HELPFUL PRODUCT NAMES

There are at least four properties that you should look for when selecting a grease:

- thickener type
- oil viscosity
- operating conditions and application
- NLGI grade (consistency).

Shell's Gadus greases have names based on these properties that aim to help you select the right products for your needs.

Shell Gadus is the family name for all Shell's greases | Thickener guide | Special conditions or applications

Shell Gadus *S3 V460D 2*

Relative performance level from S1 to S5 (higher is better) | Viscosity grade | NLGI grade

KEY LETTERS USED

- **A** = Wet (aqueous) conditions
- **C** = Coloured grease
- **D** = Contains solids, suitable for shock-load conditions
- **OG** = Open gear
- **Q** = Noise-dampening (quiet) applications
- **T** = Extreme-temperature applications, polyurea thickener
- **V** = Versatile, lithium, lithium calcium or lithium complex thickener

FULL PRODUCT AND SERVICE PORTFOLIO

Shell Lubricants is the number-one finished lubricants supplier[2] and has a 60-year history of innovation. It constantly invests to develop better lubrication solutions, including advanced synthetic technologies such as

- Shell Tellus S4 ME synthetic hydraulic oil – for long life and energy saving
- Shell Corena S4 R air compressor oil – for up to 12,000 hours of protection.

In addition, Shell provides the world-leading Shell LubeAnalyst oil condition monitoring service, which is designed to help improve your business performance.

Whatever your needs or application, Shell can provide a full range of oils and greases, including synthetic, high-performance products and additional services.

Product	Benefits	Technology (Thickener, base oil and key properties)	ISO viscosity grade	NLGI grade	Specifications and approvals (Ask your Shell representative for full approval details. Approvals and claims vary by viscosity grade.)
Shell Gadus "V" range					
Shell **Gadus *S5*** *V100*	■ Long life ■ Improved efficiency ■ Lithium complex	Lithium complex, synthetic	100	2	Approved: Vestas Wind Systems Listings: ABB, CH Schäfer Getriebe, FLSmidth, Hegenscheidt-MFD and perma Schmiersysteme
Shell **Gadus *S3*** *V220C*	■ Extra protection ■ High temperature ■ Red lithium complex	Lithium complex, mineral, EP	220	1, 2	Specification: Meets ASTM D4950-08 GC-LB. Approved: Aichelin, Dexter Axle, Sør-Norge Aluminium and Willy Vogel Listings: Listed by over 20 major companies from a wide variety of industries.
Shell **Gadus *S3*** *V460D*	■ Heavy-duty protection ■ High temperature ■ Lithium complex	Lithium complex, mineral, EP, solid EP additive (MoS_2)	460	2	Specification: Meets Caterpillar, Liebherr and P&H Mining Equipment Approved: Bucyrus International, CMI FPE Ltd, Gebr. Pfeiffer perma Schmiersysteme, Rothe Erde, SMS Meer and Voith Listings: BE (certified), Bucyrus International, CMI Groupe, Dieffenbacher, Gebr. Pfeiffer, Hitachi, Konecranes and Komatsu Mining
Shell **Gadus *S2*** *V100*	■ Reliable protection ■ Multipurpose ■ Lithium	Lithium, mineral	100	1, 2, 3	Approved: Approved by 18 major companies from a wide variety of industries. Listings: Listed by over 60 major companies from a wide variety of industries.
Shell **Gadus *S2*** *V220*	■ Reliable protection ■ Multipurpose ■ Lithium	Lithium, mineral, EP	220	00, 0, 1, 2, 3	Specification: Meets ASTM D4950-08 LB Approved: Approved by 24 major companies from a wide variety of industries. Listings: Listed by over 100 companies from a wide variety of industries.
Shell **Gadus *S2*** *V220AD*	■ Heavy-duty protection ■ Water resistant ■ Lithium calcium	Lithium calcium, mineral, EP, solid EP additive (MoS_2)	220	1, 2	Approved: Sandvik (endorsed) and Xiamen XGMA Machinery Listings: Listed by 12 major companies from a wide variety of industries.
Shell **Gadus *S2*** *V220AC*	■ Heavy-duty protection ■ Water resistant ■ Red lithium calcium	Lithium calcium, mineral, soluble EP additive	220	0, 1, 1.5, 2, 3	Approved: Willy Wogel Specification: Meets ASTM D4950-08 LB Listings: David Brown, Danieli, Eirich, Harburg-Freudenberger Maschinenbau, Maschinenfabrik Gustav Eirich, New Zealand Steel, Ondrives, Power Jacks Group, Tetra Pak International, ZZ-Antriebe
Shell Gadus speciality ranges Contact your Shell representative for details					
Shell Gadus "Q" greases for noise-dampening (quiet) applications					
Shell Gadus automotive greases for automotive components, from door-lock motors to steering systems and constant-velocity joints					
Shell Gadus "OG" lubricants for mobile and stationary open-gear applications requiring spray or fluid bath lubrication					
Shell GadusRail greases meet European and American railway specifications, especially for railway applications, including axle journal bearings, traction motor bearings and curve rails					
Shell Tactic EMV automatic single-point lubricators – available with a selected range of high-performance Gadus greases					
Related products Contact your Shell representative for details					

FOR MORE INFORMATION, PLEASE CONTACT

"Shell Lubricants" refers to the various Shell companies engaged in the lubricants business.

[1]Saving reported by one customer. Actual savings may vary, depending on the application, the current oil used, the maintenance procedures and the condition of the equipment.

[2]Source: Kline & Company, "Competitive Intelligence for the Global Lubricants Industry, 2008–2018."

shell.com/lubricants

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DESIGNED TO DO MORE. JUST LIKE OUR GREASES – SHELL GADUS.

DESIGNED TO MEET CHALLENGES

SHELL GADUS IS A COMPREHENSIVE FAMILY OF GREASES DESIGNED TO MEET YOUR NEEDS.

Shell Gadus is a comprehensive family of greases designed to meet your needs. The Gadus ranges include multipurpose greases that are designed to help simplify your product inventory, as well as speciality greases, including advanced polyurea synthetic products designed for the most severe extreme-temperature and long-life applications, and a range of open-gear lubricants.

Whether you need greases for steel production, mining, construction, power generation, general or automotive manufacturing, other applications or your vehicles, Shell has a grease designed to best meet your challenges.

The Shell Gadus range has been developed to deliver optimum value through

- enhanced wear protection
- long grease life
- system efficiency.

WEAR PROTECTION

Equipment wear can reduce system efficiency and service life. Protecting components from wear is fundamental for getting the most out of your investments through prolonging asset life and preventing production losses through breakdowns.

