DLA
DEFENSE LOGISTICS AGENCY
Established 1961

The Nation's Combat Logistics Support Agency

Solid Color Instrumental Threshold Submission

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What Is New

- The PTC-Analytical engaged in a Pilot Program with MUST (Military Unique Sustainment Technology) with DLA HQ R&D
- The use of technology to speed testing is important to DLA and to our Vendors
- Shade evaluation will continue to be acceptance testing, and samples will continue to be sent to the PTC-A for visual evaluation
- Visual evaluation will be the only official acceptance determination
- All instrumental threshold, instrumental numbers must be vetted and approved by the using service
- This submission threshold will stand as instrumental guides

How Will This Work?

- What is a threshold submittal level? We believe once this number is established, it should give the vendor a 95% confidence level that visual samples will be approved.
- Threshold submittal level corresponds to instrumental DECMC and all instrumental numbers making up this number.
- It will be different for each color, weave, and substrate
- Only for solid-colored items
- Measurements for the PTC-A will be completed on a DataColor instrument, so that the QTX files can be shared with vendors and the Services
- This process can also be completed on a Hunter Lab Spectro
- Vendors, following set protocols, can submit the QTX files along with the visual samples. Visual samples will always be submitted.
- QTX files will be reviewed at the PTC for correlation

Proof Of Concept

- This is the beginning; we would like to start small to shown proof of concept
- We are looking for suggestions on three to five different solid-colored standards to begin working this project.
- In order to have enough data for proof of concept, we need at least 50 data points across multiple lots.
- Looking to test naturals, synthetics and blends to cover multiple types of component items.
- Optically brightened and pile components are not good candidates
- We expect this phase to take 6 to 12 months

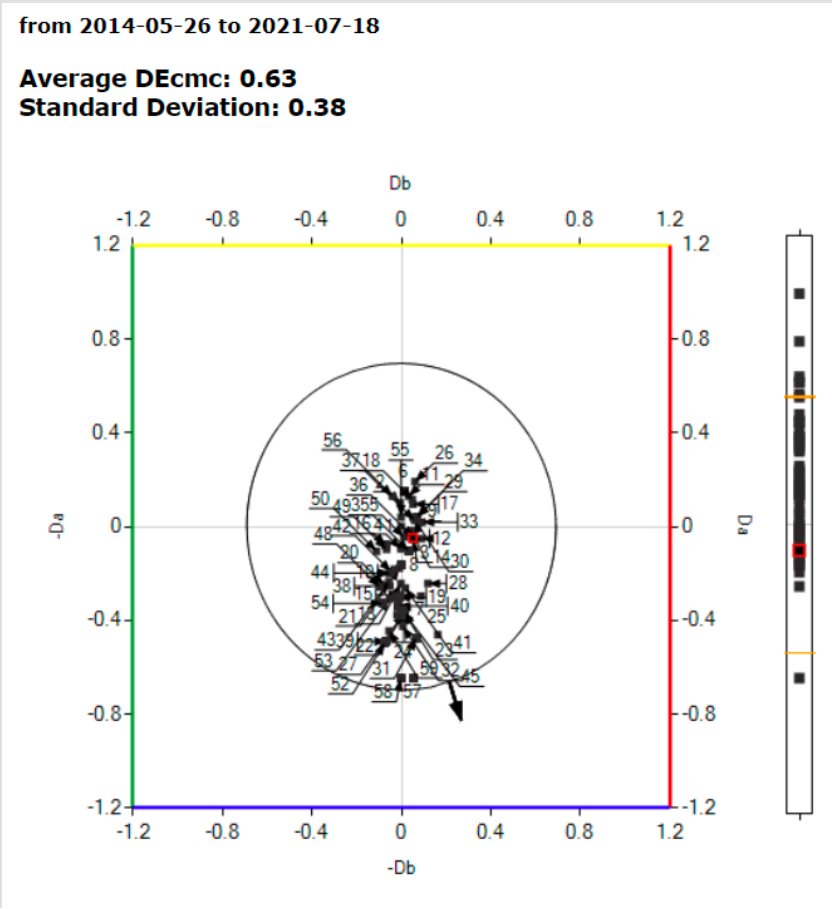
Analyst Commentary

- Current and past data for visual approvals determines how close a specific shade is being regulated for the given end-use.
- Preferential shade direction of the limits for a given color is determined by historical visually approved samples, and direction from the services.
- Shade variability limits are based on this preferential shade direction which should be maintained using the limits as shade guides on subsequent production samples.
- Inconsistency in shade for visual evaluation in production lots will cause high standard deviations, which will create false limits
- Samples near the boundaries of the limits are where the visual discernment of the professional colorist are most needed to make the required judgement calls for shade acceptability.

Methodology

- The goal was to develop instrumental limits that would filter out most samples that are likely to be rejected visually before they are submitted to PTC for review.
- Data from each shade sample set was filtered to contain only visually approved samples.
- The confidence intervals were calculated using data from visually approved samples for each color.
- All samples were then compared to the calculated confidence intervals to determine which samples would be within the upper and lower limits for L*, a*, and b* by the numbers.
- Correlation between the digital and visual assessment methods was compared.

Black 557 Roll #3916
59 Samples



While CIE was also used in this study, going forward Decmc will be used for confidence intervals.

Black 557 #3916
95% Limits
49 approved Samples
Average of Samples as Digital Reference

95%	CIE L*	CIE a*	CIE b*	CIE DL*	CIE Da*	CIE Db*	CIE DC	CIE DH	DE CIElab	DEcmc 2:1
Upper Limit	16.57	0.40	-0.68	0.96	0.11	0.21	0.53	0.12		0.99
Lower Limit	15.09	0.18	-1.45	-0.53	-0.10	-0.56	-0.19	-0.20		0.05
Failures for each Limit	0	3	2	0	3	2	2	1		0
Sample Failures Based on 95% Limits CIE L*,a*,or b*				5		Failures Based on CMC 95% Upper Limit				0

Black 557 #3916
Correlation 49 Approved Samples
95% Confidence Interval

Confidence Interval	Approved	Rejected	Correlation %	
Visually Approved Samples	49	0	N/A	
Using CIELab 95% Limits	49	5	90%	
Using DEcmc 95% Limits	49	0	100%	

Black 557 #3916
99% Limits
49 approved Samples
Average of Samples as Digital Reference

99%	CIE L*	CIE a*	CIE b*	CIE DL*	CIE Da*	CIE Db*	CIE DC	CIE DH	DE CIElab	DEcmc 2:1
Upper Limit	16.81	0.44	-0.55	1.19	0.15	0.33	0.65	0.12		1.14
Lower Limit	14.85	0.15	-1.57	-0.76	-0.14	-0.68	-0.31	-0.20		-0.10
Failures for each Limit	0	1	0	0	1	0	0	1		0
Sample Failures Based on 99% Limits CIE L*,a*,or b*				1		Failures Based on CMC 99% Upper Limit				0

Black 557 #3916
Correlation 49 Approved Samples
99% Confidence Interval

Confidence Interval	Approved	Rejected	Correlation %	
Visually Approved Samples	49	0	N/A	
Using CIELab 99% Limits	49	1	98%	
Using DEcmc 99% Limits	49	0	100%	

Decide where Metamerism is of Concern