



Spectroradiometer Lightsource Test

Report No: 910

Test Time: 2025-10-24 12:10:19

Category: Growth

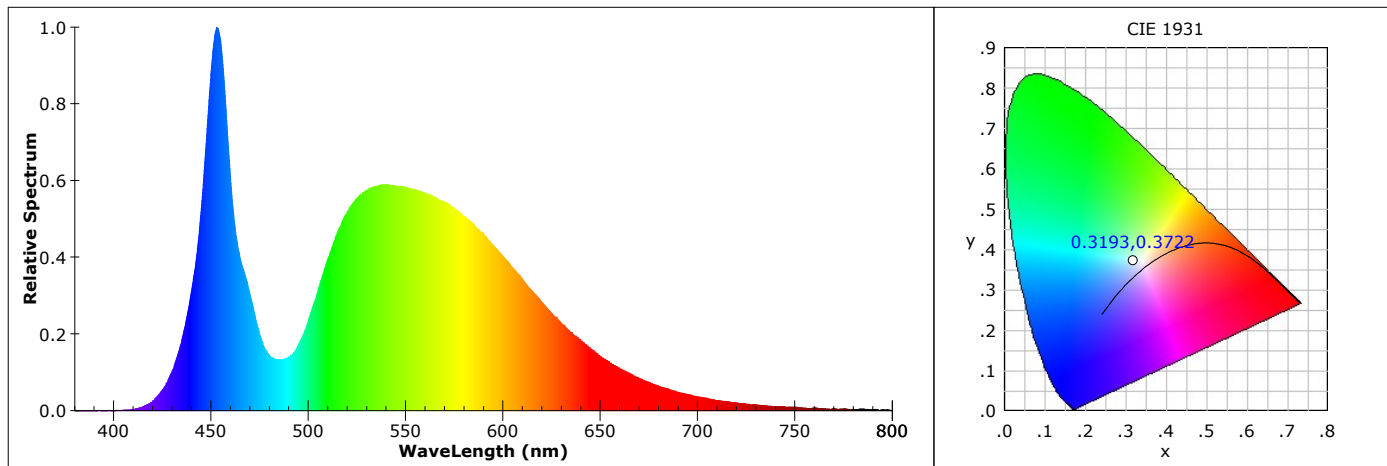
Type: LED

Spec: Hydra Small Growth 240W 609-230

Number: 910

Manufacturer: Industrial Lighting Ltd

Submitter:



CIE Colorimetric Parameters

CIE(x,y): 0.3193,0.3722

CIE(u,v): 0.1871,0.3271

CIE(u',v'): 0.1871,0.4906

CCT: 6000 K (Duv=0.020758)

Dominant Wavelength: 531.5 nm

Color Purity: 0.084

Peak Wavelength: 453.3 nm

Half Width: 17.5 nm

Color Ratio: R:0.107, G:0.856, B:0.037

Color Render Index: Ra:67.6, avgR(1~14):53.8, avgR(1~15):53.7

R1: 60

R2: 73

R3: 85

R4: 65

R5: 62

R6: 65

R7: 83

R8: 49

R9: -69

R10: 38

R11: 60

R12: 30

R13: 62

R14: 92

R15: 51

Color Quality Scale: Qa:70.6, Qf:71.4, Qp:68.4, Qg:81.4,

Q1: 74

Q2: 98

Q3: 71

Q4: 62

Q5: 67

Q6: 67

Q7: 70

Q8: 81

Q9: 95

Q10: 81

Q11: 76

Q12: 75

Q13: 73

Q14: 50

Q15: 59

TM-30-18: Rf:73, Rg:87

Gamut Area Index (GAI): GAI_EES:68.5, GAI_BB_8:72.0, GAI_BB_15:80.5

Photometric Parameters

Luminous Flux: 48416.82 lm

Radiant Power: 136.395 W

Efficiency: 204.65 lm/W

Energy Efficiency Class: B (EU 2019/2015 η_{TM} :204.65lm/W)

