ATIEL | EELQMS | SAIL

ARGUS Latin America Conference

Why a fully approved engine oil is crucial to success in international markets

20May 2025

Mike Boyer, Director | SAIL

- Importance of Quality standards and the ACEA European Oil Sequences
- The European Engine Lubricants Quality Management System (EELQMS)
- Role of SAIL - Monitoring quality in the market

Latin America Market Dynamics

EV Adoption: Latin America vs. Global Leaders

- EV sales in Latin America surged by 60% in 2024.
- Electrified light vehicle fleet grew over 14 times since 2020.
- Latin America: Boasts 4,848 public charging stations, averaging 3.3 stations per 100 EVs, ahead of Europe (1.3) and the U.S. (2.8) and electric buses per million inhabitants, surpassing Europe (3 per MM) and the U.S. (0.9 per MM)
- EVs account for only 3.8 vehicles per 10,000 inhabitants, lower than China (241.4), Europe (183), and the U.S. (72.4).
- Despite the Latin American region being well positioned for continued growth in EV sales, ICE will continue to be the dominant power source for both light and heavy-duty vehicles in the short to medium term

Latin America Market Dynamics

Key Light Duty Manufacturers and Brands of European Origin

- **Volkswagen Group:** Volkswagen is another major player, with a wide range of vehicles sold under the Volkswagen, Audi, and other brands. They are particularly strong in Brazil and Argentina.

- **Fiat Chrysler Automobiles (FCA) / Stellantis** : With brands like Fiat and Peugeot/Citroen (now under Stellantis), this group has a substantial footprint in the region.

- **Renault-Nissan-Mitsubishi Alliance:** Renault and Nissan both have a presence, with Renault often focusing on smaller, more affordable vehicles, and Nissan offering a broader range.

Latin America Market Dynamics

Key Heavy-Duty Manufacturers and Brands of European Origin

- **Daimler Trucks:** Daimler, with its Mercedes-Benz and Freightliner brands, is a major player in the heavy-duty truck market in Latin America.
- **Volvo Group:** Volvo Trucks and Mack Trucks (owned by Volvo Group) have a significant presence, offering a range of heavy-duty trucks and buses.
- **Volkswagen Truck & Bus:** VW's heavy-duty division, including the MAN and Scania brands, competes in this segment.
- **Iveco:** Iveco, part of CNH Industrial, offers a range of commercial vehicles, including heavy-duty trucks.

Importance of Quality standards and the ACEA European Oil Sequences

Importance of quality standards

- OEMs need to know that appropriate quality engine lubricants will be available in all their markets.
- Trade/workshops need assurance that inadequate lubricant performance will not lead to warranty claims.
- Consumers need confidence in quality of the products being used in their vehicles.

Quality and performance claims

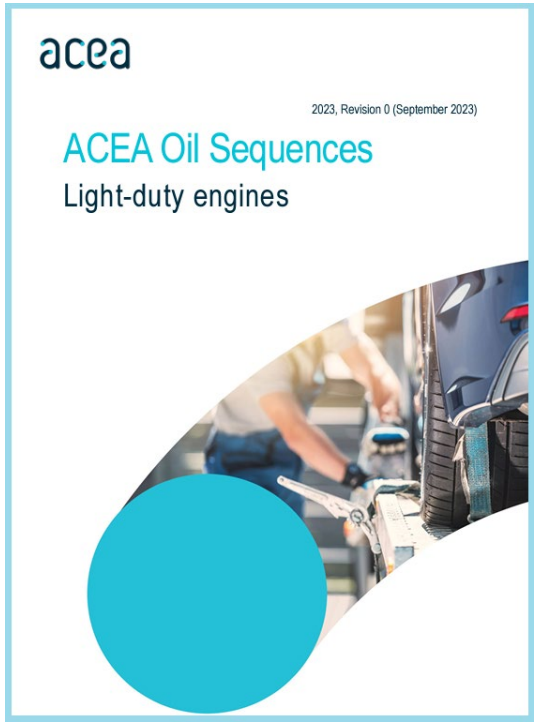
- Although, typically, an engine lubricant will carry a number of industry and OEM claims, today we will focus on ACEA sequence performance claims
- An ACEA claim represents the minimum level of performance required to provide basic protection. It is often quoted in vehicle handbooks as an alternative if an OEM approved lubricant is not available and is a prerequisite for many OEM engine oil specifications

About ACEA

- ACEA (European Automobile Manufacturers Association) represents the interests of major European car, truck and bus manufacturers.
- Sets performance specifications for engine lubricants through its European Oil Sequences.
- ACEA performance specifications increasingly adopted outside Europe.

