CEC 2010 - Role of CEC in Developing Tests for the European Automotive Industry

BASE OILS AND LUBRICANTS IN RUSSIA & THE CIS CONFERENCE

23-25 March 2010, Marriott Royal Aurora, Moscow

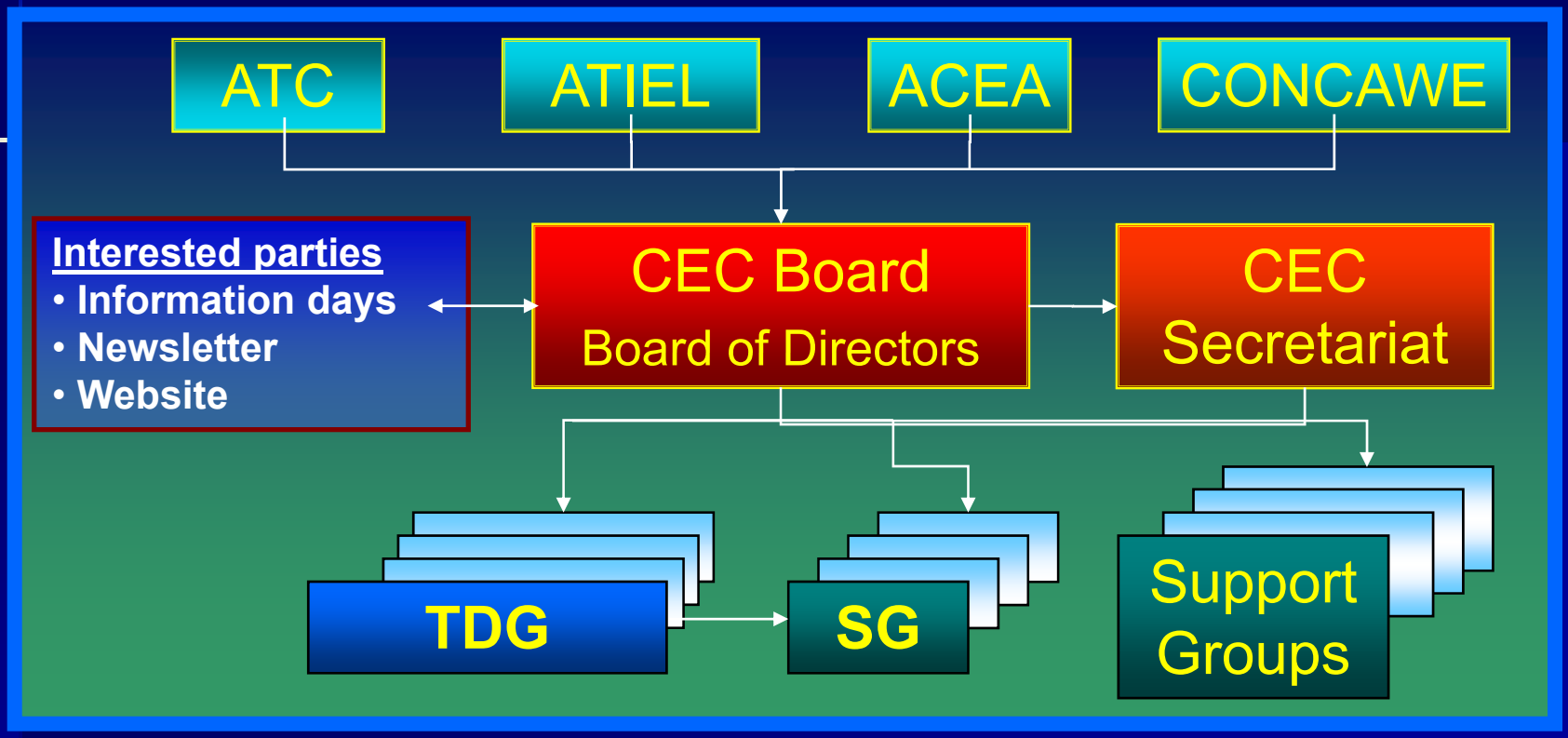
The Co-ordinating European Council for the development of performance tests for transportation fuels, lubricants and other fluids

What is CEC?

