

## New ASTM Standard to be Published in 2009

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### Good News: Put Away the Graph Paper

Balloting closed June 10, 2008 on the new ASTM standard D5334-08 for single needle heat pulse probes. You can read the full text of the standard at the ASTM International website (<http://www.astm.org>). New 2009 ASTM publications will cite the revised standard, but the bottom line for consultants and practicing engineers who use the KD-2 PRO is that at last they can conform to the ASTM standard using the KD-2's sophisticated data analysis software instead of a pencil and graph paper.

### Outdated Standard

ASTM D5334-05 was originally written decades ago, and according to Dr. Doug Cobos, a Research Engineer at Decagon, although it had small updates as recently as 2005, it had simply become obsolete. "The standard required you to heat a needle for 1000 seconds, collect time versus temperature data, and plot natural log of time vs. temperature. Then, to conform, you picked two points, drew a line, and calculated the slope," says Cobos.

### Errors in the Method

The old method had some significant limitations. "Heat flow is a basic equation when you're calculating heat flow from a plane to a plane," explains Cobos. "Heat flow from a needle is also pretty simple if you keep the needle heated. But as you heat the needle, you cause water to flow away from it, and you get big errors as the water redistributes. You can solve the water redistribution problems by heating the needle in short bursts, but then calculating heat flow is no longer simple-it goes way beyond two points and a line."

### KD-2 Uses Complex Numerical Methods

Decagon's KD-2 probe gets its accuracy by using the heat pulse method and calculates thermal conductivity using an intricate mathematical algorithm. "The KD-2 uses complex numerical methods, but it should simplify things for the engineer," says Dr. Cobos. "If you stick the needle in right, you get very accurate thermal conductivity data with one punch of the button."

### Conforming With Pencil and Paper

The KD-2 Pro complied with the old ASTM standard, but there was a hitch. "In order to conform completely to standard, our customers had to extract raw data and draw a graph. It created a lot of extra work and degraded the quality of the data," says Cobos. "It became clear that we needed to help bring that standard up to date."

### Change "Long Overdue"

Two years ago, Dr. Cobos got involved with ASTM. As you'd expect, standards change is slow and deliberate. The process involves sitting on a subcommittee, proposing changes, authoring them, debating them and responding to all comments. Naturally, every committee member has to agree to the new standard.

It took two years to update ASTM D5334-05. But the result is a modern standard that lets engineers use best practices and conform to the ASTM standard with the push of one button.

### One Down, One to Go

As one committee member said, "Thanks for stepping up to the plate and revising this standard. It's been badly needed but nobody has

been willing to devote the time to update it.”

“It was worth it,” says Cobos, “but I’m not ready to take on the dual needle standard until I’ve recovered a little bit.”