

# STRUB Spindle fluid XLI

Anti-corrosion fluid for spindle cooling systems

Art.-No. 30719

## Description

STRUB Spindle Fluid XLI is a non-toxic, environmentally friendly, glycol-free inhibitor concentrate.

## Application

The patented acid technology enables long-term corrosion protection in aqueous solutions on all metals including aluminum-iron-copper-zinc and solder alloys. Mixing ratio: 7 % by volume in tap water. STRUB Spindle Fluid XLI can be used as a live time coolant. However, the concentration should be checked periodically by refractometer (% Brix).

Refractometer reading: 2.6 = ~ 8 vol.%  
3.3 = ~ 10 vol.%

In case of an unforeseen change, our STRUB System Cleaner should be mixed into the system approx. 2 % 24 hours beforehand.

## Features and advantages

- Prevents electrochemical corrosion
- Among other things, protects against the leaching of copper (complex formation) in the spindle cooling system
- excellent cavitation protection
- increases the thermal conductivity
- environmentally friendly

## Chemical and physical parameters

Corrosion protection Modified ASTM D1384 glassware corrosion test - 300 ppm chloride							
	Weight loss in mg/coupon*						
	Brass	Copper	Lot	Steel	Cast iron	Aluminum	AlMn
ASTM D3306 (max)	10	10	30	10	10	30	/
5 % Strub spindle fluid XLI	0.6	0.6	4.5	0.0	0.7	9.8	4.8

Technical parameters	Strub Spindle Fluid XLI	Method
Inhibitor content	33 % w/w	
Water content	67 % w/w	ASTM D1123
Nitrite, Amines, Phosphates, Borates, Silicates	none	
Color	colorless	
Specific gravity, 20°C	1.055 typ.	ASTM D1122
pH	9.4 typ.	ASTM D1287
Cloud point	- 15 °C typ.	
Storage stability	3 years	

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	5 % dilution in water	Method
pH	8.1 typ.	ASTM D1287
Foam height at 25°C	10 ml typ.	ASTM D1881
☞ Foam decay time	1 sec. typ.	
Effect on non-metals	none	GME 60 255
Hard water stability	No precipitation	VW PV 1426

### Corrosion test with aging under Strub test conditions

To emphasize the corrosion protection properties of **STRUB Spindle Fluid XLI**, STRUB has modified the aging test with regard to higher requirements than typically applies in the industry

Test parameters	Typical OEM standard	STRUB
Test duration	169 pc	504 pc
Liquid quantity	5.0 L	6.0 L
Print	1.5 Bar	2.5 Bar
Flow rate	3.0 L/min	3.5 L/min
Heat output	5500 W	5000 W
Temperature in warm container	95 °C	115°C
Temperature in cold tank	75 °C	95°C
Concentration in water	40 vol. %	20 vol. %

	Weight loss in g/m <sup>2</sup> (based on Strub test parameters) <sup>1</sup>						
	Al <sup>2</sup>	AlMn	Cast iron	Steel	Cu	CuZn	Lot CB
<b>Reference coolant<sup>3</sup></b>	82.	64.029					
After 1st cleaning	10125.0	4	-2.19-0	-1.680	3.624	2.905	21.4525
After final cleaning	1	.33	.36	.11	.99	.66	.83
<b>Strub Spindle Fluid XLI</b>		27.056				1.	
After 1st cleaning	23.9160	3	0.	0.36	1.031.	131.	0.
After final cleaning	.16	.15	520.69	0.40	46	76	270.52

Modified MTU hot test (2000 W)			
	Weight loss in mg/coupon <sup>1</sup>		
	Cast iron	Aluminum	
Test duration: 116 hours		Al <sup>2</sup>	AlMgSi1
<b>5 % Spindle fluid XLI in deionized water</b> Hot coupon	-1.3	9.3	1.8
<b>5% Spindle fluid XLI in FVV water</b> Hot coupon	-9.0	-16.4	40.7

- weight loss AFTER chem. Cleaning according to (shortened) MTU method. Weight gain is indicated with a "-".
- Aluminum SAE 329.
- The reference coolant is a high quality coolant based on ethylene glycol and silicate.

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**Dilution range: % 6.0 / 10.0**

**Temperature: 60°C**

Dilution (%)	7 %	8 %	10 %
Density (kg/m <sup>3</sup> )	983.42	987.92	989.17
Kinematic viscosity (mm <sup>2</sup> / s)	0.515	0.52	0.54
Specific heat (kJ/kg.K)	4.17	4.17	4.17
Thermal conductivity (W/mK)	0.6382	0.6348	0.6316
Vapor pressure (Pa)	19851.51	19891.51	19891.51
Electrical conductivity (μS/cm)	6245.13	6866.97	8368.31
Prandtl number	3.37	3.40	3.52

### Seal compatibility

- Nitrile rubber (NBR)
- Hydrogenated nitrile rubber (H-NBR)
- Acrylic rubber (ACM)
- Silicone rubber (MVQ)
- Fluorocarbon rubber, e.g. Viton from DuPont (FPM)
- Ethylene propylene diene rubber (EPDM)
- Butyl rubber (IIR)
- Natural rubber (NR)
- Styrene butadiene rubber (SBR)
- Polychlorobutadiene elastomers, e.g. Neoprene from DuPont (CR)
- Polytetrafluoroethylene, e.g. Teflon or Hostaflon (PTFE)
- Polyethylene, soft and hard type (LDPE and HDPE)
- Polypropylene (PP)
- Polyvinyl chloride, soft and hard version (PVC)
- Polyamide (PA)
- Polyester resin (UP)
- Elastogran 1100 (PUR ether)

### Transportation

ADR/SDR No dangerous goods

### Disposal

FVO VeVA / EAK 12 01 09

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