Revolutionary gear oil programme targeted at the food industry

Contains Calcium Sulphonate technology

- Slows down the oxidation process
- Increases oil life

What does broken equipment actually cost your company?

NCH lubricants

Replacement Parts

Downtime

Production Loss

Audit

Step #1
Oil Analysis

Step #1

How do you know when it is the right time to change your oil?

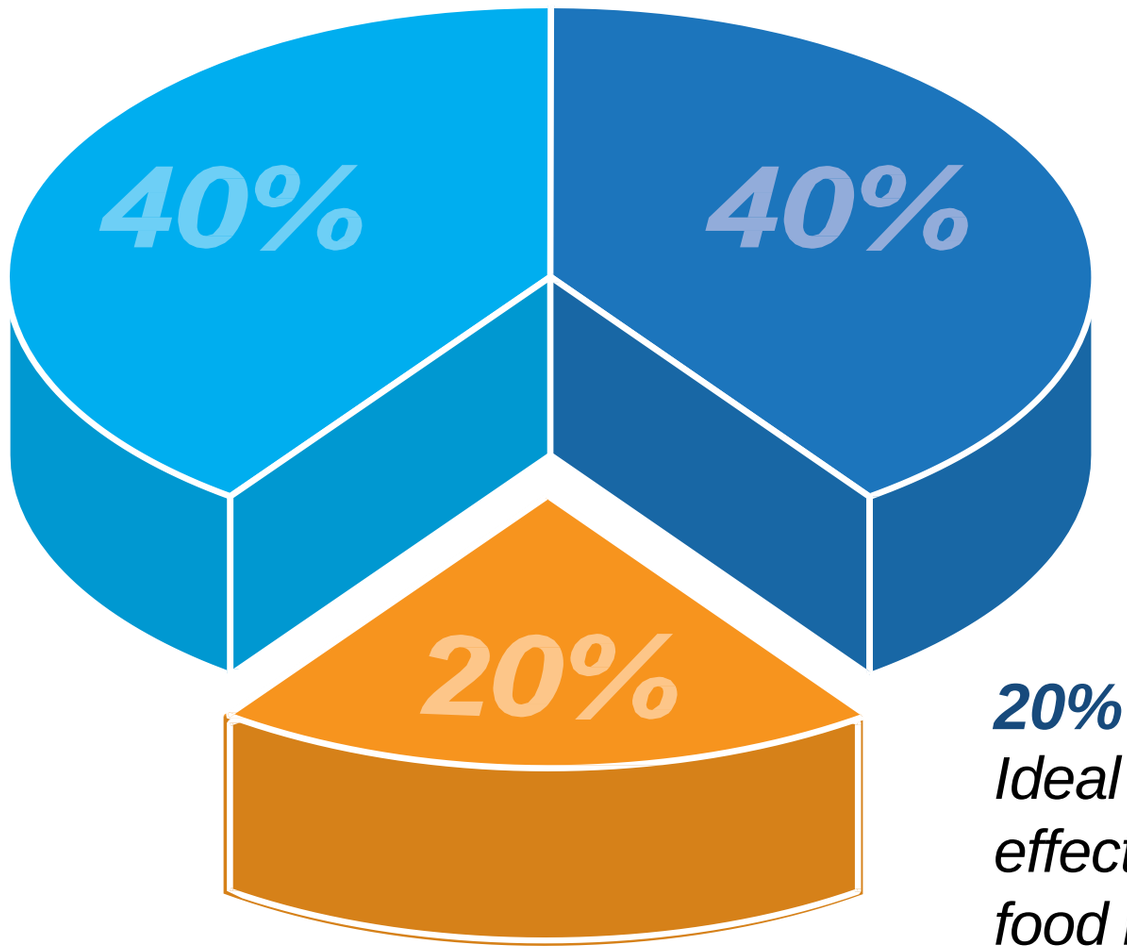
What % of oil is changed at the right time?

Step #1

Problem: Oil changed at the wrong time

Only 20% of oil changes happen at the right time!!!*

40% too late:
Dangerous and expensive. Causes machine damage, repairs, lost production and profit



40% too early:
Expensive and unnecessary

20% on time:
Ideal and the most effective especially in the food industry where just in time delivery is critical

** Source: Trucker's Connection*

OIL CHANGED AT THE WRONG TIME

Solution – NOSP *(independent laboratory)*

To help you improve your 20% to 100%, sign up to the NCH OSP (NOSP) programme today!!!

- **RECOGNIZES-** The best time to change oil
- **MONITORS-** Machinery to prevent breakdowns and unscheduled downtime

NCH lubricants OSP Oil Service Program

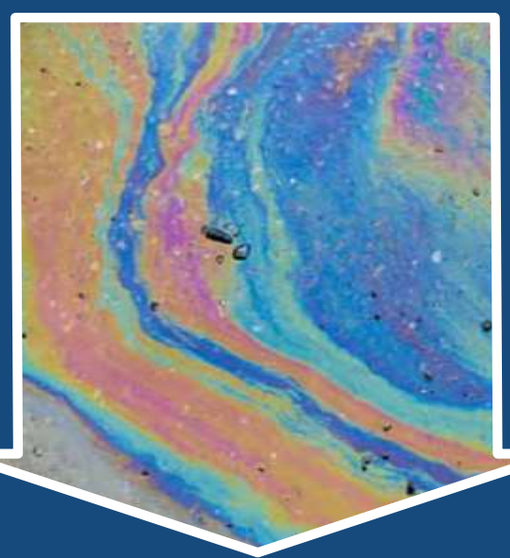
Samples are analyzed using precise, state-of-the-art methods. User friendly reports provide accurate results

NCH lubricants OSP Oil Service Program

Step #1

NOSP measures and controls...

