SAIL/ATIEL's latest activity to ensure a continuous improvemnt in the quality of engine oil.

Aktualna działalność SAIL/ATIEL mająca na celu zapewnienie ciągłej poprawy jakości olejów silnikowych

Środki Smarowe 2024, Zakopane

Today's session - what we will cover

01

ATIEL and EELQMS

02

SAIL's quality surveys latest findings

03

SAIL/ATIEL's latest activity to ensure a continuous improvemnt in the quality of engine oil.

Speaker introduction

Piotr Niemiec

- Orlen Oil, Poland
- Coordinator, Technology Dept.
- Member of the ATIEL Board of Directors
- Over15-year career in the Lubricants Industry

Today's session

01

ATIEL and EELQMS

ATIEL

The technical association of the European lubricants industry

- Non for-profit association under Belgian law (Association Sans But Lucratif-ASBL).

Represents the common interests of European lubricant manufacturing and marketing companies

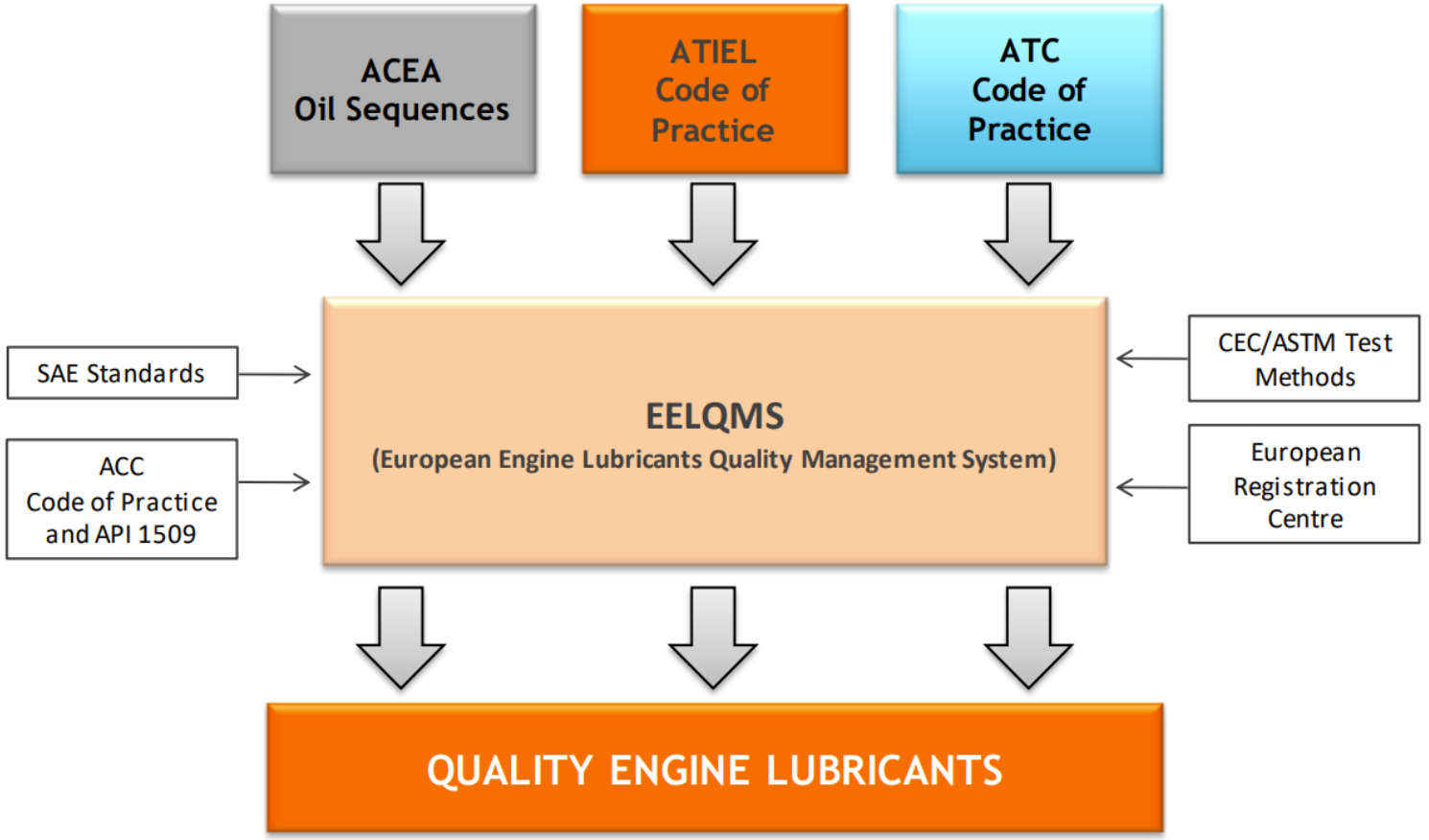
- Membership open to companies actively engaged in the marketing and/or manufacture of lubricants in Europe.
- Promotes dialogue between its members and associated industries on technical issues, regulations, specifications and Codes of Practice.

