

ECOCOOL ULTRA-MOTIVE

Soluble metalworking fluid
for the automotive industry.



LUBRICANTS.
TECHNOLOGY.
PEOPLE.



ECOCOOL ULTRA-MOTIVE

the greatest development in soluble metalworking fluids for a generation

SCOPE

A series of intensive tests were conducted by a network of FUCHS laboratories to demonstrate the unique performance characteristics of ECOCOOL ULTRA-MOTIVE. Listed below are some results.

MILLING PERFORMANCE TEST

Machining performance is tested by measuring wear when milling under controlled conditions. Products that perform well in this test increase tool life, improve surface quality, reduce scrap, and increase production speeds through higher metal removal rates.

TEST METHOD

A vertical CNC mill is filled with an emulsion mixed at 9 % concentration. Test blocks of Ti-6Al-4V are milled in sequential cuts using a 10 mm solid carbide end mill from a major tooling manufacturer.

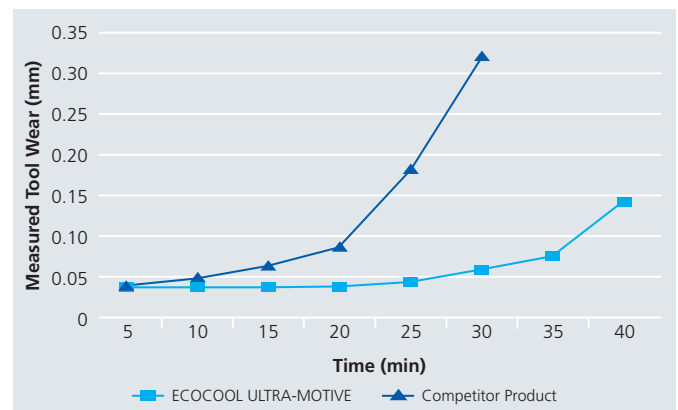
The following parameters are used:

Spindle speed: 3193 RPM
Feed rate: 1019 mm/min
Depth of cut: 3 mm
Width of cut: 3 mm

Flank wear is measured every 5 min. The results are compared against a leading aerospace industry product.

TEST RESULT

ECOCOOL ULTRA-MOTIVE provided longer tool life than a leading competitor industrial product



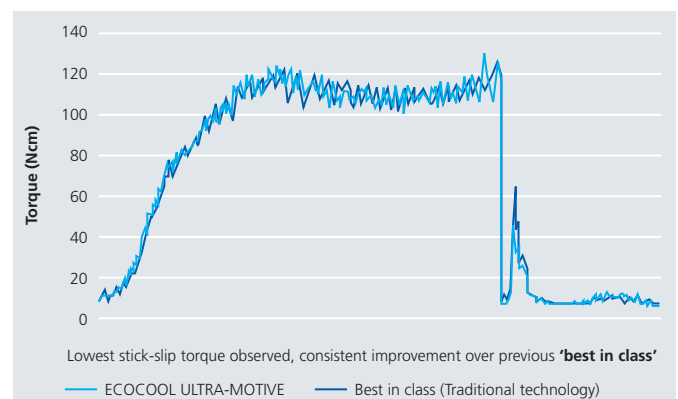
LUBRICITY

FUCHS ECOCOOL ULTRA-MOTIVE contains a novel lubricity package that makes it especially effective for stainless steel, aluminium and titanium machining. Stainless steel milling and drilling applications show dramatic improvements in tool life and surface finish.

High lubricity is vital to extend tool life. When determining the lubricity of a coolant under laboratory conditions, a special Tapping-Torque Test is performed. For the evaluation of lubricity performance, fluids with lower observed torque values lubricate better than fluids with higher observed values.

TEST RESULT

Tapping Torque Test: New product benchmarked against previous 'best in class' and FUCHS ECOCOOL ULTRA-MOTIVE



FOAMING CHARACTERISTICS SIMULATION

The ability to control foam is tested by circulating the fluid at a high turn-over rate. Products that perform well in this test are likely to remain low foaming when mixed in low hardness water and used in high pressure through-the-tool fluid delivery systems as well as other high turn-over, high agitation systems.

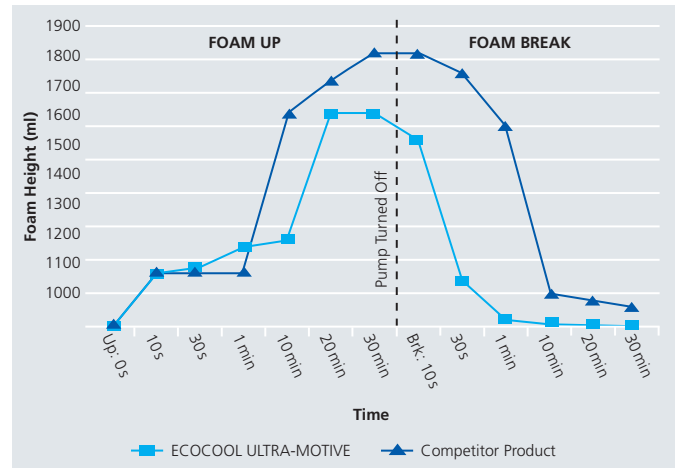
TEST METHOD

A 1000 ml sample of a 7 % emulsion is prepared using de-ionized water (0 ppm as CaCO₃) and added to the bottom of a water-jacketed graduated 2000 ml test cylinder. Using a centrifugal pump drawing from the bottom of the cylinder, the fluid is circulated at a rate of 250l/hr (1.1 gal/min) and cascaded back upon itself from a height of 390 mm above the 1000 ml mark.

The total volume of foam + fluid is recorded at 10 s, 1 min, 10 min, 20 min and 30 min after starting the pump to record "foam up", and at the same time intervals after the pump is turned off for "foam break".

TEST RESULT

ECOCOOL ULTRA-MOTIVE shows lower foaming characteristics than a leading traditional metalworking fluid



EMULSION STABILITY TEST

Products that perform well in this test are less likely to exhibit coarsening of the emulsion leading to instability and residue formation on machine surfaces and parts.

TEST RESULT

De-ionized water (0 ppm as CaCO ₃)	Soft water (40 ppm as CaCO ₃)	Hard water (400 ppm as CaCO ₃)
PASS Tight milky emulsion with no separation	PASS Tight milky emulsion with no separation	PASS Tight milky emulsion with no separation

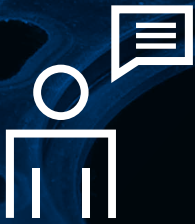
CHARACTERISTICS: ECOCOOL ULTRA-MOTIVE

Property	Unit	Data	Test method
Density at 15°C (59°F)	g/ml	0.98	DIN 51 757
Kinematic viscosity at 40°C (104°F)	mm ² /s	55	DIN 51 562-1
Corrosion test emulsion > 5%	Corr.-grad	0-0	DIN 51 360-2
pH-value 5% emulsion		9.2	DIN 51 369
Handheld refractometer factor (Testroe)		1.0	FLV-T 5*)

*) FLV = Test procedure of FUCHS EUROPE SCHMIERSTOFFE GMBH

Innovative lubricants need experienced application engineers

Every lubricant change should be preceded by expert consultation on the application in question. Only then the best lubricant candidate can be selected. Experienced FUCHS engineers will be glad to advise on products for the application in question and also on our full range of lubricants.



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