The Shell Gadus range of greases offers protection across a wide range of applications. The range includes Shell's latest extreme-temperature "T" polyurea synthetic greases, which can help to protect bearings under extreme temperatures, heavy loads and contaminated conditions.

GREASE LIFE

The longer your grease lasts, the longer your components last and the less lubrication maintenance your equipment needs. Shell Gadus greases are designed to help your equipment continue to operate without interruption. The comprehensive product range enables you to select a grease with a life that meets your operational needs.

Customers using Shell Gadus extra-long-life synthetic technologies are doubling grease life for some applications. Others prefer to take advantage of cost-effective, reliable, multipurpose Shell Gadus greases for standard life applications.

SYSTEM EFFICIENCY

To help your equipment perform to its design standards, you need a grease that stays in place and provides effective protection and lubrication where you need it.

Shell Gadus greases are designed to help maintain or even improve the efficiency of your systems. From greases that offer reliable performance for standard applications to specialist low-noise, high-temperature and heavy-load greases, there is a Shell Gadus product that can help to optimise your system's efficiency and costs of operation.

A WIDE RANGE OF THICKENER TECHNOLOGIES

Different applications and conditions require different thickeners. The Shell Gadus range uses a wide range of thickener technologies, each with relative benefits.

Thickener guide	Thickener	Temperature	Water resistance	Shear and vibration stability
T	Polyurea	✓✓✓✓✓	✓✓✓	✓✓✓✓✓
V	Lithium complex	✓✓✓✓	✓✓✓	✓✓✓✓✓
V	Lithium calcium	✓✓	✓✓✓✓	✓✓✓
V	Lithium	✓✓	✓✓	✓✓✓
A	Calcium	✓	✓✓✓	✓✓✓
U	PTFE	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓
U	Clay	✓✓✓✓✓	✓✓	✓✓✓

T = Extreme-temperature performance using Shell polyurea thickeners
V = Versatile, multipurpose application using lithium and lithium complex thickeners
A = Thickeners for wet (aqueous) conditions
U = Unusual non-melting thickeners or other applications

SHELL'S ADVANCED POLYUREA "T" THICKENER

Shell's research teams have developed superior greases using advanced polyurea thickener technology. These products are designed to outperform conventional greases in extreme-temperature applications, such as electric motors and automotive constant-velocity joints. In one example, a global steel manufacturer reported that it reduced bearing failure rates by 75% and grease consumption by 30% through switching to Shell Gadus S3 T100 polyurea technology grease.

LEADING TECHNOLOGY

Shell's international research and development team works in close co-operation with customers and equipment makers to create the latest advanced-technology greases. These greases are designed to outperform conventional greases by combining a wide range of thickener technologies, which keep the grease in place under different conditions, with innovative oils that provide efficient lubrication and protection.

FIT-FOR-PURPOSE PROTECTION

Using the right grease for your needs can deliver significant savings. For example, a construction company reports saving $3.8 million[1] a year through changing to Shell Gadus S3 V460D 2 grease, which provided the protection needed for performing heavy-duty work. The grease is extending excavator component life by 40%, reducing downtime and maintenance costs, and increasing equipment availability.

A RANGE OF GREASES TO MEET YOUR NEEDS

	MULTIPURPOSE	MULTIPURPOSE EXTREME PRESSURE (EP)		HEAVY-DUTY MULTIPURPOSE
	Bearings carrying low loads at higher speeds Auxiliary industrial equipment, including electrical motors and fans, and lightly loaded roller element or plain bearings	Bearings carrying medium loads at medium speeds Roller element or plain bearings for industry and transport		Bearings carrying heavy loads at lower speeds and shock loads Large roller element or plain bearings for industry and transport
		DRY ENVIRONMENTS	WET ENVIRONMENTS	
GREASE BASE OIL VISCOSITY	100	220		460

INCREASINGLY EFFICIENT PROTECTION

ADVANCED TIER 5/4

Shell Gadus S5 V100
- Long life
- Improved efficiency
- Lithium complex

Higher temperature and longer life

PREMIUM TIER 3

MAIN LINE TIER 2

Shell Gadus S2 V100
- Reliable protection
- Multipurpose
- Lithium

SPECIAL APPLICATIONS AND PRODUCTS

This table highlights several Shell Gadus greases to illustrate the range. Whatever your application, there is a Shell Gadus grease designed to meet your needs, including specialist products such as Shell Gadus S2 V100Q for noise-dampening (quiet) applications and Shell Tactic EMV automatic, single-point lubricators.

Contact your Shell representative for details.

Shell Gadus S3 V220C
- Extra protection
- High temperature
- Red lithium complex

Higher temperature

Better in water

Shell Gadus S2 V220
- Reliable protection
- Multipurpose
- Lithium

Higher temperature, heavier load and greater shock load

Shell Gadus S2 V220AD
- Heavy-duty protection
- Water resistant
- Lithium calcium

Better shock load and better in water

Shell Gadus S2 V220AC
- Reliable protection
- Water resistant
- Red lithium calcium

Shell Gadus S3 V460D
- Heavy-duty protection
- High temperature
- Lithium complex

Electric motor
Plain bearing
Rolling element bearing
High temperature
Extreme pressure
Wet conditions
Shock load

SHELL TACTIC EMV LUBRICATORS

Irregular greasing can cause problems. Using a Shell Tactic EMV automatic, single-point lubricator, especially in hard-to-reach places, can help to enhance operational efficiency through precise and reliable lubrication. For example, a mining customer reports saving over $167,000[1] a year through using the Shell Tactic EMV system with a high-quality Shell Gadus grease to increase maintenance efficiency.

PERFORMANCE THAT YOU CAN RELY ON

The way a grease is made has a huge impact on its performance. Shell manufactures grease in a highly controlled and systematic way, from precisely specifying the ingredients to detailing how it is packaged, shipped and delivered. This quality process ensures that every batch you receive, no matter where in the world it is made, gives you the same high performance levels.

NEED EXPERT ADVICE?

Shell has on-the-ground grease specialists, supported by a global network of technicians, who can help to design a complete lubricant solution for your needs or work with you to solve a specific lubrication problem.

Technical Data Sheet

- *Multi-purpose Application*
- *Lithium*

Shell Gadus *S1 V220 2*

Multi-purpose Extreme Pressure Grease

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- Fair Protection Against Wear due to Good EP Properties
- **Good Mechanical Stability**

  Maintains consistency, reducing leakage
- **Good Resistance to Water Wash-out**
- **Fair Corrosion Resistance Characteristics**

  Protects bearing surfaces against corrosion

Main Applications

- General lubrication of moderate-duty plain and rolling bearings operating with poor sealing and/or exposed to external contaminants (Steel, Cement and General Engineering sectors).