ATIEL active Members (as of QIII 2024)

ATIEL related presentations presented to polish audience so far

- Ensuring quality and upholding standards in the european lubricants sector – the role of EELQMS and SAIL, Środki smarowe 2023, Starachowice
- Interchange Guidelines and Tests for ACEA Performance Automotive Engine Oils, Środki smarowe 2021, Zakopane
- Role of CEC in Developing Tests for the European Automotive Industry, Środki smarowe 2019, Zakopane
- Benefits of signing the LoC. 2018 update, Środki smarowe 2018, Krynica Zdrój
- Monitoring engine lubricants quality in the market, Środki smarowe 2017, Krynica Zdrój

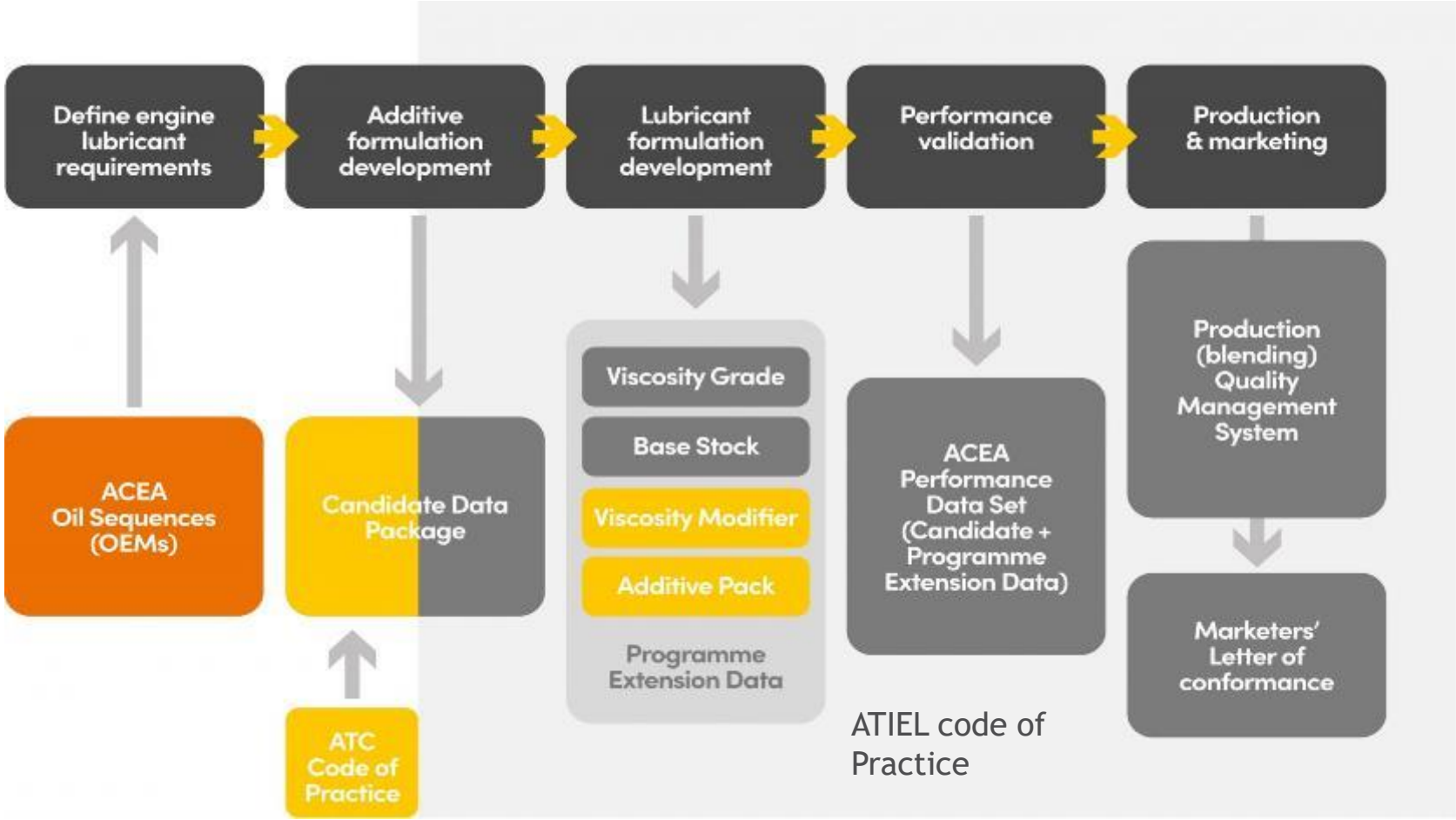
About the EELQMS



EELQMS

EUROPEAN ENGINE LUBRICANTS QUALITY MANAGEMENT SYSTEM

EELQMS: Applying the ATC and ATIEL codes of practice according to ACEA sequences



About the EELQMS

- Voluntary quality management system for automotive engine lubricants – but ACEA requires marketers making claims to comply with EELQMS.
- The ONLY system that can be used to qualify engine lubricants against ACEA Oil Sequences.
- Developed by industry stakeholders to promote development of improved, fit-for-purpose engine lubricants that meet increasing technical requirements.
- Designed to assist lubricant marketers in assuring the quality of their lubricants and performance claims made for them in the marketplace.
- The ATIEL Code of Practice is a key element of the EELQMS.
- Visit: www.eelqms.eu

EELQMS©

EUROPEAN ENGINE LUBRICANTS QUALITY MANAGEMENT SYSTEM

Summary of EELQMS guidelines

Lubricant marketers developing engine lubricants in compliance with ACEA Oil Sequences shall carry out formulation development, blending and marketing in accordance with the guidelines in the ATIEL Code of Practice :

- Incorporating EELQMS guidelines in a quality management system (eg ISO 9001, or ISO TS 16949)
- Ensuring an independent audit of the lubricant development process.
- Having Code of Practice checklists signed off by an authorized company representative.
- Blending products according to requirements of ATIEL Code of Practice, including accreditation to an auditable QMS.
- Signing a Marketers' Letter of Conformance and submitting the Letter and quality certificates to the EELQMS administrators, SAIL.

