AMALIE MOTOR OIL
Better than it has to be

Metal Working Oils

Consult your Amalie District Manager for specific pack sizes and product availability.

Heat Transfer and Quenching Oils • Rust Prevention Fluids • Rolling Oils General Purpose • Soluble Oils • Cutting Oils

Amalie Heat Transfer/Quenching Oils are high quality metal heat treating and quenching oils, with excellent heat transfer properties. ***Amalie Heat Transfer/Quenching Oils*** are specifically formulated for use in a variety of quenching, spraying, and heat treating applications where a variety of cooling rates are required. As a heavy transfer medium, this series is recommended for use in closed liquid-phase heat transfer systems, and open systems where maximum bulk oil temperatures do not exceed 380 degrees F. ***Amalie Heat Transfer/Quenching Oils*** provide excellent oxidation stability, good rust and corrosion protection, and uniform cooling of metal parts. In addition they are very thermally stable and will provide long life. These oils provide excellent deposit-control, quench acceleration, improved hardening capabilities, and reduced quench oil reservoir maintenance. Note that it is import not to mix heat transfer oils with other lubricants as such contamination will impair thermal and oxidative stability and could disrupt the cooling process. Amalie Heat Transfer and Quenching Oils exhibit superior cooling rate performance as measured by the GM quenchometer test, and provide deposit control that exceeds current industry benchmarks. They also exhibit superior thermal and oxidation stability when compared to competitive quench oils. ***Amalie Heat Transfer/Quenching Oils*** exhibit the following features:

- Accelerated cooling rate
- Constant cooling rates in service
- Minimum viscosity increase through controlled formation of organic acids
- Reduced Steel component cracking and distortion
- Promotes deep hardening
- Low toxicity and corrosivity

Amalie Rust Prevention Fluids are formulated for use in applications requiring a robust and effective level of protection that may be applied by brush, roller, dip or spray. This fluid contains a solvent and various chemical additives that will prevent corrosion and yellow stain on sheet metal and will prevent the formation of white rust on galvanized steel. Evaporation of the solvent provides a protective oily film on the metal. When the solvent evaporates, a thin, transparent, oily film remains for rust prevention. ***Amalie Rust Prevention Fluids*** are available in two grades, light and medium. The ***Amalie Rust Prevention Fluid – Light*** offers faster penetration and has a low flash point. The ***Amalie Rust Prevention Fluid – Medium*** will give a more stable protective film, which is suitable for protecting surfaces for longer periods of time. ***Amalie Rust Prevention Fluids*** are formulated with mineral base oils and light volatile solvents.

Amalie Rolling Oils – General Purpose are multipurpose rolling oils formulated from premium base stocks and using quality additives which are non-staining. These rolling oils provide wear, rust, and oxidation protection, and contain lubricity agents to improve the metal finish. ***Amalie Rolling Oils – General Purpose*** are recommended for use in a variety of rolling applications for nonferrous materials, such as aluminum, copper, brass, and other copper alloys. They are non-staining, do not contain zinc, and provide very good wear protection for use in hydraulic systems. These oils can also be used as an exceptional oxidation resistance, foam control, rust and corrosion protection, and rapid demulsibility.

Amalie Rolling Oils- General Purpose provide the following specific performance benefits:
- Oxidation resistance and thermal stability.
- Non-staining – will not discolor finishes
- Superior rust and corrosion for gears and bearings.
- Rapid water separation.
- Quick foam release.

Amalie Soluble Oil 294 is a water-soluble metal cutting oil containing rust and foam inhibitors and an emulsifier that effectively stabilized the fluid in soft and hard water. ***Amalie Soluble Oil 294*** is recommended for use in cutting ferrous and non-ferrous metals, in boring milling, and turning operations. It is designed for machine ability of both ferrous and non-ferrous metals with ratings of 50 - 100. The formulation contains no nitrite or phenol and is safe to use in high speed cutting operations. ***Amalie Soluble Oil 294*** is recommended for machining operations of plane and shaping, drilling and sawing, and grinding using dilutions with water at ratios of 30:1 for aluminum and copper, 10:1 for copper alloys, 15:1 for ferrous metals. ***Amalie Soluble Oil 294*** is economical, forms a stable emulsion, is foam inhibited, and offers rust protection for machine and work piece. It is a safe to use product with no nitrates and phenols.

Amalie Cutting Oils are premium cutting oils formulated with high quality mineral oils and additives. These oils are designed to aid the cutting, grinding, or forming of metal and to provide good finish and work piece quality while extending the life of the machine tools. Both products identified below are EP and anti-wear formulated without chlorine containing chemistry. ***Amalie Medium Cutting Oil 304*** is high quality general-purpose oil formulated to provide extreme pressure (EP) properties and friction modification for a variety of metals. The inactive sulfurized fatty additive package is not corrosive to aluminum or yellow metals such as copper or bronze, and is thus non-staining to the metal being worked. ***Amalie Heavy Cutting Oil 310*** is designed for heavy duty, extreme pressure conditions where an active sulfur agent is desired. This formula also contains a finishing agent and is primarily formulated for ferrous metals. Amalie has the capability of formulating many types of Metalworking Fluids, both straight and soluble. Please discuss your needs with a Company representative.

Some performance levels are limited by viscosity grades. Please consult the Amalie Performance Application Chart, the Amalie Inspection Data Table for the appropriate Amalie product or contact your Amalie District Manager for more complete information and recommendations.

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	ISO grade	API Gravity	Flash Point C.	Viscosity cSt@40C	Viscosity cSt@100C	Viscosity Index	Pour Point, C.
Heat Transfer	22	33.0	200	22.0	4.2	100	-15
Quenching Oils	32	30.0	200	32.0	5.4	100	-12
Rust Prevention	Light	32.2	180	13.0	-	-	-15
Fluid	Medium	33.9	180	15.0	-	-	-12
Rolling Oil	10	32.0	150	10.0	-	-	-15
General	15	33.8	170	15.0	-	-	-15
Purpose	68	35.4	220	68.0	-	-	-15
Soluble Oil 294	32	28.0	190	38	6.2	100	-12
Cutting Oils							
Medium 304	32	29.5	190	29.0	5.1	100	-12
Heavy 310	46	28.0	190	46.0	6.5	100	-12