

LIPA At A Glance

Laser Illuminated Projector Association

What We Are: A not-for-profit organization run by industry-leading companies that share a goal of speeding the adoption of laser-based projection technology in multiple venues, especially commercial theatres.

When formed: March 2011

Where based: San Jose, California

Why LIPA Was Formed: Though laser-based projection technology is new, different and safe, a multitude of multi-national regulatory and legislative organizations are influencing the commercialization of laser illuminated projection because of outdated and inequitably applied safety guidelines and restrictions. A unified advocacy effort, with competing companies speaking as one, will accelerate the process of changing or easing restrictions.

Mission Statement: LIPA will speed the adoption of laser illuminated projectors through cooperative industry activity.

Core Issue: A department of the U.S. Food and Drug Administration regulates the safe use of lasers and is enforcing the same guidelines on new, safe laser-based projectors for the cinema market that were developed in the 1970s for laser light rock shows, which apply entirely different technology. Using a laser-based projector system today requires operators to first obtain a "laser light show variance" and then adhere to a laundry list of unnecessary safety checks, training and paperwork. The FDA requirements are just one of many regulatory hurdles – at various government levels and in several countries - that will slow the introduction of laser-based systems.

How laser illumination works: An array of red, green and blue lasers replace white-hot xenon arc lamp bulbs as the illumination source coming from the optical block of a digital cinema projector.

Commercial status: Laser-based systems are not yet commercially available but are in advanced development and being actively demonstrated in commercial environments. Commercial systems are expected to be on the market by the end of 2013.

Key benefits: Laser illuminated projectors deliver a higher quality movie-going experience through brighter, sharper and richer visuals. The brightness improvement is particularly apparent with 3D movies, with lasers likely doubling the typical light output. Replacing 500-hour lifespan xenon arc lamp bulbs now used by exhibitors with 25,000-hour laser light sources will lower operating and maintenance costs, and provides a considerably greener solution through reduced energy consumption. Operating conditions for cinema staff will also be far safer by switching to cool lasers and decommissioning high-pressure, white-hot arc lamp systems that pose risks even in handling.

Key Activities: LIPA is in the process of gathering data that will confirm the safety of these systems and influence decision-making by regulatory institutions worldwide. Informal discussions have started with the FDA, through its Center for Devices and Radiological Health, to establish negotiating parameters and begin the process to change regulations or establish new ones. LIPA is also engaging with and educating non-FDA stakeholder groups, such as ANSI, OSHA, TC-76, and FAA.

Membership: 22 companies (June 2012), led by founding members Christie Digital, Barco, Eastman Kodak, IMAX, Laser Light Engines, NEC Display Solutions, Necsel/Ushio, and Sony.



Overview

Laser Illuminated Projector Association

The Laser Illuminated Projector Association is a member run body organized by industry leading companies that share a goal of speeding the adoption of this transformative technology.

Though the light from these new projection systems poses no more hazard to movie-goers than the lamp-based projectors that have been used in movie houses for decades, laser-based systems are burdened by a variety of onerous regulations that were developed years ago for other uses, such as ensuring audience safety at vector laser light planetarium rock shows and live concerts. That technology is entirely different, but the regulations are being enforced as though they are the same because the original light source is laser.

The US Food and Drug Administration's vector laser regulations are just one of many regulatory barriers in place in the US and internationally. LIPA was formed in March 2011 by many of the largest companies in the projection and movie technology businesses to develop and provide conclusive evidence of the safety and benefits of these systems, as well as work on common standards, methodologies and training guidelines. LIPA's aim is to effect change to a multitude of regulations – at all government levels – that as they stand will unreasonably impair the growth and transition away from the aging, costly and energy-consuming lamp technology now being used.

Based in San Jose, California, LIPA is the industry's powerful, unified voice. Though LIPA members are in many cases direct competitors, they share a common problem they agree is best addressed through collaboration and cooperation. The eventual transition and adoption of laser-illuminated systems, when commercial systems come on the market by the end of 2013, will result in lowered costs for exhibitors, greatly lowered energy consumption, and a dramatically enhanced viewing experience for movie-goers everywhere.

