



SHAPING A MORE PRODUCTIVE FUTURE

Produce more. Spend less.
Today and tomorrow.

NORTH AMERICA

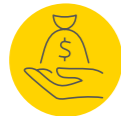
shell.us/metals

**SHELL
LUBRICANT
SOLUTIONS**



OUR WORLD IS CHANGING

We are witnessing the impact of three key trends on the metals industry – all of which require urgent action from businesses who want to stay one step ahead.



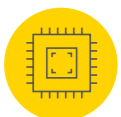
COST PRESSURES

Between external pressures and aging assets, there is a growing demand to reduce downtime and avoid unnecessary costs, by more accurately predicting maintenance needs.



ENVIRONMENT

The industry is also under mounting pressure to reduce its carbon footprint, through less intensive water use and lower carbon emissions, while fully embracing circular economies.



TECHNOLOGY

Strides are being made in the area of digitization, with the upgrading of facilities and upskilling of workforces boosting productivity throughout the sector.



HOW CAN SHELL HELP?

No matter where you are in the world, Shell Lubricant Solutions has a dedicated offer for your metals business, helping to maximize equipment efficiency and reduce downtime.

Our reputation is built on strong technical capabilities that have served the leading industry players for several decades.

We are a partner in the truest sense, willing to work as an extension of your team and able to understand the intricacies of your operation.

With ambitions of leading the world in cleaner energy solutions, our competitive range of products and services has your energy and environmental needs at their core.



SHELL'S PORTFOLIO OF PRODUCTS

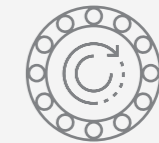
Shell has designed a winning portfolio of oils, fluids and greases that our team of experts can recommend based on your specific technical and operational needs.

BEARING AND CIRCULATING OILS:

- Shell Morlina S4 B - Synthetic technology
- Shell Morlina S3 BA: Flat products – Morgoil bearing, Super-demulsibility
- Shell Morlina S2 B: Flat products - Morgoil bearing
- Shell Morlina S2 BA: Long products - No-Twist Wire Rod Mill, zinc-free
- Shell Morlina S1 B: Flat products – Morgoil bearing

MORLINA S3 BA:

MORGOIL® bearing application. Super demulsification, meets the requirements of the Morgan and Danieli for super demulsibility applications.



GEAR OILS:

- Shell Omala S4 GXV, PAO
- Shell Omala S4 WE, PAG - Worm gear
- Shell Omala S3 GP, Extra Load
- Shell Omala S2 GX

OMALA S4 GXV:

Advanced synthetic heavy-duty industrial gear oil. Approved by Flender, offering outstanding lubrication performance under severe operating conditions.



INDUSTRIAL HYDRAULIC OILS:

- Shell Tellus S4 ME (PAO)
- Shell Tellus S4 VE (GTL)
- Shell Tellus S3 M, zinc free
- Shell Tellus S2 MX
- Shell Hydraulic S1 M

TELLUS S4 ME

Advanced synthetic industrial hydraulic fluid. Energy efficiency, outstanding wear protection, and long oil life





HYDRAULIC FLUIDS – FIRE RESISTANT & LESS FLAMMABLE:

In steel mills, some lubricants and greases may come into contact with an ignition source or be subjected to extreme temperatures and pressures such as in coking plants, steel making plants, hot rolling mills: furnace systems. In these cases, a fire-resistant fluid may be used to avoid the risk of fluid ignition in the event of a leak. A fire-resistant fluid poses a significantly lower fire hazard than conventional mineral oils. Different types of fire-resistant fluids offer varying degrees of fire resistance to different types of fire hazards.

The selection of the appropriate fluid involves an assessment of requirements and fire risks in the given application. Our technical advisors provide support to customers to help manage the change-over process, adhering to the highest level of safety.

FIRE-RESISTANT HFC:

- Shell Water-Glycol S3 CX (Formerly ACT FR WG 46-HP)
- Shell Water-Glycol S2 C (Formerly ACT FR WG)
- Shell Water-Glycol S1 C (Formerly Irus Fluid C)

LESS FLAMMABLE HFDU:

- Shell EcoSafe S3 DU (Formerly ACT Ecosafe FR)
- Shell EcoSafe S1 DU (Formerly ACT Ecosafe V)

AUXILIARY EQUIPMENT:

Many integrated steel mills contain an in-house power plant powered by a steam turbine. Our recommendation is Shell Turbo T46 for all manufacturers, except MHI where Turbo J46 should be used.



