



102 Barton Street, St. Louis, Missouri 63104 In-State (314) 865-4100/Out of State 800-325-9962/Fax (314) 865-4107 http://www.schaefferoil.com

#254 HTC SUPREME ISO 32 THROUGH 220

HTC Supreme is a premium quality semi-synthetic, non detergent, rust and oxidation inhibited, antiwear oil that is specially formulated to meet the lubrication requirements of all types of air lines, pumps, vacuum pumps, hydraulic, turbine, compressor, bearing and general oiling applications.

HTC Supreme is blended from the finest quality severely solvent refined, severely hydrofinished 100% pure paraffin base oils and polyalphaolefin (PAO) synthetic base fluids available. This unique combination provides HTC Supreme with the following advantages.

- 1. **Excellent Low Temperature Properties**. This results in the bearing and other machine parts being instantly lubricated at sub-zero temperatures the moment they start turning.
- 2. Superior Oxidation Stability. Any oil as it is increasingly exposed to high temperature operation undergoes the process of oxidation. This results in the oil's thickening and buildup of acidic components. Because of the PAO and 100% paraffin base oil's uniform molecular structure, the process of oxidation is greatly reduced.
- 3. Excellent Resistance to Thermal Degradation.
- 4. **Excellent Hydrolytic and Demulsibility Characteristics**. This results in the separation of water much faster and more completely, allowing the water to be easily removed from the system. These

properties result in increased bearing, pump and gear life, antiwear protection and improved rust and corrosion protection.

- 5. **High Viscosity Index**. This results in a minimum change in viscosity. The adequate viscosity for proper lubrication is provided regardless of temperature change.
- 6. Excellent Film Strength. This results in increased wear protection.

base oils have better specific heat values (less heat is absorbed) and better thermal conductivity **7. Superior Operating Temperature Reduction**. This unique combination of PAO and 100% paraffin

than conventional oils. These combined properties help to reduce operating temperature.

8. Compatibility With All Types of Seals and Coatings.

Blended into these 100% pure paraffin base oils and polyalphaolefin base fluids is a highly specialized multifunctional additive package that provides HTC Supreme with the following performance benefits.

- 1. Exceptional antiwear protection
- 2. Extended pump life
- 3. Extended bearing life
- 4. Enhanced thermal and oxidative stability
- 5. Superior hydrolytic stability
- 6. Excellent demulsibility characteristics
- 7. Excellent rust and corrosion protection
- 8. Excellent antifoaming and air release properties
- 9. Reduced sludge, varnish and deposit formation
- 10. Improved durability of non-ferrous parts

Continued On Reverse Side

TD-254 (Rev. 4/2001)

Continued

- 11. Reduced filter blockage
- 12. Enhanced filterability
- 13. Enhanced compatibility with existing fluids
- 14. Enhanced fluid life
- 15. Enhanced seal life
- 16. Reduced system maintenance

The trend among hydraulic pump builders and compressor manufacturers is to employ higher speed and pressures. Further many turbine systems, especially those that are geared type turbine systems are generally subjected to shock loads and occasional overloading. These conditions often result in conditions of thin film lubrication, that can result in excessive wear. This excessive wear can not only result in a loss in hydraulic pump and compressor efficiency, but also can result in a costly shutdown for maintenance.

Though HTC Supreme contains an exceptional antiwear performance that lasts longer than most conventional antiwear hydraulic fluids, even this exceptional antiwear package also will disappear over time. To fortify the HTC Supreme's antiwear capabilities, Micron Moly® is further blended into the HTC Supreme.

Micron Moly® is a liquid soluble type of moly that plates itself to the sliding and rubbing surfaces of the hydraulic, turbine and compressor systems. This plating action forms a long lasting solid lubricant film on these rubbing and sliding surfaces. This moly film will withstand pressures up to 500,000 pounds per square inch. Once plated to the sliding 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 also downtime.

HTC Supreme can also be used as a slide and way lube, an airline oil for pneumatic systems, as a circulating oil and in bearing and gearbox applications, where a non extreme pressure oil is called for.

HTC Supreme meets and exceeds the following specifications and manufacturers' requirements: Haggulands Dension HF-O, Vickers I-286-S and M-2950-S, Rexnord, Commercial Shearing HD 2/900, Commercial Hydraulics, Cincinnati Milicron P-54, P-68, P-69, P-70, DIN 51524 Part 1 & 2, Lee-Norse 100-, Jeffery No. 87, U.S. Steel 126,127 and 136, AFNOR E 48-603, MIL-L-17331H, General Electric GEK 32568A,Brown Boveri HTGD 90117, Westinghouse turbine specifications, Ingersoll Rand, Joy, Garnder Denver, Sullair, Worthington, LeRoi, Quincy and Atlas Copco compressor specifications.