ACEA Oil Sequences

- ACEA European Oil Sequences cover light-duty passenger cars & heavy-duty trucks.
- The ACEA Oil Sequences are updated regularly to address:
  - Changes in European legislation
  - Changes in engine technology
  - Changes in fuel composition
- The current issues of the Oil Sequences are ACEA 2024 for Heavy–duty engines and ACEA 2023 for Light-duty engines.



Validity of ACEA Oil Sequences

Light-duty

Sequence issue	First allowable use	Mandatory for new formulation claims	Oils with this claim may be marketed until
2004	1st Nov 2004	1st Nov 2005	31st Dec 2009
2007	1st Feb 2007	1st Feb 2008	23rd Dec 2010
2008	22nd Dec 2008	22nd Dec 2009	22nd Dec 2012
2010	22nd Dec 2010	22nd Dec 2011	22nd Dec 2014
2012	14th Dec 2012	14th Dec 2013	1st Dec 2018
2016	1st Dec 2016	1st Dec 2017	1st May 2023
2021	1st May 2021	1st May 2022	1st August 2025
2023	12th Sep 2023	12th Sep 2024	

Validity of ACEA Oil Sequences

Heavy-duty

Sequence issue	First allowable use	Mandatory for new formulation claims	Oils with this claim may be marketed until
2004	1st Nov 2004	1st Nov 2005	31st Dec 2009
2007	1st Feb 2007	1st Feb 2008	23rd Dec 2010
2008	22nd Dec 2008	22nd Dec 2009	22nd Dec 2012
2010	22nd Dec 2010	22nd Dec 2011	22nd Dec 2014
2012	14th Dec 2012	14th Dec 2013	1st Dec 2018
2016	1st Dec 2016	1st Dec 2017	1st May 2024
2022	1st May 2022	1st May 2023	1st Oct 2026
2024	1st Oct 2024	1st Oct 2025	

The European Engine Lubricants Quality Management System (EELQMS)

About EELQMS (European Engine Lubricant Quality Management System)

- EELQMS addresses product development testing and product performance documentation, involves the registration of all candidate and reference oil testing, and defines the compliance process.
- Compliance with the Code of Practice of the Technical Association of the European Lubricants Industry (ATIEL), which forms part of the EELQMS, is **mandatory** for any claim to meet the requirements of this issue of the ACEA sequences.
- **Therefore, ACEA requires that claims against the ACEA Oil Sequences can only be made by oil companies who have signed the EELQMS oil marketers' letter of conformance**

