REGAL® R&O ISOCLEAN® CERTIFIED LUBRICANT

32, 46, 68, 100, 150, 220, 320, 460

PRODUCT DESCRIPTION

Regal® R&O Oils are circulating and turbine oils formulated with highly refined base stocks to give an outstanding performance in industrial machinery requiring R&O oils.

Circulating oils are specialized lubricants used primarily in industrial machinery and equipment where continuous lubrication is necessary. R&O circulating oils are a specific type of industrial lubricant designed with rust and oxidation (R&O) inhibitors. These oils are used in systems where the primary concern is protecting metal surfaces from rust and oxidation rather than handling extreme pressure or heavy loads.

Chevron ISOCLEAN Certified Lubricants have been certified to meet specified ISO Cleanliness standards at point of delivery using industry leading filtration and testing technology. ISOCLEAN Certified products are the first step for contamination control and maximizing component life.

CUSTOMER BENEFITS

Regal R&O ISOCLEAN Certified Lubricants deliver value through:

- **Ready to use** — Enables users to meet stringent original equipment manufacturers' cleanliness standards for fill lubricants.
- **Flexibility** — ISO Cleanliness targets can be customized to fit your business application needs.
- **Peace of mind** — Each delivery of Chevron ISOCLEAN Certified Lubricant includes an ISOCLEAN Certificate of Analysis.
- **OE fluid cleanliness requirements** — Customized to meet specific equipment manufacturers' fluid cleanliness requirements.
- **Long lubricant life** provided by excellent thermal and oxidation stability. Formulated with an ashless, zinc-free formulation.
- **Excellent demulsibility** helps ensure good lubricant film strength and minimal wear through quick water separation.
- **Excellent air release** in turbine oil reservoir systems by the foam inhibitor hastening the release of foam and entrained air.
- **Rust protection** of metal surfaces due to the use of an effective rust and corrosion inhibitor.
- **Environmental benefits** — All grades are ashless. This facilitates reclaiming and recycling of the used oils.

FEATURES

Key Features of R&O circulating oils include:

- Rust Inhibitors - prevent corrosion of metal surfaces, especially in the presence of moisture
- Oxidation Inhibitors - extend oil life by preventing the formation of sludge, varnish, and acids
- Good Water Separation - helps in systems where water contamination is possible
- Foam Resistance - prevents foam formation which can impair lubrication

Regal R&O oils provide rust protection, oxidation inhibition, and foam suppression.

The thermal and oxidation stability of these lubricants, due to their high level of refinement, has been further enhanced by their unique ashless, zinc-free formulation. The high thermal and oxidation stability help protect against oxidation deposit formation or the generation of acidic material.

Product(s) manufactured in the USA.
Always confirm that the product selected is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.

A **Chevron** company product

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Regal R&O oils have very good demulsibility characteristics allowing quick release of moisture.

Regal R&O oils minimize entrained air which otherwise could result in low lubricant film strength between moving parts and pump cavitation.

APPLICATIONS

Regal® R&O ISOCLEAN® Certified Lubricants ISO 32 through ISO 150 are recommended for use in most electric motor bearings, air compressors, gears, hydroelectric turbines, steam turbines, marine turbines, and non-heavy duty hydraulic systems where OEM recommends R&O type oils (for heavy duty hydraulic systems, customers should consider Rando HD ISOCLEAN Certified Lubricants).

These products can also be used as a general purpose machine oil for shop use when R&O type oil is needed or is recommended. The multifunctional characteristics of Regal R&O type oils may allow them to replace other special application lubricants, which can result in reduced inventory and operating cost.

CLAIMS AND SPECIFICATIONS

ISO Grade	32	46	68	100	150	220	320	460
Alstom			M	M				
Alstom HTGD 90117	M	M						
British Standard 489	M	M	M	M				
Fives Cincinnati[a] (formerly MAG Cincinnati, Cincinnati Machine, Cincinnati Milacron)	M P-38	M P-55	M P-54					
Fresh Water Corrosion Test (ASTM D665, Procedure A)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
General Electric			M	M				
General Electric GEK 28143b	M	M						
General Electric GEK 46506D	M							
MORGOIL Advanced				M	M	M	M	M
Siemens TLV 901304	M	M						
Synthetic Sea Water Rust Test (ASTM D665, Procedure B)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Westinghouse hydroelectric turbines, land and marine steam turbines, and associated reduction gears when OEM recommends R&O type oil			M	M				
ANSI/AGMA 9005-F16 R&O					M	M	M	M
ASTM D4304 Type I	M	M	M	M				
DIN 51515 standard organization requirements for new lubricants used in gas and steam turbines and auxiliary equipment	M	M	M	M				
DIN 51517/2 CL requirements					M	M	M	M

a Obsolete specification

M: Meets or exceeds requirements

Do not use Regal R&O ISOCLEAN Certified Lubricants in large and high temperature gas turbines. GST® Oils are recommended for these gas turbines.

