

Shell
Argina Oils



New Argina
- proven to take the stress
so you won't have to



Shell Lubricants

Greater engine reliability at lower operational costs

Shell Argina has an excellent track record as the benchmark product in its category for decades. The new generation Argina, with its significantly improved low and high temperature deposit resistance, high BN retention and resistance to viscosity increase, represents another step change in performance. The benefits? **Lower operational costs through better oil durability, greater engine protection and improved engine reliability.**

Greater power to clean and protect

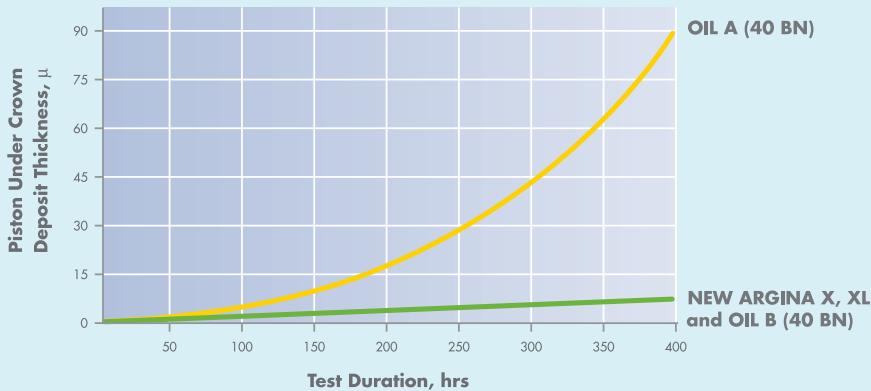
Clean engines are efficient engines. Shell Argina oils have always kept engines exceptionally clean. With increased resistance to fuel oil contamination and physical thickening, new Argina further improves resistance to the formation of deposits caused by Thermal and Asphaltene Stress in heavy fuel engines.

Improved piston cleanliness

Control of deposits in the ring belt prevents ring sticking, blow-by and liner damage. Keeping the piston undercrown clean maintains the cooling of the crown, which prevents burning and prolongs piston life.

In field trials, new Argina has clearly demonstrated visible improvement in ring belt cleanliness and significant reduction in undercrown deposits.

New Argina X & XL: piston undercrown



Results of Shell's accelerated test procedure:

- previous leading products (Argina X, competitor Oil A) gave 50-100 μ after 400hrs
- one competitor (Oil B) gives almost no deposits after 400hrs, but demonstrates poor oil durability
- new generation Argina X and XL give almost no deposits after 400hrs

Previous Argina X



New Argina X



New Argina X: piston ring belt-field trial on Pielstick engine, power station, West Africa

After 5000hrs with new Argina X, ring belt cleanliness is dramatically improved, compared to a similar period with the previous Argina X. Undercrown deposits were also reduced.

Better general engine cleanliness

Lower amount of deposits in the crankcase and valve deck help prolong the life of filters and reduce the cleaning needed during maintenance. A clean crankcase is also one indicator of the condition of engine parts that are less easily visible.

With new Argina, field trials have shown exceptional general cleanliness thanks to the increased Oil Stress resistance, resulting in fewer deposits.

New Argina X and XL: engine cleanliness - field trials, power station, West Africa.



Argina X
Camshaft of Pielstick engine clean after 5000hrs in severe conditions



Argina XL
Valve deck on the Wärtsilä 64 engine shows no deposits after 5000hrs of operation