Source: ACEA Oil Sequences General requirements September 2023

About EELQMS stakeholders and inputs

About the EELQMS

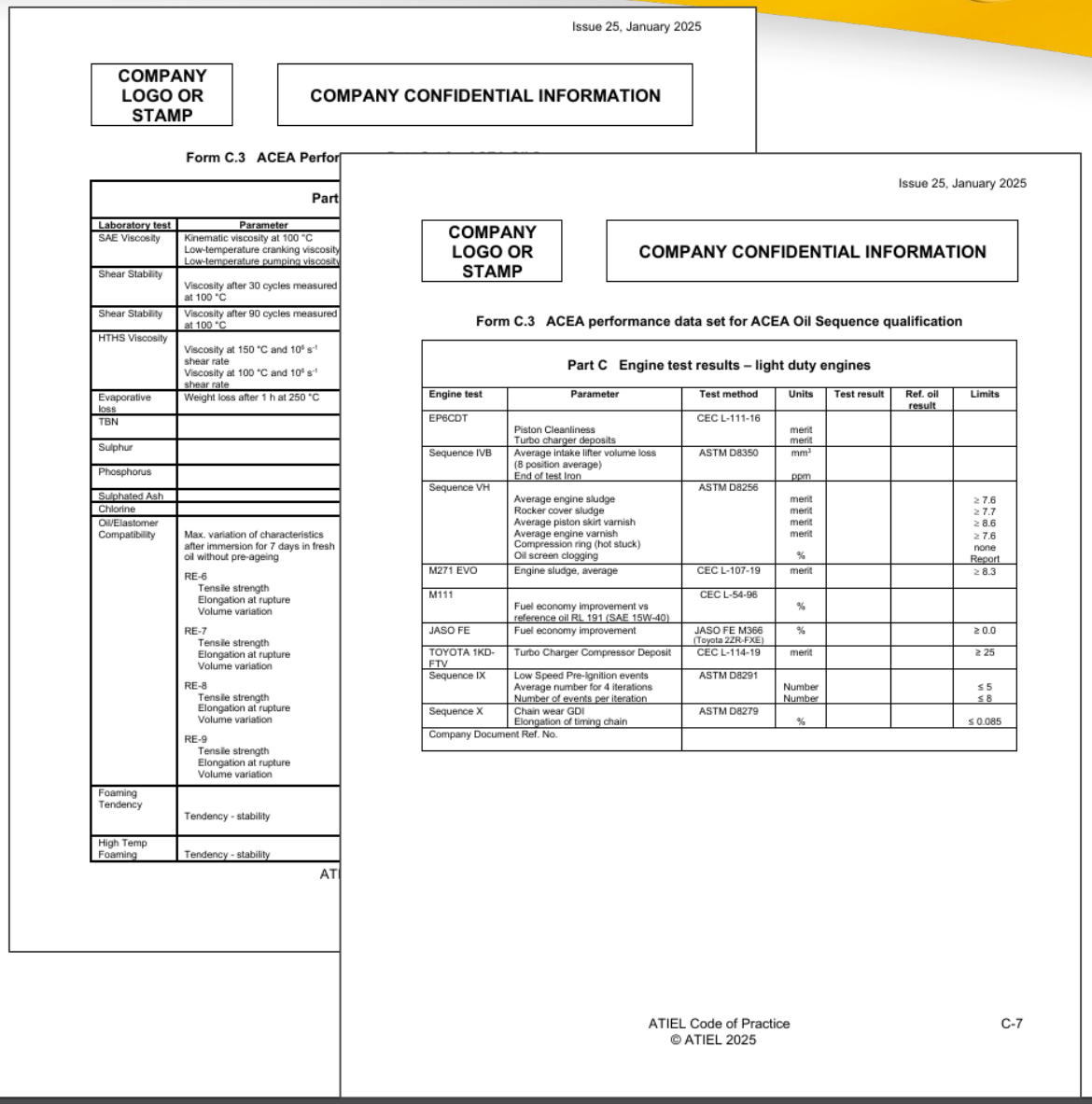
- Quality management system for automotive engine lubricants.
- Only for claims made against the ACEA engine oil sequences. Some OEM approvals may also require participation.
- If you choose to participate then the system rules are **mandatory** , for example the Codes of Practice. You can't pick and choose.
- 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 the performance claims being made for them in the marketplace for the benefit of end users.

Quality and performance claims

- How do you know that your products meet the ACEA requirements?
- As a lubricant marketer you are responsible for all aspects of product liability!
- Typically, technology providers can provide candidate data packages that demonstrate how their technology and the approved formulations that they promote meet the constituent parts of the requirements of EELQMS

About candidate data packages

Oil Code ST123456		
		Treat Rate %wt
DI	Supertec YZ2233	13.7%
VM	Supertec VI9988	10.1%
Base Oil 1	Goodbase 4 cSt	60%
Base Oil 2	Goodbase 6 cSt	16%
PPD		0.2%
ACEA 2023		C3
API		SP
Mercedes - Benz		229.51



Issue 25, January 2025

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COMPANY CONFIDENTIAL INFORMATION

Form C.3 ACEA Perfor

Part

Laboratory test	Parameter
SAE Viscosity	Kinematic viscosity at 100 °C Low-temperature cranking viscosity Low-temperature pumping viscosity
Shear Stability	Viscosity after 30 cycles measured at 100 °C
Shear Stability	Viscosity after 90 cycles measured at 100 °C
HTHS Viscosity	Viscosity at 150 °C and 10^6 s^{-1} shear rate Viscosity at 100 °C and 10^6 s^{-1} shear rate
Evaporative loss	Weight loss after 1 h at 250 °C
TBN	
Sulphur	
Phosphorus	
Sulphated Ash	
Chlorine	
Oil/Elastomer Compatibility	Max. variation of characteristics after immersion for 7 days in fresh oil without pre-ageing RE-6 Tensile strength Elongation at rupture Volume variation RE-7 Tensile strength Elongation at rupture Volume variation RE-8 Tensile strength Elongation at rupture Volume variation RE-9 Tensile strength Elongation at rupture Volume variation
Foaming Tendency	Tendency - stability
High Temp Foaming	Tendency - stability

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Issue 25, January 2025

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Form C.3 ACEA performance data set for ACEA Oil Sequence qualification

