Forward
at every turn

Introducing Castrol's suite of advanced products, solutions and expertise, engineered to help your wind business move forward at every turn.

Castrol

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An iconic brand with global scale

>6,000
employees

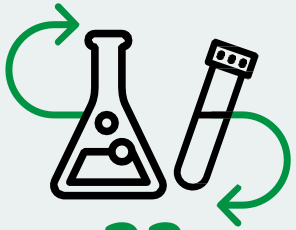
>160
countries where Castrol markets products

CC Wakefield was established in 1899 and then registered in 1909 as Castrol brand

Castrol is headquartered in the UK

200m
customer touchpoints

7 technology centres



23
blending plants

across automotive, industrial, marine and energy

Answering the three core needs of wind industry businesses

Castrol is chosen by leading turbine manufacturers for first fill when their machines go out to market. We are the trusted supplier for thousands of wind farms across the globe, not just for the warranty period, but for the entire working life. That's due to our deep understanding of three core needs for wind operators…

1 Lowering LCOE

Lowering the levelised cost of energy to make your business more profitable today and tomorrow.

2 Reducing downtime

Tackling heat, wear, and unplanned maintenance, to optimise efficiency in the field.

3 Extend asset life

Maximise the life of your asset with Castrol high-performance lubricants.

Castrol lubricants for the wind industry

Chosen by leading manufacturers for first fill. Trusted by owners, operators and engineers over the entire working life of a turbine.

Gearbox oils

Protection that optimises efficiency for less downtime

- Castrol Optigear Synthetic X 320
- Castrol Optigear Synthetic CT 320
- Castrol Optigear Synthetic CT 320 NG

Gear oil life extension

For large wind farms, our booster could save millions[1] of dollars in maintenance costs every year

- Castrol Optigear Synthetic X 320 AD
- Castrol Optigear Synthetic CT 320 AD

Grease

Protecting your wind turbine's critical components

- Castrol Tribol GR 1350-2.5PD
- Castrol Tribol GR SW 460-1
- Castrol Tribol GR SW 680-1
- Castrol Tribol GR 100-2 PD

Hydraulics

Protecting critical hydraulic systems

- Hyspin AWH-M 32 Superclean
- Hyspin SY 32 Superclean

Value delivered in the field

Energy saving

Up to 1% energy

Enhance efficiency by up to 1% and save $3,700 per year per wind turbine.

Cost saving

$215,000 saved

Eliminating just one oil exchange over the life of a turbine saves at least $4,300[2] per turbine.

The supermajor has topped up 50 turbines with Castrol Optigear Synthetic X 320 AD.

Time saving

4-hour shutdown avoided

Removing the need to change the oil means the turbine can remain operational and avoid the usual downtime of 4 hours.

[1] Field case study with tier one wind turbine OEM manufacturer. Details of the case are available on request
[2] Kline: Wind Turbines report 2022
[3] Based on Castrol Optigear Synthetic X 320 AD being used on the top-up of 50 turbines to date, each turbine can save $4,300 through elimination of oil change (significantly more for offshore farms). Calculated in UK trial with major wind OEM in 2017. Data approved and verified.

The Castrol pathways to wind industry success

Advanced lubricants

Fighting friction, corrosion and wear as the application demands, to optimise performance and efficiency, while helping extend asset life.

New efficiencies

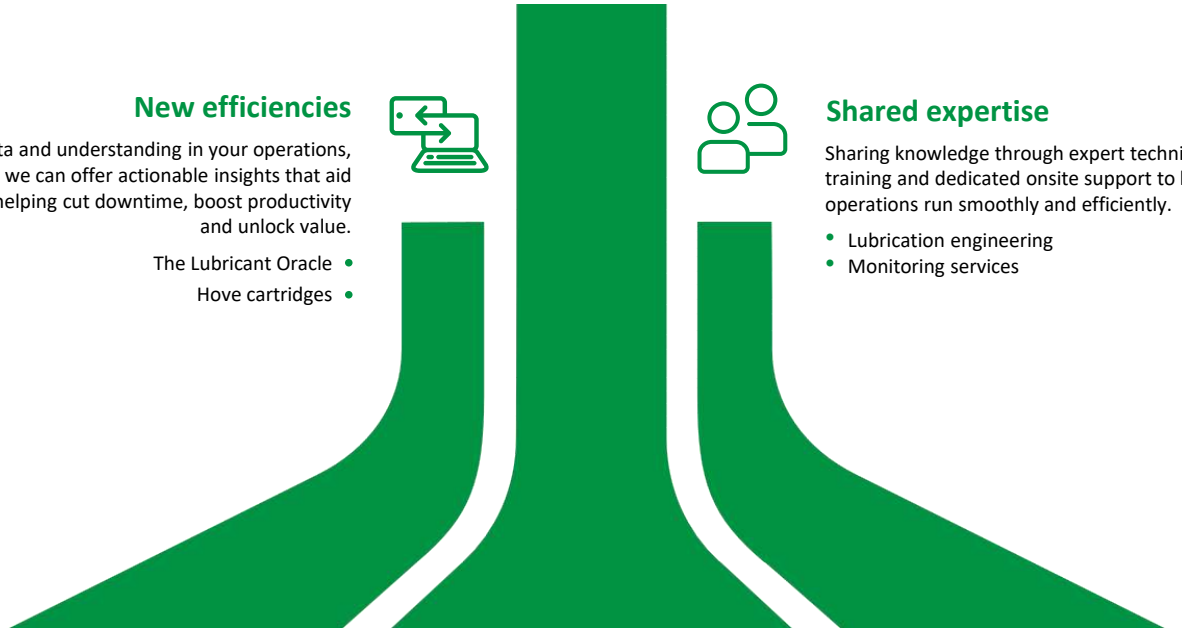
By collecting data and understanding in your operations, we can offer actionable insights that aid decision-making, helping cut downtime, boost productivity and unlock value.

