

## Emergency Lighting Requirements

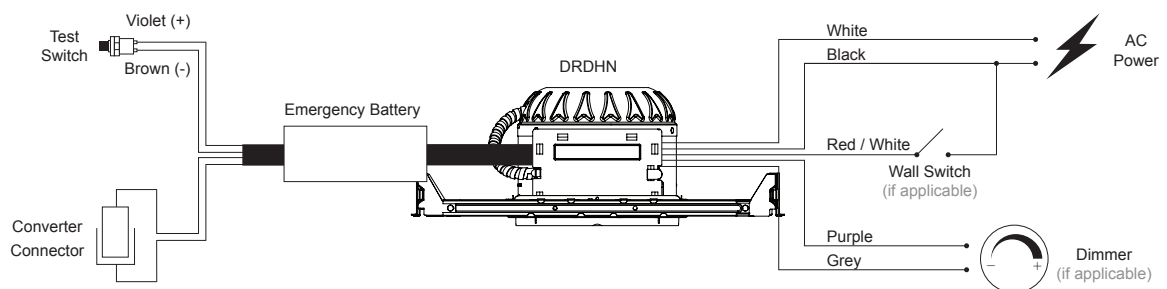
### What are the Emergency Lighting Requirements?

The National Fire Protection Association (NFPA®) standard NFPA 101®, Life Safety Code 2018, chapter 7 - Means of Egress, section 9 - Emergency Lighting, describes the requirements for emergency lighting<sup>1</sup>, which, when required, must provide the following system performance:

- 7.9.2.1 – The emergency lighting system must provide a minimum of 1.5 hours (90 minutes) of illumination if the normal lighting fails.
- 7.9.2.1.1 - The emergency lighting system must be arranged to provide initial illumination of at least 1 ft-candle average and a 0.1 ft-candle minimum at any point measured along the path of egress at floor level.
- 7.9.2.1.2 – The illumination levels can decline to a minimum of 0.6 ft-candle average and 0.06 ft-candle at any one point, at the end of emergency lighting time of 1.5 hours.
- 7.9.2.1.3 - The maximum-to-minimum illumination should not be greater than 40 to prevent excessively bright and dark spots.
- 7.9.2.3 - The emergency lighting system must be arranged to provide illumination automatically in the event of any interruption of normal lighting.

### Typical Emergency Light Fixture.

DMF Lighting provides EM (Emergency) lighting options with most of its light fixture housing types.

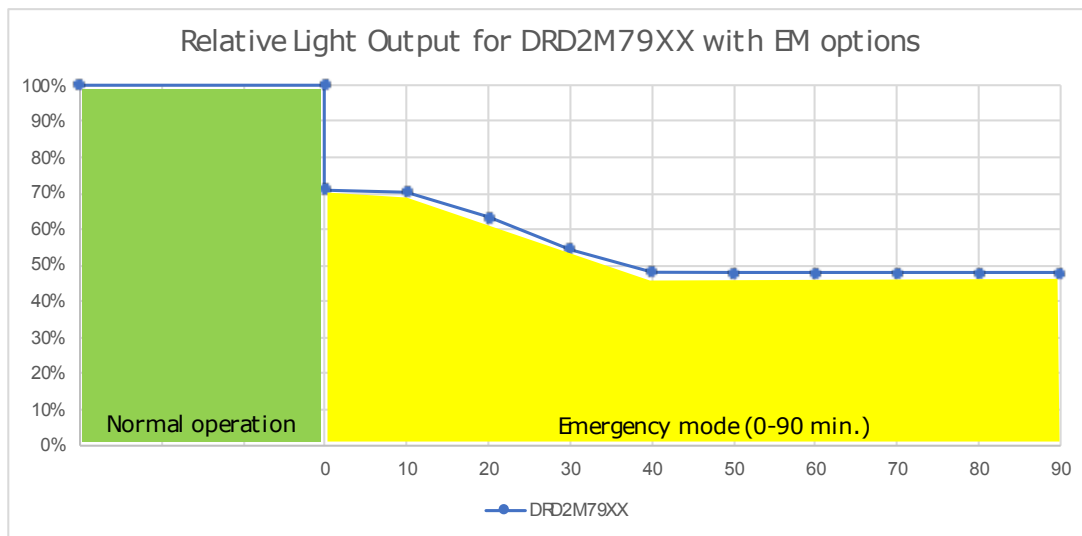


<sup>1</sup> Note, please consult the NFPA 101 2018®, and national, state and local municipal building codes for the requirements pertaining to a specific occupancy.