Part C Engine test results – light duty engines

Engine test	Parameter	Test method	Units	Test result	Ref. oil result	Limits
EP6CDT	Piston Cleanliness Turbo charger deposits	CEC L-111-16	merit merit			
Sequence IVB	Average intake lifter volume loss (8 position average) End of test Iron	ASTM D8350	mm^3 ppm			
Sequence VH	Average engine sludge Rocker cover sludge Average piston skirt varnish Average engine varnish Compression ring (hot stuck) Oil screen clogging	ASTM D8256	merit merit merit merit % %			≥ 7.6 ≥ 7.7 ≥ 8.6 ≥ 7.6 none Report
M271 EVO	Engine sludge, average	CEC L-107-19	merit			≥ 8.3
M111	Fuel economy improvement vs reference oil RL 191 (SAE 15W-40)	CEC L-54-96	%			
JASO FE	Fuel economy improvement	JASO FE M366 (Toyota 2ZR-FXE)	%			≥ 0.0
TOYOTA 1KD-FTV	Turbo Charger Compressor Deposit	CEC L-114-19	merit			≥ 25
Sequence IX	Low Speed Pre-Ignition events Average number for 4 iterations Number of events per iteration	ASTM D8291	Number Number			≤ 5 ≤ 8
Sequence X	Chain wear GDI Elongation of timing chain	ASTM D8279	% %			≤ 0.085
Company Document Ref. No.						

ATIEL Code of Practice
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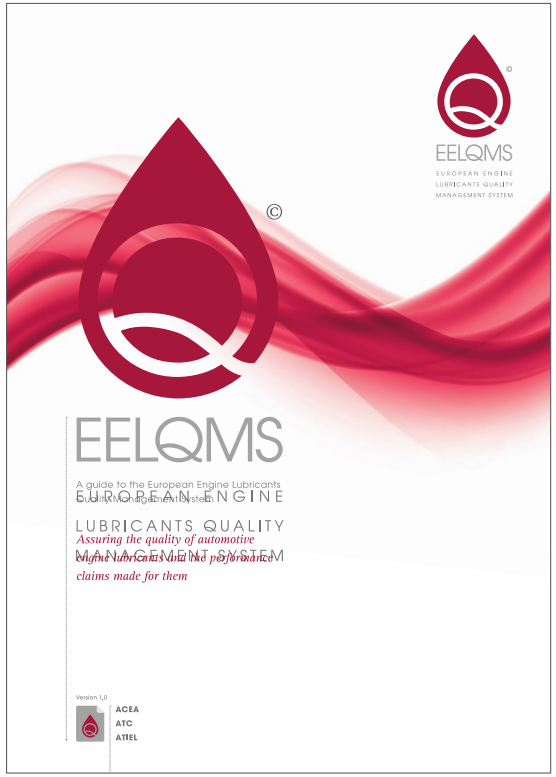
C-7

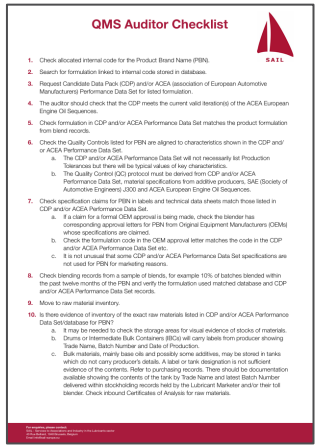
EELQMS contribution to quality

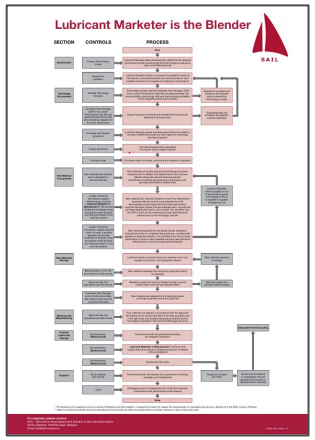
- Detailed process and structure for lubricant development, production and performance validation.
- Provides assurance of the quality of engine lubricants on the market that claim to meet the performance requirements of ACEA.
- The ONLY system that can be used to qualify engine lubricants against ACEA Oil Sequences.
- Administered by ATIEL on behalf of the other key stakeholders.



Promoting EELQMS

- New identity with logo and branding.
- New separate document clearly setting out the guidelines for compliance with EELQMS.
- New dedicated website: www.eelqms.eu
- Logo can be used in marketing material under license, but only by signatories of EELQMS.
- EELQMS tools: Checklist and flowchart to enable thorough and consistent approach for internal and external auditors





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 and ATC Code of Practice:
  - incorporating EELQMS guidelines in a quality management system (e.g. ISO 9001, or IATF 16949).
  - ensuring an independent audit of the lubricant development process.
  - requires Code of Practice checklists signed off by an authorised 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 registering it with ATIEL.