External Contamination



Presence of water, dirt, anti-freeze, etc

Metal Wear

15 different wear metals measured within the oil

Oil Condition

Viscosity, Oxidation (TBN, TAN)

Loss of Oil Additives

Additive depletion which leads to reduction in oil performance

STEP #2

A Clean Start

Step #2

What is the benefit to cleaning your system before refilling with fresh oil?

FRESH OIL

SAME OIL AFTER SEVERAL HOURS IS NOW CONTAMINATED

Problem: Deposit build-up

Contaminant deposits block your machine and can lead to:

- **Increased** energy consumption
- **High** operating temperature
- **Premature** wear
- **Increased** oil usage
- **Reduction** in power transmission through the gear box
- **Reduction** of the oil life
- **Downtime** and parts replacement

Deposits build up on the gear surface

DEPOSIT BUILD-UP

Solution - Flush & Clean FG

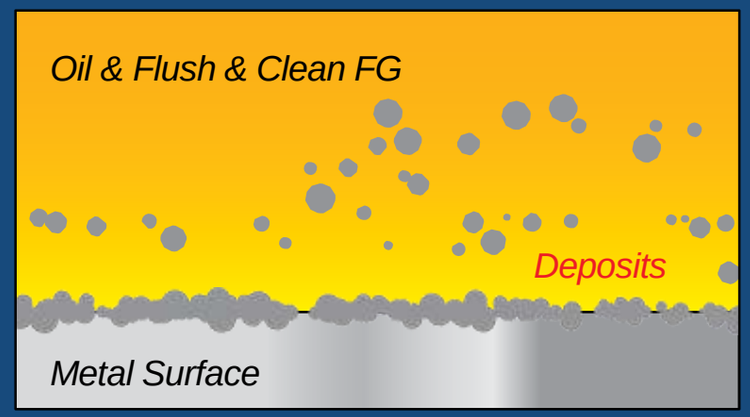
NSF H1 certified, NCH's Advanced Technology Flush & Clean limits deposit build up in your gearbox*

Increases oil life with no shutdown necessary…

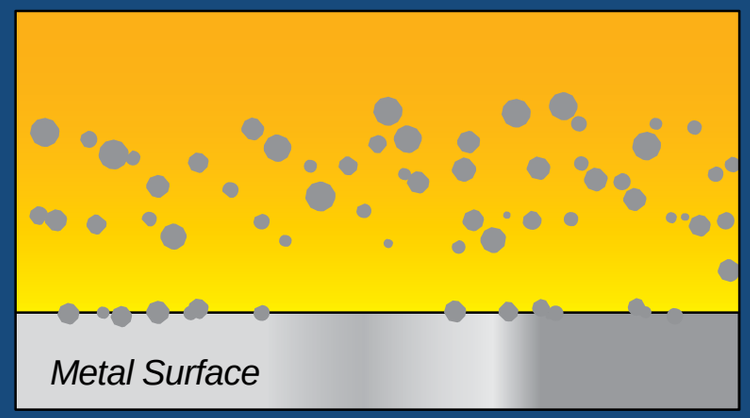
- **DISSOLVES DEPOSITS-** Neutralizes acids (100 times its weight)
- **CLEANS METAL SURFACES-** Reduces operating temperatures, system wear & prepares surface for additives
- **EASY TO USE-** Add to existing oil, operate and drain

** Can also be used in gear boxes, hydraulic systems and compressors*

Deposits on metal surface



Super detergents dissolve different types of deposits



Suspended deposits will be removed during oil changes

STEP #3
The right gear oil

NSF REGISTERED

Step #3

How do you select the most suitable gear oil to reduce your costs?

Problem: Leaking seals

This is the most common problem in gear boxes

Seals leak because...

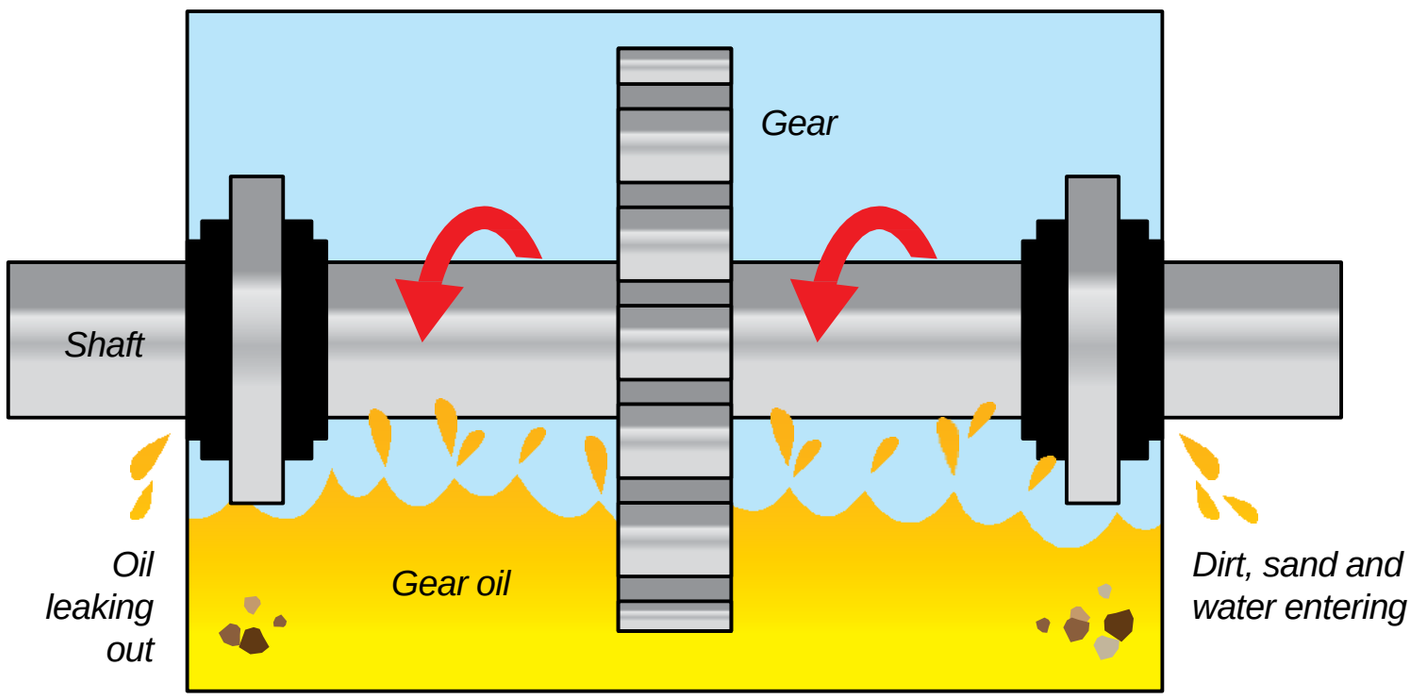
- **They become brittle** and crack with age
- **Acids from oxidized oil** attack them
- Metal shavings and rust particles cause **abrasive wear**
- Foam **build-up increases pressure** and causes them to rupture

