



Spray Nozzles and Systems for the Shipbuilding Industry



Advanced spray technology based on 125 years of experience

Nozzles and spray systems are used for a lot of applications in the shipbuilding industry. Their performance has a major impact on the success of a variety of processes.

For over 125 years, Lechler as a world-wide leading supplier has pioneered developments in spray technology for all industries, designing, developing and manufacturing products of outstanding reliability and performance. All accompanied by expert advice based on knowledge gained through experience in providing both conventional and innovative solutions.



Today, Lechler offers one of the most comprehensive range of nozzles and spray systems available to industry world-wide.

Serving industry worldwide

Lechler is a truly international company, offering sales and technical support to diverse industries, throughout the world.

In addition to over 250 employees at our Metzingen headquarters in Germany, subsidiary companies have plants and offices in the UK, the USA, China, India, France, Belgium, Spain, Finland, Sweden and Hungary. We also have a network of sales offices and representatives covering many other countries.

Wherever you are, Lechler seeks to establish a partnership, helping you to enhance process quality through the application of advanced fluids engineering expertise.



Headquarters, Germany



Lechler Ltd., United Kingdom



Lechler Inc., USA

How you can profit from our know-how

Lechler spray nozzles are the kind of system component that have a decisive role in the reliability and economic efficiency of entire processes, such as

- fire fighting
- cleaning
- cooling
- protection against radiation heat
- NBC protection.

Lechler – synonymous with quality

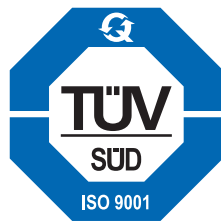
The Lechler policy of continuous improvement and meticulous inspection is evidence of our commitment to whole life quality. From development, through manufacture to installation, Lechler products are subject to continuous quality management. State of the art test and inspection methods according to ISO 9001:2000 certification guarantee the durability, reliability and longevity of Lechler spray nozzles and systems.



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This is the main reason why Lechler spray nozzles for applications on ships are approved by SAK (ship equipment catalogue of the German navy), by Germanischer Lloyd and Bureau Veritas.



Automated production for consistent performance

Many of Lechler's automated manufacturing processes have been developed to guarantee not only optimum productivity, but also consistence of product parameters to exacting tolerances. Not only does every nozzle look like another of its type, but their spray characteristics will also be identical.



Lechler – your reliable partner

Many important shipyards all over the world rely in Lechler products. Working close together with them our experts in spray technology find the optimum solution for their nozzle application. Actually, there is always a Lechler sales office or representation close by, wherever you are in the world.



On the following pages you will find a lot of detailed information on Lechler spray nozzles for applications on civilian and military ships. If you need further information, please do not hesitate to contact us. Our competent technical advisors will give you any support you need.

Your advantages at a glance:

Safety:

- reliable operation
- defined performance

Economic efficiency:

- optimized spray characteristics
- long service life

Easy handling:

- quick installation
- uncomplicated maintenance

Reliable Service:

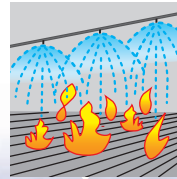
- competent consultation services
- short-notice availability

Spray solutions for civilian ships

Functional reliability and dependability have always been of paramount importance on the high seas. Accordingly, ship builders have always given preference to the best suppliers. When it comes to nozzles and spraying systems, major shipyards rely on the name Lechler.

In the space available, of course, we can only touch upon a few of the most important areas of application and the respectively suitable nozzles, but feel free to consult our comprehensive nozzles catalogue at your convenience. And if you have any questions about any particular applications, our specialists will be glad to help you out.

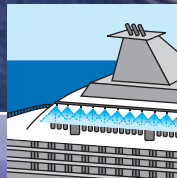
Fire fighting



Fire protection and cooling Containers

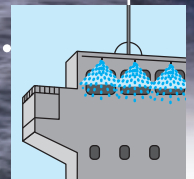


Cleaning Windows



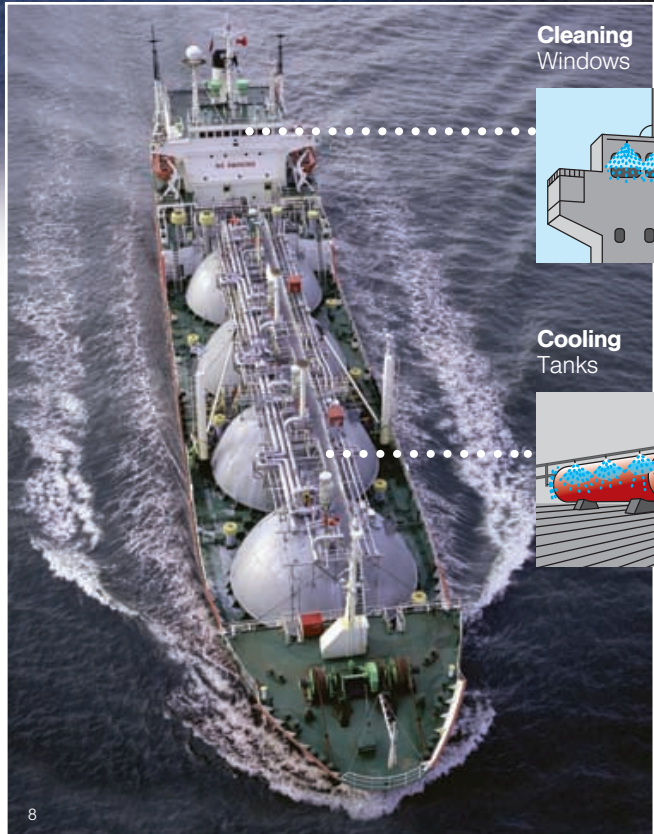
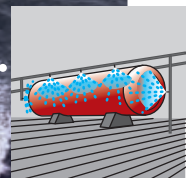
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Cleaning Windows



