

aramco



base oils

aramco
base oils
product catalog 2022



aramco base oils: your complete source
of products to propel your business further



“We are ready to collaborate closely with our customers in meeting their base oils product needs in a dynamic, formidable marketplace today, and into the future. As the world’s largest producer of high-quality base oils, Aramco’s portfolio of advanced manufacturing complexes are positioned around the globe to enable the delivery of a full slate of high-quality Aramco branded base oils reliably, anywhere, at any time.”

Yasser M. Mufti

Saudi Aramco Vice President of Fuels



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لهبريف
luberef

Luberef is known as a reliable supplier of high-quality base oils to customers operating across the Middle East, East Africa, India, Pakistan, Singapore and Europe. The strategically advantageous location of Luberef's refineries in Jiddah and Yanbu', in the Kingdom of Saudi Arabia, is combined with a consistent and reliable high quality supply of base oil, and an optimized grade mix to provide supply chain efficiencies to Luberef customers. Luberef's total base oil production capacity is 24,300 barrels per day (1.2 million tons per year).

MOTIVA

Motiva base oils are recognized for their quality and are key components in a broad spectrum of lubricants – including automotive, industrial, and functional fluid applications. Motiva's Port Arthur refinery is the site of the largest base oil plant in North America, operating three lube hydroprocessing units that use Motiva-patented unit designs, to upgrade heavy gas oils into high-quality premium base oils. With a world-class sales and supply logistics team, Motiva will consistently fulfill your Group II and Group III needs in the Americas and around the world. Motiva's total capacity is 40,300 barrels per day (2.0 million tons per year).

S-OIL

S-Oil is one of the world's top base oil producers, leading in South Korea since S-OIL's foundation in 1976 as the first local lube base oil refinery located in Ulsan. S-OIL's global presence has been successfully expanded into not only Asia but also Europe and North America, by utilizing its full range of product portfolio from Group I to Group III, with a daily production capacity of 44,700 barrels per day (2.2 million tons per year).

Introducing aramco base oils

For over 80 years, Saudi Aramco has been a reliable, trusted supplier of oil and gas to our customers across the world.

Through a series of joint ventures, we have been a major supplier of premium quality base oils around the world for over 40 years. Under the trusted company names of Luberef, Motiva, and S-OIL, we have collaborated with our customers to navigate market change, while delivering to them base oil solutions that meet their needs.



Three brand families for the products you trust

Aramco Base Oils is proud to present its high-performance, premium-quality base oils portfolio. Our broad portfolio of base oils will help you choose the right solution for whatever challenge you and your customers face so together you can innovate. Aramco Base Oils is a brand family, for the products you know, from the global name you trust.



aramco**DURA**®

aramcoDURA API Group I base oils are used in a wide range of applications, including: passenger car and heavy duty engine oils, gear oils, and transmission fluids, as well as in industrial applications such as hydraulic oils, turbine oils, compressor oils, and marine oils.

aramco**PRIMA**®

aramcoPRIMA API Group II base oils give you the power to formulate the majority of automotive and industrial lubricating oils for heavy duty diesel engine oils, as well as driveline, industrial hydraulic, and turbine oils.

aramco**ULTRA**®

aramcoULTRA API Group III base oils are used in applications that require high performance and efficiency, such as high-performance engine oils, automatic/manual transmission fluids, and long-life industrial fluids.



aramco**DURA**® 60

aramco**DURA**® 150

aramco**DURA**® 500

aramco**DURA**® 600

aramco**DURA**® 150BS

aramco**DURA**® BS150

aramcoDURA[®]

aramcoDURA API Group I base oils are used in a wide range of applications, including: passenger car and heavy duty engine oils, gear oils, and transmission fluids, as well as in industrial applications such as hydraulic oils, turbine oils, compressor oils, and marine oils.

