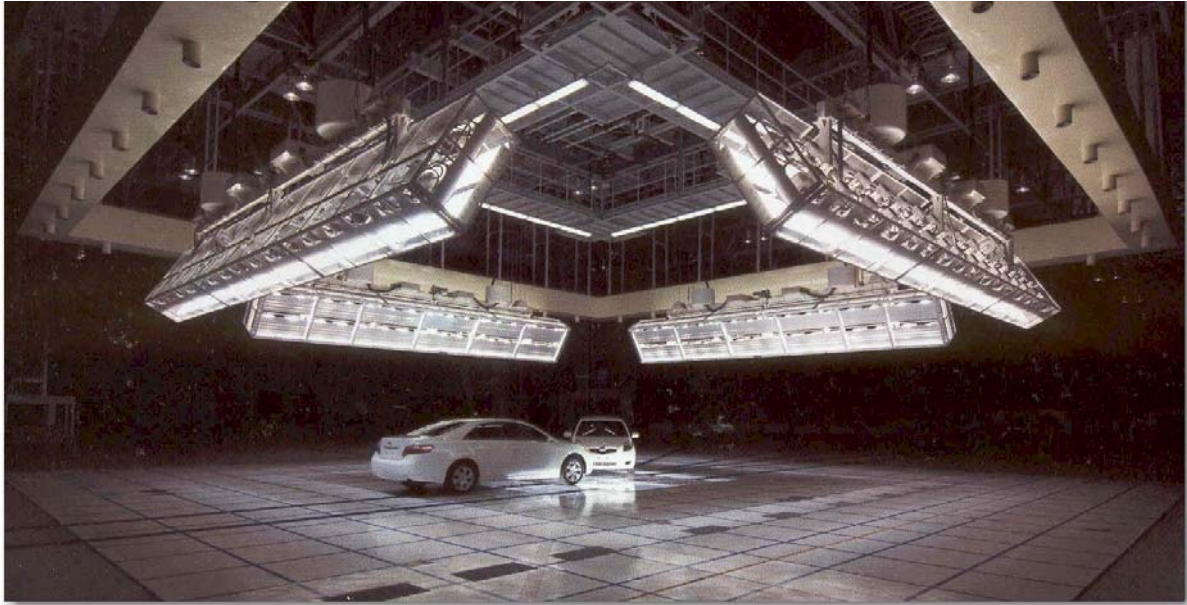


Pursuit of Safety



EYE/Iwasaki configurable lighting system, Toyota Safety Research Laboratory, Higashifuji Proving Ground



Programmable array elevation, tilt, and shutter systems provide uniform lighting profiles

When Toyota Motor Corporation developed requirements for their new testing facility, they sought the help of a company they could trust to provide a complete engineered lighting solution.

The pursuit of safety has stimulated the development of ever greater demands on crash testing facilities to provide extensive amounts of high quality data. Toyota's objective, with their new test center, was to not just satisfy requirements of the National Traffic and Motor Safety Act but rather to dramatically expand testing capabilities to create a "best-in-class" laboratory.

The Toyota Safety Research Laboratory is a vast facility with a total floor area of 44,000m². It can accommodate car-to-car crash tests at a top speed of 140km/h. It is also designed to allow indoor drop-tests and rollover tests, giving the laboratory a huge advantage over most safety facilities.

An exceptionally configurable lighting system was dictated in order to handle the diverse requirements for these tests.

Toyota contacted Iwasaki Electric / EYE Lighting to fulfill this requirement.

Toyota challenged Iwasaki to develop a lighting system that would:

1. Provide the best available photo environment for high-speed filming.
2. Provide efficient uniform lighting for all test configurations.
3. Provide a computer configurable system to ensure test repeatability.

High speed, high resolution digital video dictates the use of new technology lighting systems. The latest CMOS sensor technology digital cameras can deliver significantly higher resolutions and light sensitivity, along with increased color fidelity.

To achieve this, it is essential to replicate natural sunlight as closely as possible. The Iwasaki Electric / EYE Lighting short arc metal halide lighting system is designed specifically to satisfy this requirement. The definitive criteria are color temperature and CRI (color rendering index).

The new EYE / Iwasaki systems meet Class "A" CIE spectrum standards and provide a color temperature of 5500°K vs. approximately 3000°K for halogen systems.

As frame rates have increased, it is more important than ever to ensure stable lighting. Iwasaki / EYE proprietary square wave electronic inverters were developed to ensure flicker free light. Additionally, they are electronically quiet and will not interfere with data acquisition systems.

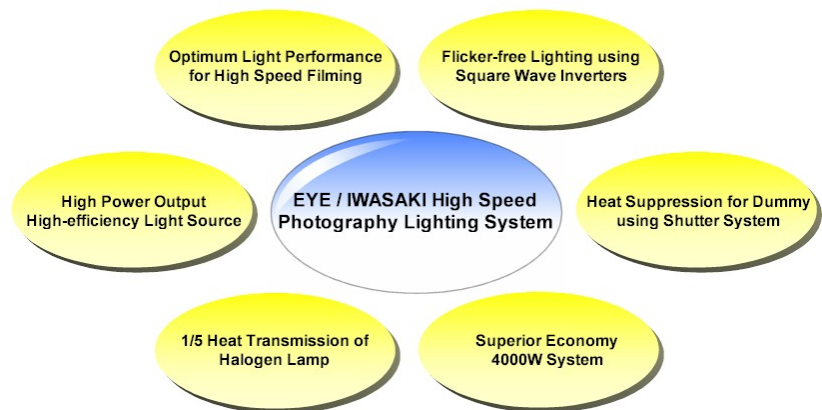
Toyota's requirement to handle many distinct types of testing demanded extreme system flexibility. Lighting uniformity is even more critical when attempting to illuminate especially large areas for filming. The lighting system had to be properly positioned to ensure uniform illumination for each different test setup.

High output metal halide systems are much more efficient than halogen systems, producing about five (5) times the lumens/Watt. Fewer fixtures are required to achieve a desired illuminance level simplifying and reducing the cost of system maintenance. The lower energy consumption and lower heat output protect against test dummy heat up and reduce the demand on facility HVAC. Because of the necessity for a single lighting system to handle the diverse test protocols, an auxiliary quick reaction shutter system was added to each lighting array.

When extended test / camera setup is required, this shutter system can fully block the light, protecting the crash test dummies from harmful heat up. When the shutter system is opened, the lighting in the test area is immediately at the correct level for filming with no concern over color shift, as may occur with some dimming systems.

The Iwasaki / EYE custom designed mechanical system provides three axis lighting array positioning to guarantee optimum illumination profiles for all test configurations. More importantly, the PC programmable system assures the lighting configuration can be saved and recalled, using logical test names, for perfect repeatability. The MS-Windows based lighting control system is also easily integrated into the test system control process to reduce potential operational errors.

Crash testing is time consuming and costly, yet, the need for more testing and for new kinds of testing will continue to increase. A properly integrated lighting system will significantly increase productivity while decreasing operational and maintenance costs. Iwasaki Electric / EYE Lighting is unique in its capability to design and manufacture application specific lamps, fixtures, electronics and control systems specific to the needs of high-speed crash test filming. The company's innovative designs are a culmination of years of global crash test application experience. In-house engineering, installation and service / maintenance personnel, ensure a trouble free project. This exclusive integrated lighting system engineering capability made Iwasaki the perfect partner for Toyota's pursuit of safety.



EYE / Iwasaki integrated lighting systems