CEC is an Industry-based organisation for the development of Test Procedures and Methods:

- Automotive Fuels, Engine Oils & Transmission Fluids
- Marine & Large Engine Oils
- Two-stroke Engine Oils
- Associated Bench Tests
- Industrial & Hydraulic Fluids

CEC – 2001 Organisation

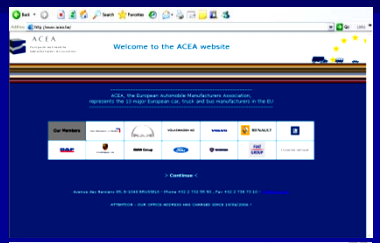


Articles of Association	Bye-Laws	Guidelines	Test Methods
Legal requirement	Constitution	How to operate	End result

CEC was reorganised in 2001. Its Board of Directors is made up from members of four Industry Associations:-

ACEA: *www.ACEA.be*

Association des Constructeurs Europeens de l'Automobile



ATC*: www.ATC-Europe.org*

ATC is the Organisation of Europe's biggest additive manufactures

ATIEL*: www.ATIEL.org*

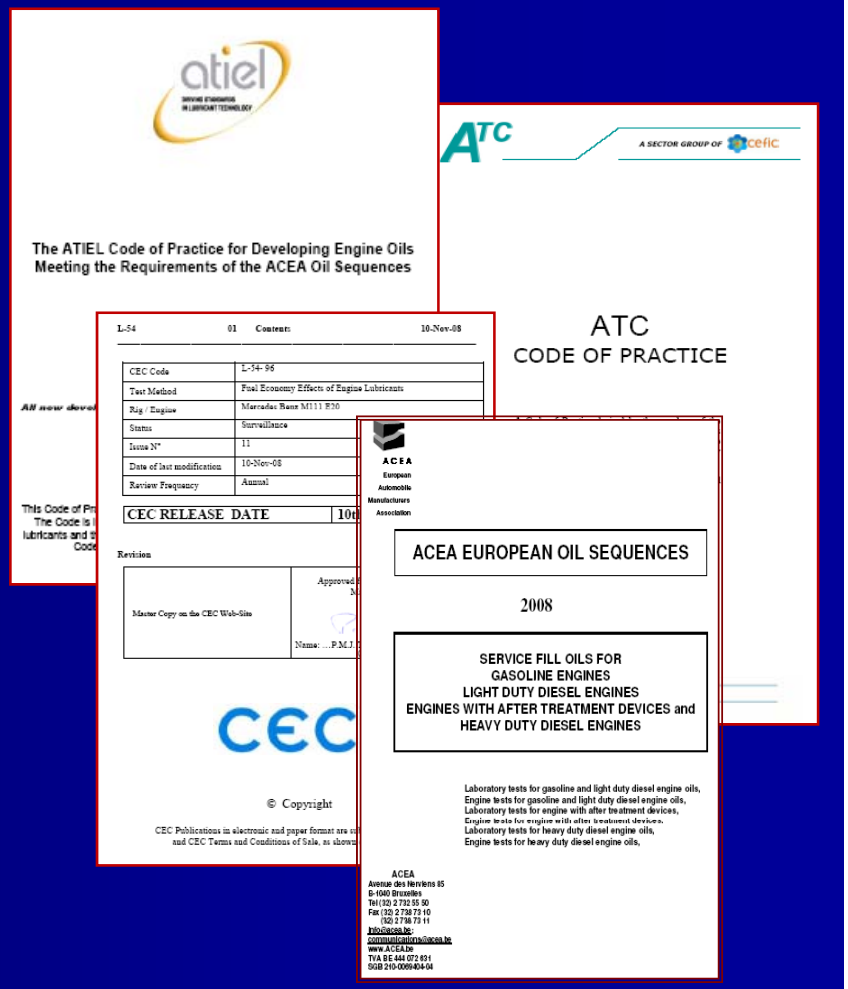
ATIEL is the Organisation of Europe's leading engine oil manufactures

