METALTEC

METAL WORKING FLUIDS

high performance
range of specialist
metalworking
products

AZTEC OILS
THE LUBRICATION SPECIALISTS

Produced in the UK

DEVELOPING & SUPPLYING QUALITY LUBRICANTS
30 YEARS
1995 · 2025

METALTEC is a complete range of metalworking products comprising of water-soluble metalworking fluids, neat metalworking fluids and corrosion preventatives. We know selecting the correct metalworking fluid which has the right balance of safety and performance is an important step in protecting employees and improving productivity. Our products ensure compliance with the latest HSE guidelines whilst assisting in maximising efficiency to help keep running costs low.

- Many of our products are compatible with multiple metals to help reduce stock inventories and mitigate the risk of incorrect product selection.
- Downtime will be reduced, leading to increased production and lower maintenance costs.
- Greater biological stability allows longer fluid lifetimes, lower fluid consumption, less downtime and lower costs.
- The correct MWF will maintain the workpiece surface finish whilst extending tool life, reducing the necessity for additional finishing operations to save time and help minimise costs on purchasing and installing new tools.

SOLUBLE CUTTING OILS

METALTEC MIRACOOL

Water miscible or soluble metalworking fluids:

There are detailed discussions in the industry with regards to the components used in metalworking fluid and the impact they have of the environment as well as the health of the operator. The **MIRACOOL** range has been designed to be free of chemistries such as formaldehyde release biocides while giving the option to use boron derived or boron free chemistries to extend product life and provide corrosion protection.

What is a water soluble MWF?

Water soluble metalworking fluids usually come in concentrated form and are designed to produce an emulsion when they are mixed with water, they are very popular in industry due to their affordable costs and the advantages they can offer in many machining and grinding processes. They are often grouped into three distinct categories; milky, semi-synthetic and synthetic.

What makes choosing the right product so important?

The selection process for choosing a soluble metalworking fluid can involve multiple aspects such as surface finish, tool wear, metals, type of machining, make up water but with the priority always being the health, safety and wellbeing of equipment operators.

- **MIRACOOL 100 SERIES**

The first most common metalworking fluid is known as a 'Soluble Oil', 'Suds' or 'Milky Soluble' as the concentrate has a high oil content (>60%) and forms an opaque white emulsion which is 'milky' in appearance. Suitable to use on a variety of materials and machining applications and is commonly used for general purpose machining.

- **MIRACOOL 200 SERIES**

Semi-synthetic metalworking fluids tend to produce a semi-translucent (hazy but not quite transparent) appearance when mixed with water, this is often called a micro emulsion. They have a lower mineral oil content (10% - 50%) and combine Xother chemical compounds to provide lubricity. These fluids have a lower tendency to foam, offer more resistance to tramp oil, provide a longer life and leave less oil on the work piece when compared with their high-oil counterparts. This enables them to be better suited to higher-performance, higher-pressure applications.

- **MIRACOOL & MIRAGRIND 300 SERIES**

Synthetic metalworking fluids do not contain any oil and instead rely on synthetic and often water-soluble polymers to provide lubricity. These polymers are temperature sensitive so work best when the fluid, or more precisely, the cutting-edge increases in temperature. As there is no oil contained in these fluids and so they do not require the same amount of detergent emulsifiers, resulting in a much lower potential to foam. This makes synthetic fluids ideal for very high-performance, high-pressure cutting applications.

- **MIRACOOL 600 SERIES**

High-performance cutting fluids that are focused on meeting the specific requirements of machining aluminium and aerospace alloys.

- **MIRACOOL SERIES NUMBER:**

100 = High oil content/general purpose
200 = High-performance semi-synthetic
300 = Ultra-performance fully synthetic
600 = Specialist aerospace alloys & aluminium

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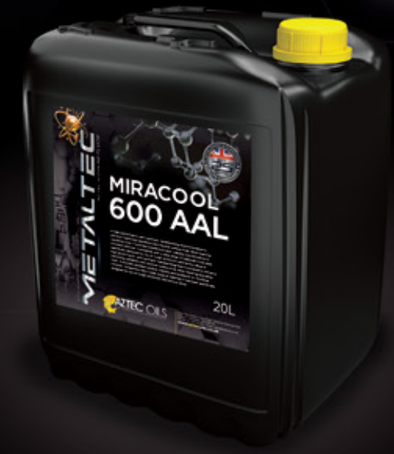

