

Repealed

Filed Jan 18 - 1957  
11 am

IND 21.00

STATE OF WISCONSIN )  
DEPT. OF INDUSTRIAL COMMISSION ) SS.

I, Helen E. Gill, Secretary of the Industrial Commission of Wisconsin, hereby certify that on December 21, 1956 the Industrial Commission voted to repeal and abolish Safety Orders 2100, 2101, 2102, 2103, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117 and 2118, known collectively as the Industrial Lighting Code For Factories, Mills, Offices And Other Work Places, as of December 31, 1956.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the department at the Capitol in the City of Madison, this 17th day of January, A. D., 1957.

  
Secretary

INDUSTRIAL LIGHTING CODE

FOR

FACTORIES, MILLS, OFFICES AND  
OTHER WORK PLACES

Issued by the

INDUSTRIAL COMMISSION OF WISCONSIN

INDUSTRIAL LIGHTING CODE FOR FACTORIES,  
MILLS, OFFICES AND OTHER WORK PLACES

SECTION I. APPLICATION AND DEFINITIONS.

Order 2100. New Construction. This code shall apply as a minimum requirement to all new construction and replacements which are begun subsequent to July 1, 1918.

Order 2101. Additions to Existing Lights and Equipment. All work on existing lighting systems and equipment required by this code, which can be accomplished by the addition of new material without the abandonment of the existing equipment and material, shall be completed by July 1, 1920.

Note: Supplying proper enclosing globes, shades or reflectors for exposed lamps, frosting lamp bulbs, installing control switches at convenient points, are among the items intended to be covered by this order.

Order 2102. Replacement of Existing Lights and Equipment. Where the condition of existing lighting systems and equipment is such that compliance with this code requires their abandonment and the construction of a new system, the work shall be prosecuted as rapidly as the circumstances permit.

Order 2103. Meaning of Terms. In this code:

(1) Candle (or candle-power) means the unit of luminous intensity maintained by the National Laboratories of the United States, France and Great Britain.

(2) Lumen means the unit of luminous flux equal to the flux emitted in a unit solid angle (steradian) by a point source of unit candle-power.

(3) Foot-candle means the unit of illumination equal to one lumen per square foot.

Note: The foot-candle is the lighting effect produced upon an object by a lamp of one candle-power at a distance of one foot; at two feet, the effect would be not one-half foot-candle, but one-fourth foot-candle; at three feet, one-ninth foot-candle, etc.

(4) Photometer means an instrument suitable for making illumination measurements.

(5) Lamp means that part of the lighting equipment from which the light originates.

Note: With electric lighting it means the incandescent lamp bulb or the arc, and with gas lighting, the burner and mantle.

(6) Local Lamps (or Lighting) means lighting units located close to the work, and intended to illuminate only a limited area about the work.

(7) Overhead Lamps (or Lighting) means lighting units installed above ordinary head level to secure a general illumination over a considerable area.

(8) Brightness means the intensity of light per unit area emitted from or reflected by a body; and in this code is expressed in candle-power per square inch.

(9) Glare means any brightness within the field of vision of such a character as to cause discomfort, annoyance, interference with vision, or eye fatigue.

(10) Eye strain means a physiological condition of the eye resulting in discomfort, poor vision or fatigue.

(11) Shaded means that the lamp is equipped with a reflector, shade, enclosing globe, or other accessory for reducing the brightness in certain directions, or otherwise altering or changing the distribution of light from the lamp.

## SECTION II. NATURAL AND ARTIFICIAL LIGHTING.

Order 2110. General Requirement. Working or traversed spaces in buildings or grounds of places of employment shall be supplied during the time of use, with either natural or artificial light in accordance with the following orders. (2111-2118)

Order 2111. Natural Light. Windows, skylights, saw-tooth or other roof lighting construction of buildings shall be arranged with reasonably uniform bays and the glass area so apportioned that at the darkest part of any working space, when normal exterior daylight conditions obtain, (sky brightness of 1.5 candle-power per square inch) there will be available a minimum intensity equal to twice that of Order 2112 for artificial light.

Awnings, window shades, diffusive or refractive window glass shall be used for the purpose of improving daylight conditions or for the avoidance of eye strain wherever the location of the work is such that the worker must face large window area, through which excessively bright light may at times enter the building.

Note: The intensity requirements for adequate daylighting are much higher than those for adequate night lighting, because in general under daylight conditions, the light coming to the eye from all the surroundings in the field of vision is much brighter than at night, and hence a correspondingly more intense light must fall on the object viewed.

Order 2112. Artificial Light. When the natural light is less than twice the minimum permissible intensities of illumination set forth in the following table, artificial light shall be supplied and maintained in accordance with the table.

Note: The intensities of ordinary practice indicate the desirable illumination for best working conditions.

