





PRODUCT RANGE





Steidle GmbH has pioneered and paved the way for the technique known as Minimum Quantity Lubrication (MQL), which has now established itself as the most advanced strategy for metal processing.

Founded in 1979, Steidle GmbH began producing lubricooling systems in the early 80's, when they were still known as "spray cooling" devices. Spurred on by this success, Steidle GmbH then focused on the application of minimal quantiti of liquids.

As a result of our research, development and production, we were able to greatly extend our product range. Today, Steidle offers a unique range of over half a dozen minimum quantity lubrication (MQL) systems for internal and external lubrication, metal-cutting and chipless forming operations, for initial installers and end users.

You can put together your own individual system from over 900 components (in the standard range alone). And, if for any reason, you cannot find anything suitable, the provision of tailor-made solutions is one of our strengths.



The range of products offered, expert advice, extensive experience and continuous, customer-oriented innovations - all these factors give Steidle customers a distinct advantage. Our product range is rounded off with lubricoolants specially developed for MQL, and, as an expert systems supplier, you can rely on Steidle for all your MQL needs.



Experience.

Quality.

Product.

11111

Diversity.





Specialists.

Customized.

Solutions.



Targeted.

Lubrication.

Quantity.

The idea behind MQL

In conventional circulating lubrication, an emulsion consisting of lubricant concentrate (approx. 5%) and water (approx. 95%) is generally used. Let us consider the effect of this mixture. Most of the emulsion serves only to cool down the heat that is produced by its poor lubricant effect. This was the starting point for MQL. If lubrication is optimized, the reduction in friction results in a reduction in the amount of heat produced, which means that there is less heat to dissipate.

Moreover, only a certain amount of the lubricant is needed for the lubrication process. Everything over and above this amount is wasted.

So MQL also means using only the exact quantity of lubricoolant required. This is why MQL is also known as "dry lubrication".

MQL makes the lubricating process more efficiently and offers a lot of advantages. A time-consuming and costly cleaning of chips and work piece is not needed. Similarly the machine and the surroundings remain dry, which improves the safety of the workplace. No emulsions must be maintained and disposed of any more and dry chips can be reused as valuable materials. The tool lifetime normally increases.

Optimization.

Nowadays, the quantity of lubricant used needs to be between 20 and 50 ml per process hour for it to be defined as MQL. Compared to the amount used in closed-circuit cooling, this corresponds to a ratio of approx. 1 : 10,000 or, in other words: only one drop of MQL is needed for every litre of emulsion!



Properties & Suitability

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		2	5	late /	∕∕ ⊛	3%®	ele Ste
C = criteria fulfilled / very suitable					a d		1
 = partly fulfilled / semi-suitable 	23	Same	elle elle		03	Sol a	
System Properties							
Piston pump							
Micro questitios (un to 50 ml/h/morte)							
Micro qualities (up to 50 mi/n/nozzle)							
Air/medium mix_ecores							
Air/medium-mix, coarse							
	•	•					
Ain/medium-mix, aerosol				•			
Liquid only (airiess system)							
LOW VISCOSE MECIA (1 - 25 mm ² /s at 40°C)							
Medium viscose media (25 - 50 mm ² /s at 40°C)					•		
High viscose media (50 - 100 mm ² /s at 40°C)				•		•	
Type of lubrication							
External lubrication							
Internal lubrication							
Single channel/ external mixing							
Dual channel/ internal mixing				•			
Suitability for ranges of application							
Metal-cutting operations							
Drilling							
Turning			•			•	
Milling						•	
Thread moulding							
Thread cutting							
Engraving							
Reaming	•		•	•	•		
Countersinking							
Sawing						•	
Grinding	•						
Chipless forming operations							
Bending						•	
Compressing							
Punching							
Forming							
Other applications							
Lubrication of bearings			•	•			
Chain lubrication							
Cooling	•						
Application of mould release agents					•		
Application of assambly aids					•	•	
Application of anti-corrosion agents					•		

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Piston pumps transport the minimum quantity of the medium to the nozzle, which is then sprayed using compressed air. The discharge rate can be set at a consistent level. The version of Sawfix[®] SF is equipped with a nozzleblock for lubricating saws.

Centermat[®] C30 / Toolmat[®] T70

MQL systems produced especially for internal lubrication, for use in internally cooled appliances. Both can be easily connected to machine tools. Toolmat® T70 has a hybrid nozzle which produces fine particles, whereas with Centermat[®] C30, this function is carried out by an aerosol booster using PRO-CYCLON[®] technology.

Spraymat[®] S700

Low pressure produced by the sprayed air in the nozzle sucks the lubricant out of the unpressurized reservoir. Valves regulate the quantity of air and liquid. Spraymat[®] S700 is suitable for the spray application of larger quantities of liquid.

Pulsomat[®] P35

The "airless" lubrication system propels only liquid from its nozzle, without any addition of air. The intervalled and pinpoint application makes the Pulsomat[®] particularly suitable for chipless forming and light metal-cutting operations.

Lubrimax[®] lubricoolants

Steidle lubricoolants have been specially developed for MQL technology and so yield the best results. Alongside the all-purpose Lubrimax[®] Edel C, which is suitable for most uses, products for special purposes are also available.

Filling system PAF

PAF permanently fills containers with a low volume flow and thus prevents overflowing or foaming. Automatic refilling of hard-to-reach containers or unmanned systems during operation increases process and work safety.



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Case studies / Configuration help / FAQ Pages 28 - 35

Various examples of practical applications demonstrate the variety of possible uses for MQL. The Configuration help supports you choosing your individual MQL system.

SF

Case studies /

FAQ



Lubrimat[®] L60

Brief description:	Piston pump system for spraying the smallest quantities of liquid.
Main application range:	External MQL in all metal-cutting operations. Pinpoint or small area lubricati- on in chipless forming operations. Application of mould release and anti-cor-
	rosion agents or other spray-on substances.
Operating principle:	The liquid flows from the reservoir into a piston pump. This
	pushes an exact quantity of the lubricant into the internal feed
	tube. Separately supplied compressed air splits the medium
	at the nozzle tip and sprays it.
Adjustability:	Swept volume of the pump (manual)
	Clock frequency of the pump (manual)
	Quantity of spray air (manual)
	Spray air pressure (manual)
	Switch on/ off via actuation control
	device/drive (electric, pneumatic or manual)

Technical Data:

Fig.: Lubrimat[®] L60 4 - 8 Operating pressure bar 0 - 150 1) Liquid throughput ml/h per nozzle Typical consumption 10 - 20 ¹⁾ ml/h per nozzle Lubrimax[®] and others Lubricoolant Recommended viscosity mm²/s (at 40°C) 1 - 100

¹⁾ depending on application, medium used, viscosity and temperature

System components:

1. Base / Base addition

- Pneumatically driven, finely meterable piston pump (1) with FPM seals, manually adjustable with PMC precise metering control (3), enabling easy adjustment of the volume using a dial. Volume 0 - 0.03 ml per stroke. If required, pumps with half (0.5DF), double (2DF) or quadruple (4DF) flowvolume with up to 0.015, 0.06 or 0.11ml per stroke are available.
- All pumps are standard synchronous drive. Separate drive, if required (all pumps individually or certain groups). The use of the logic panel enables all pumps to be operated using only one frequency generator.
- Ventilation unit ② integrated underneath the pump module.
- Frequency generator for pump pulses, manually adjustable 0 90 stroke min⁻¹.
- On request also as digital frequency generator for precise adjustment.
- A dedicated air valve for each nozzle, to enable the quantity of spray air to be adjusted.
- Pressure reducing valve to set spray air pressure. It also equalizes pressure variations in the supply tube and the system and ensures that the sprav profile is even.
- Manometer (0 10 bar) in front of door to display spray air pressure.
- · Coupler plug for compressed air supply to left side of housing.
- Air filter with integrated water separator and drainage opening on housing underside.
- High-grade push in/screw fittings/ pneumatic tubes.
- Stable, compact metal housing (200x200x155, 300x300x210, or 400x400x210) with robust metal closer and door seal for dust protection and noise reduction, earthing pin.



Fig.: Pump module L60

Lubrimat[®] L60

- Connections for feed tube with **EASY-COAX**[®] **system** (plug-in system for speedy, simple assembly, disassembly and interchange) on the left side of the housing.
- Component labelling in accordance with the designations in the pneumatic connection diagram.
- Numbering clips on every liquid conduit.

2. Reservoirs from 0.33 to 27 litres available:

Housing assembly

- Reservoir 0.33 litre PA with screw cap, ventilation plug, drainage sieve.
- Reservoir 1.0-/2.0-/3.0-litre with plexiglass cylinder / NBR seals or glass cylinder / FPM seals. With filler neck, screw plug, detachable sieve, automatic ventilation, drainage sieve. Can be supplied with float switch min or min+max (potential-free, either NC or NO).
- The 3.0 liter tank with pneumatic agitator is available on request.
- Reservoir 6.0-/10-/17-/27-litre aluminium. With filler neck, screw plug, detachable sieve, automatic ventilation, drainage sieve stopcock and fill level display. Combinated wall-housing bracket of sturdy aluminium construction 40x40 with 4 mounting straps for wall installation. Can be supplied with float switch min or min+max (potential-free, either NC or NO).



Vol.	Ø	Н
0.33	83	150
1.0	105	190
2.0	140	225
3.0	155	250

Dimensions*: Reservoir with wall-housing bracket (incl. housing)

Туре	Vol.	Dimensions depending on housing size (HxWxD)			
		200x200x155	300x300x210	400x400x210	
A6AWG	6,0	504 x 281 x 286	604 x 381 x 286	704 x 481 x 286	
A10AWG	10	539 x 311 x 289	639 x 381 x 289	739 x 481 x 289	
A17AWG	17	569 x 369 x 327	669 x 381 x 327	769 x 481 x 327	
A27AWG	27	610 x 490 x 340	710 x 490 x 340	810 x 490 x 340	

*) = Dimensions given are approximate in mm, excluding mounting straps, feed tubes or valve rocker; for the float switch min option: height +4, for the float switch min+max option: height +70.