**Source: European Agency for Safety and Health at Work Campaign Guide Healthy Workplaces*

Leaks are environmentally unfriendly (1),Safety risks: 20% of accidents are maintenance related* (2)

Leaks lead to…

- **Poor lubrication**
- Entry of **abrasives and contaminants**
- Potential safety and **environmental problems**
- **Costly downtime**, parts replacement and oil loss



Inadequate lubricants lead to expensive repairs

Problem: Dry starts

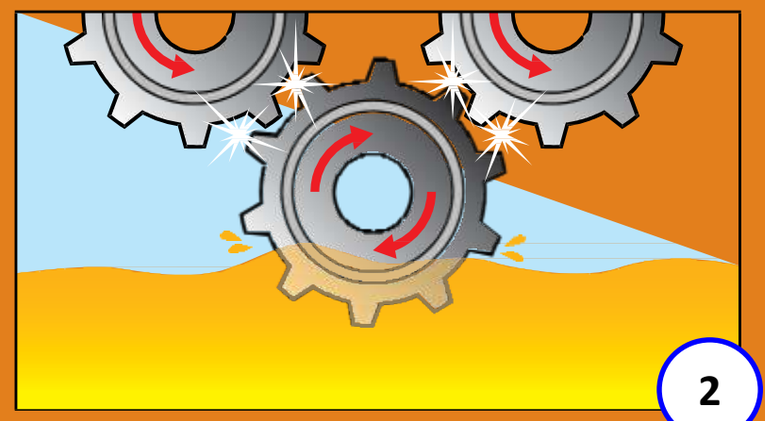
Why does 80-85% of gear wear occur during start-up?

Most gear oils drain off during shut down and leave gears unprotected.

Dry starts lead to...

- **Mechanical wear** and cold welding
- Flash **rusting and corrosion**
- Gear failure and **costly shutdown**

0.4 - 0.6mm pitting caused by poor lubrication
during start up (1),
Gears are typically only 1/3 submerged in oil during start-up (2)



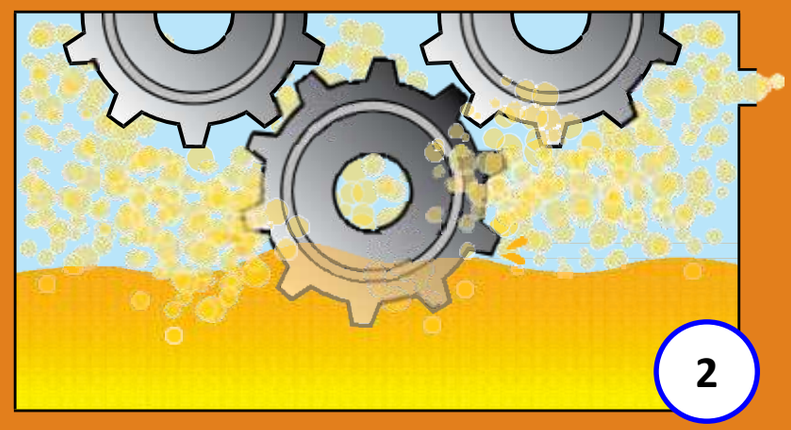
Problem: Foaming

Naturally occurs when air mixes with oil during operation

Foam causes...