Template for the EELQMS Lubricant marketers' Letter of Conformance

Subject: Participation in the ATIEL European Engine Lubricants Quality Management System: Letter of Conformance

Role of SAIL –
Monitoring quality in the market

Who are SAIL?

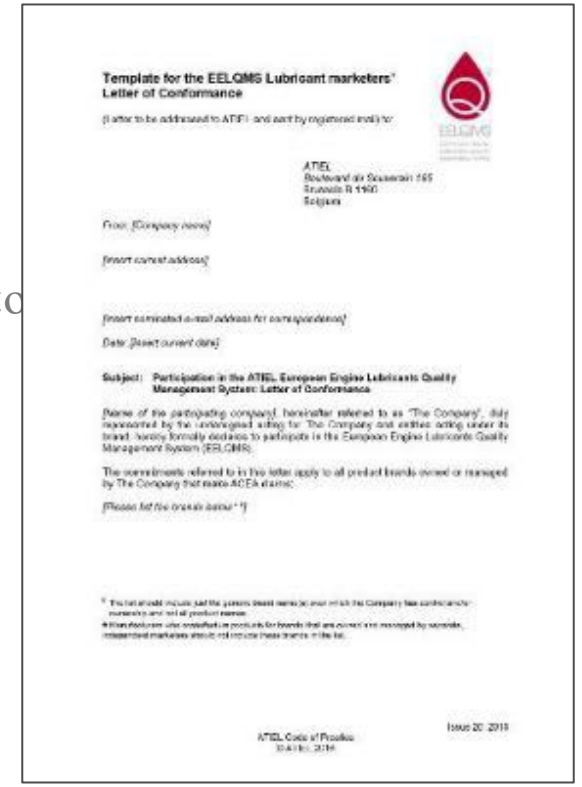
- Subsidiary of ATIEL - The Technical Association of the European Lubricants Industry
- Contracted by ATIEL to provide administrative, financial and management services in support of ATIEL's global product compliance and Letter of Conformance activities on a non-profit making basis.
- Manages the registration system of Letter of Conformance signatories
- Responsible for managing ATIEL's product compliance monitoring programme.
- Licences the EELQMS quality trademark in association with ATC and ACEA.

SAIL

Marketer's Letter of Conformance

Compliance with the EELQMS includes signing a Lubricant Marketers' Letter of Conformance:

- Required for ACEA performance claims
- Declaration of compliance with EELQMS by lubricant marketer
- Signed Letters held by SAIL of behalf of ATIEL (EELQMS administrato
- List of signatories on SAIL website
- Renewed annually
- Membership of ATIEL not required to be a signatory
- Letter of Conformance template available from SAIL website: www.sail-europe.eu



Template for the EELQMS Lubricant marketers' Letter of Conformance

(Letter to be addressed to ATIEL and sent by registered mail) to:

ATIEL
Boulevard du Souverain 165
Brussels B 1160
Belgium

From: [Company name]

[insert current address]

[insert nominated e-mail address for correspondence]

Date: [Insert current date]

Subject: Participation in the ATIEL European Engine Lubricants Quality Management System: Letter of Conformance

[Name of the participating company] hereinafter referred to as "The Company", duly represented by the undersigned acting for The Company and neither acting under its brand, hereby formally declares to participate in the European Engine Lubricants Quality Management System (EELQMS).

The commitments referred to in this letter apply to all product brands owned or managed by The Company that make ACEA claims.

[Please tick the boxes below *]

ATIEL Code of Practice

Issue 20 2019

SAIL's Role in EELQMS

- SAIL operates the registration system of the signatories of the Letter of Conformance, and on behalf of ATIEL, in association with ATC and ACEA, licences the use of the EELQMS quality trademark.
- SAIL has been contracted by ATIEL to provide administrative, financial and management services in support of ATIEL's product compliance and Letter of Conformance activities on a non-profit making basis.
- SAIL is responsible for ATIEL's product compliance monitoring programme.
- SAIL ensure all survey reports and summaries are anonymised to avoid potential conflicts of interests between members and participants

Did you know …?