9

Cooling Tanks



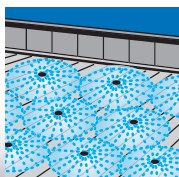
8

Examples for applications

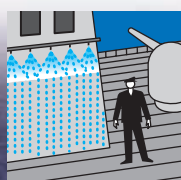
Application	Location	Nozzle Type	Page
Fire fighting	Pump room	525	14
	Engine room	502	6
	Car deck	525	14
	Rescue passages	525 502	14 6
Cleaning	Suction tunnel (tanker)	617	13
	Windows	612	13
Cooling	Vessels/tanks	302	12
		524 460/461	14 General catalogue
	Pipe spraying	460	General catalogue
		524	14

Spray solutions for military ships

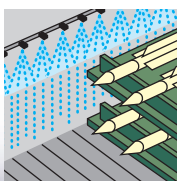
NBC Protection
Deck



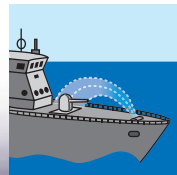
NBC Protection
Superstructures



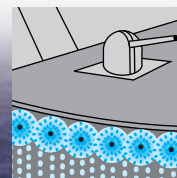
Radiation and heat protection
Ammunition rooms



NBC protection
Single objects
Missile launchers



Reduction of infrared signature



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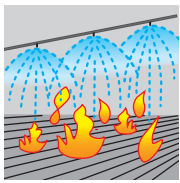
Examples for applications

Application	Location	Nozzle type	Page
Fire fighting	Engine room	502	6
Protection against radiation and heat	Bulwark (fire boats)	571	8
		571	8
Protection	Ammunition rooms	302	12
		304	12
		304	12
NBC protection	Decks	571	8
		Single objects on board	503
	Superstructures	652	10
	Missile launchers	600	11
Cleaning	Windows	612	13
Cooling	Vessels/tanks	302	12
		524	14
		460	General catalogue
	Pipe spraying	460/461	General catalogue
		524	14

The particular circumstances and requirements of military task scopes make those responsible in such areas especially sensitive to things like precision and dependability - attributes that apply without restriction to Lechler-made products.

Otherwise, nozzles by Lechler could not serve so reliably in their rough-and-tumble day-to-day marine applications. Moreover, their perfect engineering keeps opening up additional application potentials.

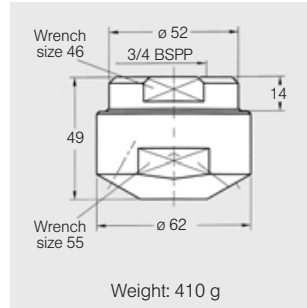
Here you see a few of the more common applications. Leafing through our full catalogue, however, you are sure to run across numerous additional good ideas. And don't forget: whenever you find yourself grappling with a particularly tricky problem, you can tap into our nozzle specialists' comprehensive know-how as you wish.



Multiple spray nozzles Series 502 Fire fighting

- Fine full cone atomization with the aid of several hollow cones spraying into one another

Application:
Fire fighting in engine rooms.



Spray angle	Ordering no.			Flow rate \dot{V}		Sieve (Material: 1.4401)	Spray diameter D at p = 2 bar	
	Type	Material no. 1.4571	Code 3/4 BSPT	p [bar] l/min 5	p [bar] m ³ /h 5		1000 mm	2000 mm
130°	502. 688	17	29	7.0	0.4	0.40 x 0.25 x DIN 4189	1000	1100
	502. 748	17	29	11.0	0.7	0.63 x 0.40 x DIN 4189	1100	1200
	502. 798	17	29	15.0	0.9	0.80 x 0.50 x DIN 4189	1200	1300
	502. 828	17	29	18.0	1.1	0.80 x 0.50 x DIN 4189	1400	1600
	502. 868	17	29	22.0	1.3	0.80 x 0.50 x DIN 4189	1500	1700

Diagrams for other spray distances on request.

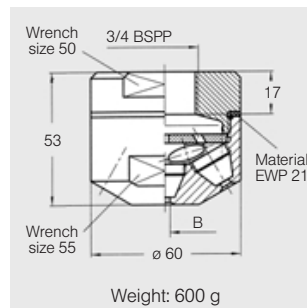


Cluster solid jet nozzles Series 502/503 NBC Protection

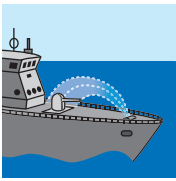
- Clustered jets with coarse drops
- Low wind drift
- Large coverage range

Application:
To wash off NBC deposits from single objects on ships.

