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An Accelerated Life Testing Questions and Answers Event

The background of the image is a close-up, top-down view of parched, cracked soil. The soil is a rich, dark brown color, and the cracks form a complex, irregular network of polygonal shapes across the entire surface. Some small, dry, brown leaves and twigs are scattered throughout the soil, adding texture and detail to the scene. The lighting is bright, casting subtle shadows that emphasize the depth of the cracks.

Cheating Time



Mechanisms and Methods



Tradeoffs

How many ways
have you run an ALT?

Recent ALT Questions



ORT & Acceleration

Recent ALT Questions

Our group is planning on implementing ORT on a new product line.

The plan is to mimic years of life through thermal acceleration.

Does it make sense to use the Arrhenius model to calculate time needed to reach those simulated years or to run units to failure and calculate the MTTF

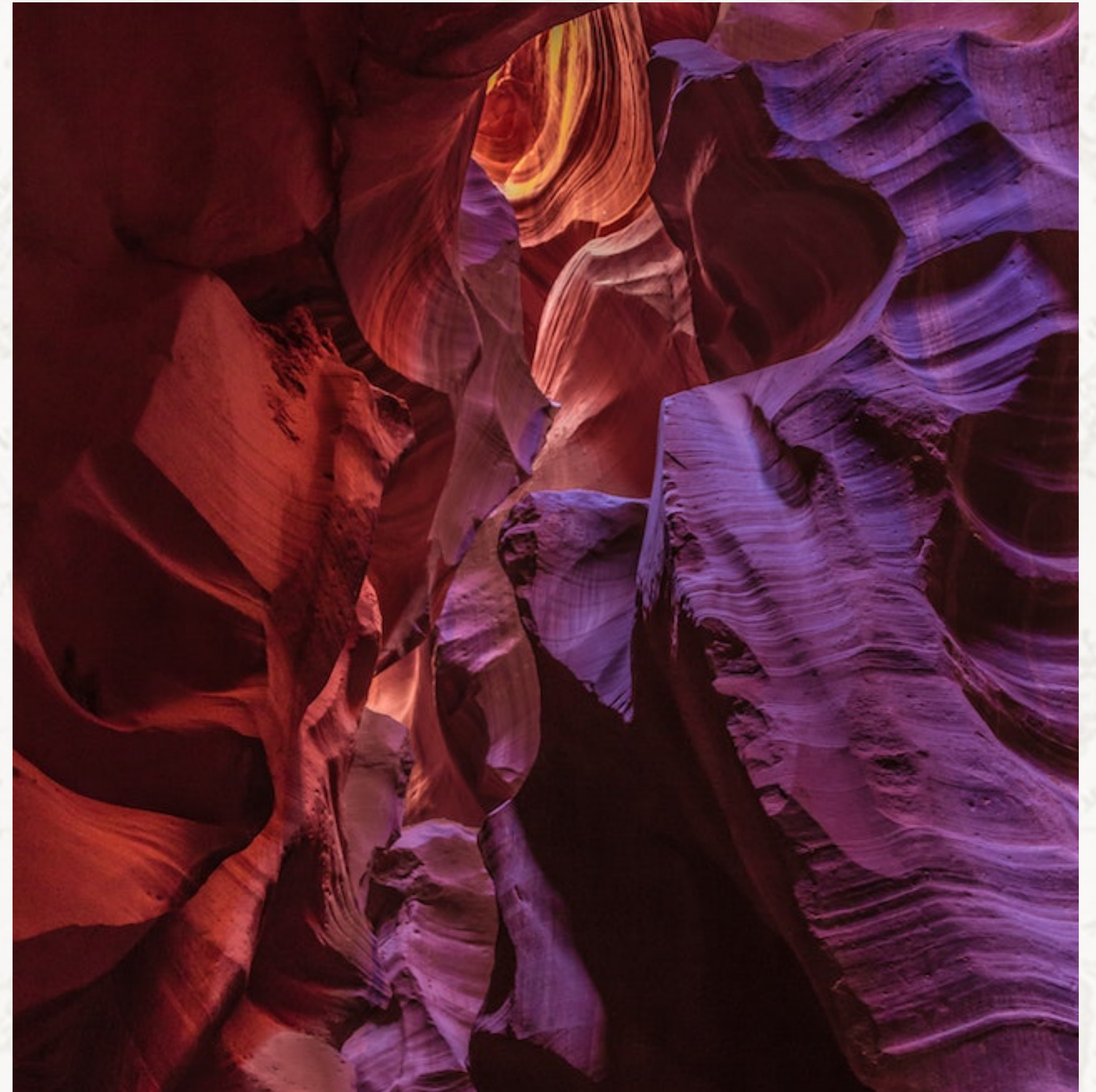


Parameter listings

Recent ALT Questions

I am looking for a list of model parameters for different components/failure mechanisms for humidity acceleration. I searched online but did not get any comprehensive table. Could you please help me locate one if you already know?