Typical Properties Continued On Next Page

TD-254 Page 3

TYPICAL PROPERTIES

AGMA Grade 1 1 2 3 4 5 API Gravity 60°F 34.8 31.16 32.23 30.75 30.1 29.3 Specific Gravity 60°F .8509 .8639 .8671 .8756 .88 Viscosity SUS 100°F (ASTM D-445) .139.7.180.4 .232.264.3 .336.2-338.4 448e-547.2 .728.1-736.3 .1063.4-1163.2 Viscosity Cat 100°C (ASTM D-445) .100 - 00.35.0 450.5-12.2 .500.0 .138.4-110.6 .202.20.5 Viscosity (ASTM D-445) .49.5.6 .672.7.3 .868.9.47 .103.01.18 14.17.14.5 .18.34-19.59 Viscosity (ASTM D-2420) .104 .102 .102 .100 .101 .107.12.3 <	ISO Grade	32	46	68	100	150	220
Specific Gravity 60°F 8509 8638 8721 8756 88 Viscosity SUS 100°F (ASTM D-445) 139.7-180.4 232-264.3 362-383.4 486-547.2 728.1-736.3 1053.4-1163.2 Viscosity Cst 40°C (ASTM D-445) 27.0-33.5 64D-94.7 10.90-11.89 14.04 10.20 10.5 10.83-4-140.5 200-220.5 Viscosity Index (ASTM D-445) 4.9-56.6 6.72-7.3 8.66-9.47 10.90-11.89 14.37-14.45 18.34-19.59 Viscosity Index (ASTM D-24250) 104 102 105 10.5 10.9 14.34-19.59 Viscosity Index (ASTM D-2287) 104 0.20 10.7 Brootified Viscosity (ASTM D-2893) -101/23.33" 01/17.178" Brootified Viscosity (ASTM D-92) 4107/210" 4497/241" 4647240" 476/247" 502/261.11" 5007/265" Fire Point "F/C ASTM D-92 4507/232" 4907/254" 505"2639" 105'2.33" 01/17.178" 57/515" Toui Point "F/C ASTM D-92	AGMA Grade	1	1	2	3	4	5
Viscosity SUS 100°F (ASTM D-445) 139,7-180.4 232.2284.3 336.2382.4 486-547.2 728.1-736.3 1053.4-1163.2 Viscosity CSt 40°C (ASTM D-445) 27.00-33.50 45.0-51.2 65.00-74.00 92.50-105.00 138.94-140.6 200-220.5 Viscosity CSt 100°C (ASTM D-445) 43-5.6 67.27.3 866-9.47 10.90-11.88 14.17-14.45 18.34-19.59 Viscosity Index (ASTM D-2270) 104 102 105 102 100 101 Brochfield Viscosity (ASTM D-2893)	API Gravity 60°F	34.8	31.16	32.32	30.75	30.1	29.3
Viscosity Cs1 40°C (ASTM D-445) 27.0.33.50 45.0-51.2 65.0-9.470 92.50-105.00 138.94-19.60 200-220.5 Viscosity Index (ASTM D-245) 104 102 105 102 100 101 Brochfield Viscosity (ASTM D-2270) 104 102 105 102 100 101 Brochfield Viscosity (ASTM D-2270) 104 102 105 102 100 101 Brochfield Viscosity (ASTM D-2270) 104 102 105 Borderline Pumping Temperature 5027 4007 448*/240° 476*/247° 502*/261.11* 500*/265° Fire Point "F/°C ASTM D-92 410*/210° 448*/231° 464*/240° 476*/247° 502*/261.41* 509*/265° Four Point "F/°C ASTM D-92 450*/122.2 400*/22.2 400*/24.8° 505*/263° 515*/266° 539*/278.44* 548*/282.22° Pour Point "F/°C ASTM D-97 -25*/31.67* 10*/23.38* 748.5 748 548*/282.22* Total Add Number ASTM D-664 0.50.9 0.50.9 0.5	Specific Gravity 60°F	.8509	.8699	.8638	.8721	.8756	.88
Viscosity (AST 100°C (ASTM D-445) 49.5.6 6.72.7.3 8.66.9.47 10.90.11.89 14.17.14.45 18.34.19.59 Viscosity Index (ASTM D-2270) 104 102 105 100 101 Brockfield Viscosity (ASTM D-2293)	Viscosity SUS 100°F (ASTM D-445)	139.7-180.4	232-264.3	336.2-383.4	486-547.2	728.1-736.3	1053.4-1163.2
Viscosity Index (ASTM D-2270) 104 102 105 102 100 101 Brocklied Viscosity (ASTM D-2803)	Viscosity Cst 40°C (ASTM D-445)	27.00-33.50	45.0-51.2	65.00-74.00	92.50-105.00	138.94-140.6	200-220.5
Brooktied Viscosity (ASTM D-2893)	Viscosity Cst 100°C (ASTM D-445)	4.9-5.6	6.72-7.3	8.66-9.47	10.90-11.89	14.17-14.45	18.34-19.59
cP @ 0° F 3204 4060 Borderline Pumping Temperature Borderline Pumping Temperature Firs Point *F/C (ASTM D-92) 410°/210* 448°/21* 464'/240* 476'/24* 502'/261.11* 500'/265* Pour Point *F/C (ASTM D-92) 450'/32* 409'/24* 505'/263* 515'/268* 535'/278.45 548'/282.22* Pour Point *F/C (ASTM D-665) 548'/282.22* Procedure A-Distilled Water Pass	Viscosity Index (ASTM D-2270)	104	102	105	102	100	101