CONCAWE :*www.concawe.be*

The Oil companies' European association for environment, health and safety in refining and distribution

ACEA European Oil Sequences and EELQMS

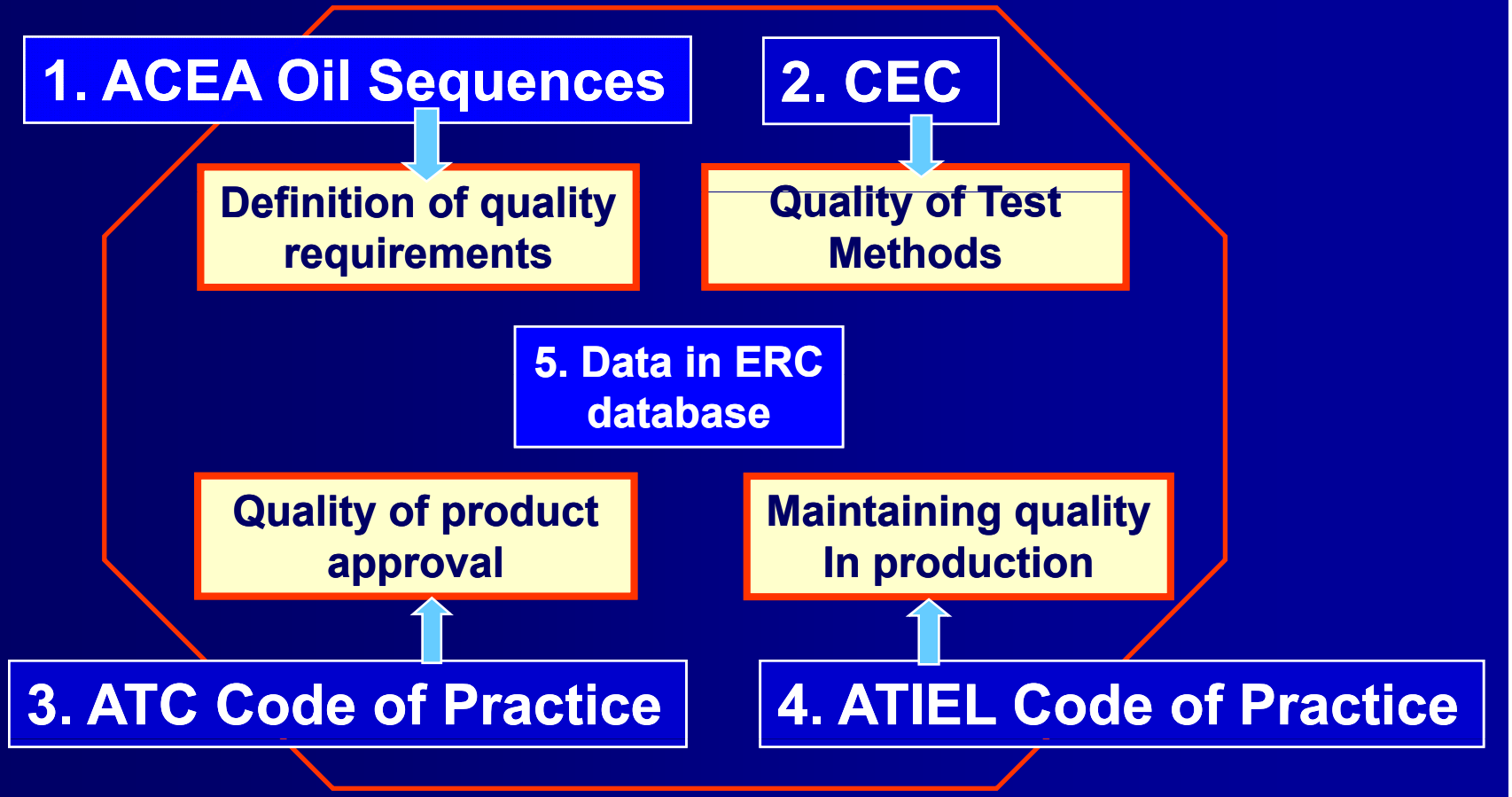
In 1995 the European industry associations ACEA, ATC and ATIEL developed a quality system to ensure that engine lubricants claiming performance against the ACEA Oil Sequences would have been developed and tested according to best industry practices.
This system is called the "**European Engine Lubricant Quality Monitoring System** (EELQMS)"