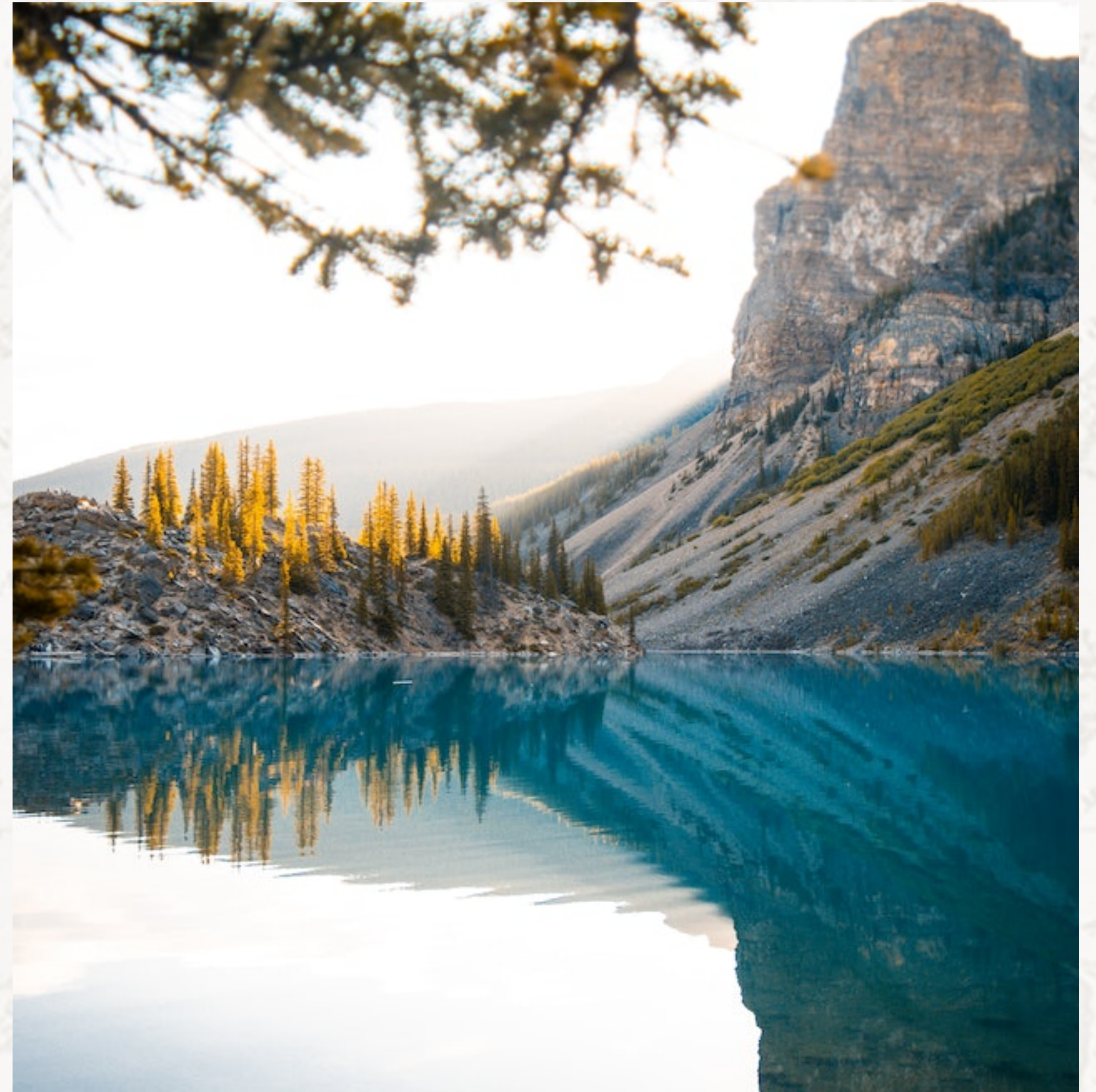
The same question for Temp acceleration. I appreciate your help.



Degradation

Recent ALT Questions

I need to advice regarding the best approach to model this kind of failures, it is better to choose the exponential distribution for degrading failure modes or weibull also can be apply? Can the life Data Analysis approach be used? What kind of data do I need to collect? Can be done this analysis in minitab? Or excel can be also an option, so summarizing I got few expertise with this kind of reliabilty analysis. Any help, advise or suggestion will be very welcome.



Are you trying to answer

before or along with me?

A few more



Peck's Equation

A few more

What is the relation of using
Conservative RH constant (exponent)
as $2.66 \approx 2.7$ or 3 in acceleration
factor calculation $[A_{RH} = (RH_{field}/RH_{test})^{-n}]$?