LIPA has volunteer member run committees focused on: Internal/External Communications and Outreach; Regulatory Technology Issues; Regulatory Business Issues; Membership/Recruitment; and Finance.

FlexTech Alliance, a 501(c)6 Corporation, manages all administrative and organizational activities of LIPA.

What LIPA is doing

Laser Illuminated Projector Association

Multi-national regulatory and legislative organizations are now influencing and effectively slowing the commercialization of laser-illuminated projection, mostly based on safety codes and requirements that are being applied simply because the technology has been associated with entirely different, aging and genuinely hazardous laser light show technology. By pure technical definition, the light coming out of these new cinema projectors is processed in such a way that it doesn't legally qualify as "laser light" as it leaves the projector.

Laser projection systems being developed or supported by LIPA members for cinema and other applications produce light that poses no more risk to movie-goers than the light output of conventional movie projectors, which have been used without incident or injury for the last 50 years.

If the industry continues to simply try to work within what is an outdated, and unreasonably applied regulatory environment, the transition to laser systems will be slowed. To effect change more rapidly, LIPA is:

1. Taking the appropriate steps to collect data that confirms the safety and influences regulatory institutions, worldwide;
2. Working with the U.S. Food and Drug Administration, through its Center for Devices and Radiological Health, to establish negotiating parameters and begin the process to change regulations or establish new ones;
3. Educating and engaging with non-FDA stakeholder groups, such as ANSI, OSHA, TC-76, and FAA.

Why Laser Illumination?

Laser Illuminated Projector Association

Motion picture exhibitors have been using the same lighting technology to drive big cinema screens for half a century. While everything else has changed in the digital cinema era, even the newest D-cinema projectors are still using short arc xenon-based lamps to light up the movies. Lasers have long been talked about as the replacement technology for this inefficient, high-maintenance bulb technology, and after years of advanced promotion and a lot of R&D, the technology is here and the benefits are obvious.

The new systems are not replacement bulbs. They're called light engines – controllable, plug and play light-sources that push red, green and blue laser-driven beams through projection systems. Different manufacturers use the light-sources in different ways to produce visuals, but the core results are the same:

A Higher Quality Experience For Movie-Goers

Laser illumination advances the premium viewing experience now being demanded by both consumers and the producers of big-budget, hyper-visual Hollywood blockbusters.

Brighter: Laser-based systems drive brighter images to screens, with estimates of projector brightness levels two to three times that of xenon lamps. Laser engines solve the low brightness problem that has plagued the 3D cinema business by simply driving more light. The 3D output from a laser projector is roughly twice as bright as the light produced by an arc lamp projector.

Better: Lasers introduce significant, demonstrated increases in uniform color intensity, contrast ratios, color gamut and color saturation. In lay terms, they'll produce dramatically richer, sharper and brighter visuals. Laser displays use one laser each for red, green and blue colors, and combine them to provide better definition and a wider color gamut (150%) than other displays, such as LCD (70-90%) and OLED (100%).

Lowered Operating and Maintenance Costs

Switching to solid state laser light sources should result in no lamp changes over the full five to ten year operating lives of cinema projectors. That compares with 6 kW xenon bulbs that have operating lives of roughly 500 hours. At five showings a day, and two hours per movie and trailers, a 1,000-hour bulb might last three months. The anticipated lamp cost savings to exhibitors is \$8,000-\$12,000 annually.

The savings are also dramatic for the energy costs of cooling the projection units, with lasers reducing direct and indirect power consumption by 30-50%. Using laser instead of white hot xenon lamps should save exhibitors as much as \$5,000 annually because of the removed need for cooling fans and dedicated air conditioning.