Today's session

02

SAIL's latest findings

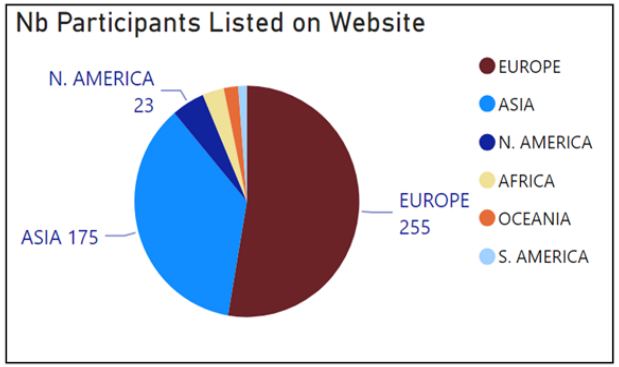
Registration Status

Number of registrants 05/04/2024

- Listed on website = 484
- All listed participants signed LoC

Number of signed sub-license agreements

- 237 signed sub-license agreements from participants listed on the website



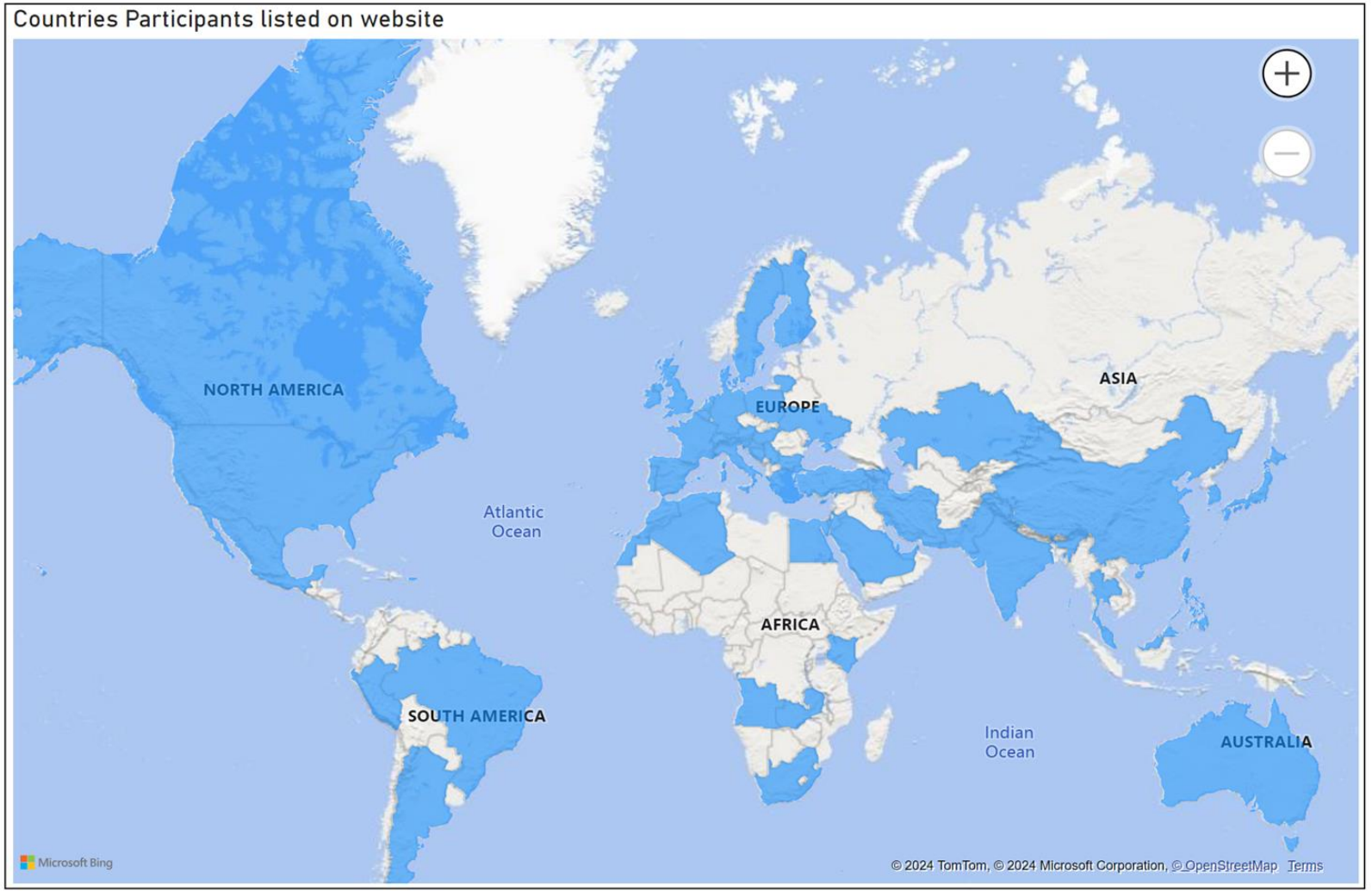
Nb Partcipants Listed on Website - Continent

CONTINENT	Nb Participants	Nb Sig %
AFRICA	15	3.1%
ASIA	175	36.2%
EUROPE	255	52.7%
N. AMERICA	23	4.8%
OCEANIA	10	2.1%
S. AMERICA	6	1.2%
Total	**484**	**100.0%**

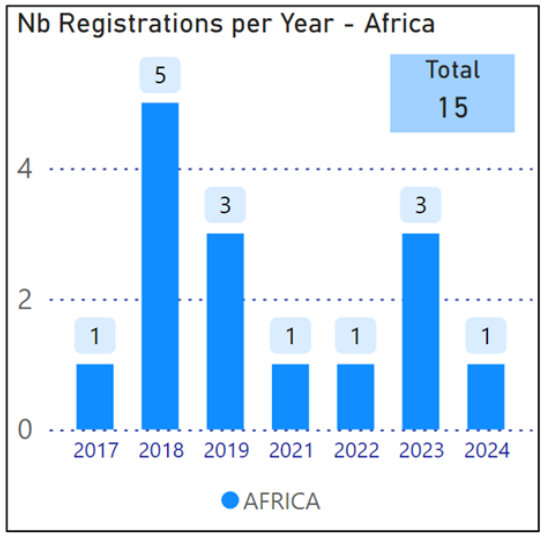
Nb Listed Participants with signed Sub License

