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Fundamentals of Interpreting Test Results



Assumptions

The background of the image is a close-up of a glass surface, possibly a window or a pane, covered in numerous water droplets of varying sizes. The droplets are most concentrated in the center, where a bright, circular light source creates a strong glow, making the droplets appear more prominent and reflective. The overall color palette is dominated by cool blues and greys, with the bright light source adding a warm, yellowish-white highlight. The text 'Design' is overlaid on the right side of the image, in a bold, orange-yellow font.

Design



Measurements

What's the purpose
of testing?



Testing to get Results

Environments

Testing to get Results

Find failure mechanisms

Determine robustness

Detect weaknesses

An environment's set of stresses
are difficult to replicate in a lab



Standards

Testing to get Results

Good for how to setup, apply, and measure

Not good for estimating robustness or durability



Modeling

Testing to get Results

Building a model

Verifying a model

Fitting parameters in a model

how far can you extrapolate?



Are all results

Meaningful?

Assumptions & Testing



Sample Size

Assumptions & Testing

Is one sample enough?

Is 1,000?

Sample of a population

Is the sample representative?



Failure Mechanisms

Assumptions & Testing

Do we know the mechanisms at play?

Will the stress excite the mechanisms of interest?

Does the mechanism respond in similar ways with each stress level?



Acceleration Factors

Assumptions & Testing

Never, ever, assume an activation energy.

Can the test provide model verification?

Can the test provide assumption checking?

Is the AF linear over entire range of interest?



Other assumptions?

linear, interactions, ...

A Couple of Examples



85°C/85%RH

A Couple of Examples

What does having 22 samples that pass 1,000 hours in an 85°C at 85% RH mean?

for an applied finish on metal

for a solar panel

for a personal computer



Life Testing

A Couple of Examples



Success Testing

A Couple of Examples

22 samples and all pass

22 samples and one fails



What results

have you seen?

Do testing well and
trust your results.

Thanks

see more at AccendoReliability.com