

## Useful DI Information - v2.0

This information is provided with no guarantees.  
If you find an error please inform: [steve@digitalpraxis.net](mailto:steve@digitalpraxis.net)

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### Monitor Colour Temp.

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#### Colour Temp. Coordinates

Temp	X coordinate	Y coordinate
D50	x0.3457	y0.3585
<b>D55</b>	<b>x0.3324</b>	<b>y0.3474</b>
D65	x0.3127	y0.3290
D95	x0.2848	y0.2932
D-Cinema?	x0.3140	y0.3510

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### Film Recording

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#### Digital LAD Print AIM Density - 445 patch

Film Printing: LAD 445

<b>Status M:</b>	<b>R</b>	<b>G</b>	<b>B</b>
OCN (5245) above D-Min	0.67	0.72	0.69
D-Min av.	0.21	0.60	0.98
Total:	0.88	1.32	1.67
IN (5242) above D-Min	0.87	0.93	0.91
IP (5242) above D-Min	1.02	1.09	1.08
D-Min av.	0.07	0.57	0.67
IN Total:	0.94	1.50	1.58
IP Total:	1.09	1.66	1.75
<b>Av. Film Recorder Printer Lights:</b>			
OCN	25	25	25
IN	30	37	25
<b>Status A:</b>	<b>R</b>	<b>G</b>	<b>B</b>
Vision Print	1.09	1.06	1.03

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### Cd/m2 & Foot-lamberts

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1 foot-lambert = 3.43cd/m2

14 foot-lamberts = 48.02cd/m2

16 foot-lamberts = 54.88cd/m2

Film projector spec – 16 foot lamberts open gate (no film)  
Film projector spec – 14 foot lamberts with film D-Min  
SMPT monitor spec = 35 foot lamberts (120cd/m2)

## Printer Lights

### Printer Light Effect - on positive print

<i>Printer Light</i>	<b>-ve</b>	<b>0</b>	<b>+ve</b>
<i>Colour</i>	Red	25	Cyan
	Green	25	Magenta
	Blue	25	Yellow
<i>Density</i>	Lighter	Nominal	Darker

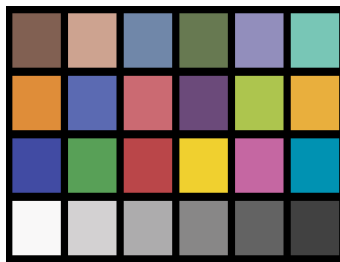
*Lower = more R, G, B & lighter*

*Higher = more C, M, Y & darker*

1 printer point = 0.07 density

7 printer points = 1 stop

## Macbeth Colour Chart Values



### Print Film (D54) Tristimulus Values

	<b>x</b>	<b>y</b>	<b>Y</b>
Dark Skin	0.426	0.374	9.83
Light Skin	0.401	0.370	35.7
Blue Sky	0.265	0.288	18.7
Foliage	0.355	0.445	13.3
Blue Flower	0.287	0.273	23.4
Bluish Green	0.276	0.378	42.0
Orange	0.524	0.412	29.6
Purplish Blue	0.226	0.205	11.3
Moderate Red	0.485	0.323	19.4
Purple	0.312	0.239	65.0
Yellow Green	0.392	0.499	43.7
Orange Yellow	0.486	0.444	44.3
Blue	0.196	0.148	58.7
Green	0.319	0.505	23.3
Red	0.567	0.323	12.1
Yellow	0.460	0.474	60.6
Magenta	0.401	0.260	19.2
Cyan	0.206	0.287	18.8
White	0.336	0.352	88.5
Neutral 8	0.333	0.348	58.4
Neutral 6.5	0.332	0.348	35.6
Neutral 5	0.334	0.349	19.5
Neutral 3.5	0.331	0.347	8.7
Black	0.333	0.346	3.1

