2)	-
Growth regulators		●●	●●	●●	●	○
Irrigation (via boom)		●●	●●	●	●	-

Heed label of chemical company Nozzle size: * IDKS-03/-04/-05

●● = very well-suited ● = well-suited ○ = less well-suited - = unsuitable

DF (Page 16)	FT / DT (Page 18)	TR (Page 23)	ITR (Page 23)	FD (Page 24)	FL (Page 25)
					
					
2-3-5	**1-2**-3	**3-8**	3-**5-10**	**1,5-4**	**1-5**
high	medium	high	very low	very low	very low
-	●●	○	●●	-	-
-	●●	○	○	-	-
○	●	○	○	-	-
●●	●	●●	-	-	-
●●	●	●●	○	-	-
●	●	●	●	-	-
●●	●	●●	○	-	-
●	●	●	●	-	-
-	● (1-2)	-	●● (3-5)	●●	●● (1-5)
○	●	○	○	-	-
-	-	-	●	●●	●

●● = very well-suited ● = well-suited ○ = less well-suited - = unsuitable
* Please request any additional information y ou may require.

Farmer's helpers

In addition to our brochures, technical data sheets and other printed information, we also have a lot of useful tools to offer. Examples **(see page 57)**:

- Pocketwind 

- Droplet-size and dosage calculator 

Apple Android

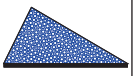
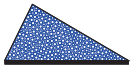
- Water sensitive paper 

- Nozzle aligner 

- Cleaning brush 

- Nozzle assembly wrench 

Selection guide for orchards, vineyards and speciality crops

		Spraying w/o air assistance							
		ID (Page 20)	IDK (Page 21)	AD (Page 22)	IS (Page 28)	IDKS (Page 29)	ST (30°-120°)** (Page 13)	TR (Page 23)	ITR (Page 23)
									
Spray geometry									
Recommended pressure range (bar)		3-**8-15**-20	2-**8-15**-20	2-**8-15**-20	2-**8-15**	1*-/1.5-**8-15**	5-**10-30**	3-**8-20**	**10-30**
Drift potential		extremely low	very low	low	extremely low	very low	medium	high	very low
Fungicides	contact	●●	●●	●●	●●	●●	●●	●●	●
	systemic	●●	●●	●●	●●	●●	●●	●●	●●
Insecticides	contact	●●	●●	●●	●●	●●	●●	●●	●
	systemic	●●	●●	●●	●●	●●	●●	●●	●●
Plant growth regulators		●●	●●	●●	●●	●●	●●	●●	●

Heed label of chemical company
** Special applications: strawberries, sweet cherries

Nozzle size: * IDKS-03/-04/-05

●● = very well-suited ● = well-suited ○ = less well-suited - unsuitable

NEW

Air-injector flat spray nozzles ID3

ID3 the new nozzle-generation

Lechler ID3 nozzle is rated for drift reduction by JKI: 90/75/50 %

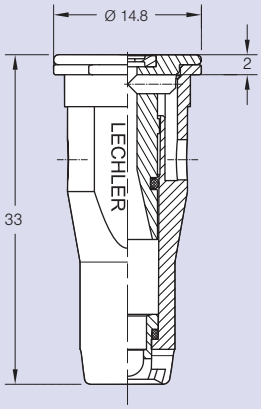
Current list under **www.lechler-agri.com**

Spray angle: 120°
Material: POM, ceramic

G 1965	G 1971
G 1966	G 1972
G 1968	G 1973
G 1970	G 1974

ID3

ID3-C

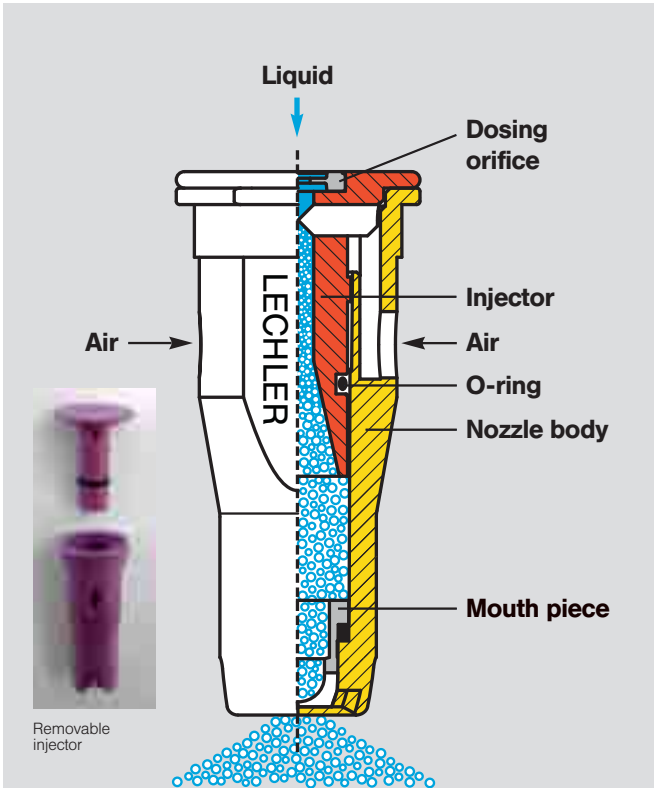


Features

- Air-aspirating flat-spray nozzle
- Nozzle sizes 01 through 08
- Pressure range 2.0 to 8.0 bar
- Extremely low drift potential for whole pressure range
- Significantly improved deposition structure thanks to aerated droplets
- Combines with IS end nozzle (of equal size), for sharply defined edges
- Fits all bayonet cap systems with 10 mm AF and threaded caps (Ø 12.6 mm)

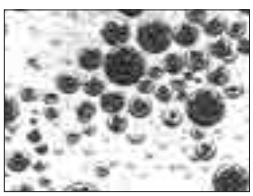
Range of application

- Application of plant protectants and growth regulators
- Particularly well-suited for application of liquid fertilizer (UAN); pressure range for pure UAN: 2.0 to 4.0 bar



Benefits of ID3 nozzles

- More solid design of nozzle body by filed construction
  - 0.9 cm shorter in comparison to ID range
  - Improved protection of nozzle tip by reinforced side walls
  - Easier cleaning of nozzle body by smooth transition
- Plane injector orifice
  - Easy wipe away of residues and dirt
  - Toolless removal and assembly of injector e.g. for cleaning purpose
  - Correct alignment of injector into the nozzle body by inside catch
  - Safe sealing between injector and nozzle body by o-ring
- Extended pressure range from 2.0 to 8.0 bar
- Long injector design responsible for high drift stability
  - Reduced fine droplet fraction also at higher pressure
  - Increased work rate at higher speeds
  - Even better adaption of sprayer speed and l/ha-rate without changing of nozzles
  - Application in due time even under worse weather conditions
  - For use at wind speeds up to 5 m/s according to good agricultural practice
  - Potential of 90 % drift reduction at 2.0 bar
- Proved materials such as POM or ceramic available depending on application conditions
- Non sensitive towards clogging due to big cross sections
- Very good deposition structure and crop-canopy penetration ensures high biological performance



Aeration effect

Spray table for air-injector flat spray nozzles ID3

	[bar]	l/min	l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
ID-120-01 (80/60 M)	2.0	0.32	77	64	55	48	38	32	27	24	21
	3.0	0.39	94	78	67	59	47	39	33	29	26
	4.0	0.45	108	90	77	68	54	45	39	34	30
	5.0	0.51	122	102	87	77	61	51	44	38	34
	6.0	0.55	132	110	94	83	66	55	47	41	37
	7.0	0.60	144	120	103	90	72	60	51	45	40
	8.0	0.64	154	128	110	96	77	64	55	48	43
ID-120-015 (60 M)	2.0	0.48	115	96	82	72	58	48	41	36	32
	3.0	0.59	142	118	101	89	71	59	51	44	39
	4.0	0.68	163	136	117	102	82	68	58	51	45
	5.0	0.76	182	152	130	114	91	76	65	57	51
	6.0	0.83	199	166	142	125	100	83	71	62	55
	7.0	0.90	216	180	154	135	108	90	77	68	60
	8.0	0.96	230	192	165	144	115	96	82	72	64
ID-120-02 (60 M)	2.0	0.65	156	130	111	98	78	65	56	49	43
	3.0	0.80	192	160	137	120	96	80	69	60	53
	4.0	0.92	221	184	158	138	110	92	79	69	61
	5.0	1.03	247	206	177	155	124	103	88	77	69
	6.0	1.13	271	226	194	170	136	113	97	85	75
	7.0	1.22	293	244	209	183	146	122	105	92	81
	8.0	1.30	312	260	223	195	156	130	111	98	87
ID-120-025 (60 M)	2.0	0.81	194	162	139	122	97	81	69	61	54
	3.0	0.99	238	198	170	149	119	99	85	74	66
	4.0	1.15	276	230	197	173	138	115	99	86	77
	5.0	1.28	307	256	219	192	154	128	110	96	85
	6.0	1.40	336	280	240	210	168	140	120	105	93
	7.0	1.52	365	304	261	228	182	152	130	114	101
	8.0	1.62	389	324	278	243	194	162	139	122	108
ID-120-03 (60 M)	2.0	0.97	233	194	166	146	116	97	83	73	65
	3.0	1.19	286	238	204	179	143	119	102	89	79
	4.0	1.37	329	274	235	206	164	137	117	103	91
	5.0	1.53	367	306	262	230	184	153	131	115	102
	6.0	1.68	403	336	288	252	202	168	144	126	112
	7.0	1.81	434	362	310	272	217	181	155	136	121
	8.0	1.94	466	388	333	291	233	194	166	146	129
ID-120-04 (60 M)	2.0	1.29	310	258	221	194	155	129	111	97	86
	3.0	1.58	379	316	271	237	190	158	135	119	105
	4.0	1.82	437	364	312	273	218	182	156	137	121
	5.0	2.04	490	408	350	306	245	204	175	153	136
	6.0	2.23	535	446	382	335	268	223	191	167	149
	7.0	2.41	578	482	413	362	289	241	207	181	161
	8.0	2.58	619	516	442	387	310	258	221	194	172
ID-120-05 (25M)	2.0	1.61	386	322	276	242	193	161	138	121	107
	3.0	1.97	473	394	338	296	236	197	169	148	131
	4.0	2.28	547	456	391	342	274	228	195	171	152
	5.0	2.55	612	510	437	383	306	255	219	191	170
	6.0	2.79	670	558	478	419	335	279	239	209	186
	7.0	3.01	722	602	516	452	361	301	258	226	201
	8.0	3.22	773	644	552	483	386	322	276	242	215
ID-120-06 (25 M)	2.0	1.93	463	386	331	290	232	193	165	145	129
	3.0	2.36	566	472	405	354	283	236	202	177	157
	4.0	2.73	655	546	468	410	328	273	234	205	182
	5.0	3.05	732	610	523	458	366	305	261	229	203
	6.0	3.34	802	668	573	501	401	334	286	251	223
	7.0	3.61	866	722	619	542	433	361	309	271	241
	8.0	3.86	926	772	662	579	463	386	331	290	257
ID-120-08 (25 M)	2.0	2.58	619	516	442	387	310	258	221	194	172
	3.0	3.16	758	632	542	474	379	316	271	237	211
	4.0	3.65	876	730	626	548	438	365	313	274	243
	5.0	4.08	979	816	699	612	490	408	350	306	272
	6.0	4.47	1073	894	766	671	536	447	383	335	298
	7.0	4.83	1159	966	828	725	580	483	414	362	322
	8.0	5.16	1238	1032	885	774	619	516	442	387	344

Matching air-injector off center nozzles IS, see page 28

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

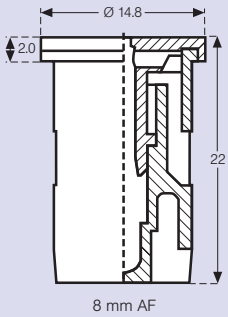
Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
ID3	120°	025	(POM)	= ID-120-025
ID3	120°	025	C (ceramic)	= ID-120-025C

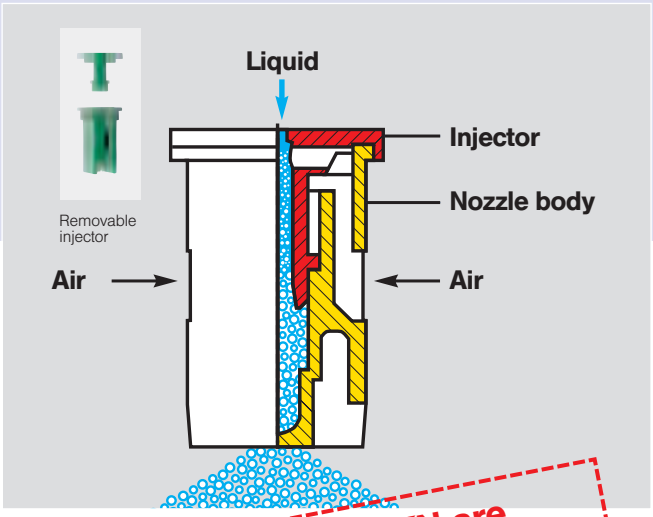
Air-injector flat spray compact nozzles IDK
Air-injector flat spray compact nozzles IDKN

Spray angle: 120°/90°
Material: POM, PP, ceramic

G 1661 G 1799
G 1662 G 1800
G 1663 G 1801
G 1683 G 1802
G 1718 G 1936



* IDKN-characteristic: body with white stripe



Lechler IDK/IDKN are rated in several countries for drift reduction 90/75/66/50 %.
Current list under **www.lechler-agri.com**

Features

- Air-injector flat-spray nozzle
- Pressure range: IDK-01 to -03 : 1.5 to 6.0 bar
  IDK-04 to -06 : 1.0 to 6.0 bar
  IDKN-03/-04 : 1.0 to 6.0 bar
- Very low drift potential and loss-reducing effect in pressure range up to 3.0 bar (according to size)
- At pressures above 3 bar, less drift resistance than other well-known ID/IDN nozzles, i.e., coarse-to-fine droplet size characteristic
- Very compact design (8 mm width across flats, 22 mm long)
- Fits all bayonet cap systems with 8 mm AF and threaded caps (Ø 12.6 mm)
- Included in the lists of »Drift-and-loss-reducing Techniques« **LERAP, JKI, Staatscourant, SPF, Hjälpreda, ÖAIP, Equipement de limitation de la dérive de pulvérisation and Tuulikulkeumaa Alentava suutin**

Range of application

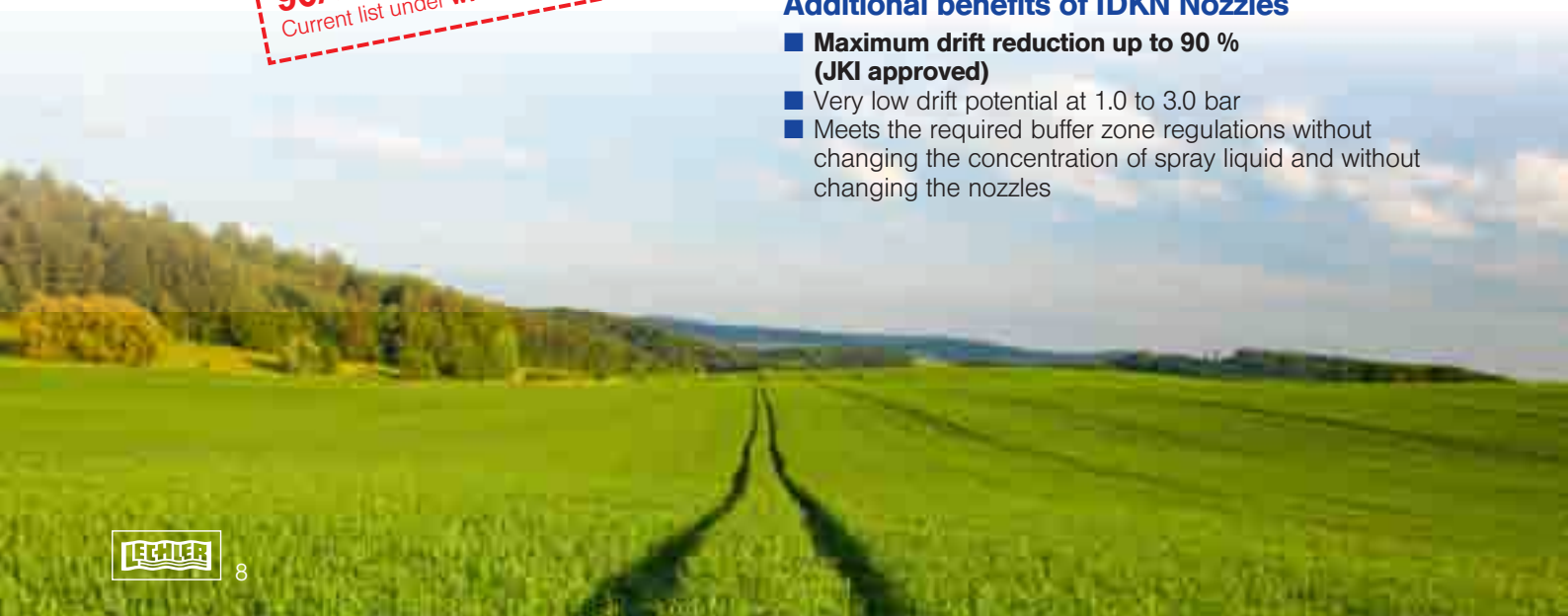
- Application of plant protectants and growth regulators
- Well-suited for application of liquid fertilizer (UAN); pressure range for pure UAN:
  IDK-01 to -03: 1.5 to 2.5 bar,
  IDK-04 to -06; IDKN-03/-04: 1.0 to 2.5 bar

Main benefits of IDK nozzles

- Inexpensive alternative to conventional standard-type nozzles
- Easy installation, with no adapter necessary
- One-piece nozzle with reproducibly fixed-position injector for toolless removal
- Hard-wearing and non-clogging thanks to lateral air-aspirating channels of ample size
- Very good deposition structure and canopy penetration
- Designed for »good modern practice«, i.e. for use at wind velocities up to 5 m/s and higher sprayer speeds

Additional benefits of IDKN Nozzles

- **Maximum drift reduction up to 90 % (JKI approved)**
- Very low drift potential at 1.0 to 3.0 bar
- Meets the required buffer zone regulations without changing the concentration of spray liquid and without changing the nozzles



Spray table for air-injector flat spray compact nozzles IDK / IDKN

	BCPC/ ASABE				l/ha (0.5 m)								
	IDKN	IDK	[bar]	l/min	5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
IDK 120-01 90-01 (80 M)		C	1.5	0.28	67	56	48	42	34	28	24	21	19
		C	2.0	0.32	77	64	55	48	38	32	27	24	21
		C	2.5	0.36	86	72	62	54	43	36	31	27	24
		M	3.0	0.39	94	78	67	59	47	39	33	29	26
		M	4.0	0.45	108	90	77	68	54	45	39	34	30
		M	5.0	0.51	122	102	87	77	61	51	44	38	34
		F	6.0	0.55	132	110	94	83	66	55	47	41	37
IDK 120-015 90-015 (60 M)		C	1.5	0.42	101	84	72	63	50	42	36	32	28
		C	2.0	0.48	115	96	82	72	58	48	41	36	32
		C	2.5	0.54	130	108	93	81	65	54	46	41	36
		C	3.0	0.59	142	118	101	89	71	59	51	44	39
		M	4.0	0.68	163	136	117	102	82	68	58	51	45
		M	5.0	0.76	182	152	130	114	91	76	65	57	51
		F	6.0	0.83	199	166	142	125	100	83	71	62	55
IDK 120-02 90-02 (60 M)		C	1.5	0.56	134	112	96	84	67	56	48	42	37
		C	2.0	0.65	156	130	111	98	78	65	56	49	43
		C	2.5	0.73	175	146	125	110	88	73	63	55	49
		C	3.0	0.80	192	160	137	120	96	80	69	60	53
		M	4.0	0.92	221	184	158	138	110	92	79	69	61
		M	5.0	1.03	247	206	177	155	124	103	88	77	69
		M	6.0	1.13	271	226	194	170	136	113	97	85	75
IDK 120-025 90-025 (60 M)		VC	1.5	0.70	168	140	120	105	84	70	60	53	47
		VC	2.0	0.81	194	162	139	122	97	81	69	61	54
		C	2.5	0.91	218	182	156	137	109	91	78	68	61
		C	3.0	0.99	238	198	170	149	119	99	85	74	66
		C	4.0	1.15	276	230	197	173	138	115	99	86	77
		M	5.0	1.28	307	256	219	192	154	128	110	96	85
		M	6.0	1.40	336	280	240	210	168	140	120	105	93
IDK 120-03 90-03 IDKN 120-03 (60 M)	EC		1.0*	0.69	166	138	118	104	83	69	59	52	46
	VC	VC	1.5	0.84	202	168	144	126	101	84	72	63	56
	VC	VC	2.0	0.97	233	194	166	146	116	97	83	73	65
	VC	VC	2.5	1.08	259	216	185	162	130	108	93	81	72
	C	C	3.0	1.19	286	238	204	179	143	119	102	8	79
	C	C	4.0	1.37	329	274	235	206	164	137	117	103	91
	M	M	5.0	1.53	367	306	262	230	184	153	131	115	102
	M	M	6.0	1.68	403	336	288	252	202	168	144	126	112
IDK IDKN 120-04 (60 M)	EC	EC	1.0	0.91	218	182	156	137	109	91	78	68	61
	VC	VC	1.5	1.12	269	224	192	168	134	112	96	84	75
	VC	VC	2.0	1.29	310	258	221	194	155	129	111	97	86
	VC	VC	2.5	1.44	346	288	247	216	173	144	123	108	96
	VC	VC	3.0	1.58	379	316	271	237	190	158	135	119	105
	C	C	4.0	1.82	437	364	312	273	218	182	156	137	121
	C	C	5.0	2.04	490	408	350	306	245	204	175	153	136
	M	M	6.0	2.23	535	446	382	335	268	223	191	167	149
IDK 120-05 (25 M)		EC	1.0	1.14	274	228	195	171	137	114	98	86	76
		VC	1.5	1.39	334	278	238	209	167	139	119	104	93
		VC	2.0	1.61	386	322	276	242	193	161	138	121	107
		VC	2.5	1.80	432	360	309	270	216	180	154	135	120
		VC	3.0	1.97	473	394	338	296	236	197	169	148	131
		C	4.0	2.28	547	456	391	342	274	228	195	171	152
		C	5.0	2.55	612	510	437	383	306	255	219	191	170
		M	6.0	2.79	670	558	478	419	335	279	239	209	186
IDK 120-06 (25 M)		EC	1.0	1.36	326	272	233	204	163	136	117	102	91
		EC	1.5	1.67	401	334	286	251	200	167	143	125	111
		VC	2.0	1.93	463	386	331	290	232	193	165	145	129
		VC	2.5	2.15	516	430	369	323	258	215	184	161	143
		VC	3.0	2.36	566	472	405	354	283	236	202	177	157
		VC	4.0	2.73	655	546	468	410	328	273	234	205	182
		C	5.0	3.05	732	610	523	458	366	305	261	229	203
		C	6.0	3.34	802	668	573	501	401	334	286	251	223

* 1.0 bar only for IDKN

Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
IDK	120°	01	C (Ceramic)	= IDK 120-01C
IDK	120°	01	(POM)	= IDK 120-01
IDK	120	03	(PP)	= IDK 120-03 PP
IDKN	120°	04	(POM)	= IDKN 120-04
MultiCap IDK	120°	01	(POM)	= MultiCap IDK 120-01

Improved Spray coverage on foliage and vertical targets with TWIN IDKT, see page 14

Matching air-injector off center nozzles IDKS, see page 29

Best Protection of IDK/IDKN/IDKS/ IDKT nozzles through long side walls of MultiCap, see page 42

Available assembled with IDK-, IDKT- and IDKN nozzle

BCPC/ASABE Droplet size classification

VF	Very fine
F	Fine
M	Medium
C	Coarse
VC	Very coarse
EC	Extreme Coarse

Classifications are subject to change

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

Pre-emergence flat spray nozzle PRE

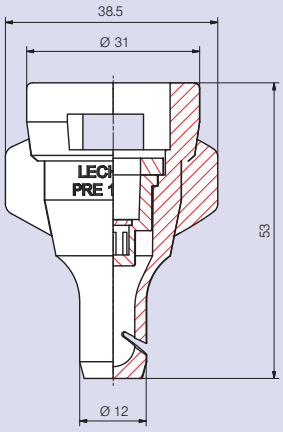
Lechler PRE nozzle is rated for drift reduction by JKI: 95/90 %

Current list under **www.lechler-agri.com**

Spray angle: 130°
Material: POM

NEW
Patented

G 1981



Features

- Flat spray nozzle with horizontal jet formation
- Nozzle size 05
- Pressure range: 1.5 to 8.0 bar
- Extremely low drift in complete pressure range
- Recommended height of spray boom 0.4 to 0.6 m at 50 cm nozzle spacing
- Nozzle and cap one piece, fits to standard nozzle holder system MULTIJET
- Intermediate- and extension adapter see page xy
- Included in the JKI list of “Drift and loss reducing Techniques”

Range of application

- Application of clomazone containing pre-emergence herbicides
- Turfgrass spraying
- Liquid fertilizer

Main benefits of PRE Nozzles

- 95 % drift reduction from 1.5 to 5.0 bar
- More flexible realization of distance to water requirements
- Large pressure range from 1.5 to 8.0 bar
- High working rate by adaption of l/ha-rate and forward speed
- Extreme reduction of fine droplet fraction
  - Lowest risk of drift towards sensitive areas and neighboring crops
  - Due to time application even under bad weather conditions
- Quick assembly as nozzle and cap is one piece
- Prevention of splashing on boom by backwards directed flat fan
- Wide spray angle of 130° guaranties multiple overlap and uniform cross distribution
- Good biological performance of clomazone containing pre-emergence herbicides
- Toolless removal of dosage insert for cleaning purpose
- Patented nozzle with specific afflux and discharge

Spray table for pre-emergence flat spray nozzle PRE

	BCPC/ ASABE	[bar]	l/min	l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
PRE 130-05 (25 M)	EG	1.5	1.55	372	310	266	233	186	155	133	116	62
	EG	2.0	1.73	415	346	297	260	208	173	148	130	69
	EG	3.0	2.00	480	400	343	300	240	200	171	150	80
	EG	4.0	2.24	538	448	384	336	269	224	192	168	90
	EG	5.0	2.45	588	490	420	368	294	245	210	184	98
	EG	6.0	2.64	634	528	453	396	317	264	226	198	106
	EG	7.0	2.82	677	564	483	423	338	282	242	212	113
	EG	8.0	2.99	718	598	513	449	359	299	256	224	120

BCPC/ASABE
Droplet size classification

VF	Very fine
F	Fine
M	Medium
C	Coarse
VC	Very coarse
EC	Extreme Coarse

Bestellbeispiel
Type + Spray angle + int’l nozzle size + material = Order no.
PRE 130° 05 (POM) = PRE 130-05

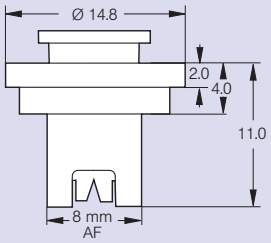
Anti-drift flat spray nozzles AD

Spray angle: 120°/90°
Material: POM, ceramic

G 1666
G 1667
G 1668

AD

AD-C



Features

- Anti-drift flat spray nozzle
- One-piece nozzle, with removable insert and integrated pre-chamber
- Nozzle sizes 015 to 04
- Pressure range AD 120: 1.5 to 6.0 bar (arable crops)
  AD 90: 2.0 to 20.0 bar (space crops)
- Fits all bayonet cap systems with 8 mm AF and threaded caps (Ø 12.6 mm)
- Medium-to-coarse, low-drift application, even for low l/ha rates

Range of application

- Application of plant protectants and growth regulators

	BCPC/ ASABE	[bar]	l/min	l/ha 0.5m 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
AD 120-015 (80 M)	M	1.5	0.42	101	84	72	63	50	42	36	32	28
	M	2.0	0.48	115	96	82	72	58	48	41	36	32
	M	2.5	0.54	130	108	93	81	65	54	45	41	36
	M	3.0	0.59	142	118	101	89	71	59	51	44	39
	F	3.5	0.63	151	126	108	95	76	63	54	47	42
	F	4.0	0.68	163	136	117	102	82	68	58	51	45
	F	4.5	0.72	173	144	123	108	86	72	62	54	48
	F	5.0	0.76	182	152	130	114	91	76	65	57	51
	F	6.0	0.83	199	166	142	125	100	83	72	62	55
AD 120-02 90-02 (60 M)	C	1.5	0.56	134	112	96	84	67	56	47	42	37
	M	2.0	0.65	156	130	111	98	78	65	54	49	43
	M	2.5	0.73	175	146	125	110	88	73	61	55	49
	M	3.0	0.80	192	160	137	120	96	80	67	60	53
	M	3.5	0.86	206	172	147	129	103	86	73	65	57
	M	4.0	0.92	221	184	158	138	110	92	77	69	61
	F	4.5	0.98	235	196	168	147	118	98	82	74	65
	F	5.0	1.03	247	206	177	155	124	103	87	77	69
	F	6.0	1.13	271	226	194	170	136	113	95	85	75
AD 120-03 90-03 (60 M)	C	1.5	0.84	202	168	144	126	101	84	70	63	56
	C	2.0	0.97	233	194	166	146	116	97	81	73	65
	C	2.5	1.08	259	216	185	162	130	108	91	81	72
	M	3.0	1.19	286	238	204	179	143	119	100	89	79
	M	3.5	1.28	307	256	219	192	154	128	108	96	85
	M	4.0	1.37	329	274	235	206	164	137	116	103	91
	M	4.5	1.46	350	292	250	219	175	146	123	110	97
	M	5.0	1.53	367	306	262	230	184	153	130	115	102
	F	6.0	1.68	403	336	288	252	202	168	141	126	112
AD 120-04 90-04 (60 M)	C	1.5	1.12	269	224	192	168	134	112	93	84	75
	C	2.0	1.29	310	258	221	194	155	129	108	97	86
	C	2.5	1.44	346	288	247	216	173	144	122	108	96
	C	3.0	1.58	379	316	271	237	190	158	133	119	105
	C	3.5	1.71	410	342	293	257	205	171	144	128	114
	M	4.0	1.82	437	364	312	273	218	182	154	137	121
	M	4.5	1.94	466	388	333	291	233	194	164	146	129
	M	5.0	2.04	490	408	350	306	245	204	173	153	136
	M	6.0	2.23	535	446	382	335	268	223	189	167	149

Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
AD	120°	02	(POM)	= AD 120-02
AD	120°	02	C (ceramic)	= AD 120-02 C

Spray table (2 – 20 bar), for applications in orchards, vinegards and speciality crops see page 19.

Cleaning brush for AD nozzles
Order no. 06A.D30.56.00

Integrated pre-chamber for optimal drop-size characteristics

The special design of the pre-chamber inflow section, reduces the undesirable fine-droplets fraction. Within the pre-chamber itself, the pressure is dissipated before the liquid emerges. This effectively minimizes the tip's susceptibility to wear.

