Soluble Oil

Emulsifiable Metalworking Fluid

Soluble Oil is a chlorine-free, light-duty metalworking fluid designed to emulsify easily and form a long-lasting, stable emulsion when mixed with water. It provides excellent cooling and lubricity for light- to medium-duty cutting and grinding of ferrous and non-ferrous metals, resulting in extended tool life and good surface finishes on the machined parts. It has been specially formulated to provide enhanced rust protection and greater emulsion stability when used with water qualities of varying hardness.

Soluble Oil is fortified with special emulsifiers to form a stable, milky emulsion when mixed with water. The high specific heat of water and the excellent metal wetting ability of the emulsion provide excellent cooling and lubricity for most machining operations that require soluble oil. This promotes longer tool life by dissipating heat and reducing friction between the cutting tool and the workpiece. Its improved emulsion stability allows extended time between sump clean outs. Its enhanced rust protection helps protect the cutting tool and the parts being machined.

Soluble Oil has very low foaming tendency, which allows its use in high-speed machining and grinding operations. It also provides a high level of rejection of tramp oil contamination to facilitate skimming and removal of tramp oils from sumps and reservoirs. It does not contain any chlorinated compounds, making disposal of the used fluid easier.

Note: *Soluble Oil does not contain a biocide. A biocide such as Bioban™ P-1487 or Bioban™ GK should be added in service to combat the growth of harmful microorganisms in machine sumps and reservoirs.*

Applications

- Light- to medium-duty machining operations, including broaching, drilling, grinding, milling, sawing and tapping, with water hardness up to 500 ppm
- Machine shops working with a wide variety of ferrous and non-ferrous metals

Features/Benefits

- Excellent cooling and lubricating properties
- Helps extend cutting tool life
- Reduces grinding wheel wear
- Good surface finish
- Emulsifies easily with water(1)

CONTACT INFORMATION

Phillips66 Lubricants.com

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1-800-368-7128

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1-877-445-9198

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1-832-765-2500

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lubricants@p66.com

- Forms a stable macro emulsion
- Improved rust protection
- Rejects tramp oils
- Good antifoam properties
- Suitable for both ferrous and non-ferrous metals

(1) ***Note:*** *When mixing, always add Soluble Oil to water,* ***never*** *add water to Soluble Oil. Typical concentrations (Soluble Oil in water) range from 3% to 10% for cutting operations and from 3% to 4% for grinding operations, depending on the type of metal and water hardness. Concentration may be monitored with a refractometer.*

CAUTION: *Containers of Soluble Oil should be stored indoors. They should* ***not*** *be stored at temperatures below 40°F (4°C) or above 130°F (54°C).*

Soluble Oil

Typical Properties	
Specific Gravity @ 60°F	0.919
Density, lbs/gal @ 60°F	7.65
Color, ASTM D1500	3.5
Flash Point (PMCC), °C (°F)	184 (363)
Pour Point, °C (°F)	-43 (-45)
Viscosity,	
cSt @ 40°C	34.2
cSt @ 100°C	5.0
SUS @ 100°F	178
SUS @ 210°F	43.1
Viscosity Index	51
Emulsion Stability	Good
pH, 5% (1:20) dilution	10.3
Rust Test, ASTM D665 A&B	Pass
Chlorine, wt %	Nil
Fatty Oil, wt %	Nil
Sulfur, Total, wt %	0.43
Sulfur, Active, wt %	Nil

Recommended Concentrations, Soluble Oil in Water (Volume %)

Operation	High Alloy Steels	Tool Steels	Nickel Alloys
Broaching, Milling, Tapping	10	10	10
Deep Drilling, Gear Hobbing, Gear Shaping, Sawing	5	7	7
Grinding	3	3	3

Refractometer Reading

Dilution Ratio	1:10	1:15	1:20	1:30
Reading	**10**	**6.7**	**5.0**	**3.3**

Health and Safety Information

For recommendations on safe handling and use of this product, please refer to the Material Safety Data Sheet via *http://w3apps.phillips66.com/NetMSDS*.