### 10bit LOG Values

	<b>R</b>	<b>G</b>	<b>B</b>
Dark Skin	425	347	320
Light Skin	558	481	496
Blue Sky	388	458	552
Foliage	370	416	328
Blue Flower	477	463	585
Bluish Green	444	566	581
Orange	575	439	302
Purplish Blue	363	398	570
Moderate Red	581	377	428
Purple	393	316	429
Yellow Green	505	558	370
Orange Yellow	590	512	327
Blue	264	328	549
Green	363	512	370
Red	594	303	298
Yellow	610	568	330
Magenta	585	395	534
Cyan	334	483	585
White	619	616	662
Neutral 8	566	575	622
Neutral 6.5	512	523	564
Neutral 5	441	452	490
Neutral 3.5	357	362	380
Black	240	245	238

### 10bit 'Print' Video Values

	<b>R</b>	<b>G</b>	<b>B</b>
Dark Skin	422	294	253
Light Skin	667	524	552
Blue Sky	359	482	656
Foliage	330	407	265
Blue Flower	517	491	715
Bluish Green	456	682	708
Orange	698	447	228
Purplish Blue	319	376	689
Moderate Red	708	341	428
Purple	368	248	429
Yellow Green	569	667	330
Orange Yellow	724	582	264
Blue	178	265	651
Green	319	582	330
Red	731	229	222
Yellow	758	685	268
Magenta	715	371	623
Cyan	274	528	715
White	758	768	838
Neutral 8	682	698	777
Neutral 6.5	582	603	678
Neutral 5	451	471	541
Neutral 3.5	309	317	346
Black	149	155	147

### 10bit 'Corrected' Video Values

	<b>R</b>	<b>G</b>	<b>B</b>
Dark Skin	516	384	328
Light Skin	820	652	576
Blue Sky	448	540	676
Foliage	412	484	324
Blue Flower	584	568	752
Bluish Green	480	792	728
Orange	564	228	800
Purplish Blue	364	424	712
Moderate Red	812	424	456
Purple	428	296	488
Yellow Green	692	788	312
Orange Yellow	932	700	244
Blue	260	300	163
Green	352	640	348
Red	744	280	292
Yellow	960	832	188
Magenta	788	412	648
Cyan	0	584	712
White	996	992	992
Neutral8	844	836	840
Neutral6.5	692	688	692
Neutral5	544	540	540
Neutral3.5	396	396	396
Black	260	260	260

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### Frames/Feet

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35mm – 16 frames/ft. (4perf)

16mm – 40 frames/ft.

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### Human Eye Response

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Neutral Colour      R \* 0.309  
                                 G \* 0.609  
                                 B \* 0.082

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### Film Illumination

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Candlelight	1500K
40W incandescent	2680K
200W incandescent	3000K
Sunrise/set	3200K
Tungsten	3200K
(HMI - 3200K-5500K/5600K)	
Photo flood	3400K-5600K
1 hour pre/post dusk/dawn	3400K
Zenon/arc	4500K/5000K
Daylight @ noon	5500K
Overcast daylight	6500K

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## Capacity

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### KB - Kilobyte

1,024 Bytes

### MB - Megabyte

1,024 KB

1,048,576 Bytes

### GB - Gigabyte

1,024 MB

1,048,576 KB

1,073,741,824 Bytes

### TB - Terabyte

1,024 GB

1,048,576 MB

1,073,741,824 KB

1,099,511,627,776 Bytes

### PB - Petabyte

1,024 TB

1,048,576 GB

1,073,741,824 MB

1,099,511,627,776 KB

1,125,899,906,842,624 Bytes

### EB – Exabyte

1024 PB

1,048,576 TB

1,073,741,824 GB

1,099,511,627,776 MB

1,125,899,906,842,624 KB

1,152,921,504,606,846,976 Bytes

### ZB – Zettabyte

1024 EB

1,048,576 PB

1,073,741,824 TB

1,099,511,627,776 GB

1,125,899,906,842,624 MB

1,152,921,504,606,846,976 KB

1,180,591,620,717,411,303,424 Bytes

### YB – Yottabyte

1024 ZB

1,048,576 EB

1,073,741,824 PB

1,099,511,627,776 TB

1,125,899,906,842,624 GB

1,152,921,504,606,846,976 MB

1,180,591,620,717,411,303,424 KB

1,208,925,819,614,629,174,706,176 Bytes

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## Film Scanning

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### Cineon .CIN/DPX Density Mapped data

