IGPG SG2 – Accelerated Wiper Testing

June 2013 SG2 meeting update

IGPG Meeting 18-19 June 2013 – Mannheim, Germany
IGPG-SG2 ACCELERATED WIPER TESTING

SG2 TARGET:

- Define principle test setup/test machine
- Define procedure / test protocol
- Propose an evaluation methodology
- Check Repeatability and reproducibility
- Correlate with Subgroup I - onroad results
IGPG-SG2 ACCELERATED WIPER TESTING

MEETING HAD IN DARMSTADT W48/2012

- Feed back on preliminary test result carried on some equipment
- Reviewed Methodology & Equipment based on questionnaire feed back from Bayer, Bosch, BYK, Evonik, Momentive, PSA, Renault, SABIC, Valeo
- Defined wiper lab equipment / wiper test methodology / main protocol /evaluation methodology, with identification of main “extreme condition” protocols
- Reviewed planning from 11/12 to 04/13
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Reviewed Methodology & Equipment based on questionnaire feed back from Bayer, Bosch, BYK, Evonik, Momentive, PSA, Renault, SABIC, Valeo

Questionnaire feed back on below main topics:

- Available test equipments
- Wiper blades
- Mud/Mixture
- Protocols (Load, velocity, test cycle, flow rate, samples...)
- Evaluation methodology
- Comparison with real data
IGPG-SG2 ACCELERATED WIPER TESTING – PROCESS

- Each sample was measured in 9-12 locations depending on the size of the sample
- Analysis Tools were percent change in haze and percent change in clarity
- Samples were measured on both exposed and unexposed sides
- Five different test methods were used
  A. Wet with Bath for 25,000 cycles. Tested by Bayer, Bosch, Evonik, and Momentive.
  B. Wet with Slurry Flow for 25,000 cycles. Tested by SABIC
  C. Dry for 1,000 cycles. Tested by Bayer, Bosch, Evonik, and Momentive.
  D. Continuous Protocol: 10 dry cycles, 20 wet cycles, 6 seconds off, repeated up to 25,000 cycles. Tested by SABIC
  E. Wet with Bath for 25,000 cycles then dry for 1,000 cycles (A + C). Tested by Bayer, Bosch, Evonik, and Momentive
**IGPG-SG2 ACCELERATED WIPER TESTING – RESULTS**

- Analysis based on Delta Haze on exposed side of sample.

- Without taking interactions into account, including all test methods and labs, there appears to be a visible difference between sample types.

![Main Effects Plot for Delta Haze](image)

**NOTE:** Wet coated PC samples must be retested due to an expected error in coating application of original samples.
IGPG-SG2 ACCELERATED WIPER TESTING – RESULTS

Results per test method:

A. One of the test labs showed high variability in comparison to the other labs. Retesting is in progress.

B. No statistical difference was between the materials and not noticeable using delta haze. All mean results were less than 1%.

C. There is a statistical difference between materials, but no statistical difference between the laboratories (possibly due to the variability in the test and samples). Variability is the same for all labs used.

D. Results appear most consistent when reviewing the standard deviations per material.

E. Not enough samples were tested to show the repeatability or reproducibility of this method.
There is high variation in all tests except for Test D.

There is low variation in Test A only specific to one test lab.

In order to really understand if the values are real, we need to increase the sample size to possibly 10. 3 samples may not enough based on the variation that is present in these tests.

Using another analysis tool may provide better insight to the difference in samples, labs and protocols that haze cannot provide.
IGPG-SG2 ACCELERATED WIPER TESTING – PATH FORWARD

As agreed based on the results we will perform a second quick round test as following:

Procedure **A**  Sample PC Wet Coated Laboratory Bayer, Bosch, Evonik, Momentive
Procedure **A_LOW**  (test at lower speed) Sample PC Wet Coated Laboratory Bayer, Bosch, Evonik, Momentive

Procedure **D**  Sample PC Wet Coated Laboratory SABIC
Procedure **D_LOW**  (test at lower speed) Sample PC Wet Coated Laboratory SABIC

Will be tested N° 3 sample for each protocol/laboratory.
IGPG-SG2 ACCELERATED WIPER TESTING

(Subgroup 2)

10/12  Decision to start the activities

KW48/12

Definition of the lab test methodology / required equipment parameter /evaluation methodology

Review of Defined Methodology data, Repetability (Reproducibility)

First results of subgroup 1 and subgroup 2

Start round robin according defined fine tuned test

Analysis of the samples from final road test

Correlation of results to on-road tests

Proposal to UNECE, GRSG, IGPG

04/13  06/13  08/13  12/13  02/14  04/14

(Subgroup 1)

10/12  02/13  06/13  12/13  02/14  04/14

Decision to start the activities

Preparation of test cars; start on-road tests at OEMs

First results of subgroup 1 and subgroup 2

Analysis of the sample parts

Correlation of results to wiper lab tests

Proposal to UNECE, GRSG, IGPG

No. 10
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