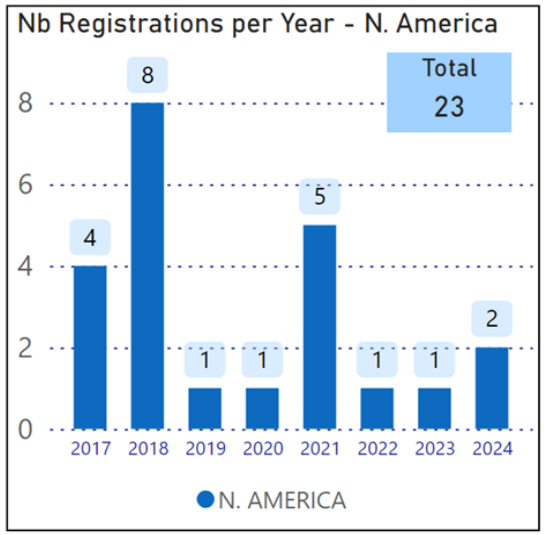
CONTINENT	Nb SubLicences	Nb Lic %
AFRICA	7	1%
ASIA	109	23%
EUROPE	112	23%
N. AMERICA	6	1%
OCEANIA	3	1%
Total	**237**	**49%**

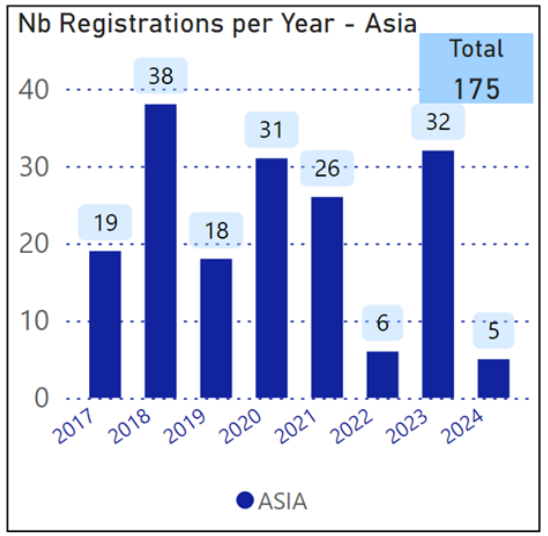
Global Reach

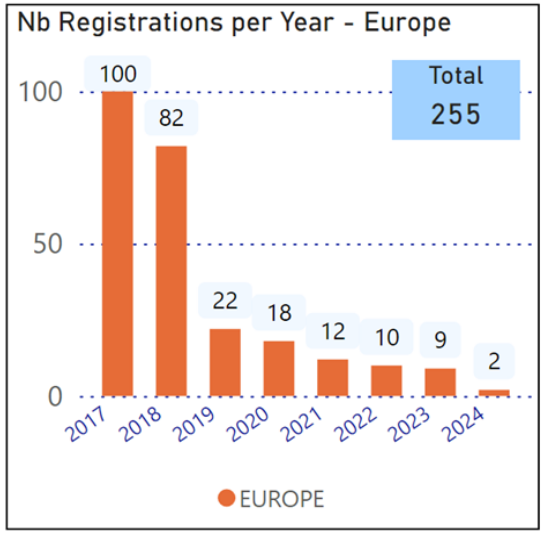


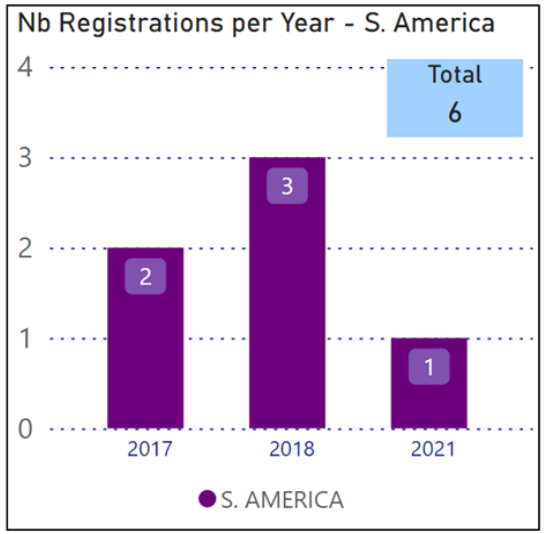
New Registrations by Region

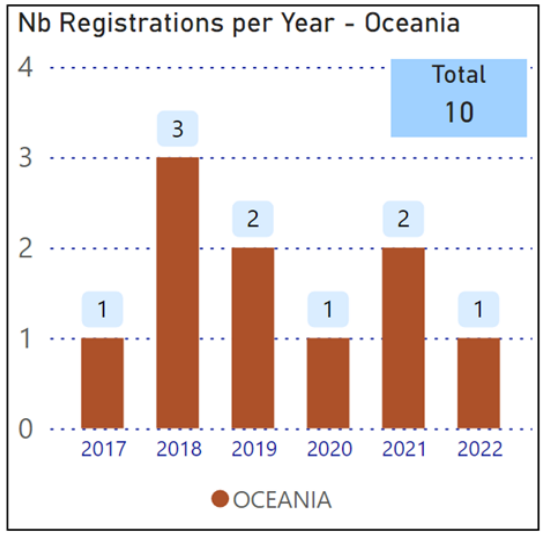










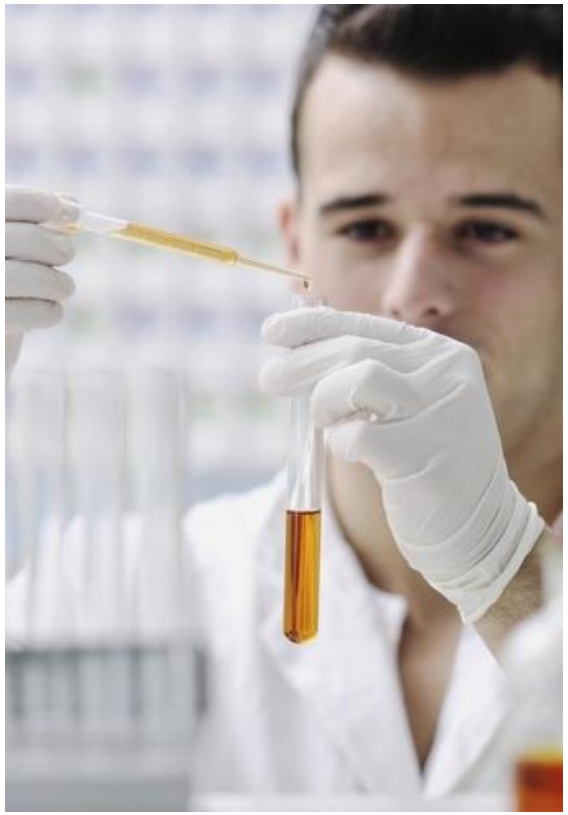


ATIEL's/SAIL Quality surveys

- The objective is to test lubricants for conformance against the ACEA specifications that are being claimed
- Lubricant brands tested are marketed by signatories of the EELQMS Marketers' Letter of Conformance (LoC)
- Where a product is marketed with an ACEA claim by a marketer that has not signed the LoC, the marketer is informed of the position of ACEA and encouraged to sign or remove the ACEA claim(s) from their products
- Lubricant marketer or Manufacturer must demonstrate a suitable quality system is in place
- Oil products are purchased by independent contractor from retail outlets and authorised distributors
- Objective is to test three different samples from each oil marketer, each three-year period

Quality survey methodology

- All samples sourced independently, coded and ‘blind’ tested.
- Tested against most appropriate ACEA European Oil Sequences and parameters including:
  - Viscosity (high and low temp)
  - Noack volatility
  - SAPS (Sulphated Ash, Phosphorous & Sulphur)
  - TBN (Total Base Number)
- Testing and statistical analysis conducted by independent expert laboratory.
- Individual results shared only with respective marketer.
- Appropriate follow-up actions and sanctions in case of serious breaches of compliance.



