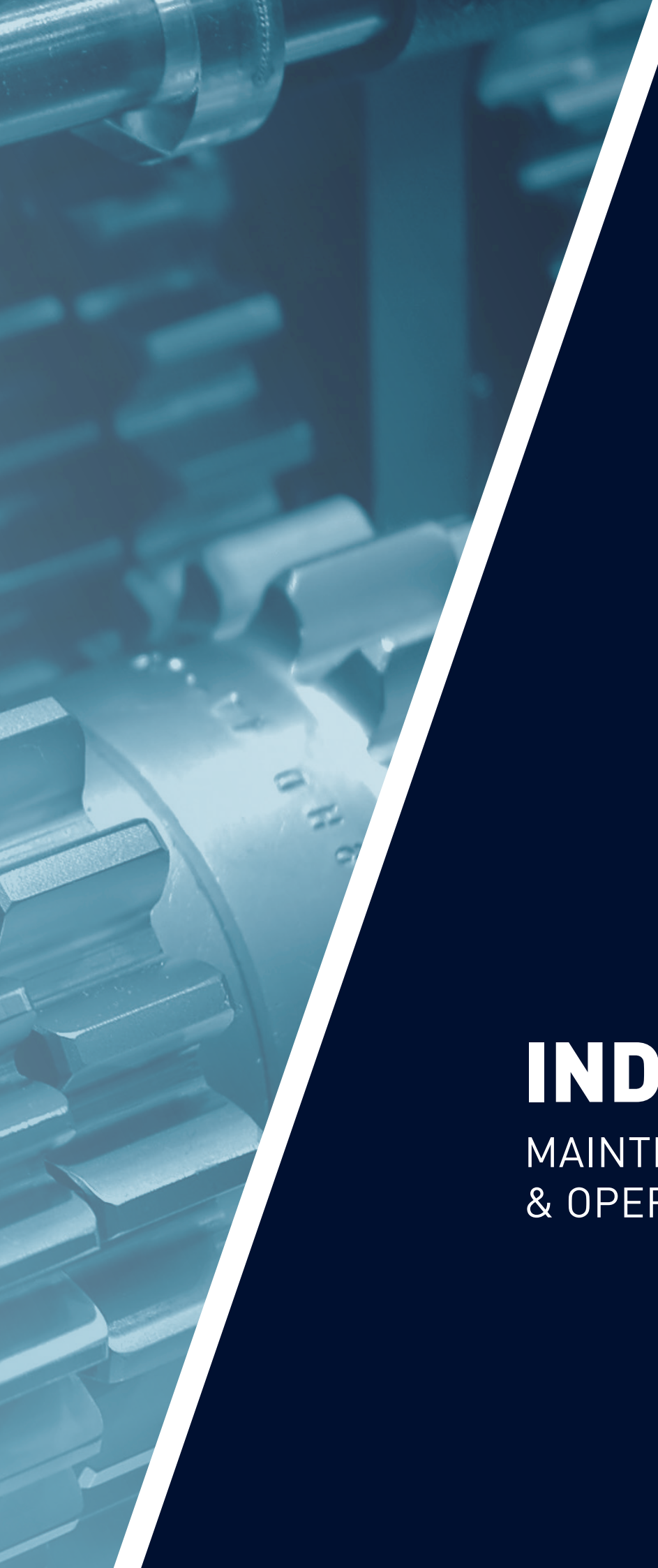


MILLERS OILS

INDUSTRIAL

MAINTENANCE, REPAIR & OPERATIONS

INTRO

The Millers Oils range of industrial lubricants for Maintenance, Repair & Operations covers a huge variety of lubrication needs. From general purpose oil, to extreme pressure grease — or even energy efficient hydraulic oil, Millers Oils has a product for the application.

We also understand the constant pressures our customers are facing — to reduce costs, increase efficiency, reduce unplanned down-time, decrease energy consumption — all while maintaining a safe working environment for employees.

We offer not only an extensive range of high quality industrial lubricants, but also a comprehensive fluid management service,
Millers-Xtra, to give you peace of mind and allow you to focus on your core business.

CONTENTS

HYDRAULIC OIL

The Millmax range of hydraulic oils maximises power in hydraulic applications whilst protecting from corrosion and wear for extended component life.

