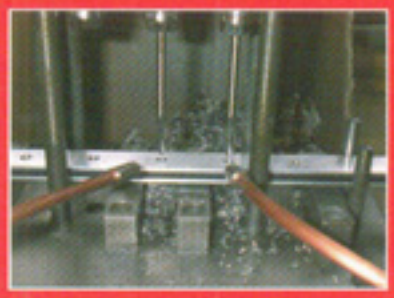
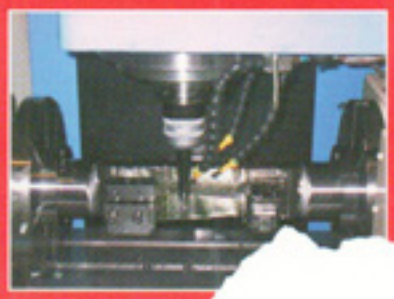
Micro Lubrication Systems

PRODUCT RANGE





Steidle®

Micro Lubrication Systems MLS

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Contents

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Lubrimat® L50 and L60

Brief description: Piston pump system for spraying the smallest quantities of liquid.

Main application range: External MLS in all metal-cutting operations. Pinpoint or small area lubrication in chipless forming operations. Application of mould release and anti-corrosion 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)

Fig.: Lubrimat® L50

Technical Data:

Operating pressure	bar	4 - 8
Liquid throughput	ml/h per nozzle	0 - 150 [1]
Typical consumption	ml/h per nozzle	10 - 20 [1]
Lubricoolant		Lubrimax® and others
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 (using locking pieces) volume 0 - 0.03 per stroke, including adjusting key. If required, pumps with double flow volume (2DF) with up to 0.06 ml per stroke are available. In the case of Lubrimat® L60, each pump is additionally fitted with PMC precise metering control ②, enabling easy adjustment of the volume using a dial.
- 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** ③ integrated underneath the pump block.
- **Frequency generator** for pump pulses, manually adjustable 0 - 90 stroke min^{-1}.
- 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 spray profile is even.
- **Manometer** (0 – 10 bar) in front of door to display spray air pressure.
- Coupler plug NG8 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, 250x250x210, 300x250x210, or 400x400x210) with robust metal closer and door seal for dust protection and noise reduction, earthing pin.
- Connections for feed tube with **EASY-COAX® system** (plug-in system for speedy, simple assembly, disassembly and interchange, including EASY-COAX® twist-stop) on the left side of the housing.

Fig.: Pump block L50

Fig.: Pump block L60

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Lubrimat® L50 and L60

- **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 (in metal, potential-free, either NC or NO), or electric level monitoring (24V DC or 230V AC).
  - 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 steel clips for wall installation.
    Can be supplied with float switch min or min+max (in metal, potential-free, either NC or NO).

Fig.: Reservoir P2 (2.0 l)

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

Vol.	ø	H
0.33	83	135
1.0	105	180
2.0	140	225
3.0	155	250

Fig.: Reservoir A27WNC

Volume (l)	Width (mm)	Height (mm)	Depth (mm)	Weight (kg)
6	260	288	319	4.0
10	315	324	316	5.5
17	369	357	356	7.0
27	491	388	376	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.*

3. Drive electric, pneumatic or manual option:

- Solenoid valve 3/2 way (up to 3 nozzles 120 Nl/min, 4 nozzles and over 800 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. 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 Nl/min, 4 nozzles and over 800 Nl/min). With push in connection ø6 for control air on left outer side of housing.
- Hand valve 3/2 way (600 Nl/min) as valve rocker on right outer side of housing.

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.
- Numbering clips on feed tube for easy assignment of pumps and nozzles.

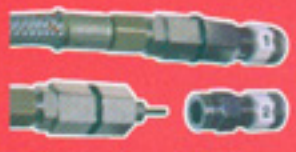

Fig.: EASY-COAX®

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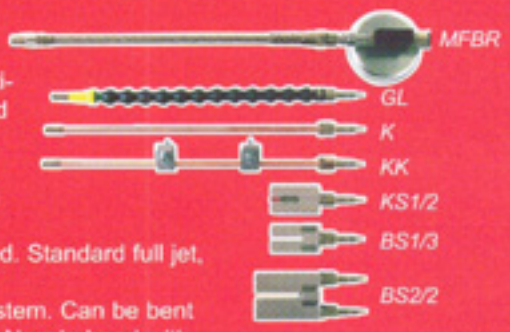
Lubrimat® L50 and L60

5. Nozzle options:

- Nozzle **copper tube** Ø6 with EASY-COAX® system. Can be bent once, most suitable for rigid laying. Nozzle head with flow optimized construction for targeted, fogless spraying and nickel-plated protective sleeve Ø8. Standard length 300, non-standard lengths in increments of 50 can also be supplied. 2 clamps, a connection block (40x30x15 with 2 fixing holes Ø6) or a connection block with round magnet Ø80 can be supplied for mounting, if required. Standard full jet, also available as flat-jet (spray angle approx. 75°).
- Nozzle **multi link tube** Ø17 with EASY-COAX® system. Can be bent several times, particularly suitable for flexible laying. Nozzle head with flow optimized construction for targeted, fogless spraying and nickel-plated protective sleeve Ø8. Standard length 300, non-standard lengths in increments of 50 can also be supplied. A connection block (40x30x15 with 2 fixing holes Ø6) or a connection block with round magnet Ø80 can be supplied for mounting, if required. Standard full jet, also available as flat-jet (spray angle approx. 75°).