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S1 V220 2
NLGI Consistency				2
Colour				Dark brown
Soap Type				Lithium
Base Oil Type				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	220
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	18
Cone Penetration, worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	>180

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S1 V220 2 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/
- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature**

  Shell Gadus S1 V220 2 is recommended for use over the temperature range -20°C to +110°C.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Cardium Compound, Cardium Compound EP**

Shell Gadus *S1 OG 200*

- *Suitable Wear Resistance*
- *Bitumen*

Open Gear and Wire Rope Grease

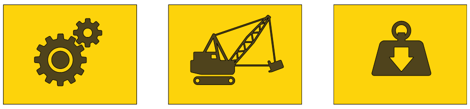
Shell Gadus S1 OG are a range of high viscosity, residual-type (bituminous) lubricants, which are recommended principally for open gears, sugar mills and wire rope applications which require an adhesive, high load-carrying, EP product. All grades are blends of bitumen and heavy mineral based oils, blended in different proportions to suit various applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- Strongly adhesive and resistant to water washout
- Excellent load carrying capacity
- Good corrosion resistance

Main Applications



- Shell Gadus S1 OG are recommended for use in open gears and cane bearings operating with high loads and low speeds. They may also be used for lubrication of wire ropes.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S1 OG 200
Colour				Black
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	200
Flash Point (COC)			ASTM D92	Min 210°C
4 Ball Weld Load		kg	ASTM D2596	Min 250
Copper Corrosion			ASTM D4048	1b

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S1 OG is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Multiroad Grease CT 3**

Shell Gadus *S1 A320 3*

- *Multi-purpose Application*
- *Calcium*

Multi-purpose Grease

Shell Gadus S1 A320 is a light-duty grease based on mineral oil and a calcium soap thickener with tackifier additives.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Excellent water wash-out resistance**

  Prevents corrosion. An excellent quality for vehicles working in wet environments.

- **Good adhesive properties**

  Reduces losses, reducing grease consumption.

Main Applications

- Shell Gadus S1 A320 is used for the following automotive applications:
- Commercial vehicle chassis lubrication
- Shackle pins
- Ball joints
- Suspension joints
- Shell Gadus S1 A320 is NOT suitable for the lubrication of automotive wheel bearings.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S1 A320 3
NLGI Consistency				3
Colour				Brown
Soap Type				Calcium
Base Oil Type				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	320
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	27
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	220-250
Dropping Point		°C	IP 396	90

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S1 A320 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Malleus Grease GL 500**

Shell Gadus *S2 OG 85*

- *Reliable Wear Protection*
- *Corrosion Protection*

Superior Performance Open Gear Greases

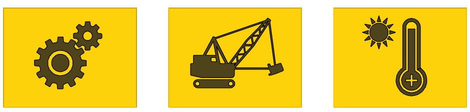
Shell Gadus S2 OG greases are a range of premium quality lead and solvent free, full EP lubricants developed for the lubrication and protection of open gears and wire ropes subjected to extremes of ambient temperature and operating conditions.
They are a unique blend of high quality paraffinic mineral and synthetic base oils with carefully selected additives to provide optimum performance. Its balanced formulation allows the lubricant to stay soft and pliable over long periods, thus eliminating the build-up of lubricant in the roots of the gear teeth.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Exceptional physical and mechanical stability**
  Shell Gadus S2 OG retains its natural protective properties over its long working life.
- **Excellent anti-wear performance**
  At working temperatures, speeds and pressures, Shell Gadus S2 OG forms a protective cushion between the large gear (girth, bull etc) and pinion teeth.
- **Superb load carrying capacity**
  Molybdenum disulphide and other solid lubricants combine to reduce tooth contact zone temperatures, reduce gear surface pitting and alleviate 'stick-slip' conditions.
- **Water repellent**
  Effectively resists water 'wash-off' by immersion or spray.
- **Corrosion protection**
  Protects metal surfaces from corrosion in hostile environments such as salt-water conditions. Repels dirt and dust.
- **Environmental compliance**
  Lead and solvent haven't been added intentionally to Shell Gadus S2 OG 85.

Main Applications



- Heavily loaded open gears, particularly those found in grinding mills, kilns, shovels, draglines, ship loaders, stackers and reclaimers and excavator applications. When choosing a product to suit your ambient temperature conditions, always consult with your Shell representative for the appropriate grade.
- Multi service lubricant that can be used as the one grease (multi purpose and open gear) for the entire machine on most shovels, excavators and draglines (excluding electrical motors bearings).
- Surface dressing of slow moving gears open to the atmosphere.
- Plain bearings, pivot pins/bushings & articulations found in earth moving equipment.
- Mooring, static and slow moving wire ropes including those intermittently immersed in salt water.
- Wide variety of heavy-duty mining and industrial applications.

Specifications, Approvals & Recommendations

- FLSmidth
- Ferry Capitain
- Lincoln

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 OG 85
Grade				85
Soap Type				Clay
Base Oil Kinematic Viscosity	@100°C	mm^2/s	ASTM D445	85
Base Oil Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	1700
Flash Point COC		°C	ASTM D92 / ISO 2592	min 130
Four Ball Extreme Pressure Test, Weld Load		N	ASTM D2596	8000
Four Ball Extreme Pressure Test, Scar Diameter		mm	ASTM D2266	max 0.68
Timken, OK Load (without solids)		lbs	ASTM D2509	min 50
Copper Strip Corrosion	rating		ASTM D4048	1b max
Rust Protection			ASTM D1743	Pass
Falex Continuous Load Failure		N	ASTM D3233	min 20450

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S2 OG Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Alvania Grease RL 2**

Shell Gadus *S2 V100 2*

- *Reliable Protection*
- *Multi-purpose*
- *Lithium*

High Performance Multipurpose Grease

Shell Gadus S2 V100 2 is a general purpose grease based on a new lithium hydroxystearate soap thickener fortified with anti-oxidant, anti-wear and anti-rust additives.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Reliable high temperature performance**

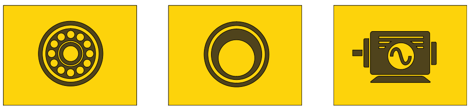
  Very good performance up to +130°C, resulting in longer bearing life.
- **Good oxidation and mechanical stability**

  Resists the formation of deposits caused by oxidation at high operating temperatures. Shell Gadus S2 V100 greases are extremely stable under vibrations and give NO LEAKAGE even in repeated shock-loaded bearings.
- **Good corrosion resistance characteristics**

  Effective protection in hostile environments.
- **Long storage life**

  Does not alter in consistency during prolonged storage.