… in 2024, ATIEL/SAIL sponsored over 4000 individual tests as part of the Lubricant Marketers' Letter of Conformance compliance program

… ACEA lubricants have a truly global reach with over four hundred participants in sixty - three countries across six continents

…ACEA is a full and active participant in the process

… Letter of Conformance scheme participants are licensed to use the EELQMS logo on their packaging demonstrating that their lubricant meets the minimum standards of leading European vehicle manufacturers

1 SAIL - Registration Status - Listed Website

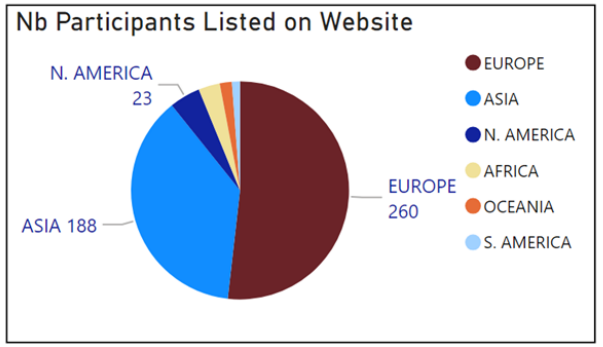
Date Refreshed = 20-Mar-25

Number of registrants 20/03/2024

- Listed on website = 502
- All listed participants signed LoC

Number of signed sub-license agreements

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



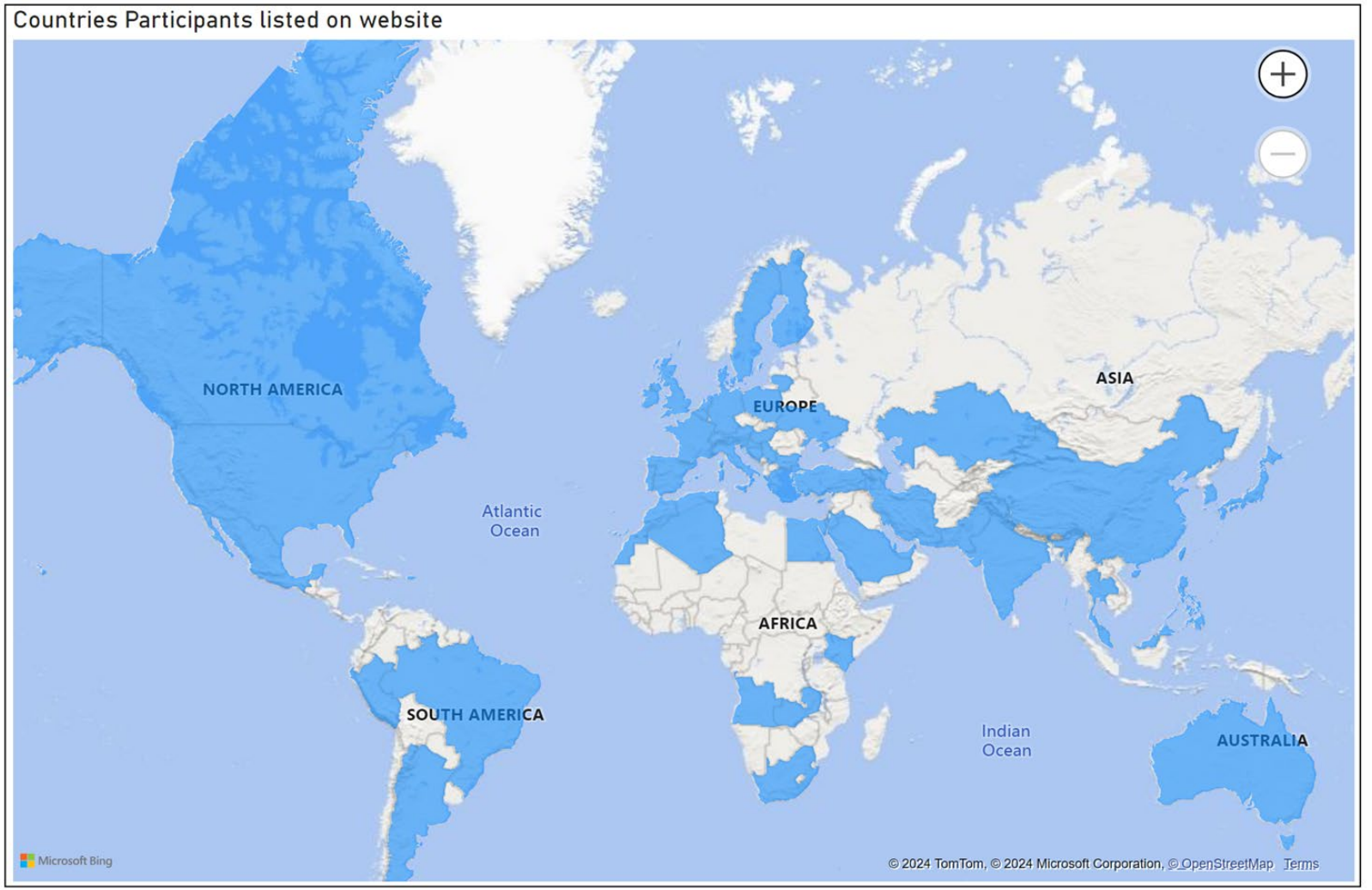
Nb Partcipants Listed on Website - Continent