BCPC/ASABE Droplet size classification

VF	Very fine
F	Fine
M	Medium
C	Coarse
VC	Very coarse
EC	Extreme Coarse

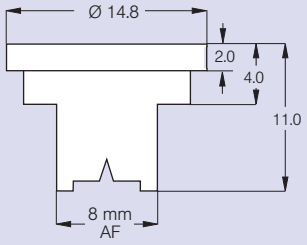
Classifications are subject to change

Multirange flat spray nozzles LU

Spray angle: 120°/90°
Material: POM, stainless steel, ceramic

G 1240 G 1596
G 1242 G 1597
G 1524


LU




LU-C


LU-S

Features

- Multirange/Universal flat spray nozzle
- Nozzle sizes 01 to 08
- Pressure range 1.5 to 5.0 bar
- Fits all bayonet cap systems with 8 mm AF and threaded caps
- Low-drift application up to 2.5 bar
- Fine, medium and coarse droplets, depending on the size of the nozzle and the applied pressure

Range of application

- Application of plant protectants and growth regulators

	BCPC/ ASABE	[bar]	l/min	l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
LU 120-01 90-01 (80 M)	F	1.5	0.28	67	56	48	42	34	28	24	21	19
	F	2.0	0.32	77	64	55	48	38	32	27	24	21
	F	3.0	0.39	94	78	67	59	47	39	33	29	26
	F	4.0	0.45	108	90	77	68	54	45	39	34	30
	F	5.0	0.51	122	102	87	77	61	51	44	38	34
LU 120-015 90-015 (80 M)	F	1.5	0.42	101	84	72	63	50	42	36	32	28
	F	2.0	0.48	115	96	82	72	58	48	41	36	32
	F	3.0	0.59	142	118	101	89	71	59	51	44	39
	F	4.0	0.68	163	136	117	102	82	68	58	51	45
	F	5.0	0.76	182	152	130	114	91	76	65	57	51
LU 120-02 90-02 (60 M)	F	1.5	0.56	134	112	96	84	67	56	48	42	37
	F	2.0	0.65	156	130	111	98	78	65	56	49	43
	F	3.0	0.80	192	160	137	120	96	80	69	60	53
	F	4.0	0.92	221	184	158	138	110	92	79	69	61
	F	5.0	1.03	247	206	177	155	124	103	88	77	69
LU 120-025 (60 M)	F	1.5	0.70	168	140	120	105	84	70	60	53	47
	F	2.0	0.81	194	162	139	122	97	81	69	61	54
	F	3.0	0.99	238	198	170	149	119	99	85	74	66
	F	4.0	1.15	276	230	197	173	138	115	99	86	77
	F	5.0	1.28	307	256	219	192	154	128	110	96	85
LU 120-03 90-03 (60 M)	M	1.5	0.84	202	168	144	126	101	84	72	63	56
	F	2.0	0.97	233	194	166	146	116	97	83	73	65
	F	3.0	1.19	286	238	204	179	143	119	102	89	79
	F	4.0	1.37	329	274	235	206	164	137	117	103	91
	F	5.0	1.53	367	306	262	230	184	153	131	115	102
LU 120-04 90-04 (60 M)	M	1.5	1.12	269	224	192	168	134	112	96	84	75
	M	2.0	1.29	310	258	221	194	155	129	111	97	86
	M	3.0	1.58	379	316	271	237	190	158	135	119	105
	F	4.0	1.82	437	364	312	273	218	182	156	137	121
	F	5.0	2.04	490	408	350	306	245	204	175	153	136
LU 120-05 90-05 (25 M)	M	1.5	1.39	334	278	238	209	167	139	119	104	93
	M	2.0	1.61	386	322	276	242	193	161	138	121	107
	M	3.0	1.97	473	394	338	296	236	197	169	148	131
	M	4.0	2.28	547	456	391	342	274	228	195	171	152
	M	5.0	2.55	612	510	437	383	306	255	219	191	170
LU 120-06 90-06 (25 M)	G	1.5	1.67	401	334	286	251	200	167	143	125	111
	G	2.0	1.93	463	386	331	290	232	193	165	145	129
	M	3.0	2.36	566	472	405	354	283	236	202	177	157
	M	4.0	2.73	655	546	468	410	328	273	234	205	182
	M	5.0	3.05	732	610	523	458	366	305	261	229	203
LU 120-08 90-08 (25 M)	G	1.5	2.23	535	446	382	335	268	223	191	167	149
	G	2.0	2.58	619	516	442	387	310	258	221	194	172
	G	3.0	3.16	758	632	542	474	379	316	271	237	211
	G	4.0	3.65	876	730	626	548	438	365	313	274	243
	M	5.0	4.08	979	816	699	612	490	408	350	306	272

BCPC/ASABE Droplet size classification

VF	Very fine
F	Fine
M	Medium
C	Coarse
VC	Very coarse
EC	Extreme Coarse

Classifications are subject to change

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

Sample order

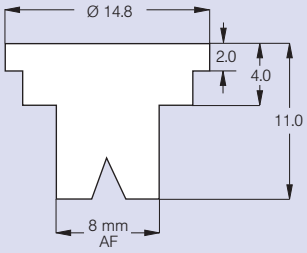
Type	+ spray angle	+ int'l nozzle size	+ material	= order number
LU	120°	02	(POM)	= LU 120-02
LU	120°	015	C (ceramic)	= LU 120-015 C
LU	120°	03	S (stainless steel)	= LU 120-03 S

Standard flat spray nozzles SC / ST

Spray angle: 110°/80°
Material: POM, ceramic, brass (on request)


ST


ST-C



Features

- Flat spray nozzle
- Nozzle sizes 01 through 08
- Pressure range 2.0 to 5.0 bar
- Fits all bayonet cap systems with 8 mm AF and threaded caps (Ø 12.6 mm)
- Colour coded acc. to ISO standard 10625

Range of application

- Application of plant protectants and growth regulators

	[bar]	l/min	l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
ST 110-01 80-01 (80 M)	2.0	0.32	77	64	55	48	38	32	27	24	21
	2.5	0.36	86	72	62	54	43	36	31	27	24
	3.0	0.39	94	78	67	59	47	39	33	29	26
	4.0	0.45	108	90	77	68	54	45	39	34	30
	5.0	0.51	122	102	87	77	61	51	44	38	34
ST 110-015 80-015 (80 M)	2.0	0.48	115	96	82	72	58	48	41	36	32
	2.5	0.54	130	108	93	81	65	54	46	41	36
	3.0	0.59	142	118	101	89	71	59	51	44	39
	4.0	0.68	163	136	117	102	82	68	58	51	45
	5.0	0.76	182	152	130	114	91	76	65	57	51
ST 110-02 80-02 (60 M)	2.0	0.65	156	130	111	98	78	65	56	49	43
	2.5	0.73	175	146	125	110	88	73	63	55	49
	3.0	0.80	192	160	137	120	96	80	69	60	53
	4.0	0.92	221	184	158	138	110	92	79	69	61
	5.0	1.03	247	206	177	155	124	103	88	77	69
SC 110-025 (60 M)	2.0	0.81	194	162	139	122	97	81	69	61	54
	2.5	0.91	218	182	156	137	109	91	78	68	61
	3.0	0.99	238	198	170	149	119	99	85	74	66
	4.0	1.15	276	230	197	173	138	115	99	86	77
	5.0	1.28	307	256	219	192	154	128	110	96	85
ST/SC 110-03 80-03 (60 M)	2.0	0.97	233	194	166	146	116	97	83	73	65
	2.5	1.08	259	216	185	162	130	108	93	81	72
	3.0	1.19	286	238	204	179	143	119	102	89	79
	4.0	1.37	329	274	235	206	164	137	117	103	91
	5.0	1.53	367	306	262	230	184	153	131	115	102
ST/SC 110-04 80-04 (60 M)	2.0	1.29	310	258	221	194	155	129	111	97	86
	2.5	1.44	346	288	247	216	173	144	123	108	96
	3.0	1.58	379	316	271	237	190	158	135	119	105
	4.0	1.82	437	364	312	273	218	182	156	137	121
	5.0	2.04	490	408	350	306	245	204	175	153	136
ST/SC 110-05 80-05 (60 M)	2.0	1.61	386	322	276	242	193	161	138	121	107
	2.5	1.80	432	360	309	270	216	180	154	135	120
	3.0	1.97	473	394	338	296	236	197	169	148	131
	4.0	2.28	547	456	391	342	274	228	195	171	152
	5.0	2.55	612	510	437	383	306	255	219	191	170
ST 110-06 80-06 (25 M)	2.0	1.93	463	386	331	290	232	193	165	145	129
	2.5	2.16	518	432	370	324	259	216	185	162	144
	3.0	2.36	566	472	405	354	283	236	202	177	157
	4.0	2.73	655	546	468	410	328	273	234	205	182
	5.0	3.05	732	610	523	458	366	305	261	229	203
ST 110-08 80-08 (25 M)	2.0	2.58	619	516	442	387	310	258	221	194	172
	2.5	2.88	691	576	494	432	346	288	247	216	192
	3.0	3.16	758	632	542	474	379	316	271	237	211
	4.0	3.65	876	730	626	548	438	365	313	274	243
	5.0	4.08	979	816	699	612	490	408	350	306	272


SC

Features

- Spray angle 110°
- Nozzle sizes 025 to 05
- Spray nozzle and bayonet-cap in one piece
- Easy and quick assembling to the spray boom
- Reduced assembling and storage cost

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

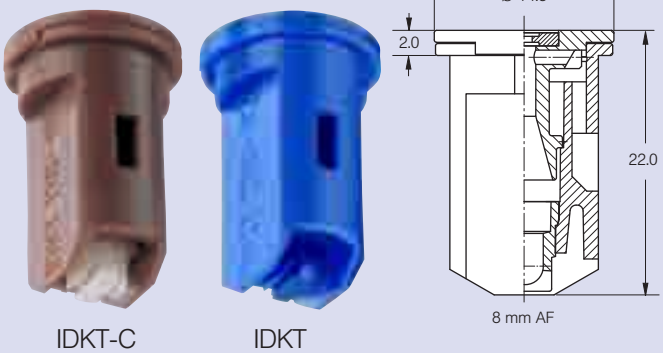
Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
SC	110°	03	(POM)	= SC 110-03
ST	110°	06	(POM)	= ST 110-06
ST	110°	06	C (ceramic)	= ST 110-06 C

TWIN flat spray air-injector compact nozzles IDKT

Spray angle: 2 x 120°
Material: POM, Ceramic

G 1836 G 1884
G 1837 G 1911
G 1865 G 1912
G 1882 G 1935
G 1883



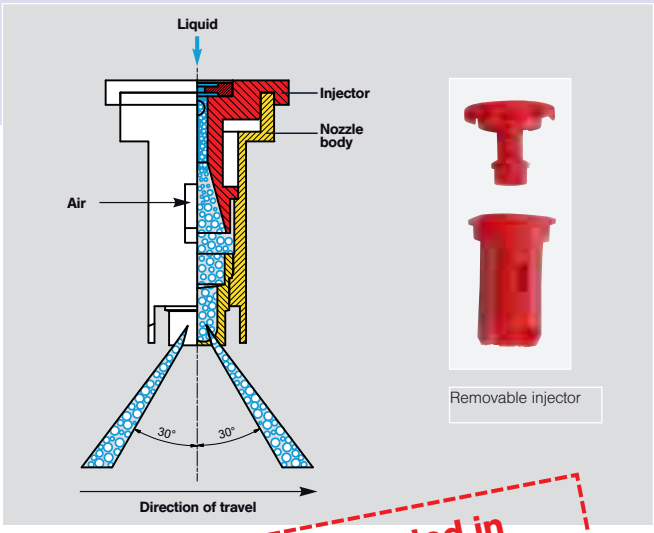
IDKT-C IDKT

Features

- Air-injector twin flat spray nozzle
- Pressure range: IDKT 015 to 025 1.5 to 6.0 bar
  IDKT 03 to 06 1.0 to 6.0 bar
- Symmetric double flat spray design
- Droplet spectrum extreme coarse to fine
- Very low drift potential in pressure range up to 3.0 bar
- Very compact design – only 22 mm long
- Fits all bayonet cap systems with 8 mm AF and threaded caps
- Included in the lists of »Drift-and-loss-reducing Techniques« **JKI, Staatscourant, SPF, Hjälpreda, ÖAIP, Equipement de limitation de la dérive de pulvérisation and Tuulikulkeumaa Alentava suutin**

Range of application

- Herbicide application
- Treatment during rape seed blossom
- Treatment of ear in cereals
- Potato blight control and desiccation
- Vegetable growing



Removable injector

Lechler IDKT are rated in several countries for drift reduction 95/90/75/66/50 %.
Current list under **www.lechler-agri.com**

Benefits of IDKT-nozzles

- Very compact flat spray air-injector compact nozzle
  - fits on all nozzle holders
  - no contact with boom unit when turning the multiple nozzle holder
- One-piece nozzle with reproducibly fixed-position injector for easy removal
- Very low drift potential compared to conventional TWIN nozzles
- Thanks to two angled fans, increased number of droplets and impacts compared to normal air injector nozzle
- Excellent coverage on dense foliage and vertical targets (stalk, ear)
- Easy cleaning of injector ceramic orifice
- Best protection of the nozzle tip through long side walls of nozzle body
- Little risk of clogging at the nozzle tip thanks to central afflux profile

Observation

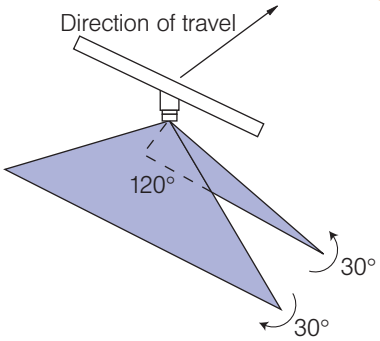
In case that forward turned spray jets of IDKT nozzles hit the frame of the sprayer in the mid segment of the boom, exchange them with IDK / IDKN nozzles of same size.

JKI-approval for mixed nozzle equipping

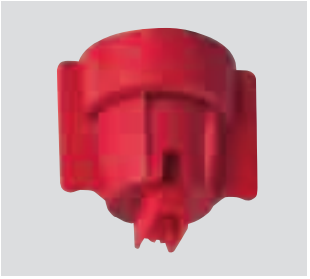
G 1932 IDKT 120-03 POM + 6 x IDKN 120-03 POM
G 1933 IDKT 120-04 POM + 6 x IDKN 120-04 POM
G 1934 IDKT 120-05 POM + 6 x IDK 120-05 POM
G 1937 IDKT 120-06 POM + 6 x IDK 120-06 POM

Spray table for TWIN flat spray air-injector compact nozzle IDKT

	BCPC/ ASABE	[bar]	l/min	l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
IDKT 120-015 (60 M)	EC	1.5	0.42	101	84	72	63	50	42	36	32	28
	EC	2.0	0.48	115	96	82	72	58	48	41	36	32
	EC	2.5	0.54	130	108	93	81	65	54	46	41	36
	EC	3.0	0.59	142	118	101	89	71	59	51	44	39
	EC	3.5	0.64	154	128	110	96	77	64	55	48	43
	EC	4.0	0.68	163	136	117	102	82	68	58	51	45
	VC	5.0	0.76	182	152	130	114	91	76	65	57	51
	VC	6.0	0.83	199	166	142	125	100	83	71	62	55
IDKT 120-02 (80 M)	EC	1.5	0.56	134	112	96	84	67	56	48	42	37
	VC	2.0	0.65	156	130	111	98	78	65	56	49	43
	VC	2.5	0.73	175	146	125	110	88	73	63	55	49
	C	3.0	0.80	192	160	137	120	96	80	69	60	53
	C	3.5	0.86	206	172	147	129	103	86	74	65	57
	C	4.0	0.92	221	184	158	138	110	92	79	69	61
	M	5.0	1.03	247	206	177	155	124	103	88	77	69
	M	6.0	1.13	271	226	194	170	136	113	97	85	75
IDKT 120-025 (60 M)	VC	1.5	0.70	168	140	120	105	84	70	60	53	47
	VC	2.0	0.81	194	162	139	122	97	81	69	61	54
	C	2.5	0.91	218	182	156	137	109	91	78	68	61
	C	3.0	0.99	238	198	170	149	119	99	85	74	66
	C	3.5	1.07	257	214	183	161	128	107	92	80	71
	C	4.0	1.15	276	230	197	173	138	115	99	86	77
	M	5.0	1.28	307	256	219	192	154	128	110	96	85
	M	6.0	1.40	336	280	240	210	168	140	120	105	93
IDKT 120-03 (60 M)	EC	1.0	0.69	166	138	118	104	83	69	59	61	54
	VC	1.5	0.84	202	168	144	126	101	84	72	63	56
	VC	2.0	0.97	233	194	166	146	116	97	83	73	65
	C	2.5	1.08	259	216	185	162	130	108	93	81	72
	C	3.0	1.19	286	238	204	179	143	119	102	89	79
	C	3.5	1.28	307	256	219	192	154	128	110	96	85
	M	4.0	1.37	329	274	235	206	164	137	117	103	91
	M	5.0	1.53	367	306	262	230	184	153	131	115	102
	M	6.0	1.68	403	336	288	252	202	168	144	126	112
IDKT 120-04 (60 M)	EC	1.0	0.91	218	182	156	137	109	91	78	68	61
	VC	1.5	1.12	269	224	192	168	134	112	96	84	75
	C	2.0	1.29	310	258	221	194	155	129	111	97	86
	C	2.5	1.44	346	288	247	216	173	144	123	108	96
	C	3.0	1.58	379	316	271	237	190	158	135	119	105
	M	3.5	1.71	410	342	293	257	205	171	147	128	114
	M	4.0	1.82	437	364	312	273	218	182	156	137	121
	M	5.0	2.04	490	408	350	306	245	204	175	153	136
	M	6.0	2.23	535	446	382	335	268	223	191	167	149
IDKT 120-05 (60 M)	EC	1.0	1.14	274	228	195	171	137	114	98	86	76
	VC	1.5	1.39	334	278	238	209	167	139	119	104	93
	C	2.0	1.61	386	322	276	242	193	161	138	121	107
	C	2.5	1.80	432	360	309	270	216	180	154	135	120
	C	3.0	1.97	473	394	338	296	236	197	169	148	131
	M	3.5	2.13	511	426	365	320	256	213	183	160	142
	M	4.0	2.28	547	456	391	342	274	228	195	171	152
	M	5.0	2.55	612	510	437	383	306	255	219	191	170
	F	6.0	2.79	670	558	478	419	335	279	239	209	186
IDKT 120-06 (60 M)	EC	1.0	1.36	326	272	233	204	163	136	117	102	91
	VC	1.5	1.67	401	334	286	251	200	167	143	125	111
	VC	2.0	1.93	463	386	331	290	232	193	165	145	129
	VC	2.5	2.15	516	430	369	323	258	215	184	161	143
	VC	3.0	2.36	566	472	405	354	283	236	202	177	157
	VC	3.5	2.55	612	510	437	383	306	255	219	191	170
	VC	4.0	2.73	655	546	468	410	328	273	234	205	182
	C	5.0	3.05	732	610	523	458	366	305	261	229	203
	C	6.0	3.34	802	668	573	501	401	334	286	251	223



Matching air-injector off center nozzles IDKS, see page 29.



Recommendation: Best protection of IDKT nozzles through long side walls of MultiCap.

BCPC/ASABE Droplet size classification

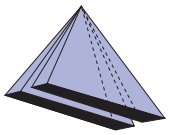
VF	Very fine
F	Fine
M	Medium
C	Coarse
VC	Very coarse
EC	Extreme coarse

Classifications are subject to change.

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

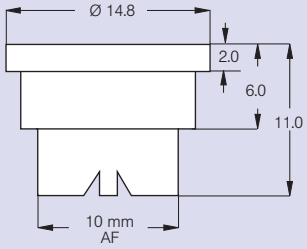
Sample order

Type	+ spray angle	+ Int'l nozzle size	+ material	= order number
IDKT	120°	04	(POM)	= IDKT 120-04
IDKT	120°	04	C (ceramic)	= IDKT 120-04 C
MultiCap IDKT	120°	04	(POM)	= MultiCap IDKT 120-04



TWIN flat spray nozzles DF

Spray angle: 2 x 120°
Material: stainless steel



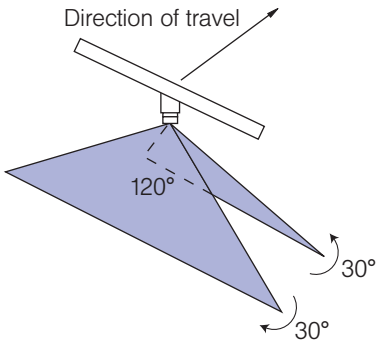
Features

- Twin flat spray nozzle
- Nozzle sizes 02 to 06
- Pressure range: 2.0 to 5.0 bar
- Special-purpose nozzle for fine-spray application
- TWIN flat spray jets in direction of travel, 30° to the front and 30° to the rear
- Fits all bayonet cap systems with 10 mm AF and threaded caps (Ø 12.6 mm)
- Good coverage of foliage
- Uniform deposition on vertical targets (stalks, ears)
- Little danger of clogging thanks to central infeed profile

Range of application

- Particularly well-suited for application of contact and (semi-)systemic fungicides and insecticides
- Ear treatment
- Potato blight control
- Treatment of leaf diseases

	[bar]	l/min	l/ha (0.5 m) 4.0 km/h	5.0 km/h	5.5 km/h	6.0 km/h	6.5 km/h	7.0 km/h	7.5 km/h	8.0 km/h	10.0 km/h	12.0 km/h
DF 120-02 (80 M)	2.0	0.65	195	156	142	130	120	111	104	98	78	65
	2.5	0.73	219	175	159	146	135	125	117	110	88	73
	3.0	0.80	240	192	175	160	148	137	128	120	96	80
	3.5	0.86	258	206	188	172	159	147	138	129	103	86
	4.0	0.92	276	221	201	184	170	158	147	138	110	92
	4.5	0.98	294	235	214	196	181	168	157	147	118	98
	5.0	1.03	309	247	225	206	190	177	165	155	124	103
DF 120-03 (80 M)	2.0	0.97	291	233	212	194	179	166	155	146	116	97
	2.5	1.08	324	259	236	216	199	185	173	162	130	108
	3.0	1.19	357	286	260	238	220	204	190	179	143	119
	3.5	1.28	384	307	279	256	236	219	205	192	154	128
	4.0	1.37	411	329	299	274	253	235	219	206	164	137
	4.5	1.46	438	350	319	292	270	250	234	219	175	146
	5.0	1.53	459	367	334	306	282	262	245	230	184	153
DF 120-04 (60 M)	2.0	1.29	387	310	281	258	238	221	206	194	155	129
	2.5	1.44	432	346	314	288	266	247	230	216	173	144
	3.0	1.58	474	379	345	316	292	271	253	237	190	158
	3.5	1.71	513	410	373	342	316	293	274	257	205	171
	4.0	1.82	546	437	397	364	336	312	291	273	218	182
	4.5	1.94	582	466	423	388	358	333	310	291	233	194
	5.0	2.04	612	490	445	408	377	350	326	306	245	204
DF 120-05 (60 M)	2.0	1.61	483	386	351	322	297	276	258	242	193	161
	2.5	1.80	540	432	393	360	332	309	288	270	216	180
	3.0	1.97	591	473	430	394	364	338	315	296	236	197
	3.5	2.13	639	511	465	426	393	365	341	320	256	213
	4.0	2.28	684	547	497	456	421	391	365	342	274	228
	4.5	2.42	726	581	528	484	447	415	387	363	290	242
	5.0	2.55	765	612	556	510	471	437	408	383	306	255
DF 120-06 (60 M)	2.0	1.93	579	463	421	386	356	331	309	290	232	193
	2.5	2.16	648	518	471	432	399	370	346	324	259	216
	3.0	2.36	708	566	515	472	436	405	378	354	283	236
	3.5	2.55	765	612	556	510	471	437	408	383	306	255
	4.0	2.73	819	655	596	546	504	468	437	410	328	273
	4.5	2.90	870	696	633	580	535	497	464	435	348	290
	5.0	3.05	915	732	665	610	563	523	488	458	366	305



- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
DF	120°	02	S (stainless steel)	= DF 120-02 S

TwinSprayCap
Bayonet combi-cap for air-injector nozzles and flat spray nozzles

MULTIJET
with round hole bore,
e.g. for use on Dropleg[UL]
(p. 40)

MULTIJET

Hardi

Features

- Enables the advantages of drift-reducing air-injector nozzles to be combined with the effect of the double flat jet for improved spray coverage
- Combi-cap suitable for nozzles with widths across flats of 8 and 10, e.g. IDK, IDKN, E, LU and ID3
- TWIN flat spray jets in direction of travel, 30° to the front and 30° to the rear
- 2-part TwinSprayCap, easy to disassemble thanks to plug-fit bracket system for assembly and changing the nozzles
- Automatic alignment and offset of the nozzles for optimum lateral distribution

Suitable for

- Lechler nozzle holder system MULTIJET (blue connection) see page 43
- Hardi nozzle holder system (red connection)
- Intermediate and extension adaptor see page 43

Range of application

- Particularly contact (semi)-systemic pesticides
- Ears treatment
- Potato blight control and desiccation
- Vegetable-growing
- Grass control
- Band spraying with E band spray nozzles
- All herbicid applications in particular on low tillage systems

Recommendation for installations:

Wet gasket with water before mounting on nozzle holder.

Note:

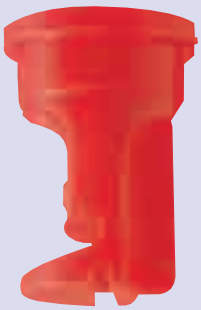
Select the nozzle size using the l/ha spraying tables - the correct rating corresponds to the determined nozzle size divided by two, e.g. two times -02 corresponds to the application rate of -04 or alternatively one time -015 and one time -025 corresponds as well to -04.

Sample order

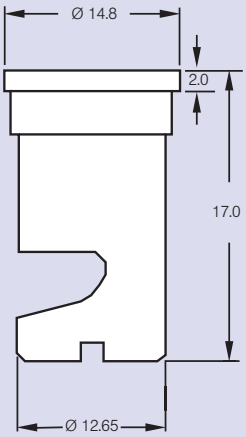
Type			order number
TwinSprayCap System MULTIJET	(incl. Gasket no. 095.015.6C.08.59.0)	=	092. 163. 56. 00
TwinSprayCap System MULTIJET	(incl. Gasket no. 095.015.6C.08.59.0) with round hole bore	=	092. 163. 56. 10
TwinSprayCap System Hardi	(incl. Gasket no. 095.015.73.01.60.0)	=	092. 163. 56. 01

Flood nozzles FT / DT

Spray angle: 140°
Material: stainless steel, POM
DT 80° to 105° depending on nozzle size



FT



Features

- Flat spray nozzle
- Nozzle sizes FT 0.5 through 10.0
- Nozzle sizes DT 0.5 through 1.5
- Pressure range 1.0 to 3.0 bar
- Little danger of clogging thanks to ample free cross sections
- Compact design
- Fitting bayonet- and threaded caps (Ø 12.65 mm) see pages 43, 45, 47

Range of application

- Broadcast spraying
- Small implements, e.g. for knapsack sprayers
- Boom irrigation, e.g. for watering cars
- In-furrow treatment in potato, e.g. Ortiva
- Dropleg[UL], e.g. for application of plant protectants and liquid fertilizer

	[bar]	l/min	l/ha 0.5 m						l/ha 1 m					
			6.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	6.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h
FT 0.5-308 (60 M)	1.0	0.23	46	35	28	23	20	17	23	17	14	12	10	9
	1.5	0.28	56	42	34	28	24	21	28	21	17	14	12	11
	2.0	0.32	64	48	38	32	27	24	32	24	19	16	14	12
	3.0	0.39	78	59	47	39	33	29	39	29	23	20	17	15
FT 0.75-348 (60 M)	1.0	0.35	71	53	42	35	30	27	35	27	21	18	15	13
	1.5	0.43	87	65	52	43	37	32	43	32	26	22	19	16
	2.0	0.50	100	75	60	50	43	38	50	38	30	25	21	19
	3.0	0.61	122	92	73	61	52	46	61	46	37	31	26	23
FT 1.0-368 (60 M)	1.0	0.45	90	68	54	45	39	34	45	34	27	23	19	17
	1.5	0.55	110	83	66	55	47	41	55	41	33	28	24	21
	2.0	0.63	126	95	76	63	54	47	63	47	38	32	27	24
	3.0	0.77	154	116	92	77	66	58	77	58	46	39	33	29
FT 1.5-408 (60 M)	1.0	0.71	142	107	85	71	61	53	71	53	43	36	30	27
	1.5	0.87	174	131	104	87	75	65	87	65	52	44	37	33
	2.0	1.00	200	150	120	100	86	75	100	75	60	50	43	38
	3.0	1.22	244	183	146	122	105	92	122	92	73	61	52	46
FT 2.0-448 (60 M)	1.0	0.88	176	132	106	88	75	66	88	66	53	44	38	33
	1.5	1.08	216	162	130	108	93	81	108	81	65	54	46	41
	2.0	1.25	250	188	150	125	107	94	125	94	75	63	54	47
	3.0	1.53	306	230	184	153	131	115	153	115	92	77	66	57
FT 2.5-488 (25 M)	1.0	1.13	226	170	136	113	97	85	113	85	68	57	48	42
	1.5	1.39	278	209	167	139	119	104	139	104	83	70	60	52
	2.0	1.60	320	240	192	160	137	120	160	120	96	80	69	60
	3.0	1.96	392	294	235	196	168	147	196	147	118	98	84	74
FT 3.0-528 (25 M)	1.0	1.41	282	212	169	141	121	106	141	106	85	71	60	53
	1.5	1.73	346	260	208	173	148	130	173	130	104	87	74	65
	2.0	2.00	400	300	240	200	171	150	200	150	120	100	86	75
	3.0	2.45	490	368	294	245	210	184	245	184	147	123	105	92
FT 4.0-568 (25 M)	1.0	1.77	354	266	212	177	152	133	177	133	106	89	76	66
	1.5	2.17	434	326	260	217	186	163	217	163	130	109	93	81
	2.0	2.50	500	375	300	250	214	188	250	188	150	125	107	94
	3.0	3.06	612	459	367	306	262	230	306	230	184	153	131	115
FT 5.0-608 (25 M)	1.0	2.23	446	335	268	223	191	167	223	167	134	112	96	84
	1.5	2.73	546	410	328	273	234	205	273	205	164	137	117	102
	2.0	3.15	630	473	378	315	270	236	315	236	189	158	135	118
	3.0	3.86	772	579	463	386	331	290	386	290	232	193	165	145
FT 7.5-688 (25 M)	1.0	3.54	708	531	425	354	303	266	354	266	212	177	152	133
	1.5	4.33	866	650	520	433	371	325	433	325	260	217	186	162
	2.0	5.00	1000	750	600	500	429	375	500	375	300	250	214	188
	3.0	6.12	1224	918	734	612	525	459	612	459	367	306	262	230
FT 10.0-728 (25 M)	1.0	4.45	890	668	534	445	381	334	445	334	267	223	191	167
	1.5	5.46	1092	819	655	546	468	410	546	410	328	273	234	205
	2.0	6.30	1260	945	756	630	540	473	630	473	378	315	270	236
	3.0	7.72	1544	1158	926	772	662	579	772	579	463	386	331	290

Flood nozzle DT

Spray table for Flood nozzle DT on request (www.lechler.de)

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles in the boom have the same size.

Sample order

Type	+ spray angle	+ material	= order number
FT 2.0-448	140°	S (stainless steel)	= FT 2.0-448, 140°, S
DT 0.5	80°	(POM)	= DT 0.5

Spray table for
Air-injector flat spray nozzles ID 90
Air-injector flat spray compact nozzles IDK 90
Anti-drift flat spray nozzles AD 90
Hollow cone nozzles TR 80
Air-injector hollow cone nozzles ITR 80

ID/IDK/AD	TR/ITR		l/min																
			[bar]																
			2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	19.0	20.0
TR 80-005		60 M	0.16	0.20	0.23	0.25	0.28	0.30	0.32	0.34	0.36	0.38	0.39	0.41	0.42	0.44	0.45	0.47	0.49	0.51
TR 80-0067 IDK 90-0067		60 M	0.22	0.27	0.31	0.35	0.38	0.41	0.44	0.47	0.49	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.68	0.70
ID/IDK 90-01 TR/ITR 80-01		60 M	0.32	0.39	0.45	0.51	0.55	0.60	0.64	0.68	0.72	0.75	0.78	0.82	0.85	0.88	0.91	0.93	0.99	1.01
ID/IDK 90-015 TR/ITR 80-015		60 M	0.48	0.59	0.68	0.76	0.83	0.90	0.96	1.02	1.07	1.13	1.18	1.22	1.27	1.31	1.36	1.40	1.48	1.52
ID/IDK/AD 90-02 TR/ITR 80-02		60 M	0.65	0.80	0.92	1.03	1.13	1.22	1.30	1.38	1.45	1.53	1.60	1.67	1.73	1.79	1.85	1.90	2.01	2.07
ID/IDK 90-025		60 M	0.81	0.99	1.15	1.28	1.40	1.52	1.62	1.71	1.81	1.90	1.98	2.06	2.14	2.21	2.29	2.36	2.49	2.56
ID/IDK/AD 90-03 TR 80-03		60 M	0.97	1.19	1.37	1.53	1.68	1.81	1.94	2.06	2.17	2.28	2.38	2.48	2.57	2.66	2.75	2.83	2.99	3.07
ID/AD 90-04 TR 80-04		60 M	1.29	1.58	1.82	2.04	2.23	2.41	2.58	2.74	2.88	3.03	3.16	3.29	3.41	3.53	3.65	3.76	3.98	4.08
ID 90-05 TR 80-05		25 M	1.61	1.97	2.28	2.55	2.79	3.01	3.22	3.42	3.60	3.77	3.94	4.10	4.26	4.41	4.55	4.69	4.96	5.09
ID 90-06		25 M	1.93	2.36	2.73	3.05	3.34	3.61	3.86	4.09	4.32	4.52	4.72	4.91	5.10	5.28	5.45	5.62	5.94	6.09

■ The stated liter-per-hectare rates apply to water ■ Prior to each spraying season, verify the table data by gauging the flow rates ■ Spray pressure at the nozzle tip (gauged with a diaphragm valve)

Using nozzles of the same size

The total nozzle output of the sprayer is calculated by the following formula:

$$\dot{V} = \frac{M \times v_F \times B}{600}$$

$\dot{V}$ = **Total nozzle output, l/min**

M = **Liter-per-hectare rate, l/ha**

v_F = **Sprayer speed, km/h**

B = **Working width, m**

The flow rate of a single nozzle is calculated by dividing the total nozzle output by the number of working nozzles.

Nozzle size and pressure are determined by the flow rate indicated in the table above.

The working width corresponds to the distance of the rows, i.e. the row spacing when every row is driven on. If only every second row is driven along, the working width is obtained from double the row spacing.