- The Lubricant Oracle
- Hove cartridges

Shared expertise

Sharing knowledge through expert technical advice, training and dedicated onsite support to help your operations run smoothly and efficiently.

- Lubrication engineering
- Monitoring services

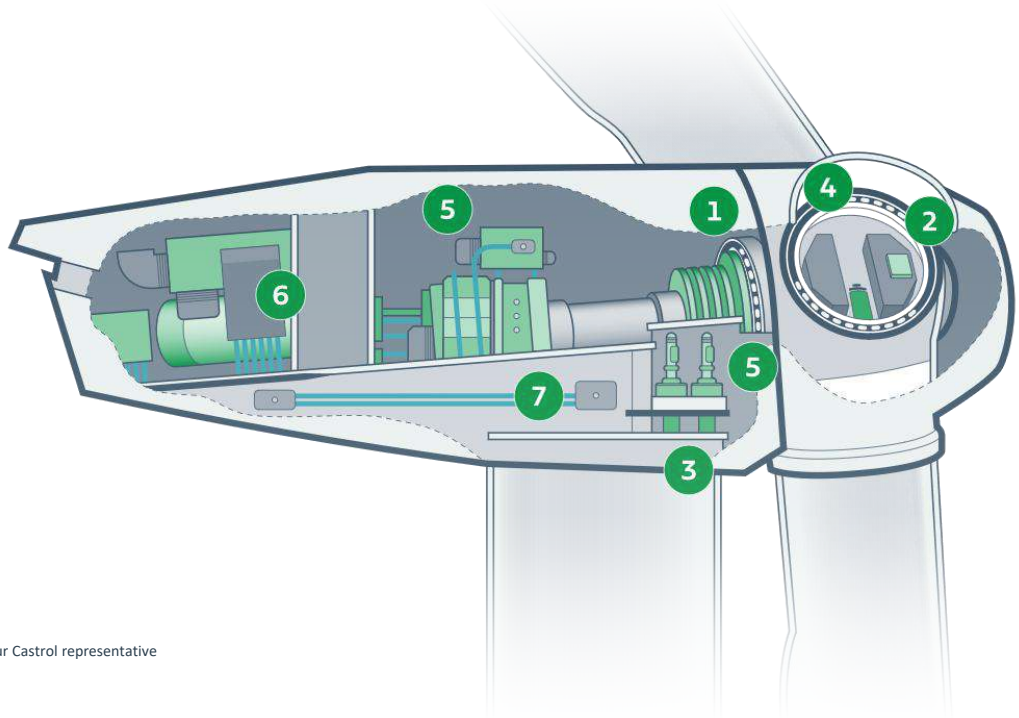


Advanced lubricants

Fighting friction, corrosion and wear as the application demands, to optimise performance and efficiency, while helping extend asset life.

Key lubrication points of a wind turbine

This diagram shows all the areas of a turbine where Castrol products can help reduce friction and improve performance



1 – Main bearing

- Castrol Spheerol LC 2 NG
- Castrol Optigear Synthetic CT 320 NG
- Castrol Optigear Synthetic X 320
- Castrol Optigear Synthetic CT 320
- Castrol Tribol GR SW 460-1
- Castrol Tribol GR SW 680-1

2 – Pitch adjustment

- Castrol Tribol GR SW 460-1
- Castrol Tribol GR SW 680-1
- Castrol Spheerol LC 2 NG

3 – Yaw bearing

- Castrol Tribol GR 1350-2.5 PD
- Castrol Tribol GR SW 460-1
- Castrol Tribol GR SW 680-1

4 – Hydraulic systems

- Castrol Hyspin AWH-M 32 Superclean
- Castrol Hyspin AWH-M 32
- Castrol Hyspin HVI 32
- Castrol Brayco 717

5 – Main gear and auxiliary drives

- Castrol Optigear Synthetic CT 320 NG
- Castrol Optigear Synthetic X 320
- Castrol Optigear Synthetic CT 320
- Castrol Optigear Synthetic A 320

6 – Generator bearing

- Castrol Tribol GR 100-2 PD
- Castrol Tribol GR 4541 HT

7 – Yaw open gear

- Castrol Tribol GR 1350-2.5 PD
- Castrol Molub-Alloy OG 936 SF Heavy

Document link

For info contact your Castrol representative

Availability subject to market

Castrol Optigear Synthetic CT 320 NG

Next-generation, high-performance, long-service-life wind turbine gear oil

Next-generation ashless technology builds on Castrol wind turbine oil experience, with field data indicating extended oil life under specific operating conditions.

Extensive rig testing and field trials support asset protection and long-service-life capability.

Castrol Optigear Synthetic CT 320 NG helps wind operators reduce maintenance whilst continuing to protect gearboxes.

Increased oil life

Increased oil life up to a potential 25 years when combined with the use of Castrol Optigear Synthetic CT 320 AD.