- Nozzle flexible metal tube Ø9 with EASY-COAX® system. Can be bent several times, particularly suitable for flexible laying. Nozzle head with flow optimized construction for targeted, fogless spraying and nickel-plated protective sleeve Ø12. Standard length 340, but also available in 220 and 420. Connection block (40x30x15 with 2 fixing holes Ø6) with or without round magnet Ø80 can be supplied for mounting, if required.
- **Nozzleblocks** (Aluminium) with EASY-COAX® system. For 1, 2 or 3 feed tubes. With optimized spray points for band saws or circular saws and elongated holes for mounting 6x18 or 6x21.

6. Option

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

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

0. Base	L50	MLS with piston pumps
	L60	MLS with piston pumps and precise metering control (PMC)
1. Base addition	/.....	(state number of nozzles required, e.g. "/4")
	/.....S	(separate drive, all nozzles separately, e.g. "/4S")
	/.....S...+...	(separate drive, not all nozzles separately, e.g. "/4S2+1+1")
2. Reservoir	Y03	0.33 litre PA
	P1	1.0 litre plexiglas / NBR
	P1NC	... with float switch min NC
	P1NO	... with float switch min NO
	P1NCNC	... with float switch min NC + max NC
	P1NCNO	... with float switch min NC + max NO
	P1NONC	... with float switch min NO + max NC
	P1NONO	... with float switch min NO + max NO
	P2...	as P1, but 2.0 litres
	P3...	as P1, but 3.0 litres
	G1...	as P1, but glass / FPM
	G2...	as P2, but glass/ FPM
	G3...	as P3, but glass/ FPM

(Level monitor variation for reservoirs P1 to P3 and G1 to G3 also available)

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Lubrimat® L50 and L60

	A6W	6.0 litre aluminium (wall installation) with wall bracket
	A6W...	... with float switch variation, as P1
	A10W...	as A6W, but 10 litre aluminium
	A17W...	as A6W, but 17 litre aluminium
	A27W...	as A6W, but 27 litre aluminium
	A6WG	6.0 litre aluminium (housing assembly) with wall-housing bracket
	A10WG...	as A6WG, but 10 litre aluminium
	A17WG...	as A6WG, but 17 litre aluminium
	A27WG...	as A6WG, but 27 litre aluminium
3. Drive	e...V..	electric up to 3 nozzles (24V DC, 24V AC, 110V AC or 230V AC)
	E...V..	electric 4 nozzles and over (24V DC, 24V AC, 110V AC or 230V AC)
	p3	pneumatic up to 3 nozzles
	P3	pneumatic 4 nozzles and over
	H3	hand actuated control device
4. Feed tube	ZM3000	feed tube, metal outer ø11 / inner PTFE Ø3, length (L)=3,000 (standard)
	ZM.....	feed tube, length =.... (non-standard length, min. 500, in increments of 500)
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 Ø80
	KF...	as nozzle K, but with flat-jet
	GL	multi link tube (L=300)
	GLB	multi link tube (L=300) with connection block
	GLBR	multi link tube (L=300) with connection block and round magnet Ø80
	GLF...	as nozzle GL, but with flat-jet
	MFB	flexible metal tube (L=340) with connection block
	MFBR	flexible metal tube (L=340) with connection block and round magnet Ø80
	MF220B	flexible metal tube (L=220) with connection block
	MF220BR	flexible metal tube (L=220) with connection block and round magnet Ø80
	MF420B	flexible metal tube (L=420) with connection block
	MF420BR	flexible metal tube (L=420) with connection block and round magnet Ø80
	BS1/3	band saw nozzleblock for 1 feed tube/ with 3 spray points
	BS2/2	band saw nozzleblock for 2 feed tubes/ with 2 spray points
	BS3/3	band saw nozzleblock for 3 feed tubes/ with 3 spray points
	KS1/2	circular saw nozzleblock for 1 feed tube/ with 2 spray points
	KS2/2	circular saw nozzleblock for 2 feed tubes/ with 2 spray points
	KS3/3	circular saw nozzleblock for 3 feed tubes/ with 3 spray points
	(additional types and models also available)	
6. Option	RG	housing mounting 4 x round magnet Ø80

Sample order code: L50/3 - P1NC - e24VDC - ZM3000 - MFBR - RG

0. Base
1. Base addition
2. Reservoir
3. Drive
4. Feed tube
5. Nozzle
6. Option

Steidle®
Sawfix® SF

Brief description: Piston pump system for spraying the smallest quantities of liquid.
Main application range: External MLS for circular saws and band saws.
Operating principle: 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	mm²/s (at 40°C)	1 - 50
Dimensions (HxWxD)		
Housing (without reservoir)	mm	200 x 200 x 155
Nozzleblock	mm	15 x 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 (using locking pieces) volume 0 - 0.03 per stroke, including adjusting key.
- **Ventilation unit** ② integrated underneath the pump block.
- **Frequency generator** for pump pulse, manually adjustable 0 - 90 stroke min^{-1}.
- Coupler plug NG8 for compressed air supply to left side of housing
- **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.

Fig.: Reservoir P2 (2.0 l)

3. Drive otions:
- 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 Nl/min) as valve rocker on the right outer side of housing.

Vol.	ø	H
0.33	83	135
1.0	105	180
2.0	140	225
3.0	155	250

Steidle®
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.