Borderline Pumping Temperature	Brookfield Viscosity (ASTM D-2893)						
°F/°C ASTM D-3829 -10°/-23.33° ·10°/-23.33° ·10°/-23.33° ·10°/-27° · · Flash Point "F°C (ASTM D-92) 410°/210° 448°/240° 476°/247° 502°/261.11° 500°/265° Flore Point "F°C (ASTM D-92) 450°/2222 490°/254° 505°/268° 515°/268° 515°/278.44° 548°/282.22° Pour Point "F/°C ASTM D-664 0.50.9 0.50.9 0.50.9 0.50.9 0.50.9 0.50.9 Total Acid Number ASTM D-665 - - - - - - - Procedure A-Distilled Water Pass <	cP @ 0°F	3204	4060				
Flash Point °F/°C (ASTM D-92) 410°/210° 448°/231° 464°/240° 476°/247° 502°/261.11° 500°/265° Fire Point °F/°C ASTM D-92 450°/232° 490°/254° 505°/263° 515°/268° 538°/279.44* 548°/282.22° Pour Point °F/°C ASTM D-97 25°/31.67° 25°/31.67° 10°/23.33° 0°/17.78° 59'.15° Total Acid Number ASTM D-664 0.5-0.9	Borderline Pumping Temperature						
Fire Point °F/°C ASTM D-92 450°/232° 490°/234° 50°2639° 515°/268° 535°/279.44° 548°/282.22° Pour Point °F/°C ASTM D-97 -25°/31.6° -25°/31.6° -10°/-23.33° 0°1.17.78° 5°/-15° Pour Point °F/°C ASTM D-664 0.5-0.9 0.5-0.9 0.5-0.9 0.5-0.9 0.5-0.9 0.5-0.9 Rust Test (ASTM D-665) Pass Pas	°F/°C ASTM D-3829	-10°/-23.33°	-10°/-23.33°	0°/-17.78°			
Pour Point °F/°C ASTM D-97 -25°/-31.67° -25°/-31.67° -10°/-23.33° -10°/-23.33° 0°/-17.78° 5'/-15° Total Acid Number ASTM D-664 0.5-0.9 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.9 0.5 0.5 0.5 0.5 0.5	Flash Point °F/°C (ASTM D-92)	410°/210°	448°/231°	464°/240°	476°/247°	502°/261.11°	500°/265°
Total Acid Number ASTM D-664 0.5-0.9 0.5-0.9 0.5-0.9 0.5-0.9 0.5-0.9 0.5-0.9 Rust Test (ASTM D-665) <td>Fire Point °F/°C ASTM D-92</td> <td>450°/232°</td> <td>490°/254°</td> <td>505°2639°</td> <td>515°/268°</td> <td>535°/279.44°</td> <td>548°/282.22°</td>	Fire Point °F/°C ASTM D-92	450°/232°	490°/254°	505°2639°	515°/268°	535°/279.44°	548°/282.22°
Rust Test (ASTM D-665) Procedure A-Distilled Water Pass Add 1a Pass Add Add Add Four Ball Wear Test (ASTM D-4172) (1hr/20kg/130°F) .27 .27 .27 .25 .20	Pour Point °F/°C ASTM D-97	-25°/-31.67°	-25°/-31.67°	-10°/-23.33°	-10°/-23.33°	0°/-17.78°	5°/-15°
Procedure A-Distilled WaterPass<	Total Acid Number ASTM D-664	0.5-0.9	0.5-0.9	0.5-0.9	0.5-0.9	0.5-0.9	0.5-0.9
Procedure B-Salt Water Pass Pass Pass Pass Pass Pass Pass Pass Coper Strip Corrosion Test (ASTM D-130) 1 1a 1a 1a 1a 1a 3 hrs 1 1a 1a 1a 1a 1a Four Ball Wear Test (ASTM D-4172) (1 hr/40kg/130°F) .45 .45 .45 .45 .40 Four Ball Wear Test (ASTM D-4172) (1 hr/20kg/130°F) .45 .45 .45 .45 .40 Four Ball Wear Test (ASTM D-4172) (1 hr/20kg/130°F) .77 .27 .27 .25 .20 Mean Scar Diameter, mm .67 .27 .27 .27 .25 .20 Four Ball Wear Test (ASTM D-2783) . . .26.2 .26.2 .27.7 .27.7 .28 .29.2 Falex Continuous Load (ASTM D-3233) . .250 .250 .500 .500 .500 .500 Conradson Carbon Residue (ASTM D-189) Load Stage Pass <td< td=""><td>Rust Test (ASTM D-665)</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Rust Test (ASTM D-665)						
Copper Strip Corrosion Test (ASTM D-130) 3 hrs 1a 1a 1a 1a 1a 1a 1a Shrs 1a 1a 1a 1a 1a 1a 1a Four Ball Wear Test (ASTM D-4172) (1hr/40kg/130°F)	Procedure A-Distilled Water	Pass	Pass	Pass	Pass	Pass	Pass
3 hrs 1a	Procedure B-Salt Water	Pass	Pass	Pass	Pass	Pass	Pass