Controlling costs by maximising oil durability

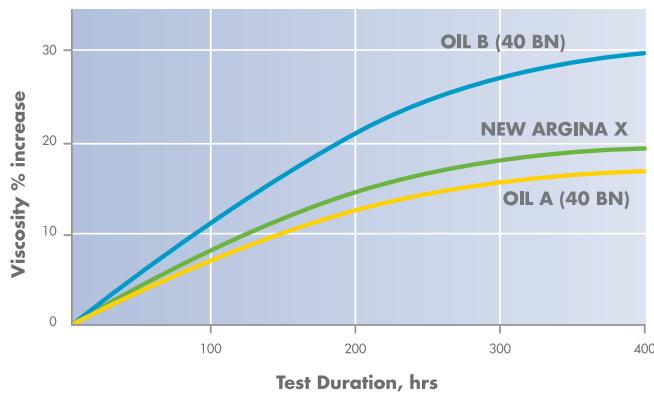
Engines with low oil consumption can stress the oil so much that it has to be replaced, partially or completely, at regular intervals. This is costly and inconvenient. An oil change or partial replenishment is usually needed because the viscosity has become too high due to Asphaltene Stress, or the Base Number (BN) has become too low due to Acid Stress.

An oil that lasts longer will need less partial replacement or change. Therefore using a more durable oil will reduce the quantity needed, thereby controlling your oil costs. Because of the superior viscosity control and BN retention of new Argina, less oil replacement is required to control these properties. Research has shown that using **new Shell Argina can reduce the quantity of oil needed by up to 20%** compared to competitors' products.*

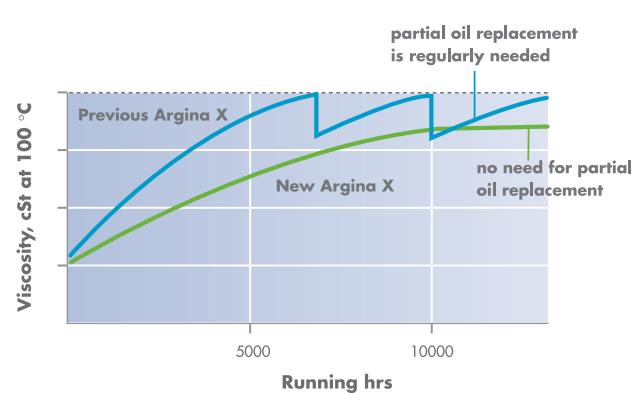
Superior viscosity increase control

New Argina's ability to handle Asphaltene Stress can be seen in the slow rise in viscosity during Shell's accelerated engine test and in field trials.

Viscosity increase during testing



Viscosity increase in field trials



Shell accelerated engine test

- after 400hrs, new Argina X and Oil A showed viscosity increase of less than 20%, but Oil A gave more deposits.
- in contrast, leading competitor product (Oil B) gave 29% viscosity increase over the same time period.

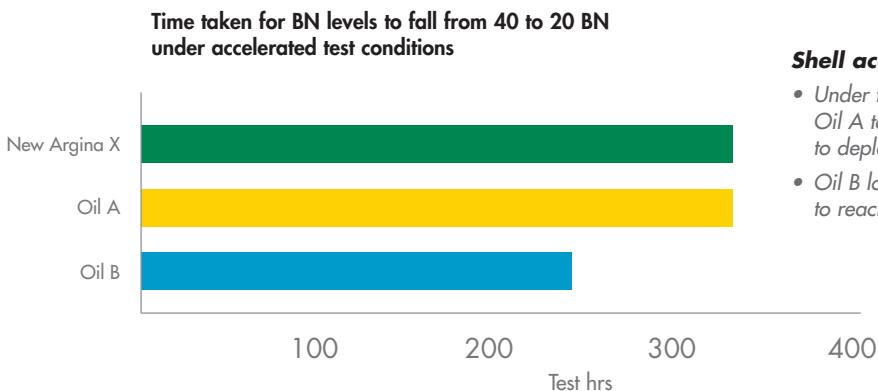
Field trials - MAN B&W, severe Asphaltene Stress

- current product reached 19-20cSt after 6000-7000hrs
- new Argina X reached only 17.7cSt after 6500hr trial
- predicted to stabilise at 18.5cSt

Excellent BN retention

Since the role of BN is to manage Acid Stress by neutralising corrosive sulphur acids, it is natural for it to be depleted over time. However it can also be wasted, through depletion by secondary processes, such as oxidation of the oil. Good BN retention implies that BN is released in a controlled manner and is conserved for its primary function. New Argina's ability to do this is shown by reduced BN loss in the Shell test engine.

