



Soluble Oil

Soluble Oil is a chlorine-free, light-duty metalworking fluid developed to emulsify easily and form a stable emulsion when mixed with water. It provides excellent cooling and lubricity for light-duty cutting and grinding of ferrous and non-ferrous metals, resulting in extended tool life and good surface finishes on the machined parts.

Soluble Oil is formulated with naphthenic base oils and fortified with emulsifiers that form a stable 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 grinding, cutting and other machining operations. This promotes longer tool life by reducing friction between the cutting tool and the work piece and by dissipating heat.

Soluble Oil provides good rust protection for both the cutting tool and the parts being machined. It has very low-foaming tendency, which is an advantage in high-speed machining and grinding operations.

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

Soluble Oil is recommended for light-duty machining operations with water hardness up to 250 ppm. Typical applications include:

- Broaching
- Drilling
- Grinding
- Milling
- Sawing
- Tapping

Outstanding Features

- Excellent cooling and lubricating properties
- Helps extend cutting tool life
- Reduces grinding wheel wear
- Good surface finish
- Emulsifies easily with water*
- Forms a stable emulsion
- Good rust protection

**Emulsifiable
Metalworking Fluid**

**U.S. Technical Services
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- Good antifoam properties
- Forms a stable emulsion
- Good rust protection
- Good antifoam properties

***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). Under proper storage conditions, the shelf life of Soluble Oil is one year. After one year, the product should be disposed of properly and not used.

Soluble Oil Typical Properties

ISO Grade	32
Specific Gravity @ 15.6°C (60°F)	0.917
Density, lbs/gal	7.64
Color, ASTM D1500	3.0
Flash Point (COC), °C (°F)	177 (351)
Pour Point, °C (°F)	-20 (-4)
Viscosity,	
cSt @ 40°C	28.5
cSt @ 100°C	6.0
SUS @ 100°F	146
SUS @ 210°F	46
Viscosity Index	162
Emulsion Stability	Good
Foam Test, ASTM D892	Pass
pH, 5% (1:20) dilution	9.6
Rust Test, ASTM D665 A&B	Pass
Chlorine, wt %	Nil
Fatty Oil, wt %	Nil
Sulfur, Total, wt %	0.28
Sulfur, Active, wt %	Nil

Due to continual product research and development, the information contained herein is subject to change without notification.

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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	1:25	1:30
Reading	10.3	7.2	5.4	4.6	3.0

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