* NATO/BW-order number:
4730 - 12 - 189 - 8184



Spray angle	Ordering no.			B Ø [mm]	E Ø [mm]	Flow rate \dot{V}									
	Type	Material-no. 1.4571	Code 3/4 BSPT			p [bar] l/min					p [bar] m ³ /h				
				5	6	7	8	9	5	6	7	8	9		
75°	503. 885	17	06	1.9	2.8	25.0	27.0	30.0	32.0	34.0	1.5	1.6	1.8	1.9	2.0
	502. 915*	17	06	2.1	2.8	30.0	33.0	36.0	38.0	40.0	1.8	2.0	2.2	2.3	2.4
	502. 005	17	06	2.8	4.1	50.0	55.0	59.0	63.0	67.0	3.0	3.3	3.5	3.8	4.0
	503. 035*	17	06	3.6	2.8	60.0	65.0	70.0	75.0	80.0	3.6	3.9	4.2	4.5	4.8

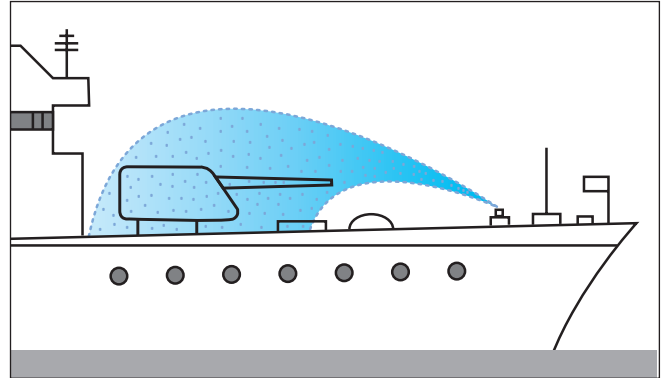
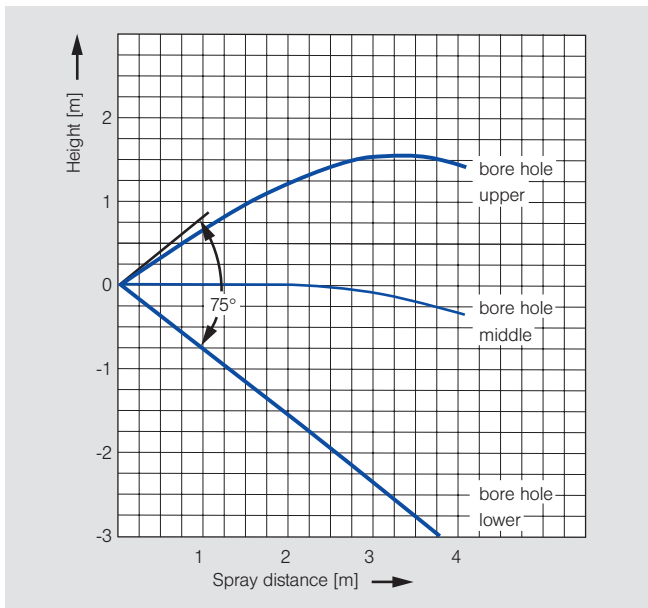


Cluster solid jet nozzles

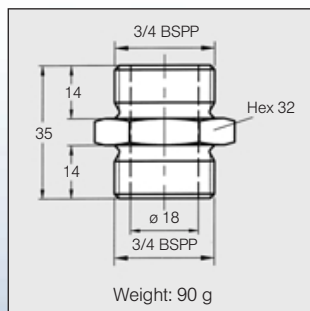
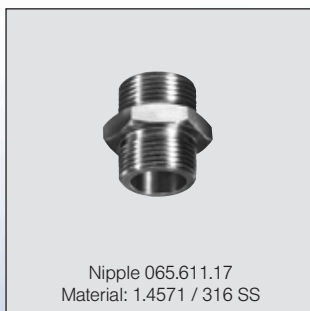
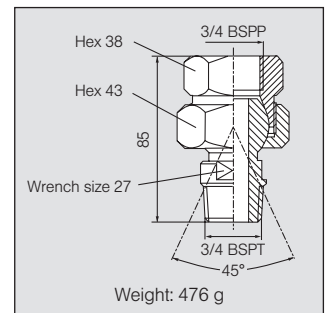
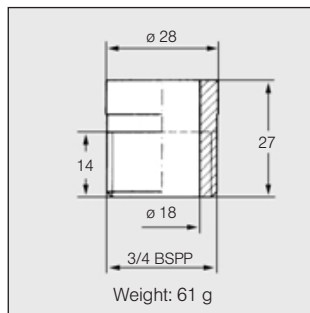
Accessories

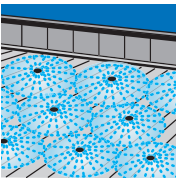
Typical spray coverage

Nozzle horizontally mounted.
Spray distance approx. 4 m.



Accessories

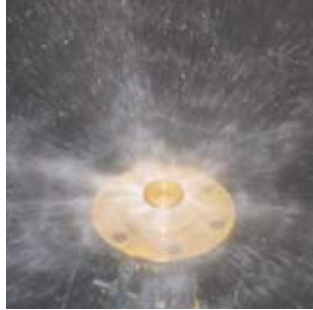




Deflector type nozzles Series 571 NBC protection on decks

- Uniform, flat and coarse spray sheet
- Low wind drift, long range of coverage

Application:
Washing off NBC deposits from ship decks.