Example Report

4800 James Savage Road
Midland, MI 48642

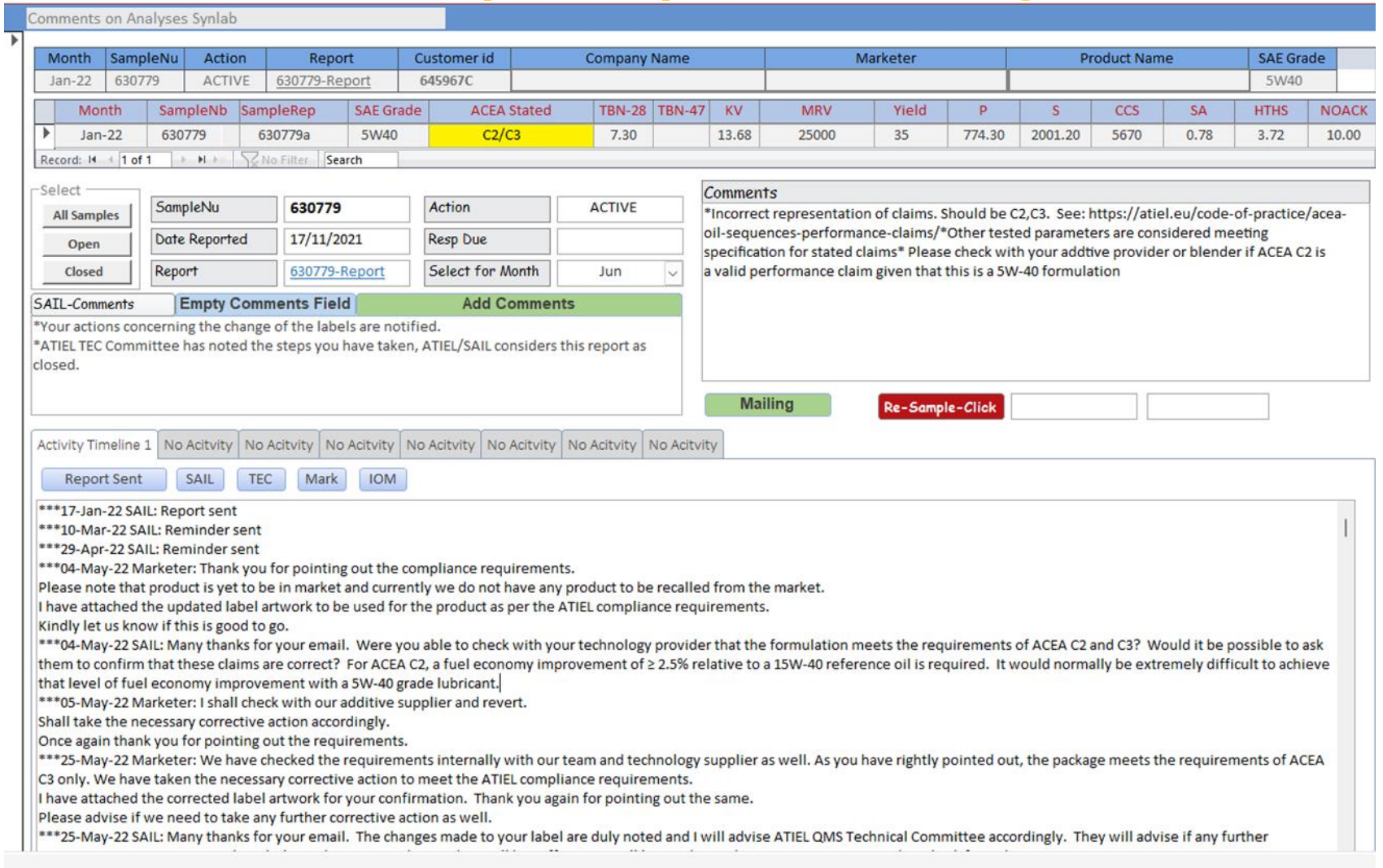
Institute of Materials

Analytical results

Sample Number	630641

Country		
Supplier		
Brand		
Batch Number		
Production date		**Specification Evaluation**
Bottle 1		*Incorrect representation of claims. Year identifiers are not to be used for consumer use. See https://atiel.eu/code-of-practice/acea-oil-sequences-performance-claims/ *ACEA 2008 is obsolete standard, formulation has to be updated to ACEA 2016. See https://atiel.eu/code-of-practice/acea-oil-sequences-performance-claims/ *TBN results outside specification limits and oustide 95% statistical confidence limits for A3/B4. Considered a fail for TBN *SA results outside specification limits and oustide 95% statistical confidence limits for A3/B4. Considered a fail for SA *HTHS result outside specification limits, but within 95% statistical confidence limit. Considered a pass. *Other tested parameters are considered meeting specification for stated claims
Bottle 2		
SAE	5W30	
ACEA	A3/B3, A3/B4	
ACEA Stated	A3/B3-08, A3/B4-08	
API	SN/CF	
OEM	RENAULT RN 0700, MB-APPROVAL 229.1	

Example Report Tracking

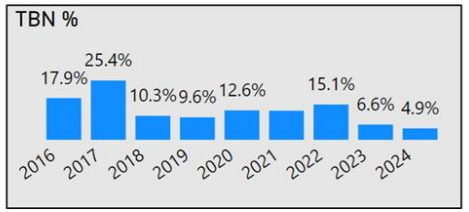


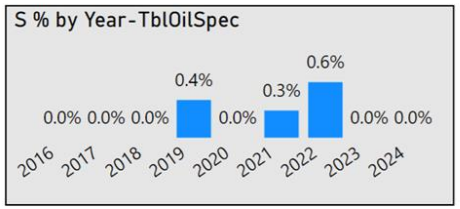
SAIL SURVEYS - # Remarks /parameter

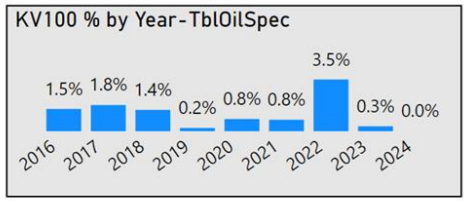
2024 = 2 months

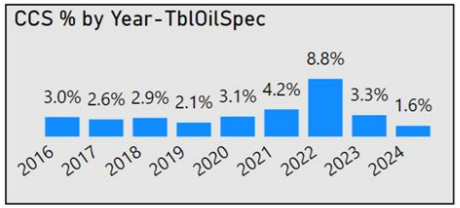
Number of Remarks per parameter in %

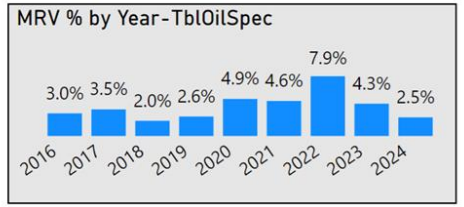
	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
ReportsTotal	67	114	350	467	491	649	317	305	122	2882
ACEA %	21%	8%	25%	25%	39%	37%	33%	13%	20%	29%
TBN ´%	18%	25%	10%	10%	13%	12%	15%	7%	5%	12%
KV100 %	1%	2%	1%	0%	1%	1%	3%	0%	0%	1%
MRV %	3%	4%	2%	3%	5%	5%	8%	4%	2%	4%
YS %	1%	2%	5%	7%	6%	7%	13%	8%	6%	7%
P %	0%	4%	1%	1%	1%	1%	2%	2%	1%	1%
S %	0.0%	0.0%	0.0%	0.4%	0.0%	0.3%	0.6%	0.0%	0.0%	0.2%
CCS %	3%	3%	3%	2%	3%	4%	9%	3%	2%	4%
SA %	4%	4%	8%	4%	6%	10%	14%	6%	5%	8%
HTHS %	3%	4%	8%	4%	7%	6%	8%	12%	12%	7%
Noack %	0%	1%	2%	0%	0%	0%	2%	1%	0%	1%