Using nozzles of different sizes

If nozzles of different sizes are used in a sprayer, the first rating determined derives from the assumption that nozzles of the same size are fitted.

The number of nozzles of the next smallest size is taken into account according to the total number of nozzles.

In order to obtain the specified liquid output (setpoint), the pressure must be increased in accordance with the formula beside.

$$\text{Pressure-setpoint} = \text{Pressure-actual value} \times \left[\frac{\text{Total nozzle output setpoint}}{\text{Total nozzle output actual value}}\right]^2$$

Example
At a sprayer speed of 6.5 km/h, 600 l/ha should be applied. The working width is 2.0 m. The total nozzle output is then:

$$\frac{600 \times 6.5 \times 2.0}{600} = 13.0 \text{ l/min}$$

If 10 nozzles of the same size are used, the flow rate of each nozzle is 13.0 : 10 = 1.3 l/min.
➔ nozzle/pressure as per Table see above:

ID 90-02/yellow at 8 bar

Instead of nozzle ID 90-02, the lower and two upper nozzles with the next smaller size **6 x ID 90-015/green** should be fitted on both sides of the sprayer. The total nozzle output (actual value) is as follows at 8 bar (actual value):

(6 x 0.96 + 4 x 1.30) l/min = 10.96 l/min.
The pressure setpoint to be set for 600 l/ha (setpoint) is then:

$$8 \times \left[\frac{13.0}{11.0}\right]^2 = 11.2 \text{ bar}$$

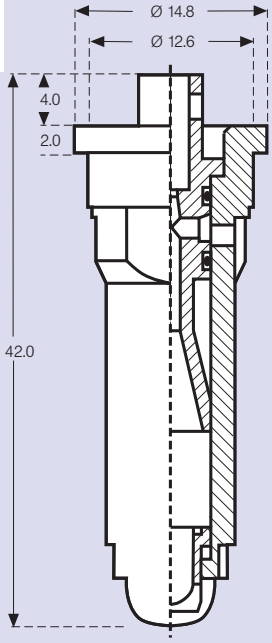
More detailed information is available in Lechler brochure for viticulture, orchard and speciality crops as well as www.lechler-agri.com

Air-injector flat spray nozzles ID 90

Lechler ID 90 nozzles are rated in several countries for drift reduction 99/95/90/75/50 %.
Current list under **www.lechler-agri.com**

Spray angle: 90°
Material: ceramic

G 1612 G 1659
G 1632 G 1660

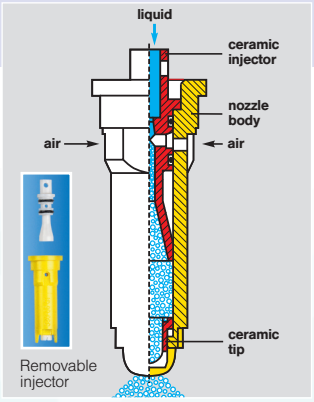


Features

- Air-injector flat spray nozzle
- Nozzle sizes 01 to 06
- Flow rates see page 19
- Pressure range 3.0 to 20.0 bar
- Heavy-duty, chemical-resistant ceramic
- One-piece nozzle with easily removable solid-ceramic injector, reproducible reassembling
- Large, non-clogging cross sections of flow
- Compact design with minimal impact surfaces
- Fits all bayonet cap systems with 10 mm AF or threaded caps (Ø 12.6 mm)
- Safe and sure, adaptorless mounting, easy alignment
- Droplet spectrum: very coarse to coarse
- Optimal spray pressure: 8.0 to 15.0 bar
- Included in the Lists of »Drift-and-loss reducing techniques« **JKI, ÖAIP, SPF, Staatscourant and Hjälpreda**

Range of application

- Application of plant protectants in vineyards, orchards and speciality crops
- Works with and without air assistance (from airblast sprayer)
- Use in recycling and tunnel sprayers
- Use in sprayers equipped with sensor technique



Main benefits of ID 90 in airblast sprayers

- Extremely low drift potential
- Environmentally benign application of plant protectants
- Same biological efficacy as with fine-droplet spraying
- Much-improved crop/canopy penetration
- Superior active-ingredient coverage
- Uniform deposition structure
- Optimal airflow application via flat jet
- No »wet fan«
- No visible spray mist
- Prompt setup and reduction of spray jet
- ISO colour-coded for simple replacement of IDK, AD and TR nozzles

Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
ID	90°	02	C (ceramic)	= ID 90-02 C

Installation instructions

Align the spray jets of ID, IDK, AD nozzles to agree with the orientation of the air from the blower.
Adjust the nozzles to a spray-plane offset of 7° to 10°. Use a 10-mm fork wrench (ID) respectively 8 mm (IDK, AD) to make the adjustments.

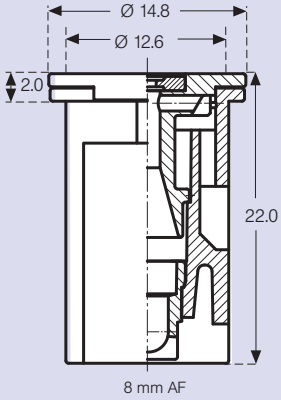
For optimal mounting and fitting of nozzles use:

- with cup-strainer, gasket 3.0 mm (order no. 065.240.73.01)
- without cup-strainer, gasket 5.0 mm (order no. 095.015.6C.07.10)

Air-injector flat spray compact nozzles IDK 90

Spray angle: 90°
Material: ceramic

G 1834
G 1835
G 1886
G 1941



IDK 90-01 C
75 % drift reduction according to MABO dosage modell

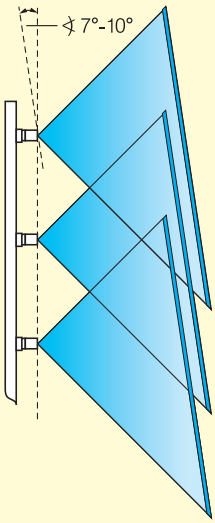
Lechler IDK 90 are rated in several countries for drift reduction 99/95/90/75/50 %.
Current list under **www.lechler-agri.com**

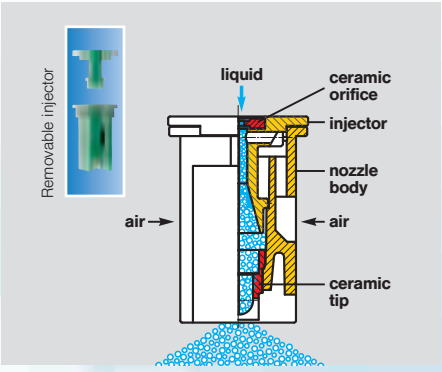
Features

- Air-injector flat spray nozzle
- Nozzle sizes 0067 to 03
- Flow rates see page 19
- Pressure range 2.0 to 20.0 bar
- Heavy-duty, chemical-resistant ceramic
- One-piece nozzle with easily removable injector; reproducible reassembling
- Large, non-clogging cross sections of flow
- Compact design (22 mm short)
- Fits all bayonet cap systems with 8 mm AF or threaded caps (Ø 12.6 mm)
- Safe & sure, adaptorless mounting, easy alignment
- Droplet spectrum: very coarse to medium
- Optimal spray pressure: 2.0 to 15.0 bar
- High drift reduction potential
- Included in the lists of »Drift-and-loss-reducing Techniques« **JKI, ÖAIP, SPF, Staatscourant and Hjälpreda**

Range of application

- Application of plant protectants in vineyards, orchards and speciality crops
- Works with and without air assistance (from airblast sprayer)
- Use in recycling- and tunnel-sprayers
- Use in sprayers equipped with sensor technique





Main Benefits of IDK 90 in airblast sprayers

- Shortest air-injector flat fan nozzle for air blast sprayers
- Only 7 mm longer than Hollow cone nozzle TR
- One piece nozzle with easily removable injector; reproducable reassembling
- No clogging due to ample lateral air aspirating orifices
- Very low drift potential at 2.0 to 8.0 bar
- Dirt on injector ceramic orifice can be wiped away easily
- No visible spray mist
- No »wet fan«
- Optimal air flow application via flat jet
- Prompt setup and reduction of spray jet
- ISO colour-coded for simple replacement of ID, AD and TR nozzles

Sample order

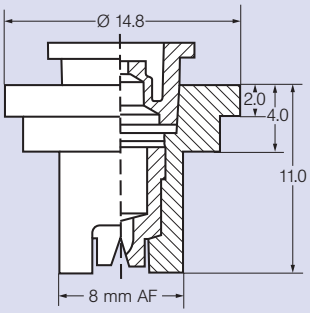
Type	+ spray angle	+ int'l nozzle size	+ material	= order number
IDK	90°	02	C (ceramic)	= IDK 90-02 C

Anti-drift flat spray nozzles AD 90

Lechler AD 90 nozzles are rated in several countries for drift reduction 99/90/75/50 %.
Current list under www.lechler-agri.com

Spray angle: 90°
Material: ceramic

G 1666
G 1667
G 1668

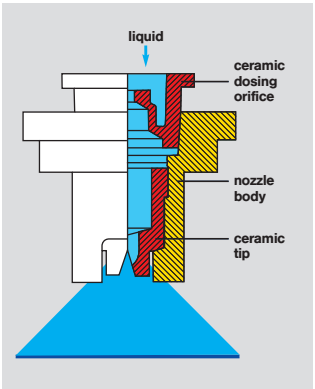


Features

- Flat spray nozzle
- Nozzle sizes 02, 03, 04
- Flow rates see page 19
- Pressure range 2.0 to 20.0 bar
- Highly wear-resistant and chemical-resistant ceramic
- One-piece nozzle, with removable insert and integrated pre-chamber
- Very compact design (11 mm short)
- Fits all bayonet cap systems with 8 mm AF or threaded caps (Ø 12.6 mm)
- Droplet spectrum coarse to fine
- Optimal spray pressure 2.0 to 15.0 bar
- Included in the lists of »Drift-and-loss reducing techniques« **JKI, ÖAIP, SPF and Hjälpreda**

Range of application

- Application of plant protectants in vineyards, orchards and speciality crops
- Works with and without air assistance (from airblast sprayers)
- Use in recycling and tunnel sprayers
- Use in sprayers equipped with sensor technique



Large discharge cross section – low risk of blockage

Compared with standard flat-jet nozzles, AD nozzles have a discharge cross-section that is up to 50 % larger. This makes them much less susceptible to blockage.

Benefits of AD 90 in airblast sprayers

- Very low-drift at low pressure
- Same biological efficacy as fine-droplet spraying
- Uniform deposition structure
- Optimal air flow application via flat jet
- Fine droplets at higher pressure
- Installation in all air assisted sprayers thanks to extremely compact design, particularly under cramped installation conditions of older sprayers
- Prompt set up and reduction of jet therefore predestinated for sprayers with sensor technique

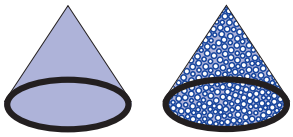
Integrated pre-chamber for optimal drop-size characteristics

The pre-chamber reduces the undesirable fine-droplets fraction. Within the pre-chamber itself, the pressure is dissipated before the liquid emerges. This effectively minimizes the tip's susceptibility to wear.
See page 20/21 for nozzles installation instructions.

Cleaning brush for AD nozzles
Order No. 06A.D30.56.00

Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
AD	90°	03	C (ceramic)	= AD 90-03C

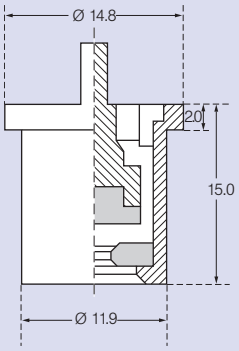


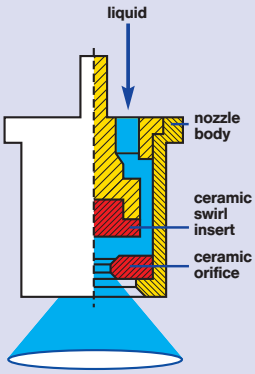
Hollow cone nozzles TR 80
Air-injector hollow cone nozzles ITR 80

Hollow cone nozzles TR

G 1496
G 1497
G 1498

Spray angle: 80°
Material : ceramic





Features

- Hollow cone nozzle with ceramic orifice and swirl insert
- Colour coding in accordance to ISO standard
- Nozzle sizes 005 to 05
- Pressure range 3.0 to 20.0 bar
- Flow rates see page 19
- Highly wear and chemical-resistant ceramic of orifice and swirl insert
- Easy maintenance, by easily removable nozzle insert
- Secured nozzle insert prevents falling out
- High degree of coverage thanks to fine/very fine droplet spectrum
- Optimal pressure range:
  - 8.0 to 15.0 bar for fruit spraying
  - 3.0 to 8.0 bar for broadcast spraying
- JKI approved (3.0 to 20.0 bar)

Range of application

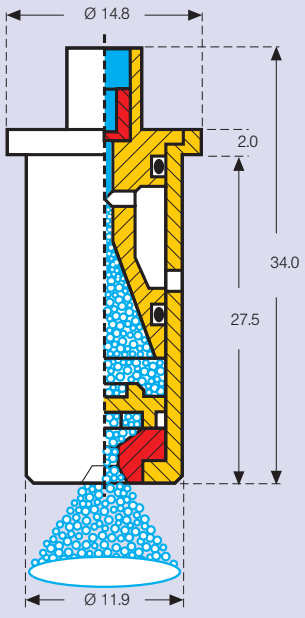
- Vineyards, orchards and speciality crops: Plant protectants, sprayers with and without air assistance, recycling and tunnel sprayers
- Horticulture: fungicides, insecticides, growth regulators, acaracides and in watering cars
- Broadcast spraying: fungicides, insecticides, growth regulators, boom sprayers with and without air assistance

Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
TR	80°	02	C (ceramic)	= TR 80-02 C

Air-injector hollow cone nozzles ITR

Spray angle: 80°
Material : ceramic



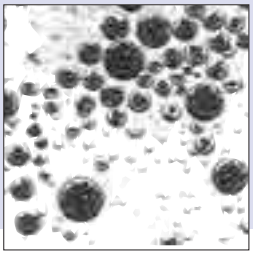
Features

- Air-injector hollow cone spray nozzle
- Nozzle sizes 01 to 02
- Pressure range 3.0 to 30.0 bar
- Flow rates – see page 19
- Highly wear and chemical-resistant ceramic
- One piece nozzle with easily removable injector
- Large flow cross section insensitive to blocking
- Droplet spectrum coarse to extremely coarse
- Colour-coding in accordance to ISO standard
- Optimal pressure range:
  - 10.0 to 30.0 bar for fruit spraying
  - 5.0 to 10.0 bar for broad cast spraying
- Extremely low drift potential

Range of application

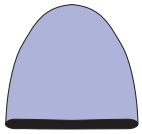
- Vineyards, orchards and speciality crops: Plant protectants and growth regulators
- Broadcast spraying: Plant protectants

Aeration effect



Sample order

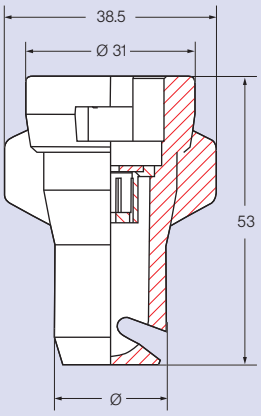
Type	+ spray angle	+ int'l nozzle size	+ material	= order number
ITR	80°	02	C (ceramic)	= ITR 80-02 C



Liquid fertilizer nozzles FD

PATENTED

Spray angle: 130°
Material: POM



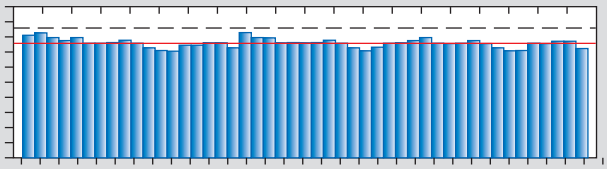
Features

- Flat spray nozzle with horizontal jet formation
- Nozzle sizes 03 to 20
- Pressure range: 1.5 to 4.0 bar
- Hard wearing and corrosion resistant material
- Nozzle and cap one piece, fits to standard nozzle holder system MULTIJET
- ISO colour coded for easy identification
- Intermediate- and extension adaptor see page 43
- Height of spray boom: 50 to 70 cm at 50 cm nozzle spacing

Range of application

- Liquid fertilizer
- Irrigation
- Watering car
- Turfgrass spraying

FD-04 Cross distribution on patternator (with water)
Spray pressure: 2 bar – spray height: 600mm – CV: 3.4 %



More detailed information is available in Lechler brochure for application of liquid fertilizer as well as www.lechler-agri.com

	[bar]	l/min Water	l/min UAN	UAN l/ha 0.5m 6.0 km/h	8.0 km/h	10.0 km/h	14.0 km/h	18.0 km/h
FD 03 (60 M)	1.5	0.85	0.75	150	113	90	64	50
	2.0	0.98	0.86	172	129	103	74	57
	3.0	1.20	1.06	212	159	127	91	71
	4.0	1.39	1.22	244	183	146	105	81
FD 04 (60 M)	1.5	1.13	1.00	200	150	120	86	67
	2.0	1.31	1.15	230	173	138	99	77
	3.0	1.60	1.41	282	211	169	121	94
	4.0	1.85	1.63	326	245	196	140	109
FD 05 (25 M)	1.5	1.41	1.24	248	186	149	106	83
	2.0	1.63	1.44	288	216	173	123	96
	3.0	2.00	1.76	352	264	211	151	117
	4.0	2.31	2.03	406	305	244	174	135
FD 06 (25 M)	1.5	1.70	1.49	298	224	179	128	99
	2.0	1.96	1.72	344	258	206	147	115
	3.0	2.40	2.11	422	317	253	181	141
	4.0	2.77	2.44	488	366	293	209	163
FD 08 (25 M)	1.5	2.26	1.99	398	299	239	171	133
	2.0	2.61	2.30	460	345	276	197	153
	3.0	3.20	2.82	563	422	338	241	188
	4.0	3.70	3.25	650	488	390	279	217
FD 10 (25 M)	1.5	2.83	2.49	498	374	299	214	166
	2.0	3.27	2.88	576	432	345	246	192
	3.0	4.00	3.52	704	528	422	302	235
	4.0	4.62	4.07	813	610	488	348	271
FD 15 (25 M)	1.5	4.24	3.73	746	560	448	319	249
	2.0	4.90	4.31	862	647	517	370	288
	3.0	6.00	5.28	1056	792	634	452	352
	4.0	6.93	6.10	1220	915	732	523	407
FD 20 (25 M)	1.5	5.66	4.98	996	747	598	427	332
	2.0	6.53	5.75	1149	862	690	493	383
	3.0	8.00	7.04	1408	1056	845	604	469
	4.0	9.24	8.13	1626	1220	976	697	542

Benefits of FD nozzles

- Extremely gentile application of fertilizer by horizontal jet formation
- Danger of crop scorch reduced to a minimum by extreme coarse droplets
- Optimised cross distribution across the spray boom according to JKI requirements for flat spray nozzles
- No striation in the crop
- Considerable less clogging than multi orifice-nozzles
- Fits to all current boom types as the nozzle tip is placed distinct lower
- Toolless removal of dosing orifice for cleaning purpose

- Spray pressure at the nozzle tip (gauged with a diaphragm valve)
- The stated liter-per-hectare rates apply to UAN (28/1.28 kg/l)
- Nozzle spacing 0.5 m
- Prior to each spraying season, verify the table data by gauging the flow rates
- Make sure that all nozzles have the same settings

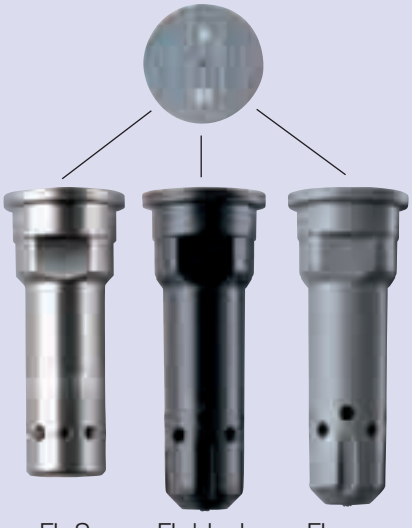
Conversion factors and formula see page 57

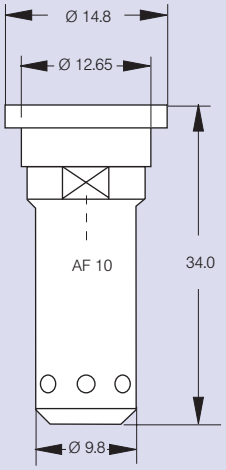
Sample order

Type	+	int'l nozzle size	+	material	= order number
FD		06		(POM)	= FD 06

5-orifice nozzles FL (for liquid fertilizers)

Spray angle: 160°
Material: nozzle body stainless steel, POM
dosing orifice stainless steel





Features

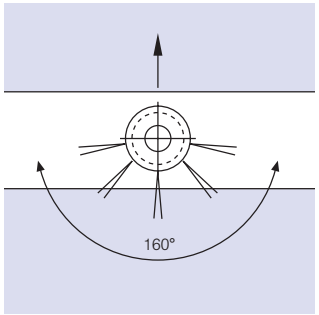
- 5-orifice nozzle with horizontal jet formation
- Nozzle sizes grey and black
- Pressure range dosing orifice
  0.8 to 1.0: 1.0 to 5.0 bar
  1.2: 1.0 to 4.0 bar
  1.5 to 1.8: 1.0 to 3.0 bar
- Fits all bayonet cap systems with 10 mm AF and threaded caps (Ø 12.6 mm)
- Drift prevented by large drops
- Easy adjustment of liter-per-hectare rate via exchange of dosing orifices
- Dosing orifices made of solid stainless steel and, hence, resistant to wear and corrosion
- Plant-protective spraying of fertilizer thanks to extremely coarse (dribble) application
- Uniform distribution of fertilizer across the entire effective width
- Height of spray boom: 1.0 m

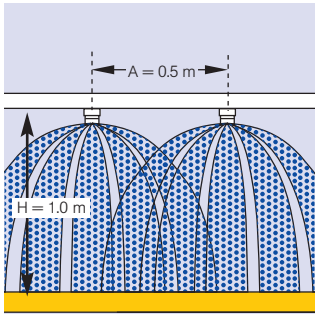
Range of application

- Liquid fertilizer

Description		Order number
5-orifice nozzles FL (excl. dosing orifice)		
Stainless steel		500.179.16
POM (■ black) for dosing orifices 0.8/1.0/1.2 mm Ø		500.179.56.00
POM (■ grey) for dosing orifices 1.2/1.5/1.8 mm Ø		500.179.56.01
Dosing orifices		
0.8 mm/32	stainless steel	050.030.1C.00.00
1.0 mm/39	stainless steel	050.030.1C.01.00
1.2 mm/48	stainless steel	050.030.1C.03.00
1.5 mm/59	stainless steel	050.030.1C.02.00
1.8 mm/72	stainless steel	050.030.1C.04.00

Installation advice: Upturn labeling of dosing orifice.





Ordering

When ordering, please include both order numbers, that of the nozzle and that of the dosing orifice.

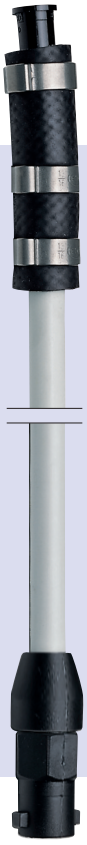
Recommendation

Please use grey 5-orifice nozzles (order no. 500.179.56.01) for combination with large dosing orifices (1.2, 1.5 and 1.8 mm)

Dosing orifice Ø mm	[bar]	l/min Water	l/min UAN	UAN l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	9.0 km/h	10.0 km/h	11.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
0.8/32	1.0	0.31	0.27	65	55	47	41	37	33	30	27	23	20	18
	2.0	0.43	0.38	91	76	65	57	51	46	41	38	33	29	25
	3.0	0.53	0.47	113	94	80	70	62	56	51	47	40	35	31
	4.0	0.62	0.55	132	110	94	82	73	66	60	55	47	41	37
	5.0	0.69	0.61	146	122	105	91	81	73	67	61	52	46	41
1.0/39	1.0	0.46	0.41	98	81	70	61	54	49	44	41	35	31	27
	2.0	0.65	0.57	137	115	98	86	77	69	63	57	49	43	38
	3.0	0.80	0.71	170	141	121	106	94	85	77	71	61	53	47
	4.0	0.92	0.81	194	163	139	122	108	98	89	81	69	61	54
	5.0	1.03	0.91	218	182	156	137	121	109	99	91	78	68	61
1.2/48	1.0	0.67	0.59	142	118	102	89	79	71	65	59	51	44	39
	2.0	0.95	0.84	202	168	144	126	112	101	92	84	72	63	56
	3.0	1.16	1.03	247	205	176	154	137	123	112	103	88	77	69
	4.0	1.34	1.18	283	237	203	178	158	142	129	118	101	89	79
1.5/59	1.0	0.97	0.86	206	171	147	129	114	103	94	86	74	65	57
	2.0	1.38	1.22	293	244	209	183	163	146	133	122	105	92	81
	3.0	1.69	1.49	358	299	256	224	199	179	163	149	128	112	99
1.8/72	1.0	1.38	1.22	293	244	209	183	163	146	133	122	105	92	81
	2.0	1.96	1.73	415	346	297	260	231	208	189	173	148	130	115
	3.0	2.40	2.12	509	424	364	318	283	255	231	212	182	159	141

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- Lateral spacing 0.5 m.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.
- The stated liter-per-hectare rates apply to UAN (28/1.28 kg/l).

Tube drop system for boom sprayers



Features

- Tube-to-tube spacing on boom: 0.5 m or rather 0.25 m
- Hinged nipple to prevent tube breakage
- Pressure range 1.0 to 5.0 bar

Benefits of tube drop system

- Uniform application of liquid fertilizer thanks to broad-casting 5-orifice nozzles FL recpectively liquid fertilizer nozzle FD
- Underleaf application of herbicides with low drift flat fan nozzles to prevent damage of the crop
- Robust, sturdy design
- Mounts easily on any boom sprayer
- Less load for big booms
- No danger of upper-leaf burn
- No dripping and run at idle by use of ball check valve (Pos. 11)
- Fertilization in row crops, e.g. corn
- Underleaf herbicide application in sensitive row crops, e.g. in corn with drift reducing nozzles

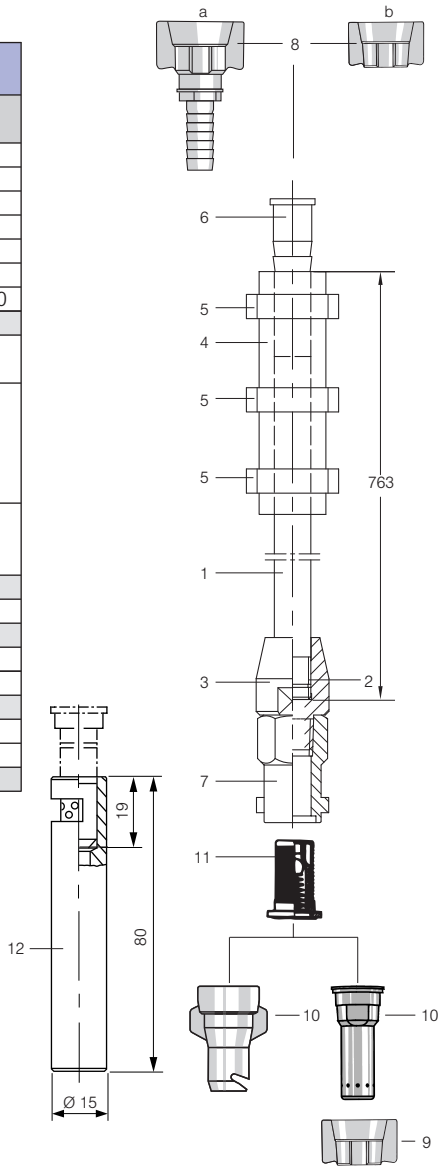
Range of application

- Liquid fertilizer
- Herbicides in row crops for underleaf application

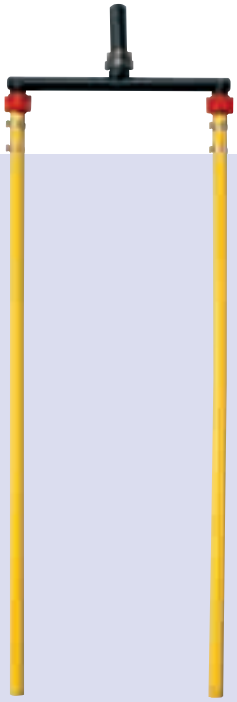
Item	Description	Material	Order no.
1-7	Tube drop, complete (exclusive of nozzle, caps, strainer, extension)		092.170.00.00.00.4
1	Tube	PP	092.170.53.00.010
2	O-ring 7x1	EPDM	095.015.6C.02.09.0
3	Body	POM	092.170.56.00.03.0
4	Hard hose	Rubber	095.009.72.13.69.0
5	2-eye clamp	Stainl. steel	095.016.1C.12.04.0
6	Hose shank	POM	095.016.56.07.49.0
7	Bayonet body	PA	A400.275.N0.00.00.0
8	Bayonet cap – Spray boom		
	System Lechler. TWISTLOC (incl. gasket 065.242.73)	POM	065.202.56.11.00.0
	System: MULTIJET*		
8a	+ Hose shank 13 mm/AG 1/4"	POM	A.103.20.10
8a	+ Bayonet cap G 1/4" (incl. 3.0 mm gasket A.402.200.04.00)	POM	A.402.910.01
8b	+ Bayonet cap (incl. 3.0 mm gasket A.402.200.04.00)	POM	A.402.904.10
	+ optional: 4.0 mm gasket for tight fit of bayonet cap	Rubber	095.015.73.02.85.0
	System Rau	POM	095.016.56.05.93.0
	+ gasket	Rubber	095.015.73.04.61.0
	+ safety stirrup	Stainl. steel	095.016.16.05.94.0
9	Bayonet cap for 5-orifice nozzles FL		
	(incl. gasket A.402.200.04.00)	POM	A.402.902.10
10	Fertilizer nozzles		
	5-orifice nozzles FL		see p. 25
	Fertilizer nozzles FD		see p. 24
11	Strainer w/o ball valve		
	Nozzle strainer 25 M		065.256.56.00
	Nozzle strainer with ball valve, 25 M		065.266.56.00
12	Extension, compatible to FL-nozzle in POM	POM	092.170.56.20.00.0

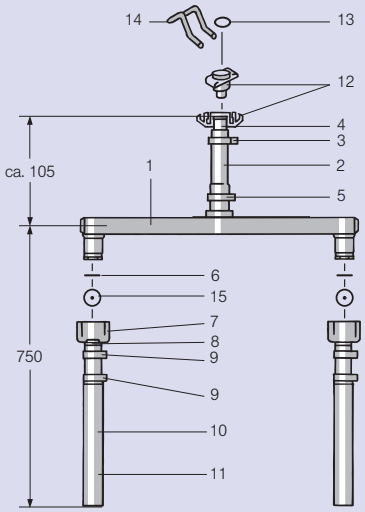
Please see UAN spray tables for FD and FL nozzles on page 24/25

* Please note correct alignment when bajonet cap (8a) is assembled



Hose drop system for boom sprayers





Features

- Hose spacing: 0.25 m
- Pressure range 1.0 to 10.0 bar
- Strong fabric hose avoids coming up in the canopy

Benefits of hose drop system

- Suitable for precision-farming application of fertilizer via N sensor or other techniques
- Thin hoses are sliding easily through the canopy allowing higher forward speeds without risk of upward movement
- No danger of upper-leaf burn
- Less dependence on weather conditions
- Quick mounting/removal
- Robust, sturdy design, made of corrosion-resistant materials

Range of application

- Liquid fertilizer
- N-fertilisation according to CULTAN strategy by deposition as line on the soil

Spray table for hose drop system

lateral hose spacing: 0.25 m

Dosing orifice* Ø mm	[bar]	l/min Water	l/min UAN	UAN l/ha (0.5 m) 5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	9.0 km/h	10.0 km/h	11.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h
0.8/32	1.0	0.31	0.27	130	108	93	81	72	65	59	54	46	41	36
	2.0	043	0.38	182	152	130	114	101	91	83	76	65	57	51
	3.0	0.53	0.47	226	188	161	141	125	113	103	94	81	71	63
	4.0	0.62	0.55	264	220	189	165	147	132	120	110	94	83	73
	5.0	0.69	0.61	293	244	209	183	163	146	133	122	105	92	81
	6.0	0.76	0.67	322	268	230	201	179	161	146	134	115	101	89
	7.0	0.82	0.72	346	288	247	216	192	173	157	144	123	108	96
	8.0	0.87	0.77	370	308	264	231	205	185	168	154	132	116	103
	10.0	0.96	0.85	408	340	291	255	227	204	185	170	146	128	113
1.0/39	1.0	0.46	0.41	197	164	141	123	109	98	89	82	70	62	55
	2.0	0.65	0.57	274	228	195	171	152	137	124	114	98	86	76
	3.0	0.80	0.70	336	280	240	210	187	168	153	140	120	105	93
	4.0	0.92	0.81	389	324	278	243	216	194	177	162	139	122	108
	5.0	1.03	0.91	437	364	312	273	243	218	199	182	156	137	121
	6.0	1.13	1.00	480	400	343	300	267	240	218	200	171	150	133
	7.0	1.22	1.07	514	428	367	321	285	257	233	214	183	161	143
	8.0	1.30	1.15	552	460	394	345	307	276	251	230	197	173	153
	10.0	1.45	1.27	610	508	435	381	339	305	277	254	218	191	169
1.2/48	2.0	0.95	0.84	403	336	288	252	224	202	183	168	144	126	112
	4.0	1.34	1.18	566	472	405	354	315	283	257	236	202	177	157
	6.0	1.65	1.45	696	580	497	435	387	348	316	290	249	218	193
	8.0	1.90	1.67	802	668	573	501	445	401	364	334	286	251	223
1.5/59	2.0	1.38	1.22	586	488	418	366	325	293	266	244	209	183	163
	4.0	1.95	1.72	826	688	590	516	459	413	375	344	295	258	229
	6.0	2.39	2.10	1008	840	720	630	560	504	458	420	360	315	280
	8.0	2.76	2.43	1166	972	833	729	648	583	530	486	417	365	324
1.8/72	2.0	1.96	1.73	830	692	593	519	461	415	377	346	297	260	231
	4.0	2.77	2.44	1171	976	837	732	651	586	532	488	418	366	325
	6.0	3.39	2.98	1430	1192	1022	894	795	715	650	596	511	447	397
	8.0	3.92	3.45	1656	1380	1183	1035	920	828	753	690	591	518	460

* Additional Spray table on request

- Prior to each spraying season verify the table data by gauging the flow rates
- Make sure that in all hoses the same dosing orifice are fitted
- Lateral hose spacing 0.25 m
- Spray pressure at dosing orifice (gauged with a diaphragm valve)
- The stated liter-per-hectare rates apply to UAN (28/1.29 kg/l)

Item	Qty.	Description	Order no.
1-11	1	**Hose drop system complete** (excl. dosing orifices and bayonet cap)	092.160.00.00
1	1	Tee	095.016.56.09.41
2	2	Fabric hose, L = 80 mm	-
3	1	2-eye clamp	095.016.1C.09.44
4	1	Hose shank	095.016.56.07.49
5	1	2-eye clamp	095.009.1C.13.67
6	2	Gasket Ø 11 x Ø 18 x 2.0	095.015.73.06.92
7	2	Threaded cap M 20 x 1.5	095.016.56.09.42
8	2	Hose shank with vent bore	095.009.56.10.44
9	4	Hose clamp	095.009.1C.10.45
10	2	Pipe, L = 686 mm	095.009.50.13.47
11	2	Fabric hose, L = 713 mm	-
12		**Bayonet cap**	
12	1	– System TWISTLOC, (cf. page 44)	065.202.56.11.00
13	1	(incl. gasket 065.242.73.00) Safety clamp, system: TWISTLOC/Holder (not illustrated)	Z.KLA.MME.R1.21.00.6
12	1	– System: MULTIJET etc (cf. page 43)	A.402.904.10
13	1	(incl. 3.0 gasket A.402.200.04.00) optional 4.0 mm gasket**	095.015.73.02.85.0
13	1	– System RAU	095.016.56.05.93.0
12	1	Gasket	095.015.73.04.61.0
13	1	Safety stirrup	095.016.16.05.94.0
14	1	**Dosing orifices**	
15	2	D = 0.8 mm/32; OD = 17.4 mm	050.033.1C.00.00***
		D = 1.0 mm/39; OD = 17.4 mm	050.033.1C.01.00***
		D = 1.2 mm/48; OD = 14.8 mm	050.030.1C.03.00
		D = 1.5 mm/59; OD = 14.8 mm	050.030.1C.02.00
		D = 1.8 mm/72; OD = 14.8 mm	050.030.1C.04.00

Installation advice: Upturn labeling of dosing orifice.