Wall installation

• Reservoir 6.0-/10-/17-/27-litre aluminium as discribed before. With wall bracket of sturdy aluminium construction 40x40 with 4 mounting straps for wall installation. Can be supplied with float switch min or min+max (potential-free, either NC or NO).

type	Vol.	Dimensions* (HxBxT)	weight (kg)
A6AW	6.0	264 x 321 x 361	4.0
A10AW	10	299 x 346 x 369	5.5
A17AW	17	329 x 391 x 369	7.0
A27AW	27	370 x 490 x 389	10.5

*) = Dimensions given are approximate, including wall bracket, stopcock and filler neck; for the float valve min option: height +4, for the float valve min+max option: height +70.



Fig.: Reservoir A10AWNC

Lubrimax® ubricoolant:

Filling system

Case studies /

FAQ

PAF



Fig.: Lubrimat with reservoir A10AWGNC

Nozzle bodies

Lubrimat[®] L60

- 3. Drive electric, pneumatic or manual option:
- Solenoid valve 3/2 way (up to 3 nozzles 120 NI/min, 4 nozzles and over 1300 NI/min) with auxiliary actuation (for occasional manual switching on/off). Coil with plug in 24V DC, 24V AC, 110V AC or 230V AC. Cable bushing on left side of housing. In the case of separate actuation control device, each pump (or group of pumps) is controlled via a dedicated solenoid valve.
- Pneumatic valve 3/2 way (up to 3 nozzles 550 NI/min, 4 nozzles and over 1300 NI/min). With push in connection Ø6 for control air on left outer side of housing.
- Hand valve 3/2 way (600 NI/min) as valve rocker on right outer side of housing.
- Mechanical valves 3/2 way (700NI/min) as plunger, roller lever or knee roller lever in versions NC or NO. Delivered with the corresponding connectors and a 2m tube PUNØ8 to the unit.

4. Feed tube

- Coaxial feed tube with EASY-COAX[®] system. Outer tube of strong rubber construction with robust metal sleeve Ø11, inner tube for delivery of medium, constructed of long-life PTFE Ø3. Standard length 3,000, special lengths up to 14,000 per piece. Extension by EASY-COAX plug-in system up to 40m without problems. Minimum bending radius R50.
- Numbering clips on the feed tube for easy assignment of pumps and nozzles.
- On request, all feed hoses also available with plastic sheathing Ø8 PUN.
- On request, all feed hoses also with reduced cross-section of the inner hose for very low viscosity media.

5. Nozzles, nozzle blocks and spraying units selectable:

All nozzles are equipped with EASY-COAX[®], the simple plug&play connector system for quick and tool-free connection and changing of nozzles. The nozzles are designed with optimized flow for targeted, mist-free spraying. Unless otherwise specified, the standard length is 300mm and special lengths are available in increments of 50. The EASY-COAX connection block (40x30x15 with 2 fixing holes Ø6) with or without round magnet Ø80 is used to fix the nozzles. 2 clamping pieces are also possible as an alternative for copper tube nozzle bodies.

• **Nozzle K**: copper tube Ø6. The copper tube is robust and uniquely bendable, making it perfect for rigid use.

- Nozzle GL: Link hose Ø17 made of plastic segments. The segments are repeatedly adjustable and are preferred for flexible uses.
- **Nozzle GLA**: Link hose Ø17 made of aluminum segments. The robust segments are adjustable in their mobility, which allows them to be used both flexibly and rigidly virtually combining the advantages of nozzle K and nozzle GL.
- **Nozzle MF**: Flexible metal tube Ø9 with nickel-plated protective sleeve Ø12. Robust nozzle body that can be bent several times for flexible use. Standard length 340, alternatively 220 and 420 available.

Fig.: EASY-COAX®





Spray pattern

The K, GL and GLA nozzles are equipped with exchangeable stainless steel nozzle heads. Standard nozzle heads are full jet or flat jet approx. 75° (KF, GLF, GLAF). Many special solutions such as ring jet, fan jet, cylinder jet are possible.

Nozzle blocks

Туре

BS1/3*

BS3/3

*) = figures see page 15

All nozzle blocks are made of aluminum and equipped with EASY-COAX[®], the simple plug&play connector system for quick and tool-free connection and change. We offer standard nozzle blocks with optimized spray points for band saws or circular saws with slotted holes for attachment.

Mounting hole

2 slotted holes 6x17

2 slotted holes 6x11

BS3/3	90 x 50 x 20	9 x 45	2 slotted holes 6x30
BS3/3	130 x 50 x 20	9 x 70	2 slotted holes 6x40
KS1/2*	52 x 30 x 15	-	1 slotted hole 6x15
KS2/2	60 x 50 x 20	-	1 slotted hole 6x30

Opening

4 x 32,5

9 x 29

**) = Dimensions without EASY-COAX®

Spraying units, brushes and special solutions

Dimension**

52 x 30 x 15

60 x 50 x 20

We also design special nozzles up to the individual spraying device for your application. Wherever you want to apply liquids in the smallest quantities in a targeted manner, e.g. in applications relating to assembly, sliding film, release agent, corrosion protection, robot applications, chain and bearing lubrication. Contact us.

General information about spray angle / spray distance / spray surface:

- Full jet nozzles have a spray angle of 20-25°, flat jet nozzles of 75°.
- In order to get an even covering of the surface*, the distance between the tip of the nozzle and the surface must not be more than 150 mm.
- The size of the covered surface* can be calculated like follow (as thumbrule): Full jet: Diameter of the surface* (b) = 1/3 of the distance nozzle to surface (a) Flat jet: Length of the surface* (b)= $1.5 \times 1.5 \times 10^{-10}$ k surface (a)







ulsomat

P35

Lubrimat[®] L60 Sawfix[®] SF

Centermat[®] C30 Toolmat® T70

KS2/2

BS3/3

BS3/3

BS3/3

(130)

(60)

(90)



FAQ

PAF









Lubrimat[®] L60

6. Option

- 4 x round magnet Ø80 (mounted on the reverse side) with protection sleeve for easy installation of the housing. (see example on page 14).
- 4 x mounting straps (mounted on the reverse side) for fixed installation of the housing. (see example on page 8).
- Filler reservoir 2.0-litre, fits into the filler neck (reservoir 1.0 litre and higher). This solution enables you to fill in media of high viscosity more easily. You do not have to wait until the media is poured in as its own weight makes the media flow faster through the sieve. In addition the filler reservoir has a bigger opening Ø. Dimensions: Ø120 x 240 height.

Order codes (Standard range, special solutions on request):

0. Base	L60 L60Di	MQL with piston pumps and precise metering control (PMC) as L60, but with digital frequency generator
1. Base addition	/ /S /S	(state number of nozzles required, e.g. "/4") (separate drive, all nozzles separately, e.g. "/4S") (separate drive, not all nozzles separately, e.g. "/4S2+1+1")
2. Reservoir	Y03 P1 P1NC P1NO P1NCNC P1NCNO P1NONC P1NONO P2 P3 G1 G2 G3 A6AW A6AW A10AW A10AW A17AW A6AWG A6AWG A6AWG A10AWG A10AWG A17AWG A27AWG A27AWG A27AWG	 0.33-litre PA 1.0-litre plexiglas / NBR with float switch min NC with float switch min NO with float switch min NC + max NC with float switch min NC + max NC with float switch min NO + max NC with float switch min NO + max NC with float switch min NO + max NO as P1, but 2.0-litres as P1, but 3.0-litres as P1, but glass / FPM as P2, but glass / FPM 6.0-litre aluminium (wall installation) with wall bracket with float switch variation, as P1 as A6AW, but 10-litre aluminium as A6AW, but 27-litre aluminium 6.0-litre aluminium (housing assembly) with wall-housing bracket with float switch variation, as P1 as A6AWG, but 10-litre aluminium as A6AWG, but 10-litre aluminium as A6AWG, but 17-litre aluminium

Lubrimat[®] L60



3. DriveeVelectric up to 3 nozzles (24VDC, 24VAC, 110VAC oder 230VAC)EVelectric 4 nozzles and over (24VDC, 24VAC, 110VAC oder 230VAC)V[H5] with preselection switch for operating modespv3pneumatic up to 3 nozzlesPV3pneumatic 4 nozzles and overM3SNC2000mechanic plunger valve, NC, with tube 2,000mmM3RNC2000mechanic roller lever valve, NC, with tube 2,000mm	Lubrimat◎ L60 Sawfix◎ SF
M3KNC2000 mechanic knee roller lever valve, NC, with tube 2,000mm H3 hand actuated control device	30
	iat® C:
4. Feed tube ZM3000 feed tube, metal outer Ø11 / inner PTFE Ø3, length (L)=3,000 (standar ZM feed tube, length = (non-standard length, min. 500, in increments of 50 ZMQ with reduced cross-section of the inner hose ZP with plastic sheathing Ø8 PUN	Centern Toolm
5. Nozzle K copper tube (Ø6, L=300) KK copper tube (Ø6, L=300) with 2 clamps KB copper tube (Ø6, L=300) with connection block KBR copper tube (Ø6, L=300) with connection block and round magnet Ø8 KF as nozzle K, but with flat jet GL multi-link hose (L=300) GI B multi-link hose (I = 300) with connection block	Spraymat [®] \$700
GLBRmulti-link hose (L=300) with connection block and round magnet Ø80GLFas nozzle GL, but with flat jetGLAmulti-link hose aluminum (L=300)	late
GLAB multi-link hose aluminum (L=300) with connection block GLABR multi-link hose aluminum (L=300) with connection block and round magnet Ø80	Pulsom P35
GLAFas nozzle GLA, but with flat jetMFBflexible metal tube (L=340) with connection blockMFBRflexible metal tube (L=340) with connection block and round magnet f	Ø80
BS1/3 nozzle block band saw (1 feed hose / 3 spraying points) size 52x30x1 BS3/3 nozzle block band saw (3 feed hoses / 3 spraying points) selectable in sizes 60x50x20 / 90x50x20 / 130x50x20	15 • * 1
KS1/2nozzle block circular saw (1 feed hose / 2 spraying points) size 52x30KS2/2nozzle block circular saw (2 feed hoses / 2 spraying points) size 60x50x20	Lubrima bricoola
(other variants as well as brushes, special nozzles and spraying units on request)	
6. OptionRGhousing mounting 4 x round magnet Ø80MGhousing mounting 4 x mounting strapsFY2filler reservoir 2.0-litre (for reservoir 1.0 litre and higher)	ystem
<u>Sample order code:60/3</u> - <u>P1NC</u> - <u>e24VDC</u> - <u>ZM3000</u> - <u>GLBR</u> - <u>RG</u>	Filling s
0. Base6. Option	
1. Base addition	
2. Reservoir 5. Nozzle 3. Drive 4. Feed tube	ase studie: FAQ