S/P: 1.999

Pupil Flux: 83114.79 Plm (Kp=1.717)

Pupil Lumens per Watt: 351.32 Plm/W

Cirtpic Flux: 186606.45 lm

Mesopic Flux (CIE R.): 58006.93 lm (Lp=0.300)

Mesopic Flux (USP): 58442.56 lm (Lp=0.300)

Mesopic Flux (MOVE): 60252.25 lm (Lp=0.300)

Electric Parameters

Voltage: 230.000 V

Current: 1.0450 A

Power: 236.580 W

Power Factor: 0.9840

Frequency: 49.99 Hz

Geometry: 4n, m

Warmup Time: 30 Minutes 53 Seconds

Spectroradiometer: LMS-9000A

Self-absorption Factor: 1.138

Integration Time: 5 ms

Digital Power Meter: LS2010

Photometric Method: sphere-spectroradiometer

Peak of Signal: 47722

Power Source: LSP Series

Test Lab: Lighting Lab TU-Gabrovo

Operator: Ivaylo Stoyanov

Testing Environment: Ts:24.8°C, Ta:23.9°C,55%

Approver:



Plant Growth Lamp Test Report

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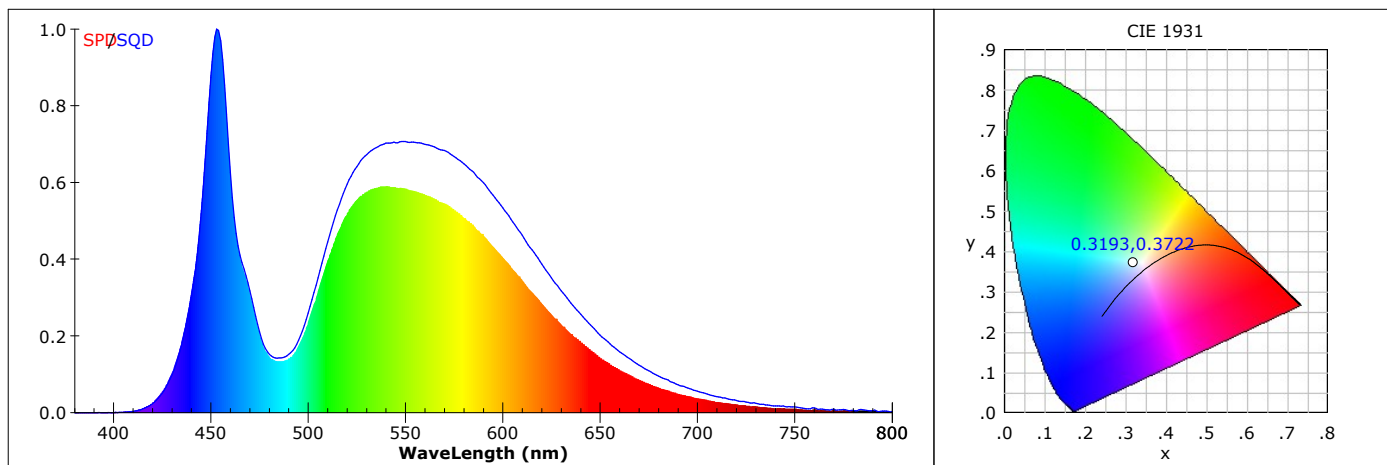
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R11: 60