- Consistency in the quality of base oils
- High quality brightstock for marine, driveline, and heavy viscosity applications

| | | 60 | 150 | 500 |
|--------------------------------------|-------------|----------------|----------------|----------------|
| API Base Oil Category | | Group V | Group I | Group I |
| Properties | ASTM Method | Typical | Typical | Typical |
| Appearance | Visual | Clear & Bright | Clear & Bright | Clear & Bright |
| Kinematic Viscosity @ 40°C, cSt | D 445 | 7.92 | 28.09 | 92.30 |
| Kinematic Viscosity @ 100°C, cSt | D 445 | 2.19 | 5.08 | 10.60 |
| Viscosity Index | D 2270 | 71 | 101 | 97 |
| Sulfur Content, wt% | D 5453 | <0.001 | 0.90** | 1.15** |
| Pour Point, °C | D 5950 | -20 | -12* | -6* |
| Density @ 15°C, kg/L | D 4052 | 0.8751 | 0.8730 | 0.8894 |
| ASTM Color | D 1500 | L0.5 | L1.0 | L2.0 |
| Flash Point, COC, °C | D 92 | 149 | 220 | 258 |
| Flash Point, PMCC, °C | D 93 | | 208 | 235 |
| Furfural Content, ppm | D 5837 | | 1 | 1 |
| Copper Strip Corrosion, 100°C, 3 hrs | D 130 | 1b | 1a | 1a |
| Conradson Carbon Residue, wt% | D 189 | <0.01‡ | | 0.1 |
| Total Acid Number, mgKOH/g | D 664 | <0.01 | 0.01 | 0.02 |
| Ash, wt% | D 482 | | <0.01 | <0.01 |
| Manufacturing Site | | Ulsan | Jeddah | Jeddah |

Notes: * - D 97 | ** - D 4294

| | | 600 | 150BS | BS150 |
|--------------------------------------|-------------|----------------|----------------|----------------|
| API Base Oil Category | | Group I | Group I | Group I |
| Properties | ASTM Method | Typical | Typical | Typical |
| Appearance | Visual | Clear & Bright | Clear & Bright | Clear & Bright |
| Kinematic Viscosity @ 40°C, cSt | D 445 | 117 | 488.6 | 500.4 |
| Kinematic Viscosity @ 100°C, cSt | D 445 | 12.49 | 31.85 | 32.03 |
| Viscosity Index | D 2270 | 98 | 96 | 95 |
| Sulfur Content, wt% | D 5453 | | | 1.15** |
| Pour Point, °C | D 5950 | -14 | -14 | -6* |
| Density @ 15°C, kg/L | D 4052 | 0.8791 | 0.8929 | 0.9050 |
| ASTM Color | D 1500 | L 0.5 | L 1.0 | 2.5 |
| Flash Point, COC, °C | D 92 | 259 | 316 | 298 |
| Flash Point, PMCC, °C | D 93 | | | 268 |
| Furfural Content, ppm | D 5837 | | | 1 |
| Copper Strip Corrosion, 100°C, 3 hrs | D 130 | 1b | 1b | 1a |
| Conradson Carbon Residue, wt% | D 189 | 0.01‡ | 0.2‡ | 0.6 |
| Total Acid Number, mgKOH/g | D 664 | <0.01 | <0.01 | 0.03 |
| Manufacturing Site | | Ulsan | Ulsan | Yanbu |

Notes: * - D 97 | ** - D 4294, ‡-D4530

aramcoPRIMA® 100

aramcoPRIMA® 110

aramcoPRIMA® 150

aramcoPRIMA® 220

aramcoPRIMA® 230

aramcoPRIMA® 500

aramcoPRIMA® 600

aramcoPRIMA® 100S

aramcoPRIMA® 150S

aramcoPRIMA® DFF

aramcoPRIMA® 60

aramcoPRIMA® 70



aramcoPRIMA®

These grades of aramcoPRIMA are not classified as API Group II. They are commonly used for nonengine oil applications.

aramcoPRIMA API Group II base oils give you the power to formulate the majority of automotive and industrial lubricating oils for heavy duty diesel engine oils, as well as driveline, industrial hydraulic, and turbine oils.

- Provide optimized automotive engine oil formulations, ranging from 5W 20 to 20W 50
- Wide performance and viscosity grade coverage for North and South American/ Asian/ Middle East/European automotive engine oils.

