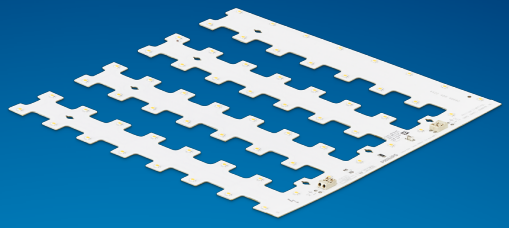
PHILIPS

Fortimo

LED

Fortimo LED Square
1250lm 8xx HV/LV2



Datasheet

Fortimo LED Square

Fortimo LED Square systems consist of white light LED modules with square outer dimensions delivering high energy efficiency and high quality of light. Fortimo LED Square systems are ideal for office applications where the luminaires require a very homogeneous exit surface window. Typical applications are recessed, surface mounted and suspended office luminaires.

Key features and benefits

- LED module efficiency up to 178 lm/W
- Long life-time: >50,000 hours
- High color rendering (CRI >80)
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000 K, 4000 K and 6500 K)
- Two lumen packages: 1250lm and 2500lm
- Tunable lumen output, efficacy and lifetime
- Wide temperature (Tc) range from -40 °C to +80 °C
- Push-in connectors enabling automated wiring
- Five year system warranty

December 2020

Ordering data

Commercial product name	EOC	12NC	Box quantity
Fortimo LED Square 1250lm 830 HV/LV2	8718696 673386 00	9290 015 31606	40
Fortimo LED Square 1250lm 840 HV/LV2	8718696 673829 00	9290 015 31706	40
Fortimo LED Square 1250lm 865 HV/LV2	8718696 673843 00	9290 015 31806	40

Drive currents

Parameter	Nominal*	Life**	Max***	Unit
Fortimo LED Square 1250lm 8xx HV/LV2	160	400	400	mA

Module temperatures

Parameter	Nominal*	Life**	Max***	Unit
T_c (case temperature at T_c point)	45	65	80	°C

* Nominal value at which typical performance is specified

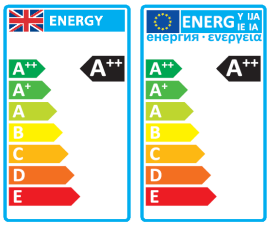
** Value at which life time is specified

*** Maximum value for safe operation, do not operate above this value

Optical characteristics - table per color (CCT)

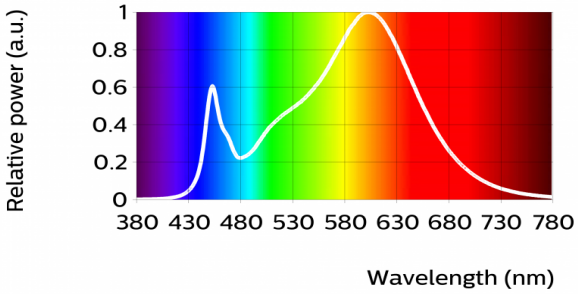
Fortimo LED Square 1250lm 830 HV/LV2

Parameter	Min	Typ	Max	Unit
Luminous flux	1082	1170	1258	lm
Module efficacy	153	165	182	lm/W
Correlated color temperature (CCT)		3000		K
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
Δu'v' at 6000 hours			0.007	



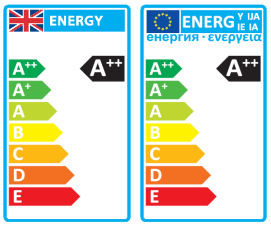
Measurement precision for flux +/- 5%.Measurement precision for efficacy +/- 6%. Measurement precision for x, y +/- 0.005. Measurement precision for CRI 1.5

Operation point	830	lm	lm/W
80% I-nom 128mA	Tc 25 °C	957	169
	Tc-nom 45 °C	938	168
	Tc-life 80 °C	916	166
I-nom 160mA	Tc 25 °C	1198	167
	Tc-nom 45 °C	1170	165
	Tc-life 80 °C	1139	163
I-life 400mA	Tc 25 °C	2874	150
	Tc-nom 45 °C	2784	147
	Tc-life 80 °C	2684	144