Order codes:

0. Base	SF	MLS with piston pumps for saws
1. Base addition	/1	(for 1 nozzleblock)
2. Reservoir	Y03	0.33 litre PA
	P1	1.0 litre plexiglas / NBR
	P2	2.0 litre plexiglas / NBR
	P3	3.0 litre plexiglas / NBR
	G1	1.0 litre glass / FPM
	G2	2.0 litre glass / FPM
	G3	3.0 litre glass / FPM
3. Drive	e...V..	electric (24V DC, 24V AC, 110V AC or 230V AC)
	p3	pneumatic
	H3	hand actuation
4. Feed tube	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)
5. Nozzle	BS1/3	band saw nozzle block for 1 feed tube / with 3 spray points
	KS1/2	circular nozzle block for 1 feed tube / with 2 spray points
6. Option	RG	housing mounting 4 x round magnets Ø80

Sample order code:

SF/1 - Y03 - e24VDC - ZM3000 - BS1/3 - RG

0. Base
1. Base addition
2. Reservoir
3. Drive
4. Feed tube
5. Nozzle
6. Option

Steidle®
Centermat® C30

Brief description: Aerosol booster with piston pumps and PRO-CYCLON® technology to produce fine oil-air mixtures.

Main application range: Internal MLS for single channel rotary transmission leadthrough, middle and upper rotational speeds.

Operating principle: The piston pumps spray the oil from the supply reservoir into a spray chamber. Coarse drops are filtered out in the topped separation chamber to produce a fine, homogenous aerosol mixture. This is transported via the feed tube to the rotary transmission leadthrough.

Adjustability:
Pump 1 swept volume (manual), pump 2 swept volume (manual)
Clock frequency of the pumps (manual)
Quantity of spray air 1 (manual), quantity of spray air 2 (manual)
Quantity of additional air (manual)
Switch on/off of small spray nozzle 1 (machine-controlled)
Switch on/off of large spray nozzle 2 (machine-controlled)
Switch on/off of additional air (machine-controlled)

Fig.: Internal view of Centermat® C30

In the case of internal lubrication, the MLS oil-air mixture is fed through the rotary transmission leadthrough and the spindle to the outflow drill holes in the internally cooled machine tool. 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, thereby minimizing consumption. The smallest droplets in the µ-range that remain form a fine, stable aerosol mixture. This is transported to the rotary transmission leadthrough via the feed tube. There, the feed tube can be connected quickly using a push-in/screw fitting. When it exits the drill holes in the machine tool, the aerosol hits the exact spot where it is needed and, with its fine oil film, guarantees optimal lubrication of the machining process. Centermat® C30's two, separately controllable spray nozzles of different sizes can be adjusted to three different settings for small, medium and large tools via the machine control system. The quantity of additional air can also be regulated and this can be used for particularly large tools or for blowing-out.

Technical Data:

Operating pressure	bar	5 - 8
Typical consumption	ml/h	10 – 30 [1]
Lubricoolant		Lubrimax® and others
Recommended viscosity	mm²/s (at 40°C)	1 - 50
Dimensions (HxWxD)		
Housing	mm	500 x 400 x 210

[1] *depending on application, medium used, viscosity and temperature*

System components:

1. Base / Base addition

- Two pneumatically driven, finely meterable **piston pumps** with FPM seals, manually adjustable (using locking pieces) volume 0 - 0.03 per stroke, including adjusting key.
- Standard **separate actuation control**/ drive (both pumps can be controlled individually). The use of the logic panel enables both pumps to be operated using only one frequency generator.
- **Ventilation unit** integrated on the side of the pump block.

Steidle
Centermat® C30

- **Frequency generator** for pump pulses, manually adjustable 0 - 90 stroke min^{-1}.
- Two **spray nozzles** of different sizes, integrated into the spray chamber.
- A dedicated **air valve** for each spray nozzle to set spray air quantity.
- A dedicated **pressure reducing valve** for each spray nozzle to adjust the pressure of the spray air, including manometer (0 – 10 bar) to indicate pressure of spray air.
- Dedicated **air valve** to set quantity of additional air.
- **Visual Display Unit** in the door front to indicate operating status (operation / error).
- **Manometer** (0 – 10 bar) in the door front to indicate reservoir pressure.
- Pneumatic **pressure switch** to switch off nozzles in case of pressure build up.
- Automatic **ventilation valve** with 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.
- High grade push in/screw fittings / pneumatic tubes.
- Robust, compact **metal housing** 500x400x210 with robust metal closer and door seal for dust protection and noise reduction, earthing pin, 4 steel clips for wall mounting of the device.
- Connection for feed tube with push-in coupler Ø12 on the upper side of housing.
- **Component labelling** in accordance with the designations in the pneumatic connection diagram.

2. Reservoirs
- Aluminium reservoir, 1.5 litre inside housing with stopcock on the reservoir outlet.
- Float switch min (metal, potential-free, either NC or NO).
- Hand pump for filling the reservoir and funnel tube.
- Visual fill level display in door front.

3. Drive
- Two solenoid valves for the two spray nozzles, one for the additional air. Each 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 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	MLS for internal lubrication
1. Base addition	/1	(for 1 feed tube)
2. Reservoir	A1HPNC	1.5 litre aluminium with hand pump and float switch min NC
	A1HPNO	1.5 litre aluminium with hand pump and float switch min NO
3. Drive	e...V..	electric (24V DC, 24V AC, 110V AC or 230V AC)
4. Feed tube	ZP3000	feed tube PUN Ø12, L=3,000 (standard length)
	ZP.....	feed tube, L=.....(non-standard length, min. 500, in increments of 500)

Sample order code: C30/1 - A1HPNO - e24VDC - ZP3000

0. Base
1. Base addition
2. Reservoir
3. Drive
4. Feed tube

Steidle®

Toolmat® T70a and T70i

Brief description: Piston pump system with hybrid nozzle for fine oil-air mixtures.