For mobile equipment we recommend the following industry-leading products:

1. Diesel Engine Oil – Shell Rotella T4 15W-40, CK-4
2. Transmission Fluid - Shell Spirax S4 CX

For your full suite of utilities, we can also provide additional lubricant recommendations that cover the full suite of utilities found in steel mills:

- Turbine oils - Shell Turbo T; Shell Turbo J; Shell Turbo S4 GX
- Compressor oils – Shell Corena S3 RX
- Transformer oils - Shell Diala S4 ZX-I
- Heat transfer oils – Shell Heat Transfer Oil S2
- Slideway oils – Shell Tonna S2 M

NORTH AMERICAN GREASE PORTFOLIO:

Key Processes	Continuous Casting	Rolling Mills	General Purpose Mill Applications	Electric Motors / Fans	Couplings
Key Applications	Caster segment bearings	Work Rolls	Tables, Mandrels, Shears, Cooling beds	High-speed bearings	Mechanical couplings, spindles and universal joints
Critical Grease Performance Requirements	<ul style="list-style-type: none"> ■ Excellent central system mobility ■ Load carrying capacity ■ Heat resistance ■ Water Resistance / Corrosion Inhibition 	<ul style="list-style-type: none"> ■ Shear Stability ■ Corrosion inhibition / protection ■ Washout resistance ■ Load carrying capacity 	<ul style="list-style-type: none"> ■ Excellent central system mobility ■ Load carrying capacity ■ Heat resistance ■ Water Resistance / Corrosion Inhibition 	<ul style="list-style-type: none"> ■ Shear Stability ■ Corrosion inhibition / protection ■ Energy Efficiency ■ Extended service interval 	<ul style="list-style-type: none"> ■ Excellent Load carrying capacity ■ Resistance to centrifugal separation ■ Extended service interval ■ Corrosion inhibition / protection
Physical Profile	NLGI 1.5	NLGI 2	NLGI 1.5	NLGI 2	NLGI 0.5, 1 or 2
	ISO VG 320 to 1000	ISO VG 220 to 1000	ISO VG 220 to 680	ISO VG 100	ISO VG 220 to 1000
	Lithium Complex, Polyurea	Lithium Calcium, Lithium Complex	Lithium Complex, Polyurea	Lithium Complex, Polyurea	Lithium Calcium, Lithium Complex
Li / LiCa	Shell Gadus S3 V1000A	Shell Gadus S2 V460A or Shell Gadus S3 V1000A		Shell Gadus S2 V100	Shell Gadus S2 HSCoupling Grease or Shell Gadus S2 HD Coupling Grease Shell Gadus S3V1000A
Lithium Complex	Shell Gadus S3 V550L Shell Gadus S3 V460"	Shell Gadus S3 V220 Shell Gadus S3 V460 Shell Gadus S3 V550L	Shell Gadus S3 V550L Shell Gadus S3 V460	Shell Gadus S2 V100	Shell Gadus S3 V220 Shell Gadus S3 V550L Shell Gadus S3 V460
Calcium Sulfonate Complex	Shell Gadus S3 U460AC or Shell Gadus S3 U460AD	Shell Gadus S3 U460AC	Shell Gadus S3 U220A or Shell Gadus S3 U460AC		
Polyurea	Shell Gadus S3 T460 or Shell Gadus S5 T460		Shell Gadus S3 T460	Shell Gadus S3 T100	

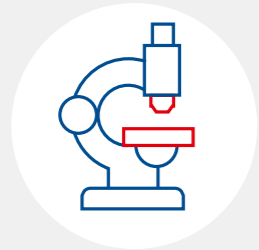
Technology choices when selecting greases:

Thickener behaviour / performances	Application challenges				
	Load Carrying Capacity	Corrosion protection	Heat Resistance	Mobility / Pumpability	Water Washout Resistance
Lithium	Good to very good	Good to very good	Poor to good	Very good to excellent	Good to very good
Lithium/Calcium	Very good to excellent	Very good to excellent	Good to very good	Very good to excellent	Very good to excellent
Lithium Complex	Very good to excellent	Very good to excellent	Good to very good	Very good to excellent	Very good to excellent
Calcium Sulfonate Complex	Very good to excellent	Very good to excellent	Good to very good	Very good to excellent	Very good to excellent
Polyurea	Very good to excellent	Very good to excellent	Very good to excellent	Very good to excellent	Very good to excellent

SHELL'S PORTFOLIO OF SERVICES

Shell's complete toolkit of services for the Metals sector puts you back in control of your maintenance. Easy-to-use digital tools and cutting-edge oil analysis allow you to make informed technical decisions, while our training programs cater to lifelong learning, empowering you to make better lubrication choices.