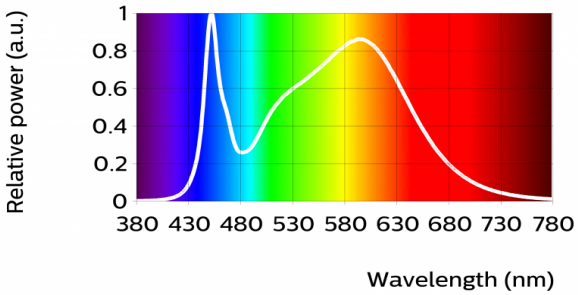
Fortimo LED Square 1250lm 840 HV/LV2

Parameter	Min	Typ	Max	Unit
Luminous flux	1156	1250	1344	lm
Module efficacy	163	177	195	lm/W
Correlated color temperature (CCT)		4000		K
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
Δu'v' at 6000 hours			0.007	



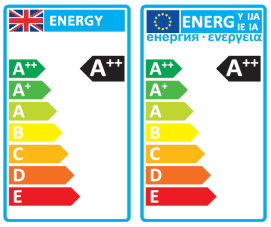
Measurement precision for flux +/- 5%.Measurement precision for efficacy +/- 6%. Measurement precision for x, y +/- 0.005. Measurement precision for CRI 1.5

Operation point	840	lm	lm/W
80% I-nom 128mA	Tc 25 °C	1022	180
	Tc-nom 45 °C	1002	179
	Tc-life 80 °C	979	177
I-nom 160mA	Tc 25 °C	1280	178
	Tc-nom 45 °C	1250	177
	Tc-life 80 °C	1216	174
I-life 400mA	Tc 25 °C	3071	161
	Tc-nom 45 °C	2975	157
	Tc-life 80 °C	2868	154



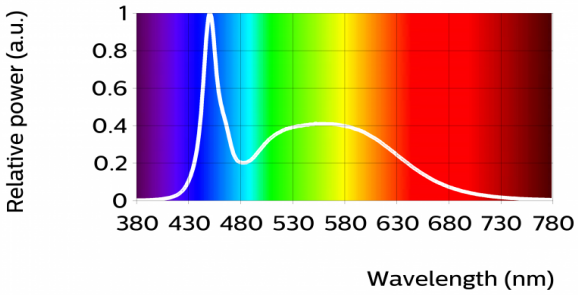
Fortimo LED Square 1250lm 865 HV/LV2

Parameter	Min	Typ	Max	Unit
Luminous flux	1156	1250	1344	lm
Module efficacy	163	177	195	lm/W
Correlated color temperature (CCT)		6500		K
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
Δu'v' at 6000 hours			0.007	



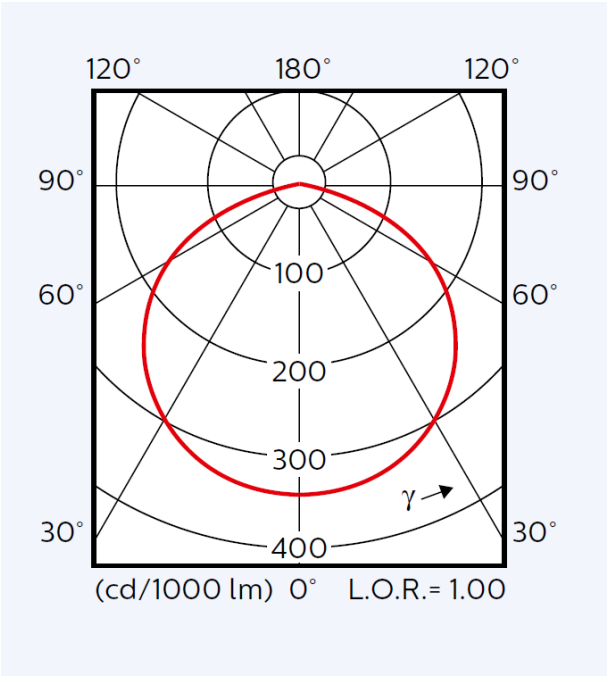
Measurement precision for flux +/- 5%.Measurement precision for efficacy +/- 6%. Measurement precision for x, y +/- 0.005. Measurement precision for CRI 1.5

Operation point	865	lm	lm/W
80% I-nom 128mA	Tc 25 °C	1022	180
	Tc-nom 45 °C	1002	179
	Tc-life 80 °C	979	177
I-nom 160mA	Tc 25 °C	1280	178
	Tc-nom 45 °C	1250	177
	Tc-life 80 °C	1216	174
I-life 400mA	Tc 25 °C	3071	161
	Tc-nom 45 °C	2975	157
	Tc-life 80 °C	2868	154



Beam shape

The Philips LED module generates a Lambertian beam shape, which is a pragmatic starting point for OEMs wishing to design secondary optics.