** for tight fit of bayonet cap

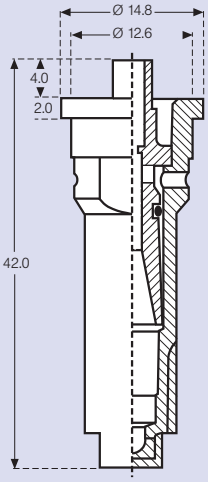
*** outer diameter 17.4 mm; adapted to Pos. 7

Air-injector off center nozzles IS

Lechler IS nozzles are rated in several countries for drift reduction 90/75/66/50 %.
Current list under www.lechler-agri.com

Spray angle: 80°
Material: POM

G 1682
G 1753
G 1754
G 1755

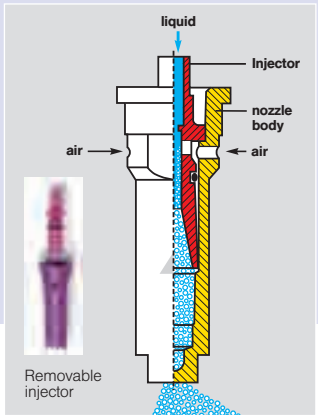


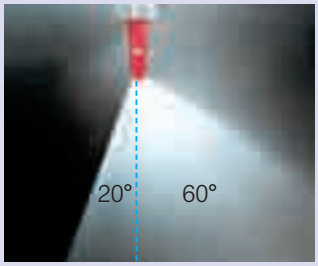
Features

- Air-injector off center flat spray nozzle
- Nozzle sizes 02 to 06
- Pressure range: 2.0 to 8.0 bar; vertical boom sprayers and fans 8.0 to 15.0 bar
- Asymmetrical spray pattern (20°/60° to nozzle axis)
- Flow rates (cf. table below)
- Droplet spectrum: very coarse to coarse
- Extremely low drift potential
- Optimal distribution in combination with ID3/ID/IDN nozzle of same colour
- Volume flow adapted to good cross distribution
- Fits all bayonet cap systems with 10 mm AF or threaded caps (Ø 12.6 mm)
- Included in the list of »Drift and loss reducing techniques«, **LERAP, JKI, Staatscourant, ÖAIP, Equipment de limitation de la dérive de pulvérisation, Hjälpreda, SPF and Tuulikulkeumaa Alentava suutin**

Range of application

- For banding/row- and broadcast spraying in combination with ID3/ID/IDN nozzles in a boom
- Along water courses
- Along field peripheries and hedge rows
- Protection of sensitive adjacent crops
- Underleaf application of herbicides in row crops (e.g. asparagus)
- Banding of herbicides in orchards, vineyards, tree nurseries, special cultures
- On airblast and above-row sprayers for limiting the flat jets of the top and bottom (first and last) nozzles.





Sample order

Type	+ spray angle	+ int'l nozzle size	+ material	= order number
IS	80°	02	(POM)	= IS 80-02

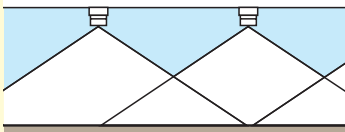
Flow rate table for air-injector off center nozzles IS

		l/min						
		[bar]						
		2.0	3.0	4.0	5.0	6.0	7.0	8.0
IS 80-02	60	0.49	0.60	0.69	0.77	0.84	0.91	0.97
IS 80-025	60	0.70	0.86	0.90	1.13	1.24	1.34	1.43
IS 80-03	60	0.86	1.05	1.21	1.35	1.48	1.60	1.71
IS 80-04	60	1.11	1.36	1.57	1.75	1.92	2.07	2.21
IS 80-05	25	1.23	1.51	1.74	1.95	2.14	2.31	2.47
IS 80-06	25	1.36	1.67	1.93	2.16	2.37	2.56	2.73

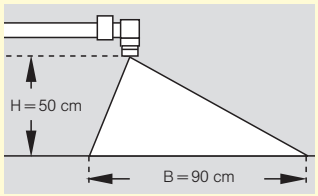
- Application data valid for water
- Gauge the nozzle flow rates prior to each spraying season
- Spray pressure at the nozzle tip

Please ask for additional installation instructions A100 for broadcast spraying and A 200 for banding.

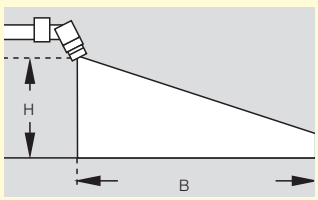
ID3/ID-/IDN-/IDK-/IDKN/IDKT-Nozzle



Application example: ID3/ID/IDN 120-03



Spray dimensions



Accessories: swivel nozzle holders, etc. (cf. p. 46)

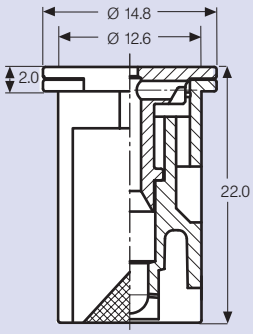
Air-injector off center compact nozzles IDKS

Lechler IDKS nozzles are rated in several countries for drift reduction 90/75/50 %.
Current list under **www.lechler-agri.com**

Spray angle: 80°
Material: POM

G 1786
G 1787
G 1788
G 1789

NEW! IDKS 80-015



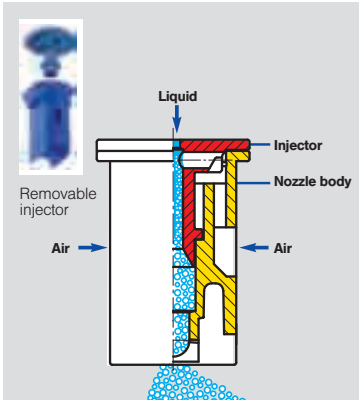
8 mm AF

Features

- Air-injector off center flat spray nozzle
- Nozzle sizes 015 to 05
- Pressure range: IDKS 02 to 25: 1.5 to 6.0 bar
  IDKS 03 and 05: 1.0 to 6.0 bar
  vertical spraying boom/fan: 8.0 to 15.0 bar
- Asymmetrical spray pattern (20°/60° to nozzle axis)
- Optimal distribution in combination with IDK/IDKN/IDKT nozzles of same colour
- Volume flow adapted to good cross distribution
- Droplet spectrum very coarse to medium
- Very low drift potential at 1.0/1.5 to 3.0 bar
- Very compact dimensions (length 22 mm)
- Fits all bayonet cap systems with 8 mm AF or threaded caps
- IDKS nozzles differ visibly from IDK nozzles by lighter injector colour and an asymmetrical triangle on the housing edge
- Included in the list of »Drift and loss reducing techniques«, **JKI, ÖAIP, Staatscourant, Hjälpreda and Tuulikulkeumaa Alentava Suutin**

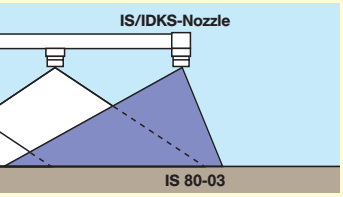
Sample order

Type + spray angle + int'l nozzle size + material	= order number
IDKS 80 02 (POM)	= IDKS 80-02

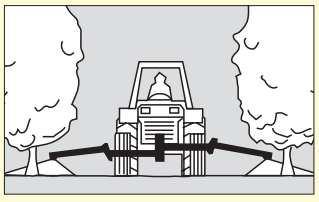


Range of application

- For banding/row- and broadcast spraying in combination with IDK/IDKN/IDKT-nozzles in a boom
- Along water courses
- Along field peripheries and hedgerows
- Protection of sensitive adjacent crops
- Underleaf application of herbicides in row crops (e.g. asparagus)
- Banding in orchards, vineyards, tree nurseries, special cultures



Defined edge spraying



Band spraying in orchards/ vineyards

Underleaf spraying in row crops

Main benefits of IDKS nozzles

- An economical alternative to ordinary OC nozzles
- Low risk of damage, thanks to its very compact design
- Low wear and good blockage prevention thanks to two large air-aspirating channels of ample size
- Easy operation of the nozzle with an electric diaphragm pump in e.g. banding (cut-off pressure normally 2.4 bar, more rarely 3 bar)
- Maximum protection of culture plants against drift during underleaf application in orchards, vine yards etc.

Flow rate table for air-injector off center compact nozzles IDKS

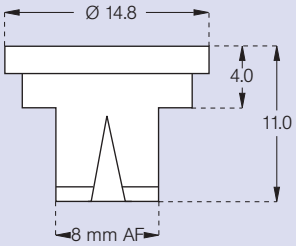
		l/min						
		[bar]						
		1.0	1.5	2.0	3.0	4.0	5.0	6.0
NEW IDKS 80-015	60 M	-	0.28	0.32	0.39	0.45	0.51	0.55
IDKS 80-02	60 M	-	0.42	0.48	0.59	0.68	0.76	0.83
IDKS 80-025	60 M	-	0.56	0.65	0.80	0.92	1.03	1.13
IDKS 80-03	60 M	0.57	0.70	0.81	0.99	1.15	1.28	1.40
IDKS 80-04	60 M	0.69	0.84	0.97	1.19	1.37	1.53	1.68
IDKS 80-05	25 M	0.91	1.12	1.29	1.58	1.82	2.04	2.23

- Application data valid for water
- Gauge the nozzle flow rates prior to each spraying season
- Spray pressure at the nozzle tip

Please ask for additional installation instructions
A 100 for broadcast spraying and
A 200 for banding

Off center flat spray nozzles OC (small sizes)

Spray angle: 80°
Material: brass, stainless steel

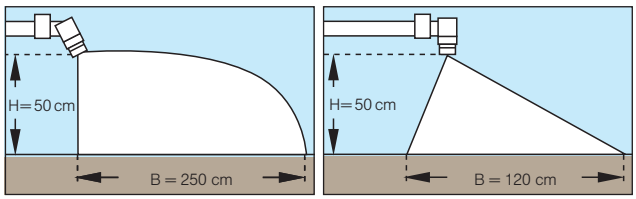


Features

- Off center flat spray nozzle
- Assymmetrical spray pattern via eccentric orifice
- Nozzle Sizes 2 to 30
- Pressure range 1.5 to 5.0 bar
- Fits all bayonet cap systems with 8 mm AF or threaded caps (Ø 12.6 mm)
- Droplet spectrum medium to fine

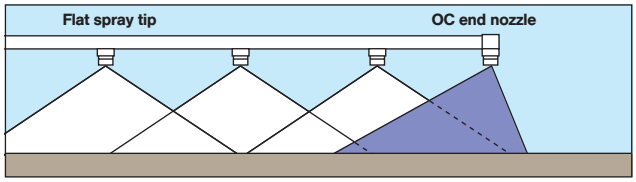
Range of application

- Adaption of boom width for defined edge spraying respectively extension
- Banding in orchards, vineyards, tree nurseries, special cultures
- Underleaf application of herbicides in row crops (e.g. sugar beets, asparagus)

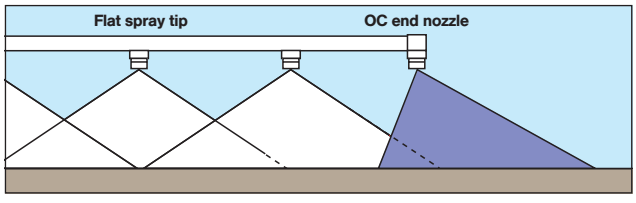


Spray dimensions

OC nozzles mounted on individual or double swivel joints* allow adjustment to any angle and, hence, wide and narrow covered areas.
*(see page 46)



Defined edge spraying

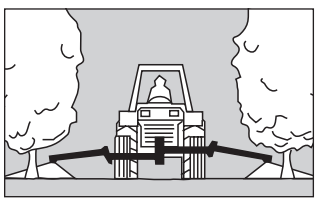


Adaption of boom width
For adaption of boom width replace at the end of the boom the flat spray nozzle by an OC-nozzle. The effective extension of the boom amount to 0.5 m (0.25 m to each side). However, optimal cross distribution will be achieved by using double swivel nozzle holder at the final nozzle position for flat spray and OC-nozzle.

		l/min				
		[bar]				
		1.5	2.0	3.0	4.0	5.0
OC 2	60	0.49	0.65	0.80	0.92	1.03
OC 3	60	0.88	1.01	1.24	1.43	1.60
OC 4	60	1.11	1.28	1.56	1.81	2.02
OC 5	25	1.37	1.58	1.94	2.24	2.50
OC 6	25	1.64	1.90	2.32	2.68	3.00
OC 8	25	2.16	2.50	3.06	3.53	3.95
OC 12	25	3.47	4.00	4.90	5.66	6.33
OC 20	25	5.45	6.30	7.71	8.91	9.96
OC 30	25	8.66	10.00	12.25	14.14	15.81

- Application data valid for water
- Gauge the nozzle flow rates prior to each spraying season
- Spray pressure at the nozzle tip (gauged with a diaphragm valve)

Nozzle size in boom (LU / ST)	Recommended OC-end nozzle	
	Adaption of boom width	Defined edge spraying
-015	**OC 2**	-
-02	**OC 3**	**OC 2**
-03	**OC 4**	**OC 3**
-04	**OC 5**	**OC 4**
-05	**OC 6**	**OC 5**
-06	**OC 8**	**OC 6**
-08	**OC 12**	**OC 8**



Banding in orchards/vineyards

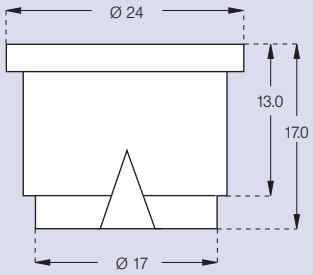
Underleaf spraying in row crops

Sample order

Type	+	material	=	order number
OC 2		brass	=	OC 2 brass
OC 2		S (stainless steel)	=	OC 2 S

Off center flat spray nozzles OC (large sizes)

Spray angle: 90°
Material: brass



Features

- Off center flat spray nozzle
- Asymetrical spray pattern via eccentric orifice
- Nozzle sizes 40 to 80
- Pressure range 2.0 to 5.0 bar
- Spraying range 6 to 8 m

Range of application

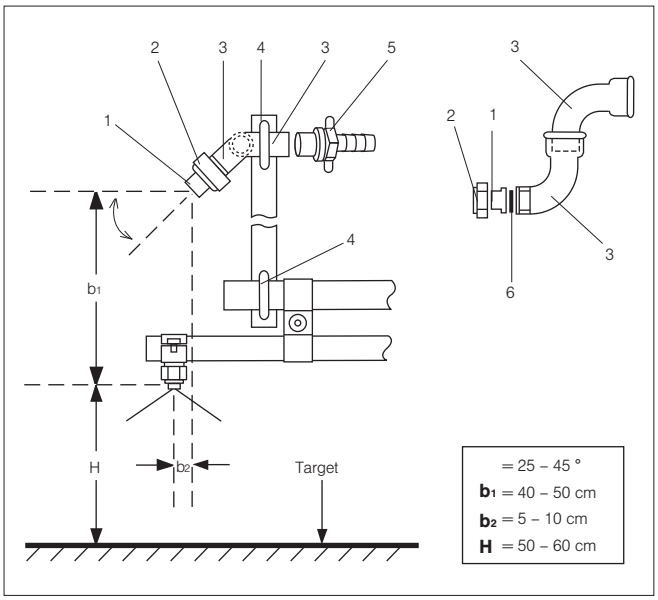
- Boom irrigation
- Moistening of indoor riding arenas
- Watering cars

Mounting/adjusting of boom-sprayer nozzles

Mount one wide-angle nozzle at each end of the boom.
The individual nozzles are supplied with liquid via additional part-width connections to teed branches of existing, adequately sized feedlines.
Take care to ensure that the implement has a sufficiently powerful pump, because a pair of wide-angle nozzles consume (up to 80 l/min.)

	l/min [bar]				Recommended combination with flat-spray nozzles, e.g. LU-/IDK-/IDKN-nozzles
	2.0	3.0	4.0	5.0	
OC 40-846	12.50	15.30	17.70	19.80	-03/-04
OC 60-926	20.00	24.49	28.28	31.62	-05/-06
OC 80-966	25.00	30.62	35.36	39.53	-06/-08

- Application data valid for water
- Gauge the nozzle flow rates prior to each spraying season
- Spray pressure at the nozzle tip (gauged with a diaphragm valve)



Item	Description	Order no.
1	OC nozzle	OC 40-846 OC 60-926 OC 80-966
2	Threaded cap	065.600.30.00
3	90° elbow 3/4" male and female threads	see page 49
4	Pipe clamp	-
5	3/4" hose shank	see page 48
6	Gasket	065.640.72.00

Nippel
Order-no.
065.611.30

Gasket
Order-no.
065.640.72

OC nozzle

Threaded cap 3/4"
Order-no.
065.600.xx
(Brass or stainless steel)

Spraying range/effective working width

The spraying range is a function of the setting angle :

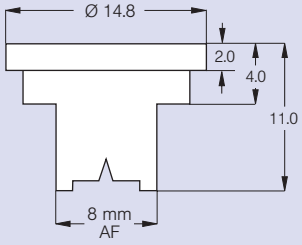
Setting angle (degree)	Spraying range a (m) circa
25	9.0
30	8.5
35	8.0
40	6.0
45	5.5

Even flat spray nozzles E

Approval of former ES

G 1435
G 1436
G 1437
G 1438

Transfer of JKI-approvals to E is requested.



Spray angle: 90°
Material: brass, POM

Features

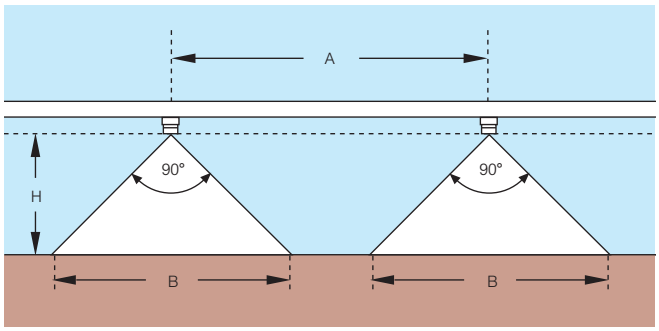
- Even Flat spray nozzle
- Nozzle sizes 01 to 08
- Pressure range 1.0 to 4.0 bar
- Fits all bayonet cap systems with 8 mm AF or threaded caps (Ø 12.6 mm)
- Special-purpose nozzle for band and row spraying in combination with boom sprayers, seeders and hoeing implements
- Uniform distribution of active ingredient across the entire range thanks to rectangular spray pattern
- Fully developed spray angle from 1.0 bar on up
- Minimal spray losses thanks to precise delimitation of the liquid jet

Range of application

- Application of plant protectants in banding/row spraying
- Small implements, e.g. as individual nozzle for knap sack sprayers

Nozzle alignment

Lechler's even flat spray nozzles ES enable extremely short spray heights (H), thus extensively avoiding band drift.
The width of the spray band (B) can be varied by altering the spray height (H) and/or rotating the spray axis to change the spray offset.



Application-rate reduction

See page 61 for a formula with which to calculate the application rate for band and row spraying.

Spray height cm	Band width cm	Application rate* (in %). for a row spacing, A, of: 50 cm	75 cm	100 cm
7	10	20	13	10
10	15	30	20	15
13	20	40	27	20
16	25	50	33	25

*) Percentages in comparison with full-area treatment

Hoe with band sprayer

Band sprayer

Spray table for even flat spray nozzles E

	[bar]	l/min	l/ha 0.5 m														
			Row spacing 0.5 m					Row spacing 0.75 m					Row spacing 1.0 m				
			5.0 km/h	6.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	5.0 km/h	6.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	5.0 km/h	6.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h
E 8001 (80 M)	1.0	0.23	55	46	35	28	23	37	31	23	18	15	28	23	17	14	12
	1.5	0.28	67	56	42	34	28	45	37	28	22	19	34	28	21	17	14
	2.0	0.32	77	64	48	38	32	51	43	32	26	21	38	32	24	19	16
	3.0	0.39	94	78	59	47	39	62	52	39	31	26	47	39	29	23	20
	4.0	0.45	108	90	68	54	45	72	60	45	36	30	54	45	34	27	23
E 8015 (80 M)	1.0	0.34	82	68	51	41	34	54	45	34	27	23	41	34	26	20	17
	1.5	0.42	101	84	63	50	42	67	56	42	34	28	50	42	32	25	21
	2.0	0.48	115	96	72	58	48	77	64	48	38	32	58	48	36	29	24
	3.0	0.59	142	118	89	71	59	94	79	59	47	39	71	59	44	35	30
	4.0	0.68	163	136	102	82	68	109	91	68	54	45	82	68	51	41	34
E 8002 (60 M)	1.0	0.46	110	92	69	55	46	74	61	46	37	31	55	46	35	28	23
	1.5	0.56	134	112	84	67	56	90	75	56	45	37	67	56	42	34	28
	2.0	0.65	156	130	98	78	65	104	87	65	52	43	78	65	49	39	33
	3.0	0.80	192	160	120	96	80	128	107	80	64	53	96	80	60	48	40
	4.0	0.92	221	184	138	110	92	147	123	92	74	61	110	92	69	55	46
E 8003 (60 M)	1.00	0.72	173	144	108	86	72	115	96	72	58	48	86	72	54	43	36
	1.50	0.88	211	176	132	106	88	141	117	88	70	59	106	88	66	53	44
	2.00	1.01	242	202	152	121	101	162	135	101	81	67	121	101	76	61	51
	3.00	1.24	298	248	186	149	124	198	165	124	99	83	149	124	93	74	62
	4.00	1.43	343	286	215	172	143	229	191	143	114	95	172	143	107	86	72
E 8004 (60 M)	1.0	0.91	218	182	137	109	91	146	121	91	73	61	109	91	68	55	46
	1.5	1.12	269	224	168	134	112	179	149	112	90	75	134	112	84	67	56
	2.0	1.29	310	258	194	155	129	206	172	129	103	86	155	129	97	77	65
	3.0	1.58	379	316	237	190	158	253	211	158	126	105	190	158	119	95	79
	4.0	1.82	437	364	273	218	182	291	243	182	146	121	218	182	137	109	91
E 8005 (25 M)	1.0	1.14	274	228	171	137	114	182	152	114	91	76	137	114	86	68	57
	1.5	1.39	334	278	209	167	139	222	185	139	111	93	167	139	104	83	70
	2.0	1.61	386	322	242	193	161	258	215	161	129	107	193	161	121	97	81
	3.0	1.97	473	394	296	236	197	315	263	197	158	131	236	197	148	118	99
	4.0	2.28	547	456	342	274	228	365	304	228	182	152	274	228	171	137	114
E 8006 (25 M)	1.0	1.36	326	272	204	163	136	218	181	136	109	91	163	136	102	82	68
	1.5	1.67	401	334	251	200	167	267	223	167	134	111	200	167	125	100	84
	2.0	1.93	463	386	290	232	193	309	257	193	154	129	232	193	145	116	97
	3.0	2.36	566	472	354	283	236	378	315	236	189	157	283	236	177	142	118
	4.0	2.73	655	546	410	328	273	437	364	273	218	182	328	273	205	164	137
E 8008 (25 M)	1.0	1.82	437	364	273	218	182	291	243	182	146	121	218	182	137	109	91
	1.5	2.23	535	446	335	268	223	357	297	223	178	149	268	223	167	134	112
	2.0	2.58	619	516	387	310	258	413	344	258	206	172	310	258	194	155	129
	3.0	3.16	758	632	474	379	316	506	421	316	253	211	379	316	237	190	158
	4.0	3.65	876	730	548	438	365	584	487	365	292	243	438	365	274	219	183

- Spray pressure at the nozzle tip (gauged with a diaphragm valve).
- The stated liter-per-hectare rates apply to water.
- Prior to each spraying season, verify the table data by gauging the flow rates.
- Make sure that all nozzles have the same settings.

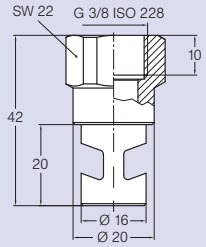
Sample order

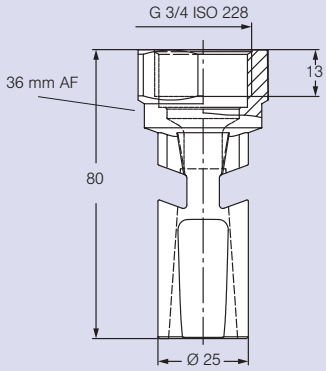
Type	+	spray angle	+	int'l nozzle size	+	material	=	order number
E		80°		02		brass	=	8002 E brass
E		80°		02		POM	=	8002 E

Injector agitator nozzles
Cleaning nozzle for induction hopper

Injector agitator nozzles

Material: Polypropylene





Features

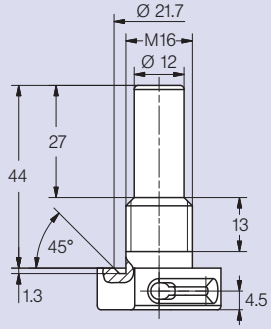
- Pressure range: 2.0 to 10.0 bar
- Quick homogenous agitation of tank contents
- Injector-enhanced turbulence of cluster solid jet inside the tank
- No danger of clogging thanks to ample free cross sections

Order-no.	Bore-Ø (mm)	l/min				
		2.0 bar	4.0 bar	6.0 bar	8.0 bar	10.0 bar
500.262.53.02	2.2	4.4	6.3	7.7	8.9	9.9
500.262.53.04	3.6	11.1	15.7	19.2	22.1	27.7
500.262.53.06	4.5	18.3	26.0	31.8	36.7	41.0
500.262.53.08	6.0	31.6	44.7	54.8	63,2	70.7
*500.262.53.20	10.55	96.1	136.0	166.5	192.3	215.0

Further sizes on request.

Cleaning nozzle for induction hopper

Spray angle: 60°
Material: POM



Features

- Pressure range 4.0 to 8.0 bar
- Easy assembly by M16 bolted/nuts design
- Quick connection on rinse water by plug connection (Ø 12 mm)
- Easy orientation of spray jet by using open end wrench AF24
- Complete rinsing of inside wall of round induction hopper
- Rotating fluid flow allows cluster free induction of chemical

Order-no.	Bore-Ø (mm)	l/min		
		4.0 bar	6.0 bar	8.0 bar
600.569.56.01	4.0	19.8	24.3	28

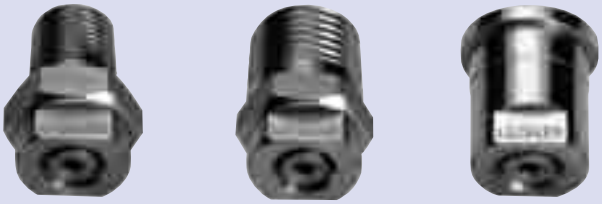
High-pressure cleaning nozzles
Fan nozzles

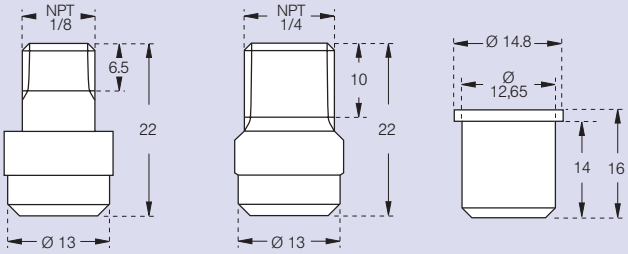
High-pressure cleaning nozzles

Spray angle: 0°, 15°, 25°, 40°
Material: hardened stainless steel
(hard-metal insert on request)

Flat spray nozzles

Cluster solid jets





Features

- Maximum cleaning power thanks to »razor-sharp« cleaning jets
- Wear-resistant, hardened, special steel for extra durability
- Flush orifice to protect tip from mechanical damage
- Maximum precision for uniform, focussed-power jet

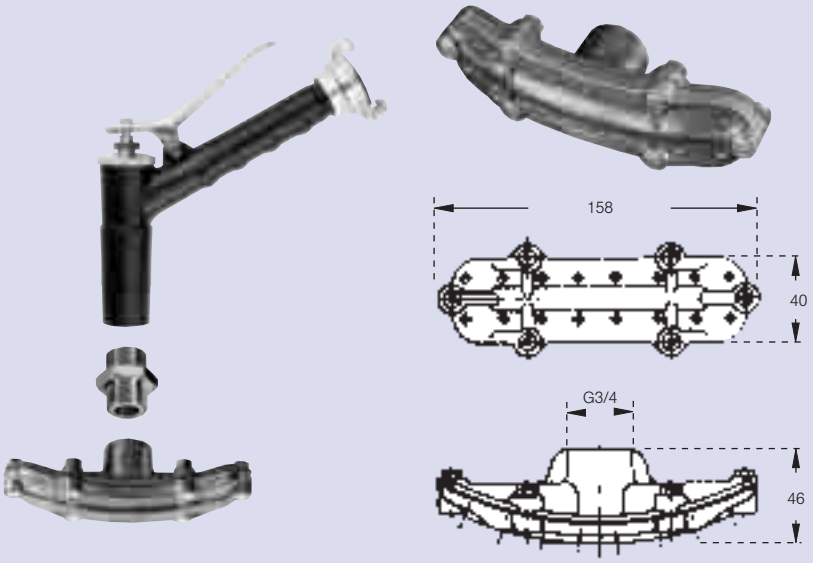
Range of application

- High-pressure/steam-jet cleaning equipment

	Type of nozzle	l/min ⊘ [bar] 60	l/min ⊘ [bar] 100	Order no. Male threads NPT 1/8	Order no. Male threads NPT 1/4	Order no. Threaded version G 3/8
0°	00-04	7.1	9.2	550.450	546.450	548.450
	00-05	8.9	11.5	550.480	546.480	548.480
	00-06	10.6	13.6	550.520	546.520	548.520
15°	15-04	7.1	9.2	608.451	602.451	652.451
	15-05	8.9	11.5	608.481	602.481	652.481
	15-06	10.6	13.6	608.521	602.521	652.521
25°	25-04	7.1	9.2	608.452	602.452	652.452
	25-05	8.9	11.5	608.482	602.482	652.482
	25-06	10.6	13.6	608.522	602.522	652.522
40°	40-04	7.1	9.2	608.453	602.453	652.453
	40-05	8.9	11.5	608.483	602.483	652.483
	40-06	10.6	13.6	608.523	602.523	652.523

Fan nozzles

Material: light alloy



Features

- Gentle, particulate atomization

Range of application

- Gentle irrigation of plants
- Disinfection of livestock buildings (Please attend security advice on product label of desinfectant.)

