

RPT:RMC

U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS  
WASHINGTON, D. C.

Letter Circular  
LC-680  
Superseding  
LC-220

February 27, 1942

INCANDESCENT ELECTRIC LAMPS: PHOTOMETRIC STANDARDS DISTRIBUTED BY  
THE NATIONAL BUREAU OF STANDARDS

A normal incandescent lamp when operated at constant voltage usually increases slightly in candlepower for a short time, the length of which depends upon the temperature of the filament. A stationary period is then reached, after which there is a progressive drop in the candlepower. The initial rise in candlepower is due to a gradual decrease in the resistance of the filament, while the subsequent decrease in candlepower is due chiefly to blackening, caused by a deposit on the inside of the bulb. Therefore, in order that a lamp may be useful as a photometric standard, it should be seasoned by a preliminary burning sufficient to bring its resistance to a steady state. This seasoning is usually done by operating the lamp at a voltage somewhat higher than the normal operating voltage of the lamp.

This Bureau is prepared to standardize incandescent filament lamps which have been properly seasoned, or to season and standardize lamps when necessary, or to furnish lamps (of the more common types and sizes) that have been seasoned and standardized, the respective fees being as given in Test Fee Schedule 151, copy attached.

Lamps with coiled filaments are not usually satisfactory as standards unless they have been specially constructed for this purpose. In particular, lamps of this type are not suitable for standards of horizontal candlepower unless they are of the monoplane-filament projection type. This type of gas-filled lamp has been found to be satisfactory as a standard of horizontal candlepower when standardized with a diaphragm in front of the lamp. This diaphragm is slightly larger than the filament and allows only the light coming directly from the filament to reach the photometer. When standardized without such a diaphragm, the calibration is valid only at the photometric distance used during the standardization of the lamp.

When lamps are submitted for standardization it is desirable that they be accompanied by a statement as to whether they have been seasoned or not. If they have been seasoned, the voltage at which they were burned and the number of hours should be given if known. It should be stated also whether they are to be standardized rotating or stationary and whether at a given luminous flux (lumens), candlepower, voltage, current, or efficiency. In the reports or certificates which are issued with standard lamps the voltage and the corresponding current and flux or candlepower are given. The Bureau can not guarantee the permanence of these values, since all lamps change gradually with use.



DEPARTMENT OF COMMERCE  
Bureau of Standards

Test Fee Schedule 151. - INCANDESCENT ELECTRIC LAMPS AS STANDARDS  
OF CANDLEPOWER OR LIGHT FLUX

Effective August 1, 1932, superseding all previous schedules  
for the items covered.

Item	Description	Fee
	151a-m Standardization of seasoned lamps. <u>Horizontal candlepower standards</u> (for use on horizontal bar photometers)	
151a	Determination of mean horizontal candlepower (lamp rotating) at one current or voltage, one lamp.....	\$10.00
151b	Same, each additional lamp of same size and type	5.00
151c	Same, at two or more voltages or currents, each additional voltage or current.....	5.00
151d	Determination of horizontal candlepower in a fixed direction, (lamp stationary) at one voltage or current, one lamp.....	12.00
151e	Same, each additional lamp of the same size and type.....	6.00
151f	Same, two or more voltages, or currents, each additional voltage or current.....	6.00
	<u>Lumen standards</u> (for use in sphere photometers)	
151g	Determination of luminous flux (lumens) at one voltage or current, one lamp (all sizes to 1000 watts).....	8.00
	Double-filament automobile headlamps are charged for as two lamps.	
151h	Same, each additional lamp of same size and type	4.00
151i	Same, at two or more voltages or currents, each additional voltage or current.....	4.00
151j	Same, 3000- and 5000-watt, multiple lamps and 15- and 20-ampere series lamps, at one voltage or current, one lamp.....	20.00
151k	Same, each additional lamp of same size and type..	5.00



Item	Description	Fee
15lm	Same, at two or more voltages or currents, each additional voltage or current.....	\$5.00
	15ln-p Seasoning and preliminary tests on lamps supplied for standardization	
15ln	Seasoning of lamps for standardization, and preliminary measurements, 15 watts to 200 watts, each lamp.....	2.00
15lp	Same, other sizes and types up to 1000 watts and all series lamps, each lamp.....	4.00
	15lq-v Standardized lamps that can usually be supplied from stock. (See also 15lqx-vx)	
15lq	Carbon-filament lamps, standardized in horizontal candles in a fixed direction, approximately 50-volt, 16-candlepower lamps (for use on bar photometer without rotator)..	8.00
15lr	Carbon-filament lamps in mean horizontal candles, approximately 110-volt, 16-candlepower lamps (lamps rotating when in use), each.....	7.00
15ls	Vacuum tungsten-filament lamps, 25-, 40-, 60- and 100-watt sizes, clear bulbs, approximately 110-volt lamps, horizontal candles in a fixed direction, each.....	8.00
15lt	Same, mean horizontal candles, lamps rotating, each.....	7.00
15lu	Vacuum tungsten-filament lamps, 25- and 40-watt sizes, luminous flux (lumens), each.....	6.00
15lv	Gas-filled tungsten-filament lamps, 40-, 60- and 100-watt sizes, luminous flux (lumens), each.....	6.00
15lqx to 15lvx	If lamps to be supplied from stock must be standardized at customer's designated voltage, candlepower, lumens, or lumens per watt, an additional charge of 50% is made for each item, 15lq to 15lv, inclusive.	
15lz	For special tests not covered by the above schedule, fees will be charged dependent upon the nature of the test.	