D-Min to D-Max of 2.048

Mapped to 10 bit Log data:

D-Min	= 95
2% black	= 180
Digital LAD	= 445
18% grey	= 470
90% white	= 685

Granularity of 0.002 density per sample [LSB]

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## Cineon Greyscale Conversion Mappings

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	Log E	Neg D	Print D	10b P.D.	8b Video	12b Lin	16b Lin
	0.00	0.19	3.26	95	16	44	44
	0.05	0.19	3.26	95	16	44	44
	0.10	0.19	3.26	95	16	44	44
	0.15	0.19	3.26	95	16	44	44
	0.20	0.19	3.26	95	16	44	44
	0.25	0.19	3.26	96	16	45	45
	0.30	0.20	3.25	98	16	45	45
	0.35	0.20	3.24	99	17	46	46
	0.40	0.20	3.24	100	17	46	46
	0.45	0.21	3.21	104	17	47	47
	0.50	0.22	3.19	108	17	49	49
	0.55	0.23	3.17	113	18	51	51
	0.60	0.23	3.15	115	18	52	52
	0.65	0.26	3.06	128	19	57	57
	0.70	0.28	2.98	140	21	62	62
	0.75	0.31	2.89	153	22	69	69
	0.80	0.33	2.81	165	24	76	76
2% Black	0.85	0.36	2.70	180	26	85	85
	0.90	0.39	2.58	195	29	95	95
	0.95	0.42	2.47	210	31	107	107
	1.00	0.45	2.36	225	34	120	120
	1.05	0.48	2.24	240	37	135	135
	1.10	0.51	2.13	255	39	151	151
	1.15	0.54	2.02	270	43	169	169
	1.20	0.57	1.90	285	46	190	190
	1.25	0.60	1.79	301	49	215	215
	1.30	0.64	1.67	318	53	244	244
	1.35	0.67	1.55	334	57	276	276
	1.40	0.70	1.44	350	62	313	313
	1.45	0.73	1.34	365	66	351	351
	1.50	0.76	1.25	380	70	394	394
	1.55	0.79	1.15	395	75	442	442
	1.60	0.82	1.06	410	80	496	496

	1.65	0.85	0.98	425	85	557	557
	1.70	0.88	0.90	440	91	625	625
Digital LAD	1.75	0.91	0.82	455	96	701	701
18% Grey	1.80	0.94	0.74	470	103	786	786
	1.85	0.97	0.68	485	109	882	882
	1.90	1.00	0.62	500	116	990	990
	1.95	1.03	0.55	515	123	1111	1111
	2.00	1.06	0.49	530	130	1246	1246
	2.05	1.09	0.45	545	138	1398	1398
	2.10	1.12	0.41	560	146	1569	1569
	2.15	1.15	0.36	575	155	1760	1760
	2.20	1.18	0.32	590	164	1975	1975
	2.25	1.21	0.29	606	175	2237	2237
	2.30	1.25	0.26	623	186	2535	2535
	2.35	1.28	0.23	639	198	2871	2871
	2.40	1.31	0.20	655	210	3253	3253
	2.45	1.34	0.18	670	222	3650	3650
90% White	2.50	1.37	0.16	685	235	4095	4095
	2.55	1.40	0.14	700	248	4095	4595
	2.60	1.43	0.12	715	255	4095	5155
	2.65	1.46	0.11	730	255	4095	5784
	2.70	1.49	0.10	745	255	4095	6490
	2.75	1.52	0.09	760	255	4095	7282
	2.80	1.55	0.08	775	255	4095	8171
	2.85	1.58	0.07	790	255	4095	9168
	2.90	1.61	0.07	805	255	4095	10286
	2.95	1.64	0.06	820	255	4095	11541
	3.00	1.67	0.05	835	255	4095	12950
	3.05	1.69	0.05	846	255	4095	14117
	3.10	1.72	0.05	858	255	4095	15391
	3.15	1.74	0.05	869	255	4095	16779
	3.20	1.76	0.04	880	255	4095	18292
	3.25	1.78	0.04	888	255	4095	19376
	3.30	1.79	0.04	895	255	4095	20524
	3.35	1.81	0.04	903	255	4095	21740
	3.40	1.82	0.04	910	255	4095	23028
	3.45	1.83	0.04	914	255	4095	23700
	3.50	1.84	0.04	918	255	4095	24393
	3.55	1.84	0.04	921	255	4095	25105
	3.60	1.85	0.04	925	255	4095	25838
	3.65	1.85	0.04	926	255	4095	26087
	3.70	1.86	0.04	928	255	4095	26338
	3.75	1.86	0.04	929	255	4095	26592
	3.80	1.86	0.04	930	255	4095	26849
	3.85	1.86	0.04	931	255	4095	27108
	3.90	1.87	0.04	933	255	4095	27369
	3.95	1.87	0.04	934	255	4095	27633
	4.00	1.87	0.04	935	255	4095	27899

