

Creating Accelerated Test Plans

Setting forth best practices to achieve your information goal

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Introduction

- There are many different forms or iterations of Accelerated Testing

“What test and test plan is best for me?”



Fundamentals of AST

- Use a series of stresses
- Impose those stresses from a point of expected maximum allowable levels for the product

Fundamentals of AST

- Incrementally increase each of these stress in succession to a point beyond the what the product is expected to handle

- Predict the reliability of the product

Understanding Your Information Goal

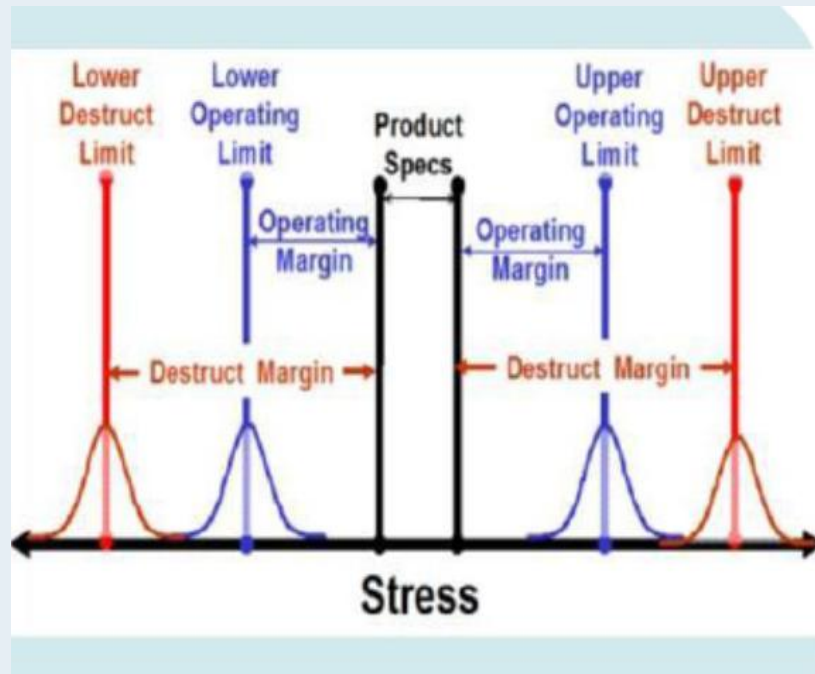
- What information about the device under test is it that you are looking to acquire?
- Is there a specific area of concern?

Understanding Your Information Goal

- What is the product capable of and what does it take to make it fail?
- What are the costs?
- What are the liabilities?