Main Applications



- Rolling element and plain grease lubricated bearings
- Electric motor bearings
- Sealed-for-life bearings
- Water pump bearings

  May be used under a wide range of operating conditions offering very significant advantages over conventional lithium greases at high temperature or in the presence of water.
- A medium consistency grease designed, mainly, for general industrial lubrication. Ideal for centralised lubrication systems operating at normal temperatures.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 V100 2
NLGI Consistency				2
Soap Type				Lithium hydroxystearate
Base Oil (Type)				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	100
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	11
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	180

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S2 V100 Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Re-greasing Intervals**

  For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Alvania Grease RL 3**

Shell Gadus *S2 V100 3*

- *Reliable Protection*
- *Multi-purpose*
- *Lithium*

High Performance Multipurpose Grease

Shell Gadus S2 V100 3 is a general purpose grease based on a new lithium hydroxystearate soap thickener fortified with anti-oxidant, anti-wear and anti-rust additives.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Reliable high temperature performance**

  Very good performance up to +130°C, resulting in longer bearing life.

- **Good oxidation and mechanical stability**

  Resists the formation of deposits caused by oxidation at high operating temperatures. Shell Gadus S2 V100 greases are extremely stable under vibrations and give NO LEAKAGE even in repeated shock-loaded bearings.

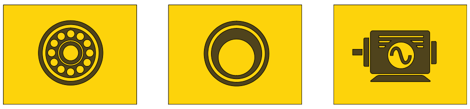
- **Good corrosion resistance characteristics**

  Effective protection in hostile environments.

- **Long storage life**

  Does not alter in consistency during prolonged storage.

Main Applications



- Rolling element and plain grease lubricated bearings
- Electric motor bearings
- Sealed-for-life bearings
- Water pump bearings

  May be used under a wide range of operating conditions offering very significant advantages over conventional lithium greases at high temperature or in the presence of water.

- A medium/hard high performance industrial grease, particularly recommended for the lubrication of electrical motor bearings.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 V100 3
NLGI Consistency				3
Soap Type				Lithium hydroxystearate
Base Oil (Type)				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	100
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	11
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	220-250
Dropping Point		°C	IP 396	180

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S2 V100 Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Re-greasing Intervals**

  For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Shell Gadus *S2 V150C 3*

- *Extra Protection*
- *Tacky*
- *Red Lithium*

Premium multipurpose extreme-pressure grease

Shell Gadus S2 V150C 3 grease is a premium multi-purpose grease based on high viscosity index mineral oil and a lithium soap thickener. It contains the latest state of the art additives to offer excellent anti wear and anti-corrosion properties and other additives to enhance its anti-oxidation properties. Shell Gadus S2 V150C 3 grease is especially suitable for wheel bearings operating in severe conditions and under load.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Excellent mechanical stability.**
- **Enhanced extreme-pressure properties.**
- **Excellent load-carrying performance.**
- **Good water resistance.**

  Ensures lasting protection even in the presence of large amounts of water.
- **High adhesion to surfaces.**
- **Long operational life with 60.000km change intervals.**
- **Effective corrosion protection.**

  Ensures components/bearings do not fail due to corrosion.

Main Applications

Shell Gadus S2 V150C 3 grease is used for the grease lubrication of heavy-duty bearings used in machinery and particularly suitable for the following applications:

- Automotive Wheel Bearings
- Roller conveyors - Tapered Roller Bearing

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 V150C 3
NLGI Consistency				3
Colour				Red
Soap Type				Lithium
Base Oil Type				Mineral
Base Oil Viscosity	@40°C	cSt	ASTM D445	150
Base Oil Viscosity	@100°C	cSt	ASTM D445	11
Cone Penetration, Worked	@25°C	0.1mm	ASTM D217	220-250
Dropping Point		°C minimum	IP 396	180
Pumpability Long Distance				Fair

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S2 V150C 3 Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used fluid. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature**

Operating Temperature range -20°C to 130°C

- **Re-greasing Intervals**

For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed.

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Alvania Grease EP(LF) 1**

Shell Gadus *S2 V220 1*

- *Reliable Protection*
- *Multi-purpose Applications*
- *Lithium*

High Performance Multipurpose Extreme Pressure Grease

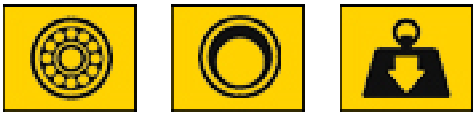
Shell Gadus S2 V220 greases are high quality multipurpose, extreme-pressure greases based on a blend of high viscosity index mineral oils and a lithium hydroxystreate soap thickener and contain extreme-pressure and other proven additives to enhance their performance in a wide range of applications.
Shell Gadus S2 V220 greases are designed for multipurpose grease lubrication of rolling element and plain bearings as well as hinges and sliding surfaces such as those found in throughout most industrial and transport sectors.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Outstanding load carrying capacity**
  Shell Gadus S2 V220 greases contain special extreme-pressure additives which enable them to withstand heavy and shock loads without failure of the lubricant film.
- **Improved mechanical stability**
  This is particularly important in vibrating environments where poor mechanical stability can lead to grease softening with subsequent loss of lubrication performance and leakage.
- **Good resistance to water wash-out**
  Shell Gadus S2 V220 greases have been formulated to offer resistance to water wash-out.
- **Oxidation stability**
  Specially selected base oil components have excellent oxidation resistance. Their consistency will not alter in storage and they withstand high operating temperatures without hardening or forming bearing deposits.
- **Anti- corrosion protection**
  Shell Gadus S2 V220 greases have an affinity with metal and have the ability to protect bearing surfaces against corrosion, even when the grease is contaminated with water.

Main Applications



Shell Gadus S2 V220 1 grease is designed for:

- Heavy duty bearings served by centralised dispensing equipment.
- Extreme-pressure gear grease for applications at normal ambient temperature.
- Heavy duty plain and rolling element bearings operating under harsh conditions including shock loading in wet environments.
- Low temperature greasing applications.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 V220 1
NLGI Consistency				1
Soap Type				Lithium
Base Oil				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	220
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	19
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	310-340
Dropping Point		°C	IP 396	180

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S2 V220 Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Hydraulic Brake Rubber Components**

  Care should be taken to ensure that the grease does NOT come into contact with hydraulic brake rubber components.