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## Film Format Pixel Tables

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### Aspect Ratios

Open Gate	2K	4K
4:3	2048x1556	4096x3112

Full Frame		
4:3	2048x1536	4096x3072
1.85	2048x1107	4096x2214
2.35	2048x871.5	4096x1743

Offset Academy		
1.33	1828x1371	3656x2664
Acad	1828x1332	3656x2664
1.66	1828x1101	3656x2202
1.76	1828x1027	3656x2054
1.85	1828x988	3656x1976
2.35	1828x778	3656x1556

Anamorphic		
2.35	1828x1556	3656x3112

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## Viper 2.37 capture to Film-Out Pixel Mapping Data

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Viper's 2.37 capture mode requires the final image to be resized for anamorphic film-out.

If using a film recorder that can map 1920 horizontal pixels into the film's academy area use:

1920 x 1620 (1634 being the true 'film' anamorphic area)

If using a film recorder that is not capable of the 1920 resize to film's academy area use:

1828 x 1542 (1556 being the true 'film' anamorphic area)

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## Decibels (dB)

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### dBFS - dB Full Scale

0 dBFS represents the highest possible level in digital gear. All other measurements expressed in terms of dBFS will always be less than 0 dB (negative numbers).

0 dBFS indicates the digital number with all digits = "1", the highest possible sample.

The lowest possible sample is (for instance for 10 bit video): 00 0000 0001, which equals -60 dBFS.

Therefore the maximum dynamic range for a 10 bit system is 60 dB ( $20\log 2^{10}$ )

For 16-bit digital video it is 96 dB.

For 24 bit digital video it is 144 dB.

Full-scale input level is the analog input voltage level that will cause the A/D converter to just equal full scale with no clipping on either positive or negative peaks.

The dynamic range of a digital system is the ratio of the full scale signal level to the RMS noise floor.

### dB SPL – dB Sound Pressure Level

The definition of dB SPL is the 20 log of the ratio between the measured sound pressure level and a fixed reference point, defined as 0.000002 Newtons per square meter, the threshold of human hearing.

Sounds	dB SPL
Rocket Launching	180
Jet Engine	140
Thunder	130
Jet Aircraft at takeoff	120
Rock Concert	110
Underground Train	100
City Traffic	90
Alarm Clock	80
Noisy Restaurant or Office	70
Normal Conversation	60
Light Traffic	50
Home Living Room	40
Soft Whisper	30
Rustling Leaves	20
Human Hearing Threshold	0

## **dBA**

The definition dBA refers to a standard for noise measurement that takes into consideration the human ear's sensitivity to certain frequencies, with measurements made by filtering out certain frequencies not audible to the human ear.

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## **Cineon/DPX to 10bit Video View LUT**

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<b>input</b>	<b>output</b>
0	0
1	0
2	0
3	1
4	1
5	1
6	1
7	2
8	2
9	2
10	2
11	2
12	3
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15	3
16	4
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