CONTINENT	Nb Participants	Nb Sig %
AFRICA	16	3.2%
ASIA	188	37.5%
EUROPE	260	51.8%
N. AMERICA	23	4.6%
OCEANIA	9	1.8%
S. AMERICA	6	1.2%
Total	**502**	**100.0%**

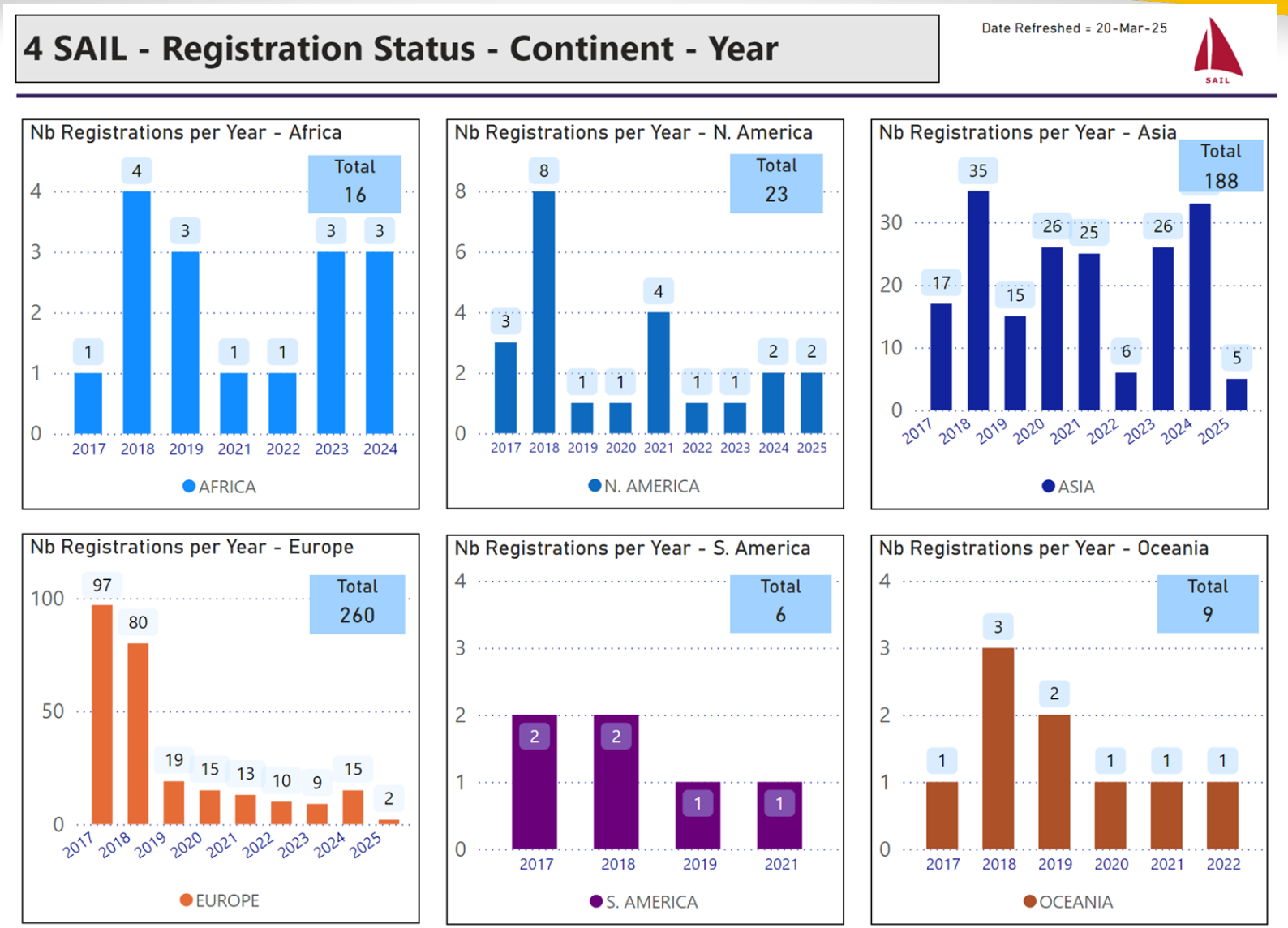
Nb Listed Participants with signed Sub License