| | | 60 | 60 | 70 |
|----------------------------------|-------------|----------------|----------------|----------------|
| API Base Oil Category | | Group V | Group V | Group II |
| Properties | ASTM Method | Typical | Typical | Typical |
| Appearance | Visual | Clear & Bright | Clear & Bright | Clear & Bright |
| Kinematic Viscosity @ 40°C, cSt | D 445 | 8.74 | 10.63 | 14.60 |
| Kinematic Viscosity @ 100°C, cSt | D 445 | 2.32 | 2.61 | 3.26 |
| Viscosity Index | D 2270 | 67 | | 83 |
| Saturates, wt% | D 7419 | | | 99 |
| Sulfur, wt ppm | D 5453 | <10 | <10‡ | 1‡ |
| Pour Point, °C | D 5950 | <-40 | -35 | -30* |
| Density @ 15°C, kg/L | D 4052 | 0.8700** | 0.8650 | 0.8610 |
| Saybolt Color | D 156 | +30 | +30 | |
| ASTM Color | D 1500 | L0.5 | L0.5 | 0.5 |
| Flash Point, COC, °C | D 92 | ≥150 | 172 | 185 |
| Copper Corrosion, 100 °C, 3hrs | D 130 | 1b | | |
| Total Acid Number, mgKOH/g | D 974 | <0.01 | | |
| Aromatics, wt% | D 7419 | <1 | | 1 |
| Aniline Point, °C | D 611 | 87.2 | | |
| Manufacturing Site | | Ulsan | Port Arthur | Yanbu |

Notes: * - D 97 | ‡ - D 2622 | **Density @15°C Kg/L

| | | 100S | 150S | 500S |
|----------------------------------|-------------|----------------|----------------|----------------|
| API Base Oil Category | | Group II | Group II | Group II |
| Properties | ASTM Method | Typical | Typical | Typical |
| Appearance | Visual | Clear & Bright | Clear & Bright | Clear & Bright |
| Kinematic Viscosity @ 40°C, cSt | D 445 | 20.94 | 30.47 | 95.86 |
| Kinematic Viscosity @ 100°C, cSt | D 445 | 4.236 | 5.189 | 11.24 |
| Viscosity Index | D 2270 | 107 | 101 | 96 |
| Saturates, wt% | D 2007 | >90 | >90 | >90 |
| Sulfur, wt ppm | D 5453 | <10 | <100 | <100 |
| Pour Point, °C | D 5950 | -15 | -12 | -14 |
| Density @ 15°C, kg/L | D 4052 | 0.8540 | 0.8630 | 0.8731 |
| Saybolt Color | D 156 | | | |
| ASTM Color | D 1500 | L0.5 | L0.5 | L0.5 |
| Flash Point, COC, °C | D 92 | 210 | 212 | 258 |
| Copper Corrosion, 100 °C, 3hrs | D 130 | 1b | 1b | 1b |
| Total Acid Number, mgKOH/g | D 974 | <0.01 | <0.01 | <0.01 |
| Aromatics, wt% | D 2007 | <2 | <2 | <2 |
| Manufacturing Site | | Ulsan | Ulsan | Ulsan |

| | | 100 | 110 | 150 |
|-------------------------------------|-------------|----------------|----------------|----------------|
| API Base Oil Category | | Group II | Group II | Group II |
| Properties | ASTM Method | Typical | Typical | Typical |
| Appearance | Visual | Clear & Bright | Clear & Bright | Clear & Bright |
| Kinematic Viscosity @ 40°C, cSt | D 445 | 20.40 | 23.30 | 29.70 |
| Kinematic Viscosity @ 100°C, cSt | D 445 | 4.16 | 4.60 | 5.2 |
| Viscosity Index | D 2270 | 105 | 113 | 105 |
| Saturates, wt% | D 7419 | | 99 | 99 |
| Sulfur, wt ppm | D 2622 | <10 | 1 | <10‡ |
| Noack Volatility, wt% (Procedure B) | D 5800 | 22.5 | 16.0 | 15.8 |
| CCS Viscosity @ - 20°C, mPa-s | D 5293 | | 900 | 1,620 |
| CCS Viscosity @ - 25°C, mPa-s | D 5293 | 1,238 | 1,500 | 2,760 |
| Pour Point, °C | D 5950 | -15 | -18* | -18 |
| Brookfield Viscosity @ -40°C | D 2983 | 13,232 | | |
| Density @ 15°C, Kg/L | D 4052 | 0.8495 | 0.8510 | 0.8590 |
| Saybolt Color | D 156 | | +30 | +30 |
| ASTM Color | D 1500 | L0.5 | L0.5 | L0.5 |
| Flash Point, COC, °C | D 92 | 207 | 224 | 218 |
| Copper Corrosion, 100°C, 3 hrs | D 130 | | 1a | 1b |
| Total Acid Number, mgKOH/gm | D 974 | | 0.01 | <0.01 |
| Aromatics, wt% | D 7419 | | 1 | <1 |
| Manufacturing Site | | Port Arthur | Yanbu | Ulsan |