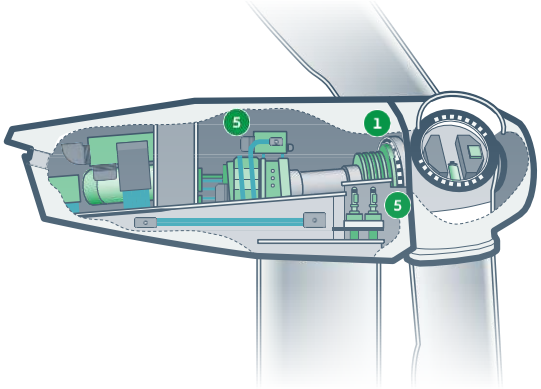
Excellent performance

Combats wear and foaming, and offers excellent yellow metal and journal bearing compatibility.

Castrol Optigear Synthetic CT 320 NG

Key features:

- Service and lifetime benefits – 25-year oil life capability
- Outstanding performance for start/stop operations and low wind speeds
- WEC resistant, suitable for wind turbine gearboxes and oil lubricated main bearings
- Excellent yellow metal and journal bearing compatibility, designed for long service life
- Low-foam performance



Lubrication points:

1. Main bearing
5. Main bearing and auxiliary gear drivers

Key information:

- Suited for high-capacity wind turbine gears
- It has a wide operating range
- 25-years oil life capability
- Fully compatible with Castrol Optigear Synthetic CT 320
- Compatible with Castrol Synthetic CT 320 AD to extend oil life
- Productivity gain capability – DNV-certified efficiency in a 2-year field trial

Product highlights

Castrol Optigear Synthetic CT 320

Robust gear protection that optimises efficiency for less downtime

A premium synthetic oil for wind turbine gears operating in wide temperature ranges and under high loads. It delivers robust surface protection and reduces gear friction. Tested and proven in both the lab and the field by customers and independent experts, it gives wind farm operators control over their levelised cost of energy.

Castrol Optigear Synthetic CT 320 helps wind operators reduce their levelised cost of energy through:

Less downtime

Through greater resistance to gearbox breakdown, and simplified maintenance.

Greater efficiencies

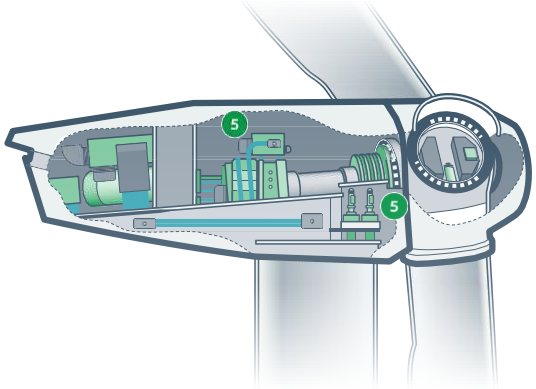
Reduced foam and heat means less wear on the gearbox and more efficient energy generation.

Castrol Optigear Synthetic CT 320

Key features:

- Formulated with an advanced ‘ashless’ technology that is proven to run up to 8°C cooler[1], providing consistent wear protection for many years of effective oil life[2]
- Tests have proven that it generates up to 28% less foam[3] than its competitors
- Lower water content than its competitors, resulting in an extended relative bearing life

[1] Sincro Mecánica Wind Oil Evaluation 2016.
[2] 8-year customer field inspection (USA, 2017).
[3] 3-year field trial – 2013.



Lubrication points:

1. Main bearing
5. Main bearing and auxiliary gear drivers

Key information:

- Suited for high-capacity wind turbine gears
- It has a wide operating range
- Often chosen by operators with mixed wind turbine fleets or complex maintenance schedules
- Approved by multiple OEMs
- Compatible with Castrol Synthetic CT 320 AD to extend oil life

Castrol Optigear Synthetic X 320

A unique gear protection that optimises efficiency for less downtime

A premium synthetic oil for wind turbine gears operating in wide temperature ranges and under high loads. It delivers best-in-class surface protection and reduces gear friction.

Castrol Optigear Synthetic X 320 has proven to enhance energy efficiency by up to 1%.

More revenue

In a typical scenario, 1% higher efficiency means ~ **$3,700** of added turnover per year per turbine. Over lifetime of a turbine (25 years), this means near **$100,000** of added revenue per turbine.

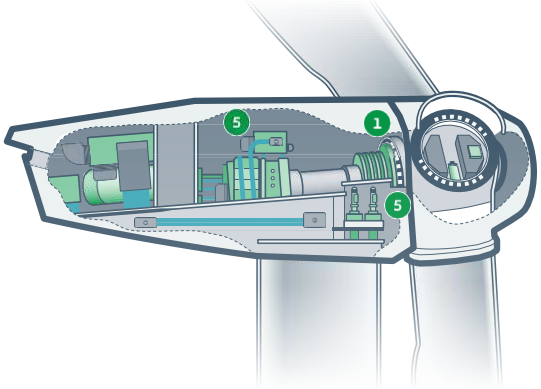
Ultimate protection

Less friction reduces heat and wear, providing greater resistance to gearbox breakdown.

Castrol Optigear Synthetic X 320

Key features:

- Tested and proven in both the lab and the field by customers and independent experts
- Formulated with Castrol's Plastic Deformation (PD) technology which is proven to give 30%[1] less friction and superior surface protection compared to other commercially available wind gear oils. This reduces critical gearbox stress, operating temperatures and wear[2], allowing bearings to emerge from tough qualification tests as good as new[3]
- It can significantly slow down[4] any further damage in pre-micropitted gears, reducing critical gearbox stress



Lubrication points:

1. Main bearing
5. Main bearing and auxiliary gear drivers

Key information:

- Suited for high-capacity wind turbine gears
- Compatible with Castrol Synthetic X 320 AD to extend oil life
- Approved by multiple OEMs

[1] The SRV friction (5ae) Test, 2016/2017.

