2016 PCCAS DSR Equipment Inventory

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PCCAS Region DSR Equipment Inventory, and responses to some operational questions.

Cooperative effort of:

Alaska DOT
Asphalt Institute
Arizona DOT
Caltrans SRL
Caltrans Translab
Hawaii DOT
Nevada DOT
Oregon DOT
Washington DOT
WFLHD (Federal Lands)

- Albina Asphalt
- Alon Asphalt (AZ)
- APART
- Ergon
- Holley Frontier
- Idaho Asphalt
- McCall Oil
- San Joaquin Refining
- US Oil
- Valero Wilmington
- Valero Benicia

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The Questions the Respondents were asked to answer are:

1. How many DSRs do you have in use in your Lab?
2. List by priority of use, for each DSR; make and model, year of purchase, DSR software type and last software update.
3. Do you run the MSCR on the RTFO sample?
4. Do you run the MSCR at the same temperature as the RTFO sample?
5. Can you see the raw data for the MSCR?
6. Do you evaluate the raw data with each MSCR result?
7. Do you see a shift between the peak value and the recorded value, and for which of your DSRs?

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Question 1):
3; 3; 1; 3; 2; 4; 2; 4; 1; 2; 2; 2; 2; 2; 2; 2; 4; 2; 1; 2; 3.

<u>Conclusions regarding makes of DSRs in use in the PCCAS:</u>

We have 49 DSRs in 21 Laboratories.

- Anton Parr (39)
- Bohlin/Malvern (8)
- TA (2)

Four Labs have more than one brand of DSR.

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Typical responses:

Question 2): The newest DSR gets the preferred use.

Question 3): Yes, the MSCR is run on the RTFO sample

Question 4): Yes, the MSCR is run at the same temperature as the RTFO sample.

Question 5): 1/3 respond with No; 2/3 respond with Yes.

Example of a more detailed response to Question 5:

- **Can you see the raw data for the MSCR?** No, not all of the raw data is displayed on test reports. However, data is displayed graphically on the test report. Tabulated data on the test report shows Epsilon sub-0, Epsilon sub-C, and Epsilon sub-R at the 10 recorded 0.1 kPa and the 10 recorded 3.2 kPa shear stress levels. The required AASHTO T350 test result calculations are also shown on the test report.

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Typical responses:

Question 6): No, the raw data is typically not evaluated.
A few respondents can and do check the raw data when errors are expected.

Question 7): Do you see a shift between the peak value and the recorded value? Typically this is not available and/or not looked at.

However there were three interesting responses to Question 7:

- No I do not see a shift in peak vs the recorded value. However, on the Malvern Kinexus, it often appears that the instrument does not use Ɛ0 in determining the strain values. It looks like the software captures Ɛr and Ɛc to determine strain values. It should also be brought to the attention that the last software update on R-space has some bugs. The combined RTFO-MSCR script initially showed 12% strain instead of the required 10% for RTFO DSR. I called support and they sent me the corrected script. Anton Paar Smart Pave DSRs sometimes have an electronic issue where temperature can fluctuate more than ±0.1°. It does not always occur, but none the less it's an issue that might introduce some variability.

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Three interesting responses to Question 7 continued:

- The values we report are the average Jnr at 0.1 and 3.2 kPa so there will be some shift between the peak and recorded values. I do not see in T350 where it indicates to report the peak value but it does instruct for the calculation of the average values.

- Tabulated data shows the peak strain value at the end of 1 second (Epsilon sub-C) for all test cycles and there is no indication of a shift in the peak strain value.

  Additional Comments: We have noticed that the graphical data that is plotted on the test report has unexpected values on the time axis (i.e., the expectation is a plot from 100 to 200 seconds for the 0.1 kPa stress level, and a plot from 200 to 300 seconds for the 3.2 kPa stress level). The graphs appear to have a 20 second delay built in.

  One other thing regarding the plotted data, we may have a time sequence difference due to a choice of testing template for the DSR, which can be either an AASHTO T350 (MSCR) only test, or a combined AASHTO T315 and AASHTO T350 test. I didn't check which template was used when I was going over the test result report.

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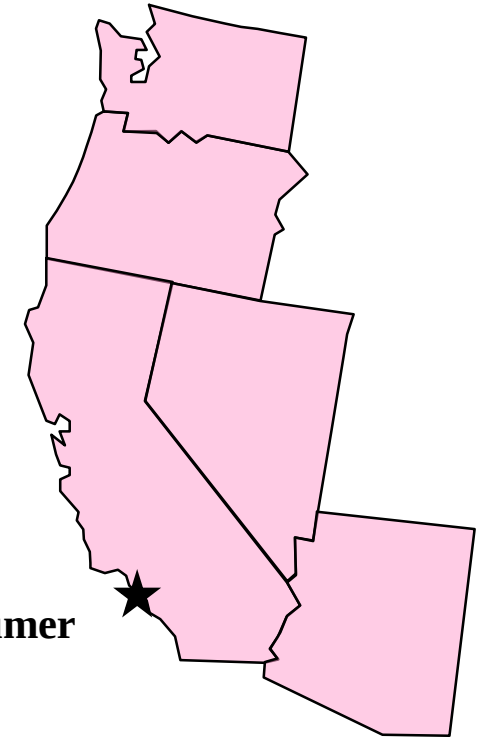
Questions?

+ Hawaii



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