| 220 | 230 | 500 | 500 | 600 |
|----------------|----------------|----------------|----------------|----------------|
| Group II | Group II | Group II | Group II | Group II |
| Typical | Typical | Typical | Typical | Typical |
| Clear & Bright | Clear & Bright | Clear & Bright | Clear & Bright | Clear & Bright |
| 42.30 | 44.50 | 87.80 | 96.40 | 109.00 |
| 6.50 | 6.78 | 10.65 | 11.30 | 12.00 |
| 104 | 103 | 104 | 104 | 98 |
| | 99.5 | 99.5 | 99 | |
| <10 | 2.0 | 1 | 2‡ | <25 |
| 10.4 | 7.5 | 2.0 | 6.9 | 2.4 |
| 3,080 | 3,200 | 9,500 | 14,550 | |
| | 5,900 | 21,500 | 26,000 | |
| -15 | -16* | -15* | -18 | -21 |
| 0.8640 | 0.8635 | 0.8690 | 0.8720 | 0.8740 |
| | | | +30 | |
| L0.5 | L0.5 | L0.5 | L0.5 | L0.5 |
| 226 | 235 | 262 | 240 | 263 |
| | 1b | 1b | 1b | |
| | | 0.02 | <0.01 | |
| | 0.5 | 0.5 | <1 | |
| Port Arthur | Yanbu | Yanbu | Ulsan | Port Arthur |



aramcoULTRA® 4
aramcoULTRA® 6
aramcoULTRA® 8
aramcoULTRA® 2
aramcoULTRA® 3

aramcoULTRA[®]

- aramcoULTRA 4
- aramcoULTRA 6
- aramcoULTRA 8

aramcoULTRA API Group III base oils are used in applications that require high performance and efficiency, such as high performance engine oils, automatic/manual transmission fluids, and long-life industrial fluids.

- aramcoULTRA 2
- aramcoULTRA 3

These grades of aramcoULTRA are not classified as API Group III.

| | | 2 | 3 |
|-------------------------------------|-------------|----------------|----------------|
| API Base Oil Category | | Group II | Group II |
| Properties | ASTM Method | Typical | Typical |
| Appearance | Visual | Clear & Bright | Clear & Bright |
| Kinematic Viscosity @ 40°C, cSt | D 445 | 7.62 | 14.0 |
| Kinematic Viscosity @ 100°C, cSt | D 445 | 2.25 | 3.38 |
| Viscosity Index | D 2270 | 103 | 115 |
| Saturates, wt% | D 2007 | >99 | >99 |
| Sulfur, wt ppm | D 5453 | 1 | 1 |
| Noack Volatility, wt% (Procedure B) | D 5800 | | |
| CCS Viscosity @ - 30°C, mPa-s | D 5293 | | |
| Pour Point, °C | D 5950 | -36 | -27 |
| Density @ 15°C, kg/L | D 4052 | 0.8300 | 0.8323 |
| Saybolt Color | D 156 | +30 | +30 |
| ASTM Color | D 1500 | L0.5 | L0.5 |
| Flash Point, COC, °C | D 92 | 158 | 202 |
| Copper Corrosion, 100 °C, 3hrs | D 130 | 1b | 1b |
| Total Acid Number, mgKOH/g | D 974 | <0.01 | <0.01 |
| Aromatics, wt% | D 2007 | <1 | <1 |
| Manufacturing Site | | Ulsan | Ulsan |