Electrical characteristics

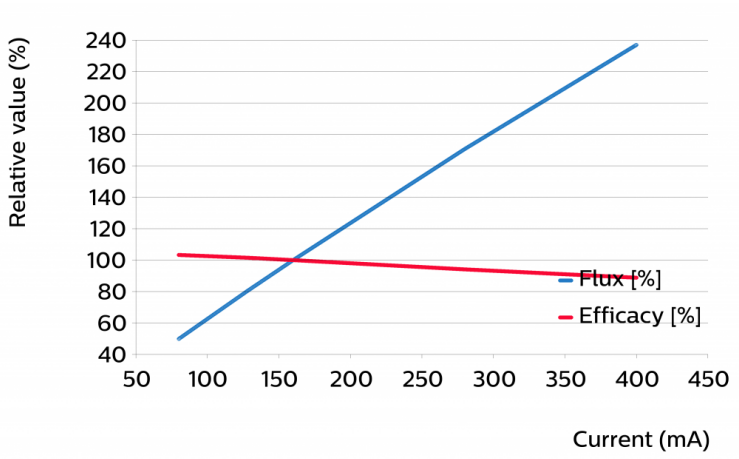
Parameter	Min	Typ	Max	Unit
Forward voltage	43.4	44.2	49.9	V
Power consumption	6.94	7.07	7.99	W = kWh/1000h
Number of modules in series per chain			6	
Number of modules per chain			4	
Number of modules in parallel			16	

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%
Specifications stated at Tc-nom and I-nom

Tuning information

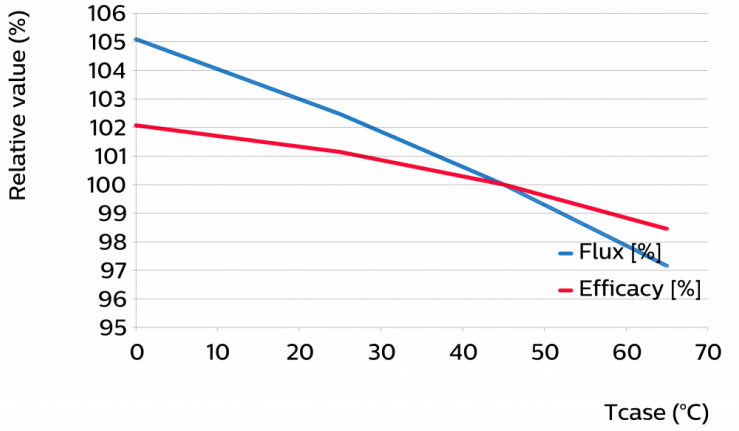
Flux and efficacy versus current (at Tc nominal)

I [mA]	Flux [%]	Efficacy [%]
400	237	89
280	171	94
160	100	100
128	80	102
80	50	103



Flux and efficacy versus temperature at Tc (at I nominal)