Is it somewhere related to an average
activation energy of the device
under test or component under test.



Comparing ALTs

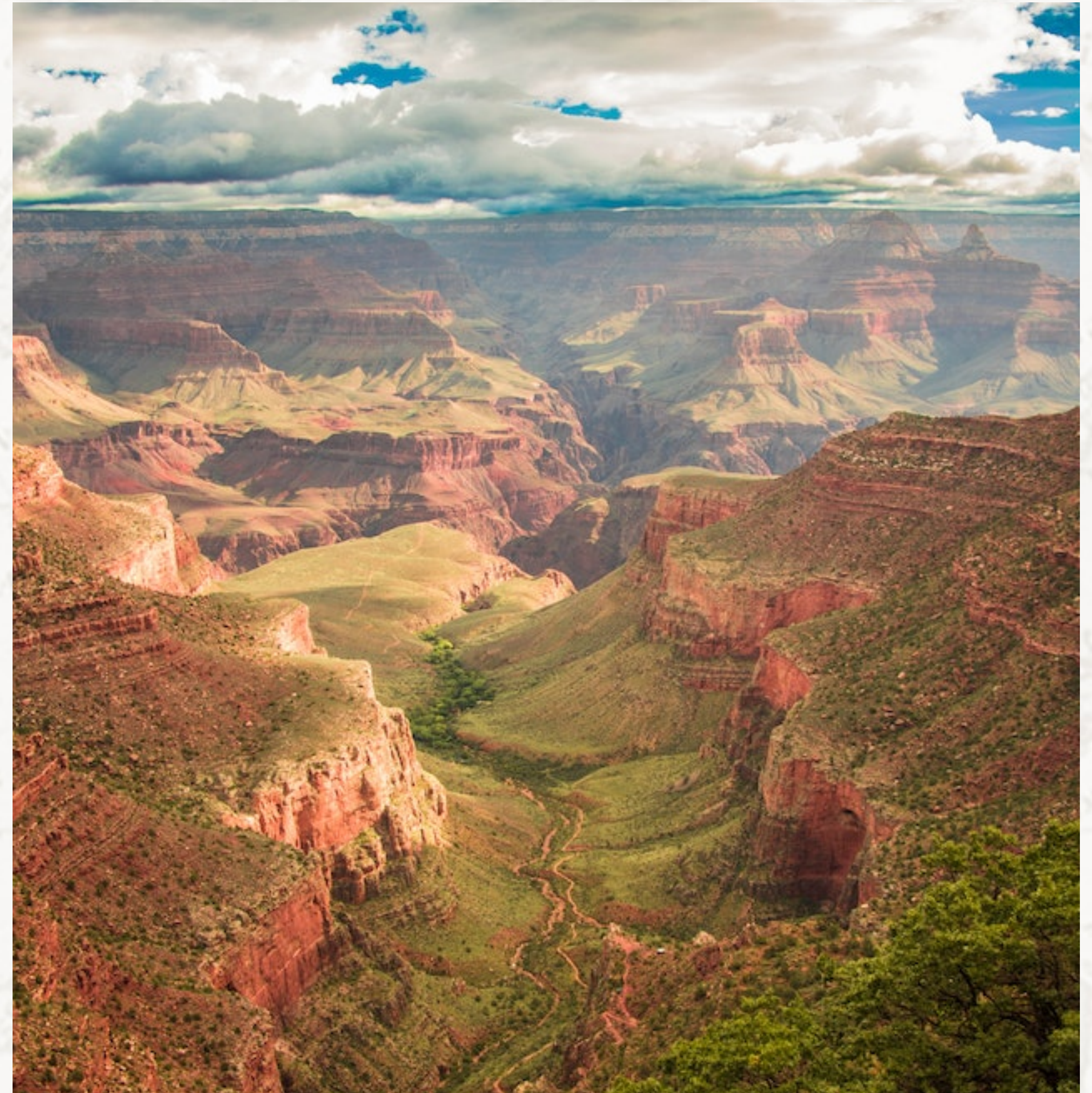
A few more

'There is one question that came up from our project: what is the difference between two populations having different results of life tests (could be accelerated life tests).

If this is measurement (for example length), then we could compare the means and calculate the Z value, which is the typical null hypothesis. However, this should be different from results of life tests.

There seems like multiple ways for comparing the life test:

- 1) comparing the fits of the life tests with giving confidence interval and see if there is overlapping.
- 2) if the two life tests could both fit to Weibull, then we have the weibull parameters and we could calculate the confidence interval of these parameters. Based on the parameters, we could plot the contour plots (of these parameters) to check for any overlapping.



Multiple Stresses

A few more

When can you use multiple acceleration factors (like combining load, speed and temperature) and how does that complicate the model and the math to estimate the life of a product?

What are the additional steps involved if you use multiple acceleration factors?