- **High operating temperatures**
- **Increased pressure** which can blow-out seals and gaskets
- Oil to **leak out** of vents
- **False oil level readings**
- **Excessive gear wear** from poor lubrication

Air & oil mix during operation creating foam (1, 2)



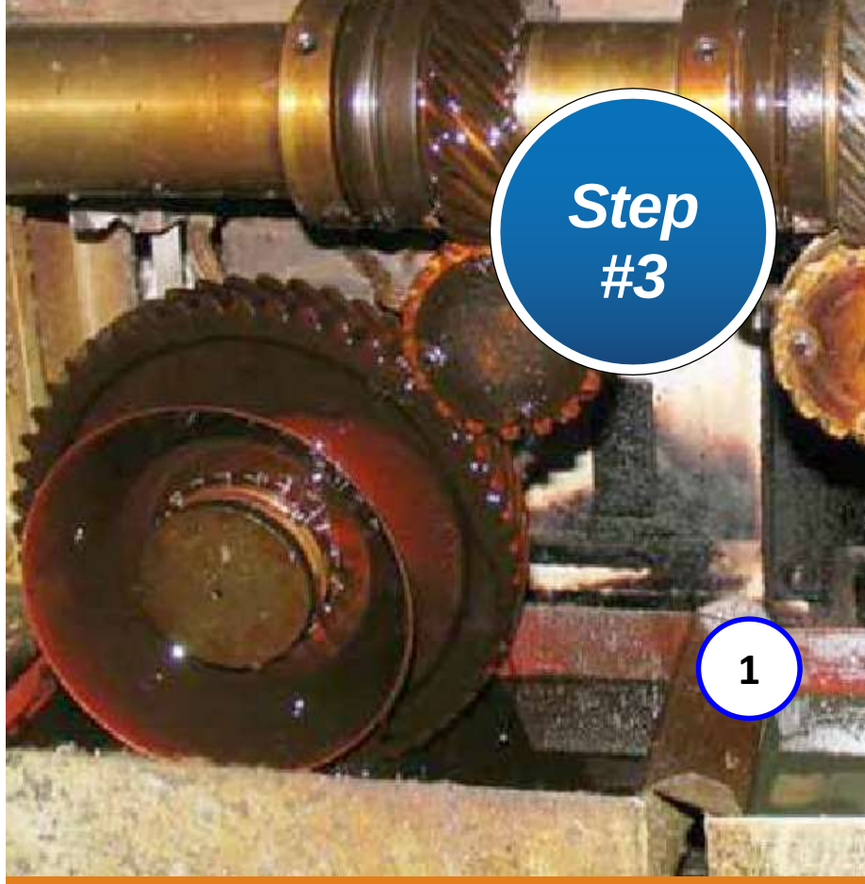
Problem: Oxidation

Oxidation is the chemical breakdown of an oil in the presence of oxygen

Every 10°C rise (above 65°C) shortens oil life by half.

Oxidation results in...

- **Reduced** service life of the oil
- **Sludge** and **varnish**
- **Acids** that promote corrosion, pitting and seal failure
- **Thickened oil** which causes equipment to work harder



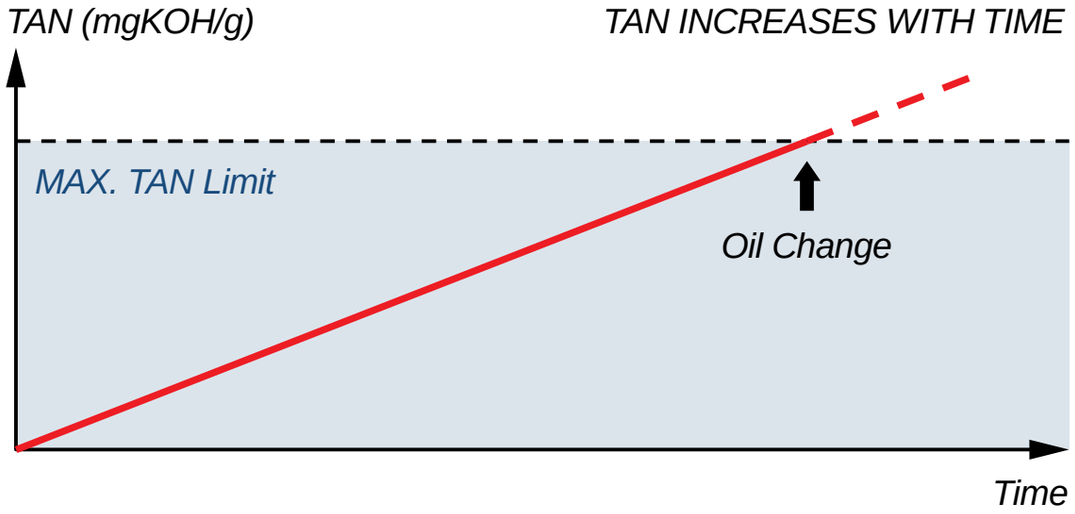
Acid (1) which is the most extreme form of oxidation attacks the gear surface (2) pitting

Understanding oxidation
TAN & PH

Step #3

TAN Explained:

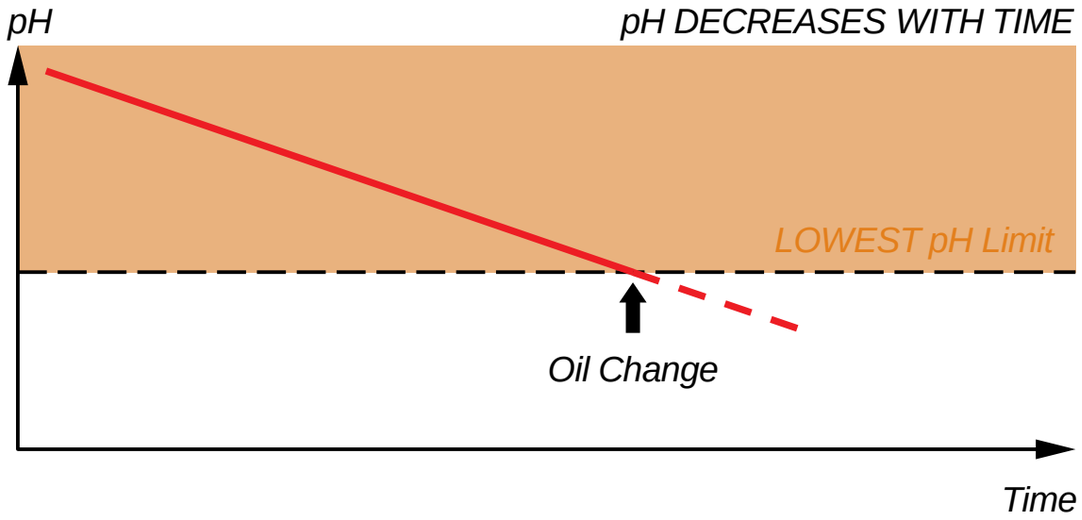
Measures the increase in oil oxidation from the increase in acidic compounds



As the oil oxidizes, the acidity increases hence the TAN (Total acid number) increases.