Spray angle α	Ordering no. Type	E \varnothing [mm]	Flow rate \dot{V}									
			p [bar] l/min					p [bar] m ³ /h				
	5	6	7	8	9	5	6	7	8	9		
180°	571.059	2.0	66.7	71.7	78.3	83.3	88.3	4.0	4.3	4.7	5.0	5.3
	571.179	2.7	131.7	145.0	155.0	166.7	176.7	7.9	8.7	9.3	10.0	10.6

Material: Cylindrical pin + nut = 1.4301

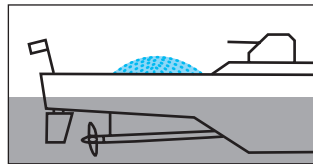
Spring = 1.4300

Other parts = Albz 8

Required quantity of spray water:

Approximative calculations are based on 0.3 m²/h (5 l/min) of water per ton of displacement. According to Federal Armed Forces regulations for ships 0.24 m²/h (4 l/min) of water are required.

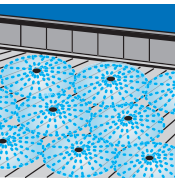
During tests it was possible to prove that a combination of Lechler nozzles reduced spray drift. Therefore 2.5 – 3.0 l/min are actually sufficient.



Spray circle at 8 bar
(according to BWB)
Type 571.039: ca. 6 m
Type 571.179: ca. 7 m

Spray diameter

Pressure [bar]	Nozzle Type	
	571.059.33.23 571.059.33.24 571.059.33.25 571.059.33.26 \varnothing [m]	571.179.33.23 571.179.33.24 571.179.33.25 571.179.33.26 \varnothing [m]
5	7.0	7.3
6	7.6	7.3
7	6.5	7.0
8	6.5	7.0
9	6.5	7.0



Deflector type nozzles

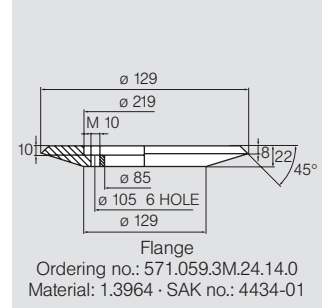
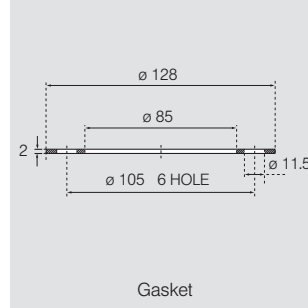
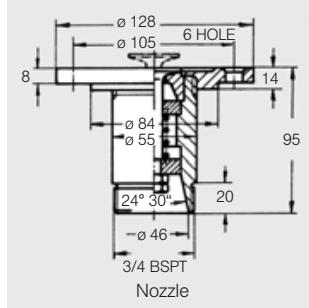
Series 571

Different versions and dimensions

Deflector type nozzles with flange for steel decks

Ordering no.: 571.059.33.24*
571.179.33.24**

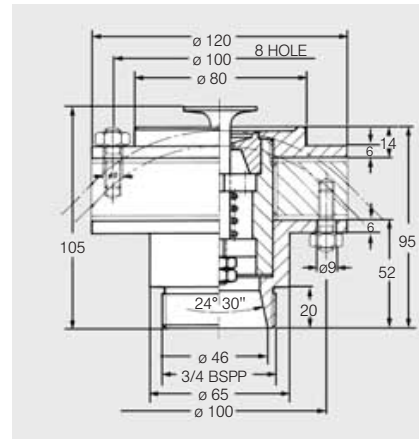
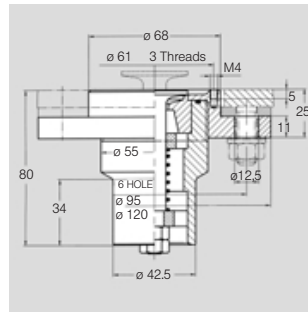
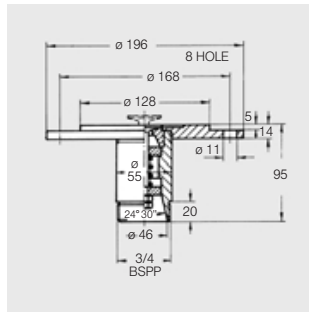
NATO/BW-order number:
* 4730-12-189-8183
** 4730-12-188-1727



Deflector type nozzles with flange for aluminium decks

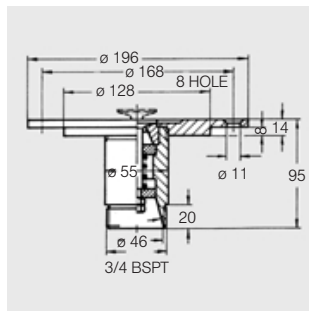
Ordering no.: 571.059.33.25
571.179.33.25*

NATO/BW-order number:
* 4730-12-316-0529



Deflector type nozzles with flange for wooden decks

Ordering no.: 571.059.33.26
571.179.33.26



Special design with coupling connection

Ordering no.: 500.289.33.00

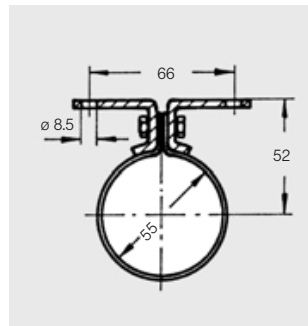
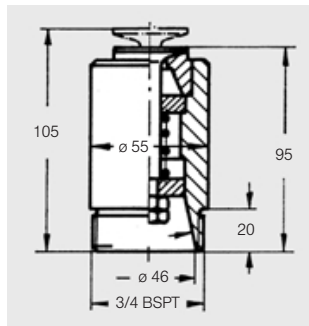
Special design for incorporation in circular ceiling openings

Ordering no.: 571.059.33.05
571.179.33.05

Special design deflector nozzle with lateral mounting

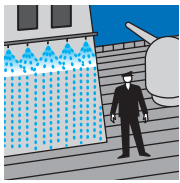
Ordering no.: 571.059.33.23*
571.179.33.23

NATO/BW-order number:
* 4730-12-188-1725



All nozzles also available with connection flange NW 32

All nozzles also available with coupling connection. Additional flanges on request.