Notes: ‡ - D 2622

| 4 | 4 | 6 | 6 | 8 |
|----------------|----------------|----------------|----------------|----------------|
| Group III | Group III | Group III | Group III | Group III |
| Typical | Typical | Typical | Typical | Typical |
| Clear & Bright | Clear & Bright | Clear & Bright | Clear & Bright | Clear & Bright |
| 19.7 | 20.50 | 32.54 | 32.40 | 41.10 |
| 4.27 | 4.41 | 6.04 | 5.89 | 7.10 |
| 124 | 127 | 134 | 127 | 134 |
| >99 | | >99 | | >99 |
| 1 | <10‡ | <1.0 | <10‡ | <1.0 |
| 14.7 | 14.4 | 6.4 | 7.4 | 4.0 |
| 1,500 | 1,534 | 3,850 | 4,084 | 6,300 |
| -20 | -20 | -16 | -21 | -14 |
| 0.8350 | 0.8367 | 0.8398 | 0.8438 | 0.8425 |
| +30 | | +30 | | +30 |
| L0.5 | L0.5 | L0.5 | L0.5 | L0.5 |
| 220 | 220 | 240 | 237 | 250 |
| 1b | | 1b | | 1b |
| <0.01 | | <0.01 | | <0.01 |
| <1 | <1 | <1 | | <1 |
| Ulsan | Port Arthur | Ulsan | Port Arthur | Ulsan |

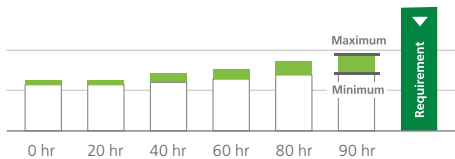
Aramco Prima API Licensability and OEM approval

The aramcoPRIMA base stock slate has completed the test program to support the API CK-4, ACEA A3/B4, E7, E9, and key North American and European Original Equipment manufacturers in commonly used SAE grades like 10W-30, 10W-40 and 15W-40 for heavy duty diesel engines. These formulations are now available for lubricant marketers to use to obtain API License and OEM approvals.

Automotive Engine Tests

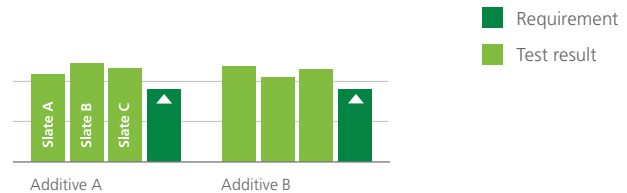
Sequence IIH Engine Test (API SN/GF-5)

Viscosity increase (cSt@40°C)
0 hr



Sequence IIH Engine Test (API CJ-4)

Weighted Piston Deposit (merit rating)



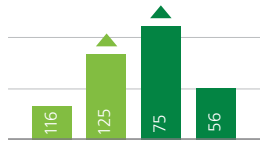
* Scales of each data adjusted for visualization

Meeting API and ACEA requirement

Interchangeable and linked group II base oils

In accordance with API and ACEA protocols, Saudi Aramco has successfully completed test programs that demonstrated the interchangeability and lineage between Group II base oils from our global manufacturing sites. The extensive testing programs covers API SN/GF-5, API CJ-4 together with ACEA A3/B4, E7 and E9 automotive engine in addition to demonstration in industrial and gear oils applications.

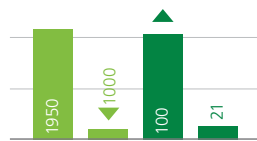
AramcoPRIMA HDD Test Program



Oxidation Height A/cm

Volvo T-13

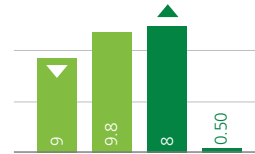
Aramco PRIMA in 15W-40



Sludge Rating, merit

Cummins ISM

Aramco PRIMA in 10W-30

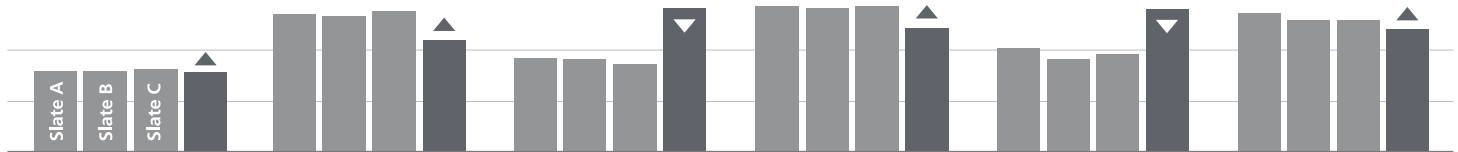


Engine Sludge, merit

OM50LA

Aramco PRIMA in 10W-30

European Engine Test (ACEA A3/B4)



Piston Cleanliness

EOT TBN

Average Cam Wear

Rocker Pad Rating

Cam Wear Inlet

Engine Sludge

Volkswagen TDi (CEC L-78-T-99)