Sawfix[®] SF

Brief description: Main application range: Operating principle:	Piston pump system for spraying the smallest quantities of liquid. External MQL for circular saws and band saws. The liquid flows from the reservoir into a piston pump. This pushes an exact amount of the medium into the internal feed tube. Separately supplied compressed air splits the medium in the nozzleblock into tiny particles of fluid and sprays it onto the tooth profile of the saw.
Adjustability:	Swept volume of the pump (manual), clock frequency of the pump (manual), quantity of spray air (manual), switch on/off via drive (electric, pneumatic or manual).

Technical Data:

Operating pressure	bar	4 - 8
Liquid throughput	ml/h	0 - 150 ¹⁾
Typical consumption	ml/h	15- 30 ¹⁾
Lubricoolant		Lubrimax [®] and others
Recommended viscosity	mm ² /s (at 40°C)	1 - 50
Dimensions (HxWxD)		
Housing (without reservoir)	mm	200 x 200 x 155
Nozzleblock	mm	15x 52 x 30

¹⁾ depending on application, medium used, viscosity and temperature

System components:

1. Base / Base addition

- Pneumatically driven, finely meterable piston pump ① with FPM seals, manually adjustable with PMC precise metering control ③, enabling easy adjustment of the volume using a dial.
 Volume 0 - 0.03 ml per stroke, including adjusting key.
- Ventilation unit ② integrated underneath the pump module.
- Frequency generator for pump pulse, manually adjustable 0 90 stroke min⁻¹.
- Coupler plug for compressed air supply to left side of housing.
- Air filter with integrated water separator and drainage opening on housingunderside
- Air valve to set spray air quantity.
- · High-grade push in/screw fittings/ pneumatic tubes.
- Stable, compact metal housing 200x200x155 with robust metal closer and door seal for dust protection and noise reduction, earthing pin.
- Connection for feed tube with EASY-COAX[®] system (plug-in system for speedy, simple assembly, disassembly and interchange) on left side of housing.
- **Component labelling** in accordance with the designations in the pneumatic connection diagram.
- 2. Reservoirs from 0.33 to 3.0 litres available.
- Reservoir 0.33 litre PA with screw cap, ventilation plug, drainage sieve.
- Reservoir 1.0-/2.0-/3.0-litre with plexiglass cylinder / NBR seals or glass cylinder / FPM seals. With filler neck, screw plug, detachable sieve, automatic ventilation, drainage sieve.

3. Drive options:

- Solenoid valve 3/2 way (120 Nl/min) with auxiliary actuation (for occasional manual switching on/off). Coil with plug in 24V DC, 24V AC, 110V AC or 230V AC. Cable bushing on left side of housing.
- Pneumatic valve 3/2 way (550 Nl/min). With push in connection Ø6 for control air on left outer side of housing.
- Hand valve 3/2 way (600 NI/min) as valve rocker on the right outer side of housing.



Fig.: pump module SF



Fig.: Reservoir Y03 (0.3I)

Vol.	ø.	Н
0.33	83	150
1.0	105	190
2.0	140	225
3.0	155	250

Sawfix[®] SF

4. Feed tube

Coaxial feed tube with EASY-COAX[®] system. Outer tube of strong rubber construction with robust metal sleeve Ø11, inner tube for delivery of medium, constructed of long-life PTFE Ø3. Standard length 3,000, non-standard lengths up to 20,000 available on request.

5. Nozzle

Nozzleblock (aluminium 15x52x30) with EASY-COAX[®] system. For band saws with 3 optimized spray points and two elongated holes for mounting 6x18. For circular saws with 2 optimized spray points and one elongated hole for mounting 6x21.

Fig.: Nozzleblocks KS1/2 and BS1/3

6. Option

- 4 x round magnet Ø80 (mounted on the reverse side) for easy installation of the housing. (see example on page 14).
- 4 x mounting straps (mounted on the reverse side) for fixed installation of the housing. (see example on page 8).

Order codes:

SF	MQL with piston pumps for saws	
/1	(for 1 nozzleblock)	
Y03 P1 P2 P3 G1 G2 C2	0.33-litre PA 1.0-litre plexiglas / NBR 2.0-litre plexiglas / NBR 3.0-litre plexiglas / NBR 1.0-litre glass / FPM 2.0-litre glass / FPM 2.0-litre glass / FPM	
eV pv3 H3	electric (24VDC, 24VAC, 110VAC oder 230VAC) pneumatic hand actuation	
ZM3000 ZM	feed tube, metal outer Ø11 / inner PTFE Ø3, L=3,000 (standard) feed tube, L= (non-standard length, min. 500, in increments of 500)	
BS1/3 KS1/2	band saw nozzle block for 1 feed tube / with 3 spray points circular nozzle block for 1 feed tube / with 2 spray points	
RG MG	housing mounting 4 x round magnets Ø80 housing mounting 4 x mounting straps	
p de:	SF/1 - Y03 - e24VDC - ZM3000 - BS1/3 - RG 6. Option 6. Option 5. Nozzle 4. Feed tube	
	SF /1 Y03 P1 P2 P3 G1 G2 G3 eV pv3 H3 ZM3000 ZM BS1/3 KS1/2 RG MG	SF MQL with piston pumps for saws /1 (for 1 nozzleblock) Y03 0.33-litre PA P1 1.0-litre plexiglas / NBR P2 2.0-litre plexiglas / NBR G1 1.0-litre glass / FPM G2 2.0-litre glass / FPM G3 3.0-litre glass / FPM G2 2.0-litre glass / FPM G3 3.0-litre glass / FPM G3 3.0-litre glass / FPM G2 2.0-litre glass / FPM G3 3.0-litre glass / FPM G3 3.0-litre glass / FPM G3 3.0-litre glass / FPM G4 mad actuation EV electric (24VDC, 24VAC, 110VAC oder 230VAC) pv3 pneumatic H3 hand actuation ZM3000 feed tube, metal outer Ø11 / inner PTFE Ø3, L=3,000 (standard) ZM feed tube, L= (non-standard length, min. 500, in increments of 500) BS1/3 band saw nozzle block for 1 feed tube / with 2 spray points KS1/2 circular nozzle block for 1 feed tube / with 2 spray points KS1/2 circular nozzle block for 2 M3000 - BS1/3 - RG 6. Option

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Lubrimat[®] L60 Sawfix[®] SF

Centermat[®] C30 Toolmat® T70

Filling system PAF

Case studies / FAQ



Centermat[®] C30

Brief description:	Aerosol-Booster with PRO-CYCLON [®] -technology for fine oil-air mixtures.	
Main application range:	Internal MQL for single channel rotary union, middle and upper rotational speeds.	
Operating principle:	A piston pump feeds the oil from the supply reservoir into a spray nozzle, which sprays it into the atomizing chamber. Coarse drops are filtered out in the upper separation chamber to produce a fine, homogenous aerosol mixture. This is transported via the feed tube to the rotary union.	
Adjustability:	Pump swept volume and frequency (manual). Quantity of spray air and additional air (each manual). Switch on/off of the spray nozzle via machine-control.	

In the case of internal lubrication only the finest drops are able to get through as the centrifugal forces inside the spindle eject the bigger oil droplets. The Centermat[®] C30 utilizes this effect through its use of PRO CYCLON[®] technology. Coarse droplets are separated in the Centermat[®] C30 early on and transported back to the supply reservoir. The smallest droplets in the µ-range that remain form a fine, stable aerosol mixture which is transported to the drill holes in the machine tool all the way through the feed tube, rotary union and spindle. The Centermat® C30 can be operated with up to 10bar operating pressure and 8bar spray pressure. This means that the Centermat[®] C30 achieves 83% more aerosol throughput than its predecessor (4 bar spray pressure).

The Centermat[®] C30 can be ordered with one, two or three spray nozzles. The C30 version with only one spray nozzle is sufficient for applications where only a single or a small number of tools with similar total cross sections (ΣQ_{W7}) are to be lubricated. Two or three spray nozzles are useful when lubricating a wide range of tools with different total cross sections (ΣQ_{WZ}). In addition, you can choose whether all nozzles are installed as large nozzle "G" or whether you want a mini nozzle "M". The mini-nozzle is required for particularly small total cross-sections (ΣQ_{WZ}) of 0.07-0.28mm².

All C30 versions always have an additional, separately controllable supplementary air. This can optionally be used for blowing out the spindle, removing chips or increasing the air volume for particularly large tools.