[2] Sincro Mecánica Wind Oil Evaluation 2016.

[3] After 7 years field experience: FE8 – Roller bearing wear test for lubricating oils according DIN 51 819-3 (D-75/90-80) in 2016.

[4] Source: FZEG Mircropitting test 2010.

Castrol Optigear Synthetic CT 320 AD

Robust gear protection that optimises efficiency for less downtime

A premium synthetic oil for wind turbine operating in wide temperature ranges and under high loads. It delivers robust surface protection and reduces gear friction. Tested and proven in both the lab and the field by customers and independent experts, it gives wind farm operators control over their levelised cost of energy.

Castrol Optigear Synthetic CT 320 helps wind operators reduce their levelised cost of energy through:

Less Downtime

Through greater resistance to gearbox breakdown, simplified maintenance.

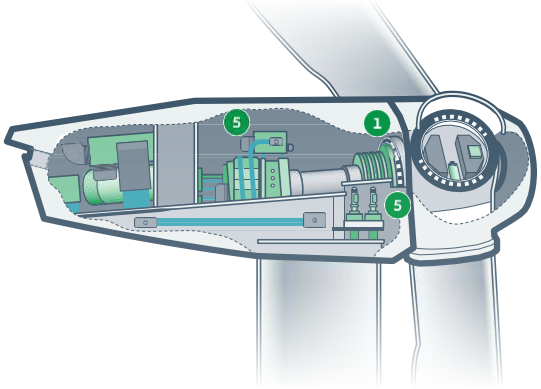
Greater efficiencies

Reduced foam and heat means less wear on the gearbox and makes energy generation more efficient.

Castrol Optigear Synthetic CT 320 AD

Key features

- Formulated with advanced ‘ashless’ technology that is proven to run up to 8°C cooler[1], providing consistent wear protection for many years of effective oil life[2].
- Tests have proven it generates up to 28% less foam[3] than competitors.
- Lower water content than competitors resulting in an extended Relative Bearing Life.



Lubrication points:

1. Main bearing
5. Main bearing and auxiliary gear drivers

Key information

- Suited for high-capacity wind turbine gears
- It has a wide operating range
- Often chosen by operators with mixed wind turbine fleets or complex maintenance schedules
- Approved by multiple OEMs
- Can be simply added to gearbox oil Castrol Optigear Synthetic CT 320 to replenish additives and ensures longer life from the oil.

Castrol Optigear Synthetic X 320 AD

Reduce levelised cost of energy even further

Oil condition depletion in turbines can cause problems for energy operators.
The need for oil changes presents challenging maintenance issues, but by extending the useful life of Castrol Synthetic X 320 beyond current expected service levels with our unique booster pack, wind operators can not only add financial value, it lowers the HSSE risk associated with oil changes.

[1] Calculated in UK trial with major wind OEM in 2017. Data approved and verified.

Our booster pack has been called 'a gamer changer for the wind industry' and will help deliver real benefits to your business:

Increase revenue

Eliminating just one oil exchange over the life of a turbine can save at least $4,300 per turbine, and, removing the need to change the oil means the turbine can remain operational and avoid the usual downtime of up to 4 hours.

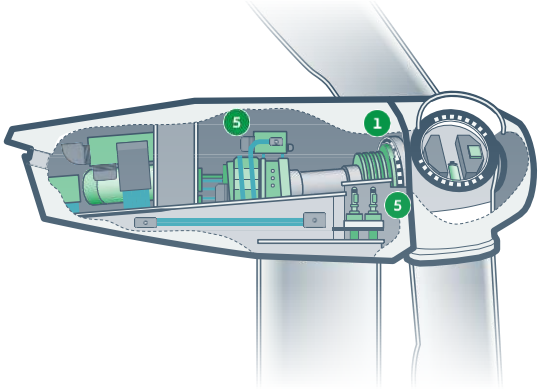
Ultimate protection

Less friction reduces heat and wear, providing greater resistance to gearbox breakdown.

Castrol Optigear Synthetic X 320 AD

Key features:

- Formulated with Plastic Deformation (PD) technology, which creates a protective layer on metal surfaces to reduce micropitting and wear, and potentially prolongs bearing life.
- PD technology has extremely low coefficient of friction even. Under severe load, components of PD are activated, initiating an improvement of surface friction characteristics through plastic deformation.
- Reduces critical gearbox stress, operating temperatures and wear.
- Significantly reduces further damage in pre-micropitted gears.



Lubrication points:

1. Main bearing
5. Main bearing and auxiliary gear drivers

Key information

- Suited for high-capacity wind turbine gears
- Can be simply added to gearbox oil Castrol Optigear Synthetic X 320 to replenish additives and ensures longer life from the oil.
- Approved by multiple OEMs

Castrol Tribol GR SW 460-1

Castrol Tribol GR SW 680-1

Protecting wind turbines critical components

Castrol Tribol greases are formulated to meet the many challenges that wind turbines, main bearings, pitch and yaw bearings face in tough environmental conditions. Both the greases adapt to offer outstanding bearing protection under high loads at low to moderate speeds, and in applications where water resistance is critical.

Adaptive protection for improved equipment reliability.

Reduce downtime and maintenance costs

Due to reduced wear, rust, corrosion and extended service life with longer intervals between re-lubrication.

Increase bearing life

Due to better wear control from axial thrust and a low coefficient of friction, the risk of pitting is reduced.