Order no. Nozzle with stay tube GEKA connector	Order no. Double nipple G 3/4 "
095.016.00.01.76	065.611.30

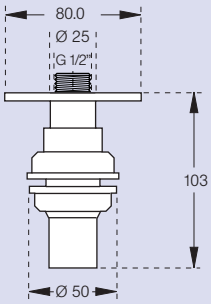
Order no. Nozzle excl. stay tube 3/4" connector	Flow rate l/min. at 2,0 bar	3,0 bar	10,0 bar
531.003.41.00	31.5	49.8	70,4
531.093.41.00	53.0	83.8	119
531.133.41.00	67.0	106	150

Tank and container cleaning nozzles

Lechler tank and container cleaning nozzles serve not only for cleaning plant-protectant tanks, but also for similar uses in other areas of agriculture, e.g.:

- dairy farming
- fattening
- cleaning of beverage tanks

For further information on tank cleaning, please consult our »Tank cleaning« brochure, which we will be happy to send you on request.



Order no.
A.510.100.00

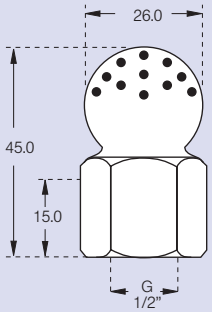
Rotating flush valve with dead-man's circuit

Features

- Fits to container cleaning nozzles with 1/2" connection
  Material: POM
  Connector: G 1/2 ISO 228
- Safety valve opens only in response to pressure from the tank

Range of application

- Cleaning the insides of containers, tanks and plant-protectant packages



	Order no.	l/min				
		2.0 bar	3.0 bar	4.0 bar	5.0 bar	10.0 bar
240°	540.909.16[1]	18.0	22.0	25.4	28.5	40.2
	540.989.16[1]	28.0	34.3	39.6	44.3	62.6
	541.109.16	57.0	69.8	80.6	90.1	127.5

1) also available in PVC

Cluster solid-jet tank and container cleaning nozzle

Spray angle: 120° or 240°
Material: solid stainless steel, PVC

Features

- Multichannel cluster solid-jet nozzle for cleaning the insides of tanks and containers

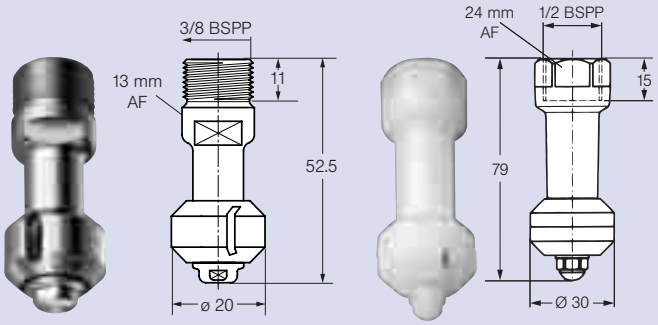
Range of application

- Flushing out and cleaning plant-protectant tanks
- Cleaning small tanks and containers with diameters up to 1.2 m

Recommendation:

For tanks up to 10 l: type 540.909.XX
For tanks larger than 10 l: types 540.989.XXX, 541.109.xxx
Flushing duration: 20 to 30 sec.
Pressure: approx. 3.0 to 4.0 bar

Tank and container cleaning nozzles



Rotating tank and container cleaning nozzles „MicroWhirly“ with slide bearing

Spray angle: 360°
Material: PVDF, stainless steel
Connector: 1/2" ISO 228 (PVDF)
3/8" DIN 2999 (stainless steel)

Features

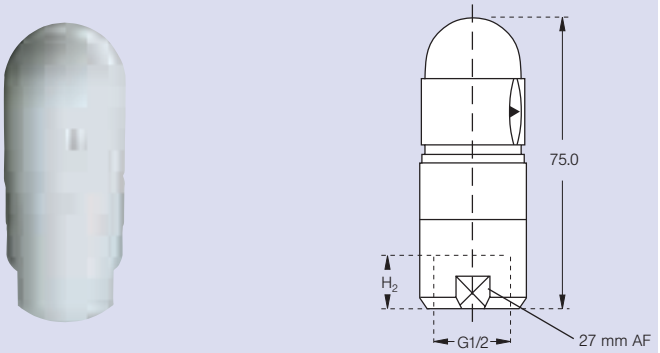
- Self-powered, requires no motor, gears or other mechanical devices for operation
- Robust design
- Resistant to chemicals

Range of application

- Cleaning the insides of sprayer tanks, plant-protectant packages and containers

	Order-no. Typ	Material-Code AISI 316L	Material-Code 5E PVDF	l/min 2,0 bar	l/min 3,0 bar	l/min 5,0 bar	Dimensions H 1	H 2	D	G	AF
360°	500.191	-	●	20.0	24.0	31.0	79	15	30	G 1/2 ISO 228	24
	566.939.1Y.AF	●	-	21.0	26.0	33.6	52.5	11	20	G 3/8 ISO 228	13

* AF = (width) across flats



Rotating tank and container cleaning nozzle, „MiniWhirly“ ball bearing-mounted

Spray angle: 360°
Material: POM
Connector: 1/2" ISO 228

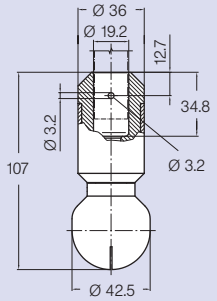
Features

- Self-powered, requires no motor, gears or other mechanical devices for operation
- Resistant to chemicals
- Slow spinning for optimum cleaning
- High operational reliability thanks to ball bearing

Range of application

- Cleaning the insides of sprayer tanks, plant-protectant packages and containers

	Order no.	l/min 2.0 bar	l/min 3.0 bar	l/min 4.0 bar	l/min 5.0 bar
300°	500.186.56	18.0	22.0	25.4	28.4



Rotating tank cleaning nozzle „MiniSpinner“ double ball bearing mounted

Spray angle: 360°
Material: Stainless Steel
Connector: 3/4" ISO female

Features

- Efficient slot design
- Operation in every direction is possible

Range of application

- Cleaning the insides of big sprayer tanks and containers with diameters up to 3.0 m

	Order No.	l/min 1.0 bar	l/min 2.0 bar	l/min 3.0 bar
360°	5MI.054.1Y.AL	21	30	37
	5MI.074.1Y.AL	35	49	60
	5MI.014.1Y.AL	49	69	85

PSV (Pneumatic Stop Valve) with single nozzle holder

Material:		
	Nozzle holder	PA
	Valve body	POM
	Rings	Viton
	Piston	PTFE
	Metal parts	Stainless steel

Single nozzle holder with basic pneumatic click action connector

Note: Perfect operation of the PSV requires oil in the pneumatic system.

Features and advantages:

- Spray pressure max. 8.0 bar
- Compressed air min. 4.5 bar to max. 8.0 bar
- Volumetric flow max. 9.0 l/min
- 4.2 l/min flow with 0.1 bar pressure drop
- MULTIJET bayonet cap system (cf. page 42/43)
- Folding clamps to fit 1/2", 3/4", 1", 20 and 25 mm tubing
- Mounts to 10 mm hole drilled in tube
- Pneumatic connectors are available as basis, 90°, straight, T or Y
- Dimensions of pneumatic line for quick-action connectors
  - Outer diameter 6 mm
  - Inner diameter 4 mm
- Valve opens by compressed air and closes by spring force
- Switching time app. 0.2 sec

Code for pipe diameter:		**Code for pre-assembled pneumatic quick-action connectors (optional):**	
20 mm	20	Basis	B
1/2"	21	90°	A
25 mm	25	Straight	S
3/4"	27	Y	Y
1"	34	T	T

Ordering example:
PSV 1/2" with 90° pneumatic connection **065.282.56.21.0A.0**

Range of application

- In all boom sprayers for plant protectants and liquid fertilizers
- As single valve e.g. for banding, distance management along water bodies and terrestrial structures

Main benefits of PSV (Pneumatic Stop Valve)

- Nozzle holder and pneumatic valve are fine tuned
- Fits to all boom designs as dimensions derive from normal single nozzle holder
- Spray pressure in the boom line can be maintained while nozzles are closed
- Immediate jet formation of all nozzles after opening the pneumatic valve
- Ring line allows circulation of the spray liquid in the boom line
  - after adding the chemical to the spray tank
  - after interruption of the application
  - for cleaning purpose
- Pneumatic shut off valves are controlled via central located electro-pneumatic valves
- Each boom section responds to one electro-pneumatic valve
- Easier boom design as no control units are needed
- Lechler AirPress for smooth unretarded control of pressure thanks to physical properties of compressed air is recommended
- Free turnable pneumatic connector of PSV facilitates assembly and installation of pneumatic hose in the boom

VarioSelect®/VarioSelect® II
2- and 4-way nozzle holder for variable locationspecific plant protectant, growth regulator and liquid fertilizer applications

Material:	Housing	POM
	Nozzle seat	POM fibre glass reinforced
	O-rings	EPDM, Viton
	Gasket	FPM
	Metal parts	Stainless steel

VarioSelect® 4-way nozzle holder (pneumatic quick-action connectors optional)

VarioSelect® II 2-way nozzle holder (pneumatic quick-action connectors optional)

Features and benefits

- V2 in new and more compact design in proven PSV valve technology (see page 38)
- V4 in modular design
- Single valve directly in front of the nozzle, immediate jet set up due to constant pressure in the pipe
- Liquid enters centrally or tangentially
- Various attachment possibilities on the spray boom thanks to modular design
- Suitable for operation with ring line, e.g. circulation and flushing
- Pneumatic connections G 1/8" (pre-fitted quick-action connectors on request, single valve “open” by compressed air (min. 4.5 bar) and “closed” by spring force
- Folding clamps for pipe diameter as per DIN 2462 and ISO 1127 for 20 mm, 1/2" incl. 22 mm, 3/4" and 1" mounts to a 9.5 mm hole in the pipe; 1" with 11 mm hole on request
- Max. spray pressure 8 bar, max. volumetric flow 10 l/min (1/2") or 25 l/min (1" with 11 mm hole), pressure loss max. 0.4 bar

Note: Fit all valve bodies on the boom in the same nozzle configuration (size, type), perfect operation of the VarioSelect® requires oil in the pneumatic system.

VarioSelect® is operated in the Vario function or the Select function, depending on the intended field spraying application

Vario

Fully-automatic switchover and optimum control on the higher/lower volumetric flow nozzle or nozzle combination, with at the same time adaptation of the pressure for

- Stepless adaptation of the spray volume (e.g. 50 to 600 l/ha) to the required subarea-specific quantity (e.g. liquid fertilizer, growth regulators).
- Application of a constant l/ha rate with great variability of the travel speed (e.g. hilly land)

Select

Remote-controlled spraying also during application, targeted activation and deactivation of individual nozzles or nozzle combinations for

- Changing the l/ha rate (pre-programmed e.g. 100/200/300/400)
- Changing the droplet size class, e.g. from »medium« to »very coarse«
- Distance management along bodies of water and terrestrial structures with drift-reducing, approved ID-/IDN-/IDK-/IDKN-/IDKT-injector nozzles

Code for pipe diameter:

20 mm	20
25 mm	25
1/2", 22 mm	21
3/4"	27
1"	34

Code for pre-assembled pneumatic quick-action connection (optional):

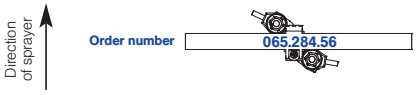
90°	A
Basis	B
Y	Y

Others on request

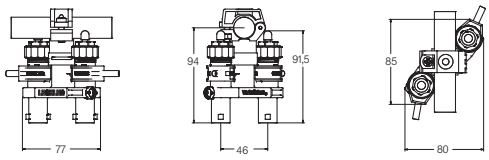
Ordering example:

V2, 1/2" with Y pneumatic connection	**065.284.56.21.Y0.0**
V4, 3/4" with 90° pneumatic connection	**065.286.MN.27.A0.0**

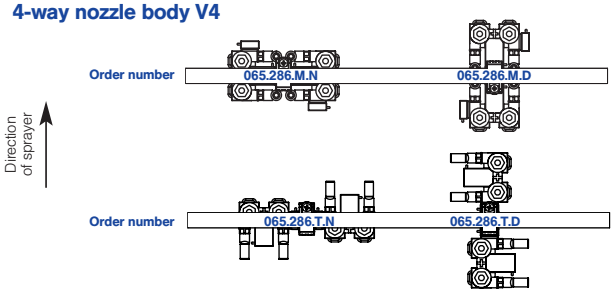
2-way nozzle body V2



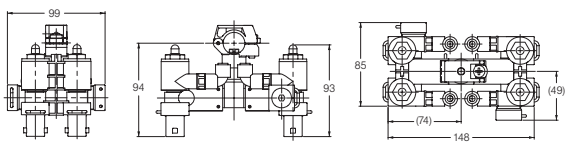
Main dimensions of 2-way nozzle body 1/2"



4-way nozzle body V4



Main dimensions of 4-way nozzle body 1/2"



Row crop spray frame Dropleg[UL]

Spray frame

Nozzle equipping:
ID (90°/120°), IDN, IDK (90/120°), IDKN, IDKT, IS, IDKS, LU (90°/120°), ST (60°), DF, E, TR, OC

Order number 092.165.00
Delivery contents: Spray frame without nozzles, nozzle strainer, gaskets and bayonet caps

Features

- Spraying arms in stainless steel
  - Length (min. 35 cm, max. 49 cm) adjustable by central locking screw
  - Opening angle adjustable (55° to 107°)
  - Automatic symmetric adjustment
- Universal mounting section for rectangular boom profile
- Max. pressure 8.0 bar
- MULTIJET bayonet nozzle holder system with diaphragm check valve
- Hose connection with MULTIJET bayonet cap A.402.904.10 (intermediate adapter see page 43)

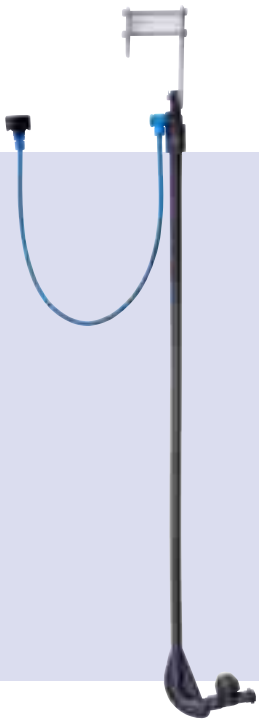
Range of application

- Application of fungicides and insecticides to row crops (e.g. strawberries)

Advantages

- Uniform coverage and penetration of canopy by spray level from top and lateral
- Flexible crop specific adaption of spray arms
- Robust and heavy duty design of spray arms in stainless steel
- Easy attachment to any boom

Dropleg[UL]



Nozzle equipping:
FT, IDKT, DF, TwinSprayCap
- ID3
- IDK/IDKN
- LU
- FT

Order number 092.171.56.00
Delivery contents: Preassembled without nozzles, nozzle strainer, gasket and bayonet cap

Features

- Tube is free laterally oscillating to row crop
- Sturdy in direction of travel
- Robust, flexible and light – only ca. 400 g
- Universal-mounting section for rectangular boom profils
- Max. pressure 8.0 bar
- Tube length 0.9 m
- MULTIJET bayonet nozzle holder with diaphragm check valve
- Hose connection with MULTIJET bayonet cap A.402.910.01 (intermediate adapter see page 43)

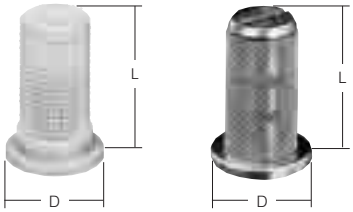
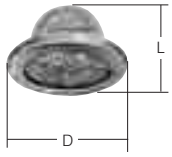
Range of application

- Application of plant protection products in row crops (e.g. vegetables, arable crops and nurseries)

Advantages

- Optimal depositon and coverage lateral and from bottom up on stalks, lower leafs and inner/lower plant canopy
- Uniform coverage
- Increased deposition of plant protection product
- Doubling of biological efficacy on average of all trials
- Environmental friendly and drift reduction by spraying in the canopy
- Gentle to plants by flexible and oscillating tube as well as optimal adaption to the row

Ball check valves
Nozzle Strainers

Ball check valves, Nozzle strainers	Opening Pressure	Mesh size	L mm	D mm	Material	Order no.
Ball check valves* 	0.5 bar	25 M ■ red	21.5	14.8	POM	065.266.56.00
	0.5 bar	60 M ■ blue	21.5	14.8	POM	065.265.56.00
	0.5 bar	25 M	21	14.8	Brass	065.261.30.00
	0.5 bar	60 M	21	14.8	Brass	065.260.30.00
	2.5 bar	25 M ■ red	21.5	14.8	POM	065.266.56.02
	2.5 bar	60 M ■ blue	21.5	14.8	POM	065.265.56.02
Ball check valve (excl. strainers) 	0.5 bar	-	18.5	14.8	POM	065.266.56.01
Nozzle strainer* 	-	25 M ■ red	21.5	14.8	POM	065.256.56.00
	-	60 M ■ blue	21.5	14.8	POM	065.257.56.00
	-	80 M ■ yellow	21.5	14.8	POM	A.424.310.5
Slotted strainer 	-	25 M ■ red	21.0	14.8	POM	095.009.56.13.43
Cup strainer 	-	25 M	8.5	14.8	Copper/Monel	065.252.26.00
	-	25 M ■ red	8.5	14.8	PA/Monel	200.029.26.00.03
	-	60 M ■ blue	8.5	14.8	PA/Stainl. steel	200.029.1C.01.03

*** Please note: If applicable we deliver the strainers and ball check valves in the colour coding according to ISO 19732:2007**

New colour code for filters and strainers according to ISO standard 19732 since 2011

		ISO 19732	
Old colour code Lechler	Old colour code ARAG	New colour code	Mesh
yellow		red	25
	white	red	32
	blue	blue	50
red		blue	60
	grey	yellow	80

Conversion table of old and new ISO colour code

Correct »filtering«

Appropriate filtering helps to avoid trouble during application of plant protectants. In general this can be a matter of coarse particles. To protect the nozzle filters and cup strainer the line strainer should be finer by one category.
Recommended mesh per nozzle size see spray table page 19.

MULTIJET, MultiCap
Quick release system – wet booms
(Max. pressure 20 bar)

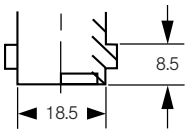
Material: PA
Stainless-steel
EPDM

Nozzle holder	Description	Material	Order no.
	**5-way nozzle holder, compact version with diaphragm check valve** with eyelet connector for 1/2" pipes for 3/4" pipes for 1" pipes	 Polyamid (PA) Polyamid (PA) Polyamid (PA)	 A.406.494.7 A.406.495.7 A.406.496.7
	**4-way nozzle holder, compact version with diaphragm check valve** with eyelet connector for 1/2" pipes for 3/4" pipes for 1" pipes	 Polyamid (PA) Polyamid (PA) Polyamid (PA)	 A.406.474.7 A.406.475.7 A.406.476.7
	**3-way nozzle holder, compact version, with diaphragm check valve** with eyelet connector for 1/2" pipes for 3/4" pipes for R1" pipes	 Polyamid (PA) Polyamid (PA) Polyamid (PA)	 A.406.424.7 A.406.425.7 A.406.426.7
	**3-way nozzle holder with diaphragm check valve** with eyelet connector for 1/2" pipes for 3/4" pipes for 1" pipes	 Polyamid (PA) Polyamid (PA) Polyamid (PA)	 A.401.274.7 A.401.275.7 A.401.276.7
	**Single nozzle body with diaphragm check valve** with eyelet connector for 20 mm pipes for 1/2" pipes for 25 mm pipes for 3/4" pipes for 1" pipes	 Polyamid (PA) Polyamid (PA) Polyamid (PA) Polyamid (PA)	 A.402.725 A.402.745 A.402.75A.5 A.402.755

MultiCap fibre glass reinforced	Description		Colour code	Order no.
On request completely assembled with IDK/IDKN/IDKT  MultiCap with IDK-Nozzle  Standard-Bayonet cap with IDK-nozzle	**Bayonet cap** - incl. gasket (A.402.200.04) - POM fibre glass reinforced - Long side walls fix IDK/IDKN/IDKS/IDKT nozzles best - best protection of the nozzle - less exposure of nozzle flats to damage - Optimal fit and offset of nozzle - Fits MULTIJET Bayonet system		 yellow lavender blue red brown black	 092.164.56.10.00 092.164.56.20.00 092.164.56.30.00 092.164.56.40.00 092.164.56.50.00 092.164.56.60.00

Code for pipe diameter:
1/2" 21 mm
3/4" 27 mm
1" 34 mm

Bayonet caps for MULTIJET and non-Lechler origin Intermediate and extension adaptor

MULTIJET	Description		Colour code	Order no.
	**Bayonet cap** incl. gasket (A.402.200.04) for combination with System MULTIJET, for example:  	**Combi cap for nozzles with 8 and 10 mm AF** AD, DF, E, FL, ID3, IDK, IDKN, IDKT, IDKS, IS, LU, OC, ST	■ red ■ blue ■ yellow ■ lavender ■ green ■ brown ■ black ■ grey □ white	Y.825.3C0.00.00.00.0 Y.825.3C0.00.30.00.0 Y.825.3C0.00.10.00.0 Y.825.3C0.00.80.00.0 Y.825.3C0.00.20.00.0 Y.825.3C0.00.70.00.0 Y.825.3C0.00.40.00.0 Y.825.3C0.00.90.00.0 Y.825.3C0.00.50.00.0
		Fibre-glass reinforced for nozzles with AF 8 AF 10	 ■ black ■ black	 A.402.900.01A A.402.902.01A
		for hollow cone nozzles TR, ITR, hose shanks	■ black	A.402.904.10
		for flood nozzles FT Bayonet cap 1/4“ NPT female Shut off cap,	■ blue ■ black ■ black	A.402.908.4 A.402.910.01 A.402.909

Non-Lechler origin				
Bayonet cap Type H 	System: – **Hardi** incl. gasket (8 and 10 mm AF: 095.015.73.06.36)	**Combi cap for nozzles with 8 and 10 mm AF** AD, DF, E, FL, ID3, IDK, IDKN, IDKT, IDKS, IS, LU, OC, ST	■ black	090.07.8.56.00.40.1
	Gasket with special shape (in combination with nozzle strainer 065.256.56 or 065.257.56 see page 41)			095.015.7J.04.34
Bayonet cap Type R 	System: – **RAU** incl. gasket (095.015.73.04.61) since 2000 see Bayonet cap MULTIJET above	for nozzles with 8 mm AF IDK, IDKN, IDKT, IDKS, AD, LU, ST, E, OC	■ red	095.016.56.05.90
		for nozzles with 10 mm AF ID3, IS, DF, FL	■ lavender	095.016.56.05.97

Intermediate and extension adaptor

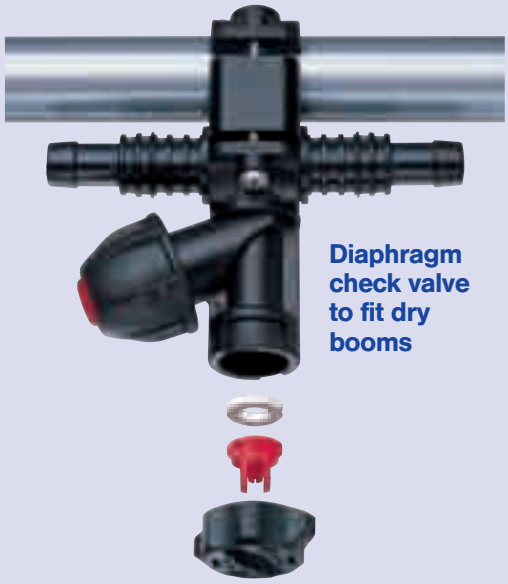
Intermediate adaptor* Sys. Lechler TWISTLOC (092.163.56.00.22.1) Extension: 22 mm

Intermediate adaptor* Sys. Rau (092.163.56.00.21.0) Extension: 43 mm

Intermediate adaptor* Sys. Hardi (092.163.56.00.20.1) Extension: 17 mm

Extension adaptor* System MULTIJET (092.163.56.00.23.1) Extension: 32 mm *incl. gasket

TWISTLOC
Quick release system
(Max. pressure 20.0 bar)



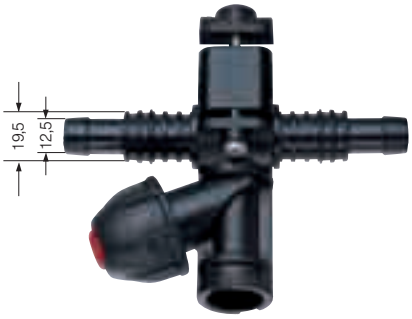
Diaphragm check valve to fit dry booms

Diaphragm check valve to fit wet booms

Diaphragm check valve with eyelet connector
for 3/4" pipes
065.272.56.KL
for 1/2" pipes
065.272.56.KH

Diaphragm check valve for threaded connection
M 18 x 1.5
065.272.56.HB

Single-hose connector
for 3/4" boom tubings
(25-28 mm O.D.)
065.274.56.KL
for 1/2" boom tubings
(20-22 mm O.D.)
065.274.56.KH



Two-hose connector
for 3/4" boom tubings
(25-28 mm O.D.)
065.275.56.KL
for 1/2" boom tubings
(20-22 mm O.D.)
065.275.56. KH

Eyelet connector
for 1" pipes
090.023.51.KA
for 3/4" pipes
090.013.51.KA
for 1/2" pipes
090.003.51.KA

Bayonet adapter with female thread
M 18 x 1.5 mm
095.009.00.07.98

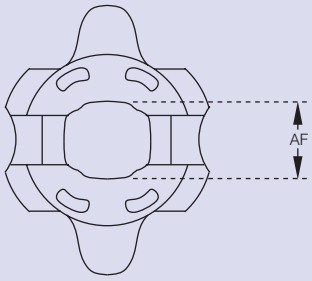
Strainer (with integrated seal)
60 M
065.268.7J (see page 41)
25 M
065.269.7J (see page 41)

Ball check valve
60 mesh
065.265.56.00
25 mesh
065.266.56.00

Bayonet cap
(range: cf. page 45)

Gasket
065.242.73

TWISTLOC
Bayonet caps
Solenoid valve



Features

- Easy to handle
- Ergonomic shaped

Benefits of TWISTLOC bayonet caps

- Concealed stay-clean bayonet fasteners fit nozzle holders on numerous different sprayer brands
- Flat spray nozzles (LU/ST/AD/ES/DF/OC) are totally integrated into bayonet cap – damage and impurification of the nozzle is prevented effectively

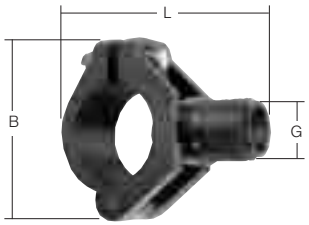
Bayonet cap	Description	Colour code	Order no.
incl. gasket (065.242.73.00) combines with following systems*: – Amazone – Brendecke – Holder – Lechler – Schmotzer – Vogel & Noot	for nozzles with 8 mm AF IDK, IDKN, IDKS, IDKT, LU, AD, E OC, ST	red black yellow green blue white brown grey	065.204.56.00 065.204.56.01 065.204.56.02 065.204.56.03 065.204.56.04 065.204.56.05 065.204.56.06 065.204.56.07
	for nozzles with 10 mm AF ID3, IS, DF, FL	red black yellow green blue grey	065.202.56.00 065.202.56.01 065.202.56.02 065.202.56.03 065.202.56.04 065.202.53.00
Round-hole bayonet caps			
incl. gasket (065.242.73.00)	TR, ITR, hose shank FT	black d-grey	065.202.56.11 065.202.56.50
Shut-off cap			
incl. gasket (095.015.73.62.51)		beige	065.202.56.40

* Depending on series/type

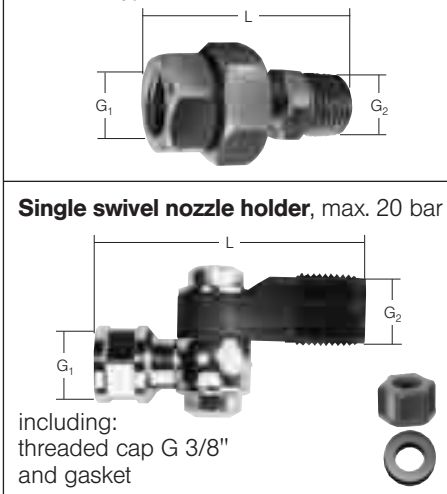
Solenoid valve	Description	Max. pressure	Order no.
	with eyelet connector - for 1/2" pipe - for 3/4" pipe female thread M 18 x 1.5	 8.0 bar 8.0 bar 8.0 bar	 065.277.56.KH.00.0 065.277.56.KL.00.0 065.277.56.HB.00.0

Eyelet connectors
Ball joint thread connectors
Swivel nozzle holders
Diaphragm nozzle holder for air assisted sprayer

Eyelet connectors*	for pipe-Ø	Male thread G	L mm	B mm	Material	Order no.
Split eyelet connector, max. 10 bar, with stainless-steel screw	3/8"	G 3/8"	49	41	Polyamide	090.053.51
	1/2"	G 3/8"	53	45	Polyamide	090.003.51
	3/4"	G 3/8"	57	51	Polyamide	090.013.51
	1"	G 3/8"	65	61	Polyamide	090.023.51

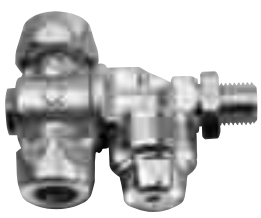


Ball joint thread connector, swivel nozzle holder*	G_1	G_2 mm	L	Material	Order no.
Ball joint thread connector, max. 25 bar, full-swiveltype max. 30°	3/8" female	3/8" male	56	Brass	092.022.30 AF
	1/2" female	1/2" female	71	Brass	092.040.30 AH
	3/4" female	3/4" female	80	Brass	092.050.30 AL
Single swivel nozzle holder, max. 20 bar	1/4" male	3/8" male	35	Polyamide	095.016.56.07.22
	NPT 1/4" female	3/8" male	35	Polyamide	095.016.56.07.21
including: threaded cap G 3/8" and gasket		3/8"		POM Rubber	065.200.56 065.240.73.00
Double swivel nozzle holder, max. 20 bar	NPT 1/4" female	3/8" male	35	Polyamide	095.016.56.07.20
including: threaded cap and gasket		3/8"		POM Rubber	065.200.56 065.240.73.00

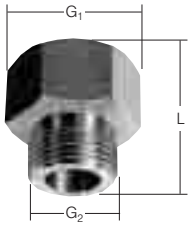
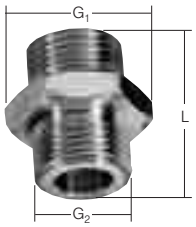


* For combination with ball valves 065.26X.XX and threaded caps 065.200.XX

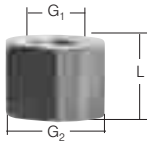
Diaphragm Nozzle Holder	Description	Material	Order no.
	Diaphragm nozzle holder incl. 2 threaded caps opening pressure: 1.1 bar closing pressure: 0.9 bar max. working pressure: 40 bar		
	G 1/4" male	Brass	095.016.30.09.61.0
	G 1/4" female	Brass	095.016.30.09.62.0