There are 4 major parts:

- ACEA European Oil Sequences
- ATC Code of Practice
- ATIEL Code of Practice
- CEC test methods

CEC's role in EELQMS



CEC Mission

Managed by industry stakeholders

Quality processes for test labs

TMS for bench tests

Rating workshops

Use of lead lab to develop new tests

All CEC processes combine to provide high quality tests that will reliably assess the true performance of a lubricant or fuel

Support of statistics group

Terms of reference for new test development

Expert fuels and lubes advisors

Monitoring and referencing of test engines

CEC Test Methods

Engine Oils – Passenger Cars

- CEC L-38-94 - Gasoline Engine Valve Train Scuffing Test (PSA TU3 Engine)
- CEC L-53-95 - Evaluation of Sludge in Gasoline Engines (MB M111 E20)
- CEC L-54-96 – Fuel Economy Effects of Engine Lubricants (MB M111 E20)
- CEC L-78-99 – DI Diesel Ring Sticking & Piston Cleanliness Test (VW 1.9L Turbocharged)
- CEC L-88-02 - Evaluation of Oil Viscosity Increase, High Temperature Deposits & Ring Sticking in Gasoline Engines (Peugeot TU5 JP+)
- CEC L-93-04 - Oil Dispersion Test at Medium Temperature for Passenger Car Direct Injection Diesel Engines

Engine Oils – Heavy Duty Diesel

- CEC L-101-09 - Piston Cleanliness and Bore Polishing Test (OM 501LA)

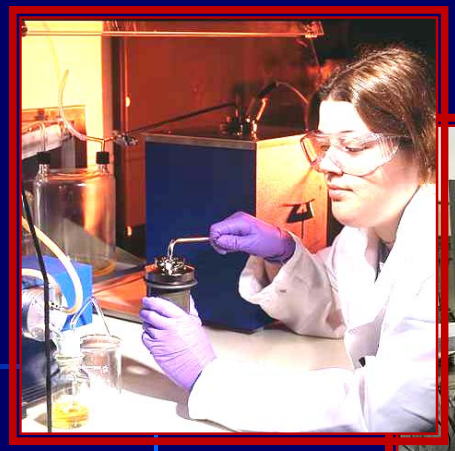
Engine Oils – Light & Heavy Duty Diesel

- CEC M-100-09 - Code of Practice Turbo Deposits
- CEC L-99-08 – Evaluation of engine crankcase lubricants with respect to low temperature lubricant thickening & wear under severe operating conditions (OM646LA)

CEC Test Methods

Automotive Fuels

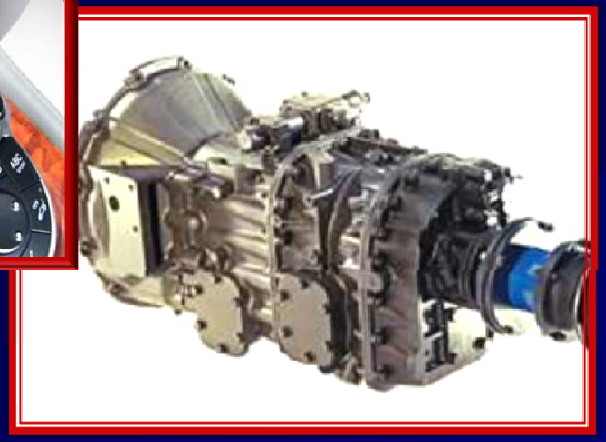
- CEC F-05-93 - Inlet Valve Cleanliness in the MB M102E Engine
- CEC F-16-96 - Assessment of the Inlet Valve Sticking Tendency of Gasoline Fuels (VW Waterboxer Gasoline Engine)
- CEC F-20-98 - Deposit Forming Tendency on Intake Valves.
- CEC F-23-01 - Procedure for Diesel Engine Injector Nozzle Coking Test (PSA XUD9A/L 1.9 Litre 4 Cylinder indirect injection diesel engine)
- CEC F-98-08 - Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.
- CEC M-92-03 – Code of Practice - Engine Non-Start Problems Relating to CCD Flaking (CCDs = Combustion Chamber Deposits)