Easy to convert

Castrol Tribol GR SW 680-01 is compatible with Mobil® SHC 681 WT and all major grease products on the market, making conversion easy[1].

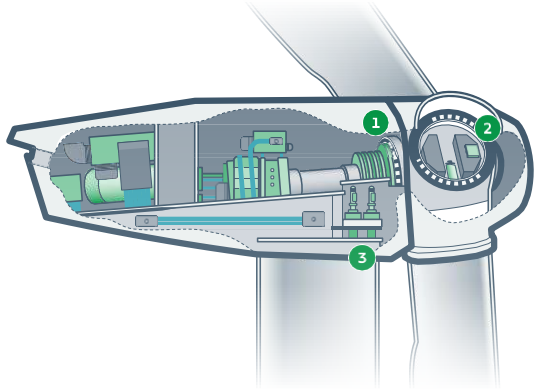
[1] Confirmed by Independent ASTM testing that the introduction of Castrol ® Tribol ® with existing manufacturer's grease will not cause a deterioration in performance.

Castrol Tribol GR SW 460-1

Castrol Tribol GR SW 680-1

Key features:

- Formulated with Plastic Deformation (PD) technology, which creates a protective layer on metal surfaces to reduce micropitting and wear, and potentially prolongs bearing life.
- PD has extremely low coefficient of friction. Even under severe loads, PD components are activated, initiating an improvement of surface friction characteristics through plastic deformation.
- Help reduce wear from static vibration, known as false brinelling, and from sliding motion due to axial thrust. These are the most prominent failure modes in wind turbine main bearings.
- Under strict, independent criteria, Castrol Tribol GR SW 680-1 demonstrated superior wear protection over the Mobil® SHC 681 WT.



Lubrication points:

1. Main bearing
2. Pitch adjustment
3. Yaw bearing

Key information:

- Castrol Tribol GR SW 680-1 is compatible with Mobil® SHC 681 WT
- Castrol Tribol greases are subject to availability
- Approved by multiple OEMs

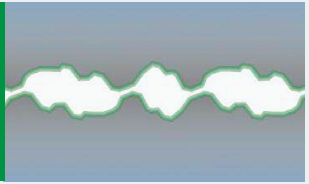
Please talk to your Castrol representative to find out more.

Plastic Deformation in action:

Step 1

Protection

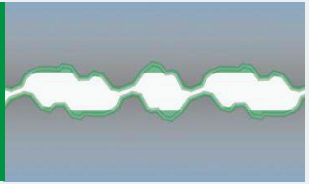
Protective layer forms immediately



Step 2

Compression

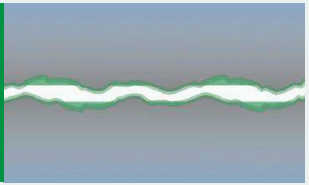
Protective layer compressed, reducing friction



Step 3

Micro-smoothing

Additives migrate into metal surface



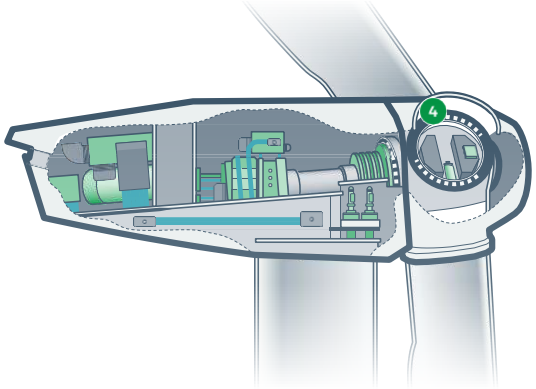
Castrol Hyspin AWH-M 32 Superclean

Maximum quality, minimum cost.

A hydraulic oil that contains a shear stable additive system which helps maintain the viscosity characteristics of the product over a wide temperature range even during prolonged use and imparts a very low pour point which enables the product to be used in very cold environments. It exhibits excellent corrosion and wear protection as well as outstanding thermal and oxidative stability.

Hyspin SY 32 Superclean

Castrol is introducing a synthetic hydraulic fluid targeted at extending oil life compared with mineral oil-based products, particularly for applications where asset management and the prevention of hydraulic component breakdown are critical, for example in the wind industry.



Lubrication points:

4. Hydraulic system

Meets the following industry standards:

- Filtered to ISO class 15/13/10
- DIN 51502 – HVLP
- ISO 6743/4
- Cincinnati Milacron P68
- Denison HF – 0
- US Steel 126 & 127
- Eaton (formerly Vickers) I-286-S & M-2950-S
- Bosch Rexroth RE90220

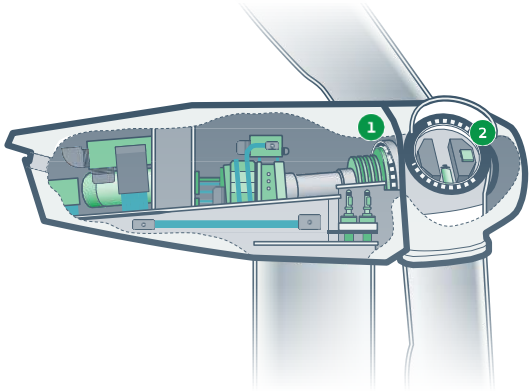
Key features and benefits:

- High viscosity index with low pour point enable use over a wide temperature range
- Excellent anti-wear performance provides extended wear protection for hydraulic pumps, reduces downtime and saves on replacement part costs
- Superior water separation provides prolonged lubricant life and increased equipment reliability
- Cleaner system with less frequent filter change

Type of system	Silt- sensitive control system with very high reliability
Typical component	High- performance servo valves
Sensitivity	Super critical

Castrol Spheerol LC 2 NG

A long-term heavy-duty grease for the lubrication of bearings in turbines.
Based on lithium-calcium thickener and mineral oil, this grease contains specially selected additives that provide outstanding wear protection, excellent corrosion prevention and long-term lubrication properties for many different areas of operation.