ΣQ _{WZ}	corres-	corres-	corres-			Version			
in mm ²	ponds to	ponds to 2	ponds to 3	C30/1M	C30/1G	C30/1GM	C30/1GG	C30/1GGM	Leger
	with Ø (mm)	with Ø (mm)	with Ø (mm)	1x mini nozzle	1x large nozzle	1x large nozzle 1x mini nozzle	2x large nozzle	2x large nozzle 1x mini nozzle	
0.07 - 0.28	0.3 - 0.6	0.2 - 0.4	0.2 - 0.3	1)		1)		1)	
0.28 - 2.0	0.6 - 1.6	0.4 - 1.1	0.3 - 0.9	1)					
2.0 - 9.6	1.6 - 3.5	1.1 - 2.5	0.9 - 2.0						
9.6 - 12.6	3.5 - 4.0	2.5 - 2.8	2.0 - 2.3						
12.6 - 19.6	4.0 - 5.0	2.8 - 3.5	2.3 - 2.9						
19.6 - 28.3	5.0 - 6.0	3.5 - 4.2	2.9 - 3.5						1)

Recommendation table: Which C30 version for which tools?

Suitable Conditionally suitable (min 8.5bar inlet pressure and supplementary air is required) min 9.0bar inlet pressure required

Unsuitable

Technical Data:

Operating pressure	bar	6 – 10
Typical air consumption	NI/min	5 – 215 ¹⁾
Typical oil consumption	ml/h	1 – 30 ²⁾
Lubricoolant		Lubrimax [®] and others
Recommended viscosity	mm ² /s (at 40°C)	1 - 50
Housing Dimensions (HxWxD)	mm	500 x 300 x 210 (version with 1 or 2 spray nozzles)
	mm	500 x 400 x 210 (version with 3 spray nozzles)
Feed tube diameter (outer diameter	r) mm	Ø 12
Design 40		¹⁾ depending on ΣQ_{WZ} , setting, inlet pressure
Pade 16		2) depending on SQuur, potting modium viscopity

Centermat® C30



System components:

1. Base / Base addition

- One, two or three **spray nozzles** integrated in the atomizer chamber. At choice, all in **large "G"** or with one mini "M" size.
- One air volume valve to supply each spray nozzle, including pressure gauge (0 10 bar).
- One air volume valve for the supplementary air, including manometer (0 10 bar).
- A **finely meterable piston pump** with FPM seals to supply each spray nozzle, manually adjustable volume 0 0.03 ml / stroke via scale indicator.
- Ventilation unit integrated on the side of the pump block.
- Frequency generator for pump pulse, manually adjustable 0 90 stroke min-1.
- Manometer (0 10 bar) in the door front to indicate reservoir pressure.
- Optical display of the device status (operation / stand-by) in the door front.
- Pneumatic **pressure switch** (switches the nozzles to stand-by mode in the event of excessive back pressure over 8bars).
- Automatic ventilation valve with optional hand actuation.
- Coupler plug NG8 for compressed air supply to left side of housing.
- Air filter with integrated water separator and drainage opening on underside of housing.
- Robust, compact **metal housing** with robust metal closer and door seal for dust protection and noise reduction, earthing pin, 4 mounting straps for wall mounting of the housing.
- Connection for feed tube with push-in coupler Ø12 on the upper side of housing.
- Marking of the components according to the designations in the pneumatic circuit diagram.

2. Reservoirs

- Aluminium reservoir, 1.5 litre inside housing with float switch min (potential-free, either NC or NO).
- Hand pump for filling the reservoir and funnel tube.
- · Visual fill level display in door front.

3. Drive

• A separate **solenoid valve** for each spray nozzle and for the supplementary air. Each solenoid valve is 3/2 way (120 Nl/min) with auxiliary actuation in 24V DC, 24V AC, 110V AC or 230V AC. Cable bushing on the left side of housing.

4. Feed tube

• Feed tube (PUN Ø12) standard length 3,000, non-standard lengths up to 15,000 available on request.

Order codes:

0. Base	C30	MQL for internal lubrication
1. Base addition	/1M /1G /1GM /1GG /1GGM	version with 1x mini nozzle version with 1x large nozzle version with 1x large nozzle and 1x mini nozzle version with 2x large nozzle version with 2x large nozzle and 1x mini nozzle
2. Reservoir	A1HPNC A1HPNO	1.5 litre aluminium with hand pump and float switch min NC 1.5 litre aluminium with hand pump and float switch min NO
3. Drive	eV	Electric (24VDC, 24VAC, 110VAC or 230VAC)
4. Feed tube	ZP3000 ZP	Feed tube PUN Ø12, L=3,000 (standard length) Feed tube, L=(non-standard length in mm, min. 500, in increments of 500)

Sample order code:

- 0. Base ——
- 1. Base addition -
- 2. Reservoir -
- 3. Drive -

<u>C30/1GGM</u> - <u>A1HPNC</u> - <u>e24VDC</u> - <u>ZP3000</u>

— 4. Feed tube Page 17 Lubrimat[®] L60 Sawfix® SF

Filling system PAF

Case studies

FAQ

Toolmat® T70



Brief description: Main application range: Operating principle:

Adjustability:

Piston pump system with special nozzle design for fine oil-air mixtures. Internal MQL for single channel rotary union, lower and middle rpm The piston pumps transport the liquid from the supply reservoir to the hybrid nozzle which sprays the air-oil mixture through the rotary transmission leadthrough. If requested, the hybrid nozzle can extend into the rotary transmission leadthrough and the spindle. Swept volume (manual), clock frequency of the pump (manual), quantity of spray air (manual), quantity of casing air (manual), switch on/off via actuation control device/ drive (electric, pneumatic or manual)

With Toolmat[®] T70 the proven piston pumps provide for an exactly selectable flow rate. The spray grade can be determined via the spray air. The saturation of the mixture can be adjusted via the casing air. In the Vario3 and Vario7 versions, 3 or 7 pre-settable oil quantities can be selected.



The hybrid nozzle is principally delivered flush-mounted to the 3/8" thread connection at the end of the feed tube. So it is possible to mount the Toolmat[®] T70 at any appropriate connection.

If possible, the hybrid nozzle may project out of the 3/8" external thread connection for a certain length so that the body (Ø5mm) of the hybrid nozzle extends

through the axial rotary transmission leadthrough into the spindle. This more complex installation pays off by better spraying results thanks to the shorter distance to the cooling channel outlet.

System components:

1. Base / Base addition

- Pneumatically driven, finely meterable piston pump () with double flow volume (2DF) with FPM seals, manually adjustable volume dial () (0 0.06 ml per stroke). Vario3 and Vario7 variations have piston pumps with simple flow (0 0.03 ml per stroke), individually adjustable.
- Ventilation unit ② integrated underneath the pump module.
- Frequency generator for pump pulses, manually adjustable 0 90 stroke min⁻¹.
- On request also as digital frequency generator for precise adjustment.
- Dedicated **air valve** to determine spray air quantity.
- · Dedicated air valve to determine casing air quantity.
- Manometer (0 10 bar) in the door front to indicate spray air pressure.
- · Coupler plug for compressed air supply on left side of housing.
- Air filter / water separator with drainage opening on underside of housing.
- High grade push in/screw fittings / pneumatic tubes.
- Stable, compact **metal housing** (300x300x210) with robust metal closer and door seal for dust protection and noise reduction, earthing pin.
- Connection for feed tube on the left side of housing.
- · Component labelling in accordance with the designations in the pneumatic connection diagram.
- 2. Reservoirs from 2.0 to 27 litres available (details, variations and data: see Lubrimat[®], on page 9).



Fig.: Pump module T70

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3. Drive electric, pneumatic or manual option:

- Solenoid valve 3/2 way (1300 Nl/min) with auxiliary actuation (for occasional manual switching on/off). Coil with plug in 24V DC, 24V AC, 110V AC or 230V AC. Cable bushing on left side of housing. Vario3 and Vario7 also offer separate actuation control of each pump via a solenoid valve.
- Pneumatic valve 3/2 way (1300 NI/min). With push in connection Ø6 for control air on the left side of housing.
- Hand valve 3/2 way (600 NI/min) as valve rocker on the right outer side of housing.

4. Feed tube

• Feed tube with Ø16 external tube with robust metal sleeve, two internal tubes for lubricant and air supply, constructed of PTFE Ø3. Standard length 3,000, non-standard lengths up to 20,000 available on request.

5. Nozzle

- HY: hybrid nozzle flush with the 3/8" external thread connection at the end of the feed tube.
- HY...: hybrid nozzle projects ...mm out of the 3/8" external thread connection at the end of the feed tube.

6. Option

- 4 x round magnet Ø80 (mounted on the reverse side) for easy installation of the housing.
- 4 x mounting straps (mounted on the reverse side) for fixed installation of the housing.