Shell LubeAnalyst Oil Analysis



ABOUT SHELL LUBEANALYST

Shell LubeAnalyst combines world-renowned industry expertise with scientific best practice, providing an end-to-end service that helps you:

- Predict potential failures before they occur - preventing unnecessary downtime.
- Identify areas to optimize operations and implement best practice recommendations.
- Access a trends-based profile of your equipment via our easy-to-use digital platform.

Shell Lube Optimiser Reliability Services



ABOUT SHELL LUBEOPTIMIZER

Helps your business with a network of on-site reliability service providers that can offer:

- Support for maintenance and troubleshooting activities during the lifetime of your oil.
- Industry expertise to identify areas of operational improvement.
- Vital physical services such as flushing, filtration, vacuum dehydration, and varnish mitigation.

Shell LubeExpert Technical Experts



ABOUT SHELL LUBEEXPERT

With productivity and TCO top of mind, Shell LubeExpert allows you to work alongside an on-site technical specialist, who can:

- Perform lubrication system audits and open-gear inspections.
- Identify and implement improvement opportunities such as converting from manual to auto-lubrication systems.
- Hands-on support that integrates with your maintenance teams.

Shell LubeAdvisor Technical Advisors



ABOUT SHELL LUBEADVISOR

One of the largest lubricant technical organizations in the world, Shell LubeAdvisor helps with

- Choosing the right lubricant or grease for your specific needs.
- Protecting equipment and preventing unnecessary downtime.
- Cost reduction programs through our comprehensive Lube Site Surveys.



ABOUT SHELL LUBEADVANTAGE

By pairing our local lubrication experts with your reliability professionals, Shell LubeAdvantage takes a project-based approach to help you unlock value by identifying your goals and aligning on maintenance tasks that have the highest impact on your bottom line, improving your equipment reliability and reducing the total cost of ownership (TCO) with simplified processes that give you a competitive advantage.



ABOUT SHELL LEAK DETECTION SERVICE

A comprehensive review of your critical circulating systems, hydraulic systems, and gear stands is provided through our Leak Detection Service. This will usually lead to a reduction in lube oil consumption and wastewater treatment as well as safety improvements and better equipment reliability.

Shell LubeCoach Training Programme



ABOUT SHELL LUBECOACH

Designed to adapt to the needs of your business and your staff. Delivered by technical experts as a modular program, it can help you to:

- Upskill and empower your team with vital lubrication knowledge.
- Better understand the relationship between maintenance and TCO.
- Reduce the time associated with lubricant-related repairs and activities.

DELIVERING OUR NORTH AMERICAN CUSTOMERS BEST IN CLASS MAINTENANCE SOLUTIONS

UNLOCKING POTENTIAL WITH SHELL GADUS S3 V460 1.5 AND SHELL LUBEADVISOR



Country: USA
Application: Cold rolling bearings



4X increase in greasing interval
Annual savings of **\$86,000***

CHALLENGES

- Increase machine reliability
- Reduce grease consumption
- Decrease maintenance costs

SOLUTIONS

- A lithium complex grease with excellent mechanical stability
- Lubrication and maintenance best practices
- Expert insights of highly-trained technical staff

RESULT

- Extension of re-greasing interval by a factor of four
- Reduced consumption, wastage, and disposal costs
- Streamlined maintenance processes

*The savings indicated are specific to the calculation date and mentioned site. These calculations may vary from site to site and from time to time, depending on, for example, the application, the operating conditions, the current products being used, the condition of the equipment and the maintenance practices.

DELIVERING OUR NORTH AMERICAN CUSTOMERS BEST IN CLASS MAINTENANCE SOLUTIONS

IDENTIFYING ISSUES AND FUTUREPROOFING BUSINESS WITH SHELL LUBEANALYST



Country: USA
Application: Mobile equipment

CHALLENGES

- Optimize more than 1,700 pieces of equipment
- Reduce equipment ownership costs
- Prevent operational problems

SOLUTIONS

- An oil and equipment monitoring service
- Access to equipment-based diagnoses and expert support
- An effective preventative maintenance program

RESULT

- Identification of previously undetected issues in three engines
- Avoidance of costly engine repairs due to data-led preventative maintenance



Total reported customer savings of **\$228,800***
20 ISO-accredited global labs available for sample testing

*The savings indicated are specific to the calculation date and mentioned site. These calculations may vary from site to site depending on the application, the operating conditions, the current products being used, the condition of the equipment and the maintenance practices.



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