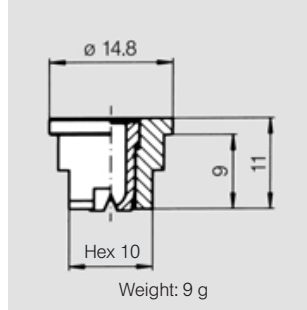


Flat fan nozzles Series 652.567 NBC protection

■ Even flat jet

Application:
To wash off NBC deposits from ships.
One nozzle 652.567 for 3 m²
(guideline).

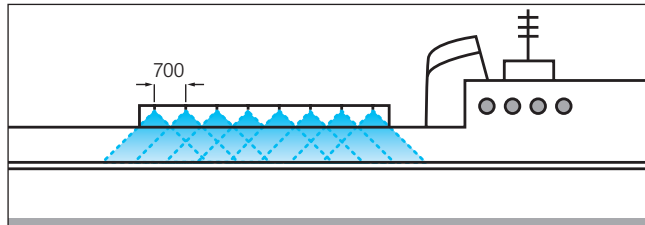
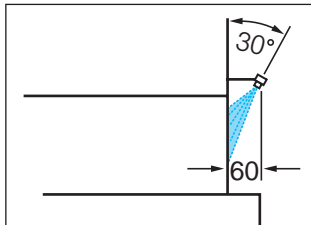
**NATO/BW-order number:
4730-12-189-9883**



Spray angle α	Ordering no.		A \varnothing [mm]	E \varnothing [mm]	Flow rate \dot{V}									Spray width B at p = 2 bar		
	Type	Material no. Material 1.4571			p [bar] l/min					p [bar] m ³ /h						
					5	6	7	8	9	5	6	7	8	9	250 mm	500 mm
120°	652.567	17	2.00	0.90	3.95	4.33	4.68	5.00	5.30	0.24	0.26	0.28	0.30	0.32	670	1280

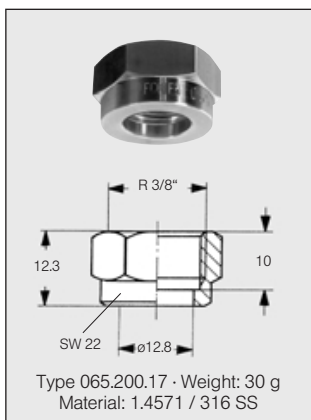
A = Equivalent bore diameter · E = narrowest free cross section

Nozzle Arrangement

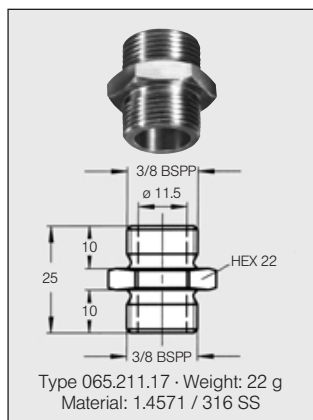


**For this application tongue
type nozzles can also
be used (see catalogue
»Precision Spray Nozzles
and Accessories«).**

Accessories



**NATO/BW-order number:
4730-12-189-6761**



**NATO/BW-order number:
4730-12-189-5389**



**NATO/BW-order number:
4730-12-189-6760**

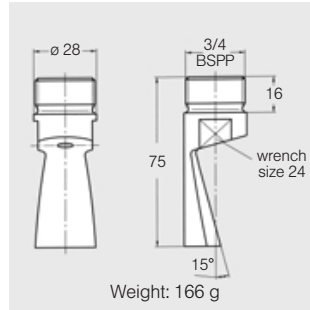


Tongue type nozzles Series 600.471 NBC protection

■ Flat jet tongue type nozzles for NBC protection and cooling of missile launchers

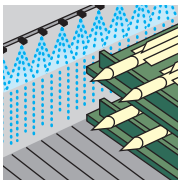
Application: NBC protection and cooling of missile launchers.

Material: 1.4571
Connection: 3/4 BSPT



Spray angle	Ordering no. Type	Flow rate \dot{V}									
		p [bar] l/min					p [bar] m ³ /h				
	5	6	7	8	9	5	6	7	8	9	
30°	600.471.17.00	79.1	86.6	93.5	100.0	106.1	4.7	5.2	5.6	6.0	6.4
45°	600.471.17.01	79.1	86.6	93.5	100.0	106.1	4.7	5.2	5.6	6.0	6.4



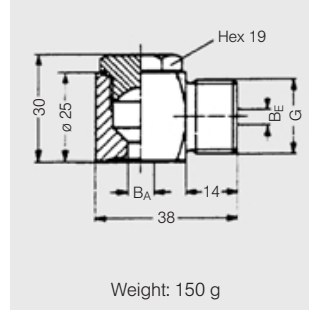


Eccentric spray nozzles Series 302/304

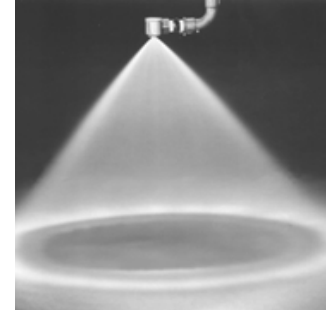
Protection against radiation heat

- Uniform hollow cone spray pattern.
- Non clogging nozzle, without inserts.