Technical Data:

Operating pressure		bar	5 - 8			
Liquid throughput		ml/h	0 – 300 ¹⁾			
Typical consumption		ml/h	20 – 50 ¹⁾			
Lubricoolant			Lubrimax [®] and c	thers		
Recommended viscosit	y mm²,	/s (at 40°C)	1 - 50			
Dimensions (HxWxD)						
Housing (without reserv	oir)	mm	nm 300x300x210			
			¹⁾ depending on app	lication, medium used, viscosity and temperature		
<u>Order codes:</u>						
0. Base	T70	MQL for interna	al lubrication, hybr	id nozzle on feed tube		
	T70Di	as T70, but with	as T70, but with digital frequency generator			
1 Base addition	/1	(for 1 nozzle st	andard)			
n Buse addition	/1\/3	(for 1 nozzle, V	ario 3 = 3 pre-adii	istable settings for the oil quantity)		
	/1\/7	(for 1 nozzle, V	ario 7 = 7 pre-adii	istable settings for the oil quantity)		
2. Reservoir		(2.0 to 27 litres	available, for orde	er code see Lubrimat, page 12)		
3. Drive EV		electric (24V D	electric (24V DC, 24V AC, 110V AC oder 230V AC)			
	PV3	pneumatic				
	H3	hand actuated				
4. Feed tube	ZM3000	feed tube, metal	outer Ø16 / inner 2	2 x PTFE Ø3, L=3,000 (standard)		
	ZM	feed tube, L=	. (non-standard le	ngth, min. 500, in increments of 500)		
5. Nozzle	HY	hvbrid nozzle fl	ush (standard) wit	th the 3/8" external thread connection		
	HY	hybrid nozzle pro	pjectsmm out of t	he 3/8" external thread connection		
6. Option	RG	housina mounti	ng 4 x round mag	net Ø80		
	MG	housing mounti	ng 4 x mounting s	straps		
Sample order code:	<u> T70/1</u> -	P2NC - E24V	<u>DC - ZM3000</u> -	<u>HY</u> - <u>RG</u>		
<u></u>						
U. Base —				6. Option		
1. Base addition —						
2. Reservoir —				5. Nozzle		
3 Drive				4 Feed tube		
0. 0110						

Page 19



Spraymat[®] S700

Brief description: Main application range:	Low pressure system for spraying low viscose substances in medium quantities. External MQL in simple metal-cutting operations. As a spray system in application of substances in not to small quantities. Depending on the substance and type of application, a suction is recommended.
Operating principle:	In the Venturi nozzle, the spray air produces a partial vacuum, which causes the liquid to be sucked out of the unpressurized reservoir and sprayed.
Adjustability:	Spray air quantity (manual), quantity of liquid (manual), spray air pressure (manual), switch on/off actuation (electric, pneumatic or manual)

<u> Technical Data:</u>

		Nozzle VD07	Nozzle VD15
Operating pressure	bar	4 - 7	4 - 7
Liquid throughput	ml/h per nozzle	0 - 1.000 ¹⁾	0 – 6.000 ¹⁾
Typical consumption	ml/h per nozzle	30 - 50 ¹⁾	50 – 100 ¹⁾
Lubricoolant		Lubrimax [®] and others	Lubrimax [®] and others
Recommended viscosity	mm²/s (at 40°C)	1 - 25 ¹⁾	1 - 50 ¹⁾
Max. suction height	mm	1.000 ¹⁾	3.000 ¹⁾
Max. feed tube length	mm	10.000 ¹⁾	20.000 ¹⁾

¹⁾ Partly application-specific, depending on operating pressure, medium used, tube length and suction height

Dimensions (HxWxD) of the standard version, depending on reservoir

S700/1-Y1W	250 x 175 x 150
S700/1-Y6W	250 x 300 x 200
S700/1-Y20	310 x 400 x 300
S700/1-Y40	310 x 600 x 400

System components:

1. Base / Base addition

- For each nozzle a needle valve to adjust air spray and one to adjust guantity of liquid.
- **Pressure reducing valve** for spray air to adjust spray jet (low pressure = coarse spray droplets; high pressure = fine spray droplets).
- Manometer (0 10 bar) on pressure reducing valve to indicate spray air pressure.
- · Ascending pipe for liquid with non-return valve and liquid filter.

2. Reservoirs 1.0 to 40 litres available:

- Reservoir 1.0 litre PE (S700/1 only) with aluminium screw cap, ventilation plug and wall bracket (with 2 round magnets Ø57, on request).
- Reservoir 6.0 / 20 or 40 litre PP, with filler neck, screw plug, detachable sieve, automatic ventilation, hinged cover, visual fill level display on the outside. Can be supplied with float switch min or min+max (potential-free, either NC or NO).
 Wall bracket for reservoir 6.0 litre on request, with or without 4 round magnets Ø57.
- 3. Actuation electric, pneumatic or manual option:
- Solenoid valve 3/2 way (up to 4 nozzles 120 NI/min, over 4 nozzles 1300 NL/min) with auxiliary actuation (for occasional manual switching on/off). Coil with plug in 24VDC, 24VAC, 110VAC or 230VAC. In case of separate actuation each nozzle (group) controlled via a dedicated solenoid valve. Pneumatic valve 3/2 way (up to 4 nozzles 550 NI/min, over 1300 NL/min)
- Hand actuated ball valve (2/2 way).
- **4. Feed tube**, coaxial, PUN Ø8 outer with internal PUN Ø3. Standard length: 1,000; non-standard length: see Technical Data. On request with outer metal protection sleeve.

5. Nozzle

• Venturi nozzle VD07 for lower capacity of up to 1l/h. Available in copper tube or multi link tube style, length 300. Nozzle tip full jet as standard or flat-jet. Different mounting options available.

Fig.: S700 with

reservoir Y6

Fig. S700 with

reservoir Y1W

Spraymat[®] S700

• Venturi nozzle VD15 for higher capacity of up to 6 l/h. Available in copper tube or multi link tube style, length 300. Nozzle tip full jet. Different mounting options available.

6. Option

 Pneumatic drip shut-off system (per nozzle) in FPM. Required if the nozzle is inserted underneath (otherwise danger of subsequent dripping) or far above (otherwise increased reaction time) of the reservoir level.

Fig.: Detail showing nozzle tip VD15, VD07F and VD07

Fig.: Multi link tube and copper tube style

Steidle

-1

Order codes:

0. Base	S700	Spray system with Venturi nozzle	VD07F and VD07
1. Base addition	/ /S	(state number of nozzles, e.g. "/4") (separate drive. All nozzles separately, e.g.: "/3S" or i	n groups, e.g.: "/3S2+1)"
2. Reservoir	Y1W Y1WR Y6 X6W/	1.0-litre PE with wall bracket (S700/1 only) with 2 x round magnet Ø57 6.0-litre PP (max. S700/4 or S700/3S) with wall bracket	
	Y6WR	with wall bracket and 4 x round magnet Ø5	57
	Y6NC	with float switch min NC	
	Y6NO	with float switch min NO	
	Y20	20-litre PP	
	Y20	with float switch variations as Y6	
	Y40	40-litre PP,	
	Y40	with float switch variations as Y6	
3. Actuation	eV	electric, up to 4 nozzles (24VDC, 24VAC, 110)	VAC or 230VAC) actuation
	EV	electric, over 4 nozzles (24VDC, 24VAC, 110	VAC or 230VAC) actuation
	pv3 (PV3)	pneumatic actuation, up to 4 nozzles	
	H2	hand actuation	
4. Feed tube	ZP1000	feed tube, PUN Ø8 outer / PUN Ø3 inner, L=	1,000
	ZP	non-standard length, L= (min. 500, in incre	ments of 500)
	ZPM	feed tube as ZP, but with metal protection sle	eve, length like ZP
5. Nozzle	VD07GLB	Venturi nozzle, full jet, multi link tube, L= 300	, with connection block
	VD07GLBR	and round magnet Ø80	
	VD07GLF	Venturi nozzle VD07GL like above, but flat-je	t
	VD07KK	Venturi nozzle, full jet, copper tube (L= 300) v	with 2 clamps
		Venturi nozzle, full jet, copper tube (L= 300) v	with connection block
		and round magnet Ø80 Venturi pozzle VD07K like above, but flat jet	
	VD15GLB	Venturi nozzle full jet multi link tube 1 = 300	with connection block
	VD15GLBR	and round magnet Ø80	, with connection block
	VD15KK	Venturi nozzle, full jet, copper tube (L= 300) v	with 2 clamps
	VD15KB	Venturi nozzle, full jet, copper tube (L= 300) v	with connection block
	VD15KBR	and round magnet Ø80	
6. Option	NpF	pneumatic drip shut-off system, FPM	<u></u>
Sample order cod	<u>le: <u>\$700/3</u> -]</u>	<u>Y6WRNC</u> - <u>e24VDC</u> - <u>ZP1000</u> - <u>VD07KB</u>	<u>R - NpF</u>
0. Base ———			^L 6. Option
1. Base addition			
2 Reservoir			5 Nozzle
3 Drive			4 Feed tube
			Pade 21

Lubrimat® L60 Sawfix® SF

Case studies / FAQ



Pulsomat® P35

Brief description:	Airless system for intermittent application of low viscose liquids	
	from a distance without the addition of air.	leid
Main application range:	External MQL in simple, metal-cutting and chipless	
	forming operations.	
Operating principle:	The liquid flows out of the reservoir into the piston	
	chamber. The piston is accelerated by means of a	
	compressed air impulse and shoots the liquid at high	
	pressure through the nozzle.	٤ (
Adjustability:	Fluid volume at the PMC precise metering control dial (manual)	~
	Optional: Pressure of piston actuation air (manual)	
	Switch on/off via drive (electric, pneumatic mechanic or by foot pedal)	



Technical Data:

bar	3 – 8
ml/stroke	0.06 ¹⁾ at P35/1
	0.12 ¹⁾ at P35/1(4DF)
	Lubrimax [®] and others
mm ² /s (at 40°C)	1 - 50 ²⁾
mm	750 ¹⁾
hout reservoir	
mm	Ø40 x 136
mm	Ø40 x 276
	bar ml/stroke mm ² /s (at 40°C) mm hout reservoir mm mm

¹⁾ Maximum values refer to water sa fluid

²⁾ Partly application-specific, depending on operating pressure, fluid, dosage quantity and dosage

System components:

1. Base / Base addition

- Compressed air-powered piston in aluminium housing Ø40, liquid seals of FPM construction.
- Free adjustability of the fluid volume (up to max. 0.06 or 0.12 ml/stroke) including an indication scale at the PMC.
- Seating 1/4" for reservoir 0.33-litre PA or push in connector Ø6 for fluid entry.
- Push in connector Ø4 for compressed air entry.
- Fixing bar Ø10 / Ø8.

2. Reservoir 0.33 to 27 litres available:

- Base assembly: Reservoir 0.33 litre PA with screw cap, ventilation plug, drainage sieve.
- Wall installation:
 - Reservoir 1.0-litre PE, with screw cap, ventilation hole, stopcock, feeding pipe L=1,500 and wall bracket (if required, with 2 x round magnet Ø57).
 - Reservoirs 6.0 to 27 litres from the Lubrimat series. See catalogue page 9.