Four Ball Wear Test (ASTM D-4172) (1 hr/40kg/130°F) Mean Scar Diameter, mm .45 .45 .45 .45 .45 .45 .40 Four Ball Wear Test (ASTM D-4172) (1hr/20kg/130°F) .45 .45 .45 .45 .40 Four Ball Wear Test (ASTM D-4172) (1hr/20kg/130°F) .27 .27 .27 .25 .20 Mean Scar Diameter, mm .27 .27 .27 .25 .20 .20 Four Ball Wear E.P. Test (ASTM D-2783) .26.2 .27.7 .27.7 .28 .29.2 Load Wear Index Load (ASTM D-3233) .1250 .1250 .1250 .1500 .010 .01	Copper Strip Corrosion Test (ASTM D-130)						
Mean Scar Diameter, mm .45 .45 .45 .45 .45 .45 .40 Four Ball Wear Test (ASTM D-4172) (1hr/20kg/130°F) .27 .27 .27 .25 .20 Mean Scar Diameter, mm .27 .27 .27 .27 .25 .20 Four Ball Wear E.P. Test (ASTM D-2783) . . .	3 hrs	1a	1a	1a	1a	1a	1a
Four Ball Wear Test (ASTM D-4172) (1hr/20kg/130°F) Mean Scar Diameter, mm .27 .27 .27 .27 .25 .20 Four Ball Wear E.P. Test (ASTM D-2783)	Four Ball Wear Test (ASTM D-4172) (1 hr/40kg/130°F)						
Mean Scar Diameter, mm .27 .27 .27 .27 .25 .20 Four Ball Wear E.P. Test (ASTM D-2783) .26.2 .26.2 .26.2 .27.7 .27.7 .28 .200 Load Wear Index .26.2 .26.2 .27.7 .27.7 .28 .29.2 Falex Continuous Load (ASTM D-3233)	Mean Scar Diameter, mm	.45	.45	.45	.45	.45	.40
Four Ball Wear E.P. Test (ASTM D-2783) Weld Load, kg 126 126 160 200 200 Load Wear Index 26.2 26.2 27.7 27.7 28 29.2 Falex Continuous Load (ASTM D-3233) 500 1500 1500 Conradson Carbon Residue (ASTM D-189) 500 1500 1500 1500 Conradson Carbon Residue (ASTM D-189) .01	Four Ball Wear Test (ASTM D-4172) (1hr/20kg/130°F)						
Weld Load, kg 126 126 160 160 200 200 Load Wear Index 26.2 26.2 27.7 27.7 28 29.2 Failex Continuous Load (ASTM D-3233) 1250 1250 1250 1250 1500 1500 Conradson Carbon Residue (ASTM D-189) 1250 1250 1250 101 .01	Mean Scar Diameter, mm	.27	.27	.27	.27	.25	.20
Load Wear Index 26.2 26.2 27.7 27.7 28 29.2 Falex Continuous Load (ASTM D-3233)	Four Ball Wear E.P. Test (ASTM D-2783)						
Falex Continuous Load (ASTM D-3233) Failure Load, lbs 1250 1250 1250 1500 1500 Conradson Carbon Residue (ASTM D-189) .01 <td< td=""><td>Weld Load, kg</td><td>126</td><td>126</td><td>160</td><td>160</td><td>200</td><td>200</td></td<>	Weld Load, kg	126	126	160	160	200	200
Failure Load, lbs 1250 1250 1250 1250 1500 1500 Conradson Carbon Residue (ASTM D-189) .01 <	Load Wear Index	26.2	26.2	27.7	27.7	28	29.2
Conradson Residue (ASTM D-189) %Residue .01 .01 .01 .01 .01 .01 FZG Gear Test (ASTM-5182)	Falex Continuous Load (ASTM D-3233)						
%Residue .01 .01 .01 .01 .01 .01 .01 FZG Gear Test (ASTM-5182)	Failure Load, lbs	1250	1250	1250	1250	1500	1500
FZG Gear Test (ASTM-5182) Load Stage Pass 12th 12th 12th 12th 12th Hydrolytic Stability (ASTM D-2619) Copper Wt Loss mg/cm ² 0.1 0.1 0.1 0.1 0.1 Acidity of Water mg/KOH 0.05 0.05 0.05 0.05 0.05 Demulsibility (ASTM D-1401)	Conradson Carbon Residue (ASTM D-189)						
Load Stage Pass 12th	%Residue	.01	.01	.01	.01	.01	.01
Hydrolytic Stability (ASTM D-2619) Copper Wt Loss mg/cm ² 0.1 0.1 0.1 0.1 0.1 Acidity of Water mg/KOH 0.05 0.05 0.05 0.05 0.05 Demulsibility (ASTM D-1401) 40-40-0 40-40-0 40-40-0 40-40-0 40-40-0	FZG Gear Test (ASTM-5182)						
Copper Wt Loss mg/cm ² 0.1 0.1	Load Stage Pass	12th	12th	12th	12th	12th	12th
Acidity of Water mg/KOH 0.05 0.	Hydrolytic Stability (ASTM D-2619)						
Demulsibility (ASTM D-1401) 40-40-0 40-	Copper Wt Loss mg/cm ²	0.1	0.1	0.1	0.1	0.1	0.1
O-W-E 40-40-0 40-40-0 40-40-0 40-40-0 40-40-0 40-40-0	Acidity of Water mg/KOH	0.05	0.05	0.05	0.05	0.05	0.05
	Demulsibility (ASTM D-1401)						
Time 15 15 15 15 15 15	O-W-E	40-40-0	40-40-0	40-40-0	40-40-0	40-40-0	40-40-0
	Time	15	15	15	15	15	15