CEC Test Methods

Bench Tests

- CEC L-14-93 - Shear Stability of Lubricating Oils Containing Polymers (Fuel Injection Pump)
- CEC L-36-90 - The Measurement of Lubricants Dynamic Viscosity, High Shear
- CEC L-39-96 - The Evaluation of Oil - Elastomer Compatibility (Laboratory Test)
- CEC L-40-93 - Evaporation Loss of Lubricating Oils (NOACK Evaporative Tester)
- CEC L-48-A-00 - Oxidation Stability of Lubricating Oils used in Automotive Transmissions by Artificial Ageing (Laboratory Test)
- CEC L-82-97 - Spectrophotometric determination of Soot in Used Engine Oil
- CEC L-83-97 - Measurement of Kinematic Viscosity @100 Deg C of Used Oil Samples
- CEC L-85-99 - Hot Surface Oxidation ? Pressure Differential Scanning Calorimeter (PDSC)
- CEC F-06-96 - Measurement of Diesel Fuel Lubricity (HFRR fuel lubricity tester)



CEC Test Methods

Transmission Fluids

- CEC L-07-A-95 - Load Carrying Capacity Test for Transmission Lubricants (FZG Test Rig)
- CEC L-45-99 - Viscosity Shear Stability of Transmission Lubricants (Taper Roller Bearing Rig)
- CEC L-66-99 - Evaluation of the Synchromesh Endurance Life using the FZG SSP 180 synchromesh test rig
- CEC L-84-02 - FZG Scuffing Load Carrying Capacity Test for High EP Oils

CEC Test Methods

Marine & Large Engine Oils

- CEC L-47-M-97 (U) - Recommended Standard Methods for Analysis of Used Oil from Large Diesel Engines (including CEC M-12-T-91 Sampling of Engine Lubricants on Board Ship)

Two-Stroke Engine Oils

- CEC L-33-A-93 (U) - Biodegradability of Two-Stroke Cycle Outboard Engine Oils in Water

Reference Fluids Manuals

- CEC P-017-97 - Reference Fuels Manual.
- CEC P-072-98 - Reference Oils Manual.