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Re-greasing Intervals**

  For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Names: **Shell Alvania Grease EP(LF) 2, Shell Retinax EP 2**

Shell Gadus *S2 V220 2*

- *Reliable Protection*
- *Multi-purpose Applications*
- *Lithium*

High Performance Multipurpose Extreme Pressure Grease

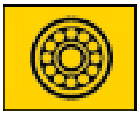
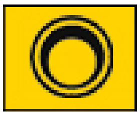
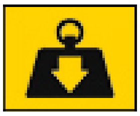
Shell Gadus S2 V220 greases are high quality multipurpose, extreme-pressure greases based on a blend of high viscosity index mineral oils and a lithium hydroxystreate soap thickener and contain extreme-pressure and other proven additives to enhance their performance in a wide range of applications.
Shell Gadus S2 V220 greases are designed for multipurpose grease lubrication of rolling element and plain bearings as well as hinges and sliding surfaces such as those found in throughout most industrial and transport sectors.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Outstanding Load Carrying Capacity**
  Shell Gadus S2 V220 greases contain special extreme-pressure additives which enable them to withstand heavy and shock loads without failure of the lubricant film.
- **Improved Mechanical Stability**
  This is particularly important in vibrating environments where poor mechanical stability can lead to grease softening with subsequent loss of lubrication performance and leakage.
- **Good Resistance to Water Wash-out**
  Shell Gadus S2 V220 greases have been formulated to offer resistance to water wash-out.
- **Oxidation Stability**
  Specially selected base oil components have excellent oxidation resistance. Their consistency will not alter in storage and they withstand high operating temperatures without hardening or forming bearing deposits.
- **Good Corrosion Resistance Characteristics**
  Shell Gadus S2 V200 greases reliably protect bearing surfaces against corrosion, even when a high amount of water is present.

Main Applications

Shell Gadus S2 V220 2 greases are designed for:

- Heavy duty bearings and general industrial lubrication.
- Heavy duty plain and rolling element bearings operating under harsh conditions including shock loading in wet environments.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 V220 2
NLGI Consistency				2
Soap Type				Lithium
Base Oil				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	220
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	19
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	180

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S2 V220 Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Hydraulic Brake Rubber Components**

  Care should be taken to ensure that the grease does NOT come into contact with hydraulic brake rubber components.

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature**

  Shell Gadus S2 V220 2 is recommended for the operating temperature range -20°C to +130°C.

- **Re-greasing Intervals**

  For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Names: **Shell Alvania Grease WR 2, Shell Alvania HD 2, Shell Retinax HD 2**

Shell **Gadus** ***S2 V220AC 2***

- *Reliable Protection*
- *Water Resistant*
- *Red Lithium Calcium*

High Performance Multi-purpose Extreme Pressure Grease

Shell Gadus S2 V220AC greases are high quality multi-purpose greases based on high viscosity index mineral oil and a mixed lithium/calcium soap thickener. They contain extreme-pressure, anti-wear, anti-oxidation and anti-corrosion additives to enhance their performance in a wide range of applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Excellent mechanical stability even under vibrating conditions.**
  Consistency retained over long periods, even in conditions of severe vibration.
- **Good corrosion resistance.**
  Provides protection from the elements of corrosion.
- **Extended life at moderate temperatures.**
  Allows longer periods between maintenance schedules reducing down-time and grease consumption.
  Demonstrated to work in the field with regreasing intervals above 30,000 kms even for demanding applications such as transmission joints.
- **Good oil separation.**
  Effective lubrication and reliable performance.

Specifications, Approvals & Recommendations

- ASTM D4950-08 LB

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Main Applications

- Heavy-duty plain and rolling element bearings operating in the following environments:
- Vibrating conditions
- Heavy load
- High temperature
- Shock load
- Presence of water

Multipurpose convenience, especially in the transport sector where product can be used for both wheelbearings and chassis lubrication of passenger cars, light trucks and heavy duty trucks. These greases are also suitable for construction equipment exposed to intense water washout.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 V220AC 2
NLGI Consistency				2
Colour				Red
Soap Type				Lithium/Calcium
Base Oil				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	220
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	18
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	180
Four Ball Weld Load		Kg minimum	ASTM D2596	315

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S2 V220AC Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature Range**

Shell Gadus S2 V220AC greases are recommended for the grease lubrication of heavy duty bearings operating up to their maximum rated speed over the temperature range -20°C to 130°C (140°C peak)

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Darina Grease R 2**

Shell Gadus *S2 U460L 2*

- *Heavy Duty Protection*
- *High Temperature*
- *Clay*

High Performance Heavy Duty Grease

Shell Gadus S2 U460L Grease, based on an inorganic non-soap thickener and a specially selected base oil, will provide satisfactory lubrication beyond the temperature limitations of lithium based greases.
The base oil component in Shell Gadus S2 U460L Grease is a high quality, solvent refined, high viscosity mineral oil with excellent oxidation and evaporation resistance. Oxidation stability is also improved by the addition of a special high temperature oxidation inhibitor.

DESIGNED TO MEET CHALLENGES

Main Applications

- Recommended for use in bearings operating in the temperature range -10°C to 180°C.
- Shell Gadus S2 U460L Grease gives good service life in many applications where expensive synthetic or silicone lubricants would otherwise be considered.
- The special high viscosity base oil in Shell Gadus S2 U460L Grease makes it particularly suitable for the grease lubrication of heavily loaded slow speed bearings.
- With caution, Shell Gadus S2 U460L Grease may be used at temperatures in excess of 200°C, but only so long as the re-lubrication period is suitably adjusted.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility

- **Sealing**

  Shell Gadus S2 U460L Grease does not melt like soap thickened greases and hence its consistency changes only marginally with increasing temperature. In bearings operating at high temperature it resists softening and remains in place providing good sealing and continuous lubrication even in the presence of vibration.

Typical Physical Characteristics

Properties			Method	Shell Gadus S2 U460L Grease
NLGI Consistency				2
Soap Type				Inorganic (clay)
Base Oil (Type)				Mineral
Kinematic Viscosity	@40°C	cSt	IP 71	460
Kinematic Viscosity	@100°C	cSt	IP 71	35
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	300

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S2 U460L Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature**

A severe limitation in many high temperature greases is the type of organic metallic soap thickener. It can melt at high temperatures destroying the grease structure - greatly reducing its retention and lubrication properties. The special inorganic clay thickener contained in Shell Gadus S2 U460L Grease is free from any melting limitation. It controls the vaporisation and oxidation stability of the base oil and helps to extend grease life and maximise working temperature.

- **Re-lubrication**

Grease life varies considerably from application to application even with bearings operating under nominally identical conditions. Variables such as air flow, dirt and humidity can have a considerable effect in addition to the more commonly recognised parameters of load, speed and temperature.

Predicted life is likely to be reduced significantly for less favourable conditions.

Recommendations should be tested on a trial basis and modified, where necessary, in the light of service experience.