Main application range: T70a: internal MLS for single channel rotary transmission leadthrough, lower and middle rotational speeds.
T70i: internal MLS for dual channel rotary transmission leadthrough, middle and upper rotational speeds.

Operating principle: The piston pumps spray the fluid from the supply reservoir into the hybrid nozzle. In the case of T70a, they are then fastened to the rotary transmission leadthrough; with the T70i, they are integrated into the spindle and supplied with oil and air via the rotary transmission leadthrough.

Adjustability: 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, you can choose between an externally (T70a) and internally (T70i) mixing model. The piston pumps ensure that the exact amount of liquid is consumed. 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.

Using its hybrid nozzle, the Toolmat® T70a produces the mixture directly in the rotary transmission leadthrough and can be installed incredibly quickly, even in the case of a retrofit. In the Toolmat® T70i, the hybrid nozzle is integrated into the spindle. Air and medium are fed separately through a dual channel rotary transmission leadthrough. Although it is more costly to install, this is compensated for by the improved spray results due to the shorter distance to the cooling duct outflow.

System components:

1. Base / Base addition

- Pneumatically driven, finely meterable **piston pump** ① with double flow volume (2DF) with FPM seals, manually adjustable volume dial (0 - 0.06 ml per stroke) ③. 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 block.
- **Frequency generator** for pump pulses, manually adjustable 0 - 90 stroke min^{-1}.
- 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 NG8 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** (250x250x210 or 300x250x210) 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.

Fig.: Pump block T70

2. Reservoirs from 2.0 to 27 litres available (details, variations and data: see Lubrimat®, page 7).

Steidle®

Toolmat® T70a and T70i

3. Drive electric, pneumatic or manual option:
- Solenoid valve 3/2 way (800 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 (800 Nl/min). With push in connection Ø6 for control air on the left side of housing.
- Hand valve 3/2 way (600 Nl/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
T70a: Hybrid nozzle on the end of the feed tube with 3/8" outer thread ready for installation.
T70i: Hybrid nozzle integrated into the spindle, specially produced to order.

6. Option
- 4 x round magnet Ø80 (mounted on the reverse side) for easy 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 others
Recommended viscosity	mm²/s (at 40°C)	1 - 50
Dimensions (HxWxD)		
Housing (without reservoir)	mm	250 x 250 x 210 (Standard and Vario3) 300 x 250 x 210 (Vario7)

[1] *depending on application, medium used, viscosity and temperature*

Order codes:

0. Base	T70a	MLS for internal lubrication, hybrid nozzle on feed tube
	T70i	MLS for internal lubrication, hybrid nozzle integrated into spindle
1. Base addition	/1	(for 1 nozzle, standard))
	/1V3	(for 1 nozzle, Vario 3 = 3 pre-adjustable settings for the oil quantity)
	/1V7	(for 1 nozzle, Vario 7 = 7 pre-adjustable settings for the oil quantity)
2. Reservoir		(2.0 to 27 litres available, for order code see Lubrimat®, page 8-9)
3. Drive	E...V..	electric (24V DC, 24V AC, 110V AC or 230V AC)
	P3	pneumatic
	H3	hand actuated
4. Feed tube	ZM3000	feed tube, metal outer Ø16 / inner 2 x PTFE Ø3, L=3,000 (standard)
	ZM.....	feed tube, L=.... (non-standard length, min. 500, in increments of 500)
5. Nozzle	HY	hybrid nozzle with connection 3/8"AG
6. Option	RG	housing mounting 4 x round magnet Ø80

Sample order code: T70a/1 - P2NC - E24VDC - ZM3000 - HY - RG

- 0. Base
- 1. Base addition
- 2. Reservoir
- 3. Drive
- 4. Feed tube
- 5. Nozzle
- 6. Option

Steidle
Deltamat® D40

Brief description: Overpressure system for spraying small to medium quantities of liquid.
Main application range: External MLS for metal-cutting operations. Pinpoint lubrication of chipless forming operations. Application of coolants.
Operating principle: The liquid in the reservoir is pressurized and fed through to the control block via an ascending pipe. Here, a fine valve regulates the quantity of fluid which is transported to the nozzle. Separately controllable spray air sprays the liquid at the nozzle tip.
Adjustability: Reservoir pressure (manual), quantity of liquid (manual) quantity of spray air (manual), switch on/off using actuation control device/drive (electric, pneumatic or manual)

Fig.: Deltamat® D40

Technical Data:

Operating pressure	bar	4 - 6
Liquid throughput	ml/h per nozzle	0 - 1.800 [1] 42 mm²/s (at 40°C)
		0 - 21.000 [1] 1 mm²/s (at 40°C)
Typical consumption	ml/h	20 - 50 [1]
Lubricoolant		Lubrimax® and others
Recommended viscosity	mm²/s (at 40°C)	1 - 75
Dimensions (HxWxD)		
(without nozzles)	mm	310 x 370-450 x 250 (for reservoir S3)
	mm	510 x 370-450 x 250 (for reservoir S7)

[1] *depending on reservoir pressure, medium used, viscosity and temperature*

System components:

