SINCE 1839
Schaeffer's
SPECIALIZED LUBRICANTS

TECHNICAL DATA

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ISO 9001 CERTIFIED

324 SPINDLE OIL
ISO 10 AND 22

Spindle Oil is premium quality anti-wear oil that is specially formulated for use in the lubrication of high speed spindle bearings in precision grinders and other machine tools that require the use of low viscosity oils.

Spindle Oil is blended from the finest high viscosity index solvent refined severely hydro-treated 100% paraffin oils available. Further blended into these paraffin base oils is a highly specialized multi-functional additive package that provides the Spindle Oil with the following performance advantages:

- Excellent anti-wear protection.
- Minimized wear under high load conditions, including those caused by spindle wobble from imbalanced loads.
- Excellent rust and corrosion protection that extends component life and protects multi-metallurgy components
- Excellent demulsibility characteristics.
- Superior hydrolytic stability.
- Excellent anti-foam and air release properties.
- Reduced sludge, varnish and deposit formation.
- Enhanced thermal and oxidative stability.
- Enhanced compatibility with existing fluids.
- Excellent fluid quality reserve to maintain its performance features even under severe service conditions and extended drain intervals.
- Extended bearing and spindle life.
- Reduced system maintenance.

High speed spindle bearings are generally subjected to shock loads and occasional overloading. These conditions often result in boundary lubrication conditions, which can result in excessive wear.

Though Spindle Oil contains an exceptional anti-wear performance additive package that lasts longer than most conventional anti-wear spindle oils, even this exceptional anti-wear package will disappear over time. To fortify the Spindle Oil's anti-wear capabilities, Micron Moly® is further blended into the product.

Micron Moly® is a liquid soluble type of Moly that plates itself to the sliding, rolling and rubbing surfaces of the spindle bearings. This plating action forms a long lasting solid lubricant film on these surfaces that will withstand pressures up to 500,000 pounds per square inch. Once plated to these sliding, rolling and rubbing surfaces, the Micron Moly® not only produces a smooth finished surface, but also reduces friction between the moving parts. This results in less heat being generated, which in turn not only reduces operating temperatures, but less downtime as well.

Spindle Oil can be applied by misting, drop feed, force-feed and wick feed, hand oiling or by the use of circulation systems. Selections of the proper grade of Spindle Oil will result in maximum bearing life. The machine builder's recommendations should always be considered.

Spindle Oil is also recommended for use in certain hydraulic systems requiring the use of an ISO viscosity grade 22 rust and oxidation inhibited anti-wear oil. Spindle Oil ISO 22 also provides excellent performance in airline oilers.

Typical Properties Continued on Next Page

TYPICAL PROPERTIES

ISO Grade	**10**	**22**
Specific Gravity 60°F/15°C	.8570	.8602
Viscosity, cSt @ 40°C (ASTM D-445)	9.5-11	20.00-23.50
Viscosity, cSt @ 100°C (ASTM D-445)		4.0-4.5
Viscosity Index (ASTM D-2270)	88	98
Flash Point °F.°C (ASTM D-92)	345°/173.88°	400°/204.4°
Fire Point °F/.°C (ASTM D-92)	370°/187.78°	440°/228.7°
Rust Protection (ASTM D-665)		
Procedure A	Pass	Pass
Procedure B	Pass	Pass
Four Ball Wear Test (ASTM D-4172)		
(1hr/40kg/130°F)		
Scar Diameter, mm	0.45	0.45
Copper Strip Corrosion Test (ASTM D-130)	1a	1a
Foam Test (ASTM D-892)	0/0	0/0
Sequence I	0/0	0/0
Sequence II	0/0	0/0
Sludge Tendencies (ASTM D-4310)		
Neutralization Number after 1000 hours	0.34	0.34
Total Copper, mg	0.1	0.1
Thermal Stability Test (ASTM D-2619)		
(168 hr./135°C, copper/steel catalyst)		
Sludge (mg/100mL)	1.8	1.8
Condition of Copper Rod	1	1
Copper weight loss, mg/100mL	0.2	0.2
Hydrolytic Stabillity (ASTM D-2619)		
Copper Wt. Loss mg/cm)	0.0556	0.0566
Acidity of Water mg/KOH	0	0
Demulsibillity Test (ASTM D-1401)		
O-W-E	40-40-0	40-40-0
Time, min	15	15
Total Acid Number (ASTM D-664)	0.91	0.91