REGAL® R&O

115 and ISO 22, 32, 46, 68, 100, 150, 220, 320, 460, 680

PRODUCT DESCRIPTION

Regal® R&O oils are turbine oils designed to give outstanding performance in steam and hydroelectric turbines.

CUSTOMER BENEFITS

Regal R&O oils deliver value through:

- **Long lubricant life** provided by excellent thermal and oxidation stability.
- **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

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

They pass the Fresh Water Corrosion Test (ASTM D665, Procedure A), and the severe Synthetic Sea Water Rust Test (ASTM D665, Procedure B).

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

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.

Product(s) manufactured in the USA, Colombia and El Salvador.
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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APPLICATIONS

Regal® R&O oils 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 oils).

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.

Regal R&O 32

- meets:
  - **Alstom** HTGD 90117
  - **ASTM** D4304 Type I, **British Standard** 489, and **DIN** 51515 standard organization requirements for new lubricants used in gas and steam turbines and auxiliary equipment
  - **General Electric** GEK 28143b, GEK 46506D
  - **MAG Cincinnati, Cincinnati Machine** P-38
  - **Siemens** TLV 901304

Regal R&O 46

- meets:
  - **Alstom** HTGD 90117
  - **ASTM** D4304 Type I, **British Standard** 489, and **DIN** 51515 standard organization requirements for new lubricants used in gas and steam turbines and auxiliary equipment
  - **General Electric** GEK 28143b
  - **MAG Cincinnati, Cincinnati Machine** P-55
  - **Siemens** TLV 901304

Regal R&O 68

- meets:
  - **ASTM** D4304 Type I, **British Standard** 489, and **DIN** 51515 standard organization requirements for new lubricants used in gas and steam turbines and auxiliary equipment
  - **MAG Cincinnati, Cincinnati Machine** P-54
- suitable for use in **General Electric, Alstom,** and **Westinghouse** hydroelectric turbines, land and marine steam turbines, and associated reduction gears when OEM recommends R&O type oil

Regal R&O 100

- meets:
  - **ASTM** D4304 Type I, **British Standard** 489, and **DIN** 51515 standard organization requirements for new lubricants used in gas and steam turbines and auxiliary equipment
- suitable for use in **General Electric, Alstom,** and **Westinghouse** hydroelectric turbines, land and marine steam turbines, and associated reduction gears when OEM recommends R&O type oil

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

Do not use Regal R&O 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.

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.

TYPICAL TEST DATA

	ASTM	115[a]	ISO 22	32	46	68
Product Number		*277311*	*277312*	*273209*	*273210*	*273211*
SDS/MSDS Number						
USA		*23566*	*23566*	*23566*	*23566*	*23566*
Colombia		—	—	*33490*	*33490*	*33490*
El Salvador		—	—	*33491*	*33491*	*33491*
API Gravity[b]	D287	30.5(27.6)	34.2(32.1)	32.9(31.3)	31.7(30.2)	31.2(29.1)
Viscosity, Kinematic	D445					
cSt at 40°C		115	23.1	30.4	43.7	64.6
cSt at 100°C		12.2	4.4	5.2	6.5	8.4
Viscosity, Saybolt	D445					
SUS at 100°F		602	120	157	226	335
SUS at 210°F		68.5	41.2	43.7	48.0	54.5
Viscosity Index	D2270	96	102	100	98	99
Flash Point, °C(°F)	D92	278(532)	220(428)	222(432)	224(435)	245(473)
Pour Point, °C(°F)	D97	-15(+5)	-15(+5)	-30(-22)	-27(-17)	-24(-11)
Rust Test, Procedure B, 24 h	D665	Pass	Pass	Pass	Pass	Pass
Oxidation Stability[b]						
Hours to 2.0 mg KOH/g acid number	D943	— (>2000)	>6000 (>3000)	>6000 (>3000)	>6000 (>3000)	>5500 (>2500)
Minutes to 25 psi pressure drop	D2272	— (>400)	>1000 (>600)	>900 (>600)	>900 (>500)	>900 (>400)
FZG, Pass Stage[c], DIN 51354		—	—	10	10	10

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

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.

TYPICAL TEST DATA

	ASTM	100	150	220	320	460	680
Product Number		*273212*	*273213*	*273215*	*273214*	*273275*	*277313*
SDS/MSDS Number							
USA		*23566*	*23566*	*23569*	*23569*	*23569*	*23569*
Colombia		*33482*	*33482*	*33482*	—	—	—
El Salvador		*33484*	*33484*	*33484*	—	—	—
API Gravity[a]	D287	30.7(28.1)	29.8(27.1)	28.5(26.1)	27.5(25.4)	26.4	26.3
Viscosity, Kinematic	D445						
cSt at 40°C		95.0	143	220	304	460	646
cSt at 100°C		10.8	14.2	19.0	23.2	31.3	39.6
Viscosity, Saybolt	D445						
SUS at 100°F		495	750	1163	1618	2463	3474
SUS at 210°F		63.1	76.4	96.8	116	152	193
Viscosity Index	D2270	97	96	97	95	97	99
Flash Point, °C(°F)	D92	262(504)	284(543)	294(561)	298(568)	310(590)	312(594)
Pour Point, °C(°F)	D97	-15(+5)	-15(+5)	-12(+10)	-12(+10)	-12(+10)	-12(+10)
Rust Test, Procedure B, 24 h	D665	Pass	Pass	Pass	Pass	Pass	Pass
Oxidation Stability[a]							
Hours to 2.0 mg KOH/g acid number	D943	>5500 (>2000)	>3500 (>1500)	>2200 (>1200)	>1800 (>1100)	>900 (>900)	>900
Minutes to 25 psi pressure drop	D2272	>900 (>400)	>450	>425	>400	>275	>275
FZG, Pass Stage[b], DIN 51354		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.

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