Typical Properties Continued

ISO Grade	32	46	68	100	150	220
Dennison Filterability Test						
Time, w/o (sec)	112	112	112	112	112	112
Time, w/water (sec)	146	146	146	146	146	146
Oxidation Stability Test (ASTM D-943)						
Hr to Tan of 2	4000	4000	4000	4000	4000	4000
Sludge Tendencies (ASTM D-4310)						
Total Sludge, mg	36	36	36	36	36	36
Copper wt. loss, mg	22	22	22	22	22	22
Iron wt. loss, mg	0.1	0.1	0.1	0.1	0.1	0.1
Vickers Pump Wear Test (ASTM D-2882)						
Mg Wt Loss	12	12	12	12	12	12
Foam Test (ASTM D-892)						
Sequence I	0/0	0/0	0/0	0/0	0/0	0/0
Sequence II	0/0	0/0	0/0	0/0	0/0	0/0
Sequence III	0/0	0/0	0/0	0/0	0/0	0/0
Thermal Stability (Cincinnati Milicron						
Method 68 hrs./135°C/copper steel catalyst)						
Sludge mg/100 ml	2	2	2	2	2	2
Condition of copper rod	1	1	1	1	1	1
Condition of steel rod	1	1	1	1	1	1
Air Release Properties						
Time @ 50°C/122°F	0.5	0.5	1	1	1	1
% Evaporative Loss @700°F/370.11°C						
(ASTM D-2887)	4.9%	4.9%	5.0%	5.0%	5.0%	5.0%
Denison T5D-042 Pump Test						
in wear, vane	.0094	.0094	.0094	.0094		
Vickers 35VQ25 Pump Test						
Wt. loss vane, mg	5	5	5	5		
Wt. loss vane, mg Wt. loss cam, mg	5 11	5 11	5 11	5 11		

Packaging: #254 HTC Supreme is available in 55 gallon drums, 30 gallon drums and 5 gallon pails.