R12: 30

R13: 62

R14: 92

R15: 51

Photometric Parameters

Luminous Flux: 48416.82 lm

Radiant Power: 136.395 W

Photosynthetic Photon Flux (Φ_p): 607.488 $\mu\text{mol/s}$

Photosynthetic Radiant Flux (Φ_e): 134.704 W

Photon Flux (400~500nm): 144.305 $\mu\text{mol/s}$

Photon Flux (600~700nm): 129.932 $\mu\text{mol/s}$

Photon Flux (PFuv 280~400nm): 0.053 $\mu\text{mol/s}$

Radiant Flux (400~500nm): 37.704 W

Radiant Flux (600~700nm): 24.605 W

Radiant Flux (280~400nm): 0.016 W

YPF (320~780nm): 518.756 $\mu\text{mol/s}$

YPF (500~600nm): 287.304 $\mu\text{mol/s}$

YPF (700~780nm): 2.052 $\mu\text{mol/s}$

Radiant Flux (Chl-A): 7.890 W

Efficiency: 204.65 lm/W

Radiant Efficiency (η): 0.577

Photosynthetic Photon Efficacy (K_p): 2.568 $\mu\text{mol/J}$

Photosynthetic Radiant Efficiency (η_e): 0.569

Photon Flux (500~600nm): 333.251 $\mu\text{mol/s}$

Photon Flux (PFfr 700~800nm): 10.204 $\mu\text{mol/s}$

Photon Flux (PF_PBAR): 617.745 $\mu\text{mol/s}$

Radiant Flux (500~600nm): 72.395 W

Radiant Flux (700~800nm): 1.675 W

R/B: 0.7 R/FR: 14.7

YPF (400~500nm): 105.195 $\mu\text{mol/s}$

YPF (600~700nm): 124.175 $\mu\text{mol/s}$

YPF (320~400nm): 0.031 $\mu\text{mol/s}$

Radiant Flux (Chl-B): 24.005 W

Electric Parameters

Voltage: 230.000 V

Current: 1.0450 A

Power: 236.580 W

Power Factor: 0.9840

Frequency: 49.99 Hz

Geometry: 4n, m

Warmup Time: 30 Minutes 53 Seconds

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IES TM-30-18 Color Rendition Report