Send over your questions

in the chat window

What are your ALT questions



Existing vs New Model

What are your ALT questions

When your ALT does not fit neatly into an existing model, like Arrhenius, Eyring, etc., what are the steps to generating a model of your own?



Failures and Samples

What are you're ALT questions

Is there a minimum number of failures you need at each level (assuming you are doing 2-3 levels) in order to calculate the expected life of a product under normal running conditions?

How do you choose how many samples to test at each level?

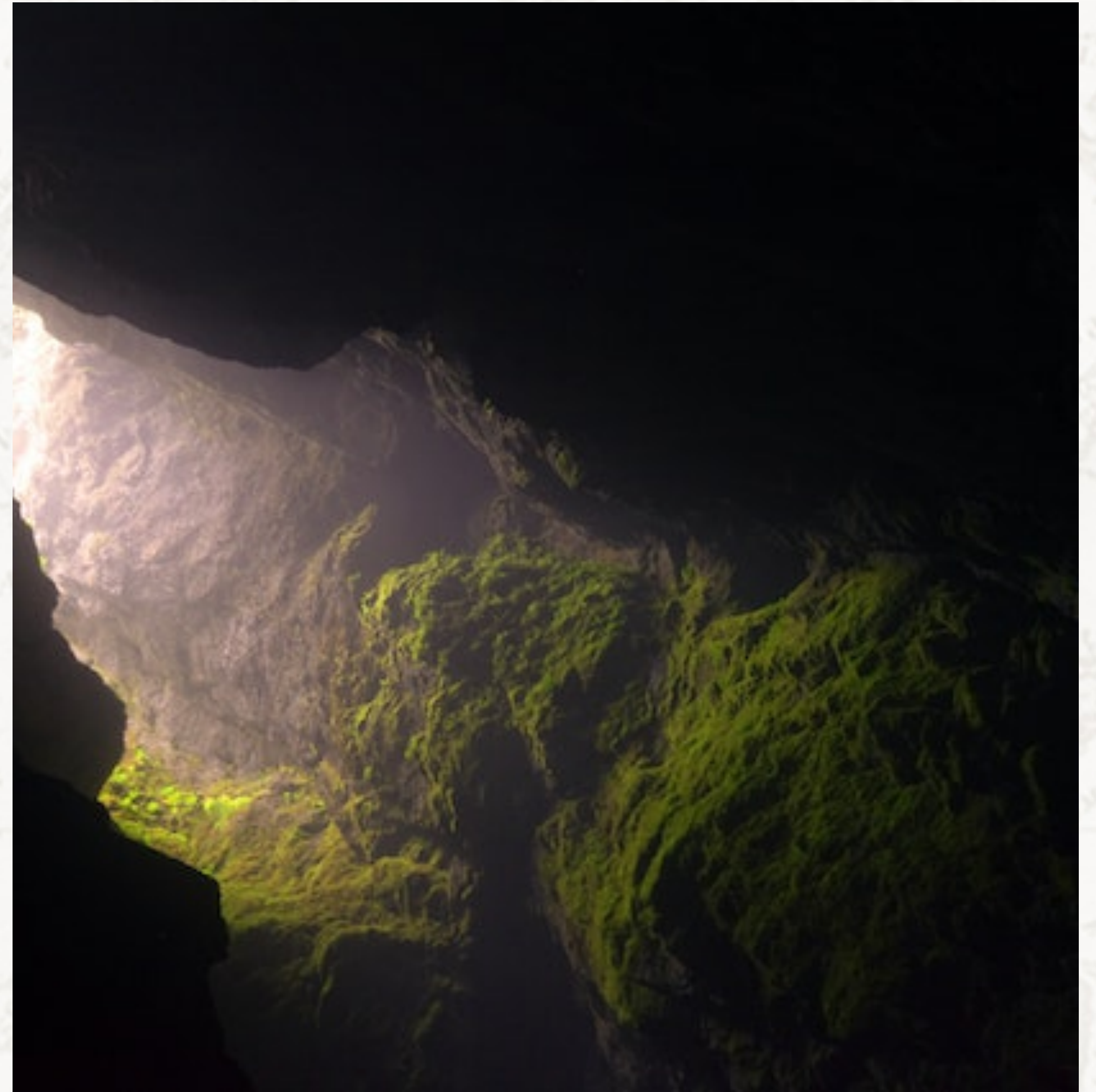


Learning

What are you're ALT questions

Assuming you need to demonstrate life performance in a very abbreviated timeframe, how do you ensure that your levels are not too aggressive and induce a new failure mode not typically seen in real life application?

If your final data is not linear when plotted on a Log normal graph, does that mean there are more than one failure mechanisms at play?



This month...

**Accelerated Testing
by Wayne Nelson**

Additional Comments and Questions

Thanks

see more at AccendoReliability.com