Product Code	Product	Product Description	Contains Boron	Emulsion Appearance	Metals
SOL048	**MIRACOOL 101 NP**	High oil content soluble - General purpose	No	White Opaque (Milky)	Ferrous, Aluminium, Yellow
SOL037	**MIRACOOL 200 SR**	Semi-synthetic - General purpose	Yes	Translucent	Cast Iron, Ferrous, Aluminium, Yellow
SOL041	**MIRACOOL 201 XFP**	Semi-synthetic Premium high performance	No	Semi-translucent	Ferrous, Aluminium, Aluminium Alloys, Yellow, Nickel, Tungsten, Titanium
SOL034	**MIRACOOL 203 SM**	Semi-synthetic - Softer metals, good hard water performance	No	Semi-translucent	Ferrous, Aluminium, Yellow
SOL039	**MIRACOOL 204 HP**	Semi-synthetic - Cast iron	Yes	Translucent	Cast Iron, Ferrous
SOL038	**MIRACOOL 205 HW**	Semi-synthetic - Hard water	Yes	Semi-translucent	Ferrous, Aluminium, Yellow
SOL040	**MIRAGRIND 300**	Synthetic grinding fluid	No	Transparent	Ferrous, Aluminium, Yellow, Nickel, Titanium
SOL036	**MIRACOOL 301 FS**	Synthetic cutting fluid	No	Transparent	Ferrous, Aluminium, Yellow
SOL043	**MIRAGRIND 302 TC**	Synthetic grinding fluid, carbide grinding	Yes	Transparent	Ferrous, Aluminium, Yellow
SOL042	**MIRACOOL 600 AAL**	Semi-synthetic - Premium high performance aluminium/aerospace	Yes	Translucent	Aluminium, Aluminium Alloys

Products are not classified as carcinogenic under the regulations relating to formaldehyde release biocides.

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NEAT METAL WORKING FLUIDS

METALTEC MIRACUT
Neat Metalworking Fluids:

Neat metal working fluids consist of cutting, forming and drawing oils that are not miscible in water. They are manufactured from a blend of high-quality base oils, various performance, anti-wear, lubricity and anti-mist additives.

Our MIRACUT range utilises a combination of high-performance esters, phosphorus and sulphur additive technology, although caution should be taken with active sulphur as this can cause staining on yellow metals. Active sulphur is often required in the heavier machining or forming operations that are carried out on ferrous metals, where it is needed to provide additional lubricity under high loads.

Historically, chlorinated lubricity additives have been used throughout the industry as one of the major lubricity components, with a few applications proving difficult to find an alternative. Due to health, safety and environmental reasons short and medium chained chloro-paraffins are not used in the MIRACUT range, instead we only offer products based on the longer chain molecules.

Alternatively, we offer high-performance chlorine-free products to ensure compliance & help minimise disposal costs. MIRACUT makes use of an array of alternate additive technologies and compounds to remain at the forefront of changes in legislation.