Product name	ISO viscosity grades	Description	Specifications*
Millmax	22, 32, 46, 68, 100, 150	HM type hydraulic fluid for use in applications where reliable anti-wear and corrosion protection are required.	ISO 11158 HH, HL & HM DIN 51524 part II Parker (Denison) HF-0, HF-1 & HF-2
Millmax ZF	32, 46, 68	HM type hydraulic fluid for use in applications where reliable zinc-free anti-wear and corrosion protection are required, e.g. ashless product is specified, or silver/ yellow metal components involved.	ISO 11158 HH, HL & HM DIN 51524 part II
Millmax Longlife	46	HM type hydraulic fluid for use in applications where anti-wear, corrosion protection are required. Outstanding oxidation stability doubles the life of the oil compared with standard HM type fluid, for increased oil drain intervals and reduced down-time.	ISO 11158 HH, HL & HM DIN 51524 part II Parker (Denison) HF-0, HF-1 & HF-2
Millmax HV	15, 22, 32, 46, 68, 100	HV type hydraulic fluid for use in applications subject to a wide temperature range, where a high viscosity index, anti-wear and corrosion protection are required.	ISO 11158 HH, HL, HM & HV DIN 51524 part II & part III Parker (Denison) HF-0, HF-1 & HF-2
Millmax SYN	46	Synthetic hydraulic fluid with high viscosity index, ideal for system where cold start-up and/or very high operating temperatures	Synthetic hydraulic fluid with high viscosity index, ideal for system where cold start-up and/or very high operating temperatures
Millmax SE Bio	15, 32, 46, 68	Fully synthetic biodegradable hydraulic fluid based on modern ester technology. Classified as a Hydraulic Environmental Ester Synthetic type fluid (HEES).	DIN 51524 part II & part III
Millmax HFD(U)	46, 68	HFD(U) type, ester-based biodegradable and fire resistant hydraulic oil.	DIN 51524 part II & part III
Millmax FRG	46	HFC type, water glycol fire resistant hydraulic fluid.	

*For full details on performance profiles and specifications please refer to the technical data sheet.

Our Longlife and HV products are also available in ZF grades.

PRODUCT FOCUS

MILLMAX SE BIO

fully synthetic biodegradable hydraulic fluid. Classified as a Hydraulic Environmental Ester Synthetic type fluid (HEES).

Key features & benefits

- Readily biodegradable, ideal for use in environmentally sensitive applications.
- Exceptional lubricity for maximised protection and component life.
- Excellent oxidation stability extends oil life and service intervals.
- Very high viscosity index and low pour point for wide operating temperature range.
- Can be used with system designed for mineral oils with no modifications or loss of performance.

SPINDLE OIL

Product name	ISO viscosity grades	Description
Millmax	2, 5, 10, 15	High speed spindle lubrication where anti-wear and corrosion protection are required. Ideal for machine tool spindles and certain hydraulic applications.

GEAR OIL

The Millgear range of industrial gear oils provide excellent protection against wear.

Product name	ISO viscosity grades	Description	Specifications*
Millgear EP	68, 100, 150, 220, 320, 460, 680	Mineral based gear oils with extreme pressure additive technology for lubrication and protection of gear teeth, even under high load. Ideal for spur, helical and bevel gears. Benefits: • Outstanding extreme pressure protection for reduced wear and extended equipment life. • Good thermal stability for increased oil life and relubrication intervals. • Consistent film thickness for protection against micropitting according to FVA 54/7 test. • Minimised deposit formation for improved oil cleanliness and reduced maintenance. • Good compatibility with elastomers and seals for longer seal life and reduced maintenance.	DIN 51517 Part 3 AIST 224 AGMA 9005-E02 SEB 181226 Flender rev. 12
Millgear SHC	68, 100, 150, 220, 320, 460	Synthetic PAO gear oil with high oxidation and thermal stability for spur, helical and bevel gears. Ideal for applications with a high or wide operating temperature range. Benefits: • Extreme pressure protection for reduced wear and extended equipment life. • Excellent thermal and oxidation stability for increased oil life and relubrication intervals. • High viscosity index for consistent film thickness to protect against micropitting, even at high temperatures. • Low pour point provides effective lubrication at low start-up temperatures. • Minimised deposit formation for improved oil cleanliness.	DIN 51517 Part 3 AGMA 9005-E02 US Steel 224 Flender AG
Millgear SY	150, 220, 320, 460, 680	Synthetic PAG oil for high temperature industrial gear applications, especially worm type gears. Note, not compatible with mineral or PAO type oils. Benefits: • High temperature performance, in excess of 200°C. • High viscosity index imparts low start up drag whilst maintaining optimum viscosity at operating temperature. • Excellent thermal and oxidation stability for increased oil life and relubrication intervals.	David Brown type G general approval

*For full details on performance profiles and specifications please refer to the technical data sheet.