1. Base / Base addition
- **Needle valve** to set quantity of **liquid** for each nozzle.
- **Needle valve** to set quantity of **spray air** for each nozzle (in pairs, if there are 3-4 nozzles).
- Each nozzle has a pneumatically activated **stop valve** for the liquid delivery.
- **Manometer** (0 – 10 bar) to indicate spray air pressure.
- **Pressure reducing valve** for setting reservoir pressure, **manometer** (0 – 10 bar). A **non-return** valve maintains the reservoir pressure even after switch off, resulting in shorter reaction time.
- **Safety valve** on the pressure reducing valve, limits reservoir pressure to max. 5 bar.
- **Ventilation plug** to let out reservoir pressure, including safety valve (max. 6 bar).
- **Fastening bow** for wall mounting of steel vessel.
- Push-in connections for feed tubes and for the compressed air supply Ø6.

2. Reservoirs 3.3 or 7.0 litre available
High grade steel pressure vessel with fill level display. Funnel-shaped screw opening and screw plug with safety groove. Seating brackets for fastening bow. Ascending pipe for liquid with non-return valve and filter. Outlet plug for emptying. Can be supplied with float switch min (in metal, potential-free, NC or NO), on request.

3. Drive electric, pneumatic or manual option:
- Solenoid valve 3/2 way (up to 4 nozzles 120, 5 nozzles and over 800 Nl/min) with auxiliary actuation (for occasional manual switching on/off). Coil with plug in 24V DC, 24V AC, 110V AC or 230V AC. Separate actuation control of each control block via a solenoid valve, on request.
- Pneumatic valve 3/2 way (up to 4 nozzles 120, 5 nozzles and over 800 Nl/min).
- Hand actuated ball valve (2/2 way).

4. Feed tube
- Parallel tubing set with one tube for spray air (PUN Ø6) and one for liquid (PTFE Ø3). Can be easily shortened. Standard length 3,000, non-standard lengths available up to 20,000.

Steidle
Deltamat® D40

5. Nozzle options (all include nozzle adapter 40x30x15 with hole for mounting Ø6):
- Nozzle **copper tube** Ø6. Can be bent once, most suitable for rigid laying. Nozzle head with flow optimized construction for targeted, fogless spraying and nickel-plated protective sleeve Ø8. Standard length 300, non-standard lengths in increments of 50 can also be supplied. 2 clamps or round magnet Ø80 can be supplied for mounting, if required. Full jet as standard, also available as flat-jet (approx. 75°).
- Nozzle **multi link tube** Ø17. Can be bent several times, particularly suitable for flexible laying. Nozzle head with flow optimized construction for targeted, fogless spraying and nickel-plated protective sleeve Ø8. Standard length 300, non-standard lengths in increments of 50 can also be supplied. A round magnet Ø80 can be supplied for mounting, if required. Full jet as standard, also available as flat-jet (approx. 75°).
- Nozzle **flexible metal tube** Ø9. Can be bent several times, particularly suitable for flexible laying. Nozzle head with flow optimized construction for targeted, fogless spraying and nickel-plated protective sleeve Ø12. Standard length 340, but also available in 220 and 420. A round magnet Ø80 can be supplied for mounting, if required.
- Nozzleblock (aluminium 15x52x30). 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. A round magnet Ø80 can be supplied for mounting, if required.

Order codes:

0. Base	D40	MLS with overpressure
1. Base addition	/....	(state number of nozzles, e.g. "/4")
2. Reservoir	S3	3.3 litre steel pressure vessel
	S3NC	3.3 litre steel pressure vessel with float switch min NC
	S3NO	3.3 litre steel pressure vessel with float switch min NO
	S7	7.0 litre steel pressure vessel
	S7...	(variations with float switch as for S3)
3. Drive	e...V..	electric, up to 4 nozzles (24V DC, 24V AC, 110V AC or 230V AC)
	E...V..	electric, 5 nozzles and over (24VDC, 24V AC, 110V AC or 230V AC)
	p3	pneumatic, up to 4 nozzles
	P3	pneumatic, 5 nozzles and over
	H2	hand actuation
4. Feed tube	ZP3000	feed tube PUN Ø6 / PTFE Ø3 (parallel), L=3,000 (standard)
	ZP.....	feed tube, L=.... (non-standard length, min. 500, in increments of 500)
5. Nozzle	KD	copper tube (Ø6, L=300) with nozzle adapter
	KDK	copper tube (Ø6, L=300) with nozzle adapter and 2 clamps
	KDR	copper tube (Ø6, L=300) with nozzle adapter and round magnet Ø80
	GLD	multi link tube (L=300) with nozzle adapter
	GLDR	multi link tube (L=300) with nozzle adapter and round magnet Ø80
	MFD	flexible metal tube (L=340) with nozzle adapter
	MFDR	flexible metal tube (L=340) with nozzle adapter and round magnet Ø80
	MF220D	flexible metal tube (L=220) with nozzle adapter
	MF220DR	flexible metal tube (L=220) with nozzle adapter and round magnet Ø80
	MF420D	flexible metal tube (L=420) with nozzle adapter and round magnet Ø80
	MF420DR	flexible metal tube (L=420) with nozzle adapter and round magnet Ø80
	BS1/3D	band saw nozzleblock for 1 feed tube/ with 3 spray points and nozzle adapter
	KS1/2D	circular saw nozzleblock for 1 feed tube/ with 2 spray points and nozzle adapter

Sample order code D40/2 - S3NC - e24VDC - ZP3000 - MFDR

0. Base
1. Base addition
2. Reservoir
3. Drive
4. Feed tube
5. Nozzle

Steidle

Spraymat® S100 and S600

Brief description: Low pressure system for spraying runny substances in medium quantities.