Preferably, bearing housings should be designed to allow for complete purging during Re-lubrication. Alternatively, the bearing should be dismantled for periodic servicing and complete replacement of the grease charge.

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Names: **Shell Albida Grease EP 2, Shell Retinax LX 2**

Shell **Gadus *S3 V220C 2***

- *Extra Protection*
- *High Temperature*
- *Red Lithium Complex*

Premium multipurpose extreme-pressure grease

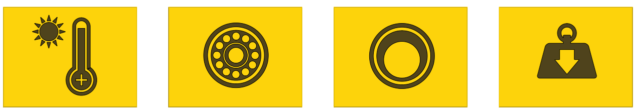
Shell Gadus S3 V220C greases are premium multi-purpose greases based on high viscosity index mineral oil and a lithium complex soap thickener. They contain the latest additives to offer excellent high temperature oxidation performance and other additives to enhance its anti-oxidation, anti-wear and anti-corrosion properties. Shell Gadus S3 V220C greases are especially suitable for bearings operating at high temperature and under load.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Excellent mechanical stability even under vibrating conditions.**
  Consistency retained over long periods, even in conditions of severe vibration.
- **Enhanced extreme-pressure properties.**
  Excellent load-carrying performance.
- **Good water resistance.**
  Ensures lasting protection even in the presence of large amounts of water.
- **High dropping point.**
- **Long operational life at high temperatures.**
- **Effective corrosion protection.**
  Ensures components/bearings do not fail due to corrosion.

Main Applications



- Shell Gadus S3 V220C greases are used for the grease lubrication of heavy-duty bearings used in machinery found in the following applications:
- Continuous casting
- Vibrating sieves
- Quarries
- Breakers
- Roller conveyors
- Automotive Wheelbearings

Specifications, Approvals & Recommendations

- ASTM D4950-07 GC-LB
- SEB 18 12 53

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S3 V220C 2
NLGI Consistency				2
Colour				Red
Soap Type				Lithium complex
Base Oil Type				Mineral
Base Oil Viscosity	@40°C	cSt	IP 71 / ASTM D445	220
Base Oil Viscosity	@100°C	cSt	IP 71 / ASTM D445	19
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	240
Pumpability Long Distance				Fair

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S3 V220C Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature**

Operating temperature range -20°C to 140°C (peak 150°C)

- **Re-greasing Intervals**

For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Retinax LX 3**

Shell **Gadus** ***S3 V220C 3***

- *Extra Protection*
- *High Temperature*
- *Red Lithium Complex*

Premium multipurpose extreme-pressure grease

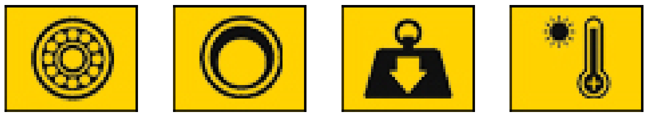
Shell Gadus S3 V220C greases are premium multi-purpose greases based on high viscosity index mineral oil and a lithium complex soap thickener. They contain the latest additives to offer excellent high temperature oxidation performance and other additives to enhance its anti-oxidation, anti-wear and anti-corrosion properties. Shell Gadus S3 V220C greases are especially suitable for bearings operating at high temperature and under load.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Excellent mechanical stability even under vibrating conditions.**
  Consistency retained over long periods, even in conditions of severe vibration.
- **Enhanced extreme-pressure properties.**
  Excellent load-carrying performance.
- **Good water resistance.**
  Ensures lasting protection even in the presence of large amounts of water.
- **High dropping point.**
- **Long operational life at high temperatures.**
- **Effective corrosion protection.**
  Ensures components/bearings do not fail due to corrosion.

Main Applications



- Shell Gadus S3 V220C greases are used for the grease lubrication of heavy-duty bearings used in machinery found in the following applications:
- Continuous casting
- Vibrating sieves
- Quarries
- Breakers
- Roller conveyors
- Automotive Wheelbearings

Specifications, Approvals & Recommendations

- ASTM D4950-07 LB-GC

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk, or the OEM Approvals website.

Typical Physical Characteristics

Properties			Method	Shell Gadus S3 V220C 3
NLGI Consistency				3
Colour				Red
Soap Type				Lithium complex
Base Oil Type				Mineral
Base Oil Viscosity	@40°C	cSt	IP 71 / ASTM D445	220
Base Oil Viscosity	@100°C	cSt	IP 71 / ASTM D445	19
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	220-250
Dropping Point		°C	IP 396	240
Pumpability Long Distance				Fair

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S3 V220C Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Re-greasing Intervals**

  For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Names: **Shell Albida Grease HDX 2 , Shell Retinax CMX 2**

Shell Gadus *S3 V460D 2*

- *Heavy Duty Protection*
- *High Temperature*
- *Lithium Complex*

Premium multi-purpose heavy duty grease with solids

Shell Gadus S3 V460D greases are high performance high temperature greases for slow moving heavily loaded large bearings subject to shock loads. They are based on high viscosity index mineral oil and a lithium complex soap thickener. Apart from containing the latest additives to ensure excellent high temperature, anti corrosion & anti oxidation performance, they also contain solids to ensure the grease can handle shock loads.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **High base oil viscosity to provide excellent load carrying performance**

  Meets the recommended base oil viscosity recommended by leading OEMs.

- **Excellent mechanical stability even under vibrating conditions**

  Consistency retained over long periods, even in conditions of severe vibration.

- **Enhanced extreme-pressure properties & resistant to shock loads**

  Excellent load-carrying performance enhanced by the presence of solids.

- **Excellent water resistance**

  Ensures lasting protection even in the presence of large amounts of water.

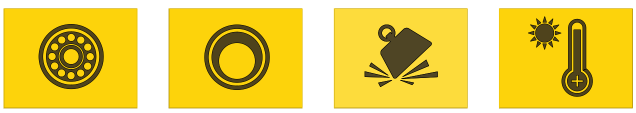
- **Effective corrosion protection**

  Ensures components/bearings do not fail due to corrosion.

- **High dropping point**

  Resistant to high temperatures.

