



# REGAL® R&O

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

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### 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.

### CUSTOMER BENEFITS

Regal R&O oils deliver value through:

- **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

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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## CLAIMS AND SPECIFICATIONS

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

a Obsolete specification

M: Meets or exceeds requirements

Regal R&O Oils are not suitable for applications requiring Extreme Pressure (EP) additives, such as heavy-duty gear systems or high-load bearings. 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.

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.

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.

## TYPICAL TEST DATA

|   | ASTM  | 32               | 46               | 68               | 100              |
|---|-------|------------------|------------------|------------------|------------------|
| <i>Product Number</i>                       |       |                  |                  |                  |                  |
| USA   |       | 273209           | 273210           | 273211           | 273212           |
| Colombia                                    |       | —                | —                | 273211           | 273212           |
| El Salvador                                 |       | 273209           | 273210           | 273211           | 273212           |
| <i>SDS/MSDS Number</i>                      |       |                  |                  |                  |                  |
| USA   |       | 23566            | 23566            | 23566            | 23566            |
| Canada                                      |       | 23567            | 23567            | 23567            | 23567            |
| Mexico                                      |       | 23568            | 23568            | 23568            | 23568            |
| Colombia                                    |       | —                | —                | 32649            | 32649            |
| El Salvador                                 |       | 32648            | 32648            | 32648            | 32648            |
| API Gravity <sup>a</sup>                    | D287  | 32.9(31.3)       | 31.7(30.2)       | 31.2(29.1)       | 30.7(28.1)       |
| Viscosity, Kinematic                        |       |                  |                  |                  |                  |
| cSt at 40°C                                 | D445  | 30.4             | 43.7             | 64.6             | 95.0             |
| cSt at 100°C                                |       | 5.2              | 6.5              | 8.4              | 10.8             |
| Viscosity, Saybolt                          |       |                  |                  |                  |                  |
| SUS at 100°F                                | D445  | 157              | 226              | 335              | 495              |
| SUS at 210°F                                |       | 43.7             | 48.0             | 54.5             | 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,<br>3h at 100°C, max       | D130  | —                | —                | —                |                  |
| Oxidation Stability <sup>b</sup>            |       |                  |                  |                  |                  |
| Hours to 2.0 mg<br>KOH/g acid number        | D943  | >6000<br>(>3000) | >6000<br>(>3000) | >5500<br>(>2500) | >5500<br>(>2000) |
| Minutes to 25 psi<br>pressure drop          | D2272 | >900<br>(>600)   | >900<br>(>500)   | >900<br>(>400)   | >900<br>(>400)   |
| FZG, Pass Stage <sup>b</sup> ,<br>DIN 51354 |       | 10               | 10               | 10               | 10               |

a Typical values for products from the Bayonne, Charleston, Cicero, Louisville, and Port Arthur plants 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.

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**

|   | <b>ASTM</b> | <b>150</b>       | <b>220</b>       | <b>320</b>       | <b>460</b>     |
|---|-------------|------------------|------------------|------------------|----------------|
| <i>Product Number</i>                       |             |                  |                  |                  |                |
| <i>USA</i>                                  |             | 273204           | 273205           | 273206           | 273207         |
| <i>Colombia</i>                             |             | 273213           | 273215           | —                | —              |
| <i>El Salvador</i>                          |             | —                | 273215           | —                | —              |
| <i>SDS/MSDS Number</i>                      |             |                  |                  |                  |                |
| <i>USA</i>                                  |             | 48146            | 48146            | 48146            | 48146          |
| <i>Canada</i>                               |             | 48160            | 48160            | 48160            | 48160          |
| <i>Mexico</i>                               |             | 48159            | 48159            | 48159            | 48159          |
| <i>Colombia</i>                             |             | 32649            | 32649            | —                | —              |
| <i>El Salvador</i>                          |             | —                | 32648            | —                | —              |
| API Gravity <sup>a</sup>                    | D287        | 29.8(27.1)       | 28.5(26.1)       | 27.5(25.4)       | 26.4           |
| Viscosity, Kinematic                        |             |                  |                  |                  |                |
| cSt at 40°C                                 | D445        | 143              | 220              | 304              | 460            |
| cSt at 100°C                                |             | 14.2             | 19.0             | 23.2             | 31.3           |
| Viscosity, Saybolt                          |             |                  |                  |                  |                |
| SUS at 100°F                                | D445        | 750              | 1163             | 1618             | 2463           |
| SUS at 210°F                                |             | 76.4             | 96.8             | 116              | 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,<br>3h at 100°C, max       |             | 1a               | 1a               | 1a               | 1a             |
| Oxidation Stability <sup>a</sup>            |             |                  |                  |                  |                |
| Hours to 2.0 mg<br>KOH/g acid number        | D943        | >3500<br>(>1500) | >2200<br>(>1200) | >1800<br>(>1100) | >900<br>(>900) |
| Minutes to 25 psi<br>pressure drop          | D2272       | >450             | >425             | >400             | >275           |
| FZG, Pass Stage <sup>b</sup> ,<br>DIN 51354 |             | —                | —                | —                | —              |

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