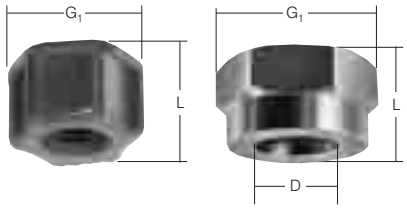


Reducing Coupling
Nipples
Threaded caps
Intermediate bajonett adapters

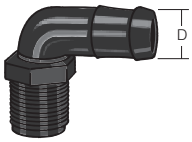
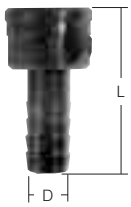
Reducing coupling, nipples	G_1	G_2	L mm	Material	Order no.
Coupler 	G 1/8"	G 3/8" A	20	Brass	040.211.30
	G 1/4"	G 3/8" A	23	Brass	065.221.30
	G 1/4"	G 3/8" A	36*	Brass	065.228.30.00.00.1
	G 3/8"	G 3/8" A	28	Brass	065.220.30
	M 11 x 1	G 3/8" A	36*	Brass	065.222.30
	G 3/4"	G 3/4" A	35	Brass	065.620.30
	G 3/8"	M 18 x 1.5 A	28	Galv. steel	095.016.02.03.43
Nipple 	G 1/4" A	G 1/4" A	27	Brass	095.019.30.00.42
	G 1/4" A	G 3/8" A	25	Brass	065.215.30
	G 1/4" A	G 3/8" A	35*	Brass	065.215.30.02
	G 3/8" A	G 3/8" A	25	Brass	065.211.30
	M 11 x 1 A	G 3/8" A	36*	Brass	065.213.30
	G 3/4" A	G 3/4" A	35	Brass	065.611.30

* Assembly of nozzle strainer and ball check valve possible (c.f. 41) A = male thread

Reduction socket	G_1 female	G_2 female	L mm	Material	Order no.
	M 18 x 1.5	G 1/4"	21	Brass	095.016.30.12.80
	G 3/8"	G 1/4"	26	Brass	095.019.30.00.23

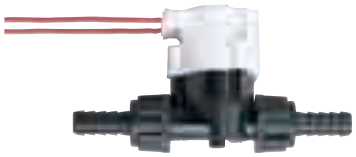
Threaded caps	G_1 female	L mm	D mm	AF mm	Material	Order no.
	M 18 x 1.5	18	13.0	*	Polyamide	095.011.51.00.21
	G 3/8"	13	12.8	22	Stainless steel	065.200.16
	G 3/8"	13	12.8	22	Brass	065.200.30
	G 3/8"	13	12.8	22	POM	065.200.56
	G 3/4"	16	20.1	32	Brass	065.600.30
	Gasket for threaded version M 18 x 1.5 16 x 10 x 2.5 Gasket for threaded version 3/8" 11 x 15 x 1.6 Gasket for threaded version 3/4" 18 x 24 x 1.0 * Wing nut				Rubber Rubber EWP	090.020.73.00.03 065.240.73 065.640.72

Hose connectors

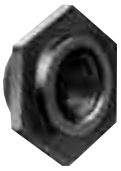
Hose connector	Threads	Max. pressure bar	Hose-Ø D mm	L mm	Material	Order no.
Hose shank to match threaded cap 065.200.XX. (page 47) or round-hole TWISTLOC cap 065.202.56.11 (page 45) or MULTIJET A.402.904.10 (page 43) 		10.0	12	34	PA	095.016.56.07.49
Hose shank connector male 	G 3/8"	25.0	11	35	Brass	095.016.30.07.67
	G 1/2"	25.0	11	40	Brass	095.016.30.07.68
	NPT 1/4"	10.0	6	35	PP	BHB02590*
	NPT 1/4"	10.0	10	54	PP	BHB025038
	NPT 3/8"	10.0	13	66	PP	BHB038050
	NPT 1/2"	10.0	13	68	PP	BHB050
	NPT 3/4"	10.0	19	74	PP	BHB075
	NPT 3/4"	10.0	25	76	PP	BHB075100
	NPT 1"	10.0	25	80	PP	BHB100
	NPT 1"	10.0	32	90	PP	BHB100125
	NPT 1 1/4"	10.0	30	90	PP	BHB125
	NPT 1 1/4"	10.0	25	81	PP	BHB125100
	NPT 1 1/2"	10.0	37	104	PP	BHB150
	NPT 2"	10.0	36	107	PP	BHB200150
	NPT 2"	10.0	49	115	PP	BHB200
	G 2"	6.0	60	134	PVC	095.016.50.05.73
	NPT 3"	10.0	75	160	PP	BHB300
Hose shank connector 90° 	NPT 1/4"	10.0	8		PP	BHB02590
	NPT 3/8"	10.0	10		PP	BHB03890
	NPT 1/2"	10.0	10		PP	BHB05003890
	NPT 1/2"	10.0	12		PP	BHB05090
	NPT 1/2"	10.0	20		PP	BHB05007590
	NPT 3/4"	10.0	12		PP	BHB07505090
	NPT 3/4"	10.0	20		PP	BHB07590
	NPT 3/4"	10.0	25		PP	BHB07510090
	NPT 1"	10.0	20		PP	BHB10007590
	NPT 1"	10.0	25		PP	BHB10090
	NPT 1"	10.0	32		PP	BHB10012590
	NPT 1 1/4"	10.0	25		PP	BHB12510090
	NPT 1 1/4"	10.0	32		PP	BHB12590
	NPT 1 1/2"	10.0	40		PP	BHB15090
	NPT 2"	10.0	50		PP	BHB20090
	NPT 3"	10.0	75		PP	BHB30090
Hose shank connector female 	G 1/2"	25.0	11	42	Brass	095.016.30.06.41
	G 1/2"	25.0	13	42	Brass	095.016.30.06.42
	G 1 1/4"	10.0	30	77	PP	095.016.53.07.47
	G 1 1/2"	10.0	40	67	PP	095.016.53.07.48
	G 2"	6.0	50	70	PP	A.100.750

Thread table see page 59.

* 90° elbow

Solenoid valve	Description	Max. pressure	Order no.
	**Solenoid valve to fit dry booms**		**Z-Endventil**
	Hose-Ø 11 mm	10.0	Z-Endventil 11
	Hose-Ø 13 mm	10.0	Z-Endventil 00
	Diaphragm: MBR (Buna)		

Pipe fittings (Polypropylene/NPT threads) Max. 10 bar

Description	Threads	Order no.
Double nipple 	1/2" male	BNIP050-SH
	3/4" male	BNIP075-SH
	1" male	BNIP100-SH
	1 1/4" male	BNIP125-SH
	1 1/2" male	BNIP150-SH
	1 1/2" male, lenght: 4"	BNIP150-4
	2" male	BNIP200-SH
	2" male, lenght: 4"	BNIP200-4
	3" male	BNIP300-SH
Reducing coupler 	1/2" male x 3/8" female	BRB050-038
	3/4" male x 1/4" female	BRB075-025
	3/4" male x 1/2" female	BRB075-050
	1" male x 3/4" female	BRB100-075
	1 1/4" male x 3/4" female	BRB125-075
	1 1/4" male x 1" female	BRB125-100
	1 1/2" male x 3/4" female	BRB150-075
	1 1/2" male x 1" female	BRB150-100
	1 1/2" male x 1 1/4" female	BRB150-125
	2" male x 3/4" female	BRB200-075
	2" male x 1" female	BRB200-100
	2" male x 1 1/4" female	BRB200-125
	2" male x 1 1/2" female	BRB200-150
	3" male x 1 1/2" female	BRB300-150
	3" male x 2" female	BRB300-200
Reducer 	1" female x 3/4" female	BRC100-075
	1 1/2" female x 1" female	BRC150-100
	1 1/2" female x 1 1/4" female	BRC150-125
	2" female x 1" female	BRC200-100
	2" female x 1 1/4" female	BRC200-125
	2" female x 1 1/2" female	BRC200-150
	3" female x 2" female	BRC300-200
Taper nipple 	1/2" male x 3/4" male	BRN075-050
	1/2" male x 1" male	BRN100-050
	3/4" male x 1" male	BRN100-075
	3/4" male x 1 1/4" male	BRN125-075
	1" male x 1 1/4" male	BRN125-100
	1" male x 1 1/2" male	BRN150-100
	1 1/4" male x 1 1/2" male	BRN150-125
	1 1/4" male x 2" male	BRN200-125
	1 1/2" male x 2" male	BRN200-150
	2" male x 2" male	BRN300-200
Blanking plug 	3/4" male	BPLUG075
	1" male	BPLUG100
	1 1/2" male	BPLUG150
	2" male	BPLUG200

Description	Threads	Order no.
Coupler 	1/2" female	BCPLG050
	3/4" female	BCPLG075
	1" female	BCPLG100
	1 1/4" female	BCPLG125
	1 1/2" female	BCPLG150
	2" female	BCPLG200
	3" female	BCPLG300
Tee 	3/8" female	BTEE038
	1/2" female	BTEE050
	3/4" female	BTEE075
	1" female	BTEE100
	1 1/4" female	BTEE125
	1 1/2" female	BTEE150
	2" female	BTEE200
	3" female	BTEE300
45° elbow 	3/4" female x 3/4" male	BSL075-45
	1" female x 1" male	BSL100-45
	1 1/4" female x 1 1/4" male	BSL125-45
	1 1/2" female x 1 1/2" male	BSL150-45
	2" female x 2" male	BSL200-45
	3" female x 3" male	BSL300-45
90° elbow 	3/8" female x 3/8" female	BEL038-90
	1/2" female x 1/2" female	BEL050-90
	3/4" female x 3/4" female	BEL075-90
	1" female x 1" female	BEL100-90
	1 1/4" female x 1 1/4" female	BEL125-90
	1 1/2" female x 1 1/2" female	BEL150-90
	2" female x 2" female	BEL200-90
	3" female x 3" female	BEL300-90
	3/8" female x 3/8" male	BSL038-90
	1/2" female x 1/2" male	BSL050-90
	3/4" female x 3/4" male	BSL075-90
	1" female x 1" male	BSL100-90
	1 1/4" female x 1 1/4" male	BSL125-90
	1 1/2" female x 1 1/2" male	BSL150-90
	2" female x 2" male	BSL200-90
	3" female x 3" male	BSL300-90
Cross 	3/4" female	BCR075
	1" female	BCR100
	1 1/4" female	BCR125
	1 1/2" female	BCR150
	2" female	BCR200

Thread table see page 59. Other thread sizes on request.

Manifold flange system

Type	Connection	Order no.
Full port		
Check valve 	1"	BMCV100
	2", full port	BMCV220
	3", full port	BMCV 300
Straight flange 	1" x 1" flange	BM100CPG
	2" x 2" full port flange	BM220CPG
	3" x 3" full port flange x 4" lang	BM300CPG
	2" x 2" full port flange x 6" lang	BM220CPG6
	3" x 3" full port flange x 7" lang	BM300CPG7
45° flange coupling 	1" x 1" 45° flange	BM100CPG45
	2" x 2" 45° full port flange	BM220CPG45
	3" x 3" 45° full port flange	BM300CPG45
90° flange coupling 	1" x 1" 90° flange	BM100CPG90
	2" x 2" 90° full port flange	BM220CPG90
	3" x 3" 90° full port flange	BM2300CPG90
90° flange, "Sweeps", (10 % more flow) 	2" 90° full port flange "Sweep"	BM220SWP90
	3" 90° flange "Sweep"	BM300SWP90
Flange reducer coupling 	2" flange x 1" flange	BM200100CPG
	2" full port flange x 1" flange	BM220100CPG
	3" flange x 2" flange	BM300200CPG
	3" flange x 2" full port flange	BM300220CPG
Flange tee 	1"	BM100TEE
	2"	BM200TEE
	2" full port flange tee x 2"	BM220200TEE
	2" full port flange tee	BM220TEE
	3"	BM300TEE
U-bolt (stainless steel)	100 series	BUB100
	200 series	BUB202
	220 series	BUB220

Type	Connection	Order no.
Full port		
Adapter, flange - BSP Gewinde (AG) 	1" flange x 1" BSP	BM100BSP
	2" full port flange x 2" BSP	BM220BSP
	3" full port flange x 3" BSP	BM300BSP
Adapter, flange - NPT Gewinde (AG) 	1" flange x 1" NPT (AG)	BM100MPT
	2" flange x 1 1/2" NPT (AG)	BM200150MPT
	2" full port flange x 2" NPT (AG)	BM220MPT
	3" flange x 3" NPT (AG)	BM300MPT
Full port 	1" flange x 1" FIXLOC	BM100A
	2" full port flange x 2" FIXLOC	BM220A
	3" full port flange x 3" FIXLOC	BM300A
Flange - hose barb 	1" flange x 3/4" hose	BM100075BR
	1" flange x 1" hose	BM100BRB
	2" flange x 1 1/2 " hose	BM200150BRB
	2" full port flange x 1" hose	BM220100BR
	2" full port flange x 1 1/4" hose	BM220125BR
	2" full port flange x 1 1/2" hose	BM220150BR
	2" full port flange x 2" hose	BM220BRB
	3" flange x 2" hose	BM300220BR
	3" flange x 3" hose	BM300BRB
Flange - 90° hose barb 	1" flange x 3/4" hose	BM100075BRB90
	1" flange x 1" hose	BM100BRB90
	2" full port flange x 1 1/2" hose	BM220150BRB90
	2" full port flange x 2" hose	BM220BRB90
	3" flange x 2" hose	BM300220BRB90
	3" flange x 3" hose	BM300BRB90

Manifold flange system

Type	Connection	Order no.
Full port		
Flange - 45° hose barb elbow 	1" flange x 1" hose	BM100BRB45
	2" full port flange x 2" hose	BM220BRB45
	3" flange x 3" hose	BM300BRB45
Flange cross 	1" flange	BM100CR
	2" full port flange	BM220CR
	3" flange	BM300CR

Type	Connection	Order no.
Full port		
Flange clamp (stainless steel) 	100er Series	BFC100
	200er Series	BFC 200
	220er Series (full port)	BFC220
	300er Series (full port)	BFC300
Flange gaskets (EPDM) 	1" with rib	BM101G
	1 1/2"	B150G
	2" with rib	BM201G
	2" full port with rib	BM221G
	3" with rib	BM301G

Type	Connection	Pressure max. (bar)	Opening	Order no.
2-way valve (bolted, "full port") 	1"	10	1"	BMV100CF
	2"	10	2"	BMV220CF
	3"	7	3"	BMV300CF
Compact "Stubby" 2-way valves ("full port") 	2", flange - FIXLOC male adapter	7	2"	BMVSF220FP
	2" flange - flange	7	2"	BMVS220CF
	3" flange - FIXLOC male adapter	7	3"	BMVSF300FP
	3" flange - flange	7	3"	BMVS300CFFP
3-way valves ("full port") 	2" bottom load	7	2"	BMV220BL
	2" side load, (cannot be turned off)	7	2"	BMV220SL
	3" bottom load	7	3"	BMV300BL

FIXLOC Lever couplings with NPT- and BSP-threads (BS21 respectively DIN EN 10226)

Material: Fibre glass reinforced polypropylene
Rings, cam levers, and pins: stainless steel

FIXLOC lever couplings are made for perfect, quick-closing connections.

Features

- Resistant to all kinds of agricultural chemicals and liquid fertilizers
- Easy opening and closing (no tools required)
- Durable, even under heavy-duty conditions
- Close-fitting thanks to high-precision fabrication
- Pressure ranges at 20 °C: 1/2" to 2" 9.0 bar
  3" 5.0 bar

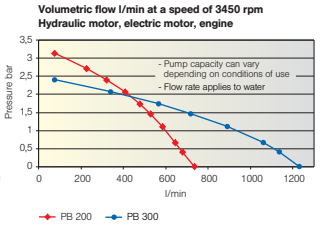
FIXLOC parts	Description	Connector	Order no.
	**Male adapter with female threads** straight version	NPT 1/2" NPT 3/4" BSP 1" NPT1 1/4" BSP 1 1/2" BSP 2" BSP 3"	B050-A-NPT B075-A-NPT B100-A-BSP B125-A-NPT B150-A-BSP B200-A-BSP B300-A-BSP
	dito as 90° elbow	NPT 1 1/2" NPT 2"	B150-A 90°-NPT B200-A 90°-NPT
	**Male adapter with male threads** straight version	NPT 1/2" NPT 3/4" BSP 1" NPT 1 1/4" BSP 1 1/2" BSP 2" NPT 3" BSP 3"	B050-F-NPT B075-F-NPT B100-F-BSP B125-F-NPT B150-F-BSP B200-F-BSP B300-F-NPT B300-F-BSP
	dito as 90° elbow	NPT 1 1/2" NPT 2"	B150-F 90°-NPT B200-F 90°-NPT
	**Male adapter with hose shank**	1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3"	B050-E B075-E B100-E B125-E B150-E B200-E B300-E
	**Female coupler with female threads** straight version	NPT 1/2" NPT 3/4" BSP 1" NPT 1 1/4" BSP 1 1/2" BSP 2" NPT 3" BSP 3"	B050-D-NPT B075-D-NPT B100-D-BSP B125-D-NPT B150-D-BSP B200-D-BSP B300-D-NPT B300-D-BSP
	dito as 90° elbow	NPT 1 1/2" NPT 2"	B150-D 90°-NPT B200-D 90°-NPT

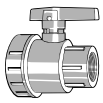
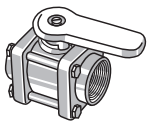
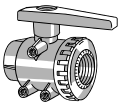
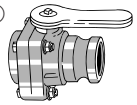
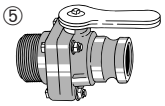
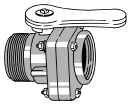
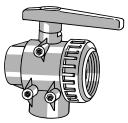
FIXLOC parts	Description	Connector	Order no.
	**Female coupler with male threads**	NPT 1/2" NPT 3/4" BSP 1" NPT 1 1/4" BSP 1 1/2" BSP 2" NPT 3" BSP 3"	B050-B-NPT B075-B-NPT B100-B-BSP B125-B-NPT B150-B-BSP B200-B-BSP B300-B-NPT B300-B-BSP
	**Female coupler with hose shank** straight version	1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3"	B050-C B075-C B100-c B125-C B150-C B200-C B300-C
	dito as 90° elbow	1 1/2" 2"	B150-C 90° B200-C 90°
	**Plug for female coupler**	1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3"	B050-PL B075-PL B100-PL B125-PL B150-PL B200-PL B300-PL
	**Plug for male coupler**	1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3"	B050-CAP B075-CAP B100-CAP B125-CAP B150-CAP B200-CAP B300-CAP
	**Spare gasket for FIX-LOC lever couplings EPDM**	1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3"	B075-G B075-G B100-G B100-G B150-G B200-G B300-G

1/2" series couplings interchange with 3/4" size couplings; Coupling ends are 3/4"
1 1/4" series couplings interchange with 1" size couplings; Coupling ends are 1"

Thread table see page 59

Pumps
Ball valves

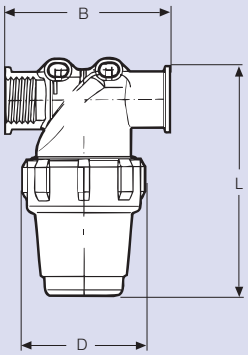
Pumps*	Description	Order no.
 	PB 200 pump with base (excl. motor) Connector: 2” female	095.016.00.07.82
	PB 200 pump with three-phase a.c. motor Connector: BSP 2” female	095.016.00.08.02
	PB 200 pump with hydraulic motor Connector: BSP 2” female	095.016.00.08.01
	PB 200 pump with 200P6PRO gasoline engine Connector: 2” female	095.016.00.07.81
	PB 300 pump with base (excl. motor) Connector: BSP 3” female	095.009.00.12.21
	PB 300 pump with three-phase a.c. motor Connector: BSP 3” female	095.009.00.12.20
	PB 300 pump with hydraulic motor Connector: BSP 3” female	095.009.00.12.22

Ball valves		Type/Connector	Max. pressure	Order no.
2-way valve (example)	① 	① 2-way valve with NPT threads		
		NPT 1/2"	7,0	BUV050FP
		NPT 3/4"	7,0	BUV075FP
		NPT 1"	7,0	BUV100FP
		NPT 1 1/4"	7,0	BUV125FP
		NPT 1 1/2"	7,0	BUV150FP
		NPT 2"	7,0	BUV200FP
	② 	② 2-way valve with NPT threads		
		NPT 1/2"	10,0	BV050
		NPT 3/4"	10,0	BV075
		NPT 1"	10,0	BV100
		NPT 1 1/2"	10,0	BV150
		NPT 2"	10,0	BV200
	③ 	② 2-way valve with BSP threads		
		BSP 3"	7,0	BV300-BSP
		BSP 3" Fullport	7,0	BV300FP-BSP
	④ 	③ 2-way valve with G threads		
		G 1/2"	16,0	A.454.132
		G 3/4"	16,0	A.454.133
		G 1"	16,0	A.454.134
		G 1 1/4"	10,0	A.454.135
		G 1 1/2"	10,0	A.454.136
		G 2"	10,0	A.454.137
	⑤ 	④ 2-way valve with 2” male adapter and 2” NPT female threads	7,0	BVSF200
		⑤ 2-way valve with 2” male adapter and 2” NPT male threads	7,0	BVSFMT200
	⑥ 	⑥ 2-way valve with 2” NPT male threads and 2” female threads	7,0	BVSMT200
3-way valve (example)	⑦ 	⑦ 3-way valve with G threads		
		G 1"	16,0	A.454.234
		G 1 1/4"	10,0	A.454.235
		G 1 1/2"	10,0	A.454.236
		G 2"	10,0	A.454.237

Thread table see page 59.

Line strainers

Material: Polypropylene



Features

- Line strainers are designed for service pressures up to 14.0 bar
- Large-area strainers with colour-coded screen inserts
- Strainer housings have bores or threads for mounting purposes
- Suitable for delivery-end or supply-end installation (only for line strainers)

Line strainer

① SGI female thread

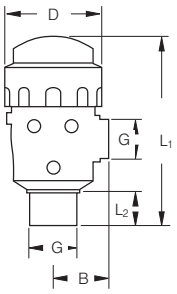
② SGA male thread

③ SGI 6R model with cleanout connector

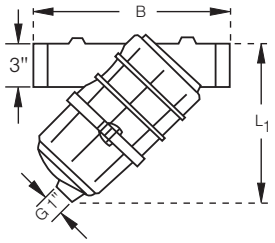
④ A.345.033 A.345.033.5 high-pressure strainer, max. 50 bar

Suction strainer

⑤ A.316.172/A.316.173



⑥ SGA2.300.53/ SGA3.300.53 max. 8 bar



Max. Flow rate l/min	Order no.	Connector G	Dimensions D mm	L mm	B mm	Screen insert order no. Mesh size* Colour code 30 M red	50 M blue	80 M yellow	100 M green
① SGI female (incl. Screen insert 50M. blue)									
100	SGI 2	1/2" female	74	136	99	012.06	012.03	012.08	012.02
100	SGI 3	3/4" female	74	136	99	012.06	012.03	012.08	012.02
160	SGI 4	1" female	86	165	107	100.06	100.03	100.08	100.02
280	SGI 5	1 1/4" female	116	279	146	114.06	114.03	114.08	114.02
280	SGI 6	1 1/2" female	116	279	146	114.06	114.03	114.08	114.02
② SGA male (incl. Screen insert 50M. blue)									
100	SGA 2	1/2" male	74	136	99	012.06	012.03	012.02	012.02
100	SGA 3	3/4" male	74	136	99	012.06	012.03	012.02	012.02
160	SGA 4	1" male	86	165	112	100.06	100.03	100.02	100.02
280	SGA 5	1 1/4" male	116	279	146	114.06	114.03	114.02	114.02
280	SGA 6	1 1/2" male	116	279	146	114.06	114.03	114.02	114.02
③ SGI 6R model with cleanout connector*									
280	SGI 6R	1 1/2" female	116	353	146	114.06	114.03	114.02	114.02

Max. Flow rate l/min	Order no.	Connector G	Dimensions D mm	L mm	Screen insert (incl.)
④ High-pressure strainer, 50 bar, made of fiberglass reinforced nylon					
150	A.345.033	1/2" / 3/4"	104	259	50M blue
150	A.345.033.5	1/2" / 3/4"	104	259	80M yellow

Order no.	Description
④ Accessory for High-pressure strainer 50 bar	
A.004.010.020	1/2" plug
A.403.000.060	Gasket for 1/2" plug
A.465.230.020	3/4" plug
A.465.005.140	Gasket for 3/4" plug

Max. Flow rate l/min	Order no.	Connector G	Dimensions D mm	L_1 mm	L_2 mm	B mm	Screen insert Mesh* Colour Code
⑤ A316.172/A.316.173							
220	A. 316.172 incl. screen 30 M	2" male	170	292	42	98	30 M red A.316.002.030
220	A. 316.173 inkl. screen 50 M	2" male	170	292	42	98	50 M blue A.316.003.030
⑥ SGA2.300.53 / SGA3.300.53							
800	SGA2.300.53 inkl. screen 30 M SGA3.300.53 inkl. screen 50 M	3" male	-	358	-	415	30 M red 002.26 / 50 M blue 003.26

* Please always specify desired mesh size on order.
Screen inserts are delivered in colour coding according to ISO 19732:2007

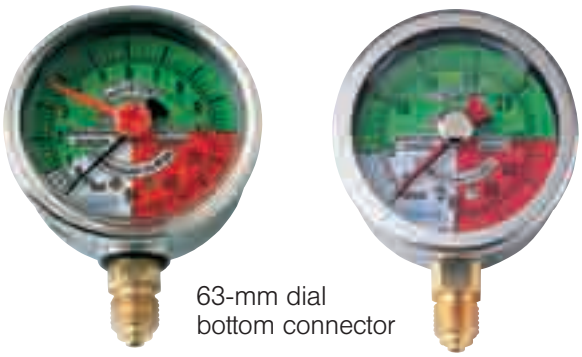
Pressure gauges

100-mm dial

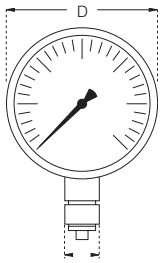
Features

- Expanded 1.0 to 5.0 bar or 1.0 to 10.0 bar coloured scale range
- Externally adjustable pressure mark (applies only to pressure gauges with 63-mm dial)
- Extra robust for heavy-duty service
- With 63-mm or 100-mm dial
- Precision and scale in line according to EN 12761
- Connection G 1/4" male

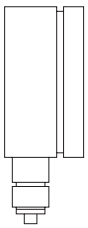
Range of display	Range of over-pressure	Connector	Scale-diameter D	Model/Order no.		Scale-division
bar	up to ... bar		mm	Standard	Liquid fertilizer-proof	bar
1 – 10	60	bottom	63	095.009.00.10.56	095.009.00.11.36	0.2
1 – 10	60	rear	63	095.009.00.11.37	095.009.00.11.35	
1 – 5	25	bottom	63	095.009.00.10.55	095.009.00.10.54	0.1
1 – 5	25	rear	63	095.009.00.10.72	095.009.00.10.71	
1 – 10	25	bottom	100	-	095.009.00.12.90	0.1
5 – 30	60	bottom	63	095.009.00.14.07.0	-	1.0



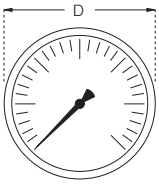
63-mm dial
bottom connector

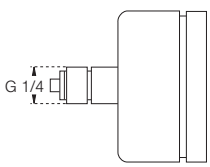


G 1/4



63-mm dial
rear connector





Top Flow II
Electro magnetic flow meter with digital read out

Material: Polypropylene
glass reinforced

Features

- Displays overall total volume and batch total volume!
- Flow rate allows for Gallons or Liters Per Minute
- Magnetic style meter
- Temperature range from -15 °C to 65 °C
- Measuring accuracy 99 % at: 1": 8 - 400 l/min
  2": 25 - 1100 l/min
  3": 60 - 2500 l/min
- Accuracy is approximately 1% from 115 to 1135 Liter
- 1", 2" FP and 3" FP **F**ull **P**ort manifold fittings.
- Max. pressure: 10 bar at 20 °C

Main benefits

- Self calibrating meter
- Measures liquid fertilizer and spray mixtures
- No moving parts to fail during use
- Easy to change six (6) AA batteries
- Easy to use, robust design
- Manifold fittings enable
  - quick and easy assembly
  - easy on/off hose connection
  - 360° orientation

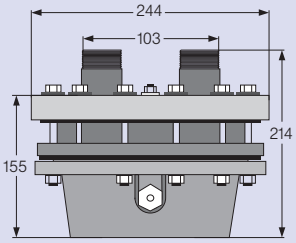
Includes manifold fittings

- 1", 2" or 3" FP manifold flange with FIXLOC male adapter
- FP worm screw clamp
- FP gasket EPDM

Note: Please consider manual.

Order number:
1": B.MFM. 100.CO.M
2": B.MFM. 220.CO.M
3": B.MFM. 300.CO.M

AirPress – pneumatic pressure regulator for boom sprayers



Order number
1 1/4": R.C79.4H
2": R.C79.4AH

Features

AirPress pressure set controls the spray pressure only by a moving flexible diaphragm; the working pressure is set by inflating the pressure set with air (ratio 1:1). In contrast ordinary regulators adjust the spray pressure via spring power.

Main benefits

- Broad volumetric flow range up to 300 l/min (11/4") or 450 l/min (2")
- Distinct quicker response in comparison to electric regulators
- Immediate pressure control without any lag time
- Ideal solution in combination with automatic boom section control or single nozzle switch
- Maintains always exact l/ha rate over all boom sections

Technical data	1 1/4" version	2" version
Weight:	6.5 kg	6.55 kg
Threads:	G 1 1/4" male thread (in and outlet)	G 2" male thread (in and outlet)
Materials:	Nylon, polyethylene, nylon coated steel flanges, bolts in stainless steel (other materials on request)	
Maximum pressure	7 bar	7 bar
Characteristics of flow	by-pass flow up to 100 l/min increases pressure of only 0,2 bar; up to 250 l/min circa 0,5 bar, max. flow rate: 300 l/min	by-pass flow up to 100 l/min increases pressure of only 0,2 bar; up to 250 l/min circa 0,5 bar, max. flow rate: 450 l/min

Farmer's helpers

Anemometer

Pocketwind IV

Function

- Humidity
  - Relative humidity
  - Dew point
  - ΔT
  - Wet bulb
- Wind speed
  - Maximum
  - Average
  - Selectable units of measure: m/s, km/h, fpm, mph, kn and bft
- Temperature/wind-chill
  Selectable units of temperature: °C, °F
- Wind direction
  - Digital compass
  - Integrated vane

Features

- Back lighted display
- Water resistant and shock proof housing
- Neck cord
- Cover for best protection against damage and dirt
- Tripod socket

Benefits

- Self-calibrating humidity sensor
- Pocket knife designed cover protects sensor best
- Measurement of all relevant data for safe and successful application of plant protection chemicals

Order no.
Z.WIN.DME.SS.ER.010

Pocketwind III

Function

- Wind speed
  - Maximum
  - Average
  - Selectable units of measure: m/s, km/h, fpm, mph, kn and bft
- Temperature/wind-chill
  - Selectable units of temperature: °C, °F

Features

- Dual display
- Data hold button
- Water resistant and shock proof housing
- Neck Cord
- Pocket knife designed cover
- Cover for best protection against damage and dirt
- Tripod socket

Benefits

- Pocket knife designed cover protects sensor best
- One hand use

Order no.
Z.WIN.DME.SS.ER.001

Accessories

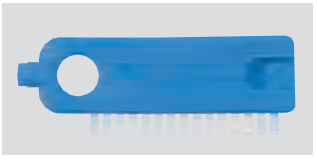
Droplet-size/dosage calculator
Order no. 095.009.50.12.11.0

Apple Android

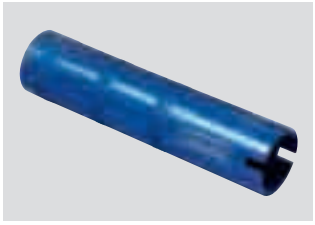
Online nozzle calculator

Water sensitive paper
Size: 76 x 26 mm
Order no. Z.WSP.76X.26.00.00.0

Nozzle aligner
Order no. 065.231.02

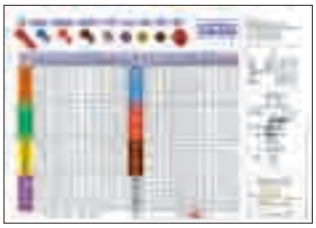


AD-nozzle cleaning brush and preorifice pick-up
Order no. 06A.D30.56.00



Nozzle assembly wrench
Order no. 092.164.40.00.99.0

Spray tables (sticker)



Arable crops (A4)

UAN (A4)

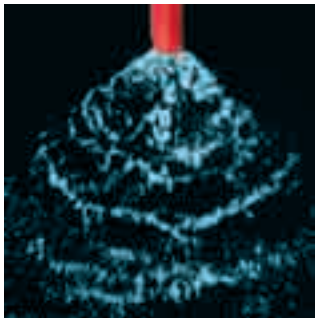
Fruit crops (e.g. orchards, vineyards and speciality crops) (A5)

Cleaning brush
Order no. 095.009.50.10.89.0

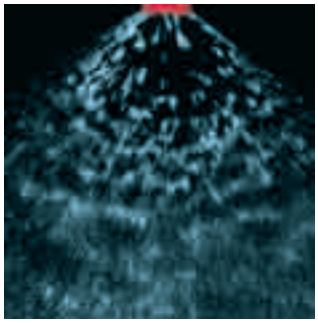
Principal facts of spray nozzle technology

Atomization

The atomization process breaks liquids down into droplets. Most of the nozzles used in agriculture rely on hydraulic atomization resulting from fluid pressure in combination with the orifice effect of the nozzle tip. Those two factors accelerate the flow velocity of the medium to be atomized. This converts potential energy into kinetic energy (= speed). The release of tension experienced by the liquid as it emerges from the nozzle tip produces an initially flat lamella of liquid that soon loses its stability and becomes wavy. That gives rise to strings of liquid that disintegrate into droplets of various size.