Apparent pH:

Measures acidity of the oil



As the acidity increases the apparent pH of the oil decreases (ie: become more acidic/corrosive).

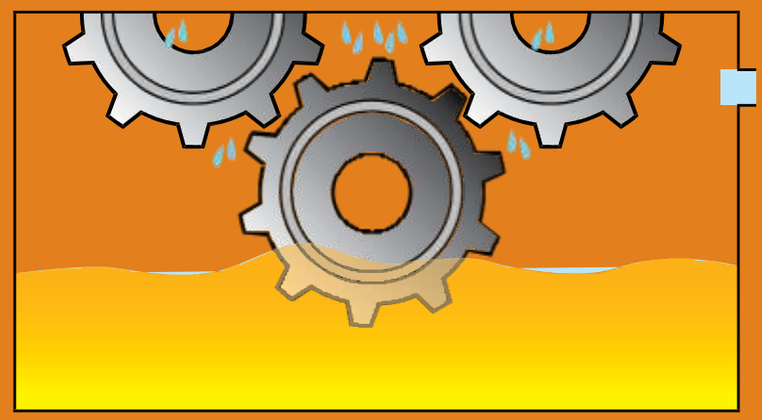
Problem: Water contamination

‘It rains in gear boxes!!! *(condensation)*

Water contamination causes:

- Oil to **emulsify promoting foam**
- Oil to **breakdown and oxidize faster**
- Non-lubricated **hot spots**
- Increased **rust and corrosion**
- Abrasive wear from **rust particles**
- **Shortened equipment life**

Condensation = Water = Rust



LEAKING SEALS

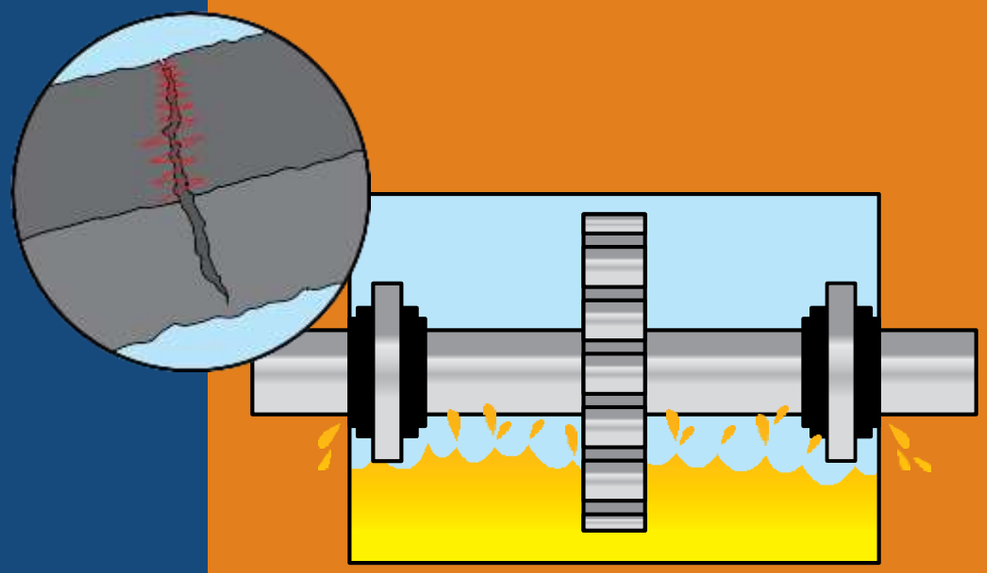
Solution: Top Blend CS FG

Top Blend CS FG contains technology to extend the life of seals and gaskets

- **SEAL CONDITIONERS-** Keep seals soft and pliable to prevent shrinking and cracking
- **PREVENT OIL LOSS-** Keeps contaminants out of the gear box
- **LEAK INHIBITORS-** Tacky polymers form a barrier to physically block leaking seals

