

ECC:MEJ
I-O

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON

Letter
Circular
LC 220

January 1, 1927

INCANDESCENT ELECTRIC LAMPS AS PHOTOMETRIC 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. In order that it may not be affected subsequently by any slight overvoltage, the lamp should be seasoned at a voltage somewhat higher than that at which it is to be used as a standard.

The 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 that have been seasoned and standardized, the respective fees being as given in Test Rec Schedule 155.

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.

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 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.