Application:
Protection against radiation heat, e. g. in storage rooms for ammunition on war ships.

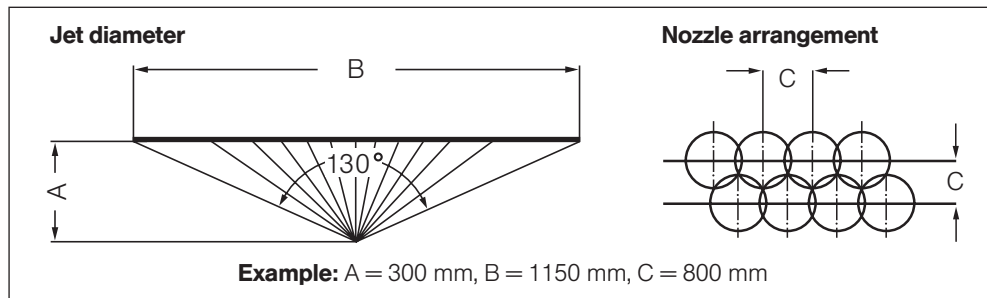


Weight: 150 g



Spray angle Δ	Ordering no.						B_A \varnothing [mm]	B_E \varnothing [mm]	Flow rate \dot{V}	
	Type	Material no.			Code				p [bar] l/min	p [bar] m ³ /h
		2.0402	2.0966	2.0920	1/2 BSBP	3/8 BSPP				
130°	302. 628	30	3E	33	-	02	5.0	3.2	7.0	0.40
	304. 688	30	3E	33	02	-	6.0	3.6	10.0	0.60
	304. 758	30	3E	33	02	-	7.5	3.9	15.0	0.90

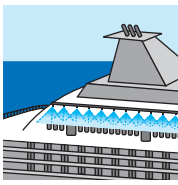
Example Type + Order no. + Code = Order no.
for ordering: 302. 628 + 30 + 02 = 302. 628. 30. 02



Spray diameter B [mm]	Spray height A [mm]
450	100
850	200
1150	300
1450	400

Regulations of the German navy require 1 m³/h (17 LPM) per m² of wall and ceiling surface.

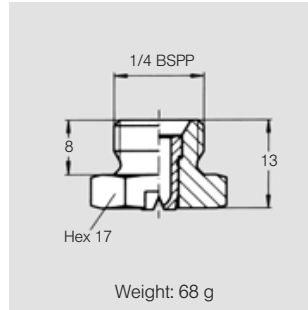
Lechler product number	NATO/BW-order number
304.688.3E.02	4730-12-315-6211
304.758.3E.02	4730-12-312-6210
304.758.33.02	4730-12-188-1726



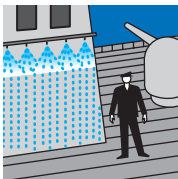
Flat fan nozzles Series 612 Cleaning

- Compact design, suitable for narrow installation conditions

Application:
Window cleaning.



Spray angle	Ordering no.			B Ø [mm]	E Ø [mm]	Flow rate \dot{V}										Spray width B at p = 2 bar	
	Type	Material no.				p [bar] l/min					p [bar] m³/h					Diagram	
		1.4305/303SS	Brass			5	6	7	8	9	5	6	7	8	9	250 mm	500 mm
120°	612.487	16	30	1.50	0.60	2.53	2.77	2.99	3.20	3.39	0.15	0.17	0.18	0.19	0.20	650	1200

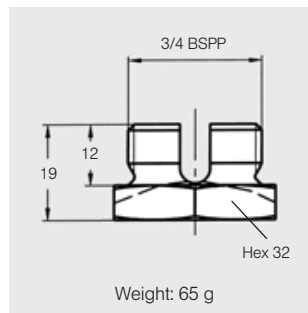


Flat fan nozzles Series 616/617 Protection against radiation heat

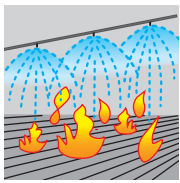
- Uniform distribution of liquid. Non clogging, less fog

Application:
Protection against radiation heat.

Material: brass.



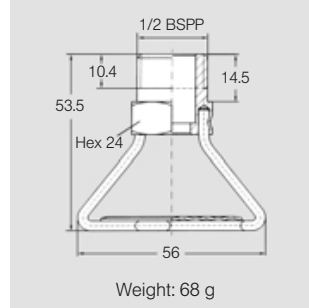
Spray angle	Ordering no. Type	B Ø [mm]	E Ø [mm]	Flow rate \dot{V}										Spray width B at p = 2 bar	
				p [bar] l/min					p [bar] m³/h					Diagram	
				5	6	7	8	9	5	6	7	8	9	250 mm	500 mm
120°	616.997.30.15	6.90	6.00	47.40	52.00	56.10	60.00	63.34	2.85	3.12	3.37	3.60	3.80	800	1460
	617.047.30.15	8.00	4.40	63.25	69.28	74.80	80.00	84.85	3.80	4.16	4.49	4.80	5.09	800	1460
	617.117.30.15	9.50	8.00	95.00	103.92	112.00	120.00	127.28	5.70	6.23	6.72	7.20	7.64	800	1460



Deflector type nozzles Series 524/525 Fire fighting

■ Full cone spray. Non clogging nozzle, without swirl insert

Application:
Fire fighting.



