

**CITGO PACEMAKER® OILS**

Date 1/09

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 1/09 - (Continued)

TYPICAL PROPERTIES:

CITGO PACEMAKER® OILS

Grade	19	32	46	68	100	150	220	320	460
Material Code	633013001	633001001	633002001	633003001	633006001	633008001	633009001	633010001	633012001
Gravity, ASTM D 4052, °API	32.6	31.0	30.4	29.4	28.8	27.9	27.5	27.0	26.5
Pounds Per Gallon	7.18	7.25	7.28	7.32	7.35	7.39	7.41	7.43	7.46
Flash Point, ASTM D 92, °F(°C), Min.	363 (184)	400 (204)	432 (222)	395 (202)	395 (202)	395 (202)	395 (202)	395 (202)	579 (304)
Viscosity:									
cSt at 40°C	19	31	45	68.3	96.4	142	208	309	456
cSt at 100°C	3.9	5.4	6.7	8.7	10.9	14.2	18.2	23.6	30.1
SUS at 100°F	101	160	232	354	503	747	1101	1644	2448
SUS at 210°F	39.5	44.2	48.8	55.7	64	76	93.5	117	148
Viscosity Index	97	106	103	100	97	97	96	96	95
Pour Point, ASTM D 97, °F(°C)	-33 (-36)	-20 (-29)	-22 (-30)	-18 (-28)	0 (-18)	0 (-18)	0 (-18)	0 (-18)	10 (-12)
Color, ASTM D 1500 Neutralization No., ASTM D 974	1.0	1.0	L1.0	L1.5	L4.0	L5.0	L5.5	L6.0	L6.0
Turbine Oil Rust Test, ASTM D 665	.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Oxidation Test, ASTM D 943, Hrs.	Pass (1)	Pass (1)	Pass (1)	Pass (1)	Pass (1)	Pass (2)	Pass (2)	Pass (2)	Pass (2)
Cincinnati Lamb Requirement	4500	4000	3500	3500	2000	1300	1000	800	820
ISO VG No.	P-45	P-38	P-55	P-54	-	P-57	-	-	-
AGMA Grade	22	32	46	68	100	150	220	320	460
ASTM Grade	-	-	1	2	3	4	5	6	7
	105	150	215	315	465	700	1000	1500	2500

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