ILLUMINATION INTENSITY AT THE WORK IN FOOT-CANDLES

	Minimum Permissible Intensity	Intensities or Ordinary Practice
(a) Roadways and yard thoroughfares.....	0.02	0.05 - 0.25
(b) Storage spaces.....	0.25	0.5 - 1.
(c) Stairways, passageways, aisles.....	0.25	0.75 - 2.
(d) Toilets and washrooms.....	0.5	1.5 - 3.
(e) Rough manufacturing such as rough machining, rough assembling, rough bench work, foundry floor work.....	1.25	2. - 4.
(f) Rough manufacturing involving closer discrimination of detail.....	2.	3. - 6.
(g) Fine manufacturing such as fine lathe work, pattern and tool making, light colored textiles.....	3.	4. - 8.
(h) Special cases of fine work, such as watch making, engraving, drafting, dark colored textiles.....	5.	10. - 15.
(i) Office work such as accounting, typewriting, etc. ....	3.	4. - 8.

Note: The measurements of illumination are to be made at the work with a properly standardized portable photometer.

The minimum foot-candles specify the lowest illumination intensity with which the employees can be expected to work with safety when artificial light is used. It is to the advantage of the employer to provide the intensities of ordinary practice, as this results in less eye strain, greater accuracy of workmanship, increased production for the same labor cost, less spoilage. When part daylight and part artificial illumination must be used together, it is desirable to employ even higher intensities than those of ordinary practice in the table above. (See note accompanying Order 2111.)

In order that the illumination intensities will never fall below the minimum during the interval between inspections, installations should be designed to produce initial values at least 25 per cent higher.

Order 2113. Shading of Lamps for Overhead Lighting. Lamps suspended at elevations above eye level less than one-quarter their distance from any position at which work is performed, shall be shaded in such a manner that the intensity of the brightest square inch of visible light source does not exceed seventy-five candle-power.

Exception: Lamps suspended at greater elevations than twenty feet above the floor, are not subject to this requirement.

Note: (a) Glare from lamps or unduly bright surfaces produces eye strain and increases the accident hazard.

The brightness limit specified in this order is an absolute maximum. Very much lower brightness limits are necessary in many interiors illuminated by overhead lamps, if the illumination is to be satisfactory. In some cases, the maximum brightness should not exceed that of the sky (1.5 to 3.0 candle-power per square inch.)

Note: (b) Where the principal work is done on polished surfaces, such as polished metal, celluloid, varnished wood, etc., it is desirable (but not mandatory at present) to limit the brightness of the lamps in all downward directions to the amount specified in this order.

Order 2114. Shading of Lamps for Local Lighting. Lamps for local lighting shall be shaded in such manner, that the intensity of the brightest square inch presented to view from any position at which work is performed, does not exceed three candle-power.

Note: In the case of lamps used for local lighting, at or near eye level, the limits of permissible brightness are much lower than for lamps used for overhead lighting, because the eyes are more sensitive to strong light received from below, and because such light sources are more constantly in the field of view.

Order 2115. Distribution of Light on the Work. The reflectors or other accessories, mounting height and spacing employed with lamps shall be such as to secure a reasonably uniform distribution of illumination, avoiding objectionable shadows and sharp contrasts of brightness. If local lighting is used, there shall be employed in addition, a moderate intensity of overhead lighting.

Note: When local lighting is used as the sole source of illumination of an interior, the field of illumination from each lamp is in contrast to the surrounding darkness, thereby causing eye strain and increasing the accident hazard.

Order 2116. Emergency Lighting. Emergency lamps shall be provided in all work space aisles, stairways, passageways, exits, and on all "B" fire escapes (three feet and four inches wide - See Building Code), to provide for reliable operation when, through accident or other cause, the regular lighting is extinguished. Emergency lighting systems, including all supply and branch lines, shall be entirely independent of the regular lighting system and shall be concurrently in operation with the regular lighting.

Note: (a) It is the intention of this order to guard against accident due to the failure of the regular lighting system, by providing sufficient illumination to enable the occupants to

1. Avoid contact with moving machinery and other danger points until the regular lighting is again put in operation.

2. To vacate the building safely and expeditiously when this is necessary because of fire or other causes.

Note: (b) Emergency lighting may be installed in various ways. The method to be employed depends upon the size of the premises, the extent of the hazards of employment, and the means available for supplying such emergency lighting.

Order 2117. Switching and Controlling Apparatus. Switching or controlling apparatus shall be so placed that at least pilot or night lights, which may be part of the emergency lighting system, may be turned on at one or more easily accessible points. All such apparatus shall be plainly labeled for identification.

Note: The purpose of this order is to make it possible for the night watchman or other qualified persons to turn on enough lamps, when entering any portion of the premises at night, to enable them to safely see their way around without the need of a lantern or flashlight.

Order 2118. Maintenance. All lighting equipment and windows shall be periodically cleaned, inspected, kept in order and when defective, replaced, so that the intensities of illumination will never fall below those specified in Order 2112.

This edition of the Industrial Lighting Code is out of print and the orders while still in effect are in need of revision. Pending revision it seems advisable to send the orders out in this form.

When revised orders are available they will be distributed. Any comments or questions on these orders should be sent to the Safety Division, Industrial Commission, State Office Building, Madison, Wisconsin.

August 1, 1952