DEMO

Interlocking polymers form a physical seal and increase seal life



DRY START

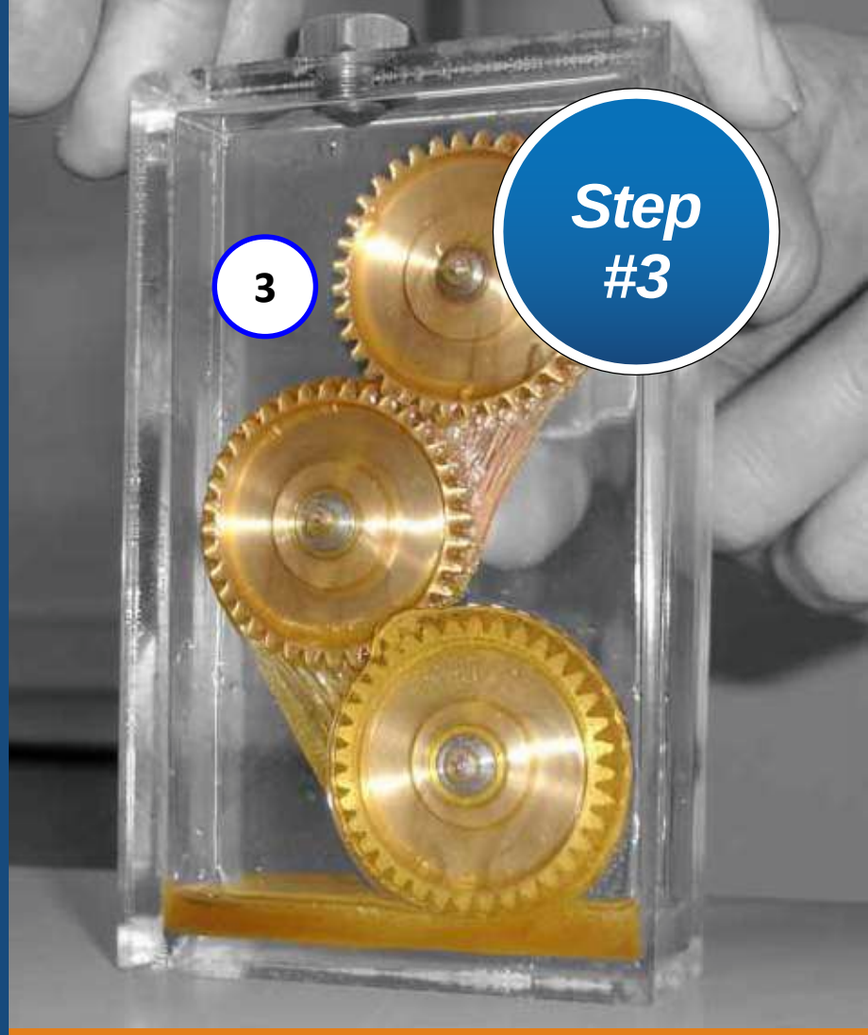
Solution: Top Blend CS FG

Top Blend CS FG contains technology to prevent dry start and reduce wear by up to 85%

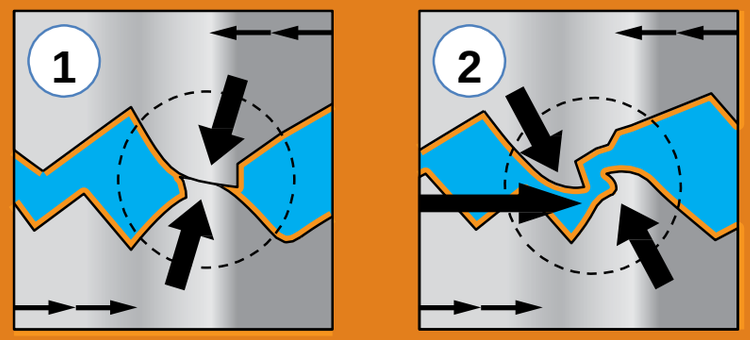
- **ADHESIVE COHESIVE POLYMERS-** Create a climbing action allowing the oil to cling to gear surfaces (even during shutdown)

- **EP ADDITIVES & SHOCK LOAD REDUCERS-** Form a protective layer to prevent metal-to-metal contact (including extreme loads, low speeds & high torque)

DEMO + DEMO



EP agents (1) react to heat and (2) place a film to reduce wear. (3) Adhesive cohesive polymers in action



FOAMING

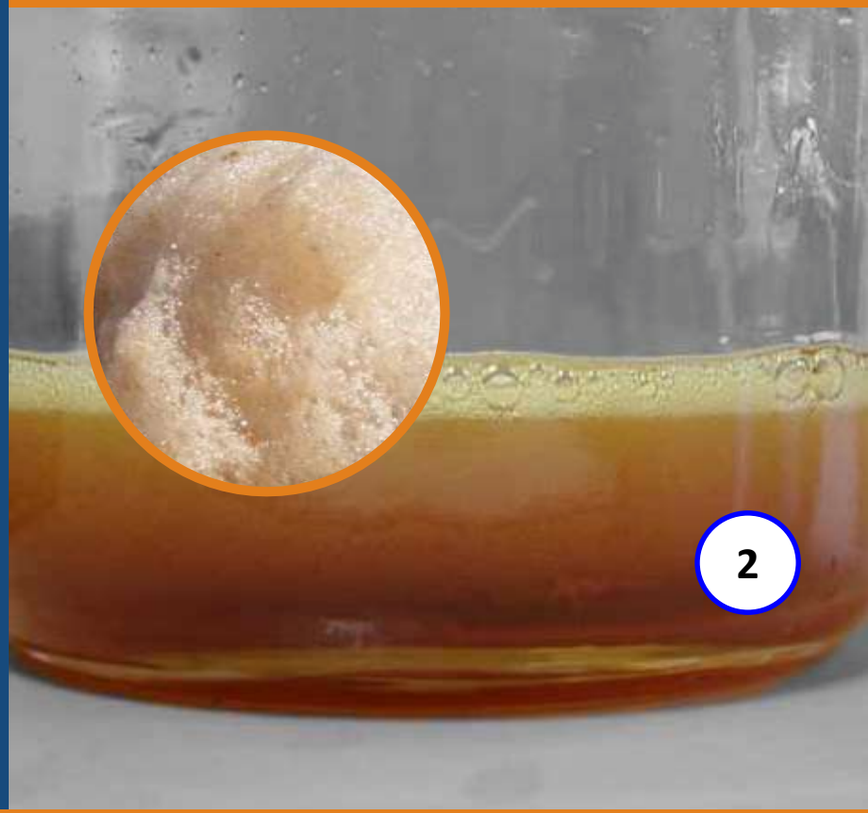
Solution: Top Blend CS FG

Top Blend CS FG contains technology to reduce foaming.

