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50038

TSSG/ESD/TEB-08-70
8 May 1970

MEMORANDUM FOR: Chief, Research & Engineering Division, TSSG

THROUGH : Chief, TEB/ESD
Chief, ESD/TSSG

SUBJECT : Memorandum Test Report on N.B.S. Measured Color Properties of Light Tables and Through a Microstereoscope

1. In late October 1969, ESD/TEB started an investigation to determine what equipments and methods were available for testing and evaluating the color quality and color rendering properties of fluorescent luminaries as used with viewing light tables. This investigation resulted in procurement of equipment and determining test procedures, both of which are now in use by TEB. The measuring system adopted was the CIE method, a widely used psychophysical system.

2. The above investigation led to discussions with [redacted] of the Photometry Section, Optical Physics Division, National Bureau of Standards. This division has been making color measurements in the past. To establish a better "feel" for color measurement and to provide base line data which we could compare our measuring techniques to, TEB asked N.B.S. to make selected color measurements of luminaires in two [redacted] Light Tables and through a microscope system. This data could also provide the center with a start point for specifying color by describing the color characteristics of existing equipments. On November 26, the following equipments along with a list of required measurements were delivered to N.B.S.

25X1
25X1
25X1

1) [redacted] Light Table Model MIM-47B100,
2) [redacted] Light Table, Model MIM-455100,
3) [redacted] Model Zoom 2[redacted] with a Rhomboid 2X attachment.

25X1
25X1

3. Although the spectroradiometric measurements were made and the equipment returned to NPIC in December, the data requested has been long in coming. An official report will be provided by N.B.S. at a later time. The measurement data which will be in the formal report has been obtained and is given in detail below.

DDR-DUPE

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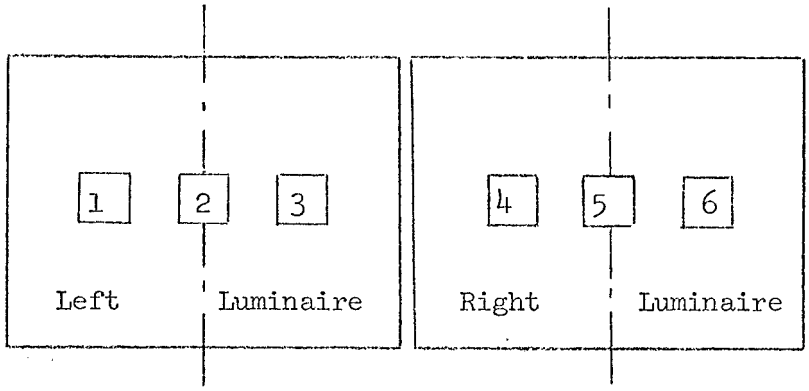
Position of Sensor During Measurement



Light Table Serial No. 00037

Test Parameter		Position of Sensor 1	2	3	4	5	6
Correlated Color Temp. - Kelvins							
At maximum intensity		5600	5600	5450	5650	5650	5650
At 10% of maximum		5500	5450	5400	5500	5550	5550
Chromaticity Coordinates							
At maximum intensity	x -	.330	.331	.334	.330	.329	.329
	y -	.358	.359	.362	.357	.357	.357
At 10% of maximum	x -	.333	.334	.336	.333	.331	.332
	y -	.361	.362	.364	.362	.361	.360
Color Rendering Index							
At maximum intensity		73.4	73.8	73.3	73.6	73.7	73.2
At 10% of maximum		75.3	75.4	75.1	75.3	75.1	75.1

Light Table Serial No. 00195

Test Parameter		Position of Sensor 1	2	3	4	5	6
Correlated Color Temp. - Kelvins							
At maximum intensity		5750	5700	5750	5650	5550	5550
At 10% of maximum		5600	5450	5450	5650	5600	5400
Chromaticity Coordinates							
At maximum intensity	x -	.326	.328	.326	.329	.331	.331
	y -	.364	.366	.365	.364	.367	.366
At 10% of maximum	x -	.330	.334	.334	.330	.330	.336
	y -	.364	.367	.369	.364	.365	.370
Color Rendering Index							
At maximum intensity		75.7	76.3	75.5	75.7	75.5	75.9
At 10% of maximum		77.7	77.5	77.1	77.4	77.4	78.0