Main application range: External MLS in simple metal-cutting operations. Application of substances in not too small quantities. Depending on the substance and type of application, a suction is recommended.

Operating principle: In the Venturi nozzle ⑤, the spray air produces a partial vacuum, which causes the liquid to be sucked out of the unpressurized reservoir ④ and sprayed.

Adjustability: Spray air quantity ③ (manual), quantity of liquid ② (manual), spray air pressure ① (manual), switch on/off via actuation control device/drive (electric, pneumatic or manual)

Fig.: S100/1 – Y8 - - ZM1150 - VDGLTR

System components:

1. Base / Base addition
- **Needle valve** for each nozzle to adjust **air spray.**
- **Needle valve** for each nozzle to adjust quantity of **liquid.**
- **Ascending pipe** for liquid with non-return valve and **liquid filter.**
- **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.
- Push-in connection for compressed air supply Ø6.

Fig.: S600/1 – Y8 - - ZP1150 - VDS

2. Reservoirs 1.0 to 50 litres available:
- Reservoir 1.0 litre PE (S100/1 and S100/2 only) with aluminium screw cap, ventilation plug and wall bracket (can be supplied with 2 x round magnets Ø57, on request).
- Reservoir 8.0 litre PP, with filler neck, screw plug, detachable sieve, automatic ventilation, sturdy metal cover. Can be supplied with float switch min or min+max (potential-free, either NC or NO). Wall bracket also available on request, with or without 2 x round magnets Ø57.
- Reservoir 25 litre or 50 litre PP, with filler neck, screw plug, detachable sieve, automatic ventilation, hinged cover, reinforcing plate, visual fill level display on the outside. Can be supplied with float switch min or min+max (potential-free, either NC or NO).


Fig.: S100/1 – Y50E - - ZM1150 - VDGLTR

3. Drive electric, pneumatic or manual option:
- 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. In case of separate actuation each nozzle (group) controlled via a dedicated solenoid valve.
- Pneumatic valve 3/2 way (550 Nl/min).
- Hand actuated ball valve (2/2 way).

4. Feed tube (standard length: 1,150; non-standard length: see Technical Data)
- S100: Protection sleeve, metal outer Ø6, with 2 internal tubes PTFE Ø2.25.
- S600: tubes PUN Ø4 / PUN Ø4 parallel.


Fig.: Nozzle S600 (without stand)

5. Nozzle
- S100: Venturi nozzle Ø5. Direct installation on feed tube or using multi link tube and tee joint on round magnet Ø57.
- S600: Venturi nozzle Ø13 with stand on round magnet Ø57.


Fig.: Nozzle S100 VDGLTR

Steidle®

Spraymat® S100 and S600

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

Technical Data:

		Spraymat® S100	Spraymat® S600
Operating pressure	bar	0.5 - 4	0.5 - 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]
Dimensions (HxWxD)			
Standard version with reservoir Y8	mm	250 x 350 x 220	220 x 350 x 220

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

Order codes:

0. Base	S100	Spray system with Venturi nozzle Ø5
	S600	Spray system with Venturi nozzle Ø13
1. Base addition	/....	(state number of nozzles, e.g. "/4")
	/.....S	(separate actuation control device/drive, all nozzles separately, e.g.: "/4S")
	/.....S...+...	(separate actuation control device/drive, not all nozzles separately, e.g.: "/4S2+1+1")
2. Reservoir	Y1W	1.0 litre PE with wall bracket (only for S100/1 and S100/2)
	Y1WR	... with 2 x round magnet Ø57
	Y8	8.0 litre PP
	Y8NC	... with float switch min NC
	Y8NO	... with float switch min NO
	Y8NCNC	... with float switch min NC + max NC
	Y8.....	... with float switch min .... + max ....
	Y8W	8.0 litre PP, wall bracket (...variations as Y8)
	Y8WR	8.0 litre PP, wall bracket with 2 x round magnet Ø57 (...variations as Y8)
	Y25E	25 litre PP, (... with float switch variations as Y8)
	Y50E...	50 litre PP, (...with float switch variations as Y8)
3. Drive	e...V..	electric (24V DC, 24V AC, 110V AC or 230V AC)
	pv3	pneumatic
	H2	hand actuation
4. Feed tube	ZM1150	S100 feed tube, metal outer Ø6 / inner 2x PTFE Ø2.25, L=1,150 (standard)
	ZM.....	S100 feed tube L=.... (non-standard lengths, min. 500, in increments of 500)
	ZP1150	S600 feed tube PUN Ø4 / PUN Ø4 (parallel), L=1,150 (Standard)
	ZP.....	S600 feed tube L=.... (non-standard lengths, min. 500, in increments of 500)
5. Nozzle	VD	S100 Venturi nozzle Ø5, L=67, direct installation on feed tube
	VDGLTR	S100 Venturi nozzle Ø5, multi link tube, tee joint, L= 240, round magnet Ø57
	VDS	S600 Venturi nozzle Ø13, L= 128, with stand on round magnet Ø57
6. Option	NpF	pneumatic drip shut-off system, FPM

Sample order code S100/3 - Y8NC - e24VDC - ZM1150 - VDGLTR - NpF

- 0. Base — S100/3
- 1. Base addition — Y8NC
- 2. Reservoir — e24VDC
- 3. Drive — ZM1150
- 4. Feed tube — VDGLTR
- 5. Nozzle — NpF
- 6. Option

Steidle®

Pulsomat® P10 and P25

Brief description: Airless system for intervalled application of runny liquids from a distance without the addition of air.