PRODUCT FOCUS

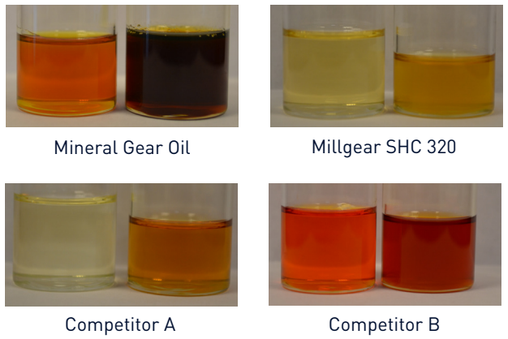
MILLGEAR SHC

High performance, synthetic gear oil to lubricate and protect gear teeth at high loads and extreme temperature.

Key features & benefits

- **Extreme pressure protection** for reduced wear and extended equipment life.
- **Excellent thermal and oxidation stability** for increased oil life and relubrication intervals.
- **High viscosity index** for consistent film thickness to protect against micropitting, even at high temperatures.
- **Low pour point** provides effective lubrication on start-up.

Excellent stability for extended oil life and service intervals:



Mineral Gear Oil | Millgear SHC 320 | Competitor A | Competitor B

Oil after 3 hours at 180°C under Argon

Extreme pressure protection for reduced wear:

Low pour point for protection on start-up:

COMPRESSOR OIL

The Millers Oils range of compressor oils provide the following benefits:

- Excellent oxidation stability for increased oil drain intervals
- Wear protection for enhanced lubrication and extended equipment life
- Resistance to rust and corrosion
- Low foaming with good air release for improved temperature control

Product name	ISO viscosity grades	Description	Specifications*
Millair	32, 46, 68, 100, 150	For use in reciprocating and rotary compressors, as well as vacuum pumps. Up to 3000 hours service life.	DIN 51506 VD-L
Millair Synth	46	Synthetic oil for reciprocating and rotary compressors, with up to 4000 hours service life.	DIN 51506 VD-L ISO/DP 6521 (DAG)
Millervane 2000	150	Rotary vane compressor oil, with up to 2000 hours service life.	

CHAIN OIL

Product name	Description
Chain Lubricant 1461	High temperature chain lubricant with synthetic ester-based technology for outstanding thermal stability. Benefits: • Wide operating temperature range, with maximum continuous operation up to 250°C with higher temperatures possible for intermittent use. • High film strength to protect against wear for extended chain life. • Very low volatility rate for minimised evaporation loss and fumes. • High resistance to moisture and acid fumes for protection in even extreme environments. • Ashless formulation for minimised deposit formation.
Bio Chain Bar Oil	Combination of vegetable oils and synthetic bio-degradable ester with ashless E.P. additive. • Chain bar lubricants are consumed on a 'total loss system' and as such the lubricant contaminates the ground. The use of a biodegradable lubricant for this purpose is both desirable and in some instances mandatory. • The formulation uses a proven E.P. additive system that has been tested under arduous conditions whilst meeting the following OECD requirement 301 with regard to biodegradability.

*For full details on performance profiles and specifications please refer to the technical data sheet.

TURBINE OIL

Product name	ISO viscosity grades	Description	Specifications*
Millbine	32, 46, 68	Lubricating oil for gas and steam turbines. Ideal for applications from small industrial gas turbines to marine turbines and equipment. Benefits: • High oxidation stability for increased oil drain intervals • Excellent corrosion protection for extended equipment life • Good air release and water separation properties	DIN 51515 Part 1 (L-TD) Siemens TLV 9013 04

AIRLINE OIL

Product name	ISO viscosity grades	Description	Specifications*
Airline oil 32	32	Airline Oil ISO 32 is a lubricant developed for pneumatic airline systems suitable for compressed air tools where a clean, low-staining product is desired.	ISO grade 32

GAS ENGINE OIL

Product name	Description	Specifications*
Millgas 40	Lubricant for natural gas powered engines. Benefits: • Good oxidation stability for maintained performance • Suitable for high temperature operation • Contains anti-wear additives • Detergent/dispersant additives maintain compressor cleanliness	API CG-4

*For full details on performance profiles and specifications please refer to the technical data sheet.