Fig.: detail PMC dial

Pulsomat® P35



- 3. Drive electric, pneumatic, mechanic or pedal-operated option:
- Solenoid valve 3/2 way (120 NI/min) with auxiliary actuation (for occasional manual switching on/off).
- Coil with plug in 24V DC, 24V AC, 110V AC or 230V AC.
- Pneumatic valve 3/2 way (550 NI/min).
- Mechanic valves 3/2 way (700NI/min) as plunger, roller lever or knee roller lever.
- Pneumatic foot pedal switch 3/2 way (800 NI/min). If required, with protection cap.

5. Nozzle

- As standard multi link tube (Ø13, L=170) with full jet nozzle, suitable for comfortable positioning. If required, this version can be converted into the short version.
- Also available as a short version with the full jet nozzle (Ø13, L=32) installed directly on the base unit, in case no space for the multi link tube is given.

6. Option

- Stand with switchable block magnet (55x50x80) and articulated bar (Lmax=250).
- · Pressure reducing valve including manometer for improved regulation of spray distance and profile (only in conjunction with a stand)



Fig.: P35/1 with multi link tube nozzle GLV



Fig.: P35/1 with short version nozzle V Lubrimat[®] L60 Sawfix[®] SF

Centermat® C30 Toolmat® T70

P35

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Lubrimax® ubricoolan

filling syster PAF

Case studies FAQ

Order codes:

01. Base and addition	P35/1 P35/1(4DF)	airless system, basic unit with max. 0.06ml/stroke airless system, basic unit with max. 0.12ml/stroke	Ģ
2. Reservoir	Y03 Y1AW Y1AWR 	0.33-litre PA (base assembly) 1.0-litre PE with stopcock, wall bracket (wall installation) 1.0-litre PE with stopcock, wall bracket and 2 x round magnet Ø57 further reservoirs (wall installation) 6.0 to 27 litres: order code see Lubrimat, catalogue page 12.	
3. Drive	eV pv3 M3SNC2000 M3RNC2000 M3KNC2000 F3 F3S	electric (24VDC, 24VAC, 110VAC oder 230VAC) pneumatic mechanic plunger valve, NC, with tube 2,000mm mechanic roller lever valve, NC, with tube 2,000mm mechanic knee roller lever valve, NC, with tube 2,000mm foot pedal switch, pneumatic foot pedal switch, pneumatic, with protection cap	
5. Nozzle	GLV V	multi link tube with full jet nozzle, standard version full jet nozzle, short version	E
6. Option	SH3 SH3 - DM	block magnet stand with articulated bar block magnet stand with articulated bar and pressure reducing valve with manometer	Filling syst
Sample order co	<u>de: <u>P35/1</u> -</u>	<u>Y1AW</u> - <u>e24VDC</u> - <u>GLV</u> - <u>SH3 - DM</u>	

- 0. Base -
- 1. Base addition -
- 2. Reservoir -
- 3. Drive

5. Nozzle

6. Option





Lubrimax[®] Edel C

Lubrimax[®] Edel C is high grade vegetable oil with additives, developed for MQL. It is used mainly in machining processes. The materials that it can be used with range from unalloyed steels to hard, high-alloy high grade steels. Lubrimax[®] Edel C has excellent wetting properties and the high grade EP additives improve the edge life of the tools. Special additives prevent Lubrimax[®] from oxidising and thereby resinifying. Lubrimax[®] Edel C is applied undiluted in small quantities. MQL systems with exact metering for the smallest quantities are suitable for applying Lubrimax[®] Edel C.

Chemical-physical data

Colour	yellow
Setting point	not available
Flash point	200 °C
Viscosity	88 mm ² /s (20 °C)
	43 mm ² /s (40 °C)

Density	0.93 g/cm ³ (15 °C)
nitial boiling point	not available
gnition temperature	> 200 °C
Nater hazard class	WGK1

Lubrimax[®] Alu-Quick

Lubrimax[®] Alu-Quick is a hydrocarbon mixture. Lubrimax[®] Alu-Quick is used mainly in machining of aluminium and forming of thin-walled metals up to 0.5 mm thick. Lubrimax[®] Alu-Quick is odour-neutral and when applied in thin coats, evaporates in the minimum amount of time, leaving the workpiece and chips virtually dry.

Lubrimax[®] Alu-Quick is applied undiluted in thin coats. MQL systems with exact metering for the smallest quantities are suitable for applying Lubrimax[®] Alu-Quick.

Chemical-physical data

Colour	colourless
Setting point	not available
Flash point	>= 62 °C
Viscosity	2.2-2.8 mm ² /s (20 °C)
	1.5-1.9 mm ² /s (40 °C)

Density	0.75-0.77 g/cm ³ (20 °C)
Initial boiling point	not available
Ignition temperature	not available
Water hazard class	WGK1

Lubrimax[®] Alu Fleckfrei

Lubrimax[®] Alu Fleckfrei is a fatty alcohol mixture, specially developed for MQL for use in metal-cutting and chipless aluminium forming operations with additional heat treatment. Lubrimax[®] Alu Fleckfrei does not leave any tiny marks on the workpiece. Lubrimax[®] Alu Fleckfrei has a high lubrication effect, good wetting properties, is low-odour, is not harsh on the skin and is biodegradable.

Lubrimax[®] Alu Fleckfrei is applied undiluted in small quantities. MQL systems with exact metering for the smallest quantities are suitable for applying Lubrimax[®] Alu Fleckfrei.

Chemical-physical data

Colour	colourless
Setting point	not available
Flash point	>150 °C
Viscosity	45 mm ² /s (20 °C)
	20 mm ² /s (40 °C)

Density0.84 g/cm³ (15 °C)Initial boiling point> 280 °CIgnition temperature> 250 °CWater hazard classGenerally hazardous
to water



MAX' Alu Flec

MAX" EDEL C

5 / Art.-Nr. 890 003 20 / Art.-Nr. 890 004 200 / Art.-Nr. 890 005

Lubricoolants

Twinmax®

Twinmax[®] is a water-soluable lubricoolant for MQL based on vegetable oils and emulsifiers in specific proportions. In addition to extremely low consumption, Twinmax[®] offers excellent results in extra heavy machining of metals and all NE metals, e.g. increased tool service life. Twinmax[®] also offers a high level of protection against corrosion and wear. The emulsion leaves behind no sticky residues. Twinmax[®] is used at a concentration of 5 % -10 %. In exceptional cases, it can also be used undiluted. MQL systems with exact metering for the smallest quantities are suitable for applying Twinmax[®] as well as systems for larger quantities.

Chemical-physical data

Colour	yellow
Setting point	not available
Flash point	> 120 °C
Viscosity	180 mm ² /s (20 °C)
	70 mm ² /s (40 °C)

Density	0.98 g/cm³ (20 °C)
Initial boiling point	not available
Ignition temperature	not available
Water hazard class	WGK2

Recommended micro lubrication lubricoolants depending on material type:



Ordering information:

Lubrimax®	51	890 003	
Edel C	20	890 004	
	200	890 005	
Lubrimax®	51	891 503	
Alu-Quick	201	891 504	
	200	891 505	
Lubrimax®	51	890 503	
Alu Fleckfrei	201	890 504	
	200	890 505	
Twinmax®	51	896 003	
	201	896 004	
	200	896 005	

Please note: All our lubricoolants are free of PCB, PCT and other inorganic chlorine compounds, nor do they contain nitrosamines or secondary amines.





Filling system PAF

Brief description: Range of application: Operating principle: Adjustability: Switch on/off:

Unit for permanent, automatic refilling of fluids in small quantities. Filling-up of reservoirs from MQL units. A piston pump sucks the fluid from an unpressurized container into a reservoir. The factory setting determines the flow rate (manually adaptable).

Via drive (electric or pneumatic).

PAF (Permanent Automatic Filler) is a space-saving unit for the transportation of liquids of a container in another one. PAF has been developed especially for the reduced outputs and smaller reservoir dimensions of minimum quantity lubrication (MQL). A low, but permanent volume flow prevents the reservoir from overfilling or the foam up of the fluid.

The powerful, self-priming piston pump of the PAF lifts fluids up to 2-m (e.g., from a container or drum) and then pumps the fluid up to 4-m height, also over a distance of up to 20 m. The pre-set output volume is 360ml/hour. PAF can pump fluids also against a pressure up to 5 bars (an integrated safety valve protects you against dangers of a too big counter pressure).



Normally PAF is actuated by an electric signal (e.g., from the machine control / PLC). On demand a purely pneumatic version is also available.

The typical area of application of PAF is the permanent, automatic refilling of reservoirs of MQL units. But PAF is also applicable in any case where an automatic transport / dosing of fluids in small quantities over a longer period is needed.

PAF increases the productivity, process reliability and working security

- · by reduced workload of the machine operator (automatic refilling)
- · by refilling also during night/unmanned shifts
- by filling of pressurized reservoirs (up to 5bars) also during operation
- by the controlled dosing of a fluid component (e.g., water mixable concentrates)
- in case of too small designed reservoirs (e.g., narrow assembly space)
- at difficult accessable / ergonomically unfavorably mounted reservoirs
- at reservoirs mounted within the danger / restricted zone

System components:

1. Base / Base addition

Powerful, self-priming piston pump with liquid seals of FPM construction.

- Work setting of the output flow = 360 ml/H (reduceable by hand).
- Functional display for operating status.
- Push in connector Ø 8 for air pressure input.
- Push in connector Ø 6 for fluid input, Ø 10 for fluid output.
- Stable steel case, dimensions BxHxT 300x150x80, with screwed lid.
- (2. Reservoir: For PAF not needed)

3. Drive electric or pneumatic option:

- Electric solenoid valve (3/2 ways, 120NI / min) with auxiliary overdrive (for occasional manual actuation) with coil / plug in 24VDC, 110VAC or 230VAC. Cable bushing with strain relief.
- Pneumatic actuation via compressed air input.

