



Chevron Marine Lubricants 2020 Ready

Sotiris Meklis, November 2019



our industry is changing – are you ready?



50 days

- Bunker fuel choices will be key to maintain operational efficiency and minimize cost
- Traditional bunker and lubricant lifting patterns may change
- Compliant bunker fuel choice and global availability will affect lubricant demand



why the change?

Sail



Diesel



0.5% S



>1900

1850-1930

1912-1960

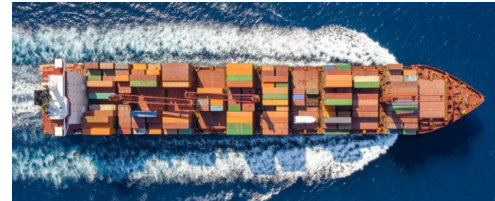
1960- today

2020

2025?



Coal



HFO



GHG?

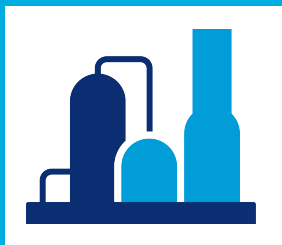


2020 - taro[®] ultra cylinder lubricants

taro[®] ultra developed and tested to meet the needs of a changing industry



21 field tests with over
75,000 hours in
severe tanker and
container applications
to ensure **reliability**



Tested with a wide
range of fuels;
HSFO, LSFO,
distillate, hybrid and
0.50% fuel blends

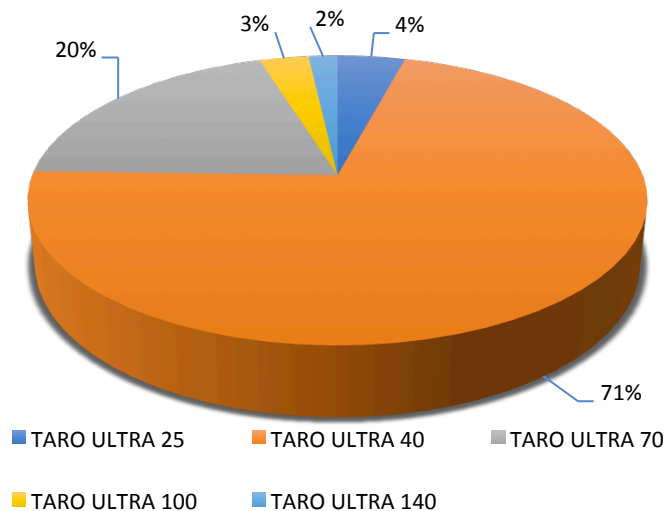


Tested using
DOT.FAST and **FAST**
to **minimize** operating
costs and **optimize**
engine performance



