

# ZURNAGEAR 2190 TEP

Premium lubricating oil engineered specifically for use in systems found aboard naval surface vessels and submarines.

Formulated to exceed the MIL-PRF-17331L, Amd 1 specification.



**INTERNATIONAL CHEMICAL COMPANY AND ZURNOIL**

2628 N. MASCHER STREET, PHILADELPHIA, PA 19133

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# ZURNAGEAR 2190 TEP

## PRODUCT DESCRIPTION

**ZURNAGEAR 2190 TEP** is a premium lubricant that is engineered specifically for use in systems found aboard naval surface vessels and submarines: main and auxiliary steam turbines and reduction gears; air compressors; compatible hydraulic equipment; as well as general mechanical lubrication. It is formulated to meet and exceed the MIL-PRF-17331L, Amendment-1 specification, and it provides the extreme-pressure performance, exceptional thermal and oxidation stability, efficient anti-foaming properties, effective rust and corrosion protection, and long service life that are required for consistent and reliable operation.

## OPERATIONAL DATA

Viscosity, cSt, 4.4°C	768.6	ASTM D445
Viscosity, cSt, 40°C	78.51	ASTM D445
Viscosity, cSt, 100°C	10.0	ASTM D445
Flash Point, °C (°F)	220 (428)	ASTM D93
Pour Point, °C (°F)	-27 (-16.6)	ASTM D97

## PHYSICAL CHARACTERISTICS

Appearance; Odor	Yellow Liquid; Petroleum
Relative Density	0.87
Pounds Per Gallon	7.25

## NATIONAL STOCK NUMBERS (NSN)

1-Gallon Container	9150-01-368-7076
5-Gallon Pail	9150-01-370-2583
55-Gallon Drum	9150-01-368-7075
330-Gallon Tote	Available Upon Request
Bulk Shipments	9150-01-372-6915

## GENERAL PRODUCT INFORMATION

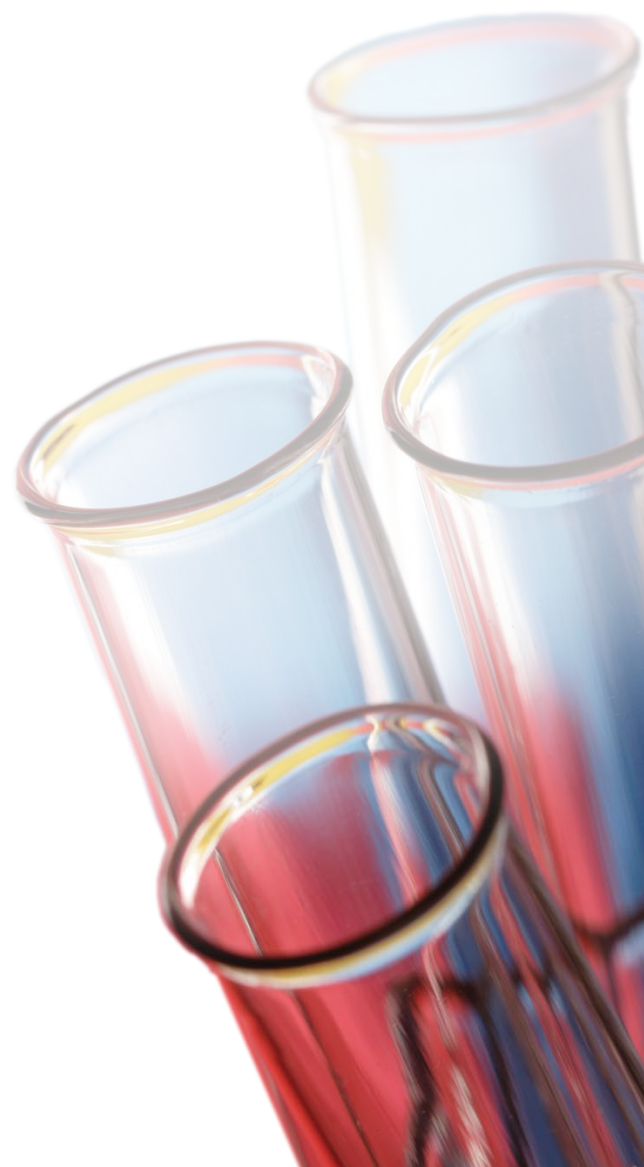
Qualification Number	Ser 05S/2024-203
Qualification Date	August 22, 2024
Military Symbol	2190 TEP
NATO Code	O-250
Product Shelf Life	24 Months From DOM