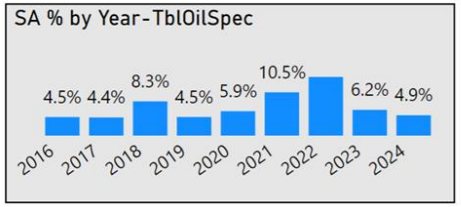


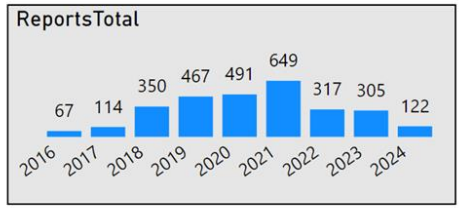


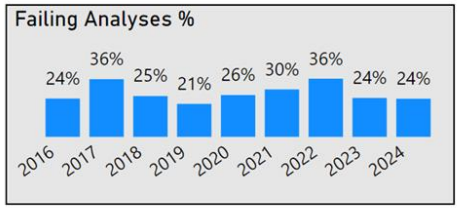


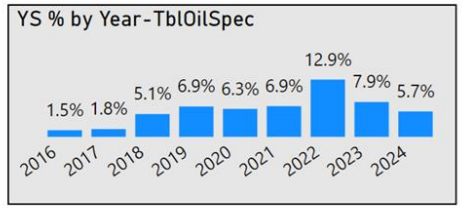


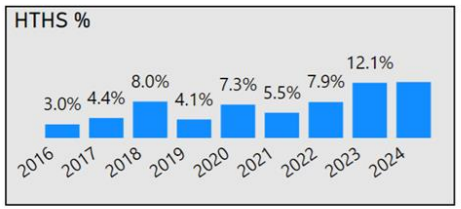


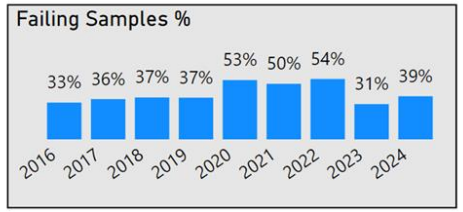


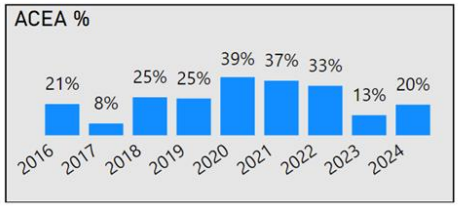


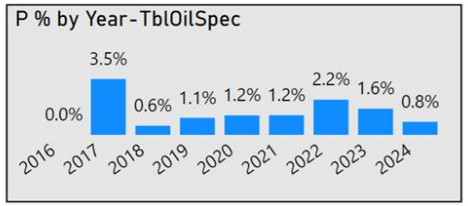


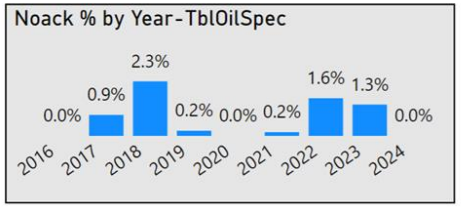












A Very Bad Example

Analytical Parameter	Standard	Unit	Result	Repetition	Limit
Kinematic Viscosity at 100°C	D445	mm2/s	**9,971**	**9,962**	12.5 - <16.3
CCS at -30°C	D5293	mPa•s	**40199**	**39861**	6600
MRV at -35°C	D4684	mPa•s	**TVTM**	**TVTM**	30,000
Yield Stress	D4684	Pa	**< 350**	**< 350**	No yield stress
HTHS at 150°C	D4683	mPa•s	**3.15**	**3.16**	≥3.5
Noack Volatility	D5800	%M/M	7.5		≤13
Sulphated Ash	D874	mass %	0.62		≤0.8
TBN D2896	D2896	mg KOH/g	**5.3**	**5.5**	≥6.0
Phosphorus content	D5185	% m/m	**0.0426**	**0.0426**	≥0.07 - ≤0.09
Sulphur content	D5185	% m/m	**0.03539**		≤0.03

Today's session

03

SAIL/ATIEL's latest activity to ensure a continuous improvemnt in the quality of engine oil.

Continuous improvement and updating of ATIEL's Code of Practice

Communication with stakeholders and industrie with www.atiel.org website

Communication with stakeholders and industrie with EELQMS Newsletter/Bulletin

EELQMS – Guidelines for auditors

Continuous improvement and updating of ATIEL's Code of Practice

The ATIEL Code of Practice Issue Number 24

- Issued January 2024
- updated with ACEA sequence 2023 for LD engine oil
- Includes clarifications regarding Base Oil Slate Linkage (Appendix B)
- Includes complements regarding Quality Management System within sections 2 and 10

The ATIEL Code of Practice Issue Number 24
Clarifications regarding Base Oil Slate Linkage (Appendix B)

Example 3: Linking two Group II slates

Question: Group II base stock slates U and V needed to be linked for ACEA A5/B5-23 and ACEA E7-22. Both slates met the pre-qualification requirements (B.6.1.1) and the typical base stocks (B.6.1.3) within each of these slates had been identified.

It was agreed to test Slates U and V against the requirements of ACEA Categories A5/B5-23 and E7-22 using SAE 5W-30 and 10W-40 formulations. Additive package K was used at 12.3 mass % for ACEA A5/B5-23. Additive package L was used at 16 mass % for ACEA E7-22 testing. The details of the formulations and of the testing results are summarised in Table B.3. All results with slate V were closer to the limits than with slate U.

Are these slates linked with this programme?

The ATIEL Code of Practice Issue Number 24 Clarifications regarding Base Oil Slate Linkage (Appendix B)

Table B.3 Linking two Group III slates

Component [1]		ACEA C3-23		ACEA E7-22	
		Oil #1	Oil #2	Oil #3	Oil #4
Slate U	Group II (4.1 mm^2/s)	34.5 %	—	16.6 %	—
	Group II (6.1 mm^2/s)	42.0 %	—	58.0 %	—
Slate V	Group II (4.3 mm^2/s)	—	35.4 %	—	16.8 %
	Group II (6.2 mm^2/s)	—	41.1 %	—	57.8 %
Additive pack K		12.3 %	12.3 %	—	—
Additive pack L		—	—	16.0 %	16.0 %
Viscosity modifier N		11.2 %	11.2 %	9.4 %	9.4%
Formulated oil		100.0 %	100.0 %	100.0 %	100.0 %
SAE J300 viscosity grade		5W-30	5W-30	10W-40	10W-40
EP6CDT		Pass	Pass	—	—
Sequence VH		Pass	RA [2]	—	—
Sequence IVB		Pass	RA [2]	—	—
M271 EVO		Pass	Pass	—	—
OM646LA		Pass	Pass	Pass	Pass
DV6C		Pass	Pass	—	—
M111		Pass	Pass	—	—
VW TDI		Pass	Pass	—	—
CAT 1N		—	—	PASS	RA [3]
Mack T-8E		—	—	RA [4]	PASS
Cummins ISM		—	—	RA [4]	PASS
Mack T12		—	—	Pass [5]	Pass [5]
Laboratory tests[6]		Pass	Pass	Pass	Pass