Tc [°C]	Flux [%]	Efficacy [%]
65	97	98
45	100	100
25	102	101
0	105	102



Lumen maintenance

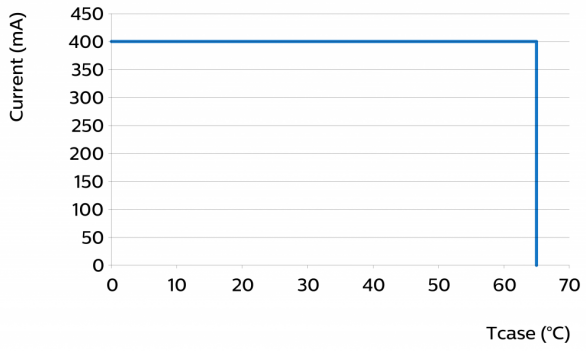
Operation point	Lumen maintenance x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 128mA	Tc 25°C	>72	>72	>72	57	55	54	26	26	25
	Tc-nom 45°C	>72	>72	>72	57	55	54	26	26	25
	Tc-life 65°C	>72	>72	>72	49	47	46	22	22	22
I-nom 160 mA	Tc 25°C	>72	>72	>72	57	55	54	26	26	25
	Tc-nom 45°C	>72	>72	>72	57	55	54	26	26	25
	Tc-life 65°C	>72	>72	>72	49	47	46	22	22	22
I-life 400mA	Tc 25°C	>72	>72	>72	57	55	54	26	26	25
	Tc-nom 45°C	>72	>72	>72	57	55	54	26	26	25
	Tc-life 65°C	>72	>72	>72	49	47	46	22	22	22

Lifetime

Parameter	Value	Unit
M70F50 nominal	>72000	hours
M70F50 life	>72000	hours

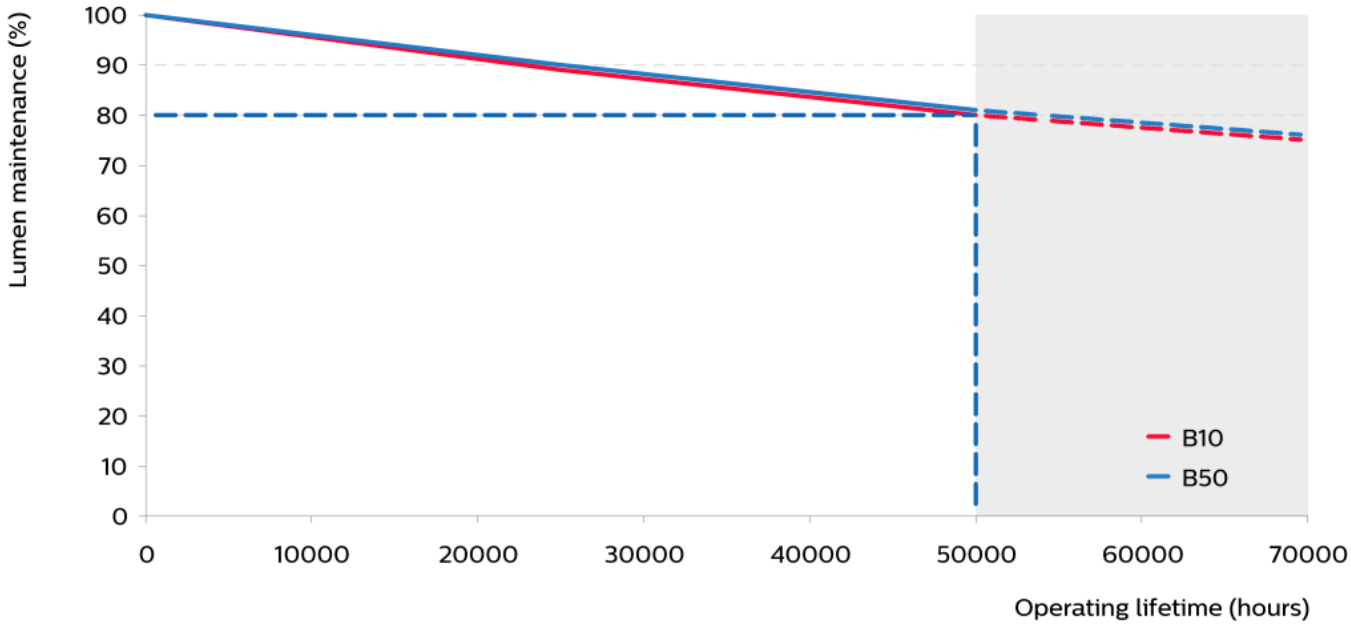
Lifetime L70B50 greater than 50 000 hours at I-life and Tc-life
Values in the table are based on available LM80 LED data (12,000h). Lumen maintenance will be updated once additional measurement data becomes available.