chevron marine lubricants

customer survey

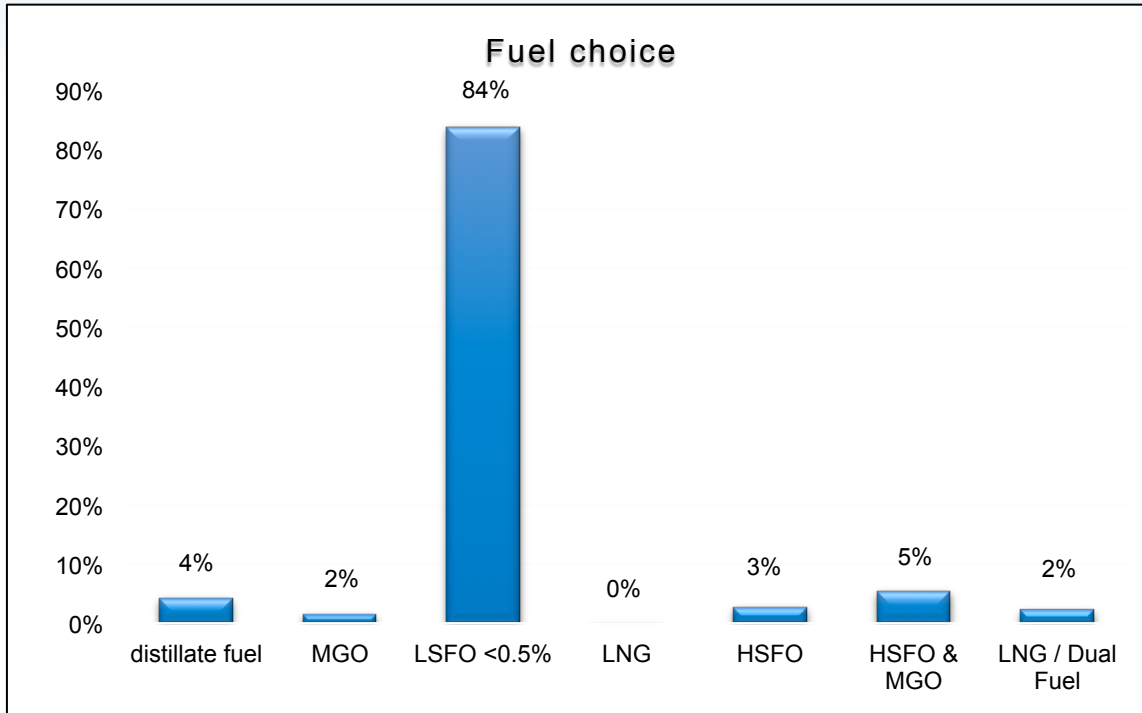


- 70/100BN make up 88% of current MCL sales
- Combined regions shows with at least 80% of vessels opting for compliant fuel combined with Taro Ultra 40 as the predominant cylinder lubricant.



chevron marine lubricants

customer survey

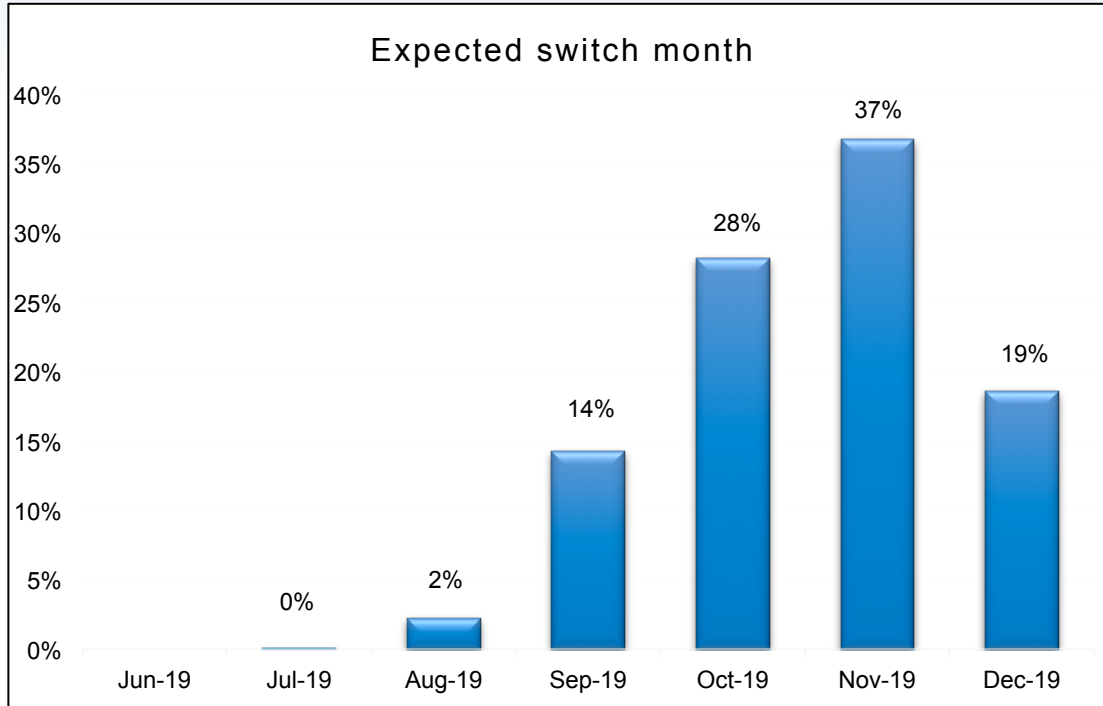


- Vessel fuel choice aligns with IMO 2020 surveys. Scrubber fitted vessels by DWT/ consumption expected to align closer to;
 - 5% of the global fleet,
 - 10% of the global tonnage
 - 15% of the global bunker fuel consumption.



chevron marine lubricants

customer survey



- Last quarter will be busy for us all with over 80% of vessels switching during the period
- 37% in November



global support & supply security



To meet the uncertain demands of 2020, Chevron's **global supply network** has been further **strengthened** to provide a **robust, flexible and agile** model to **ensure supply** in changing landscape



Chevron's world class **technical support** to the global shipping industry. From ship visits to **FAST** and **DOT.FAST** fluid analysis we have the expertise to help you transition into 2020



World class customer service with representatives **based in the regions** speaking **local languages** providing **solutions-based support** for your business