Do not use Regal R&O ISOCLEAN Certified Lubricants 32, 46, or 68 in high pressure systems in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Do not use in breathing air apparatus or medical equipment.

Note that finished lubricants may affect the adherence of applied protective coatings (such as paint). If this product is used where coating applications are performed, the coating manufacturer should be consulted regarding adequate surface preparation.

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Consult with your Chevron Lubricant Representative or Chevron ISOCLEAN Certified Lubricants Marketer to set specific ISO Cleanliness targets for your business application.

TYPICAL TEST DATA

	ASTM	32	46	68	100
Product Number		*278034*	*278049*	*278035*	*278050*
SDS/MSDS Number *USA* *Canada* *Mexico*		 *23566* *23567* *23568*	 *23566* *23567* *23568*	 *23566* *23567* *23568*	 *23566* *23567* *23568*
API Gravity[a]	D287	32.9(31.3)	31.7(30.2)	31.2(29.1)	30.7(28.1)
Viscosity, Kinematic cSt at 40°C cSt at 100°C	D445	 30.4 5.2	 43.7 6.5	 64.6 8.4	 95.0 10.8
Viscosity, Saybolt SUS at 100°F SUS at 210°F	D445	 157 43.7	 226 48.0	 335 54.5	 495 63.1
Viscosity Index	D2270	100	98	99	97
Flash Point, °C(°F)	D92	222(432)	224(435)	245(473)	262(504)
Pour Point, °C(°F)	D97	-30(-22)	-27(-17)	-24(-11)	-15(+5)
Rust Test, Procedure B, 24 h	D665	Pass	Pass	Pass	Pass
Copper Corrosion, 3h at 100°C, max	D130	—	—	—	
Oxidation Stability[b] Hours to 2.0 mg KOH/g acid number Minutes to 25 psi pressure drop	 D943 D2272	 >6000 (>3000) >900 (>600)	 >6000 (>3000) >900 (>500)	 >5500 (>2500) >900 (>400)	 >5500 (>2000) >900 (>400)
FZG, Pass Stage[b], DIN 51354		10	10	10	10

a Typical values for products from the "East of the Rockies" plants (Bayonne, Charleston, Cicero, Louisville, and Port Arthur) are in parentheses.

b FZG, Pass Stage, DIN 51354 is not applicable to products manufactured in Colombia and El Salvador.

Minor variations in product typical test data are to be expected in normal manufacturing.

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TYPICAL TEST DATA

	ASTM	150	220	320	460
Product Number		*278036*	*278052*	*278037*	*278053*
SDS/MSDS Number *USA* *Canada* *Mexico*		 *23566* *23567* *23568*	 *23566* *23567* *23568*	 *48146* *48160* *48159*	 *48146* *48160* *48159*
API Gravity[a]	D287	29.8(27.1)	28.5(26.1)	27.5(25.4)	26.4
Viscosity, Kinematic cSt at 40°C cSt at 100°C	D445	 143 14.2	 220 19.0	 304 23.2	 460 31.3
Viscosity, Saybolt SUS at 100°F SUS at 210°F	D445	 750 76.4	 1163 96.8	 1618 116	 2463 152
Viscosity Index	D2270	96	97	95	97
Flash Point, °C(°F)	D92	284(543)	294(561)	298(568)	310(590)
Pour Point, °C(°F)	D97	-21(+5)	-18(+10)	-12(+10)	-12(+10)
Rust Test, Procedure B, 24 h	D665	Pass	Pass	Pass	Pass
Copper Corrosion, 3h at 100°C, max		1a	1a	1a	1a
Oxidation Stability[a] Hours to 2.0 mg KOH/g acid number Minutes to 25 psi pressure drop	 D943 D2272	 >3500 (>1500) >450	 >2200 (>1200) >425	 >1800 (>1100) >400	 >900 (>900) >275
FZG, Pass Stage[b], DIN 51354		—	—	—	—

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