Oil & Gas measuring systems certification

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Agenda

A. Oil measuring systems and Gas measuring systems: differences and analogies under certification point of view
B. Certification of Oil measuring systems
C. Certification of Gas measuring systems
D. Certification of Level measuring systems
E. OIML certification in short
A. Oil measuring systems and Gas measuring systems: differences and analogies

**Oil measuring systems**

- They are really “systems”!
  So defined in MID 2014/32/EU Annex VII (MI-005) and OIML R-117

- They are composed of certified parties
  *flow meter, measurement transducer, flow computer, flow transmitter, sensors / transmitters, air separator*

- Certificate of “part” is Evaluation or Parts or Test certificate (old)
A. Oil measuring systems and Gas measuring systems: differences and analogies

Gas measuring systems

• Improperly called “systems”!

• They are single meters for MID 2014/32/EU Annex IV MI-002 (Gas meters and Volume conversion devices) and OIML recommandation

• They are connected with other certified devices sensors / transmitter, gas chromatograph, gas analyzer / CVDD, ecc.

• Also the meters can be composed of certified parts (mechanical part, electronical part)

• Certificate of “part” is Evaluation or Parts or Test certificate (old)
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B. Certification of Oil measuring systems

**EUROPE**

- MID 2014/32/EU Annex VII MI-005
  - Modules B+D or
  - Modules B+F or
  - Module H1 (Conformity based on full quality assurance plus design examination) or
  - Module G (Conformity based on unit verification)

- Welmec Guide 8.8 – Modular approach:
  - Evaluation certificate ➔ authorization by certificate owner
  - Parts certificate ➔ free use
B. Certification of Oil measuring systems

OUTSIDE EUROPE

- OIML Recommendations ➔ country driven, function oriented, a lot of SW / EMC
- API standards ➔ safety, user requirements, equipment oriented
- ISO standards ➔ International Standards
- National regulations
B. Certification of Oil measuring systems

OIML Recommendations

• R117 Dynamic measuring systems for liquids other than water
  - LNG will be included -

• R81 Dynamic measuring devices and systems for cryogenic Liquids

• R139 Compressed Gas for Vehicles (CNG and Hydrogen)
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EUROPE

- MID 2014/32/EU Annex IV MI-002
  *Gas meters* and *Electronic volume conversion devices*
  - Modules B+D or
  - Modules B+F or
  - Module H1 (Conformity based on full quality assurance plus design examination)

- Welmec Guide 8.8 – Modular approach:
  - Evaluation certificate → authorization by certificate owner
  - Parts certificate → free use
C. Certification of Gas measuring systems

OUTSIDE EUROPE

• OIML Recommendations → country driven, function oriented, a lot of SW / EMC

• API standards → safety, user requirements, equipment oriented

• ISO standards → International Standards

• National regulations
C. Certification of Gas measuring systems

OIML Recommendations

R137  Gas Meters

R140  Measuring Systems for Gas
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EUROPE and OUTSIDE EUROPE

OIML Recommendations

National legislation

NO

European Directive
D. Certification of Level measuring systems

OIML Recommendations

R71 Fixed Storage Tanks
R80 Road & Rail Tankers with Level Gauging
R85 Automatic Level Gauges
R95 Ships’ Tanks
R125 Measuring Systems for Mass of Liquids in Tanks (HTG)
D. Certification of Level measuring systems

Legally complicated

• Regulation on "Tank Calibration"
• Regulation on "Level Measurement"
• Regulation on "Conversions"
D. Certification of Level measuring systems

Legal Metrology

Regulations / Laws / Procedures on:

• Pre-market testing & certification
• Taking into use
• Maintenance / re-calibration
• Control / inspection in-use -> possibility to do so
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- **OIML** *Organisation Internationale de Métrologie Légale*
- Recommendations ("voluntary")
- **Three parts** for every recommendation:
  1. Metrological and technical requirements
  2. Test methods / procedures
  3. Test report format
- OIML Certification is **necessary** to enter in extra EU Countries
- **How it works?** 1. High quality level of Issuing Authorities
  2. International acceptance of test reports
  3. Conversion in national type approval
- Website: [www.oiml.org](http://www.oiml.org)
E. OIML certification in short

Example:

OIML Certificate of Conformity

National type approval certificate
Questions
Thank you for your attention

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