Performance Window

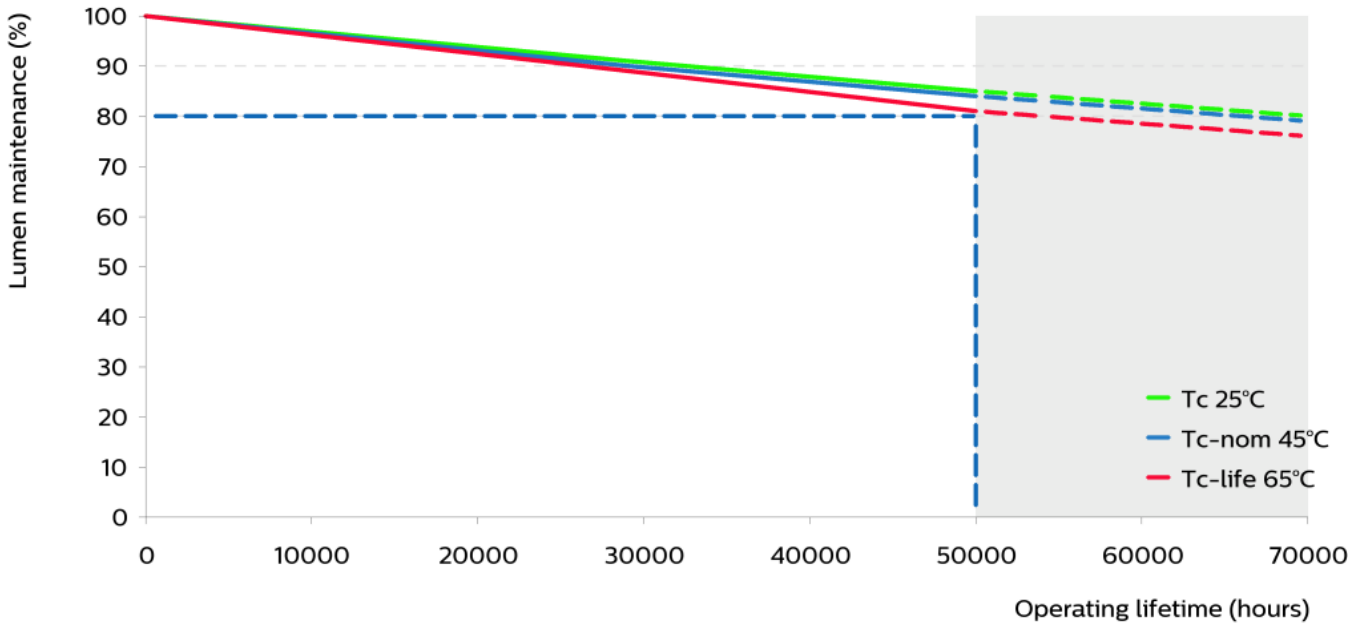


Lumen maintenance graphs

Lumen maintenance at I-life and Tc-life conditions

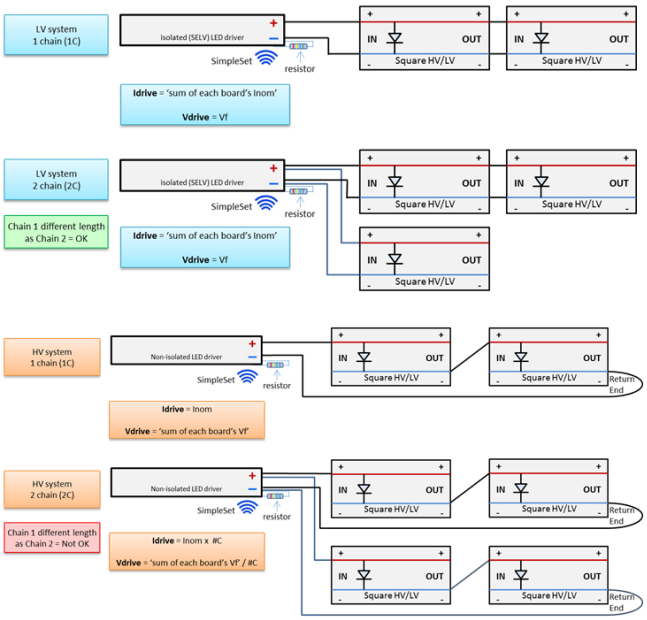


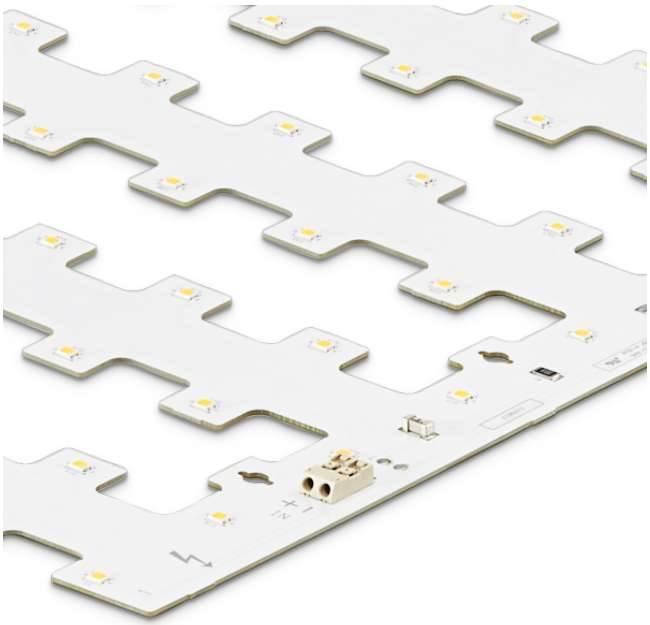
Lumen maintenance for B50 at current I-life conditions



Wiring

Specification item	Value	Unit	Condition
Input wire cross-section	0.25…0.75	mm²	solid wire
	18…24	AWG	solid wire
Input wire strip length	7.5…8.5	mm	
Input wire cross-section	0.33…0.5	mm²	stranded wire
	20…22	AWG	stranded wire
Input wire strip length	7.5…8.5	mm	

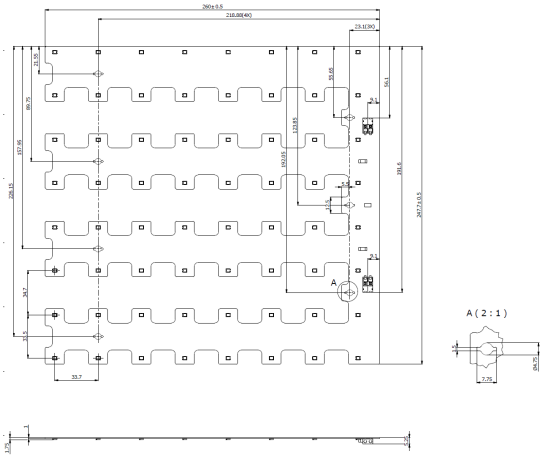




Connector suited for robot wiring.

Mechanical characteristics

Parameter	Min	Typ	Max	Unit
Length	247.2	247.7	248.3	mm
Width	259.5	260	260.5	mm
Height excl. connector	1.65	1.75	1.95	mm
Height incl. connector	4.85	5.25	5.65	mm
Product mass		65		gram



Absolute ratings

Parameter	Min	Max	Unit
Current through the LED module (I-max)		400	mA
Case temperature (Tc-max)		80	°C
Power at rated Vf-max and I-max		22.2	W
ESD (direct contact)	8		kV
ESD (air)	15		kV
Working voltage		350	V_{dc}
Voltage strength	1700		V_{ac}
Ambient temperature	-40		°C

The combined driver/system must be suitable for working at the sub-zero minimum temperature application

Application information

Certificates and Standards
IEC 62031:2008/A1:2012/A2:2014
EN 62031:2008/A1:2013/A2:2015
Relevant clauses of IEC 62471:2006 (Incl. IEC/TR 62471-2: 2009 and IEC/TR 62778: 2014)
Relevant clauses of EN 62471:2008 (With IEC/TR 62471-2: 2009 and IEC/TR 62778: 2014)
ENEC+
CE
ENEC

Environmental
RoHS/REACH

Application	
IP rating	no IP-rating
Overheating protection	No protection
Luminaire class	IEC Class I or II, see Design-In Guide LED Linear & Area modules for directions
Dimming	Yes

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