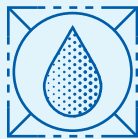




CITGO® Pacemaker® T Oils

OVERVIEW



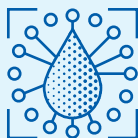
- Extra-inhibited, high-quality lubricants designed specifically as turbine oils.

FEATURES & BENEFITS



- Made from high viscosity index paraffinic base stocks processed by modern hydrotreating methods.
- High viscosity index imparts superior temperature-viscosity characteristics.
- High flash point and excellent resistance to oxidation, rusting, and foaming promote long service life in closed circulating systems.
- Pass both procedures of the ASTM D665 Rust Test and provide extended oxidation life as measured in the ASTM D943 Oxidation Test.

APPLICATIONS



- Recommended for pressure-circulation systems of direct-connected steam turbines and for the bearings of turbo-generators.
- Recommended for the lubrication of steam turbines with single-reduction gear units, as found in marine service.
- Highly recommended for use in compressor equipment, air lines, circulating oil systems, and gears where an R&O (rust- and oxidation-inhibited) type oil is specified.
- Suitable for the lubrication of industrial gas turbines and gear units.
- Pacemaker T-68 passes the Alemite test and is thus suitable for mist applications.
- Recommended for use in equipment requiring the following specifications:
 - General Electric GEK 32568 H
 - Fives Cincinnati P-38 (Grade T-32)
 - ALSTOM HTGD 90117
 - ASTM D4304 Type I, II, III
 - British Standard BS 489
 - DIN 51515 Part 1, 2
 - DIN 51524 Part 1
 - ISO 8068 TSA TGA, TGE TSE
 - ISO 11158 HH, HL
 - SIEMENS AG TLV 9013 04 Standard Thermal Stability
 - SIEMENS AG TLV 9013 05 High Thermal Stability
 - Solar ES9-244L grades C32 (150), C46 (5-215) (Grades T-32 and T-46, respectively)

PROPERTIES



Typical Properties for CITGO Pacemaker T Oils:

Grade	T-32	T-46	T-68	T-115
Material Code	633715001	633720001	633730001	633745001
Gravity, ASTM D4052, °API	32.7	31.4	30.9	29.0
Pounds Per Gallon	7.18	7.24	7.26	7.34
Flash Point, COC, ASTM D92, °F (°C)	442 (228)	446 (230)	489 (254)	536 (280)
Viscosity ASTM D445				
cSt at 40°C	32.0	44.7	66.7	109
cSt at 100°C	5.5	6.8	8.8	12.2
Viscosity Index, ASTM D2270	107	104	105	102
Pour Point, ASTM D97, °F (°C)	-38 (-39)	-38 (-39)	-38 (-39)	0 (-18)
Color, ASTM D1500	L1.0	L1.0	L1.5	1.5
Foam Test, ASTM D892(1), Seq. I, II, III	Pass	Pass	Pass	Pass
Aniline Point, ASTM D611, °F (°C)	219 (104)	223 (106)	230 (110)	244 (118)
Neutralization No., ASTM D664	0.1	0.1	0.1	0.1
Corrosion, ASTM D130, 3 hours at 212°F	1B	1B	1B	1B
Oxidation, ASTM D943(2), hours	10,000+	10,000+	—	—
Water Separation, Dist. Water, ASTM D1401				
at 130°F (54°C)	40-40-0 (15)	40-40-0 (15)	40-40-0 (20)	—
180°F (82°C)	—	—	—	40-40-0 (20)
Rust Test, ASTM D665(3)	Pass	Pass	Pass	Pass
RPVOT, ASTM D2272, minutes	2780	2500	1160	780
ISO VG No.	32	46	68	—
AGMA Grade	0	1	2	—

Note:

- (1) 50 ml. max. at end of blowing period. No foam after 10 minutes setting.
- (2) Hours to reach acid number of 2.0 mg. of KOH per gram of oil.
- (3) Procedures A (distilled water) and B (synthetic sea water) – 24 hours.

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