Lubrication points:

1. Main bearing
2. Pitch adjustment
3. Yaw bearing

Key features and benefits:

- Excellent water resistance: the lubricating film is not washed off even in the presence of water. Outstanding anti-wear properties protect equipment and help minimise bearing wear
- Superior mechanical stability: helps reduce product consumption in high-volume applications
- High dropping point: withstands breakdown in high-temperature applications. Resists oxidation and prevents corrosive activity on bearings in aggressive process water environments

The lubricant oracle

Explore our product range online 24/7

- Search by sector, product category or application for all your fluid needs
- Get product and safety data sheets
- Check out our high-performance reference guide covering all the need-to-knows of high-performance lubrication
- Register online access to OEM approvals

OEM gear oil approvals

For products in main drives

Castrol is chosen by many of the leading wind turbine manufacturers for first-fill when their machines first go out to market.

And we're the trusted supplier for thousands of wind farms who chose OEMs for their fleet, not just during the warranty period, but for the entire working life of their assets.

	Elckhoff	Winergy	ZF WPA	Moventas	NGC	CG Gearbox	Other / Unspecified
Generally approved	Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear Synthetic CT	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT	Castrol Optigear Synthetic CT	Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear Synthetic CT	Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear Synthetic CT		
GE Verona		Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear Synthetic CT	Castrol Optigear Synthetic CT	Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear Synthetic CT			
SGRE		Castrol Optigear Synthetic X Castrol Optigear Synthetic CT					
Vestas		Castrol Optigear Synthetic X Castrol Optigear Synthetic CT...NG	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT...NG	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT			
Suzion		Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear BM					
Senvion (historical)	Castrol Optigear Synthetic A Castrol Optigear Synthetic X Castrol Optigear Synthetic CT		Castrol Optigear Synthetic CT				
Nordex		Castrol Optigear Synthetic X Castrol Optigear Synthetic CT	Castrol Optigear Synthetic CT				
SE Wind	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT				Castrol Optigear Synthetic A Castrol Optigear Synthetic X	Castrol Optigear Synthetic A Castrol Optigear Synthetic X	
MHI			Castrol Optigear Synthetic CT				Castrol Optigear 1100

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OEM gear oil approvals

For products in use in China

Castrol is chosen by many of the leading wind turbine manufacturers for first-fill when their machines first go out to market.

And we're the trusted supplier for thousands of wind farms who chose OEMs for their fleet, not just during the warranty period, but for the entire working life of their assets.

	NGC	CN Gpower	DHHI	Nanfang Aviation	ZF	Winergy	QSY	Wangiiang	Other Unspecified
Envision	Castrol Optigear Synthetic X								
MingYang	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT			Castrol Optigear Synthetic CT					
SE wind	Castrol Optigear Synthetic X	Castrol Optigear Synthetic X				Castrol Optigear Synthetic X			
United Power	Castrol Optigear Synthetic X								
Sinovel	Castrol Optigear Synthetic X		Castrol Optigear Synthetic X		Castrol Optigear Synthetic X				
CNR	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT		Castrol Optigear Synthetic CT						
CSR	Castrol Optigear Synthetic X Castrol Optigear Synthetic CT						Castrol Optigear Synthetic CT		
CSIC	Castrol Optigear Synthetic CT	Castrol Optigear Synthetic CT						Castrol Optigear Synthetic CT	
HEAG	Castrol Optigear Synthetic CT	Castrol Optigear Synthetic CT							
Goldwind									Castrol Optigear Synthetic CT

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OEM grease approval matrix

OEM grease approval

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And we're the trusted supplier for thousands of wind farms who chose OEMs for their fleet, not just during the warranty period, but for the entire working life of their assets.

OEM applications	Nordex main bearing	GE main bearing	Timken main bearing	NTN main bearing
Grease	Tribol GR SW 460-1	Tribol GR SW 680-1 (Aftermarket approval. Full/first fill approval pending)	Tribol GR SW 460-1 & 680-1	Tribol GR SW 460-1 & 680-1

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Shared expertise

Sharing knowledge through expert technical advice, training and dedicated onsite support to help your operations run smoothly and efficiently.

Engineering and monitoring services

When maximising the whole life of your assets, no variable should be outside your control. Castrol's engineering, monitoring and lubrication products, tools and expertise combine to help you accurately predict component life and optimise maintenance cycles.

Talk to your Castrol representative. Services are subject to regional availability.

List of services:

- Monitoring software and hardware
- Inspection and software services
- Machinery diagnostics
- Condition monitoring retrofit

New efficiencies

Through digital automation, we share data and insights. Through equipment automation, we are helping replace inefficient manual processes. Combined, these new solutions help cut downtime, boost productivity and unlock value.