CONTINENT	Nb SubLicences	Nb Lic %
AFRICA	9	2%
ASIA	107	21%
EUROPE	114	23%
N. AMERICA	7	1%
OCEANIA	3	1%
Total	**240**	**48%**

Global Reach



New Registrations by Region



Example Report

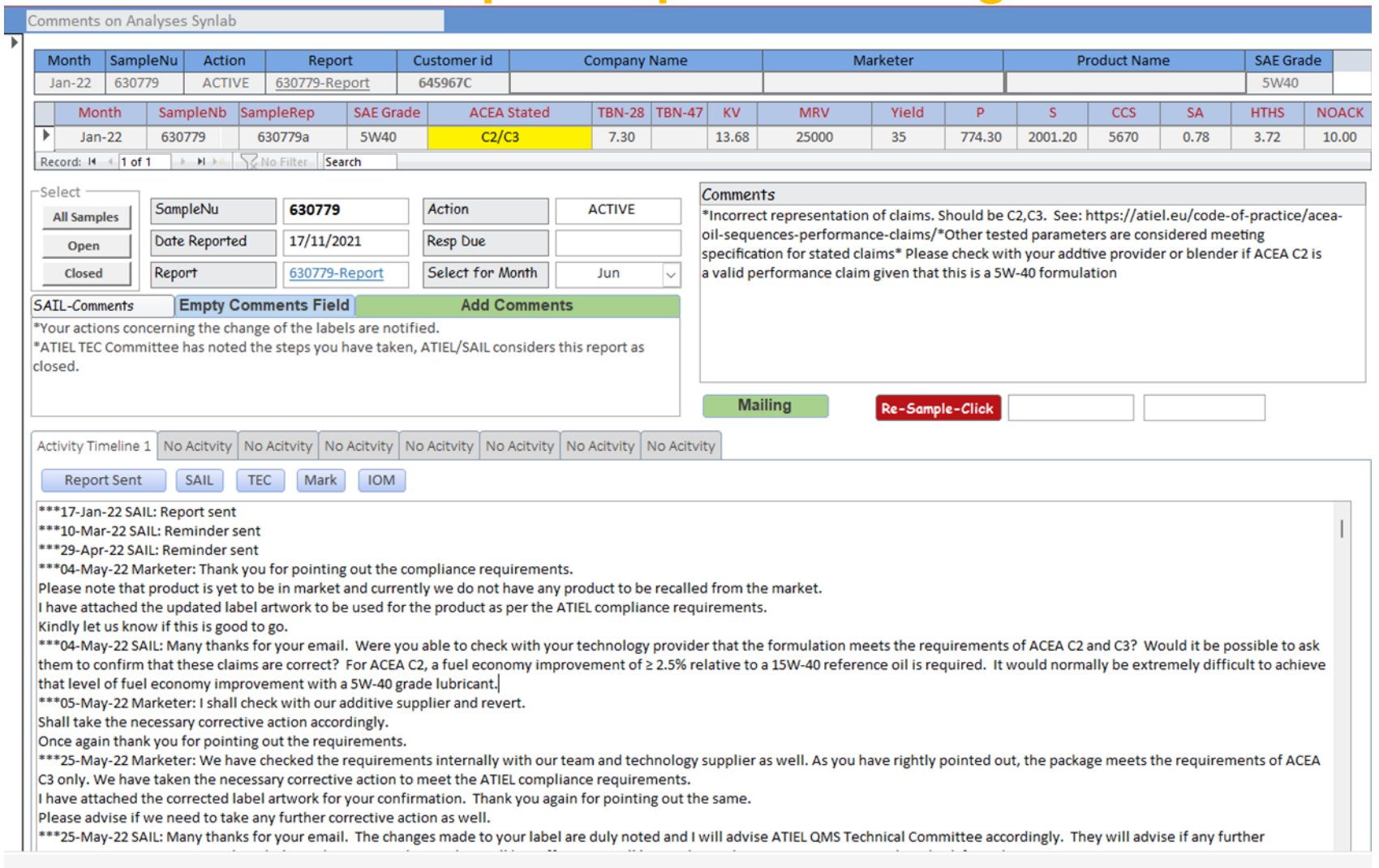
4800 James Savage Road
Midland, MI 48642

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



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

Thank you!

Any questions?

For more information visit:
www.atiel.eu
www.sail-europe.eu
www.eelqms.eu
www.acea.be