Illuminating ENGINEERING SOCIETY

ANSI/IES RP-7-17

Recommended Practice for Lighting Industrial Facilities

Approved American National Standard ANSI

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Recommended Practice
for
Lighting Industrial Facilities

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has been approved by the IES.
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should be directed to the IES.

Prepared by:
The IES Industrial Lighting Committee

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1.0 INTRODUCTION

A well-designed lighting system can make an important contribution to the success of an industrial facility. The success of the well-lighted industrial environment can affect productivity, employee performance, safety, energy efficiency, maintenance costs, and the number of errors and lost-time accidents. Many features of a lighting system other than the quantity of light provided can make a significant contribution to the efficiency and safety of the industrial worker.

In the design of lighting for industrial environments, horizontal illuminance has commonly been the only consideration. However, many industrial tasks take place in planes with various orientations and in areas with overhead obstructions. Placement of the luminaires is critical to providing light of the proper quality, as well as quantity and direction, to allow fast, easy recognition of operations. These operations may be taking place at high speeds in areas of the production machinery or industrial products where ambient light cannot easily penetrate.

Selection of the luminaire and its photometric distribution can be important to rendering the visual task properly when that task is multidimensional rather than flat, and when the task occurs in a plane other than horizontal. The operation of the lighting system should be understood to ensure that the proper light sources are selected. Improper light source choice can result in difficult and potentially dangerous conditions caused by long warm-up periods or stroboscopic effects created where rotating parts are involved. The ability of the light to render colors accurately can have an effect on the recognition of colors, including safety colors, or product components. Many industrial operations take place in hostile environments, and the lighting products and hardware used in these locations should be designed and manufactured to survive in these conditions and be easy to maintain.

For these reasons, and many others, great care is required in order to provide an effective, efficient and readily maintainable lighting system for all industrial spaces, and to help modern industrial workers operate at the peak of their ability in a safe environment.

1.1 Purpose and Scope

The primary purpose of this standard is to serve as a guide and educational tool for the design of permanently installed lighting systems for industrial facilities. This Recommended Practice deals entirely with lighting and does not give advice on the construction of a facility. The scope of this practice covers the design of new indoor and outdoor lighting systems for new industrial facilities as well as the redesign of lighting systems in existing industrial facilities. Recommendations are based on quality lighting practices, including: the safe movement of vehicles and people, enhancing the productivity and comfort of employees, conserving energy, and minimizing maintenance. Recommended minimum maintained lighting levels and maximum uniformity ratio guidelines are provided but are subject to variation for special circumstances when based upon sound engineering judgment.

This Practice does not include all information for mixed application areas such as parking lots, offices, outdoor environments, commercial facilities, or daylighting design. For these crossover applications, the associated Recommended Practice documents should be used in conjunction with this Practice to provide the lighting recommendations.

In short, this Recommended Practice will help the reader make intelligent choices to achieve the lighting goals with a minimum of expense of time and capital.

2.0 LIGHTING THE INDUSTRIAL ENVIRONMENT

Providing a successful lighting design for a modern industrial facility is a complex task. In recent years, much more has been learned about lighting and its positive effects on the wellbeing of people. The goal of providing an efficient, reliable and easily maintainable lighting system, making use of all of the knowledge available to the designer today, is one that requires experience and considerable planning.

Industrial facilities include manufacturing areas, such as fabrication, assembly, sub-assembly, and finishing, as well as quality control, warehousing and logistics. Related areas can also be laboratories, pharmaceutical and/or chemical production facilities (including “clean rooms”), and vehicle maintenance and repair facilities.

2.1 General Design Considerations for Lighting Industrial Areas

The designer of an industrial lighting system should carefully consider all of the following design criteria,