The lubricant oracle

Explore our product range online 24/7

- Search by sector, product category or application for all your fluid needs
- Get product and safety data sheets
- Check out our high-performance reference guide covering all the need-to-knows of high-performance lubrication
- Register online access to OEM approvals

Unlock new maintenance efficiencies through grease automation

With Castrol Tribol grease in Hove cartridges

- Simplify bearing protection with Castrol Tribol greases and Hove lubrication technologies
- Castrol's unique Plastic Deformation (PD) technology creates a protective layer on metal surfaces to reduce micropitting and wear, and potentially prolong bearing life
- Castrol Tribol GR SW 460-1 is designed to meet the many challenges that wind turbines face in tough environmental conditions – conditions where temperature and humidity can't be controlled, and where hard-to-reach locations result in long re-lubrication interval
- When used together with Hove advanced lubrication technologies, wind operators can unlock new maintenance efficiencies, keeping the machinery working at optimum efficiency, as well as increasing its operational life

Lubrication points:

1. Main bearing
2. Pitch adjustment
3. Yaw bearing

Key information:

- Castrol Tribol grease is approved by multiple OEMs
- Hove lubrication technologies are made to fit all grease points with custom hoses for specific WTG models

Unlock new maintenance efficiencies through grease automation

Key features of Hove lubrication technologies:

- Hove cartridges are designed for maximum durability and have been drop-tested according to MIL-STD-810H w/Change 1 standard, as of May 18, 2022. Their compact design ensures easy installation and removal, streamlining your maintenance processes
- When used with Hove pumps, operators can save up to 1.5 hours per service visit, significantly reducing manual errors and minimising the risk of contamination. With a variety of pumps available – whether you require high flow, high pressure, or both – Hove provides the right solution for your operational needs

Castrol Tribol greases and the Hove lubrication technologies will help wind operators:

Reduce downtime and maintenance costs

Automating traditionally manual tasks allows wind operators to save up to 1.5 hours per service visit, which can save up to 50% in labour costs for lubrication over 5 years[1].

Castrol Tribol greases help reduce wear, rust and corrosion, while extending service life through longer intervals between re-lubrication.

[1] Based on data provided by Hove for 100 turbines over 5 years.

Case Studies

Discover how Castrol has helped wind energy businesses like yours solve problems, create new efficiencies and increase productivity.

Cutting downtime

$215,000 of savings for a wind energy supermajor

Situation

Oil condition depletion in turbines was causing problems for one of the world's leading wind energy operators. The need for oil changes presents challenging maintenance issues – from significant financial outlay, operational downtime and investment of important resources.

Solution

Smart top-ups keep turbines turning. Castrol Optigear Synthetic X 320 AD, a premium synthetic oil for wind turbine gears, was added to the company's wind turbine main gearbox oil to replenish the additives. The top-up technology is fully compatible with the first fill gear oil, Castrol Synthetic X 320 in 2007, providing a new lease of life with no need for a time consuming, costly oil change.

Outcome

The top-up technology is fully compatible with the Optigear Synthetic X 320 fluid added to the turbines in 2007, providing a new lease of life with no need for a time-consuming, costly oil change.

- Less demand on technician time
- Reduced risk of oil spillage
- Longer oil life
- Avoiding complex hazardous waste removal and disposal processes
- Better employee safety for wind technicians
- Up to 1% higher energy efficiency

Savings**

$215,000 saved

Eliminating just one oil exchange over the life of a turbine saves at least $4,300* per turbine.

The supermajor has topped up 50 turbines with Castrol Optigear Synthetic X 320 AD.

4-hour

shutdown avoided

Removing the need to change the oil means the turbine can remain operational and avoid the usual downtime of 4 hours.

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*Calculated in the UK trial with major wind OEM in 2017. Data approved and verified.

**Based on Castrol Optigear Synthetic X 320 AD being used on the top-up of 50 turbines to date, each turbine can save $4,300 through elimination of oil change (significantly more for offshore farms).

Extending oil life

Castrol Optigear Synthetic X 320 AD

Situation

Changing main gearbox oil is a complex maintenance task – involving cost, logistical planning for new and flushing oil, technician labour in hot, humid conditions, used-oil disposal, spill risk and environmental impact. Offshore turbines compound these challenges. Even with high-quality pure PAO synthetic gear oils offering extended drain intervals, a step change in oil technology is needed.

Solution

- A major wind OEM has used Castrol Optigear Synthetic X 320 globally since 2011, progressively extending the initial 5-year calendar-based gearbox oil change interval.
- Castrol developed an additive boost package – Optigear Synthetic X 320 AD – that can be simply added to the main gearbox oil to replenish additives and keep the oil fit for further use.
- In-depth analysis by Castrol and the OEM's Project Engineer confirmed via field data that a further interval extension was possible using Castrol Optigear Synthetic X 320 AD.

Outcome

- Based on test data from field trials, Castrol Optigear Synthetic X 320 AD can eliminate one (or two depending on the turbine type) main gearbox oil changes over the life of the turbine.
- Cost savings in eliminating one main gearbox oil change for each turbine include taking technician time, oil fill cost and lost turbine revenue into account.
- Only tangible savings have been considered, other positives such as increased operator safety and minimised environmental risk are also beneficial.
- Implementing this cost saving will involve updating maintenance schedules but with no other significant outlay. The cost saving can be implemented very quickly.

“This is a

game-changer

for the wind industry.”

Reduced carbon footprint, reduced HSSE risk and a reduction in LCOE.

Castrol’s innovative additive boost package can be used to extend the useful life of Castrol Optigear Synthetic X 320 even further than before.

Removing at least one main gearbox oil change during the lifetime of each turbine can result in significant cost savings.

Reducing oil usage, as well as using a certified carbon neutral oil for initial fill, helps to minimise the turbines impact on the environment.