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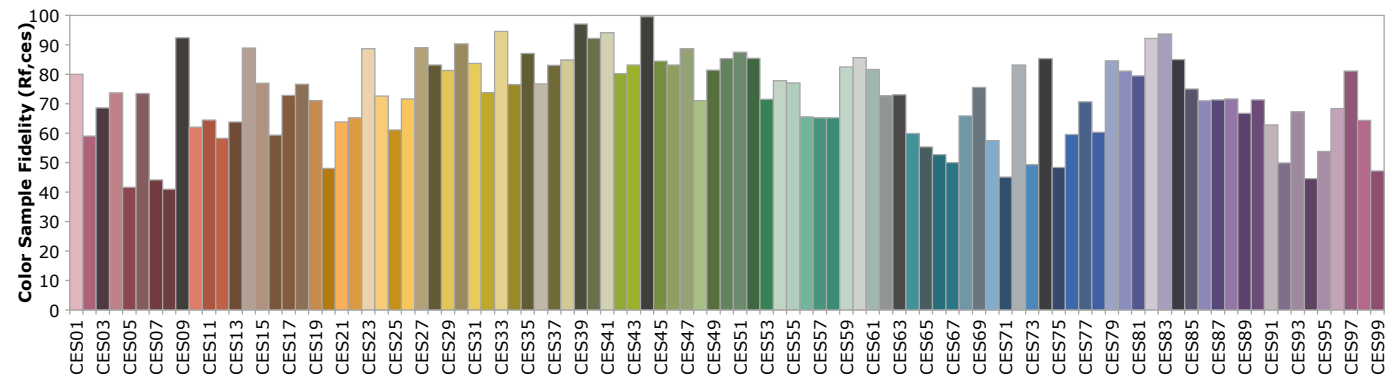
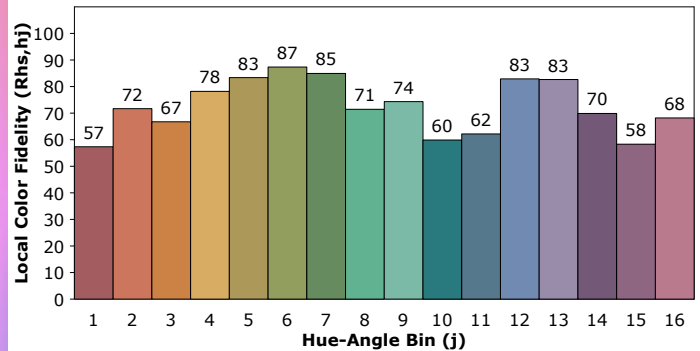
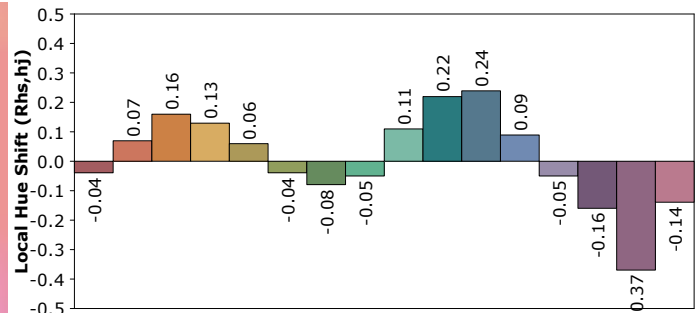
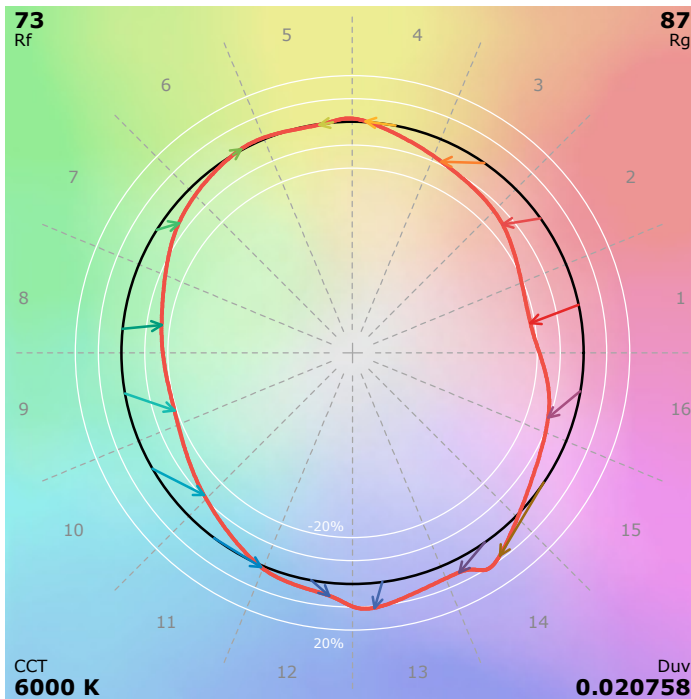
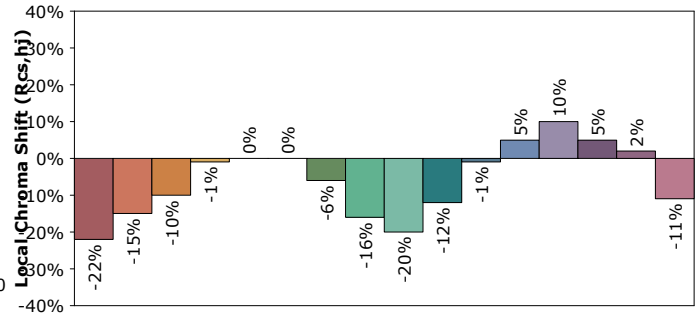
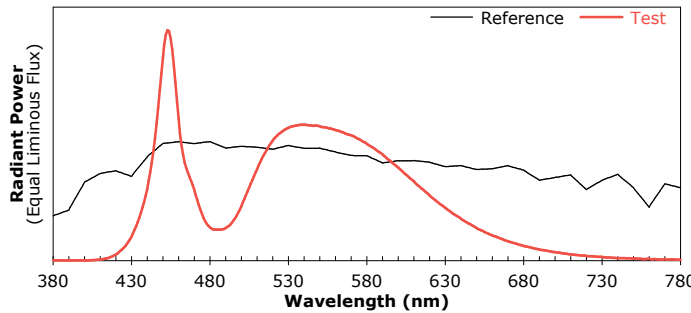
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Submitter:



Notes: This is a recommended method for displaying IES TM-30-18 information.

x 0.3193
y 0.3722
u' 0.1871
v' 0.4906

CIE13.3-1995
(CRI)
Ra 68
R9 -69

Test Lab: Lighting Lab TU-Gabrovo
Operator: Ivaylo Stoyanov

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Approver:



Spectral Power Distribution Data

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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.3579	525	0.5738	791.5404	670	0.0868	119.6917
385	0.0008	1.1292	530	0.5963	822.6399	675	0.0763	105.3288
390	0.0004	0.6119	535	0.6066	836.8665	680	0.0661	91.1861
395	0.0005	0.7107	540	0.6109	842.8096	685	0.0585	80.6367
400	0.0009	1.1928	545	0.6067	836.9249	690	0.0495	68.3224
405	0.0018	2.4403	550	0.6038	833.0435	695	0.0438	60.3592
410	0.0042	5.8167	555	0.5962	822.5002	700	0.0376	51.9311
415	0.0115	15.8322	560	0.5869	809.6832	705	0.0328	45.2013
420	0.0270	37.2240	565	0.5757	794.2174	710	0.0280	38.5623
425	0.0562	77.5668	570	0.5632	777.0126	715	0.0243	33.4609
430	0.1077	148.5634	575	0.5454	752.4814	720	0.0210	29.0311
435	0.1916	264.3838	580	0.5248	724.0338	725	0.0181	25.0108
440	0.3223	444.6120	585	0.5034	694.4642	730	0.0160	22.0540
445	0.5477	755.6089	590	0.4771	658.1494	735	0.0131	18.1266
450	0.9120	1258.1617	595	0.4477	617.5709	740	0.0112	15.4455
455	1.0000	1379.5753	600	0.4181	576.7592	745	0.0103	14.2302
460	0.6388	881.2925	605	0.3865	533.2458	750	0.0098	13.5587
465	0.4153	572.9042	610	0.3561	491.2694	755	0.0072	9.9855
470	0.3173	437.7386	615	0.3237	446.5665	760	0.0081	11.1582
475	0.2089	288.2358	620	0.2935	404.9147	765	0.0056	7.6732
480	0.1492	205.7858	625	0.2643	364.6425	770	0.0059	8.1692
485	0.1383	190.7602	630	0.2368	326.6986	775	0.0054	7.4271
490	0.1457	200.9919	635	0.2112	291.3231	780	0.0036	4.9812
495	0.1791	247.1315	640	0.1884	259.8845	785	0.0050	6.8689
500	0.2437	336.2571	645	0.1667	229.9699	790	0.0035	4.7624
505	0.3271	451.2471	650	0.1460	201.4623	795	0.0027	3.7896
510	0.4099	565.5223	655	0.1287	177.6198	800	0.0020	2.7760
515	0.4820	664.9498	660	0.1132	156.1122			
520	0.5385	742.9523	665	0.0999	137.7630			



