APLAC T 091
"ANALYSIS OF LUBRICANTS PROFICIENCY TESTING"

Objectives

The aim of the program is to assess the ability of laboratories to competently perform lubricants testing. This program will contribute to establishing mutual confidence in the comparability and traceability of testing in the Asia-Pacific region and consequently will support the removal of technical barriers to trade.

Organization and Coordination

This program is organized by National Accreditation Body (KAN) of Indonesia, with Research and Development Center for Oil and Gas Technology "LEMIGAS" as provider, under the auspices of Asia Pacific Laboratory Accreditation Cooperation (APLAC).

During this proficiency program, KAN would be responsible for proposing this program for approval by the APLAC Proficiency Testing Committee, inviting participants, assigning confidential codes to participant laboratories, dispatching samples and result sheets, collecting test results, analyzing the data and preparing the report. Research and Development Center for Oil and Gas Technology "LEMIGAS" will be responsible for providing test samples, homogeneity and stability tests.

Points of contacts

The contact details are given below:

Dhandy Arisaktiwardhana (Mr)
National Accreditation Body, Indonesia (KAN)
Manggala Wanabakti Building Block IV-4th Floor
Jl. Jendral Gatot Subroto, Senayan – Jakarta
Indonesia
Tel : +62 21 5747043, Fax : +62 21 579 20948
E-mail : dhandy@bsn.go.id cc. aplac.t091@gmail.com

Ratu Ulfiati (Mrs)
Research and Development Center for Oil and Gas Technology "LEMIGAS" JAKARTA
Jl. Ciledug Raya Kav 109, Kebayoran Lama, Jakarta
Tel/Fax : +62 21 7394178
E-mail : ratuulfi@lemigas.esdm.go.id

Selection of Participants

APLAC members as well as other non APLAC members will be invited to participate in the program. Invitations will be sent to all APLAC members and other accreditation bodies. Participating accreditation bodies will be asked to nominate laboratories to participate and indicate the accreditation status of the nominated laboratories for the test. Each accreditation body of APLAC members is invited to nominate up to maximum of 4 laboratories from the economy to participate in this program, while a maximum of 2 for non-APLAC members.

Description of PT Samples

The sample to be tested is the automotive engine oil. Participating laboratories will be given one sample bottle labeled APLAC T091 from their respective nominating accreditation bodies (AB) . Each bottle contains about 250 g of lubricant. Upon receipt of the sample, participating laboratories should carefully inspect the sample for any physical damages and defects. Participating laboratories shall promptly acknowledge receipt of the sample by returning the Receipt Form (for participating laboratories) through e-mail to the contacts mentioned above. Intact sample is recommended to be stored in secure environment at room temperature before use.

Properties Measured for Comparison and Requirement

Participating laboratories are required to determine:

NO	TEST PARAMETER (for participants)	Unit
1.	Kinematic Viscosity at 40^{o}C	cSt
2.	Kinematic Viscosity at 100°C	cSt
3.	Total Base Number (TBN)	mgKOH/g
4.	Apparent Viscosity by Cold Cranking Simulator (CCS)	cP
5.	Evaporation Loss (Noack Method)	Mass %

The participating laboratories are required to test against their routine testing method, preferably standard methods or accredited method. The accredited test method should be reported in the result form..

Homogeneity and Stability of Samples

The samples will be tested by the Research and Development Center for Oil and Gas Technology "LEMIGAS" both before and after the circulation to check the homogeneity and stability of the samples according to ISO 13528:2005 Annex B.

NO	TEST PARAMETER for HOMOGENEITY & STABILITY	TEST METHOD
1.	Kinematic Viscosity at 40^{o}C	ASTM D 445
2.	Kinematic Viscosity at 100°C	ASTM D 445
3.	Total Base Number (TBN)	ASTM D 2896
4.	Apparent Viscosity by Cold Cranking Simulator (CCS)	ASTM D 5293
5.	Evaporation Loss (Noack Method)	ASTM D 5800

The homogeneity of the test materials is a fundamental requirement for an interlaboratory study. Thus, prior to all samples being distributed to KAN, they will be tested for homogeneity and stability to ensure that they are sufficiently homogeneous to be used in the proficiency program. The homogeneity test will be carried out to 10 samples and each sample will be analyzed twice. The parameters used in this test are the same as those performed by participating laboratories. The results of this homogeneity testing will be analyzed statistically using ISO 13528:2005 Annex B.

Besides homogeneity of samples, the stability of the material with respect to longtime storage has to be verified. The stability test will be carried out to 3 samples. This verification will be done subsequently as the testing deadline. The result of this testing will be analyzed statistically using ISO 13528:2005.

The results of homogeneous test and stability test will be submitted to KAN for evaluation and a decision whether the samples are suitable or not suitable for distributing in APLAC proficiency test program

Assigned Value

The assigned value for the test material used in the round of this proficiency testing scheme is the robust mean of the results reported by all the participants in the round.

Evaluation of the Performance

With ISO 13528:2005 in reference, z-Scores will be applied to evaluate the test results that given by the participants, as following:

$$z = \frac{x - X}{\hat{\sigma}}$$

Where the X is the robust mean, $\hat{\sigma}$ is the standard deviation for proficiency assessment (Algorithm A in Annex C).

Interpretation of the report

For the evaluation of performance, the interpretation is as follow:
$|z| \leq 2.0$ Satisfactory
$2.0 < |z| < 3.0$ Questionable
$|z| \geq 3.0$ Unsatisfactory

Distribution of Samples
The samples are stored in rigid covered cases designed to restrict movement and prevent damage to the samples, includes Material Safety Data Sheet (MSDS) to meet transportation regulation requirement.

Reporting of Results
The participants must send the result to KAN as well as your AB.

Reporting to the Participants
After the test results being returned back to KAN, statistical analysis will be performed. With the approval of APLAC Proficiency Testing Committee, final report will be distributed.

Program schedule

Event	Period	Responsible
Invitation of participants	February 2014	KAN
Registration deadline for participants	April 2014	KAN
Homogeneity	May 2014	LEMIGAS
Dispatch of PT samples to participating AB	June 2014	KAN
Submit the result to KAN	July 2014	KAN
Stability	July 2014	LEMIGAS
Draft interim report	August 2014	LEMIGAS
Send draft final report to participating AB and APLAC PT Committee	September 2014	KAN
Send final report to participating AB and APLAC PT Committee	Oct 2014	KAN

Reference
[1] ISO/IEC 17043:2010, Conformity assessment-General requirements for proficiency testing
[2] ISO 13528:2005, Statistical methods for use in proficiency testing by interlaboratory comparisons