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## FEATURES & BENEFITS

- Premium Industrial Lubricating Oil
- Exceeds MIL-PRF-17331L, Amd-1
- Naval Surface Vessels & Submarines
- Marine Turbines & Reduction Gears
- Air Compressors & Hydraulic Systems
- All-Purpose Mechanical Lubrication
- Provides Extreme-Pressure Performance
- Effective Rust & Corrosion Protection
- Outstanding Thermal & Oxidation Stability
- Efficient Anti-Foaming Additive Content
- Fourth-Generation, Family-Owned Company
- Proudly Made in the USA (Philadelphia, PA)
- International Chemical Co. CAGE: 1YQK0



# MACHINE MAINTENANCE LUBRICATION



PREMIUM LUBRICATING OIL | MIL-PRF-17331L, Amd 1

TEST METHOD	QUALIFICATION DESCRIPTION, MIL-PRF-17331L, Amd 1	REQUIREMENT	ZURNGEAR 2190 TEP
ASTM D4927	Sulfur by X-Ray	Report	770 ppm
ASTM D974	Acid Number, mg KOH/g	0.3, max.	0.29
ASTM D665	Rust Prevention, Procedure B, 24 hrs.	Pass	Pass
ASTM D130	Copper Strip Corrosion, 3 hrs. at 100°C	Classification 1	1b (Shiny)
ASTM D7155	Oil Compatibility, 4.4.7	Pass	Pass
ASTM D6304	Water, Percent by Mass	0.01%, max.	0.00%
ASTM D1298	Gravity, API, 60°F	Report	31.4
ASTM D3427	Air Release, Minutes at 50°C	20, max.	8.5
ASTM D93	Flash Point, °C (°F)	204 (400), min.	220 (428)
ASTM D97	Pour Point, °C (°F)	-6 (20), max.	-27 (-17)
ASTM D445	Kinematic Viscosity Viscosity, mm <sup>2</sup> /s at 4.4°C Viscosity, mm <sup>2</sup> /s at 40°C Viscosity, mm <sup>2</sup> /s at 100°C	870, max. 77 to 97 8.0, min.	768.6 78.51 10.0
ASTM D1401	Emulsion, 30 Minutes at 54°C, Oil / H <sub>2</sub> O / Emulsion	41 / - / 3	41 / 39 / 0
ASTM D4310	Oxidation Test (Sludging & Corrosion), 1,500 hrs. Acid Number, mg KOH/g (ASTM D974) Total Sludge, mg Total Iron, mg Total Copper, mg	2.0, max. 100, max. 100, max. 100, max.	0.2 63.4 1.6 12.6
ASTM D2272	Oxidation by Rotating Pressure Vessel, 150°C	300 Minutes, min.	319 Minutes
ASTM D5182	Scuffing Load Capacity (FZG), Failure Load Stage	9, min.	11
ASTM D4172	Four Ball Wear Test, Scar Diameter, mm	0.33, max.	0.29
ASTM D892	Foaming Characteristics, Initial / Final Sequence I, mL Sequence II, mL Sequence, III, mL	65 / 0, max. 65 / 0, max. 65 / 0, max.	Trace / 0 Trace / 0 Trace / 0
ASTM D4898	Solid Particle Contamination, mg/100 mL	2.5, max.	2.34
ASTM D2070	Thermal Stability Test of Hydraulic Oils Copper Appearance, Visual Steel Appearance, Visual Sludge, mg/100 mL	Report Report 25 mg/100 mL, max.	Dull #5 Shiny #5, blued 6.0
4.4.1 (PLTL-192)	Homogeneity, Separation	None	None
FTM-3462	Coking Tendency, Panel Test	Report	Upon Request
EPA 5530	2.6 Di-tert-butylphenol (DTBP) Content, ppm	10, max.	Less than 1

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