ID-nozzle spray-jet decay



LU-nozzle spray-jet decay

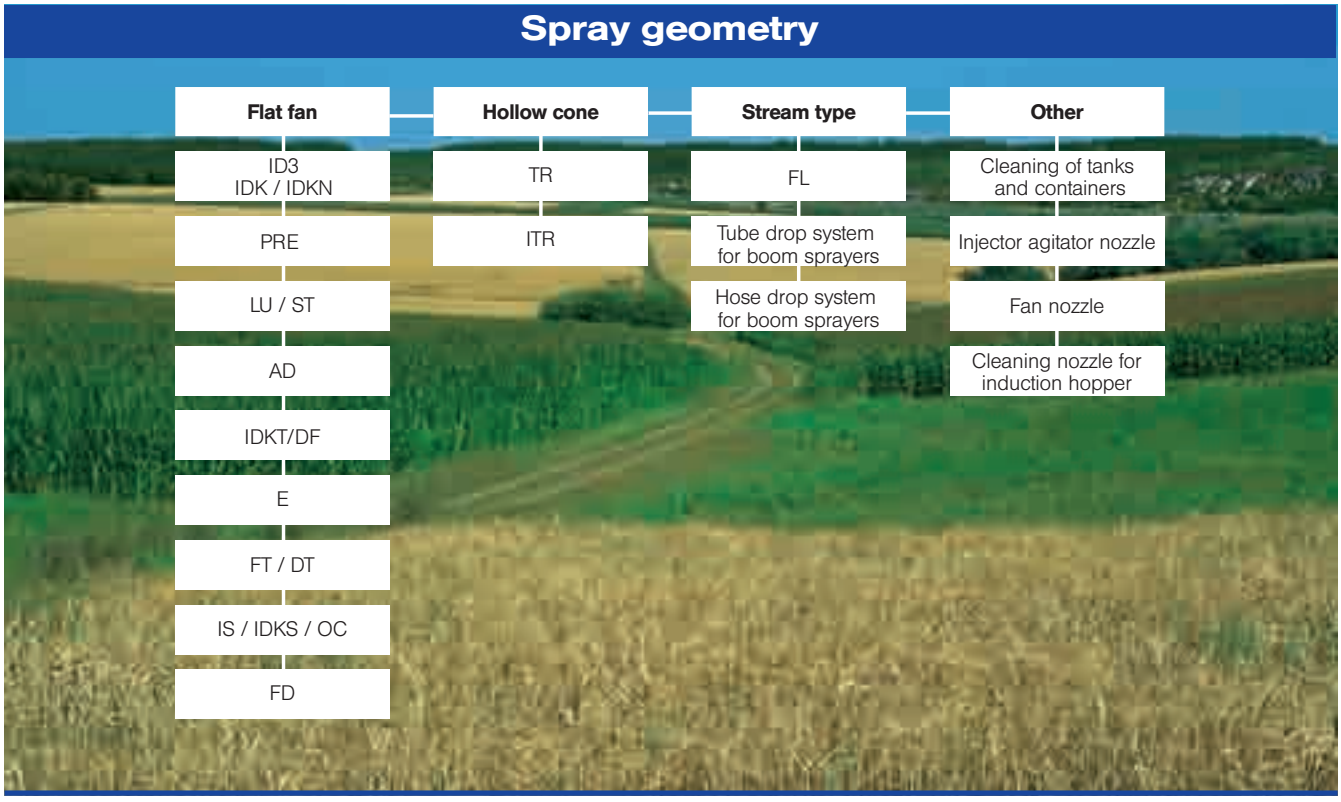
Specification of Lechler nozzles

The performance data of Lechler agricultural spray nozzles are stated in accordance with international standards and include the following information:

- type of nozzle
- spray angle
- nozzle size

Lechler nozzles are ISO colour-coded, with each different colour corresponding to a defined flow rate. The latter is also reflected in the nozzle size, e.g., -05 stands for a flow rate of 0.5 US gallons per minute – at 40 PSI, or 1.89 l/min at 2.81 bar, or 1.94 l/min at 3.0 bar (colour: brown). The material indicator for colour-coded nozzles is either “S” for stainless steel or “C” for ceramic.

Nozzle types and spray geometries



Principal facts of spray nozzle technology

Coverage

The theoretical coverage of a given nozzle is chiefly determined by the spray angle and the spray height, i.e., the distance between the nozzle and the target surface. Depending on the height of the nozzle and its size, the spray angle and accuracy of distribution can depend to a certain extent on the spray pressure. Hence, the recommended spray pressure at the nozzle tip and the minimum spray height for a specific nozzle spacing are two prerequisites for the uniform distribution of liquid within the spray pattern.

The following laws of physical regularity apply in principle

(data in table based on water):

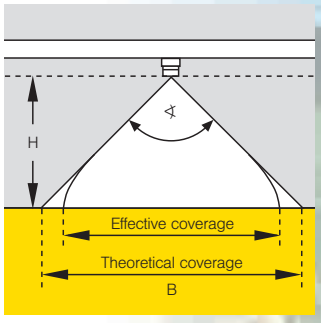
- Spray media with viscosities higher than that of water have narrower spray angles.
- Spray media with less surface tension than that of water have broader spray angles.
- The density of the spray medium has little effect on the spray angle.

Coverage

Theoretical coverage as a function of spray height and spray angle

Spray angle	Theoretical coverage B for different spray heights H [cm]											
	10	15	20	25	30	40	50	60	70	80	100	120
20°	3.5	5.3	7.1	8.8	10.6	14.1	17.6	21.2	24.7	28.2	35.3	42.0
30°	5.4	8.0	10.7	13.4	16.1	21.4	26.8	32.2	37.5	42.9	53.6	64.0
45°	8.3	12.4	16.6	20.7	24.9	33.1	41.4	49.7	58.0	66.3	82.8	99.0
60°	11.6	17.3	23.1	28.9	34.6	46.2	57.7	69.3	80.8	92.4	115.0	(138.0*)
90°	20.0	30.0	40.0	50.0	60.0	80.0	100.0	120.0	140.0	160.0	200.0	(240.0*)
120°	34.6	52.0	69.3	86.6	104.0	139.0	173.0	208.0	242.0	277.0	(346.0*)	(416.0*)
140°	55.0	82.4	110.0	137.0	165.0	220.0	275.0	(330.0*)	(385.0*)	(440*)	(550.0*)	(660.0*)

* Parenthesized data: major difference between effective and theoretical coverage.



Due to the physically unavoidable effect of spray-jet droop, the effective coverage may fall short of the theoretical coverage listed in the above table, especially in cases involving low spray pressure and substantial spray height.

Thread table

Compatibility of pipe threads			Female thread			
			DIN EN 10226		ISO 228	NPT
			Rc	Rp	G	
Male thread	DIN EN 10226	R	x	x	x*	-
	ISO 228	G	-	-	x	-
	NPT		-	-	-	x

* Leackage possible!
x = compatible
- = not compatible

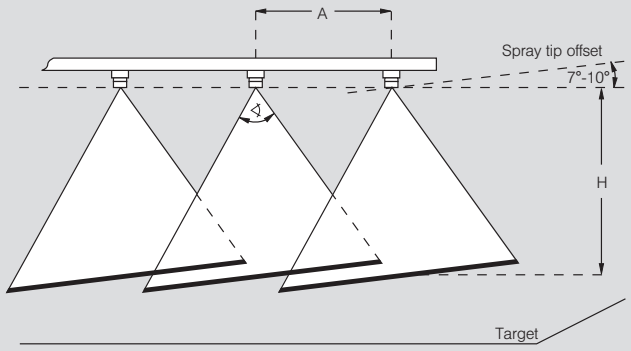
Taper thread: R, R_C, NPT
Parallel thread: R_P, G

Principal facts of spray nozzle technology

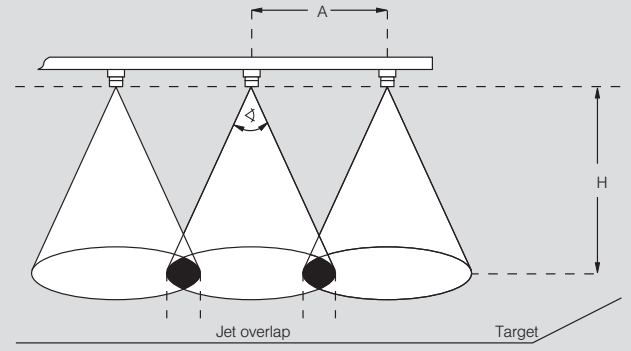
Overlapping in broadcast spraying

Most broadcast spraying with boom sprayers is executed with flat-jet nozzles. Multiple-overlapping ensures that the liquid is uniformly distributed across the entire working width of the boom. Thanks to their large spray angles of 120° and 90°, high-precision nozzles by Lechler are particularly well-suited to the job.

Arrangement of flat-jet nozzles



Arrangement of hollow-cone nozzles



Flat spray nozzles

With a view to avoiding mutual interference, the spray planes of flat spray nozzles have an offset of 5° – 10° with respect to the boom axis. In the case of Lechler diaphragm check valves used in conjunction with Lechler's TWISTLOC/ MULTIJET bayonet caps, the offset is adjusted automatically.
Lechler offers a special nozzle aligner (order no. 065.231.02 see page 55) for systems with threaded caps.

Hollow cone nozzles

Hollow cone nozzles should be arranged such way that their coverage pattern yields minimal overlap at the target-surface plane.

Spray height H: min.-**optimal**-max. [cm] for different nozzle spacings A [m]

	Flat spray nozzles									Hollow cone	Stream Jet
Type of jet Spray angle	ID3/IDKT AD/DF 120°	PRE 130°	IDK/IDKN 120°	ID/IDK/AD/ LU 90°	LU 120°	ST 110°	ST 80°	FD 130°	FT 140°	TR/ITR 80°	FL 160°
A = 1,0 m	-	-	-	-	-	-	-	-	*75	-	-
A = 0,5 m	40-**50**-60	40-**50**-60	40-**50**-90	60-**75**-90	40-**50**-70	40-**50**-60	60-**75**-90	50-70	*40	-	100
A = 0,25 m	20-30	-	20-45	-	20-35	20-30	30-45	-	-	50-**65**-80	-

* In the case of flood nozzles, the spray height is also a function of orientation. Uniform cross distribution requires at least a single overlapping.

Principal facts of spray nozzle technology

Flow rate

The flow rate through a nozzle is a function of spray pressure. The following basic relationship applies to the flow rate (l/min) with respect to spray pressure (bar): to get twice as much flow rate, you need four times as much spray pressure.

This is expressed by the following equation:

$$\dot{V}_2 = \sqrt{\frac{p_2}{p_1}} \times \dot{V}_1 \text{ (l/min)}$$

Density

All volumetric data shown in the tables are referred to the density of water (1.0 kg/l). For liquids with other specific densities, the conversion factors shown in the table at right must be applied.

Conversion factors for different densities

Densitiy of sprayed liquid	0.84	0.96	1.00 Water	1.11 Urea	1.24 ASL	1.28 UAN (28) UAN +S	1.32 UAN (30)	1.38 NP-solution	1.44	1.50
Conversion factor	1.09	1.02	1.00	0.95	0.90	0.88	0.87	0.85	0.83	0.81

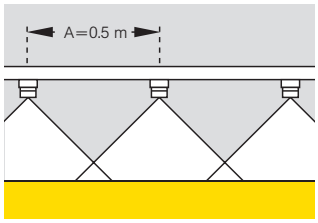
Convert as follows:

Flow rate of water (see table) **x** **Conversion factor** **=** **Actual flow rate of medium**

Application parameters

The application data in the tables of this catalogue were calculated for broadcast boom sprayers with a lateral nozzle spacing of A = 0.5 m. The formulae at right can be used for calculating flow rates for other nozzle spacings.

As a rule, three of the four application parameters – sprayer speed [km/h], liter per hectare rate [l/ha], flow rate [l/min], and nozzle spacing [cm] – are known. The most frequently unknown parameters [l/min; l/ha] are also calculated according to the formulae shown at right.



Liter per hectare rate, M (l/ha)

$$M = \frac{600 \times \dot{V}}{A \times v_F}$$

Flow rate/nozzle, $\dot{V}$ (l/min)

$$\dot{V} = \frac{1}{600} \times M \times A \times v_F$$

Lateral nozzle spacing, A (m)

Sprayer speed, v_F (km/h)

Sample for calculation of flow rate per nozzle:

A = 1 m, v_F = 6 km/h,

M = 400 l/ha

$$\dot{V} = \frac{400 \times 1 \times 6}{600} = 4 \text{ l/min}$$

Band width B [m]
Lateral nozzle spacing or row spacing A [m]

$$\frac{B}{A} \times 100 = \text{treated (sprayed) area as a percentage of total gross covered area}$$

Example:

$$\frac{0.2}{0.5} \times 100 = 40\ \%$$

The actual dosage for banding/row spraying is a function of the ratio between the treated (sprayed) area and the total gross covered area. The specific reduced dosage (liter per gross covered hectare), therefore amounts to a percentage (e.g., 40 %) of the full rate per hectare for broadcast spraying.

Principal facts of spray nozzle technology

Spray tip materials

Most agricultural spray nozzles are made of plastic (POM), stainless steel, ceramic and, in some cases, brass.

All these materials are resistant to known plant protection chemicals, and all with the exception of brass are resistant to liquid fertilizers.

- Plastic is conspicuous for high precision, resistance to wear and very good price-performance ratios.
- Stainless steel is the material of choice for high mechanical loads.
- Ceramic nozzles are the most wear-resistant of all and therefore recommended for their extremely long service lives and high area-specific performance.

Nozzle wear

- Even properly used nozzles wear down in time and eventually have to be replaced.
- The rate of wear depends on such factors as spray pressure, abrasiveness of the sprayed liquid, and the material of which the nozzle is made.
- Improper cleaning and handling can damage the nozzle tips and therefore must be avoided.
- An easy way to determine how badly worn a nozzle tip may be is to gauge its flow rate with the aid of a calibration container, a stop watch and a pressure gauge fitted on a nozzle body on the spray boom. With such a setup, one compares the flow rate through a used nozzle with that of a new one of equal size.
- If the flow rate through a used nozzle is found to exceed that of a new spray tip by more than 10 %, it should be replaced.

All data shown in the tables of this catalogue state the flow rates of new nozzles. Nozzles fitted on a spray boom can also be checked on a test bench (patternator) to determine their condition with regard to cross distribution. The quality of cross distribution and changes in flow rate can be interdependent with regard to the calculated coefficient of variation (CV).

The wear resistance of the nozzle material increases in the following order:

- brass
- stainless steel
- plastic
- ceramic

Nozzle maintenance

The proper, uniform application of plant protection chemicals requires well-functioning nozzles.

- Consequently, all nozzles should be washed out with clear water after each use to prevent any accumulation of deposits in the nozzle feed lines and in the nozzles themselves.
- Manual cleaning of nozzles should be restricted to the use of cleaning brushes (order no. 06A.D30.56.00 see page 12) to avoid damaging the exit orifice rims of the nozzles.
- The best way to avoid clogging is to ensure that all strainers and screen inserts serving the nozzles or other parts of the apparatus are properly selected.
- The flow-rate tables for nozzles of different types and sizes include references to recommended nozzle strainers.
- The strainer setup on the plant protection equipment should have decreasing mesh widths (i.e., increasing mesh number) from the filling screen to the nozzle strainer.

Regular inspection of sprayer and nozzles

Problems and consequences

Modern plant protection management, i.e., a form of practice that is both thrifty and conservational, is decisively dependent on the accurate application of plant protectants. That, however, can only be guaranteed, if the sprayer is inspected at regular intervals. Practiced hands have long known that undetected equipment defects have negative impacts on farm profits. Overdosing and underdosing cause lower yields and can damage crops to the point of total loss. False dosing also increases costs and emburdens the environment.

Mandatory testing

Some countries of Europe have laws that call for obligatory testing of sprayers, and other countries will soon be adopting such laws. In Germany, for example, all sprayers have to be checked at three-year intervals by an officially certified test station.

Heavy duty

Boom sprayers used for spraying more than 2000 ha a year are subject to accordingly heavy wear & tear and therefore should be inspected at least once a year to enable timely detection and rectification of concealed defects, thus ensuring that the implement retains a high level of operational reliability.

Cross distribution and coefficient of variation

The inspection of equipment includes an examination of in-service nozzles via computer-aided assessment of their cross distribution on a patternator (spray scanner) and calculation of the coefficient of variation. JKI-approved nozzles in as-new condition achieve coefficients of variation (CV) amounting to less than 7 % for defined spray heights on standardized laboratory spray booms and patternators. The permissible limit for sprayers and their nozzles in everyday use is 10 %.

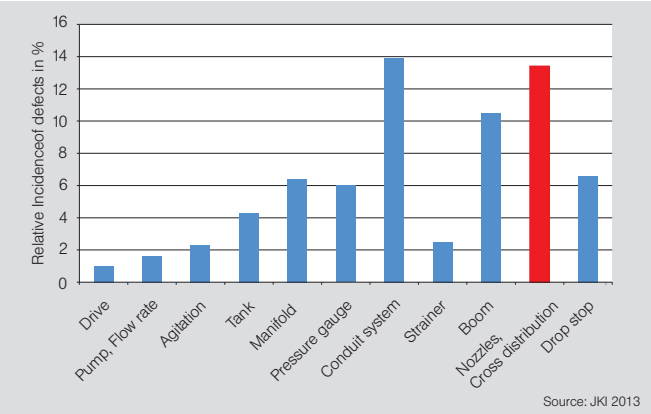
Most frequently encountered equipment defects

In connection with agricultural spray nozzles, the most frequently encountered equipment defects are:

- nonuniform nozzle output
- inadequate lateral distribution
- problems with the conduit system

Quality of Lechler-made nozzles

Agricultural spray nozzles by Lechler consistently and reliably meet all requirements imposed by the Federal Research Center for Cultivated Plants (JKI) and other international standards. Likewise, they satisfy all the requirements of Germany's new Plant Protection Law and existing European Laws.



Relative incidence of defects on boom sprayer components detected at mandatory sprayer inspection

Environmental-compatibility criteria for agricultural spray nozzles

Integrated plant protection is a term used to describe the application of physical, biological and chemical processes with allowance for economical damage thresholds. In that connection, ecologically viable techniques are becoming increasingly important, with the loss-reducing application of plant protectants enjoying a special place value.

JKI, ENTAM and CEN

Compliance with ISO, CEN, JKI and ENTAM standards regarding flow-rate tolerance and uniformity of distribution is instrumental to the optimal, selective use of plant protectants. The flow rates of new agricultural spray nozzles must remain within +/- 5 % of the table values.

The maximum allowable coefficient of cross-distributional variation within the stated pressure range and corresponding spray heights is 7 %.

These requirements derive in good part from the dependable quality of Lechler nozzles.

Drift

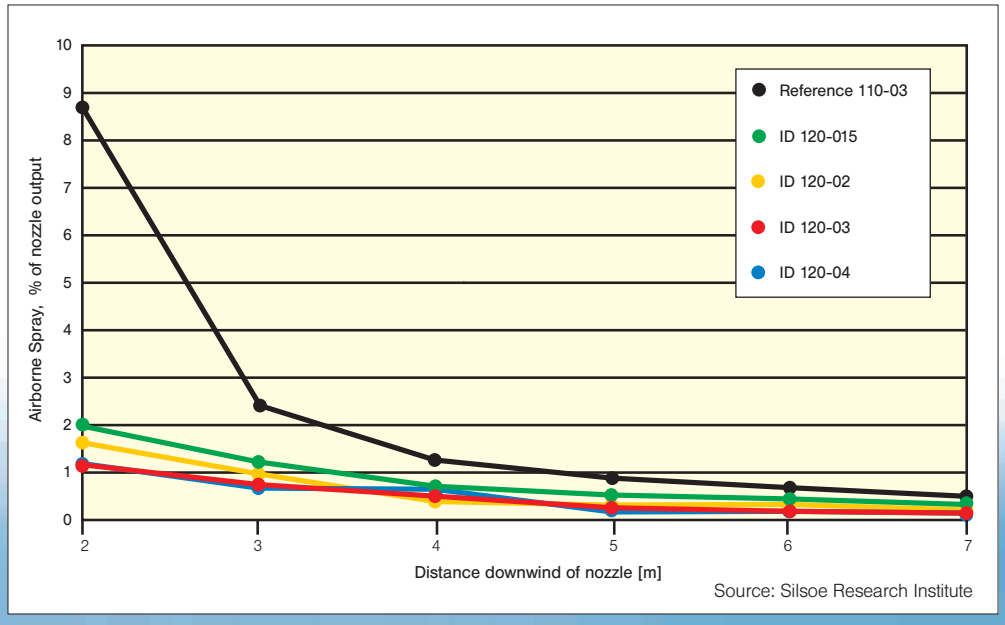
In the field of plant protection, the agent-laden droplets that do not land on the target surface but are instead carried off by the wind or thermal currents are referred to as drift.
Such errant additions to surrounding areas can damage adjacent crops, contaminate nearby waters, endanger man and animals, emburden other crops and adulterate the dosage applied to the target crop.

Drift is caused by a number of equipment-specific and meteorological factors, e.g.:

- droplet size
- sprayer velocity
- spray height
- wind velocity
- relative temperature
- ambient humidity

Technical know-how and knowledge of the determining factors enable good control of drift. Good, modern practice therefore includes:

- such drift-reducing measures as very coarse-droplet application through ID3/IDK/IDKN/IDKT nozzles
- allowance for the direction and velocity of the wind, for example metering in the field with Pocketwind III / IV, see page 55
- limitation of plant protection measures via ID3 and IDK/IDKN/IDKT-nozzles to wind velocities of 5 m/s or less, AD nozzles to 4 m/s or less, and LU nozzles to 3 m/s or less
- interruption of plant protection measures at ambient temperatures above 25 °C and relative humidity levels below 30 %, for example metering in the field with Pocket-wind III / IV, see page 55
- sprayer speed in accordance to national agricultural practice
- adherence to the optimal (in special cases the minimal) spray height.



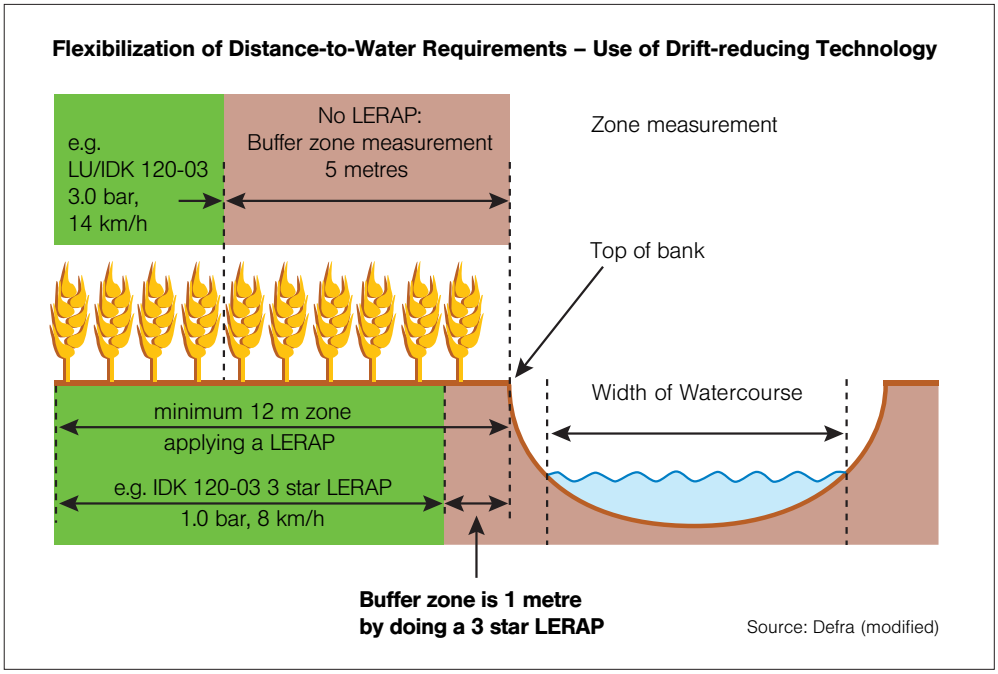
Airborne Spray Profiles of Lechler ID-Nozzles in comparison to conventional Flat Fan Nozzle

Environmental-compatibility criteria for agricultural spray nozzles

Drift- and Loss-reducing techniques

Provisions governing the application of plant protectants, e.g., distance-to-water restrictions and hedge rows, have been adopted for the protection of non-target organisms. Depending on the toxicity of the plant protectant, such drift- and loss-reducing equipment as injector nozzles can significantly reduce the required distances to water bodies and hedge rows for field crops and space crops (e.g. orchards, vineyards and tree nurseries). In Austria, Belgium, England, Finland France, Germany, the Netherlands and Sweden, Lechler nozzles are officially approved as drift reducing devices.

The distance requirements are functions of nozzle technology, type of water body, bank flora and process-technological requirements. Analyses of Lechler ID3/ID/IDN/IDK/ IDKN/ IDKT/IS/IDKS/E/AD nozzles and their drift stability in comparison with that of conventional flat spray nozzles in different countries, e.g., Austria, Belgium, England, Finland, France, Germany, the Netherlands and Sweden enabled their accreditation in the drift-reduction classes 99 %, 95 %, 90 %, 75 %, 66 %, 50 % and 25 %. For treating field crops along bodies of water,



ID3/ID/IDN/IDK/IDKN/IDKT/ PRE air-injector nozzles are used to enable shorter water-to-crop distances respectively hedge rows in compliance with pertinent regulations merely by reducing the speed of the motor and, hence, the sprayer speed and spray pressure.
It is neither necessary to readjust the sprayer nor to alter the sprayed-liquid dose rate, and the remainder of the field can be treated at the optimal pressure recommended for ID3/ID/IDN/IDK/ IDKN/IDKT/ PRE nozzles.

Even more in Austria, Germany, Finland and Sweden Lechler ES even flat spray nozzles have received the 90 % proven drift reduction for banding in row crops. For air assisted sprayers Lechler ID 90, IDK 90, AD 90 and for banding IS 80 air-injector off center nozzles are approved in Austria, Belgium, Germany, the Netherlands and Sweden.

In Austria, Belgium, England, Finland, France, Germany, the Netherlands and Sweden air-injector off center nozzles IS 80 respectively IDKS 80 are recommended along field peripheries and hedge rows at the end of the boom for sharp demarcation in combination with ID3/ID/IDN respectively IDK/IDKN/IDKT nozzles.

Analog to field crops pertinent regulations have to be followed up for air assisted sprayers by use of ID 90, IDK 90 or AD 90 nozzles such as reducing air volume or making air flow ineffective directed to water course or hedge rows for a defined number of rows and if necessary to apply defined pressure settings.

The flexibilization of distance-to-water requirements and hegde rows allow the use of drift-reducing technology in fields, vineyards and orchards. Thus has yielded useful-property gains in water's-edge and hedge row areas, higher efficiency in the use of such areas, and new regulations governing the use of plant protectants in those same areas.

Coverage and biological-efficiency criteria for agricultural spray nozzles

For the applied plant protectant to achieve a high level of biological efficiency, it has to cover the targets well. The use of Lechler high-precision nozzles characterized by exact dosing and uniform distribution achieves that goal.

Rate of water application

Heed the recommendations of the chemical companies regarding the proper rates of water application.

The lower the water application rate, the smaller the nozzles must be, and smaller nozzles tend to generate more drift.

Nozzles that emit coarse droplets, e.g., ID-/IDN-/IDK-/IDKN-/IDKT-nozzles, avoid drift. On the other hand, contact agents do not cover as well when sprayed out of air-injector nozzles with low pressure.

Coverage

The percentage share of target surface that is covered with the active agent is chiefly dependent on a number of technical, chemical and biotic factors. If the recommended application rates are adhered to, coverage should amount to at least 10 % to 15 %. Contact agents require uniform coverage, while (semi-)systemic agents must instead reach the part of the plant where the upward distribution process tends to begin.

The user's options for increasing the degree of target-surface coverage are limited:

- By technical means:
  - either the spray pressure can be raised or a nozzle producing finer droplets can be used to improve atomization.
  - the formation of a second spray level by using Lechler IDKT nozzle or TwinSprayCap in order to angle nozzles in direction of travel to the front and to the rear.
- By chemical means: the surface tension can be reduced, somewhat smaller droplets generated, secondary atomization enhanced, and/or a lower viscosity employed.
- By biotic means: the nature of the target surface (coat of wax or hair, phyllotaxy/leaf arrangement), i.e., the hairier the leaf and the wider the angle of impingement, the better the coverage.

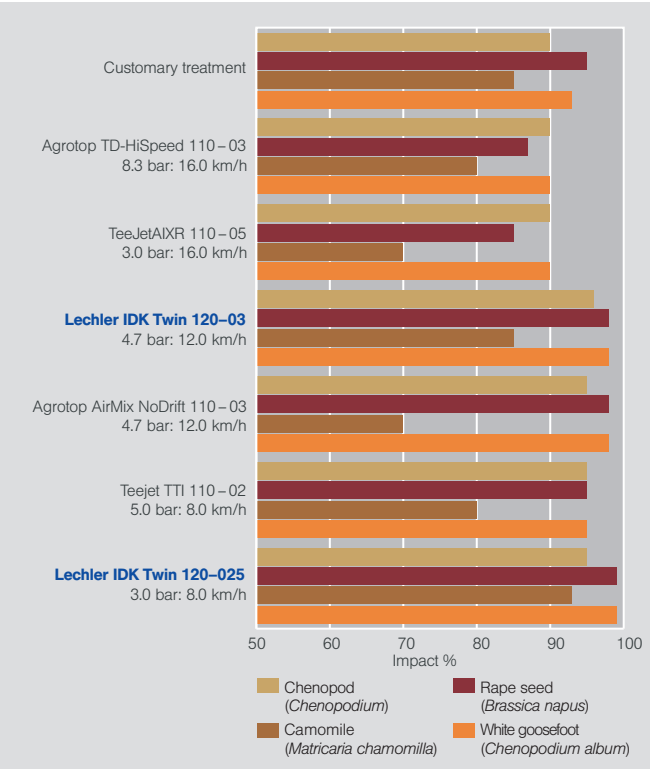
As a rule, the leaf area index (LAI) increases in the course of the vegetation period. For grain plants, it can reach levels between 70,000 and 125,000 m^2/ha. The water application rate should be adjusted to match the LAI of the target surface to ensure adequate, uniform application of the active agent. Multi-year experiments involving water application rates of 200 l/ha and more have confirmed the special suitability of coarse-droplet ID-/IDN-/IDK-/IDKN-/IDKT nozzles for achieving adequate, uniform active-substance coverage in comparison with conventional flat jet nozzles producing finer droplets. In particular, it was shown that drift reduction has the absolute effect of concentrating more active substance on the target surface.

Coarse-droplet application also scores better in terms of covering hard-to-reach target surfaces. The theoretical coverage probability for agents applied to, say, very small weeds with ID 120-03 nozzles spreading 260 l/ha at 5.0 bar, a forward speed of 7.0 km/h and a Volume Median Diameter (VMD) of 455 µm is very high at 52 drops per square centimeter.

In a given plant population, the achieved degree of coverage is determined by the penetrativity of the droplets. That, in turn, is a function of:

1. droplet size: The penetrativity decreases in inverse proportion to the fineness of the droplets. Horizontal surfaces are covered better than vertical surfaces (stalk).
2. velocity of impingement: Penetrativity improves with increasing velocity of droplet impingement. Higher pressures increase the velocity of impingement.
3. forward speed: The penetrativity of coarse droplets e.g. from ID-/IDN-/IDK-/IDKN-/IDKT-nozzles is only marginaly effected by the forward speed.

Sugar beets: Efficacy of Herbicides applied at higher forward speeds



Trials in sugar beet with regard to weed control are performed in Baden Württemberg/Germany showing biological efficacy of new nozzle types at higher forward speeds and l/ha rate of 150 l/ha

Source: Schenk in accordance with PSD Baden Württemberg

Nozzle selection via droplet size characteristic

Nozzles of a particular type and size can be selected from characteristic curves with allowance for the desired forward speed according to the following criteria:

- application rate (l/ha)
- desired atomization characteristic for the product employed and crop concerned

The atomizing characteristics of Lechler nozzles build on their droplet size data and their classification according to categories defined by BCPC (British Crop Protection Council). Lechler's droplet-size analyses are conducted according internationally standardized methods using modern Phase Doppler Anemometer (PDA). This approach yields a complete, type-specific description of each nozzle's pressure-dependent atomization characteristic in terms of droplet size and droplet velocity. The nozzles are assigned to different droplet-size categories (very fine, fine, medium, coarse, very coarse, extremely coarse) formulated on the basis of reference nozzles. This way, different types of nozzles are easier to compare for different spray pressures.