A typical EM arrangement is shown above. The emergency light fixture can be dimmed with triac/ELV, 0-10Vdc or more sophisticated digital signals. However, during emergency operation the dimmer is not used to control the light output. DMF uses UL924 qualified emergency LED drivers with battery backup<sup>2</sup>, which detect the loss of normal power and switch control to battery power in emergency mode.

## Typical DRD2M Performance under Emergency Conditions.

In house test results shown in the graph below illustrate the typical profile of the light output during battery operation in emergency mode relative to normal power conditions<sup>3</sup> This information is important to know when calculating lighting layouts for paths of egress, as it allows the lighting designer to adjust the light levels for emergency mode. See table below for details.



DMF Light Engine	Rated Power at Normal Operation	Operating Power at Emergency Mode	Avg. Lumen at Emergency Mode
DRD2 / DRD3 / DRD5	10 W	7 W	~360
DRD2 / DRD3 / DRD5	12 W	7 W	~400
DCD1M15 / DCD2M15	19 W	7 W	~400
DCD1M20 / DCD2M20	30 W	7 W	~400
DCD2M30	44 W	7 W	~400
DCD2M40	48 W	7 W	~400

<sup>2</sup> For example, Philips Bodine BSL17C-C2

<sup>3</sup> Note: A DRD2M79XX LED operates at 10W in normal power mode, hence 70% or 7W at the start of Emergency Battery Operation.

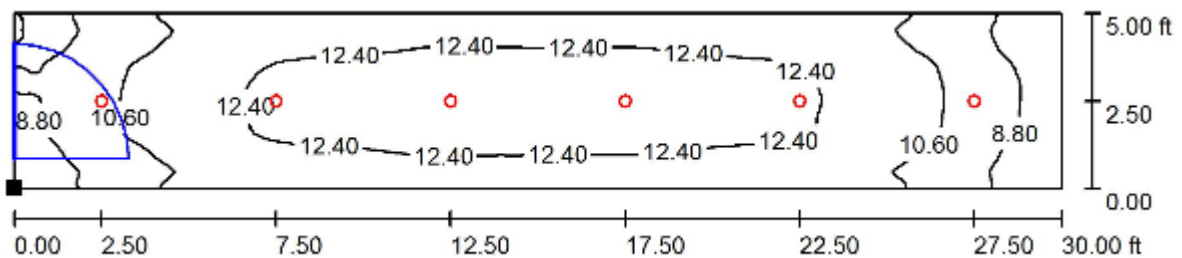
## Typical Lighting Layout for a Path of Egress

The example below shows typical data for a 30' long by 5' wide corridor with 9' high ceilings. Typical reflectance values (0.8 ceiling, 0.5 walls, 0.2 floor) are used. The Daily operation or normal power mode and the emergency modes light output are shown. The light output of the EM fixtures was de-rated per the previous table for the DRD2M79XX light engine. In normal operation the light fixtures are spaced on 5' centers. Two of the fixture spaced 15' apart have EM capability. The results meet the NFPA 101 requirements as shown below.

	Duration	Avg. ft-candle	Min. ft-candle	Max-to-Min.
<b>NFPA 101 Code Mandates</b>	<b>90 min.</b>	<b>&gt; 1</b>	<b>&gt; 0.1</b>	<b>&lt; 40</b>
Foot-candle from example	> 90 minutes	1.92	0.99	2.61

LIGHTING SCHEDULE	% LIGHT LEVEL FOR DRD2M79xx						FOOT-CANDLE ON FLOOR			
	No. 1	No. 2 (EM)	No. 3	No. 4	No. 5 (EM)	No. 6	Avg. fc	Min. fc	Max. fc	Max/Min
Schedule 1 (Daily Operation)	100%	100%	100%	100%	100%	100%	11	7.58	13	1.7
Schedule 2 (Emergency Mode)	0%	48%	0%	0%	48%	0%	1.92	0.99	2.58	2.6

**Foot-candle distribution for Schedule 1 with DRD2M79xx**



**Foot-candle distribution for Schedule 2 with DRD2M79xx**

