

**CITGO PACEMAKER® OILS**

Date 08/11

DESCRIPTION: CITGO Pacemaker Oils are rust and oxidation (R&O) inhibited oils. They are general purpose lubricants, sometimes described as circulating oils, turbine oils, hydraulic oils or bearing oils. They contain defoamer and are readily separable from water, i.e., highly demulsible.

They are manufactured from high viscosity index base stocks.

QUALITIES: These oils are made from selected high quality, paraffinic base stocks. Their high viscosity index imparts superior temperature-viscosity characteristics. Long service life in closed circulating systems is assured by low carbon-forming tendency and excellent resistance to oxidation, rusting and foaming.

APPLICATIONS: Depending on the viscosity grade, Pacemaker Oils can be used as:

- Air line oil
- Circulating oil
- Gear oil
- Compressor oil
- Rust/oxidation inhibited (R&O) oil
- Low pressure hydraulic oil
- "Non-detergent" motor oil

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Date 08/11 - (Continued)



TYPICAL PROPERTIES:

CITGO PACEMAKER® OILS

Grade	19	32	46	68	100	150	220	320	460	680
Material Code	633013001	633001001	633002001	633003001	633006001	633008001	633009001	633010001	633012001	633014001
Gravity, ASTM D 4052, °API	34.3	32.6	31.5	31.0	30.3	29.5	28.2	27.0	26.5	25.1
Pounds Per Gallon	7.11	7.18	7.23	7.26	7.28	7.32	7.37	7.43	7.46	7.52
Flash Point, ASTM D 92, °F(°C), Min.	395 (202)	395 (202)	395 (202)	442 (228)	442 (228)	442 (228)	442 (228)	442 (228)	579 (304)	579 (304)
Viscosity:										
cSt at 40°C	22	32	45	68	100	150	220	320	456	676
cSt at 100°C	4.55	5.2	6.7	8.3	10.5	16.5	18.2	23.6	30.1	39.0
Viscosity Index	102	110	103	104	102	98	98	96	95	86
Pour Point, ASTMD 97, °F(°C)	-22 (-30)	-33 (-36)	-22 (-30)	-27 (-33)	-22 (-30)	0 (-18)	0 (-18)	0 (-18)	10 (-12)	-5 (-15)
Color, ASTM D 1500	L0.5	L0.5	L0.5	L0.5	L1.0	L5.0	L5.0	L5.5	L5.5	L5.5
Neutralization No., ASTM D 974	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Turbine Oil Rust Test, ASTM D 665	Pass(1)	Pass(1)	Pass(1)	Pass(1)	Pass(1)	Pass(2)	Pass(2)	Pass(2)	Pass(2)	Pass(2)
Oxidation Test, ASTM D 943, Hrs.	4500	4000	3500	3500	2000	1300	1000	800	820	850
Cinnimati Lamb Requirement	P-45	P-38	P-55	P-54	-	P-57	-	-	-	-
ISO VG No.	22	32	46	68	100	150	220	320	460	680
AGMA Grade	-	-	1	2	3	4	5	6	7	8

Notes: (1) Procedure A (distilled water) and Procedure B (synthetic sea water) - 24 hrs
(2) Procedure A (distilled water)