

## EVALUATION OF NAVIGATIONAL MARKING LEDS SPOTLIGHTS

### FRENCH SPECIFICATIONS

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Our Leds spotlights are subjected to photometric measurements, which allow us to characterise the vertical and horizontal divergences and their radiation diagrams. To carry out these measurements we implement the 1977 recommendations of IALA. Thus the operating method, measuring equipment, methods of calculating of effective intensity and of nominal range of a spotlight are codified for this international standard.

However, the results of these measurements are subjected to corrections and radiation diagrams must answer to specifications.

#### 1. MEASUREMENTS CORRECTIONS

##### 1.1 - Corrections for dirt/ageing of the components:

It is usual to reduce the gross results of our photometric measurements by 20% to take into account the loss of luminous efficiency over time caused by the film of dirt covering the bare optics and the reduction of luminous flux.

There is no intensity correction for shape and brightness factors because of the reliability of the electronic flashers and incandescence phenomena missing.

##### 1.2 - Instability of the light support:

For lights attached to buoys, due to the simultaneous movements of the observer and the light, the official effective intensity is less than that of the same light on a fixed support. Correction factor is calculated for each light and depends of :

- average luminous range for zero angle of site;
- luminous intensity repartition for angle of site;
- buoy comportment characterized by inclination probability (from the observation of old-fashioned gas buoys and soon update)

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## 2. RADIATION DIAGRAMS SPECIFICATIONS

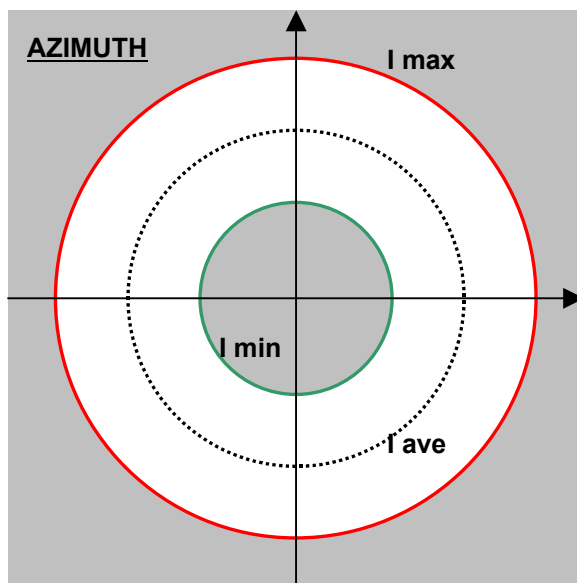
In order to decide on the approval of a signal light, a method known as 'the gauge method' is applied. The main principles of the method are outlined below :

- gauges are envelope curves which define the light's normal zone of use,
- the interior envelope defines the minimal intensities for the zone of use,
- the exterior envelope defines the maximal intensities for the zone of use.

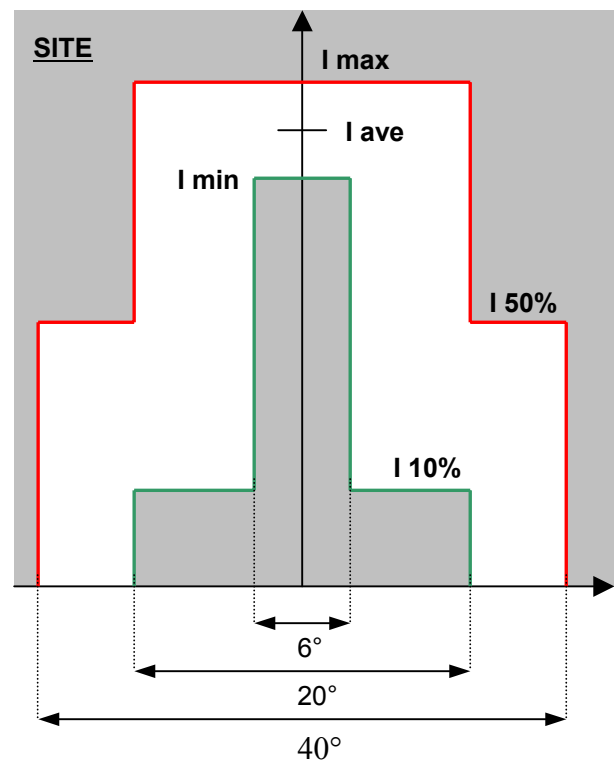
There are three gauges for three different type of Leds lights :

- one for all-round light on moving support ;
- one for all-round light on motionless support ;
- one for direction light.

### Radiation diagram : All-round light for moving support

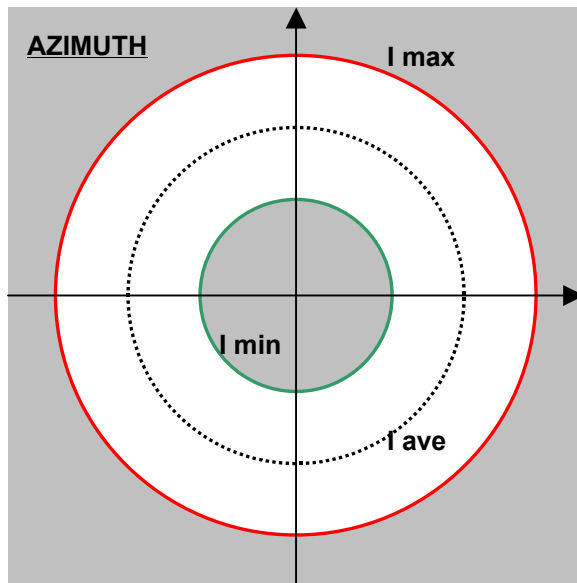


R ave : average range  
 I min : intensity for  $0.9 \times R \text{ ave}$   
 I ave : intensity for R ave  
 I max : intensity for  $1.1 \times R \text{ ave}$

