Topic 023

Stage lighting fixtures

GENERAL LUMINAIRE TYPES

THE LUMINAIRE

A STAGE LIGHT is referred to as a 'fixture' an 'instrument' or a 'unit' in North America, as a 'light fitting' or a 'lantern' in Britain and as a 'luminaire' (the 'e' is silent), in other parts of the world and by the engineering and architectural communities All terms have one thing in common. They all refer to a complete lighting 'package' - consisting of a housing, lamp (bulb), socket, reflector, electrical cord, connector and sometimes a lens, mounting clamp and color frame.

BASIC TYPES

Luminaires designed for stage, television and film lighting applications fall into two (2) main categories; SPOTLIGHTS and FLOODLIGHTS. A third specialized category includes PROJECTORS and special lighting effects. Fixtures are typically designed to be mounted from overhead pipes, from vertical pipes or from floor stands. In this respect all fixtures incorporate a mounting yoke and usually a pipe ('C') clamp. The yoke and clamp allow the fixture to pan, tilt or rotate into any position and then securely lock in place. All types are fitted with color frame clips to accept a square metal (or cardboard) 'color frame'. The color frame clips often accept other accessories including, barn doors, top hats, donuts and color wheels.

Stage lighting fixtures range in wattage from about 300 watts to over 10,000 watts in size and capacity. Common fixtures used for stage, film and television have wattages of 300, 500, 575, 600, 750, 1000, 1200, 1500, 2000, 5000, and 10,000 watts. The wattage required depends on the amount of light needed at a specific distance and the particular characteristics of the fixture itself. Needless to say, the larger the wattage, usually the larger the fixture. In the display lighting field for example, miniature fixtures may range from 50 to 300 watts. Fixtures used for theatre lighting usually range from 500 to 2000 watts, and television and film lighting frequently employs fixtures of 1000 to 10,000 watts (or more).

LAMPS

Most modern stage lighting fixtures still use incandescent (or electric filament) lamps, in order to provide a completely 'dimmable' source. Specifically it is the tungsten halogen lamp that is used almost exclusively for stage lighting applications. This type of lamp actually has a 'self-cleaning' cycle whereby the tungsten that normally blackens the outer glass bulb is redeposited back onto the filament, resulting in a more consistent light output over the life of the lamp.

Stage lighting luminaires (and lamps) are available for either 120 volt, or 240 volt lamps operation from about 12 major manufacturers, worldwide. The incandescent lamp however is largely inefficient, using most of its energy to produce heat, not light. New more efficient lamp

sources are slowly being introduced to stage lighting, using discharge and other lamp technology, however inherent dimming and re-strike problems still exist with these sources.
HID and fluorescent lamps, although seldom used for theatre lighting applications, are now commonly being used for film and television lighting. These sources are much more efficient than the electric filament lamp and produce much higher 'lumen per watt' outputs. The use of HID and other ARC LAMPS for stage lighting however is slowly starting to develop. New automated luminaires of the future will use sophisticated new sources and will be capable of producing any color or pattern, upon demand (software based). Many of today's automated lighting fixtures do use arc lamp capable of excellent dimming through mechanical means. (Most fixtures are still quite noisy due to lamp cooling requirements).

SPOTLIGHT FIXTURES
Spotlight fixtures include the PLANO CONVEX, ELLIPSOIDAL REFLECTOR, FRESNEL, PAR LAMP, BEAM PROJECTOR and FOLLOWSPOT. These fixtures are used to provide a narrow and controlled beam of localized light, to the stage. All spotlight fixtures have one or more lenses and are generally available in beam spreads of approximately 5 to 70 degrees.
Designers use spotlight fixtures for AREA and WASH lighting applications, at distances of 15-150 ft. Designers will often provide a series of 'tight', circular pools of light, to each acting area, approximately, 8' to 20' wide (depending on the application). A single acting area will usually consists of 1 to 6 fixtures positioned as; front, back, side or down lights.

FLOODLIGHT FIXTURES
Floodlight fixtures include; SCOOPS, BOX FLOODS and STRIPLIGHTS. These fixtures provide a WIDE distribution of light over a broad area and are primarily used to light backdrops and scenery at close distances of from 3 to 25 feet. Almost all floodlight fixtures are lensless. The exceptions are flood PAR/R lamps that have either spread lenses or diffusion applied to the bulb. Floodlight fixtures generally have fixed beam spreads of 70-150 degrees.