GREASES & COMPOUNDS

Product name	Thickener	NLGI no.	Description
Delta EP	Lithium soap	000, 00, 0, 1, 2, 3	Multi-purpose grease with EP for industrial and automotive applications. Delta EP is a smooth brown grease, and is ideal for both anti-friction and plain bearings.
Deltaplex EP	Lithium complex	2	Multi-purpose grease with EP performance and high drop point. Deltaplex EP is a smooth red grease, and is ideal for both anti-friction and plain bearings.
Black Moly MM2	Lithium soap	2	Multi-purpose grease with high molybdenum disulphide solids content to provide anti-wear and extreme pressure performance.
Millergrease WG2	Lithium, calcium soap	2	For use in anti-friction and plain bearings subjected to high load and where water washout is a problem.
Millergrease LLWR2	Multi-complex	2	For use in severe conditions on components subjected to high temperatures, high load, saltwater ingress and certain levels of chemical attack.
Millergrease Synth HT 2	Lithium complex	2	Synthetic base oil with PTFE solids and EP for high temperature applications.
Milltone A	Bentone (clay)	2	Non-melting grease for use at high temperatures over long periods; good water resistance.
Millersil 2	Silica	2	Silicone grease with wide operating temperature range and good resistance to chemical attack.
Millergrease NS Copper	Modified clay	1.5	Millergrease NS Copper is a copper based anti-seize compound for use on assembly to prevent seizure of threaded connections, track adjustors, rock drill extension rods etc.
Black Moly Paste			Black molybdenum disulphide assembly paste for threaded connections, plain bearings, pins and bushes to prevent scoring and seizing on start up, and to provide long-term lubrication at temperatures up to 350°
Millerguard GRL			Highly adhesive and hydrophobic grease specifically developed for the treatment of wire ropes operating under adverse conditions over a wide range of temperatures.
Black Adhesive 0			Bitumen based heavy, black tacky compound with extreme pressure performance. It is ideal for the lubrication of open gears, wire ropes, flexible couplings, and sliding surfaces of drag lines and shovels.
Open Gear Compound			Black, mineral residue lubricant ideal for slow-moving, exposed open gears. Forms a tough film on exposed surfaces, is resistant to fling, can withstand high loads, water washing and remains tacky under working conditions.

PRODUCT FOCUS

MILLERGREASE SYNTH HT2

A premium quality lithium complex grease reinforced with Extreme Pressure (EP) anti-corrosion additives and PTFE.

Ideal for use in anti-friction and plain bearings subjected to high temperatures over extended periods without leaving dry residues associated with conventional greases.

Key features & benefits

- Excellent high temperature capability, reducing carbon residues and extending the lubrication intervals.
- Also provides excellent lubrication at sub-zero temperatures.
- Extreme pressure additives and PTFE extend component life.
- Excellent corrosion protection of components and working surfaces.

FOOD GRADE LUBRICANTS

Millers Oils offers a comprehensive range of food grade lubricants, for use in the food, beverage and pharmaceutical industries.

The Millfood range of lubricants is formulated using only FDA listed ingredients and all products have NSF H1 registration for guaranteed food safety compliance, without compromise on lubrication performance.

Product name	NLGI no.	Description
Millfood Standard 2	NLGI 2	Multi-purpose, calcium thickened food grade grease with good water resistance, ideal for use on all anti-friction and plain bearings.
Millfood Premium	NLGI 2	High performance food grade grease with aluminium complex thickener, PAO base oil and PTFE solids. Ideal for heavily loaded applications where EP performance is required.
Millfood Premium 2 HT	NLGI 2	High temperature, chemically resistant, silicone food grade grease with PTFE solids. Suitable for all plain and anti-friction bearings as well as sliding surfaces. Resistant to a wide range of chemical cleaning solutions used in the food and drink industries.

Product name	ISO viscosity grades	Description
Millfood Gear Oil	ISO 150, 320	Food grade synthetic PAO gear oil protects against wear and corrosion. High oxidation stability extends oil life, and demulsification properties ensures any water can be easily separated.
Millfood 220 Chain and Gear Oil	ISO 220	Food grade synthetic PAO chain and gear oil protects against wear and corrosion. High oxidation stability extends oil life, and demulsification properties ensures any water can be easily separated. Tackifier additives result in no-drip formulation.
Millfood Hydraulic Oil	ISO 32, 46	Food grade hydraulic oil formulated from a blend of synthetic oils. Extremely low foaming, with high viscosity index and thermal stability for extended service intervals.
Millfood MP Synth	ISO 32, 46, 68, 100	Food grade, synthetic PAO multi-purpose oil ideal for both hydraulic and compressor applications. Wide operating temperature range and high oxidation and thermal stability for extended service intervals.
Confectol 15L	ISO 15	Pharmaceutical grade white oil.
Confectol 68	ISO 68	Pharmaceutical grade white oil.