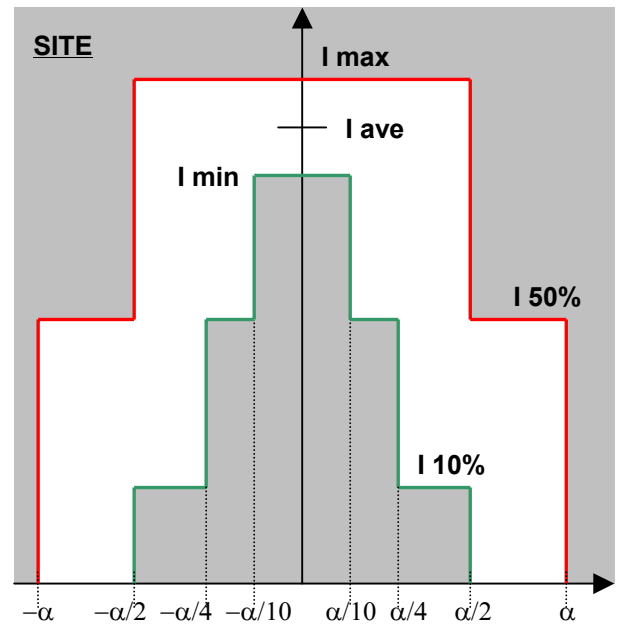


R ave : average range  
 I 10% : intensity for  $0.1 \times I \text{ ave}$   
 I 50% : intensity for  $0.5 \times I \text{ ave}$   
 I min : intensity for  $0.9 \times R \text{ ave}$   
 I ave : intensity for R ave  
 I max : intensity for  $1.1 \times R \text{ ave}$

## Radiation diagram : All-round light for motionless support

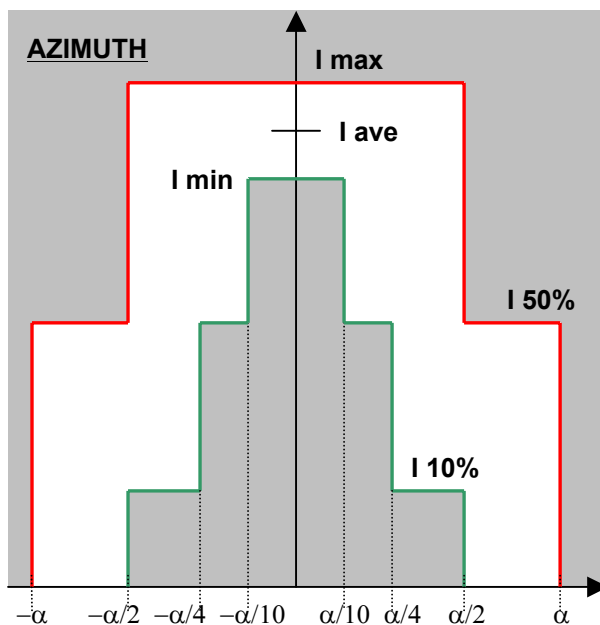


R ave : average range  
 I min : intensity for  $0.9 \times R \text{ ave}$   
 I ave : intensity for R ave  
 I max : intensity for  $1.1 \times R \text{ ave}$

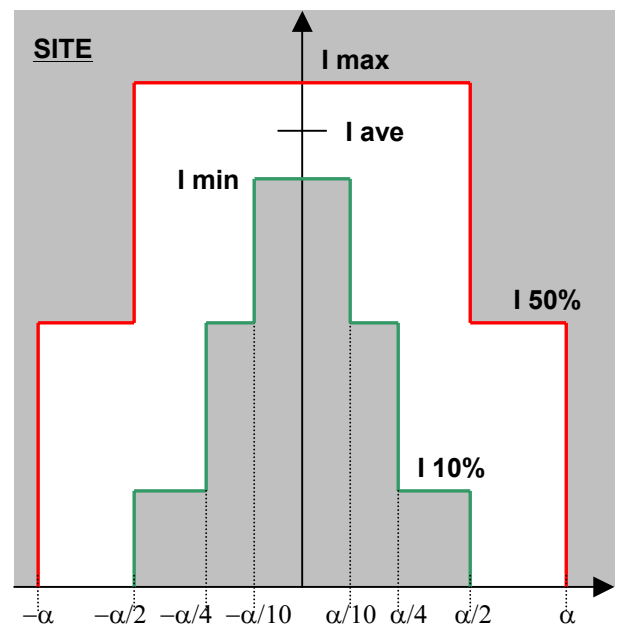


$\alpha$  : vertical divergence  
 R ave : average range  
 I 10% : intensity for  $0.1 \times I \text{ ave}$   
 I 10% : intensity for  $0.5 \times I \text{ ave}$   
 I min : intensity for  $0.9 \times R \text{ ave}$   
 I ave : intensity for R ave  
 I max : intensity for  $1.1 \times R \text{ ave}$

## Radiation diagram : Direction light



$\alpha$  : horizontal divergence  
 R ave : average range  
 I 10% : intensity for  $0.1 \times I \text{ ave}$   
 I 10% : intensity for  $0.5 \times I \text{ ave}$   
 I min : intensity for  $0.9 \times R \text{ ave}$   
 I ave : intensity for R ave  
 I max : intensity for  $1.1 \times R \text{ ave}$



$\alpha$  : vertical divergence  
 R ave : average range  
 I 10% : intensity for  $0.1 \times I \text{ ave}$   
 I 10% : intensity for  $0.5 \times I \text{ ave}$   
 I min : intensity for  $0.9 \times R \text{ ave}$   
 I ave : intensity for R ave  
 I max : intensity for  $1.1 \times R \text{ ave}$