Product Code	Product	Operation Severity	Applications	Materials	Viscosity @40°C, cSt	Colour	Chlorine	Sulphur	Active Sulphur	Ester	Flash Point °C
Chlorine-Free											
NEAT033	**MIRACUT CF 5 AL**	Light	Light machining	All Materials	5	Straw	No	No	No	Yes	>130
NEAT042	**MIRACUT CF 8**	Medium	Deep hole drilling, general machining, honing	All Materials	7	Straw	No	Yes	No	Yes	>130
NEAT011	**MIRACUT CF 15**	Medium/ Heavy	General machining	All Materials	15	Straw	No	Yes	No	Yes	>150
NEAT010	**MIRACUT CF 25**	Medium/ Heavy	General machining	All Materials	25	Straw	No	Yes	No	Yes	>150
NEAT048	**MIRACUT CF 30 FS**	Heavy	Tapping, thread cutting, general machining	Ferrous only	26	Amber/Brown	No	Yes	Yes	Yes	>150
NEAT032	**MIRAFORM CF 40 FS**	Heavy	Drawing, forming, cutting	Ferrous only	34	Amber/Brown	No	Yes	Yes	Yes	>180
NEAT078	**MIRAFORM CFD 100**	Heavy/Severe	Drawing, forming, cutting	Ferrous only	100	Dark Amber	No	Yes	Yes	Yes	>180
NEAT079	**MIRAFORM CFD 220**	Heavy/Severe	Forming, drawing, swaging	Ferrous only	220	Dark Amber	No	Yes	Yes	Yes	>180
NEAT074	**MIRAFORM CF 250 FS**	Heavy/Severe	Forming, drawing, swaging	Ferrous only	250	Brown	No	Yes	Yes	Yes	>180
Chlorinated											
NEAT043	**MIRACUT HC 3**	Light/Medium	Honing, fine finishing	All Materials	7	Clear	Yes	No	No	Yes	>130
NEAT008	**MIRACUT C 8**	Medium	Deep hole drilling, general machining	All Materials	8	Straw	Yes	Yes	No	Yes	>151
NEAT061	**MIRACUT C 15**	Medium/Heavy	General machining	All Materials	15	Straw	Yes	Yes	No	Yes	>150
NEAT071	**MIRACUT C 20 FS**	Medium/Heavy	General machining of ferrous metals, highly active EP	Ferrous Only	23	Amber	Yes	Yes	Yes	No	>150
NEAT012	**MIRACUT C 25**	Heavy	General machining	All Materials	25	Straw	Yes	Yes	No	Yes	>150
NEAT036	**MIRACUT C 30 FS**	Heavy	Tapping, thread cutting, swaging, general machining	Ferrous only	30	Dark brown	Yes	Yes	Yes	Yes	>180
NEAT039	**MIRADRAW C 90**	Heavy	Heavy drawing lubricant	All Materials	90	Colourless	Yes	No	No	No	>200
NEAT031	**MIRADRAW C 100**	Heavy	Drawing, forming, cutting	All Materials	100	Staw	Yes	No	No	No	>180
Vanishing & EDM											
NEAT064	**MIRAFORM V 40**	Light	Stamping, vanishing lubricant	All Materials	2	Light Straw	No	No	No	Yes	>40
NEAT022	**MIRAFORM V 60**	Light	Stamping, vanishing lubricant	All Materials	2	Light Straw	No	No	No	Yes	>62
NEAT058	**MIRAFORM V 6/2**	Light	Stamping, vanishing lubricant	All Materials	2	Light Straw	No	No	No	Yes	>62
NEAT049	**MIRACUT EDM 2**	Light	Spark erosion dielectric Fluid (Electric Discharge Machine)	All Materials	2	Colourless	No	No	No	No	>62
NEAT004	**MIRACUT EDM 3**	Light	Spark erosion dielectric Fluid (Electric Discharge Machine), honing cast iron, HS machine non-ferrous	All Materials	4	Colourless	No	No	No	No	>100
Biodegradable & Chlorine-Free											
NEAT063	**MIRAFORM BIO 8 ME**	Light	Light machining	All materials	8	Straw	No	No	No	Yes	>130
NEAT055	**MIRACUT BIO 10**	Medium	Turning, milling, deep hole drilling	All Materials	10	Straw	No	Yes	No	Yes	>130
NEAT072	**MIRACUT BIO 20**	Medium/Heavy	Turning, milling, general machining	All Materials	20	Straw	No	Yes	No	Yes	>150
NEAT073	**MIRACUT BIO 30**	Heavy	Turning, milling, thread cutting, broaching, general machining	All Materials	35	Straw	No	Yes	No	Yes	>200
NEAT041	**MIRACUT RSO**	Light	Light machining	All Materials	36	Straw	No	No	No	Yes	>200

Series suffix: C = Chlorinated Bio = Biodegradable CF = Chlorine Free FS = Ferrous Materials Only

RUST PREVENTATIVES

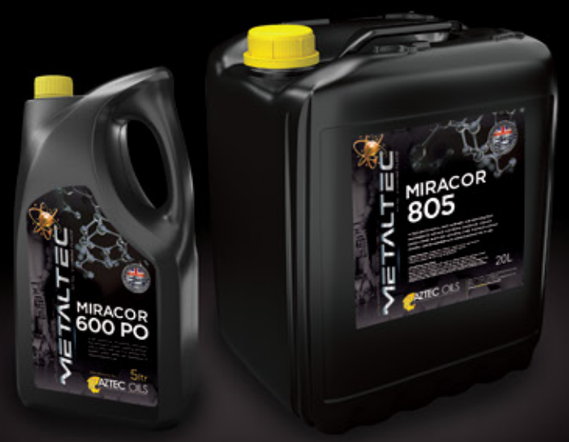
METALTEC MIRACOR
Corrosion Preventatives:

Traditional highly volatile solvent-based products have been reformulated using less volatile paraffinic diluents so they are no longer classified as flammable, this means our MIRACOR products are not classified under CLP as GHS02 Flammable, making them easier to store and transport. Extensive research has ensured that they rapidly displace water from components after machining whilst leaving an excellent protective and corrosion resistant film.

We can offer the following corrosion preventatives depending on the desired protective film type;

- **Oily** (MIRACOR 600 series)
- **Grease** (MIRACOR 700 series)
- **Soft-Wax** (MIRACOR 800 series)

The oil based MIRACOR 630 PL is a dual-purpose fluid, it has been meticulously developed as a sheet corrosion preventative whilst providing excellent pressing performance, this reduces the number of process and fluids required, crucially saving both time and money.



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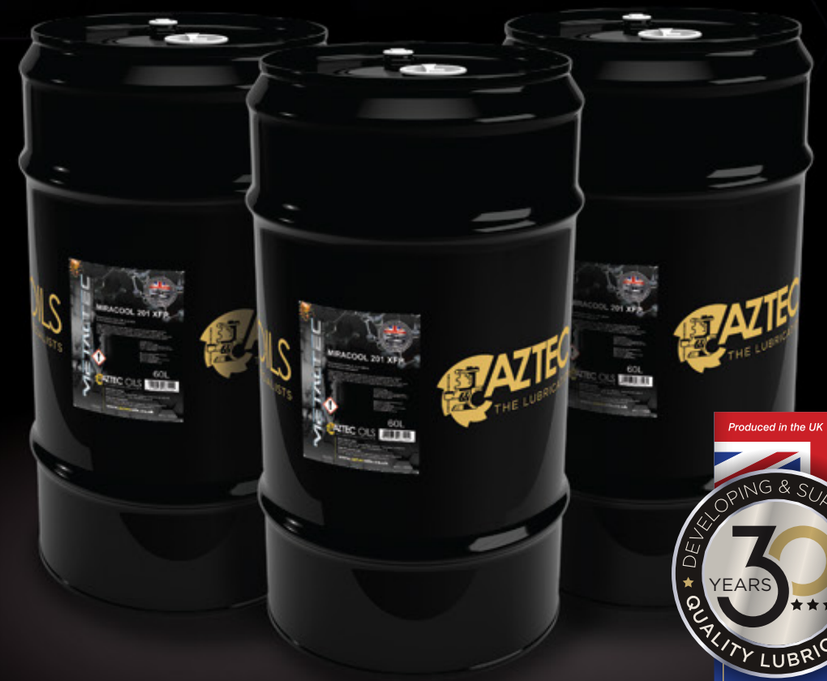
NOW AVAILABLE IN
60L BARRELS



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Contact:
Technical@aztecoils.co.uk
for assistance with selecting the best product to suit your requirements.

Product Code	Product	Description	Film Type	Solids Content %	Diluent Flash Point °C	Dewatering	Corrosion Protection Indoor Months	Corrosion Protection Outdoor Months
RUS009	**MIRACOR 600 PO**	Solvent deposited thin oily film penetrating oil	Oil	10	>62	Yes	3 to 6	--
RUS012	**MIRACOR 610**	Solvent deposited oily film dewatering fluid	Oil	30	>62	Yes	6	3
RUS018	**MIRACOR 625**	Oil based rust preventative, sheet coating oil	Oil	100	>180	No	6	3
RUS030	**MIRACOR 630 PL**	Oil based rust preventative with pressing performance	Oil	100	>180	No	18	6
RUS022	**MIRACOR 700**	Solvent deposited thin greasy film dewatering fluid	Grease	8	>62	Yes	8	3
RUS032	**MIRACOR 710**	Solvent deposited medium greasy film dewatering fluid	Grease	30	>62	Yes	18	9
RUS015	**MIRACOR 805**	Solvent deposited soft waxy film	Soft Wax	20	>62	Yes	12	6
RUS027	**MIRACOR DW**	Dewatering fluid, no film	--	0	>62	Yes	--	--
RUS014	**MIRACOR SCAFFTECT**	Short term corrosion protectant for scaffolding poles	Oil	30	>62	Yes	--	1