Main Applications



Shell Gadus S3 V460D greases are used for the grease lubrication of heavy-duty, slow moving bearings subject to shock loads found in the following industries:

- Mining
- Steel

Specifications, Approvals & Recommendations

Shell Gadus S3 V460D is listed by several leading OEMs:

- Komatsu Mining (Germany)
- Terex
- BE (certified)
- Dieffenbacher
- Konecranes
- CMI
- Flat Products Equipment
- Pfeiffer
- Voith Paper Environmental
- Rothe Erde

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S3 V460D 2
NLGI Consistency				2
Colour				Black
Soap Type				Lithium complex
Base Oil Type				Mineral
Kinematic Viscosity	@40^{o}C	cSt	ASTM D445	460
Kinematic Viscosity	@100^{o}C	cSt	ASTM D445	31
Cone Penetration, Worked	@25^{o}C	0.1mm	ASTM D217	265-295
Dropping Point		^{o}C	IP 396	>240
Four Ball Weld Load		Kg	ASTM D2596	620

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S3 V460D grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature**

-20^{o}C to +140^{o}C (peak 150^{o}C)

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Stamina Grease RL 2**

Shell Gadus *S3 T100 2*

- *Extra Protection*
- *Extreme Temperature*
- *Polyurea*

Premium Multipurpose Grease

Shell Gadus S3 T100 Greases are high technology greases designed to give optimum performance for grease lubrication in industrial bearings.
They are based on mineral oil with a special diurea thickener to give long life, low wear and shear-stable properties at high temperatures.
In high temperature applications Shell Gadus S3 T100 Greases will outperform even fully synthetic (PAO) lithium complex greases proposed in the market.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Outstanding life at high temperatures**
- **Excellent wear protection**
- **Excellent mechanical stability at high temperatures**
- **Excellent oxidation resistance**
- **Good protection against false brinnelling**
- **Low oil separation**
- **Excellent corrosion resistance**

  Provides protection from the elements of corrosion.
- **Versatile**
- **Water resistant**

  Withstands washing with water, preventing loss of protection.
- **Lead and nitrite free**

  For safe handling.
- **High temperature performance**

  The diurea thickener used in Shell Gadus S3 T100 greases have a high melting point and the grease performance is limited only by the properties of the base oil and additive components.
- **Corrosion protection**

  When a bearing is running, most high quality greases can maintain an adequate lubricating film even when the grease is loaded with water. However when the grease bearing is idle corrosion may occur causing pitting which can be destructive. Shell Gadus S3 T100 greases are formulated with corrosion inhibitors to help protect bearing surfaces even when the grease is contaminated with water.
- **Load carrying capacity**

  Although not specifically designated extreme pressure, Shell Gadus S3 T100 greases have been used very successfully in slow moving, loaded large bearings such as those found in continuous casters in steel plants.
- **Re-lubrication**

  Grease life varies considerably from application to application, even with bearings operating under nominally identical conditions. Variables such as air flow, dirt and humidity can have a considerable effect in addition to the more commonly recognised parameters of load, speed and temperature.

  The use of Shell Gadus S3 T100 greases usually permits considerable extension of the re-lubrication interval.
- **Oxidation stability**

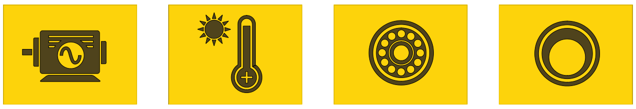
  Shell Gadus S3 T100 greases have a superior high temperature oxidation inhibitor system to ensure that they will withstand high operating temperatures without forming deposits. Unlike the soap thickeners used in most greases, the diurea thickener in Shell Gadus S3 T100 greases does not catalyse grease oxidation, indeed the diurea thickener offers inherent anti-oxidant properties. This contributes to longer grease life at higher temperatures.

  The base oil component of Shell Gadus S3 T100 greases is a specially selected high viscosity index mineral oil with excellent oxidation and evaporation resistance.
- **Water washout**

  Shell Gadus S3 T100 greases exhibit very good resistance to water washout by immersion or spray.

The lubrication properties of Shell Gadus S3 T100 greases are unimpaired by small quantities of salt water.

Main Applications



Shell Gadus S3 T100 greases are particularly recommended for use in high temperature (160°C), lightly loaded industrial bearings. It is recommended for use where long operational life and extended re-greasing intervals are an important consideration

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility

- **Sealing**

The rheology of Shell Gadus S3 T100 greases is such that at low shear rates and with heating the consistency increases. Consequently, in bearings operating at high temperatures the grease remains in place providing good sealing and continuous lubrication even in the presence of vibration.

Typical physical Characteristics

Properties			Method	Shell Gadus S3 T100 2
NLGI Consistency				2
Colour				Brown
Soap Type				Diurea
Base Oil (Type)				Mineral Oil
Kinematic Viscosity	@40°C	mm^2/s	IP 71 / ASTM D445	100
Kinematic Viscosity	@100°C	mm^2/s	IP 71 / ASTM D445	11
Cone Penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	250
Pumpability Long Distance				Fair

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S3 T100 Greases is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating Temperature Range**

-20°C to +160°C

With caution, Shell Gadus S3 T100 greases may, in some circumstances, be used at temperatures up to 180°C, but only if the re-lubrication period is suitably adjusted.

- **Advice**

1300 134 205

e may be obtained from your Shell representative.

The Shell Company of Australia Limited
(ABN 46 004 610 459) 8 Redfern Road
Hawthorn East Victoria 3123 Australia

Technical Data Sheet

Previous Name: **Shell Albida Grease HDZX**

Shell Gadus *S4 V460D 2*

- *Heavy Duty Protection*
- *Low Temperature*
- *Lithium Complex*

Advanced Multipurpose Heavy Duty Grease

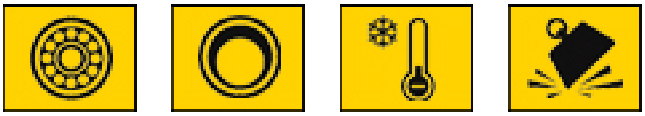
Shell Gadus S4 V460D Grease is high performance high temperature grease for slow moving heavily loaded pins, bushes and large bearings subject to shock loads. They are based on PAO synthetic oil and high viscosity index mineral oil and a lithium complex soap thickener. Apart from containing the latest additives to ensure excellent high temperature, anti corrosion & anti oxidation performance, they also contain MoS2 to ensure the grease can handle shock loads. The enhancement of PAO synthetic base oil allows the grease to be pumped and perform in lubrication systems at much lower temperatures.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **High base oil viscosity to provide excellent load carrying performance**
  Meets the recommended base oil viscosity recommended by leading OEMs
- **Excellent mechanical stability even under vibrating conditions**
  Consistency retained over long periods, even in conditions of severe vibration
- **Enhanced extreme-pressure properties & resistant to shock loads**
  Excellent load-carrying performance enhanced by the presence of MoS2
- **Excellent water resistance**
  Ensures lasting protection even in the presence of large amounts of water
- **Effective corrosion protection**
  Ensures components/bearings do not fail due to corrosion
- **High dropping point**
  Resistant to high temperatures

