



Syncon® R&O Oil (ISO VG 100-680)

Phillips 66® Syncon R&O Oil (ISO VG 100-680) is a premium quality, synthetic, rust and oxidation (R&O)-inhibited circulating oil developed for use in circulating systems, lightly loaded enclosed gear drives, and other industrial equipment operating under severe-service conditions or at extreme temperatures. It is particularly recommended for use in applications where operating conditions may be unfavorable or too severe for conventional mineral oil-based circulating oils.

Syncon R&O Oil is formulated with synthetic polyalphaolefin (PAO) base oils and select additives to provide excellent protection against rust, corrosion, and deposit formation. It has outstanding oxidation resistance and thermal stability at high temperatures to minimize sludge and varnish formation, and provide long service life. It protects system components against rust, corrosion, and wear. It has excellent low-temperature properties for use over a wide temperature range, and is resistant to excessive foam buildup that can interfere with proper lubrication.

Syncon® R&O Oil is compatible with mineral oil-based lubricants, but mixing should be avoided for optimum performance benefits. Syncon R&O Oil meets the requirements of the following industry and OEM specifications:

- AGMA 9005-F16 Inhibited, R&O, Lubricants

Applications

- Plain and rolling-element bearings operating at very high or very low temperatures, and sealed-for-life bearings
- Lightly to moderately loaded enclosed industrial gear drives that do not require a compounded or extreme-pressure (EP) gear lubricant
- Circulating systems of paper machine dryer sections and calender stacks
- Industrial blowers
- Industrial worm gear drives with bronze-on-steel gears
- Reciprocating air compressors where the manufacturer specifies a PAO-based lubricant (ISO VG 100 or 150, typically)
- Lubrication of the upper cylinders of gas compressors handling natural gas or process gas (ISO VG 150 or 220, typically)
- Industrial equipment operating over a wide temperature range where an inhibited mineral oil is recommended

Note: For information on compatibility with seals, paints and plastics, please call our Technical Support.

**Synthetic PAO-
Based, Rust
& Oxidation-
Inhibited
Circulating Oil
for Gears &
Bearings**

**KEEPING THE
WORLD
RUNNING
SMOOTHLY.**





Features/Benefits

- Outstanding resistance to thermal breakdown at high temperatures
- Outstanding oxidation resistance to minimize deposit and varnish formation
- Protects against wear
- Protects against rust and corrosion
- Good water-separating properties
- Good foam resistance
- Excellent low-temperature fluidity
- Extended service intervals compared with mineral oil-based lubricants
- Compatible with mineral oil-based lubricants⁽¹⁾

⁽¹⁾**Note:** For optimum performance, the mineral oil lubricant should be drained before using Syncon R&O Oil. Mixing the two products can reduce the effectiveness and performance advantages normally gained by using Syncon R&O Oil.

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Typical Properties						
ISO Grade	100	150	220	320	460	680
AGMA Grade (obsolete)	3	4	5	6	7	8
AGMA Classification	R&O	R&O	R&O	R&O	R&O	R&O
Specific Gravity @ 60°F	0.861	0.866	0.871	0.875	0.882	0.882
Density, lbs/gal @ 60°F	7.17	7.21	7.25	7.29	7.34	7.34
Color, ASTM D1500	1.0	1.0	1.0	1.0	1.0	1.0
Flash Point (COC), °C (°F)	266 (511)	243 (469)	266 (511)	255 (491)	243 (469)	266 (511)
Pour Point, °C (°F)	-43 (-45)	-44 (-47)	-45 (-49)	-48 (-54)	-48 (-54)	-43 (-45)
Viscosity						
cSt @ 40°C	99.1	149	231	341	480	728
cSt @ 100°C	14.4	19.8	27.6	37.2	48.3	67.5
SUS @ 100°F	508	766	1,194	1,769	2,500	3,804
SUS @ 210°F	77.0	99.9	135	180	233	326
Viscosity Index	150	153	155	157	159	166
Acid Number, ASTM D974, mg KOH/g	1.50	1.50	1.50	1.50	1.50	1.50
Copper Corrosion, ASTM D130, 48 hrs @ 80°C	1a	1a	1a	1a	1a	1a
Demulsibility, ASTM D1401, minutes to pass	15	15	20	20	25	25
Foam Test, ASTM D892, Seq. I, mL	0/0	0/0	0/0	0/0	0/0	0/0
Four-Ball Wear Test, ASTM D4172, Scar Diameter, mm	0.40	0.40	0.40	0.40	0.40	0.40
FZG Scuffing Test, ASTM D5182, Failure Load Stage	12	12	12	12	12	12

Health & Safety Information

For recommendations on safe handling and use of this product, please refer to the Safety Data Sheet via <http://www.phillips66.com/EN/products/Pages/MSDS.aspx>.