Spray angle	Ordering no.			B Ø [mm]	Flow rate \dot{V}												Spray diameter [D] at p = 3 bar	
	Type	Material no.			p [bar] [l/min]						p [bar] [m³/h]						Diagram	
		Brass	1.4571		0.5	1.0	2.0	3.0	5.0	10.0	0.5	1.0	2.0	3.0	5.0	10.0	H = 1 m	H = 3 m
180°	524. 989	-	17	6.7	14.0	19.8	28.0	34.3	44.3	62.6	0.8	1.2	1.7	2.1	2.7	3.8	10.6	14.0
	525. 049*	30	17	8.0	20.0	28.3	40.0	49.0	63.2	89.4	1.2	1.7	2.4	2.9	3.8	5.4	12.8	15.8
	525. 109**	30	17	9.3	28.0	40.0	56.0	69.0	89.0	125.0	1.7	2.4	3.4	4.1	5.3	7.5	14.0	15.8
	525. 169*	30	17	10.9	40.0	57.0	80.0	98.0	126.0	179.0	2.4	3.4	4.8	5.9	7.6	10.7	15.2	17.4

* VDS approval number: A 4870876 ** Approved by Bureau Veritas Further nozzle sizes are shown in our general catalogue.



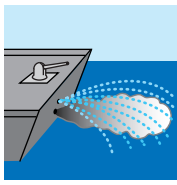
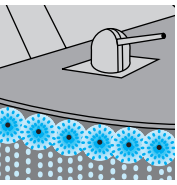
12



14



13



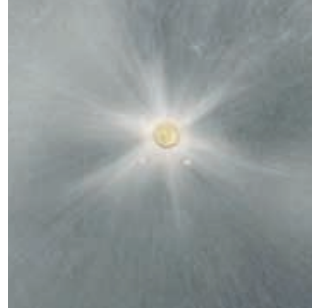
CamouTech system for reduction of infrared signature and preventing against NBC contamination

The CamouTech system for reduction of infrared signature and preventing against NBC contamination consists of two components:

■ **CamouSpray** for protection of hull and superstructures. Several special designed deflector type nozzles are creating a water film which is cooling down the hull.

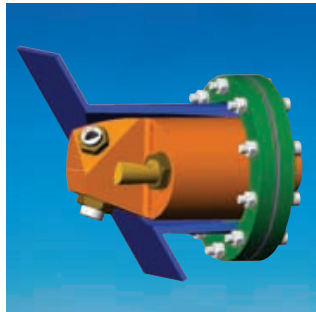


CamouSpray single nozzle



CamouSpray single nozzle spraying

■ **CamouJet** for protection of exhaust outlet. Three spray heads are installed around the exhaust outlet to cover and cooling down the exhaust gases.