Main application range: External MLS 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.

Adjustability: Quantity of liquid (manual)
Optional: Pressure of piston actuation air (manual)
Switch on/off via drive (electric, pneumatic or by foot pedal)

Fig.: P25//1 – Y02 - - V – SH3

Technical Data:

		Pulsomat® P10	Pulsomat® P25
Operating pressure	bar	3 – 7	3 – 10
Max. dosage quantity	ml/stroke	0.1 [1]	0.8 [1]
Lubricoolant		Lubrimax® and others	Lubrimax® and others
Recommended viscosity	mm^2/s (at 40°C)	1 - 25 [1]	1 - 50 [1]
Max. distance	mm	150 [1]	500 [1]
Dimensions (ØxL)			
Basic unit without reservoir	mm	Ø20 x 350 - 365 [1]	Ø32 x 180 - 220 [1]

[1] *partly application-specific, depending on operating pressure, liquid, nozzle type, dosage quantity and dosage interval*

System components:

1. Base / Base addition

Pulsomat® P10

- Compressed air-powered piston in aluminium housing Ø20, liquid seals of FPM construction.
- Quantity can be adjusted (max. approx. 0.1 ml/stroke) via the metering screw on the housing.
- Seating for reservoir 0.35 litre PE and push in connector Ø4 for liquid entry.
- Push in connector Ø4 for compressed air entry.
- Multi link tube for improved nozzle positioning.
- Fixing bar Ø10 / 8.
- Auxiliary connection for tubes with internal diameter 3, with outflow at nozzle tip; this can be used to blow chips away or to produce a spray instead of individual droplets.

Pulsomat® P25

- Compressed air-powered piston in brass housing Ø32, liquid seals of FPM construction.
- Quantity can be adjusted (max. approx. 0.8 ml/stroke) via the metering screw on the housing.
- Seating for reservoir 0.2 litre PE or push in connector Ø6 for liquid entry, both with non-return valve to prevent retroaction effects.
- Push in connector Ø6 for compressed air entry.
- Fixing bar Ø10 / 8.

2. Reservoir 0.2 / 0.35 to 2.0 litres available:

- Reservoir 0.2 litre PE (P25 only), with screw cap, ventilation hole.
- Reservoir 0.35 litre PE (P10 only), with screw cap, ventilation hole.
- Reservoir 1.0 litre or 2.0 litre PE, with screw cap, ventilation hole, stopcock, feeding pipe L=1,500 and wall bracket (if required, with 2 x round magnet Ø57).

Fig.: P10//1 – Y04 - - V – SH3

Steidle®

Pulsomat® P10 und P25

3. Drive electric, pneumatic or pedal-operated option:
- 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.
- Pneumatic valve 3/2 way (550 Nl/min).
- Pneumatic foot pedal switch 3/2 way(800 Nl/min).

5. Nozzle

Pulsomat® P10
- Fixed full jet nozzle for pinpoint lubrication.

Pulsomat® P25 optional:
- Metering screw with fixed full jet nozzle for pinpoint lubrication.
- Metering screw with nozzle seating including one of the following interchangeable nozzle inserts: full jet, conical jet, flat-jet or angled flat-jet. Can be supplied with feed tube on request PUN Ø4, L=1,000.

6. Option
- Stand with switchable block magnet (55x50x80) or round magnet Ø80 and with fixing bar (L_{max}=275) or articulated bar (L_{max}=250).
- Pressure reducing valve including manometer for improved regulation of spray distance and profile.

Order codes:

0.-1. Base and base addition	P10/1	airless system with one nozzle
	P25/1	airless system with one nozzle
2. Reservoir	Y02	0.2 litre PE (for P25/1 only)
	Y04	0.35 litre PE (for P10/1 only)
	Y1AW	1.0 litre PE with stopcock, wall bracket
	Y1AWR	1.0 litre PE with stopcock, wall bracket and 2 x round magnet Ø57
	Y2AW	2.0 litre PE with stopcock, wall bracket
	Y2AWR	2.0 litre PE with stopcock, wall bracket and 2 x round magnet Ø57
3. Drive	e...V..	electric (24V DC, 24V AC, 110V AC or 230V AC)
	pv3	pneumatic
	F3	foot pedal switch, pneumatic
5. Nozzle	V	P10 full jet nozzle
	V	P25 full jet metering screw
	DV	P25 metering screw with full jet nozzle insert
	DK	P25 metering screw with conical jet nozzle insert, size 0.4
	DF	P25 metering screw with flat-jet nozzle insert, 80° angle
	DW	P25 metering screw with angled flat-jet nozzle insert 90°, size 50
	ZPV	P25 metering screw with feed tube and full jet nozzle
	ZPD	P25 metering screw with feed tube and nozzle insert (variations as D...)
6. Option	SH1	block magnet stand and fixing bar
	SH2	round magnet stand and fixing bar
	SH3	block magnet stand and articulated bar
	SH4	round magnet stand and articulated bar
	DM	pressure reducing valve with manometer (only in conjunction with a stand)

Sample order code P25/1 - Y1AW - e24VDC - DV - SH3 - DM

0. Base
1. Base addition
2. Reservoir
3. Drive
6. Option
5. Nozzle

Steidle®
Lubricoolants

Lubrimax® Edel C

Lubrimax® Edel C is high grade vegetable oil with additives, developed for MLS. 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. MLS systems with exact metering for the smallest quantities are suitable for applying Lubrimax® Edel C.