Filling system PAF



4. Hoses

PUN Ø6, L=2000 (shortenable) with filter Hose-IN • Hose-OUT PUN Ø10, L=3000 or longer (shortenable) Optional with adapted screw cover for filler neck for Steidle reservoirs

(5. Nozzles: For PAF not needed)

6. Option

- Housing mounting straps, 4x
- Housing mounting, 2x round magnets Ø80, diagonal on backside
- Housing mounting, 1x round magnet Ø80, on the underside

Technical Data:

Operating pressure	bar	4 – 8		
Dosage quantity	ml/h	360		
Max. suction height	m	2		
Max. pump height	m	4		<u>e</u>
Max. pump distance	m	20		a
Recommended viscosity	mm²/s	(< 230)		av
Air consumption	NI/min	8		, and a second se
Power consumption	W/h	1.5	(only version with electric actuation)	
Dimensions of the steel case (wi	thout mounting devices	s, connections)		
BxHxT	mm	300x150	x80	

Order codes:

1. Basis	PAF	PAF basic unit (6-10)	ulsor
3. Drive	e24VDC e110VAC e230VAC -	Electric 24VDC Electric 110VAC Electric 230VAC Pneumatic	•
4. Hoses Hose-IN Hose-OUT	P6-2000F P10-3000 P10 P10-3000D P10D	hose-IN PUN Ø6, L=2m (shortenable) with filter hose-OUT PUN Ø10, L=3m (shortenable) as above, L= (steps of 1m, max. 20m) hose-OUT PUN Ø10, L=3m (shortenable) with screw coverl as above, L= (steps of 1m, max. 20m)	Lubrimax®
6. Option	MG RG RGU	Housing mounting, 4x straps Housing mounting, 2x round magnets Ø80, diagonal on backside Housing mounting, 1x round magnet Ø80, on the underside	system



Lubrimat[®] L60 Sawfix[®] SF

Centermat[®] C30 Toolmat® T70

S700

Filling

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Steidle Examples of application



Milling in hardened tool steel (60 HRC) mould making with a processing time of 3 hours per workpiece. In the case of dry processing, the edge life was not sufficient for one workpiece. 2 MQL nozzles lubricate the milling cutters and double the edge life. Thus, tool replacement during processing operations is no longer necessary.

Milling of a compressor rotor made of alloyed steel with a milling cutter \emptyset 250 mm. Compared to dry processing, the use of MQL resulted in increased edge life, improved finished surfaces and a reduction in the temperature of the workpiece.

Milling of plastic parts on a machining centre. Because emulsion would attack the plastic, until the introduction of MQL, dry processing had been used. However, this meant that the surface of the finished product was often unsatisfactory. Now the milling process is lubricated using one nozzle. This has improved surface quality, and has even made a gloss effect possible on some types of plastic.

Milling and **drilling** of aluminium on a machining centre. MQL with internal lubrication using internally cooled spindle and machine tool.

Milling of ring T-nuts in surface plates (Ø up to 3,000 mm) of St52 constuction. Because of the size of the parts and the open construction, flood cooling is not possible. Two nozzles lubricate the milling cutters. There was a 100% increase in the edge life compared to dry processing.

Milling of sample gauges of plastic or aluminium on a Zimmermann FZ 40 5axle portal milling machine. In this process, the oil-air mixture is conducted through a lateral cooling channel of the spindle and sprayed on by a multi-link tube nozzle using an MQL system for the internal feed. In addition, chips are removed from the workplace with the spray air function, if necessary.

Milling of individual pieces of diverse material types on a DMG 50T in the mechanical workshop of an institute. Compared to the previous dry processing, the lifetime of the tools could be decisively improved.

Milling of 3m long, forged steel ingots made of X4CrNiMo16-5-1. The scale layer is removed and the block is brought to size. With MQL it was possible to increase the edge life of the tool compared to dry processing. Furthermore processing time is reduced by 2 ½ hours per ingot as advance and feeding could be improved.

Please note: The applications presented here are all genuine practical examples. They are intended to give some insight into how Steidle systems might be used. The list given here is intended to serve as an example only and is not a complete list. Other types of procedures and materials not listed here may also be suitable for use with our products.

Turning of components for pump systems of high grade steel construction up to \emptyset 1,200 mm. 2 nozzles lubricate the tool. The heavy pollution of the area around the open machinery, associated with conventional flood cooling, was also largely eradicated. Furthermore, in relation to intricate materials, there was also an improvement in the edge life and surface finish.

Turning of grooved rolls Ø 1,500 mm made of forged steel. The diamond edges of the lathe tools were lubricated using one nozzle to prevent them becoming too hot and consequently coming loose.

Turning in a tool and jig making shop. In this department, an employee became ill and suffered from skin rashes due to contact with the lubricoolants. For this reason an alternative for the flood cooling was investigated. After changeover to MQL, the employee is now free of complaints.

Turning of aluminium screw connections with subsequent thread rolling. The process was lubricated with emulsions, which however damaged the loading robot. Trials of dry processing failed due to the built-up edge formation. Production could be changed with MQL.

Turning on a Gildemeister Graziano CTX 310 of an educational establishment for training and test purposes. Since the machine is not regularly used, it has never been filled with lubricoolants. Problems with bad tool lifetimes were faced, which can be removed with MQL.

Tapping M8 in die cast and stainless steel for the manufacture of door lokking systems. Up to present, oil has been applied with a brush. Since this procedure required too much efforts and costs and was not uniform, alternatives were looked for. Thanks to the fogfree MQL, the lubrication is now processsafe, saves time and an unnecessary displacement of oil is excluded.

Thread moulding of two internal threads with a TIN-coated M10 thread former in sanitary installation products made of galvanized sheet steel. It was necessary to avoid the flood cooling so that first the dry processing was tested, through which the lifetime of the tool only amounted to approx. 200 threads. With the Steidle MQL, good lifetimes of 7,000 threads have been achieved.

Thread moulding M5 x 5 of aluminium sections for plant engineering. First of all the tap holes are punched out. The thread former is briefly sprayed by a nozzle prior to use. There was a drastic reduction in the quantity of lubricant required compared to the drip feed lubricators previously used.

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spraymat®

Pulsomat®

P35

ubricoolants

Lubrimax®

Filling system

PAF









Case studies / FAQ



Thread moulding of M8 and M6 threads in assembly plates made of V2A. The specified edge life of the tool could be exceeded by 33% with the system directly planned with MQL.

Thread moulding M36 in rotor rings for wind power stations. Rings with a diameter of up to 6m are made of high-grade forged steel. As a high dimensional accuracy is demanded, the workpiece must not heat up too much. More oil as common for MQL is used here deliberately to reach the necessary cooling effect.

Deep hole drilling of aluminium pump cases at a drilling depth of 260 mm. Switching to MQL internal lubrication trebled the edge life in comparison to internal cooling using emulsion.

Deep hole drilling of Ø13mm with a drilling depth of 400mm. Chips can be easier removed out of the hole thanks to a good chip break and the lower own weight with MQL. As a result, the workpieces with a diameter of only 70mm remain cool.

Drilling of rectangular steel tubes. Flood cooling was used previously. Switching to MQL resulted in a reduction in pollution and improved workplace safety. In addition, the lifespan of the drills trebled.



Drilling Ø 11.5 of a hole notch for a plasma cutting machine in X2CrNiMo22, 80 mm thick. Dry boring was the method used previously. Using a drill with internal MQL cooling resulted in a 20 fold increase in the edge life and a reduction in the processing time from 20 to 6 minutes, as tool replacement was no longer necessary.

Drilling and **thread cutting** on a machine centre to the specifications of a particular customer. The work was to be carried out using MQL with internal lubrication. In the comparative test, 4,000 holes were drilled using flood cooling; using MQL, the required edge life of 8,000 drill holes was achieved.

Drilling Ø 4 mm of aluminium rollers (Ø 250 mm) on a machine centre. The holes must be dry as taper pins are to be subsequently affixed into them. When using flood cooling, the emulsion therefore had to be specially centrifugedout using a lathe. However, with MQL, the drill is lubricated using a nozzle. The drill holes stay dry and centrifuging is no longer necessary.

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Drilling with the internal lubrication on a complete processing system provided with three spindles for structural design parts, such as for e.g. double Tcarriers up to 9 m length of St37. Due to the missing closed housing a flood cooling is not possible. Drill holes of up to Ø 40mm are provided. The integrated saw unit has also been equipped with MQL.

Band sawing of aluminium tubing. Two nozzleblocks provide lubrication both before and after the tubing has been cut. When flood cooling was used, the emulsion ran into the tubes and had to be removed, and this also impaired the safety of working conditions.

Band sawing for a large steel business on Kasto twinA4 saw equipment. In case of saws of solid material Ø 100 mm in pairs, lifetime problems occurred with the old spraying device, which did not produce the required volume. With a Steidle system, the rods are now sawed without any failure and at normal lifetime.

Cold circular saws for the series manufacture of sanitary tapware. The salient brass casting is separated by the sawing equipment. A flood cooling was out of question, because it was not desirable to have any residues when remelting the gates. Dry processing and MQL were compared in a test series. Due to the longer lifetimes, an amortisation period for the MQL system of 13 days resulted.

Cold circular saws of aluminium profiles at a job order production company on a Kaltenbach SKL450NA. The old spraying device did not provide satisfying performance. With a new MQL device and medium of Steidle, very good results were achieved immediately. The consumption could be reduced from 4 to 1.5 litre per day. The lifetime could be increased by even up to 1,000%, avoidingbuilt-up edges.