The droplet size categories and their respective key areas of application break down as follows:

- **extremely/very coarse**
  e.g. ID3 and IDK, IDKN, IDKT, PRE nozzles for liquid fertilizers and plant protection chemicals for use as drift- and loss-reducing techniques
- **coarse**
  e.g. ID3 and IDK, IDKN, IDKT, PRE nozzles for liquid fertilizer and low-drift application of plant protection chemicals
- **medium**
  e.g. IDK, IDKT and LU nozzles for reduced-drift application of plant protection chemicals
- **fine**
  e.g. LU nozzles for plant protection chemicals with stringent target-covering requirements; possibly elevated risk of drift
- **very fine**
  e.g. twin flat jet (DF) and hollow cone (TR) nozzles for application of plant protection chemicals with very stringent criteria regarding target-covering efficiency and penetration of crops with closed-canopy foliage; high risk of drift under adverse weather conditions.

For a given pressure, each different nozzle produces droplets of a different size. The droplet size spectrum reflects the frequency distribution of the individual droplet size fractions. The most important parameter in this respect is the Volume Median Diameter (VMD), which means that 50 % each of the sprayed volume (l/min or l/ha) consists of droplets that are larger or smaller, respectively, than the stated size of droplet. Another factor, the 10 % VD (Volume Diameter; Dv0.1) serves as a measure of the fine-droplet fraction and, hence, provides information on the drift potential of the nozzle in question.
Each increase in spray pressure at the nozzle reduces both the VMD and the 10 % VD. The larger the spray tip size, the larger the VMD and the 10 % VD. Droplet-size data sheets for Lechler nozzles are available on request.

With state-of-the-art technology we cover the whole range of measurement tasks:

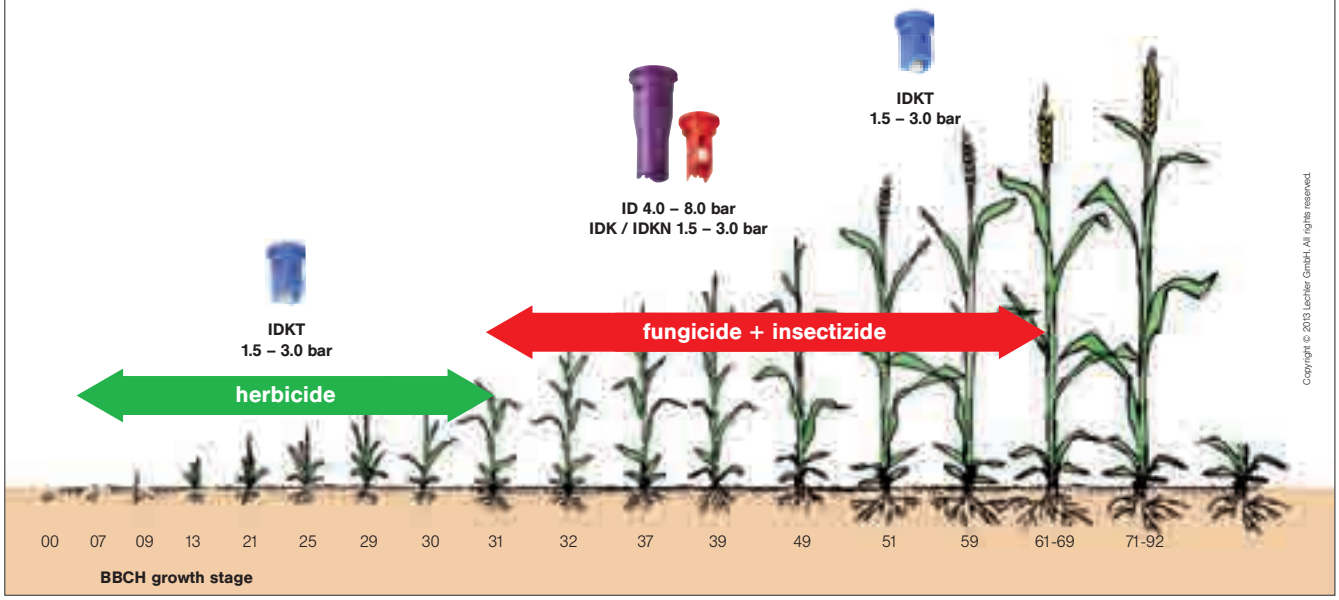
- Liquid flow rate
- Spray angle
- Spray pattern
- Air flow rate measurement
- Droplet size measurement
- Droplet velocity measurement
- 3D-Spray impact measurement
- Liquid distribution
- Spray videos
- Sound level measurement

Nozzle recommendation for pesticide application

Cereals

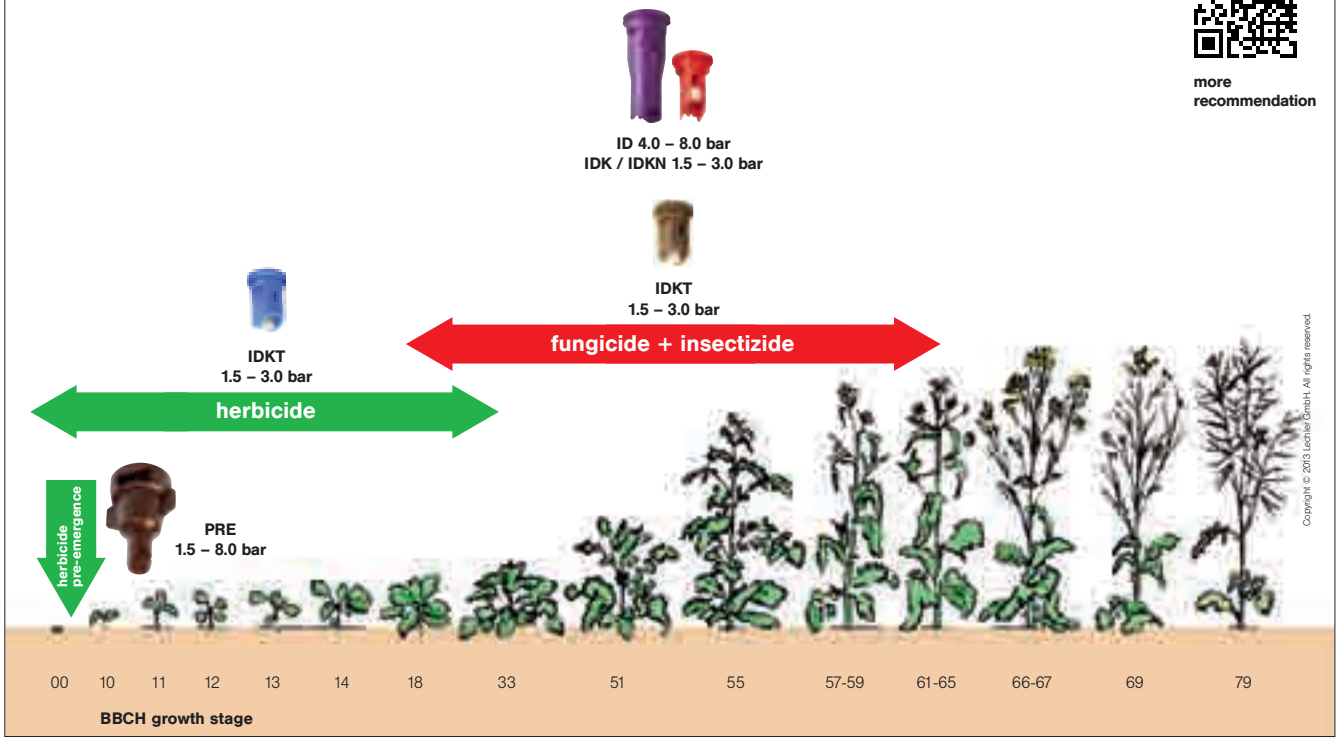
Two nozzle strategy
- ID, IDK/IDKN good canopy penetration
- IDKT optimal coverage without spray shadow

more recommendation



Rape seed

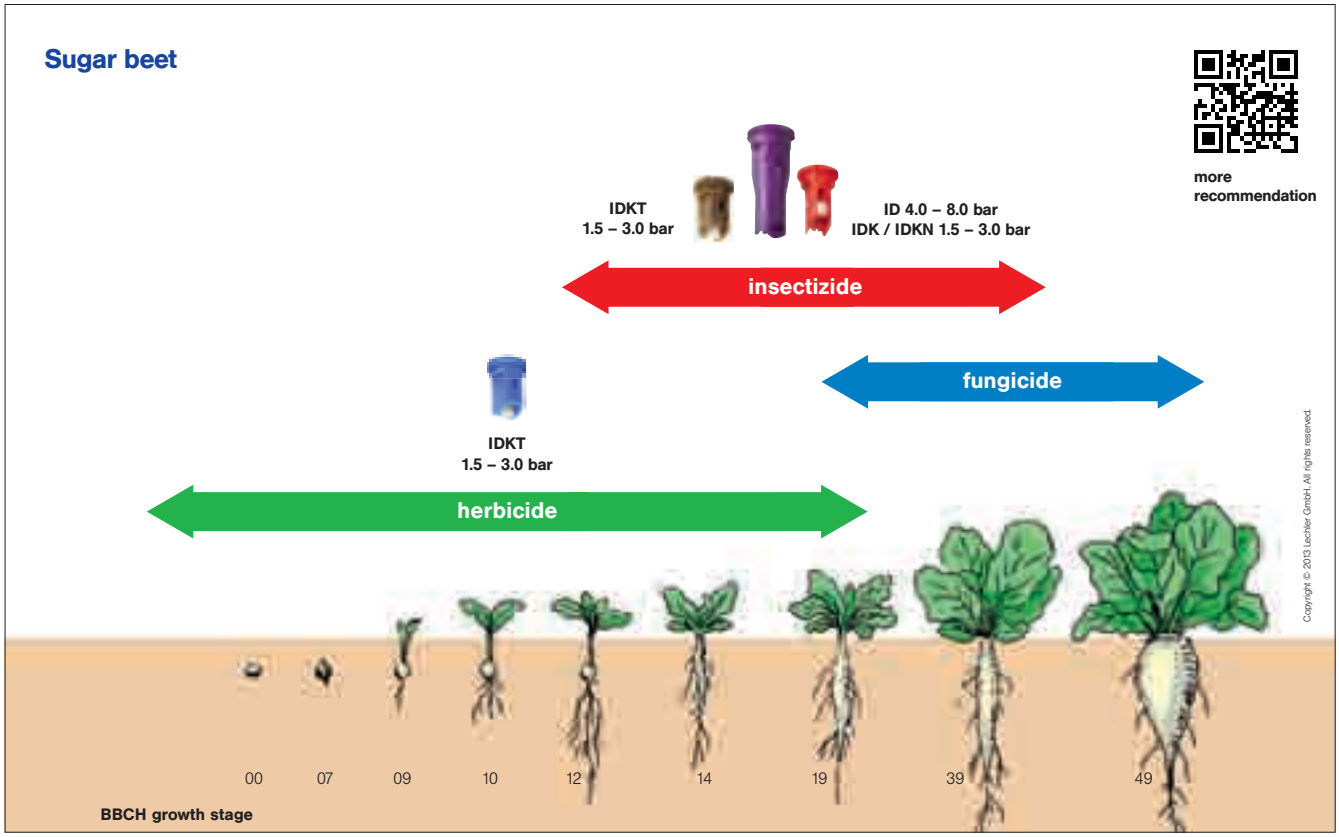
more recommendation



Nozzle recommendation for pesticide application

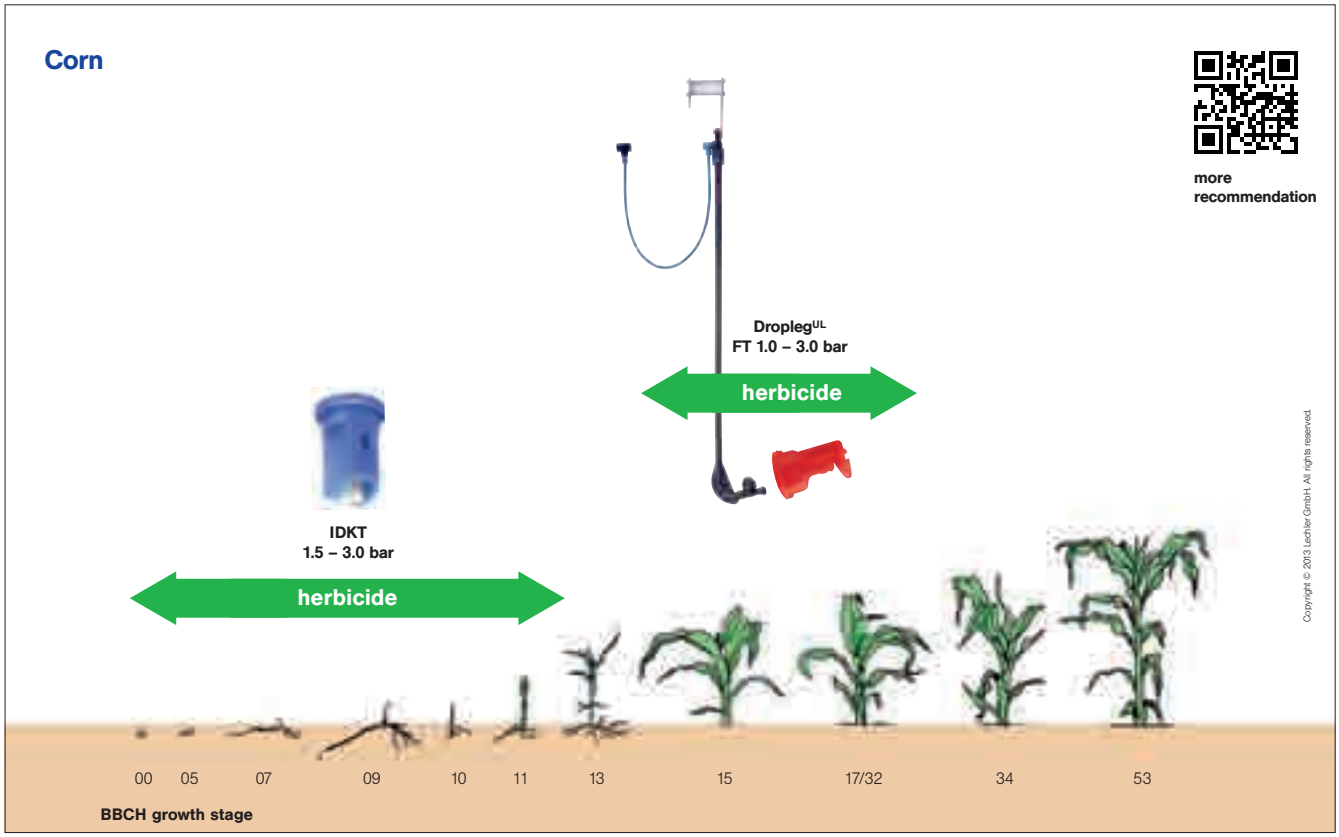
Sugar beet

more recommendation



Corn

more recommendation



For your notes

General Terms and Conditions of Contract, Delivery and Payment A 2009

Effective as per September 1, 2008

§ 1 Scope of Terms and Conditions, Exclusion of Conflicting Terms and Conditions

1. Our General Terms and Conditions for sale and delivery shall apply to all our offers, deliveries and performances.

2. The following Terms and Conditions shall only apply to entrepreneurs according to Section 14 German Civil Code, legal entities under public law or an asset under public law (hereinafter referred to as the "Customer"). Such Terms and Conditions shall also apply to all our future offers, deliveries and performances relating to the Customer without requiring any further reference or agreement.

3. As a general rule, our General Terms and Conditions apply exclusively. Any contradicting, conflicting or additional general terms and conditions used by the Customer are expressly excluded and rejected.

§ 2 Conclusion of Contract, Scope of the Delivery, Prohibition of Assignment

1. Our offers are subject to change and are non-binding. In order to become binding, any orders or agreements require our written order confirmation or our delivery of the goods. The same shall apply to any amendments, changes or side agreements.

2. All information about our products, in particular pictures, sizes, performance criteria and any other technical data included in our offers and brochures shall be regarded as approximate average values. Tolerances in quantity, weight, number of pieces and dimensions customary in this line of business are expressly reserved.

3. Our written order confirmation or, in the event of lack of such order confirmation, our offer shall be relevant determining the scope of delivery and/or the service to be rendered.

4. Any agreement, side agreement, warranty or modification to the contract must be reduced to writing in order to be binding. The foregoing shall also apply to a waiver of such written form requirement.

5. Any documents such as drawings, pictures, descriptions and specifications of weight and dimensions which form the basis of our offer shall only become an integral part of the contract if they are expressly made a part of the offer. We reserve the right to make modifications to the extent such modifications are not essential and the subject of the contract is not unreasonably impaired for the Customer.

6. The Customer shall not be entitled to assign or to transfer any claims or rights resulting from the business relationship with us without our prior consent. The same applies to any of the Customer's claims against us which have directly arisen by operation of law.

§ 3 Prices, Payments, Set Off and Rights of Retention

1. Our prices are net-prices and shall be on an Ex Works Metzingen basis. VAT at the rate applicable at a time (even if not separately shown), costs for packaging, freight, assembly, postal charges, insurance costs, customs duties, any costs for bank or payment transactions as well as any other additional costs will have to be paid in addition.

2. Our invoices are immediately due for payment. For payments made within 14 days after the invoice date, we grant a 3 % cash discount. The timeliness of the payments is determined by the date the amount is credited to the point of payment indicated by us. Where the Customer is in delay with any payment, the invoice shall be immediately due for payment without any discounts.

3. In the event of payments outstanding from the Customer - also in relation to other contractual relationships between the Customer and us – we are entitled to make any further deliveries dependant on the complete settlement of such outstanding payments.

4. Where our Customer is in delay with payments, payment conditions are not met, insolvency proceedings with regard to the assets of our Customer are filed for or any other circumstances become known or apparent that give cause to reasonable doubts with respect to the Customer's creditworthiness, including such facts that existed at the time of the conclusion of the contract beyond our best knowledge, we shall be entitled to stop any delivery and to demand advance payment or the provision of securities acceptable for us with respect to any outstanding deliveries. If such securities should not be granted after an adequate grace period, we shall be entitled to withdraw from the contract. Our further statutory rights shall remain unaffected. The Customer shall be liable for all damages arising from the resulting non-performance of the contract.

5. In the event of substantial increases of material prices, salaries or energy costs between the time of the conclusion of the contract and the delivery date, we are entitled to unilaterally raise the prices reasonably (Section 315 German Civil Code), if and to the extent the period of time between the time of the conclusion of the contract and the delivery date is longer than 4 months.

6. With respect to orders under framework agreements, delivery on demand or call orders that have not been placed yet, we reserve the right to adjust the prices in the event substantial changes in material prices should occur during the term of such framework agreements or delivery on demand/call orders. Such adjustments require a notice period of 4 weeks and can only be made if our costs (in particular caused by increases of material prices, salaries or energy costs) should increase more than 5 percentage points in the aggregate. If the resulting increase in price should exceed 10 percentage points, the Customer is entitled to rescind the contract.

7. Without requiring a prior reminder, we shall be entitled to demand interest payable from the due date at an annual rate of at least 5 percentage points above the base interest rate.

8. The Customer may only offset receivables due to us with counter claims or claim a retention right, if such counter claims are undisputed or have been established by a court of law in an unappealable manner. Notices of defect furnished by the Customer shall neither affect the Customer's payment obligations nor the date a payment falls due. The Customer hereby waives any right to refuse performance as well as any retention right. Such waiver shall not apply if we, our representatives or our vicarious agents have committed a fundamental breach of contract or the Customer's counterclaims which form the basis for the right to refuse performance or the retention right, are undisputed or have been established by a court of law in an unappealable manner.

9. 30 days after the receipt of the invoice the Customer shall be deemed in delay unless circumstances exist (e.g. reminder or terms of payment determinable by calendar) that cause the Customer to be deemed in delay earlier. When the Customer is in delay with payment, our receivables shall bear and the Customer shall pay interest at a rate of annually 8 percentage points above the base interest rate.

10. The minimum net order value is α 100,-, in the event of custom-made products α 250,-.

11. Cheques and drafts will only be accepted after previous agreement and only on account of performance. Interest and costs shall be borne by the Customer.

§ 4 Delivery Time, Partial Deliveries, Deviations in Quantity

1. If a term of delivery is agreed, such term shall begin with the date of our order confirmation, however, not before complete delivery of the documents to be provided by the Customer and/or receipt of any advance payments that may have been agreed upon. If we should be unable to make a delivery due to reasons caused by the Customer, a term of delivery shall be deemed complied with if the item to be delivered has left our premises or has been notified to the Customer as ready for dispatch before such term of delivery has expired.

2. A term of delivery shall be extended appropriately in the event of Force Majeure or any unforeseen obstacles such as unrest, strike, lock-out, fire, confiscation, embargo, statutory or official constraints of energy consumption or incorrect and/or not timely self-supply, if and to the extent such obstacles have not been culpably caused by us and - despite reasonable care - we were unable to avert such obstacles and such obstacles have influence on our ability to timely fulfil our obligations under the contract. If due to such circumstances the extension of the term of delivery should exceed a reasonable time, and after a reasonable grace period defined by the Customer has expired unsuccessfully, the Customer shall be entitled to withdraw from the entire contract or, if the Customer is interested in partial performance of the contract, withdraw from such part of the contract that is yet unfulfilled. If we have already performed in part, the Customer may only withdraw from the entire contract if the Customer can evidence that he has no interest in partial performance.

3. If we should be in delay of delivery and after a reasonable grace period defined by the Customer has expired unsuccessfully, the Customer shall be entitled to withdraw from the entire contract or, if the Customer is interested in partial performance of the contract, withdraw from such part of the contract that is yet unfulfilled. If we have already performed in part, the Customer may only withdraw from the entire contract if the Customer can evidence that he has no interest in partial performance. Further claims of any kind, in particular claims for damages including consequential damages, shall be excluded. § 9 remains unaffected hereby.

4. We are entitled to deliver before the expiry of the delivery date and to deliver in partial deliveries, provided that any conflicting interests of the Customer are not affected in an unacceptable manner.

5. In the event of custom-made products, the ordered number of items cannot always be adhered to because of considerations concerning production and the aligned risk of deficient products. We reserve the right to minor excess deliveries and short deliveries which shall lead to a proportionate reduction or increase of our remuneration; these deliveries do not represent a defect in terms of the German Civil Code.

§ 5 Passing of Risk, Delivery, Packaging

1. Unless agreed upon otherwise, our deliveries are carried out on an Ex Works basis.

2. The risk including the risk of seizure passes in all events, even if the delivery is free of transportation charges, to the Customer no later than when the delivery item is handed over to the person in charge of the transport. This shall also apply when we ourselves are in charge of the transport or if we engage a third party with the transport even if we have assumed the duty to transport or to deliver on our own costs. If the delivery is delayed due to reasons caused by the Customer, the risk already passes to the Customer on the day we have informed the Customer that the delivery item is ready for dispatch.

§ 6 Retention of Title

1. We retain the title to the goods delivered until complete fulfilment of all claims resulting from the business connection with the Customer including claims resulting from cheques and drafts and any claims for recourse resulting from payments of cheques and drafts accepted only on account of performance. If payment is agreed upon with the Customer on the basis of cheque-draft-procedure, the retention of title shall last until the danger of recourse resulting from the drafts issued by us has ceased to exist.

2. Any reprocessing or change of the delivered goods by the Customer will be done for us without creating any obligations for us. If the delivered item is connected, mixed, mingled or processed with other items not belonging to us, we acquire joint ownership of the new goods. The share of the joint ownership corresponds to the relation of the invoice value of the delivered item to the value of the new product. The Customer is authorized to connect, mix, mingle or process the delivered item in the regular course of business, provided that the aforementioned security interests are preserved.

3. The Customer is only entitled to sell the delivered items and the items coming into existence from them according to subsection 2 above (hereinafter collectively referred to as "goods subject to retention of title") in the ordinary course of business provided that the extended retention of title (assignment of claims according to subsection 4) is ensured. Any other acts of disposal, in particular pledge, lease, rent or transfers by way of security shall not be permitted.

4. The Customer hereby assigns to us all claims including any future claims resulting from the resale or other use of the goods subject to retention of title. We hereby accept this assignment. If the good subject to retention of title is jointly owned by us, such assignment shall only relate to the amount of the claim which corresponds to the proportionate value of our joint ownership.

5. The Customer is only authorized dispose, process, connect, mix or mingle the good subject to retention of title and to collect the assigned claims in the ordinary course of business and only revocably. Any revocation may only occur if the Customer has not correctly fulfilled his duties, in particular his payment duties, if he is insolvent or heavily indebted or the opening of an insolvency proceeding has been applied for. In such an event, the Customer shall notify the debtor of the assignment upon our request, furthermore we are entitled to disclose the extended retention of title to the Customer's client. If the permission to collect has been revoked, the Customer shall inform us about the name and address of his Customer.

6. The Customer's authorization to dispose of, to process, to connect, to mix or to mingle the good subject to retention of title and to collect the assigned claims shall terminate without express revocation in the event of insolvency, cessation of payments, a filing for insolvency concerning the Customer's assets by the Customer or a third party or in the event of establishment of over-indebtedness.

7. In the event of subsection 5 and 6, we are entitled to request the return of the good subject to retention of title after reminder and fruitless expiry of an appropriate additional respite. The Customer is obliged to release such goods. The Customer shall immediately disclose to us the name of the assigned claim's debtor. We are also authorized to disclose the extended retention of title to the Customer's client.

8. If the realisable value of the securities allowed according to the above-stated regulations exceeds our claims more than 20 %, we will at our discretion release our securities upon the Customer's request.

9. The Customer shall immediately inform us in writing about any future or past third parties' access to the goods subject to retention of title or the assigned claims by handing us out all documents necessary for an intervention. Any intervention costs, including costs of litigation, shall be borne in the relationship between us and the Customer by the Customer.

§ 7 Warranty

1. We are to be held responsible for material defects and defects of title according to the following provisions.

2. Certain characteristics shall only be considered as warranted if expressly confirmed in writing. A guarantee shall only be deemed issued if expressly denominated as "guaranteed" in writing.

3. The Customer shall immediately give notice in writing of any kind of obvious material defects, deviations in quantity and false deliveries, at the latest within one week after delivery, in any case before connection, mixture, processing or installation.

4. The Customer shall immediately give notice in writing of any hidden material defects, at the latest within 7 days after their discovery.

5. The Customer shall give us the opportunity to jointly assess the notified complaints and to be present at any withdrawal for material examination.

6. Unless provided otherwise, all claims for defects are subject to a limitation period of 12 months after the passing of risk. There shall be no reduction of the limitation if the delivered item is used for a building according to its intended use and has caused the building's defectiveness, as well as for claims according to Section 478 German Civil Code (right of recourse); instead, the statutory provisions on limitation periods shall apply.

7. Unless provided otherwise in this § 7, our warranty for defects of quality and for defects of title shall be limited to supplementary performance. Within the scope of our supplementary performance obligation, we are entitled, at our discretion, either to remedy the defect (subsequent improvement) or to the delivery of faultless material (replacement). If our supplementary performance is delayed beyond a commensurate period of time or if the supplementary performance is unsuccessful despite repeated efforts, the Customer is entitled to demand a reduction of the purchase price or to withdraw from the contract. A withdrawal from the contract is excluded if the defect is irrelevant. Furthermore, in the event of faultless partial deliveries, the Customer may only withdraw from the entire contract if he can evidence that he has no interest in the partial performance. Further claims, in particular claims for reimbursement of expenses and for damages, are excluded unless provided otherwise in the following § 9. Replaced parts shall be returned to us upon our request.

8. The Customer shall return the defective good to us for subsequent improvement or replacement, unless a reshipment is not possible because of the kind of delivery. We shall bear the costs for transportation due to supplementary performance, however only from the place where the good has been delivered to according to the terms of contract and limited by the amount of the purchase price. We shall take title to the replaced delivery items or parts thereof or, as the case may be, they remain our property.

9. The Customer has to give us the necessary time and opportunity for supplementary performance. Only in the event of urgent cases of risk to the plant safety, the protection against unreasonably high damages or delay with the removal of defects, the Customer shall be entitled to cure the defect by himself or by a third party after prior notice and to demand from us restitution of the necessary costs.

10. Claims for recourse according to Sections 478, 479 German Civil Code are excluded, unless the claim by the consumer was legitimate and only within the limits of statutory regulations except for gestures of goodwill which were not coordinated with us. Such claims require the observation of own duties of the person entitled to recourse, in particular the observation of the requirement to make a complaint in respect of a defect immediately on receipt of goods.

11. The processing or installation of delivered items is always deemed to be a waiver of the notice of defects to the extent the defect was obvious.

12. In the event of legitimate notices of defects, payments by the Customer may only be withheld in an adequate proportion to the material defects occurred. In the event of an unjustified notice of defects, we are entitled to demand from the Customer reimbursement of the expenses resulting therefrom.

13. Claims based on defects shall be excluded in the event of minor deviations from the agreed or usual characteristics or utility.

14. The recognition of a material defect always requires the written form.

15. There shall be no warranty obligation if the intended use of the delivery item by the Customer deviates from the common use, unless agreed upon in writing.

§ 8 Withdrawal, Impossibility of Performance

1. Irrespective of other provisions in these General Terms and Conditions, the Customer may withdraw from the contract in writing, if and to the extent the performance of the contract has become entirely impossible before the passing of the risk. In the event of partial impossibility of performance, the Customer may only withdraw from the contract if he can evidence that he has no interest in the partial delivery or partial performance – otherwise, the Customer may demand a commensurate reduction of the purchase price. Further claims of the Customer are excluded unless provided otherwise in the following § 9. Furthermore, the Customer may only withdraw from the contract if the breach of duty is substantial.

2. In the event that no party is responsible for the impossibility of performance, we are entitled to demand a part of the purchase price in proportion to the part of the contract already performed.

§ 9 Liability

1. Our liability for damages, out of which legal reasons whatsoever, is limited to

a) our acts of intent or gross negligence including acts of our leading employees and vicarious agents

b) culpable injury of life, body, health

c) culpable material breach of contract

d) if we have intentionally misrepresented the defect by silence or if we have guaranteed the absence of defects

e) to the extent we are liable for personal and material damages with respect to privately used items under the German Product Liability Act.

2. Further claims for damages are excluded.

3. In the event of a culpable material breach of contract, our liability is limited to losses reasonably foreseeable and typical for this kind of contract. The foreseeable loss typical for this kind of contract shall generally be the amount of the contract value of the particular performance.

4. If the risk of loss foreseeable and typical for this kind of contract according to § 9 subsection (3) above is covered by a liability insurance, our liability including the liability of our legal representatives and vicarious agents is limited to the insurance payments. To the extent the insurer is not liable to pay, we shall pay compensation limited by the amount of the insurance sum.

§ 10 Intellectual Property Rights, Tools

1. We reserve all title and rights including copyrights and other intellectual property rights in application recommendations, drafts, drawings and other documents. These documents may not be passed to third parties without our consent and they have to be returned to us upon request.

2. If we have delivered products according to drawings, samples or other documents supplied by the Customer, the Customer warrants that these documents are free of any third party rights. If any third party rights are infringed, the Customer shall immediately defend us, hold us harmless and indemnify us against all loss, damages, costs and expenses awarded against or incurred by us. The Customer shall reimburse us all expenses including attorney's fees incurred due to such claims.

3. Tools, necessary for the production of the delivery item and manufactured by us, remain our property, even if we are charging the Customer for the costs on a pro-rata basis.

§ 11 Assembly

With respect to assembly, the standard terms of assembly of the "Verein Deutscher Maschinenanstalten e.V.", Frankfurt, Germany, shall apply.

§ 12 Place of Performance, Place of Jurisdiction, Applicable Law

1. For all claims arising out of the business relationship, the place of performance shall be 72555 Metzingen, Germany.

2. The exclusive place of jurisdiction for all claims resulting from the business relationship including claims from cheques and drafts shall be with the court locally competent for our principal place of business. We are also authorized, however, to sue our Customer at his general place of jurisdiction.

3. These General Terms and Conditions shall exclusively be governed by German law excluding the rules of the United Nations Convention on Contracts for the International Sale of Goods (CISG) and international private law.

4. Should one or another provision of these General Terms and Conditions be or become fully or partly invalid, the validity of the remaining provisions shall remain unaffected hereby. The parties shall undertake to replace such provision by a valid provision the business purpose of which is as close as possible to that other cancelled provision.

5. Any changes of these General Terms and Conditions require the written form. This applies mutatis mutandis to a waiver of the written form.

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