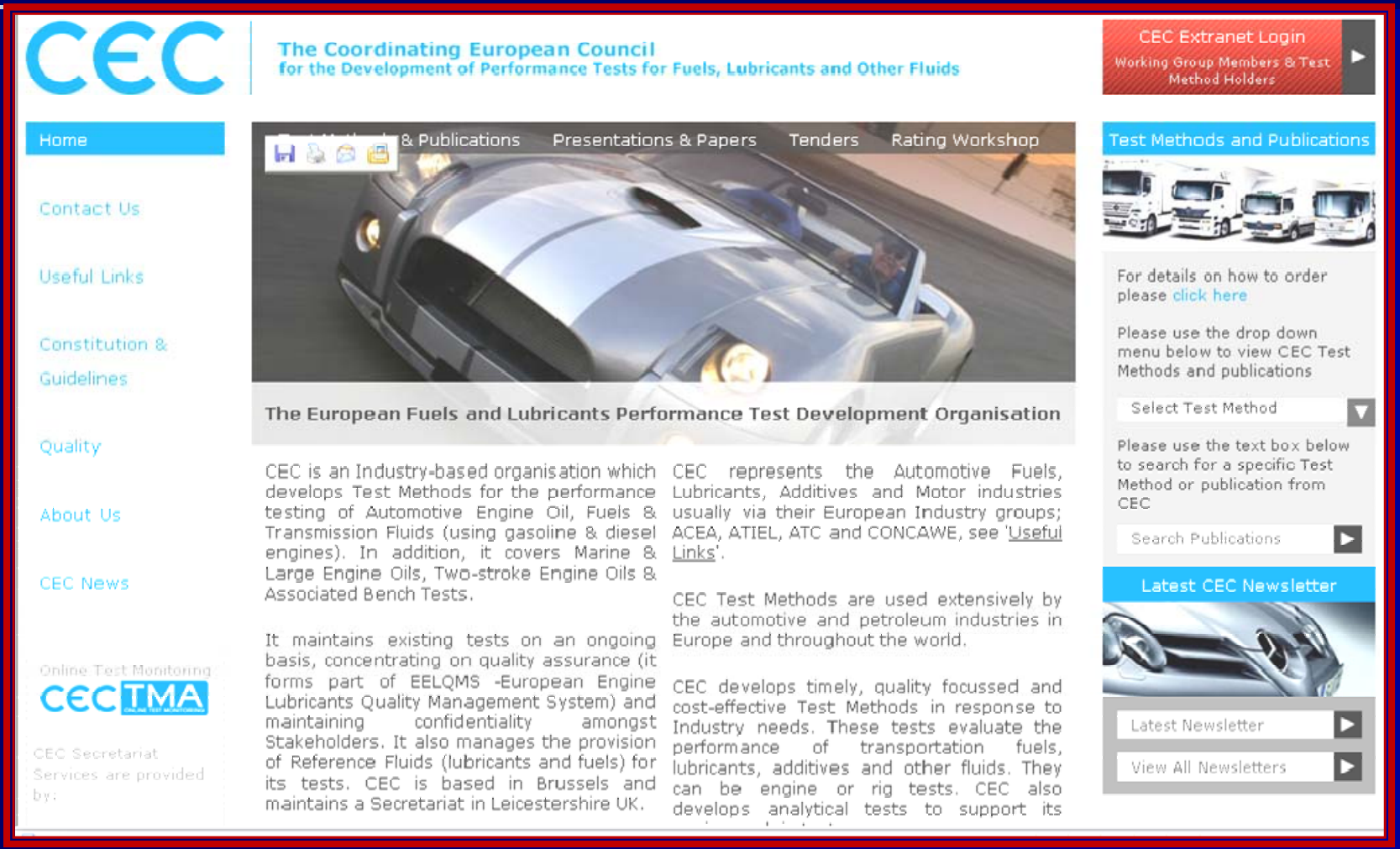
(U) Unsupported – no longer supported by a CEC Group

CEC Secretariat

- Secretarial & administrative support to Management Board
- Finance, Legal and Accounts
- Support to all CEC Groups
- Maintenance, updating and sales of Test Methods
- Maintenance of CEC's secure Web Site and information to stakeholders.
- TMS facilitator
- Helpdesk facility
- Organisation of CEC Conferences

- Website: ***www.CECtests.org***

CEC - Website: *www.CECtests.org*



Test Laboratory Quality Requirements

All laboratories running CEC tests must have an ISO 9001 equivalent system for the general quality definition and procedures.

For engine/rig tests an ISO 17025 equivalent system is required.

Laboratories must actively participate in CEC Group activities, meetings and round robins. E.g.. every laboratory must contribute to the improvement of the test method and share data/experience.

Test Laboratory OEM Quality Requirements

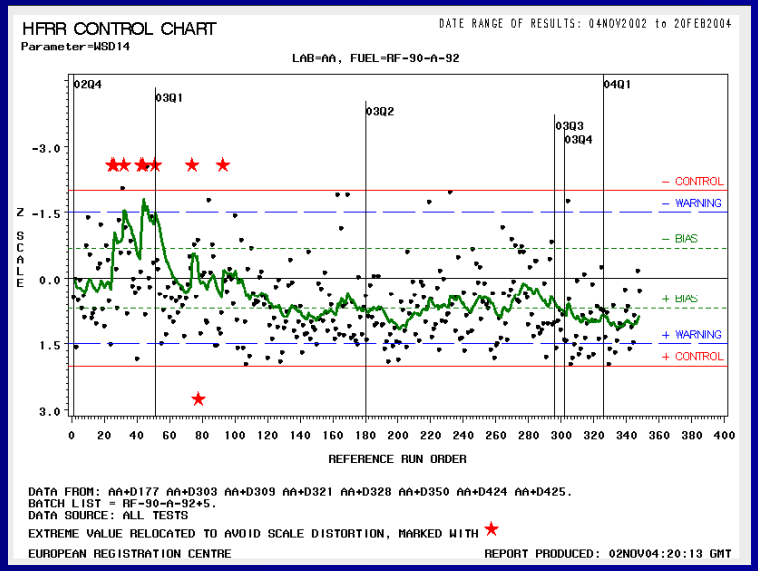
Especially for lubricant engine tests included in the ACEA Oil Sequences additional requirements must be satisfied:

- Audit by supporting OEM
- Confidentiality agreement with OEM

These requirements may exclude laboratories not meeting the “standard” required by CEC and the supporting OEM.

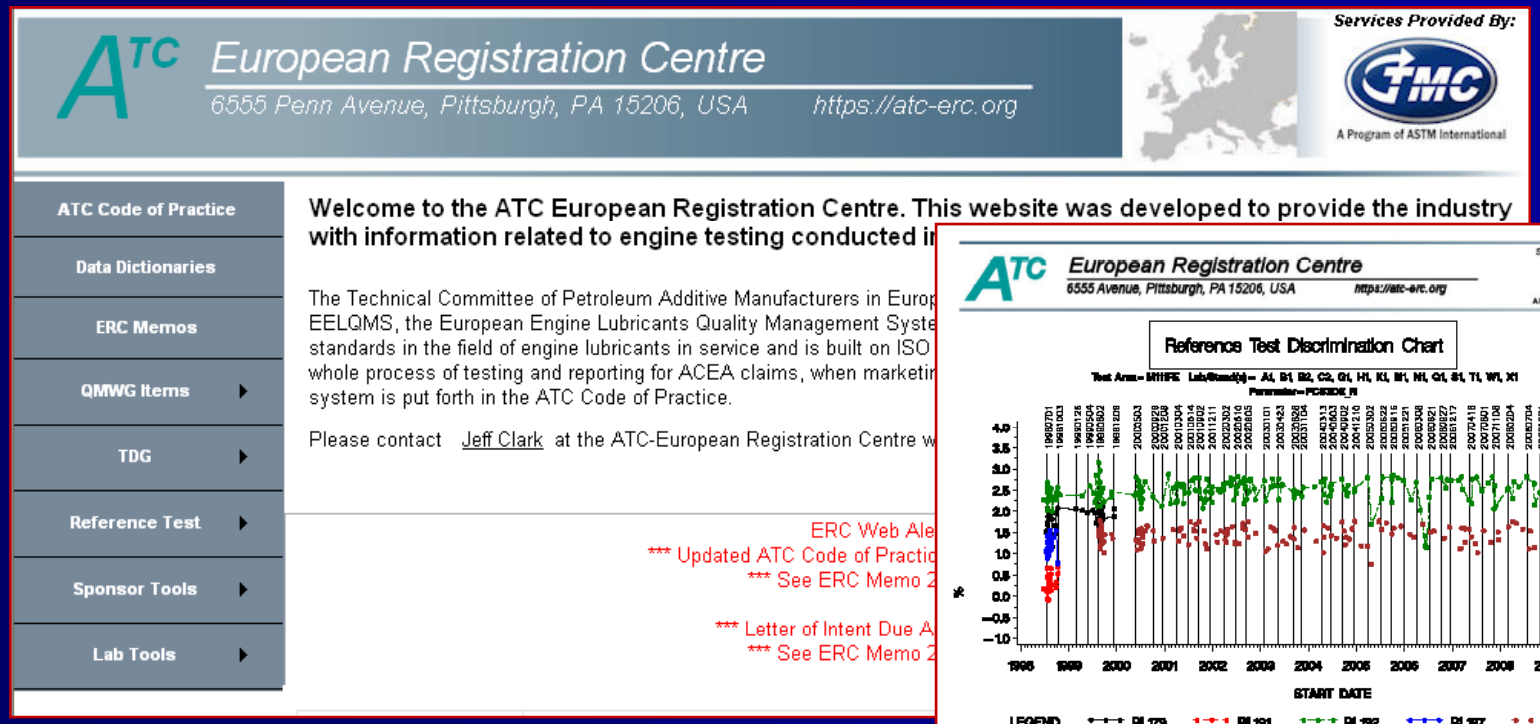
CEC Web-based Test Monitoring

- Simple process for uploading Reference data and Graphical software for analysis of data
- Location: https://www.data-interchange.com