- **ANTI-FOAM AGENTS-** Lower the surface tension of the oil causing air bubbles to rise quickly & break up (no foam)

DEMO

Top Blend CS FG minimizes foam build-up (1), foam forms with conventional gear oil (2)



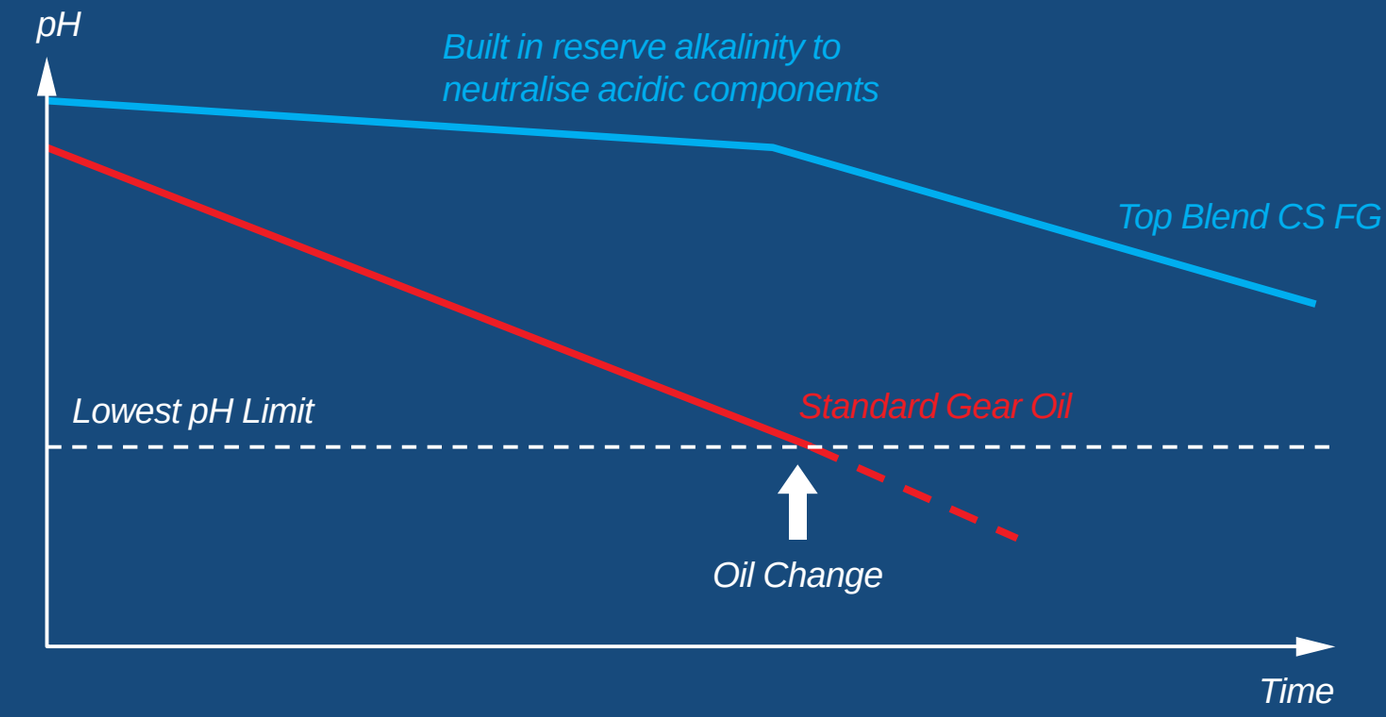
OIL OXIDATION

Solution: Top Blend CS FG

Top blend CS FG contains specialized Calcium Sulphonate Technology (CS) with built in **acid neutralizers** & **oxidation inhibitors** to greatly prolong oil life

SERVICE LIFE

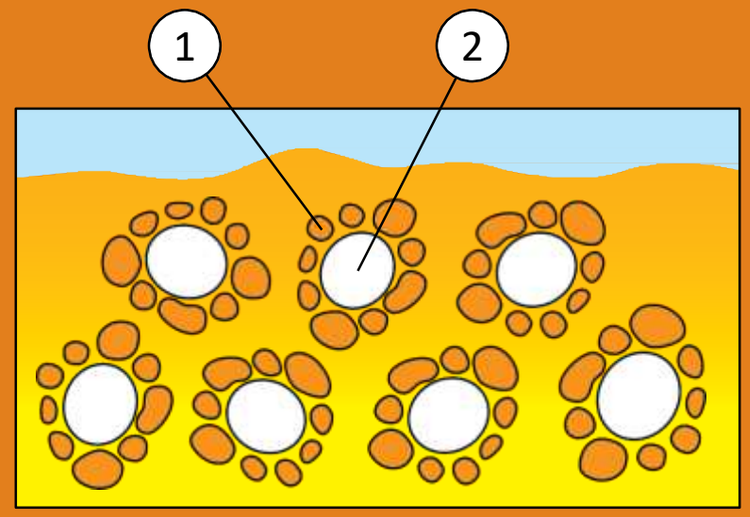
TOP BLEND CS FG vs STANDARD GEAR OIL



DEMO

Step #3

Inhibitors (1) prevent oxidation by keeping oxygen (2) from reacting with the oil