Hack sawing in a tool shop. The Kasto HBS1 was operated with a flood cooling system. However, as this unit is not used frequently, the emulsion always spoiled completely during the warm time of the year. With the MQL system, which has been installed in the meantime, this problem does not arise any more.

Engraving coated aluminium sheets. Because one nozzle lubricates the process, the workpiece remains so clean that it can be painted directly without the need for the components to be cleaned. Prior to the use of MQL, flood cooling was used and all the workpieces had to be washed.

Engraving of text elements in plastic plates with HSS cutter. As a consequence of the high speed (up to 60,000 min-1), the plastic glues at the tool which results in a low edge life. Gluing is successfully prevented with a MQL system.











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Steidle Examples of application



Countersinking (90°) of door furniture constructed of St37 (cold rolled) with coated HSS (high-performance speed cutting steel) countersinks. The lifespan of the machinery rose to 40,000 countersinks compared to 10,000 for dry processing.

Countersinking of sheet steel 8 mm thick using Ø 20 mm carbide countersinks, hardened subsequently. Emulsion residues in the hardening furnace resulted in poor flue gas values and sooting of the furnace. With MLS, the countersink is lubricated using one nozzle, resulting in an edge life of 10,000 drill holes.

Reaming of slots for ball-heads made of aluminium die casting with PKD reamers of diameters between \emptyset 22 R 6 and \emptyset 40 R 6. In former times, this machine was operated with a flood cooling. With MQL a perfect surface and high lifetimes of the reamers are obtained.

Grinding and polishing of knife blades with a double belt grinding machine, which is normally operated in dry condition. In order to prevent the tarnishing of the blades, grinding oil was sprayed in lowest quantities onto the band preventing the glazing of the grinding belts. With MQL, the surfaces have an even grinding pattern and the belts have a higher lifetime.

Grinding of motor saw chains through a grinding service. Up to present, the grinding has been done in completely dry condition, which sometimes led to a wearing-out of the cutting edged through increased temperature, as a result of which the chain had to be ground again. With MQL, the smallest quantities of lubricating material are sufficient to achieve a very good micro-section with an essentially clean cutting edge and to avoid the wearing-out.

Punching of connecting rods. The top side and underside are sprayed. Compared with manual lubrication, the method used previously, the application of the lubricant is now much more even and the tool life greater.

Punching of back-up strips made of a compound of zinced steel and a white steel band. When punching the ends small pieces of waste are produced that may be pulled into the tool. A fine adhesion-preventing coating is applied with an MQL system.

Bending of copper closed circular pipelines. The rolls are sprayed during the bending process. Consequently, the copper no longer sticks to the roll coils and the finished products do not have to be reworked.

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Remodelling of pipes made of St37 and V4A for the manufacturing of lightning conductors. Up to present, the very viscous forming-oil was applied manually with a brush. The complete process has now been automated, so that only an MQL system sprays on the end of the pipe.

Remodelling of sealing cap made of stainless steel, which has been moistened with a kind of drop-feed lubricator up to present. However, the quantity was so high that the manufactured parts had to be collected in draining reservoirs and cleaned. With the present MQL system, the consumption was reduced from 10 to 3 litres oil per layer. In addition, the lifetime of the cleaning bath has increased, since the oil injection is lower.

Beading of high grade steel elements in washing machine drum production. Four nozzles lubricate the forming rollers and protect them against overheating and wearing out

Calibration in a production department of motor operated valves. In this process, a calibration ball of ø 5 mm must be pressed through a transit drill hole of ø 4.95 mm. The process should actually take place in dry state, but the internal wall of the drill hole was too raw after pushing the ball through. Now a spraying system moistens the drill hole and the ball.

Broaching for the manufacture of steel truck axles. A large amount of oil was shot on the needle with an oil dispenser beforehand resulting in a consumption of oil of approx. 3 litres per day and in a contamination of the surroundings of the machine by oil residues. Now only 0.3 litres are consumed per day and the parts, the chips and the area surrounding the machine are clean.

Cooling of compound springs for trucks, made of spring steel. After forming at 900°C, a fixing hole is punched out. 2 nozzles spray an emulsion onto the punch (\emptyset 12 – 16 mm) to keep it cool. This prevents material build-up and so has trebled the tool life.

Application of release agents in moulds for zinc die casting. Prior to the casting process, a carrier with 6 nozzles travels between the moulds and sprays them for 5 seconds. The even application successfully prevents the finished die cast components from sticking to the mould and this has resulted in a greatly improved surface quality.

Application of anti-corrosion agents on channel sections made of flat steel. After forming, the workpieces of 2m length shall be provided with a rust protection for transport. One flat jet nozzle each sprays onto the material from the top and the bottom.

Centermat[®] C30 Toolmat^{® '}

Lubrimat[®] L60

Р Ч

Sawfix®

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Configuration help / FAQ

If you have decided for a system of Steidle, you can choose the components individually and submit your RfQ with the order code or place the order. In the following you will find some instructions for the configuration:

1. Basic addition

The basic addition determines the number of the feed pipes and thus the number of nozzles or nozzle blocks connected. By default, all nozzles of a system work simultaneously. If you wish to have the indivi dual nozzles (groups) work separately, a "separate drive" has to be selected.

Frequently asked questions to this topic:

- How many nozzles do I need? Normally, 1 nozzle per cutting tool to be lubricated is sufficient. At least 2 nozzles are to be recommended for milling in view of the multi-dimensional traversing directions. For smaller saws, one nozzle block with one feed pipe is sufficient; larger saws require several.
- Can I connect two or more nozzles to one feed pipe?
 No. Since this could never guarantee a uniform distribution, a nozzle could be undersupplied. In view of the already low minimum guantities a failure of the lubrication system could result.
- Can I increase the number of nozzles later? This is not possible for most of the devices without a larger modification. Therefore the number of the nozzles required should be selected right from the beginning.

2. Reservoir

The medium to be sprayed is stored in the reservoir. Different sizes are available. As option, you can select float switch, stirrer and several fixation options depending on the system.

Frequently asked questions to this topic:

- How large should the reservoir be selected? Normally 20-50 ml is sprayed per nozzle and spraying hour with the MQL. If this value is multipli ed with the effective spraying time per day, you receive the medium consumption of the system per day. Select the size of the reservoir so that you do not have to refill too many times. *Consumption in ml per day = 20 – 50 ml x number of nozzles x spraying time per day*
- When do I need a float switch?

A float switch is reasonable, if the system with the reservoir is not located in the field of view of the user or if a heavy contamination of the reservoir or the filling level display has to be expected due to the working environment; in addition, if a serious damage would quickly occur due to a failure of the lubrication system.

 Shall I take the float switch as NC (=opener) or NO (=closer)? In most cases, both can be used for the control which monitors the contact signal of the float switch. However, the NC offers the advantage that a possible parting of a cable in the line is monitored at the same time.

3. Drive

Through the drive you switch the system on and off. This drive can be carried out by an electrical or pneumatic control signal or through manual actuation by means of a switch. In this case, the systems work as long as the signal is alive and/or the switch is on the position "open". (Exception: Pulsomat, which carries out only one stroke per signal.)

Configuration help / FAQ



Frequently asked questions to this topic:

- Do I need current to operate the systems? No. All Steidle systems work exclusively with compressed air. Current is only necessary to open the compressed air supply, if you have selected an electric drive control.
- How much compressed air do I need for the system? Except for Pulsomat, all Steidle systems use compressed air as spray air. Normally approx. 50 NI/min per nozzle are consumed
- Can I also use the compressed air of my machine (instead of the compressed air from the network)? Yes, but in most cases only as control air. If it is used as working air, the air pressure and the compressed air flow rate must be adapted to the system requirements.

4. Feed tube

Feed tubes are the connection between the basic device (housing or reservoir) and the nozzle. They conduct the medium and the spray air and can be designed coaxially ("hose in hose") or parallel. Depending on the system, the tubes are provided with a metal sleeve.

Frequently asked questions to this topic:

- Which length do I need? Please consider where you wish to install the basic device and the nozzles and how you wish to lay the feed tubes between them. Measure this distance generously. Please note the maximum tube lengths depending on the system (see technical data).
- Can I shorten or lengthen a tube on my own? This is possible only in the system Centermat.
- Can I install the tubes in a cable drag chain? Yes, in this case, please select always the PUN synthetic tube version (presently on demand), since the danger of rubbing against other cables is too large for the tubes with metal sleeve.

5. Nozzles

In most cases, nozzles can be delivered in copper tube design (for rigid arrangement) and multilink tube design (flexible arrangement). For the fixing of the nozzles, connection blocks, round magnet systems or clamp mounting are available. Apart from the full jet nozzles, also flat jet nozzles can be offered for some systems. Saws can be provided with nozzle blocks.

Frequently asked questions to this topic:

- Which nozzle length do I need? By default, nozzles are 300mmm long. Other lengths are possible on demand. Please note that for larger lengths a decrease of the position stability has to be expected.
- Can I shorten a nozzle myself? No. The nozzles have a coaxial design and therefore, cannot be shortened.

6. Option

Depending on the system, fixing for the basic device, additional filling reservoirs or a drip shut of (S700) are available as option.



Is there anything else you would like to know? Then contact us. We are happy to advise you directly, or personally on-site through one of sales partners.

You can benefit from our extensive experience and expertise in all matters relating to minimum quantity lubrication systems by requesting our advice on the best equipment to suit your machinery or how to switch your production process to MQL.

your contact person:

This document is subject to technical alterations and no guarantee is made as to its accuracy. All lengths and diameters are stated in mm. Measurements and technical details are purely descriptive and are not intended as a guarantee as to the properties of any product.

Steidle GmbH • Röttgerweg 12 • D-51371 Leverkusen T: +49 (0) 214 / 8 25 11-25 • F: +49 (0) 214 / 8 25 11-26 www.steidle-gmbh.de • info@steidle-gmbh.de