2020 choices - we've got you covered

Routes to IMO compliance

distillate fuel or MGO

Although the new IMO regulations require a Sulphur fuel level of 0.5% or less, in emission control areas (ECAs) Sulphur levels remain much lower at 0.1% and will not be impacted by the 2020 IMO regulations. Distillate fuel is likely to remain the main fuel alternative used in ECA areas to meet the 0.1% Sulphur limit. However, it is unlikely that distillate fuels will be adopted outside of ECA areas because of the higher cost of purchase over alternatives

LSFO (low Sulphur fuel oil)

<0.5% LSFO is expected to be the predominant compliance option to meet the IMO legislation requirements post-2020, with most slow-speed engines able to operate using LSFO — typically without the need for modification. LSFOs are products that are above 0.1%, but in order to meet the 0.5% Sulphur limit, they are blended from high Sulphur HFO and lower Sulphur components such as distillate.

exhaust gas abatement systems plus high Sulphur fuel oil (HSFO)

Exhaust gas abatement systems or scrubbers provide another option for meeting the legislation. Scrubbers reduce the SO_x output to a level that will meet IMO 2020 emission requirements and allow the use of HSFO. There are several different types of scrubber — open loop, closed loop, hybrid, dry — and once installed, traditional high Sulphur fuels can be employed.

LNG

LNG can help to reduce carbon emissions by 25%, NO_x emissions by 70–80%, and has almost zero sulfur emissions, thus meeting 2020 legislation. Global LNG bunkering infrastructure is at an infant stage today, and most LNG-powered ships are LNG carriers or coastal vessels limited to European waters. Major bunkering ports in the world have yet to develop full-scale LNG bunkering facilities. The LNG option makes most sense for LNG carriers or newbuilds rather than conversions of existing ships, with several major operators. choosing LNG for vessels on liner routes.



Taro[®] ultra – developed for 2020



Chevron has developed a full range of cylinder lubricants to cope with the **demands** and **flexibility** required post IMO 2020 **whatever compliance option you choose**



Taro Ultra provides the **reassurance** of Chevron **reliability** combined with **industry leading** solutions-based service to help you through the biggest change marine has seen in decades



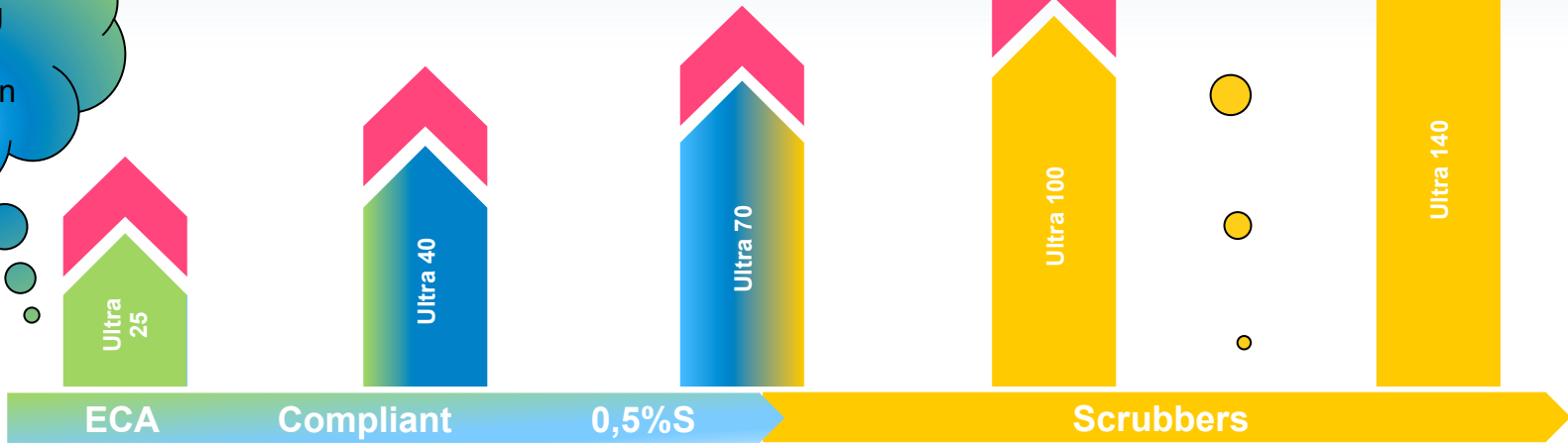
The **OEM approved** range has been extensively field tested for **over 75,000 hours** across a broad range of bunker fuels including HSFO, LSFO, distillate and **0.5% fuel blends**



Taro® ultra cylinder lubricant

Mixed fleet, including older generation engines

SCRUBBERS: newbuild & younger (corrosive) engines retrofitted



for engines operating continuously on ECA fuel, LNG, LPG, ethane ethanol,...