600 number is oil film **700** number is grease film **800** number is wax film

METALTEC
METAL WORKING FLUIDS

Soluble Metalworking Fluids: Best Practice

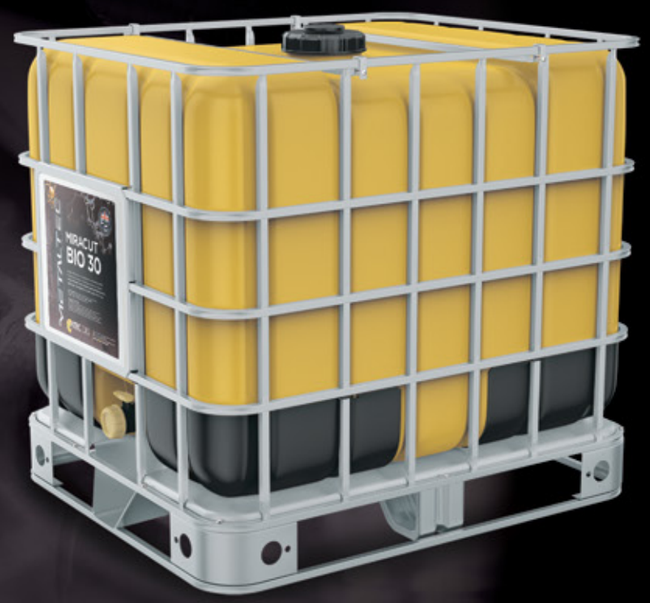
Cleaning

- Add system cleaner to the old fluid at the recommended dosage and circulate through the system for at least 8 hours prior to draining. Machining can continue during this period.
- When cleaning remember to remove the swarf from the tank as this can provide a source of re-infection.
- The water source may be contaminated with bacteria, it is therefore important to ensure the freshly made emulsion is monitored from make-up

Before using the soluble metalworking fluids, it is advised to consult the Metal Working Fluids section of the **Government HSE website** or the **UKLA guide.**

Mixing soluble MWFs

- When selecting a product, it is important to consider the water quality, in particularly the water hardness as this can affect foaming and emulsion stability.
- Use a good quality water source that has not been left stagnant to avoid introducing bacteria into the system.
- Tap (towns water) or demineralised/deionised water can be used but avoid very cold water on makeup, if possible, to aid mixing.
- **Always add the metalworking fluid concentrate to water with agitation to avoid gelling or splitting of the emulsion.**
- To ensure the best performance, use a mixer tap or dosing unit to ensure a constant concentration.
- Before using the emulsion check that the pH and concentration are within the recommended limits. Remember to continue regular maintenance checks including dip slides to monitor any microbial infection.



Maintenance

- If replacing the cutting fluid, ensure that the sump has been cleaned & sterilised by using a system cleaner before introducing fresh emulsion.
- Coolant management charts are recommended for each machine to track the condition of the fluid at regular intervals for trend analysis. A deteriorating trend can be clearly observed so intervention can easily be made before it becomes an issue.
- Carry out regular and routine maintenance checks on your fluid:
    - **Appearance** – Emulsion stable? Colour? Does tramp oil separate on standing?
    - **Odour** – Foul odours are an indication of microbial activity.
    - **pH** – Microbial activity produces short chain acids that neutralise the alkali reserve of your metalworking fluid. This can cause corrosion and emulsion instability, in turn shortening the lifespan of the fluid. The pH should be >8.5, ideally >8.8 to achieve galvanic corrosion protection.
    - **Concentration** – A product has been designed to work at its recommended concentration so it is important to maintain the correct concentration to maximise product life.
    - **Dip Slides** – These are the classic means to monitor microbial infection. There are several different brands, but all include instructions.
- Water hardness and chlorides may also be useful to monitor depending on the water quality.
- When required, always top up with mixed emulsion and not just water, this will ensure emulsion stability.
    - To increase concentration, use a high concentration mix.
    - To reduce concentration, use a more dilute mix.
- Check that tramp oil is less than 2%, the use of a belt or disk skimmer is recommended.
    - Tramp oil can promote bacterial growth, result in aerosols and splitting of the emulsion.
- Keep fines and dissolved metals within controlled limits.
- Keep records of all fluid monitoring tests for five years.