Warmup Curve

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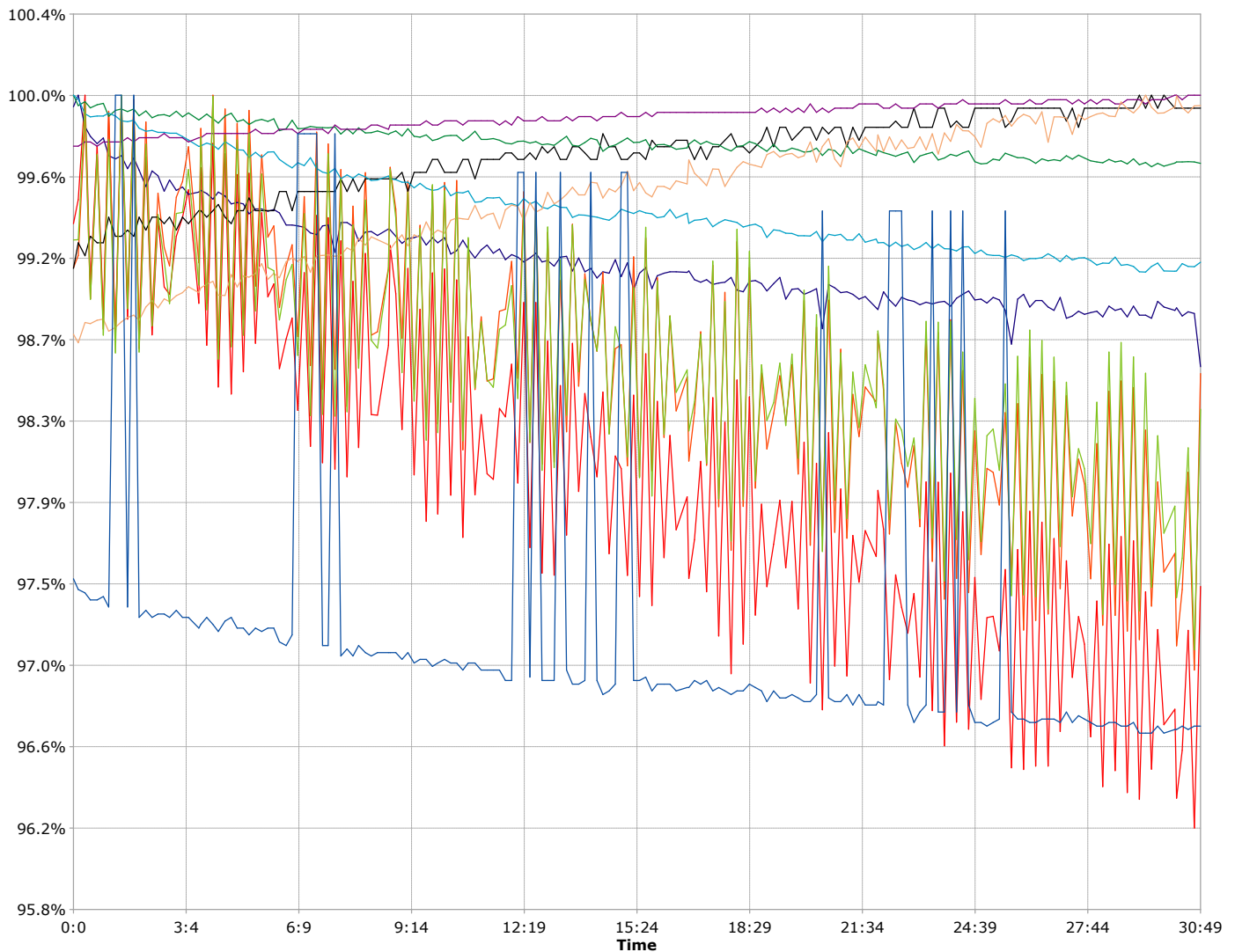
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Stable time: 30:49

Uptime: 0:0

Parameters	Maximum	Minimum	Change
Luminous Flux ,lm	49936.95	48037.00	1899.96
Power ,W	239.150	235.780	3.370
Efficiency ,lm/W	209.42	203.17	6.25
CCT ,K	6004	5950	54
CIE x	0.3204	0.3193	0.0012
CIE y	0.3756	0.3721	0.0035
Peak Wavelength ,nm	453.4	452.2	1.2
Ra	67.6	66.7	0.9
Radiant Power ,W	139.182	135.175	4.007
Dominant Wavelength ,nm	549.5	531.3	18.2

Test Lab: Lighting Lab TU-Gabrovo
Operator: Ivaylo Stoyanov

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