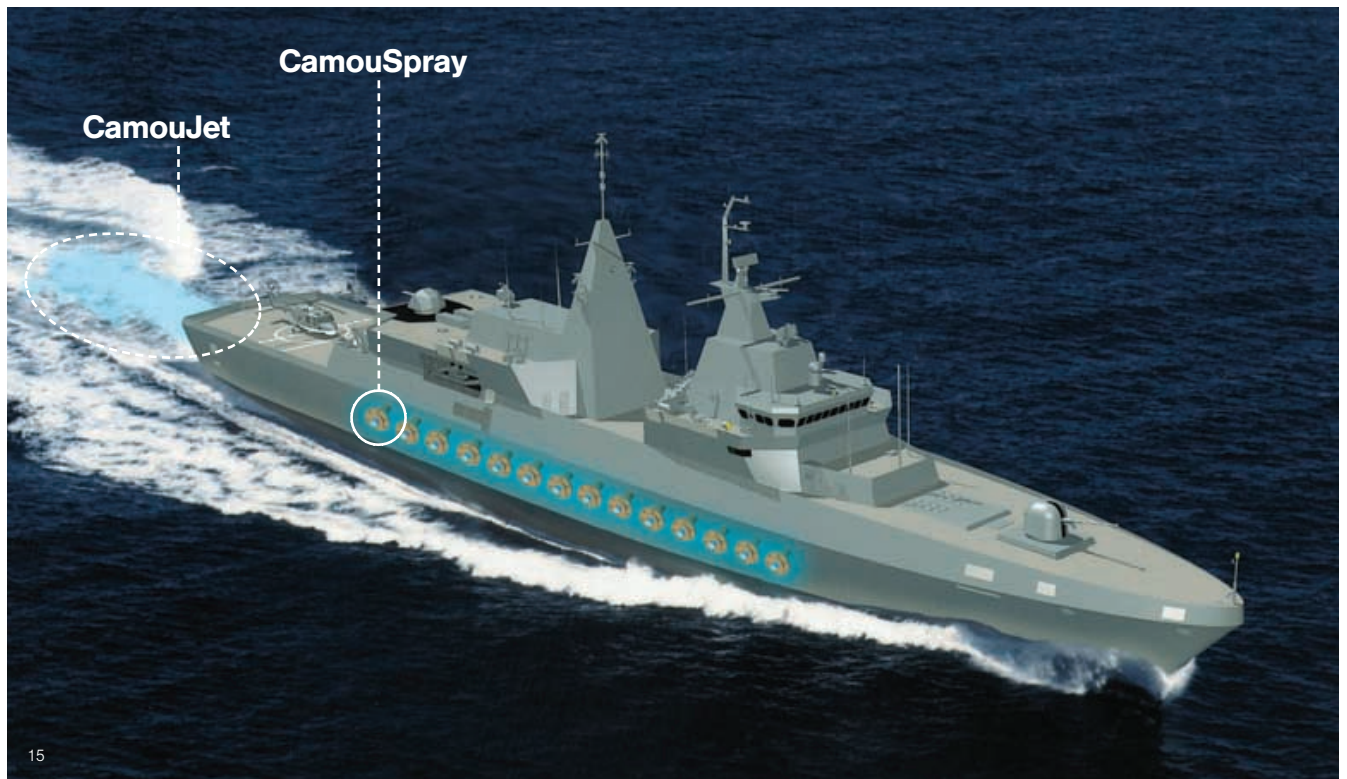


CamouJet single nozzle



CamouJet single nozzle spraying

Please contact us for further detailed information.

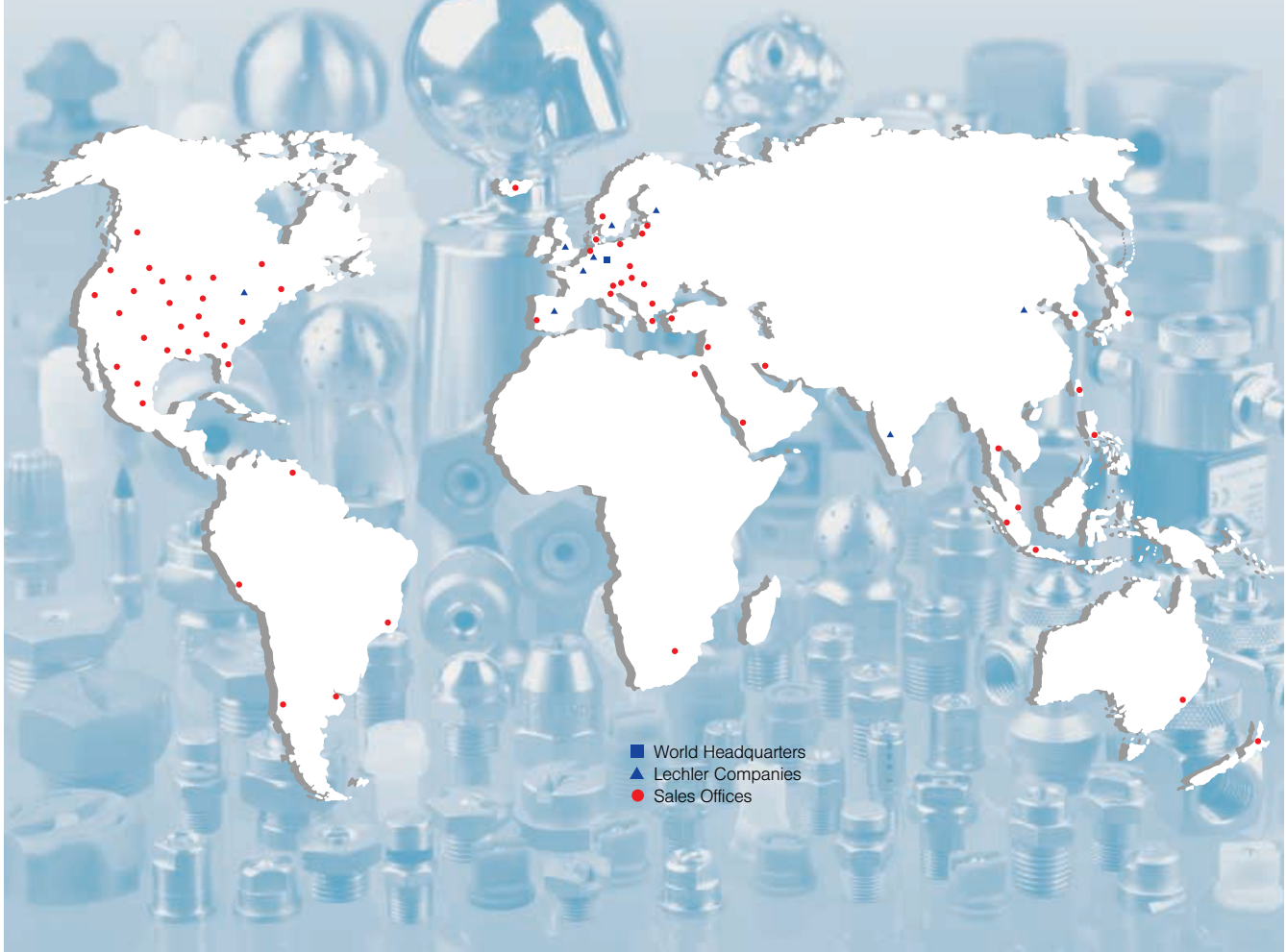


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