Significant gains in BN retention extend protection against corrosion, increase oil life and reduce the need for partial replacement.



Shell accelerated engine test

- Under test conditions, both new Shell Argina X and Oil A took more than 300hrs for BN levels to deplete from 40 to 20
- Oil B lost BN much faster, taking only 232hrs to reach 20 BN

*savings will depend on engine running conditions, top up regime and the brand of oil previously in use

New Shell Argina

– The best choice for overall stress management

Years of research and testing mean that Shell thoroughly understands how Oil Stress can affect the running of your engine and your business. That's why **new Shell Argina is the only oil designed to manage all the effects to the highest standard, resulting in a cleaner engine and longer oil life.**

New Argina – raising the benchmark

	OIL A (40 BN)	OIL B (40 BN)	NEW ARGINA X (40 BN)
piston cleanliness	✓	✓✓	✓✓
general engine cleanliness	✓✓	✓✓	✓✓
control of oil thickening	✓✓	✓	✓✓
excellent BN retention	✓✓	✓	✓✓

When examining the symptoms of Oil Stress in engines, it can be seen that some oils perform well against some criteria but poorly against others.

- Oil A showed good oil durability but performed poorly on piston cleanliness, giving far greater quantities of piston undercrown deposits than new Shell Argina.
- Testing of Oil B resulted in good engine cleanliness but demonstrated poor oil durability, both in terms of resistance to viscosity increase and BN retention.
- **Only new Shell Argina performed well in all categories and therefore is shown to give the best overall defence against the symptoms of Oil Stress**

Approved by engine manufacturers

Shell works closely with major engine manufacturers to develop oils and to keep abreast of advances in engine design. Each oil we produce is the result of thorough research and stringent testing in 'real' engines – in the lab and in the field.

New Argina is **approved by major engine manufacturers** including Caterpillar (MaK), MAN B&W, SEMT-Pielstick and Wärtsilä.

Wider fuel flexibility

You can be confident that, thanks to its capacity to handle all aspects of Oil Stress, new Argina can perform well with a wider spectrum of fuel qualities. Wherever you operate, you can use this additional flexibility to suit your business.

New Argina helps:

- »» **improve your engine reliability**, thereby reducing downtime and increasing productivity
- »» **extend oil life**, allowing you to save money on your oil costs and reduce your maintenance
- »» **extend the life of engine components** by protecting against premature wear
- »» **reduce your running costs** thanks to more efficient engine operation from improved engine cleanliness

New Argina

Designed to meet new challenges

The challenge to operators has always been to achieve higher availability and reliability at lowest cost of operation over the engine life.

This has resulted in

- engine designs that deliver increasing specific power outputs, are more compact and use less oil
- more demanding operating practices, including operation at higher engine loads, less generous maintenance schedules and less manpower to tend the machinery
- the use of a widening spectrum of fuel qualities.

These factors require the lubricant to work much harder. In other words, **the oil is more highly stressed than in the past.**

Shell's deep understanding of Oil Stress and the development of **new Oil Stress Management Technology** have resulted in a new range of Argina products designed to more effectively manage all levels of Oil Stress. Formulated to be **even better at handling high levels of Oil Stress**, new Argina sets a higher benchmark for overall lubrication performance in medium speed engines.

How Oil Stress affects your engine

Operating under tough conditions, the oil in your engine is subjected to three aspects of stress – Acid, Thermal and Asphaltene Stress – which manifest themselves in the following ways.