Main Applications



- Shell Gadus S4 V460D Greases are used for the grease lubrication of heavy-duty, slow moving pins and bushes and bearings subject to shock loads found in the following industries:
- Mining
- Steel

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Gadus S4 V460D 2
NLGI Consistency				2
Colour				Black
Soap Type				Lithium complex
Base Oil (type)				Mineral/Syn
Kinematic Viscosity	@40°C	cSt	IP 71 / ASTM D445	460
Kinematic Viscosity	@100°C	cSt	IP 71 / ASTM D445	32
Cone penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	250
Four Ball Weld Load		Kg	ASTM D2596	620

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Gadus S4 V460D 2 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Re-greasing Intervals**

  For bearings operating near their maximum recommended temperatures, re-greasing intervals should be reviewed

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Stamina RLS 2 (2006)**

Shell Gadus *S5 T100 2*

- *Long Life*
- *Extreme Temperature*
- *Polyurea*

Advanced Multipurpose Grease

Shell Gadus S5 T100 greases are a very high technology grease designed to give optimum performance for grease lubrication in industrial bearings.
It based on synthetic oil with a special diurea thickener to give long life, low wear and shear-stable properties at high temperatures.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- Outstanding life at high temperatures
- Excellent wear protection
- Excellent mechanical stability at high temperatures
- Excellent oxidation resistance
- Low oil separation
- Excellent corrosion resistance

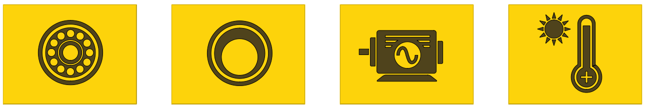
  Provides protection from the elements of corrosion.
- Versatile
- Water resistant

  withstands washing with water, preventing loss of protection.

Specifications, Approvals & Recommendations

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Main Applications



Shell Gadus S5 T100 greases are particularly recommended for use in high temperature up to 180°C, lightly loaded industrial bearings. It is recommended for use where long operational life and extended re-greasing intervals are an important consideration

Compatibility & Miscibility

- **Sealing**

  The rheology of Shell Gadus S5 T100 is such that at low shear rates and with heating the consistency increases. Consequently, in bearings operating at high temperatures the grease remains in place providing good sealing and continuous lubrication even in the resence of vibration.

Typical Physical Characteristics

Properties			Method	Shell Gadus S5 T100 2
NLGI Grade				2
Colour				Light brown
Soap Type				Polyurea
Base Oil (type)				Synthetic
Kinematic Viscosity	@40°C	mm^2/s	IP 71 / ASTM D445	100
Kinematic Viscosity	@100°C	mm^2/s	IP 71 / ASTM D445	14
Cone penetration, Worked	@25°C	0.1mm	IP 50 / ASTM D217	265-295
Dropping Point		°C	IP 396	250
FAG FE-9 Test L50 hrs	@180°C	hours minimum		100
Pumpability Long Distance				Fair

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell Gadus S5 T100 2 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Operating temperature range / high temperature performance**

The diurea thickener used in Shell Gadus S5 T100 has a high melting point and the grease performance is limited only by the properties of the base oil and additive components.

The low volatility and excellent oxidation stability of the base oil are such that they give an excellent service life in bearings operating between -40°C and +180°C.

With caution, Shell Gadus S5 T100 greases may, in some circumstances, be used at temperatures up to 200°C, but only if the re-lubrication period is suitably adjusted.

The lubrication properties of Shell Gadus S5 T100 are unimpaired by small quantities of salt water.

- **Oxidation stability**

Shell Gadus S5 T100 has a superior high temperature oxidation inhibitor system to ensure that it will withstand high operating temperatures without forming deposits. Unlike the soap thickeners used in most greases, the diurea thickener in Shell Gadus S5 T100 does not catalyse grease oxidation, indeed the diurea thickener offers inherent anti-oxidant properties. This contributes to longer grease life at higher temperatures.

The base oil part of Shell Gadus S5 T100 is a specially selected synthetic component with excellent oxidation and evaporation resistance.

- **Corrosion protection**

When a bearing is running, most high quality greases can maintain an adequate lubricating film even when the grease is contaminated with water. However when the grease bearing is idle corrosion may occur causing pitting which can be detrimental. Shell Gadus S5 T100 is formulated with corrosion inhibitors to help protect bearing surfaces even when the grease is contaminated by water.

- **Re-lubrication**

Grease life varies considerably from application to application, even with bearings operating under nominally identical conditions. Variables such as air flow, dirt and humidity can have a considerable effect in addition to the more commonly recognised parameters of load, speed and temperature. The use of Shell Gadus S5 T100 usually permits considerable extension of the re-lubrication interval.

- **Water washout**

  Shell Gadus S5 T100 exhibits very good resistance to water washout by immersion or spray.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Cyprina Grease RA**

Shell **GadusRail** *S2 Traction Motor Bearing Grease*

- *Long Life*
- *Lithium*

High Performance Traction Motor Bearing Grease

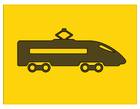
Shell GadusRail S2 Traction Motor Bearing grease is one of Shell's highest quality lithium soap based greases. It is manufactured to specifications that provide excellent mechanical stability and long service life. These properties are needed for many critical anti-friction bearing applications. Shell GadusRail S2 Traction Motor Bearing grease is a NLGI Grade 3 grease formulated using mineral base oils.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- Outstanding mechanical stability
- Long service life
- Friction reducer
- Fill-for-life capability

Main Applications



- Traction motor bearings of General Motors Electromotive Diesel and General Electric locomotives.
- Pre-packaged anti-friction bearings intended for "life-time" service without relubrication, a feature highly desired by the railroad industry.

Specifications, Approvals & Recommendations

- General Electric
- General Motors Electromotive Division (EMD)

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell GadusRail S2 Traction Motor Bearing Grease
Colour			Appearance	Amber, Buttery
Base Oil Viscosity	@40°C	cSt	IP 71 ASTM D445	110 - 120
Base Oil Viscosity	@100°C	cSt	IP 71 / ASTM D445	10.2
Penetration, dmm Worked, 60X			IP 50 / ASTM D217	230
Dropping Point		°F	Mettler	380
Bomb Oxidation Pressure drop at 100h		psi	ASTM D942	0.8 (5.5 kPa)
Wheel Bearing Leakage	@160°C	gm	ASTM D4290	1.1
4 Ball Wear Scar, 1 hr / 1200 rpm / 40 kg	@75°C		ASTM D2266	0.6
Oil Separation, 24 hrs	@100°C	%	FTM-321	0.6

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

Shell GadusRail S2 Traction Motor Bearing Grease is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

Advice on applications not covered here may be obtained from your Shell representative.