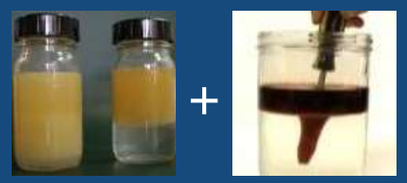


WATER

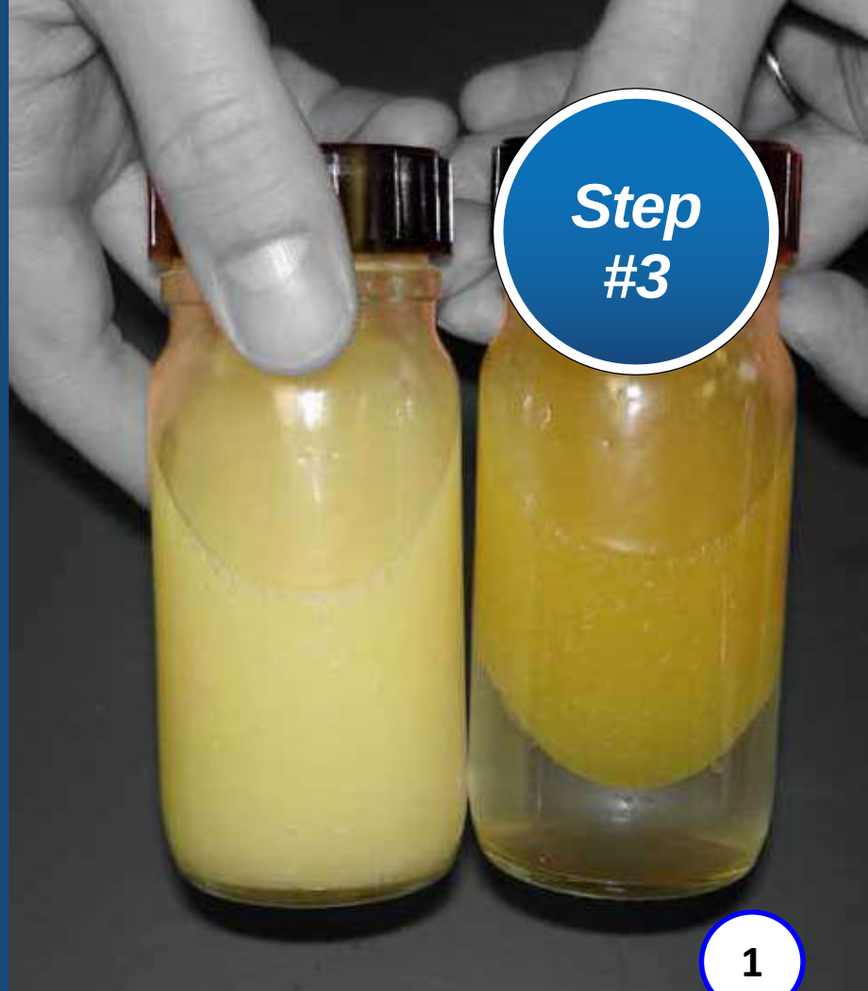
Solution: Top blend CS FG

Top Blend SC FG contains technology to prevent water emulsification

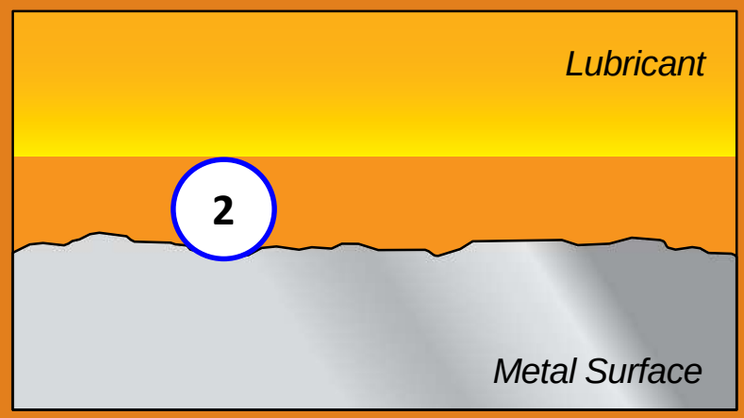
- **DEMULSIFIERS-** Seperate the oil and water to keep gears dry and properly lubricated
- **ADHESIVE & COHESIVE POLYMERS-** Coat metal surfaces to seal out water
- **RUST & CORROSION INHIBITORS-** Form a barrier preventing rust and corrosion for plate metal surfaces



DEMO + DEMO



Oil water separation enables optimum lubrication (1), barrier-type rust inhibitors form a protective film (2)



What CS Technology brings?

1. Higher TbN Reserve

- Mops up acid by product; increasing service life. Less acidic on PH Test

2. Boosts Corrosion Protection

- Less corrosive elements in the fluid increases it’s active life

3. Boosts in EP Performance

- Works better in a pressure environment

4. Improved Detergency

- Keeps surfaces cleaner, therefore machines will last longer

How the whole thing works?

NCH lubricants
OSP Oil Service Program

Step #1
Oil Analysis & Selection

Is a change needed?

Step #2
Contaminant Removal

Clean start helps!

Step #3
Fluid Replacement

Advanced new ‘Calcium Sulphonate Technology’

Step #4
Oil Analysis

Monitor oil condition

Sign up today!!!

NCH lubricants OSP Oil Service Program

1. Take a sample

2. Analyse the fluid

3. Flush & clean the system

4. Replace the fluid

Repeat all steps continuously

A comprehensive four step programme

www.ncheurope.com

Made in E.U.