The choice for the majority vessels post 2020

for engines operating on LSFO and distillate fuel
Single grade for 0.50% S & intermitted ECA fuel operation
 Methanol operation

The choice for the majority vessels today

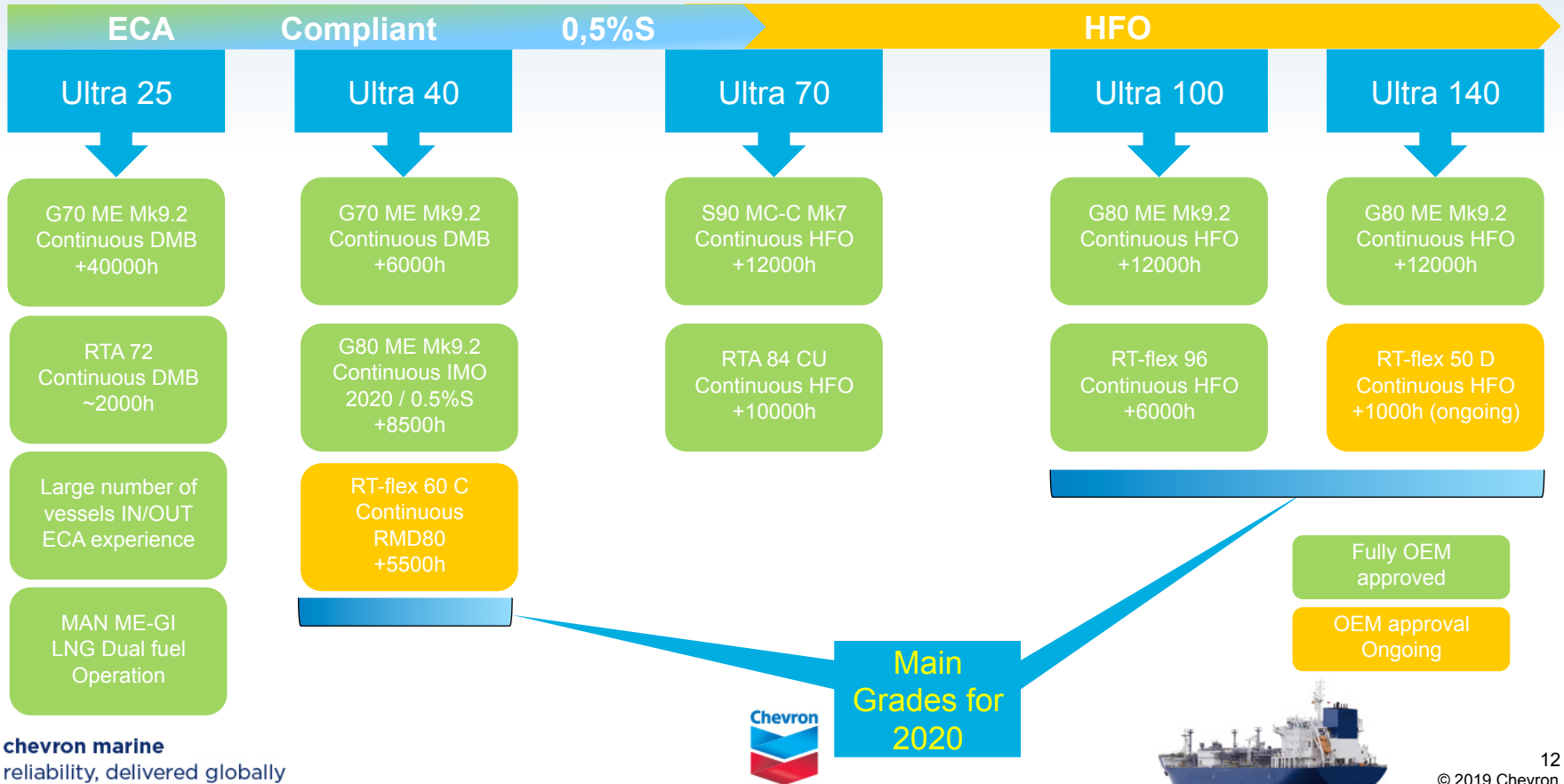
optimized to combat cold corrosion in two-stroke engines
Designed for high sulphur HFO & scrubber operation