GENERAL PURPOSE LUBRICATION

Product name	Description	Specifications*
Millube 40	5, 22, 32, 46, 68, 100, 150, 220, 320, 460, 680, 1000	Millube is a range quality, thermally stable solvent refined mineral oils. For use where basic level of lubrication is required in general purpose applications.
Millawhite TOC	15	Refined technical white mineral oil. For typical characteristics please refer to the technical data sheet.

INDUSTRIAL LUBRICATION FAQS

>> What is viscosity?

Viscosity is the "thickness" of a fluid, and is an important characteristic of a lubricant. The viscosity determines the film thickness and film strength of an oil, which are critical for reducing friction and keeping metal surfaces apart.

It's important to select the right viscosity oil for your application – check the OEM specification.

High viscosity or "thicker" oil is not necessarily better, as if the viscosity is too high it can cause excessive energy consumption, heat generation and poor start-up lubrication.

If a viscosity is too low, there will be oil film failure and insufficient lubrication, which then leads to friction and wear as well as sensitivity to particle contamination.

>> What is oxidation?

Oxidation is the chemical reaction with oxygen, which permanently changes the molecular structure and therefore, the properties of the oil. Depending on the extent of oxidation, the oil molecules become replaced by other chemicals such as alcohols, aldehydes, ketones and acids which can lead to an increase in oil viscosity, as well as deposit formation, varnishing and sludge.

>> What are EP additives?

EP stands for extreme pressure. EP additives are used in oil formulations where there are high pressures involved (e.g. gearboxes) that can cause the oil to be pushed out from between the two metal surfaces, risking metal to metal contact and wear. Once the oil film begins to fails, the EP additives kick in, reacting chemically with the metal surfaces to form a sacrificial surface film that prevents welding and seizure and protects the components.

MILLERS-Xtra FLUID MANAGEMENT

Millers-Xtra is the fluid management service from Millers Oils, supporting throughout the full life cycle of industrial oil.

Our service continues long after our oil has been delivered, to enable you to focus on what really matters to your business. Millers-Xtra services include:

- Lubrication surveys
- Lubrication training
- Initial oil fills
- Oil sampling for preventative maintenance
- Oil filtration
- Clean outs and service fills

YOUR BENEFITS:

- **Reduced unscheduled down-time**
- **Extended oil change intervals and equipment life**
- **Peace of mind: take away the stress of fluid management, so you can focus on your core business**

WHY TAKE OIL SAMPLES?

In many industrial applications, the sump is often filled with oil then left to run throughout the year without an oil change. Bearings, gearboxes, actuators, valves and ejector pins can start to stick or wear, and a machine could be on the verge of a costly breakdown without the maintenance department knowing.

Frequent oil sampling keeps the maintenance department informed of both the condition of the oil and the machine components, allowing maintenance to be planned around production - saving both time and money.

Sample reports include analysis on:	
Viscosity	Viscosity is crucial for optimum lubrication, and can change due to contamination or oxidation.
Additive level	Additives such as anti-wear, anti-corrosion etc. become depleted over time as they fulfil their purpose in the oil.
Contamination	Oil can become contaminated by environmental factors such as water, dust and debris, as well as by other oils.
Wear metals	Wear metals in the oil offer an insight into not just the health of the oil but the health of the machine components. High levels of a certain metal can indicate that a particular component may need replacing soon.

FIVE TIPS FOR TAKING AN OIL SAMPLE

1

The oil sample must be representative of the oil in circulation for accuracy, i.e. the most central point in the reservoir, and must also be from a repeatable source for consistency.

2

Always use a new sample bottle and keep sealed until the sample is taken using a sampling pump – this will avoid airborne contamination.

3

If it is safe to do so, take the sample from the machine while it is still running or within 15 minutes of the machine shutting down.

4

Always take oil samples pre-filter for accurate results, or sample both before and after filtration.

5

If the drain plug is the only option to sample, flush the valve and discard a small quantity of oil before drawing the sample, this will minimise contamination from the bottom of the sump/oil reservoir.

Contact **fluid.management@millersoils.co.uk** for more information about Millers-Xtra services.

There are other brochures available for our metalworking and injection moulding ranges.

MILLERS OILS

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All products and information are reflective of the latest specifications at the time of going to print. The company reserves the right to change formulations and specifications without prior notice. Product images are shown for illustration purposes only.

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