Technical Data Sheet

Shell **Gadus** *S5 V110KP 1*

- *Outstanding Fretting performance*
- *Synthetic*
- *LiCaComplex*

A high-performance, synthetic wind turbine blade bearing grease

Shell Gadus S5 V110KP 1 is an advanced fully synthetic wind turbine grease designed for lubrication of blade bearings and specifically suitable for greater blade diameters with high level of active pitching, high tower height and exposed to extreme weather and climate.

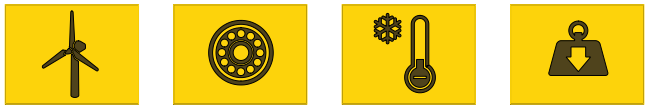
DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Outstanding Performance in Highly Variable Operating Temperature Conditions**
  Shell Gadus S5 V110KP 1 grease functions over a wide operating temperature range, from extreme climate (Arctic) conditions to high ambient temperature in centralized greasing systems e.g. of progressive or single-line type with narrow diameter due to excellent low temperature pumpability
- **Outstanding Performance in Wet, Corrosive Environments**
  Shell Gadus S5 V110KP 1 grease demonstrates excellent rust and corrosion resistance even in a salt water corrosion environment and is designed to defend equipment from corrosive environments, including coastal and offshore
- **Long Lasting**
  Shell Shell Gadus S5 V110KP 1 has very long grease life and system efficiency due to the unique thickener in combination of the synthetic oils giving extended oil life (oxidation stability) and reduces grease consumption.
- **Outstanding Protection against Wear**
  Shell Gadus S5 V110KP 1 blade bearing grease has been designed to help provide increased resistance against false brinelling and to help prevent wear at the rolling contacts even under high and variable load conditions.

  Improved wear protection at higher operating temperatures thanks to lower friction coefficients. Reliability is paramount due to the costs, logistics and safety implications of working on a wind turbine.

Main Applications



Shell Gadus S5 V110KP 1 grease is specifically designed for:

- Multi-megawatt wind turbines with greater blade diameters and tower heights and increased pitch control. Where the blade or pitch bearings are exposed to high-frequency vibration or oscillation, and high dynamic loads from the blades.
- Wind turbines that are exposed to every kind of weather and climate
- For Systems that need dispensation through the distribution lines of centralized lubrication system generally down to -40^{0}C and even down to -50^{0}C depending on equipment design.

Specifications, Approvals & Recommendations

- Rothe Erde
- SKF-Lincoln

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

Typical Physical Characteristics

Properties	Method	Shell Gadus S5 V110KP 1
NLGI Consistency		1
Colour		Beige
Soap Type		LiCaCx

Properties			Method	Shell Gadus S5 V110KP 1
Base Oil Type				Synthetic
Kinematic Viscosity	@ 40°C	cSt	IP 71 / ASTM D445	110
Penetration (Worked)	@ 25°C 0.1mm		IP 50 / ASTM D217	min. 310 max. 340
Dropping Point		°C	IP 132	Min. 220
Emcor Rust test			IP 220	0/0
Fafnir Fretting			ASTM D4170	Max. 5.0
Lincoln Ventmeter	@-20°C	PSI		Max. 600
Lincoln Ventmeter	@-35°C	PSI		Max. 1000
Flow Pressure Test	@ -45°C	mbar	DIN 51805	Max. 375
Flow Pressure Test	@ -60°C	mbar	DIN 51805	Max. 1400

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 V110KP 1 grease is unliely 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 (MSDS), which can be obtained from http//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**

  Long grease life extending industry service interval expectations

- **Operating Temperatures**

  -50°C to 120°C

- **Advice**

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