[1] All percentages are mass % of the formulated lubricant.
[2] API 1509 Tables E-7 & E-9 allows RA for Oil #2 from Oil #1 as Oil #2 has a higher BOV (5.22 vs 5.09mm^2/s)
[3] API 1509 Tables E-20 allows RA without constraints, only one PASS result is required for the linkage
[4] API 1509 Tables E-24 & E-29 allow RA if saturates is higher than in the original oil. After calculation, the saturate content is 93% for Oil #3 and 91% for Oil #4. PASS results on Oil #3 are enough.
[5] API 1509 Tables E-20 allows RA for Mack T12 if saturates AND BOV are higher than on original oil. Oil #3 has a higher saturates content but a lower BOV than Oil #4: both oils must be tested
[6] As specified in the ACEA Oil Sequences

The ATIEL Code of Practice Issue Number 24
Clarifications regarding Base Oil Slate Linkage (Appendix B)

Answer : Even if it was assessed that results with slate V were closer to the limits than with slate U in all tests, the testing was successful as the engine test data met the minimum performance standards with passing results in all tests at the first attempt.

Therefore, Slates U and V may be considered as linked slates for the tests which were part of this programme. As the final base oil blends were composed 100% with the tested slates, there will be no limitation in the Group II content that may be interchanged in future application of these linked slates (B.6.1.4).

Slate V is identified as “most severe” for CEC tests due to slightly poorer results.

For API tests, the most severe base stock slate has to be identified from the current BOI guidelines within API 1509 Code of Practice

Communication with stakeholders and industrie with www.atiel.org website

- Website section dedicated for explanation of making ACEA performance claims (https://atiel.eu/code-of-practice/acea-oil-sequences-performance-claims/) includes:
  - ACEA Oil Sequences- valid compatible claims (2 page flyer avaiable for download)
  - ACEA Oil Sequences - invalid claim
  - ACEA Oil Sequences - partial or incomplete claims
  - ACEA Oil Sequences - claim validity period
  - ACEA Oil Sequences - obsolete category claims

Communication with stakeholders and industrie via EELQMS Newsletter/Bulletin

- newsletters highlights findings from the SAIL's quality surveys and is aimed at preventing failures cases in the future.
- avaiable at https://atiel.eu/eelqms-newsletters/
- to reach wider audience some of bulletins reprinted in Lube magazine
- latest issues
  - Bulletin No. 8 - June 2024
    Additives without data supporting ACEA performance claims
  - Bulletin No. 7 version 2 - 19th March 2024
    ACEA Engine Oils - Retired and Obsolete Category Claims (Heavy Duty)
  - Bulletin No. 6 - 25th July 2023
    Managing Risk, Ensuring Compliance with the ACEA European Engine Oil Sequences

Bulletin No. 8 - June 2024
Additives without data supporting ACEA performance claims

Problem:
An additive package supplier offers additives with performance level data described as **performance indication only without data supporting ACEA performance claims**

Can I use those additive packages to blend ACEA performance engine oils?

Bulletin No. 8 - June 2024
Additives without data supporting ACEA performance claims

Explanation:

• Performance claims against the ACEA engine oil sequences are the responsibility of the Lubricant Marketer who is legally liable for the finished product.

• The Lubricant Marketer needs to satisfy themselves that relevant performance claims they have specified to their technology provider in the development of the finished lubricant, are supported by robust and reliable technical evidence setting out details of the testing that the additives have been subject to, and the results obtained.

• This testing by laboratory, bench and engine tests and the results obtained is contained in a Performance Test Data set and the Candidate Data Pack (CDP) for each formulation, both of which should be made available upon request to the technology provider by the Lubricant Marketer.

• If the technology provider is unwilling or unable to provide Performance Test Data or a CDP, then it is the responsibility of the Lubricant Marketer to ensure all performance claims can be fully supported and if necessary run the required laboratory, bench and engine test programme at their own expense.

Bulletin No. 8 - June 2024
Additives without data supporting ACEA performance claims

Explanation (cont.)

- Requirements of sets of bench and engine tests for each ACEA category tests are available at https://www.acea.auto/publication/acea-oil-sequences-2022/ for heavy-duty and https://www.acea.auto/publication/acea-oil-sequences-2023/ for light duty applications.
- **Oils blended using untested or unsupported technology can cause accelerated wear to gears and bearings, and may even cause damage to the vehicle's engine in use.**

What should I do if I observe that case within my products range?

- Quarantine the finished lubricant.
- Arrange to recall the engine oil from the market.
- Reformulate the product based on additives that are supported by Performance Test Data and a Candidate Data Pack (CDP).
- Ensure that any additive technology supplier is able to support the required ACEA performance category for the formulation through a CDP which is made available to Lubricant Marketers upon request.

EELQMS – Guidelines for auditors

- section 5 of the EELQMS requires companies intending to market, develop or manufacture engine lubricants for which compliance with ACEA Oil Sequences will be claimed, to keep records that enable independent assessment of their relevant processes by internal and/or external auditors. The auditors should report their findings to the relevant company management.
- no formal EELQMS checklist for auditors so far
- Atiel's/SAIL's work in progress, scheduled to be published on EELQMS website QIV 2024 or QI 2025

http://www.eelqms.eu/

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- EELQMS website:https://www.eelqms.eu/

If You are not registered to LoC yet - how to register

- Register with SAIL and submit a signed Marketers' Letter of Conformance
- Template letter available on SAIL website: www.sail-europe.eu
- Pay annual registration fee

EELQMS

EUROPEAN ENGINE LUBRICANTS QUALITY MANAGEMENT SYSTEM