Table 00195 Light Source When Viewed Thru Microscope and Rhomboid Optics

Test Parameter		Rhomboids Over Position 2 Left Eyepiece	Right Eyepiece
Correlated Color Temp. - Kelvins			
At maximum intensity			
- maximum magnification		4800	4800
- minimum magnification		4800	4800
Chromaticity Coordinates			
At maximum intensity			
- maximum magnification	x -	.363	.360
	y -	.443	.443
- minimum magnification	x -	.364	.362
	y -	.443	.443
Color Rendering Index			
At maximum intensity			
- maximum magnification		56.9	57.0
- minimum magnification		57.0	56.8

4. On 24 April, TEB made color measurements on the luminaires in light table serial no. 00037. The data yields a relative comparison of the accuracy of TEB's measuring process at that time to data supplied by N.B.S. During the 4 month intervening period between these measurements, it is believed that the light sources received only short periods of use. TEB's measurements are listed below with percentage deviation from N.B.S. data. This assumes that the color quality of the luminaires did not change due to intervening use.

Light Table Serial No. 00037
(TEB Measurements)

Test Parameter		Sensor Position 2	Deviation from NBS Data	Sensor Position 5	Deviation from NBS Data
Correlated Color Temp. - Kelvins					
At maximum intensity		5550	- 0.9%	5600	- 0.9%
At 10% of maximum		5200	- 4.6%	5150	- 7.2%
Chromaticity Coordinates					
At maximum intensity	x -	.331	0.0%	.331	+ 0.6%
	y -	.357	- 0.6%	.357	0.0%
At 10% of maximum	x -	.341	+ 2.1%	.343	+ 3.6%
	y -	.363	+ 0.3%	.366	- 1.4%
Color Rendering Index					
At maximum intensity		69.1	- 6.4%	69.1	- 6.2%
At 10% of maximum		70.3	- 6.8%	70.9	- 5.6%

[redacted] 25X1

Test Engineer
TEB/ESD

Distribution:
Orig. & 2 - NPIC/TSSG/ESD/TEB
1 - Addressee ✓
1 - NPIC/TSSG/PPS (through Ch/TSSG)
1 - NPIC/TSSG/RED [redacted] 25X1
1 - NPIC/TSSG/RED
1 - NPIC/TSSG/RED
1 - NPIC/TSSG/RED
1 - NPIC/TSSG/RED

NPIC/TSSG/ESD [redacted] 8 May 1970) 25X1

CENTER ROUTING SLIP

FROM	DATE
TSSG/TEB/ESD	11 May 70

TO		INITIALS	DATE
DIRECTOR			
DEP/DIRECTOR			
EXEC/DIRECTOR			
SPECIAL ASST			
ASST TO DIR			
ASST TO DEP/DIR			
CH/PPBS			
DEP CH/PPBS			
EO/PPBS			
CH/IEG			
DEP CH/IEG			
EO/IEG			
CH/PSG			
DEP CH/PSG			
EO/PSG			
CH/DBD/PSG			
CH/TSSG/ESD	1	[redacted]	11 May
DEP CH/TSSG			
EO/TSSG			
Chief/RED	2		
DIR/IAS/DDI			
CH/DIA/XX4			
CH/DIA/AP-1P			
CH/SPAD			

REMARKS

[redacted]

~~Please explain the focus problem [illegible] Dawn is talking about. It doesn't make sense.~~
~~R~~

2 Reports attached
(Color properties and filar eyepiece)

C/RED ______
DC/RED R ______
C/SOB ______

[redacted]

IP FM 30 (1-68) DESTROY PREVIOUS EDITIONS

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