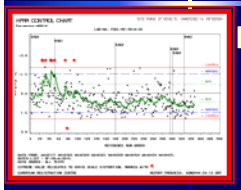


ERC – ATC's European Registration Centre

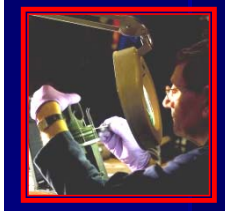
- Candidate test registration database
- Reference test registration database and charting



Support Groups



- **Statistical Development Group**
  - A designated Statistical Development Liaison Officer allocated to
  - each Group
  - Assuring Quality of Test Results



- **Rating Group**
  - Regular Workshops for Raters
  - Ensure Rating is consistent across the industry

- **Reference Fuels**
  - A suite of reference fuels are supplied for use within TDG and SG test groups to ensure consistency of fuel used.

- **Reference Lubricants**
  - Reference oils are supplied to TDG and SG test groups to enable the initial development of tests using calibration oils and to ensure correct severity of testing by running Round Robins and/or set reference frequency protocols.

Recent Test Developments

- CEC F-98-08 – Injector Fouling in Direct Injection Diesel Engines (DW10)
- CEC L-99-08 –Diesel Engine Wear Test (OM646LA)
- CEC L-101-09 - Piston Cleanliness and Bore Polishing Test (OM 501LA)
- Turbo Deposits Test - Code of Practice

New Developments

- TDG-L-103 – Biological Degradability
- TDG L-104 - Effects of Biodiesel Fuel (March 2010)

CEC L-99-08 - Diesel Engine Wear Test (OM646LA)

- Replacement for OM602A in ACEA and for OM611LA in Mercedes-Benz (MB) in-house specifications
- Cam wear is main parameter for ACEA.
- MB parameters include – Piston merits, Cylinder, Ring, Timing chain and
- Bearing wear, Viscosity increase, Bore polishing and Engine sludge
- B5 Biodiesel used
- 300 hours cyclic test

OM 646 LA - Euro V
- Engine type: R4 CDI
- Capacity: 2.2 l
- Power max: 110 kW
- Torque max: 340 Nm

CEC L-101-09 - Piston Cleanliness and Bore Polishing Test (OM 501LA)

- Replacement for OM441LA in ACEA and Mercedes-Benz (MB) specifications
- Piston merit is main criteria for ACEA
- MB parameters include - Engine sludge, General engine deposits, Bore polishing, Cylinder wear, Ring sticking and Oil consumption.
- B5 Biodiesel used
- 300 hours cyclic test

OM 501 LA - Euro V
- Engine type: HDD V6
- Capacity: 11.9 l
- Power max: 350 kW
- Torque max: 2300 Nm

New Test Development Group (TDG):
CEC TDG-L-104 – Effects of Biodiesel Test (OM646LA)

Terms of Reference for TDG-L-104

- 1st meeting : 12th March 2010
- New Biodiesel test to determine the effects on Piston deposits, Engine Sludge and Oil degradation.
- Using the same Daimler AG OM 646 DE 22 LA engine as used in CEC L-099.
- Test Fuel - B15 = 85% Diesel Fuel + 15% FAME
- Test Oil will be diluted with ≈ 7% B100

OM 646 LA - Euro V
- Engine type: R4 CDI
- Capacity: 2.2 l
- Power max: 110 kW
- Torque max: 340 Nm

Potential Future Test Developments

- New Gasoline Sludge Test, replacing the M111.
- Updated Engine for CEC L-93-04
- New Fuel Tests under consideration.

On behalf of the CEC Management Board,

Thank You

for allowing me to present today.