Storage

- Packaging should not be left exposed to elements and drums should be laid horizontally to prevent contamination.
- Store product's indoors and avoid fluctuations in temperature.
- We recommend to store MIRACOOL products between 5°C and 40°C.

Handling

- Wear suitable PPE – gloves, overalls, goggles etc.
- Cover any cuts or abrasions, ensure the dressing is waterproof.
- Avoid contact with metalworking fluids where possible.
- Wash hands with soap and water, especially before eating and drinking.
- Use barrier and after-work creams to help restore the skin's natural moisture.

Troubleshooting

Short fluid life

- This could be caused by several factors, commonly caused by contamination or poor housekeeping and fluid maintenance.

Bad smell

- Foul odours are typically caused by high levels of bacteria which also reduce fluid life and increase risks of respiratory problems.
    - Keeping the concentration at the correct level will help to prevent bacterial growth.
    - Depending on the level of bacteria, the system may require full clean-out and re-fill with fresh product.
    - Switching to a semi synthetic product or one with boron-based chemistry will help prevent the growth of bacteria.

Corrosion to machine beds or components

- Corrosion can be caused by using an incorrect product or a change in water quality, inadequate fluid concentration or be a result of contamination.

Foaming

- Foaming is often caused by soft water, contamination or air entrainment due to pump cavitation.
    - Make sure the correct product and water type is suitable for the application.
    - Keeping the concentration at the correct level helps prevent foaming.

Poor tool life

- If application is more arduous a product with better lubricity may be required.
- Fluid concentration drops, this will mean there is a lower lubricity content.
    - Check and monitor records, make the necessary adjustments to the MWF concentration.

Skin irritation

- High concentration, bacteria, and too much contact with the metalworking fluid can all contribute to skin irritation.
    - Keep direct contact with the fluid to a minimum, wash hands and wear appropriate PPE.

Equipment explained

Refractometer

- A refractometer quickly determines the concentration of the metalworking fluid.
- It does this by measuring the amount of light that travels through the fluid on a %Brix scale.
- A trend analysis can then be recorded.

Litmus paper or pH indicator strips

- pH is measured on a scale of 0-14 and most metalworking fluids are designed to be alkaline (i.e. pH 7-10).
- Contamination can hinder the pH leading to microbiological growth (bacteria, yeast and fungi) which produce acids and lower the pH. This causes instability and aerosols putting operators and personnel at risk.

Dip slides

- Dip slides are recommended as an essential and simple item to effectively measure the growth of bacteria, fungi and yeast.
- A dip slide contains growth media on both sides to support the growth of bacteria on one side and fungi on the other.
- The amount of growth expressed in CFU/gram can be obtained by comparing with a scale that accompanies the box of dip slides.

Incubator

- To allow a more accurate indication of bacteria, yeast and fungal growth an incubator is recommended to store dip slides after use to allow incubation at the correct temperature.
- It is usually recommended to set the incubation temperature between 25-37°C.
- 24-48 hours before reading bacteria and 3-5 days for fungi.

Tramp oil skimmer

- An excess of tramp oil can lead to fluid instability but also promotes the growth of bacteria.
- Skimmers or vacuum systems can all be used to remove surface oil.

Mixer tap

- A mixer tap will ensure that you use the correct concentration/dilution of metalworking fluids in line with supplier recommendations.
- The dilution can be adjusted to ensure it is as effective as possible.

Swarf/fines removal

- A spinner can help to reduce metalworking fluid usage as it allows for the segregation of waste metal.
- A magnetic swarf collector tool will collect fines.
- In addition the fluid can often be recycled for use reducing MWF costs.

Aztec Oils on hand to support you

Aztec Oils are proud to offer premium levels of assistance to all our customers. We have a dedicated Technical Support team on hand to offer guidance on the correct use of our products.

Our expert team in our on-site laboratory continually test the quality and compliance of all our lubricants so our customers know that Aztec Oils is a brand they can trust.

Email: **Technical@aztec**oils.co.uk

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