Major Wind OEM

Castrol

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Maximise quality, minimise cost

Castrol Optigear Synthetic X 320 | Castrol Hyspin AWH-M 32 Superclean

Situation

Gear oils were delivered to a central customer facility and spot checks carried out to ensure cleanliness met specification before shipping to the point of use.
Hydraulic oils were delivered to the same facility, but shipped internally for re-filtering in the central facility before being returned to the initial location until demand called for transport to the final destination.
As well as high internal transport costs, a significant cost was attributed to the sampling and filtering of the oils. Further costs could be seen in filter cartridge disposal and CO2 emissions for the internal transportation of products.

Solution

- After receiving a clear brief from the customer, a virtual team was formed to ensure timely project delivery.
- Global Supply Chain within Castrol was consulted and it was quickly agreed that cleanliness on delivery was possible.
- A final agreement was reached a few months after the initial project launch, to guarantee cleanliness on delivery.

Outcome

- Using the Castrol gear and hydraulic oils meant that a guarantee of cleanliness on delivery could be reached very quickly.
- Historical sample analysis data verified the quality of Castrol lubricant deliveries, building confidence that the project could be delivered.
- The cost savings to the customer are based on minimising costs associated with filtration, including administration, handling, man hours and maintenance, and significantly reduced transportation costs between facilities which has the added benefit of reducing overall CO2 emissions.
- Indirect benefits post-implementation include increased flexibility, improved global processes and support, and reduced internal processing costs.

"Finalising this project has hugely reinforced our confidence and trust in Castrol as a long-term partner, and has delivered considerable savings to us."

Castrol delivers quality products, which can minimise internal costs.

Trusting Castrol to deliver quality means less resource is used on non-core activities.

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Let’s move
forward
together
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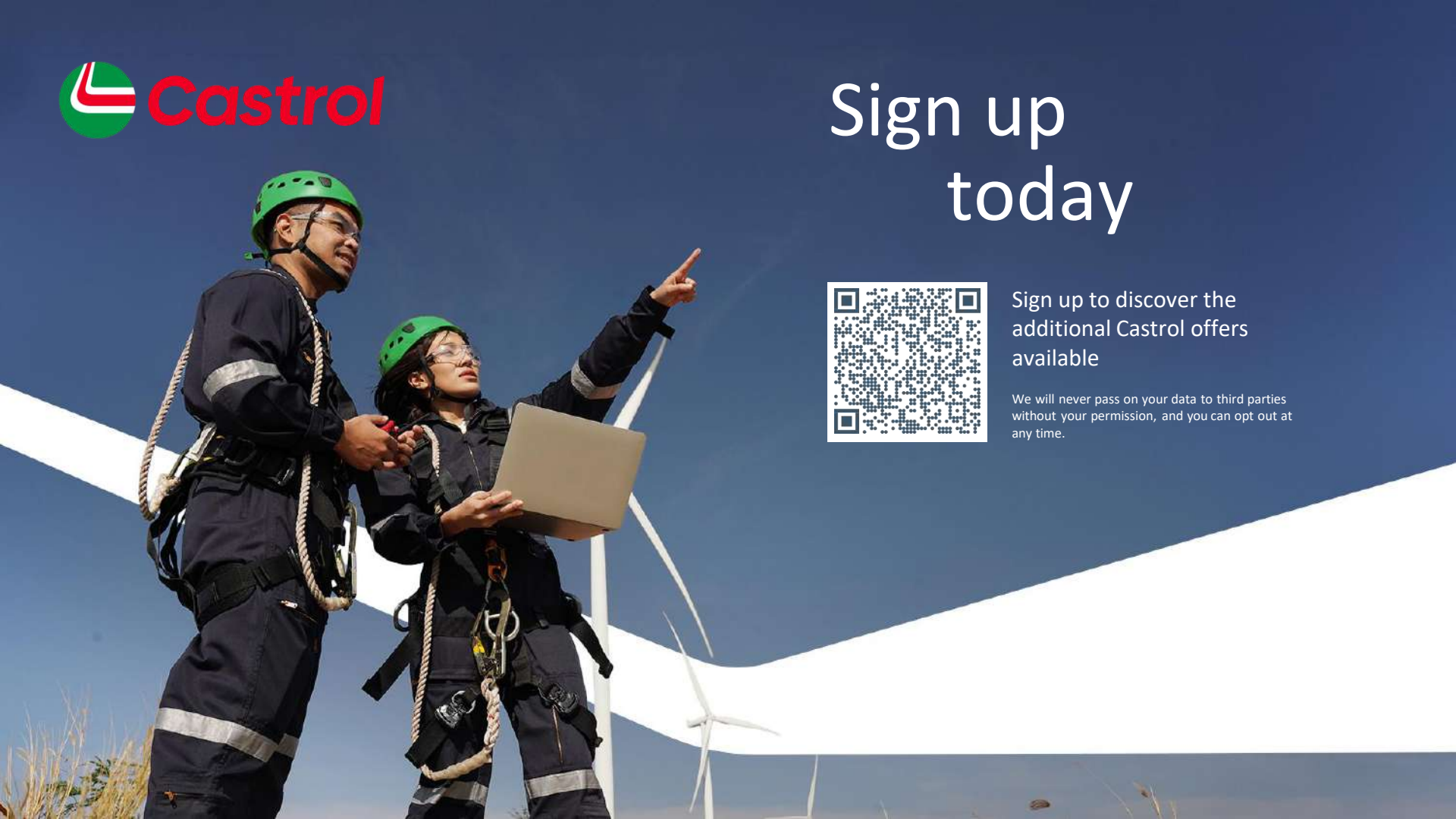
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