optimized to combat cold corrosion and lower feed rates in two-stroke engines
 Designed for cost performance optimisation with scrubbers

chevron marine
 reliability, delivered globally



service experience / field testing





OEM recommendations for 2020

1
supplier



corrosion
protection



future-proof



maintain engine
cleanliness



global support



high temperature
performance

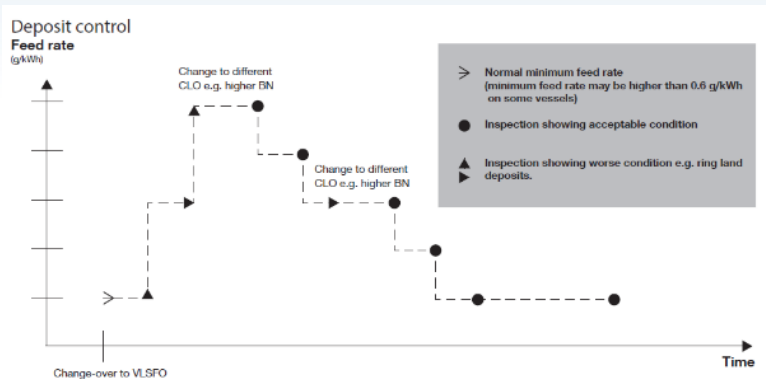


OEM approved



optimize feed
rates

OEM recommendations 2020: MAN ES (2T)



Cylinder oil for max 0.10% S ULSFO operation:

15-100 BN cylinder oil:

Start by using a 15-25 BN cylinder oil

Depending on condition, increase feed rate or Oil BN level (up to 100BN!)

Cylinder oil for 0.10-0.50% S VLSFO operation:

40-100 BN cylinder oil:

Start by using a 40 BN cylinder oil

Depending on condition, increase feed rate or Oil BN level (up to 100BN!)

MAN Energy Solutions

Service letters:

SL2019-671/JAP : compliant fuels

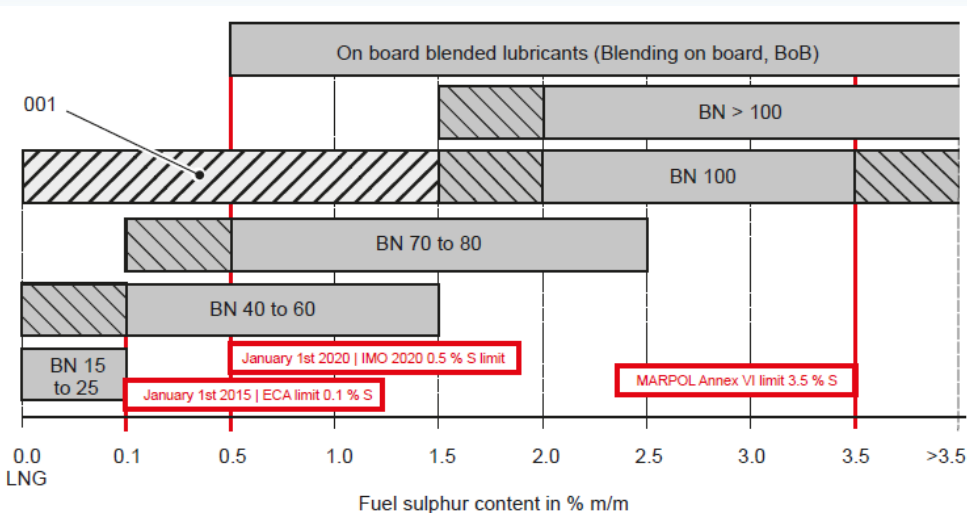
SL2014-587 : fuel content above 0.50% S

General guidance for operation on:

- **Max. 0.10% S fuel: 15–25 BN CLO**
- **0.10%-0.50% S fuel: 40–70 BN CLO**
- **0.50%-3.5% Sulphur dependent lubrication by drain oil analysis (70-100-140 BN CLO)**



OEM recommendations 2020: WinGD (2T)



For all hatched areas:

- Regular piston underside drain oil sampling and an analysis and ensure operation in safe area.
- Regular checks of conditions through scavenge port inspections.

chevron marine
reliability, delivered globally



Service letter:

AA00-0000-00AAA-018G-A

Issue 003 2019-03: lubricants

General guidance for operation on:

- **Max. 0.10% S fuel: 15–25-(40)BN CLO**
- **0.10%-0.50% S fuel: 40–60 BN CLO**
- **0.50%-3.5% S fuel: 100 – 140BN CLO**





Join the performance team

faster at understanding and providing solutions to future complexities