4 cyl., 1.9L, turbocharged, direct injection

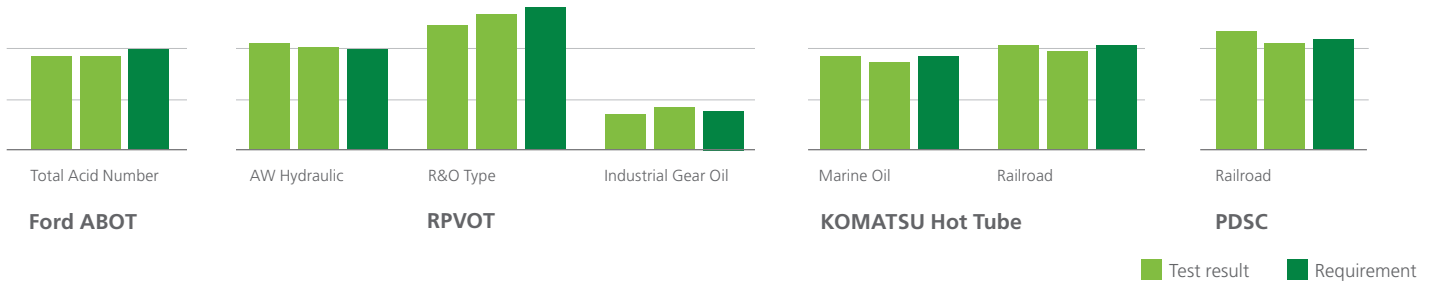
Peugeot TU3M (CEC L-38-A-94)

OHC, 4 cyl., gasoline, 1,360cc

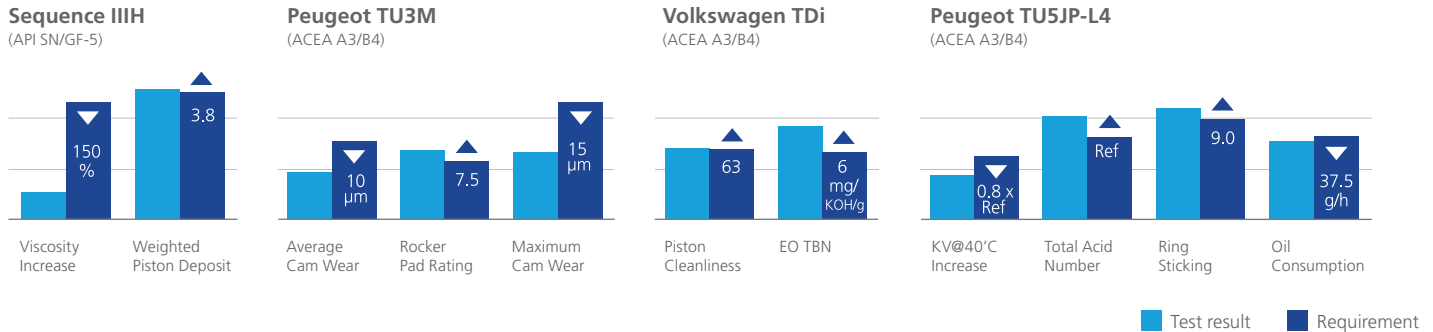
Mercedes Benz OM646LA (CEC L-099-08)

4 cyl., 2.2L, VTG turbocharged, direct injection

Driveline & Industrial Oxidation Tests



The Group II base oils show satisfactory performance in various API and ACEA engine tests across a number of metrics including oxidation, anti-wear, piston cleanliness, and sludge formation resistance using suitable additive technologies.



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saudiaramco.com/baseoils

your customers
will know that you
can offer them
consistency, reliability,
and high quality, no
matter what they
need or where they
are in the world

Disclaimer

Each company affiliated with The Saudi Arabian Oil Company ("Saudi Aramco"), and in particular, each subsidiary company including their associated research centers, is a separate entity that manages and controls its own affairs. The use of terms such as "company," "Saudi Aramco," "organization," "it(s)," "our(s)," "their(s)," "we" and "us" and of abbreviated job titles is only for convenience and is not intended as an accurate description of individual status and corporate relationship, or to indicate that Saudi Aramco is conducting commercial activities outside the Kingdom of Saudi Arabia.



Selling more base oils to the market than
any other company on earth

aramco base oils

aramco