Symptoms of High Oil Stress in your engine

		BN depletion	Ring, liner and valve wear	Piston undercrown deposits	Ring groove deposits	Viscosity increase	Crankcase fouling	Fuel pump sticking
OIL STRESS	ACID STRESS	●	●					
	THERMAL STRESS			●	●	●		
	ASPHALTENE STRESS			●	●	●	●	●
EFFECT ON YOUR OPERATION		shortens oil life	reduces reliability; shortens life of components	shortens life of piston crowns	reduces reliability; shortens life of rings and liners	shortens oil life	shortens filter life	reduces reliability

For more information about Oil Stress, see the Shell booklet
'What You Need to Understand About Oil Stress'

Manage Oil Stress Better with New Shell Argina

The Oil Stress Management Technology in new Shell Argina makes it the best all-round lubricant for medium speed diesel engines. Formulated to give outstanding management of Acid, Thermal and Asphaltene Stress, **new Argina gives improved resistance to deposit formation and longer oil life.**

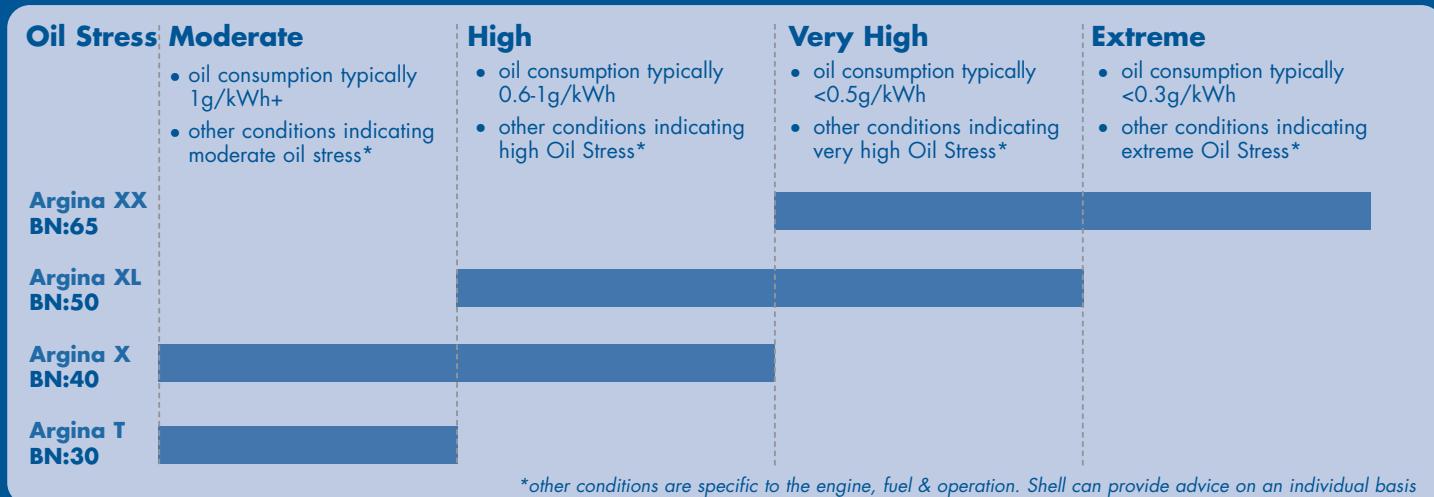
New Argina helps

- »»»improve your engine reliability
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- »»»reduce your running costs

New Argina is approved by major Original Equipment Manufacturers.

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piston cleanliness	✓	✓✓	✓✓
general engine cleanliness	✓✓	✓✓	✓✓
control of oil thickening	✓✓	✓	✓✓
excellent BN retention	✓✓	✓	✓✓

Choose the right new Shell Argina for your application



Find out more - talk to Shell

For more information about how new Shell Argina can help you to manage the effects of Oil Stress for your business, please contact your local Shell Service Centre or email us at: argina@shell.com

We can also offer you specialist lubrication solutions for a wide range of applications. Please visit www.shell.com/power for more information.



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