Chemical-physical data

Colour	yellow
Setting point	< 15 °C
Flash point	200 °C
Viscosity	88 mm²/s (20 °C) 43 mm²/s (40 °C)

Density	0.93 g/cm³ (15 °C)
Initial boiling point	not available
Ignition temperature	> 200 °C
Water hazard class	WHC1

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. MLS 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	76 °C
Viscosity	3.0 mm²/s (20 °C) 1.5 mm²/s (40 °C)

Density	0.76 g/cm³ (20 °C)
Initial boiling point	190 °C
Ignition temperature	not available
Water hazard class	WHC1

Lubrimax® Alu Fleckfrei

Lubrimax® Alu Fleckfrei is a fatty alcohol mixture, specially developed for MLS 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. MLS systems with exact metering for the smallest quantities are suitable for applying Lubrimax® Alu Fleckfrei.

Chemical-physical data

Colour	colourless
Setting point	approx. -68 °C
Flash point	156 °C
Viscosity	45 mm²/s (20 °C) 20 mm²/s (40 °C)

Density	0.84 g/cm³ (15 °C)
Initial boiling point	290 °C
Ignition temperature	approx. 260 °C
Water hazard class	WHC1

Steidle®
Lubricoolants

Twinmax®

Twinmax® is a water-miscible lubricoolant for MLS 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 8 % -12 %. In exceptional cases, it can also be used undiluted. MLS systems with exact metering for the smallest quantities are suitable for applying Twinmax® as well as systems for larger quantities.

Chemical-physical data

Colour	amber
Setting point	-15 °C
Flash point	136 °C (undiluted)
Viscosity	225 mm²/s (20°C) 106 mm²/s (40 °C)

Density	0.95 g/cm³ (20 °C)
Initial boiling point	102 °C (undiluted)
Ignition temperature	450 °C (undiluted)
Water hazard class	WHC1

Ordering information:

Lubrimax® Edel C	5 l	890 003
	20 l	890 004
	200 l	890 005
Lubrimax® Alu-Quick	5 l	891 503
	20 l	891 504
	200 l	891 505
Lubrimax® Alu Fleckfrei	5 l	890 503
	20 l	890 504
	200 l	890 505
Twinmax®	5 l	896 003
	20 l	896 004
	200 l	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.

Steidle®

Examples of application

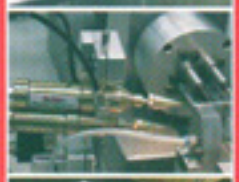
Milling in hardened tool steel (60 HRC) mould making with a processing time of 3 hours per workpiece. In the case of dry processing, the edge life was not sufficient for one workpiece. 2 MLS nozzles lubricate the milling cutters and double the edge life. Thus, tool replacement during processing operations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

Milling of a compressor rotor made of alloyed steel with a milling cutter Ø 250 mm. Compared to dry processing, the use of MLS 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 MLS, 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. MLS 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.



Tapping M4 x 9 in zinc die casting with prior **drilling** of the cored blind hole. A single droplet of lubricant is fired onto the tool with a very high degree of accuracy, prior to its use. 20 litres of MLS lubricant is sufficient for an annual output of 1.2 million threads.

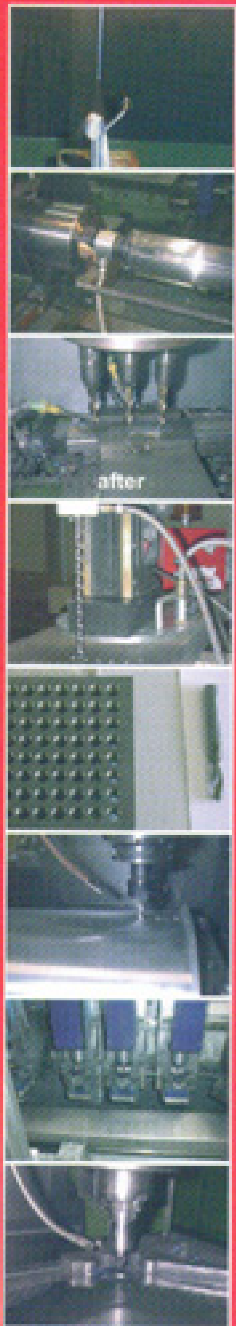
Tapping M20 x 40 in 42CrMo4. A nozzle sprays the tool. Compared to previous manual lubrication, the average cutting values were increased, thereby reducing production times.

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.

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.

Steidle®

Examples of application



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

Deep hole drilling of hydraulic shafts using single-lip drills. When MLS is used, the lifespan of the drills exceeds the manufacturer's specifications by approx. 50%. The MLS spray air also has the useful function of blowing any chips out of the drill hole.

Drilling of rectangular steel tubes. Flood cooling was used previously. Switching to MLS 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 MLS 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 MLS with internal lubrication. In the comparative test, 4,000 holes were drilled using flood cooling; using MLS, 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 centrifuged out using a lathe. However, with MLS, the drill is lubricated using a nozzle. The drill holes stay dry and centrifuging is no longer necessary.

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.

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.