

TABLE 2 (continued)

Soap manufacturing		Dark thread	100
Kettle houses, cutting, soap chip and powder	30	Warping (silk or cotton system) on reel, on running ends, on reel, on beam, on warp at beaming	70
Stamping, wrapping and packing, filling and packing soap powder	50	Drawing-in	150
Stairways, reception rooms, wash-rooms, and other service areas	20	On heddles	150
Stone crushing and screening		On reed	150
Belt conveyor tubes, main line shafting spaces, chute rooms inside of bins	10	Weaving	50
Primary breaker room, auxiliary breakers under bins	10	On heddles and reeds	50
Screens	20	On warp back of harness	50
Storage battery manufacturing		On woven cloth	70
Molding of grids	50	Textile mills (woolen and worsted)	
Storage rooms		Opening	30
Inactive	10	Grading	150
Active		Blending	30
Rough bulky	20	Picking	30
Medium	30	Carding (add an internal unit)	70
Fine	50	Combing	70
Structural steel fabrication	30	Recombining	70
Sugar refining		Gilling	70
Grading	50	Drawing (white)	50
Color inspection	150	Drawing (colored)	100
Switchboards (see control rooms)		Spinning (frame) (white)	50
Testing		Spinning (frame) (colored)	100
Rough	30	Spinning (mule) (white)	50
Fine	50	Spinning (mule) (colored)	100
Extra fine instruments, scales, etc.	200	Twisting (white)	50
Textile mills (cotton):		Winding (white)	50
Opening, mixing, picking	30	Winding (colored)	100
Carding and drawing	30	Warping (white)	50
Slubbing, roving, spinning and spooling	50	Warping (white) (at reed)	100
Beaming and slashing on comb		Warping (colored)	100
Grey goods	50	Warping (colored) (at reed)	150
Denims	150	Weaving (white)	70
Inspection		Weaving (colored)	200
Grey goods (hand turning)	70	Grey goods room	
Denims (rapidly moving)	300 ^d	Burling	150
Automatic tying-in	150	Sewing	300
Drawing-in by hand	300 ^d	Folding	70
Weaving	70	Wet finishing	
Textile mills (silk and rayon)		Fulling	150
Manufacturing		Scouring	150
Soaking, fugitive tinting, and conditioning or setting of twist	30	Crabbing	50
Winding, twisting, rewinding, and coning, quilling, slashing		Drying	50
Light thread	50	Dyeing	150
		Dry finishing	
		Napping	70
		Shearing	150
		Conditioning	70
		Pressing	70
		Inspecting (perching)	500
		Folding	70
		Tobacco products	
		Drying, stripping, general	30

TABLE 2 (continued)

Grading and sorting	150	Woodworking	
Toilets and wash rooms	20	Rough sawing and bench work	50
Upholstering—automobile, coach		Sizing, planing, rough sanding, medium machine and bench work, glueing, veneering, cooperage	100
Furniture	70	Fine bench and machine work, fine sanding and finishing	200
Warehouse	20		
Washrooms	20		
Welding			
General illumination	50		
Supplementary illumination	2000		

The footcandle recommendations may change as a result of a number of studies now under way. It is desirable to consult specific study reports at the time of design.

Obtained with a combination of general lighting plus specialized supplementary lighting. Special lighting such that (1) the luminous area shall be large enough to cover the surface which is being inspected and (2) the brightness be within the limits necessary to obtain comfortable contrast conditions. This involves the use of sources of large area and relatively low brightness in which the source brightness is the principal factor rather than the footcandles produced at a given point.

These seeing tasks generally involve the discrimination of fine detail for long periods of time and under conditions of poor contrast. To provide the required illumination, a combination of the general lighting indicated plus specialized supplementary lighting is necessary. The design and installation of the combination system must not only provide a sufficient amount of light, but also the proper direction of light, diffusion, and eye protection. As far as possible it should eliminate direct and reflected glare as well as objectionable shadows.

For all power plants.

Over the past 40 years. Present-day recommendations for various industrial operations are given in Table 2. Quality lighting has resulted in many lighting benefits to the employee and the employer alike.⁴⁹

One of these is the safety of employees in industry. The correlation between accident prevention and better lighting is well established. People closely connected with lighting for industry know that under good lighting conditions the worker can see faster and does not tire as easily as under poor lighting conditions. In a survey by an industrial firm⁵⁰ in their erection shop, it was found that accidents were cut 32 per cent when lighting was increased from 5 to 20 footcandles (Figures 13 and 14). Then, after the walls were painted with a fairly high-reflectance paint (Figure 15), the accident rate decreased another 16 2/3 per cent (Figure 16); this painting served to increase illumination to about 25 footcandles and increased seeing ability on vertical surfaces as well as creating a more comfortable environment in which to work.

Another example of a reduction in accident rate due to better lighting conditions is found in a machine tool company⁵¹ (Figures 17 and 18). Installation of fluorescent luminaires with an upward component of light provided better lighting and more comfortable seeing conditions. The illumination level was raised from 3 to 40 footcandles. Machines were painted a 30 per cent gray reflectance to reduce

⁴⁹ 25 industrial lighting solutions, *Bulletin LS-163*, Lamp Division, General Electric Co., January, 1955.

⁵⁰ Allis-Chalmers Manufacturing Co., Erection Shop, Milwaukee, Wis.

⁵¹ Morris Machine Tool Co., Second Floor Machinery Area, Cincinnati, Ohio.