Current Test Methods

- Highly Accelerated Stress Testing
- Highly Accelerated Stress Screen



Current Test Methods

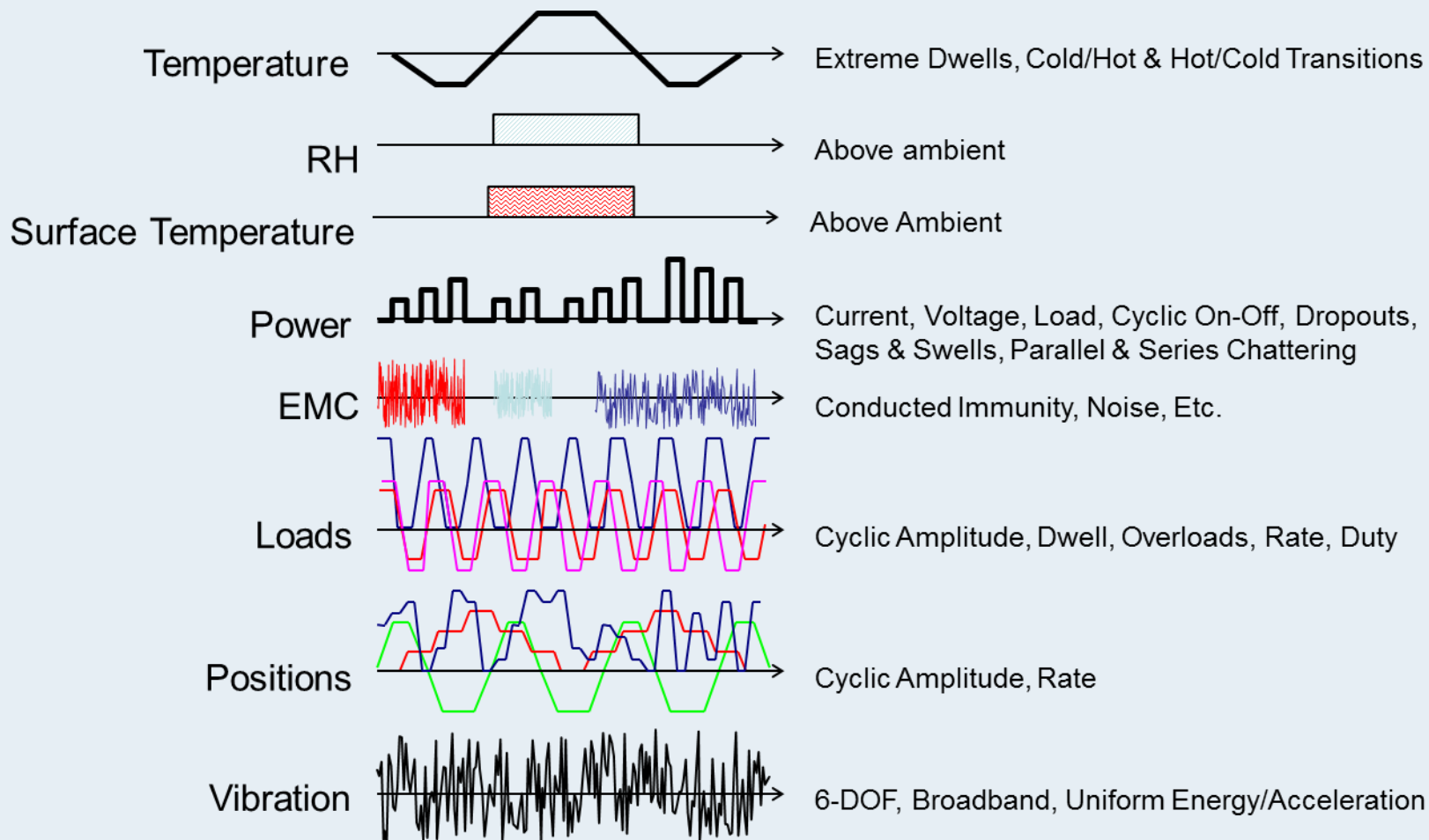


Current Test Methods

- Accelerated Life Test
- Failure Mode Verification Test
- Multi Environment Overstress Test



Commonly Used Stresses



Test Plan Creation Process

- Step 1: Establish Information Goal
- Step 2: Select Applicable Stress
- Step 3: Select Appropriate Test Method

Test Plan Creation Process

- Step 4: Set the maximum operating conditions, and destruct Limits
- Step 5: Extrapolate the stress levels based on the conditions set forth
- Step 6: Create Test Plan, along with “Stress Source Chart”

Test Plan Creation Process

Stress Source Chart								
	Test Date	Duration	Vibration**	Humidity	Temperature (cold)	Temperature (Hot)	Contaminants*	Durability Cycling***
		Fixed level length (Min)	(Grms)	%Rh	°C	°C	(ml)	(Cycles/ level)
Level 1 op	TBD	30	n.a	n.a	n.a	n.a	n.a	50
Level 1		120	0.3	55	10	60	10	n.a
Level 2 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 2		120	0.6	59.9	7.8	63.9	20	n.a
Level 3 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 3		120	0.9	64.8	5.6	67.8	30	n.a
Level 4 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 4		120	1.2	69.7	3.4	71.7	40	n.a
Level 5 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 5		120	1.5	74.6	1.2	75.6	50	n.a
Level 6 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 6		120	1.8	79.5	-1	79.5	60	n.a
Level 7 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 7		120	2.1	84.4	-3.2	83.4	70	n.a
Level 8 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 8		120	2.4	89.3	-5.4	87.3	80	n.a
Level 9 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 9		120	2.7	94.2	-7.6	91.2	90	n.a
Level 10 op		30	n.a	n.a	n.a	n.a	n.a	50
Level 10		120	3	99	-10	95	100	n.a

*Contaminants will consist of the following: A4 course Dust, Calcium Chloride and Iron powder added to the water supply
 Detergent, bleach, and fabric softener will also be added, per the same value in the contaminants column.

**Vibration to be applied in the fore/after direction of the device under test, from 5 to 1000 Hz.

***Durability cycling will consist of fully opening and closing the drawer unit.

Test Plan Creation Process

- Step 7: Gather information and equipment in order to achieve the test plan you have created
 - Possible refinement maybe needed –
 - time to review the plan

- Go test!

Pitfalls to avoid

- Redundant Testing
- Testing to avoid failure!
- Poor Communication



Questions?

Thank You!