Safer Operating Conditions

Xenon bulbs put out intense UV rays, with the resulting hazard to exhibitor operators comparable to the blinding light of welding or carbon arcs. The bulbs also run hot, with operating temperatures as high as 1050° C (1920°F). Socket design and connecting wires need to be specially designed, and even the exhaust air from projection units can be hazardous. The special glass needed for the lamps is subjected to hours of high energy heat and they grow brittle with time. If the bulbs are not replaced on a schedule, they can explode and cause tens of thousands of dollars of projector damage.

By comparison, laser light sources run at low temperature and do not require a cooling fan or other HVAC counter-measures.

Making Sense of Standards

Laser Illuminated Projector Association

During the 1970s and 1980s, planetariums, theatres and concert stages hosted highly visual laser light shows that were developed to accompany the music of rock bands and pop bands. The US Food and Drug Administration put restrictions and regulations in place to minimize the safety risks at those events, because the high-powered laser technology being employed was capable, if improperly used, of causing permanent eye damage or severe skin burns for performers and people in the audience.

Some 35 years later, those same regulations are being applied to laser illuminated digital cinema projectors – even though the technology is entirely different and the only common thread is that in both cases, the light is originally generated with a laser device.

The actual “risks” of laser-based light sources are at the same low level as the projected light from current xenon lamp-based movie projectors, but cinema exhibitors planning a switch to laser would in the current regulatory environment have to deal with a laundry list of extra requirements, because exhibitors would be classified as “laser light show producers.”

To start using laser-based projectors, exhibitors would need:

- a special license for a Laser Light Show Variance prior to purchasing or operating a cinema projector;
- pre-show safety checks;
- an operator to watch the entire theater space during every showing;
- specialized laser safety training for all employees;
- ongoing paperwork for every showing.

The FDA's Center for Devices and Radiological Health (CDRH), which regulates Laser Light Shows, has acknowledged the differences and expressed a willingness to put new and different legal requirements in place. But it has also said new regulations must represent the contributions of the full digital cinema projection industry, speaking as one unified voice. That has been a key driver behind establishing LIPA.

But the FDA is just one just hurdle industry stakeholders need to clear to mainstream this technology. There is a long list of other potential barriers to the industry-wide transition from xenon systems.

The subjects include:

- Minimum Vertical Separation Distance (the clearance height between the projected light and seated movie-goers)
- ANSI/OSHA User Requirements
- Non-Cinema Full Variance Terms
- US state by state requirements
- Different requirements in China, India, Japan, Canada, Europe and elsewhere
- Variance Delays
- FAA outdoor approvals

For example, several US states have comprehensive laser safety programs for any equipment using Class 3B & 4 lasers, while others have registration fees for each laser.

Going Forward

Just accepting and learning to live within the current regulatory environment is not feasible. It will limit market penetration and potentially erode the overall cost/benefits of transitioning from lamps to lasers. LIPA is balancing a pair of strategic options in dealing with these regulatory barriers.

It's working through legislative channels to change laws, but that's a slow and very expensive process. So committees are also working with each separate entity that currently imposes requirements to find mutually agreeable solutions and conditions to relieve any unreasonable or unworkable issues. Reaching a consensus solution, as opposed to forcing new laws through the political and lobbying process, will likely provide for a better regulatory environment.

Technical Specifications

Laser Illuminated Projector Association

Fundamentals

- Laser light sources are plug-and-play illumination systems that provide laser-driven red, green and blue primary beams from an array in the projector optical block.
- Laser projector light is no longer considered coherent, and is non-collimated.
- Systems may use several high power or many low power lasers to generate the light source.
- RGB beams can be directly coupled into the projector or delivered through one or more optical fibers.

Laser Light Source vs. Xenon Arc Lamps

General Technical Differences - values vary between laser sources

Attribute	Unit of Measure	Laser Light Sources	Xenon Lamp
E to O Conversion		Stimulated emission; High spatial brightness	Gas discharge; short arc creates bright "spot"
Output pattern		Coherent; collimated to moderately divergent	Isotropic = all directions; Must be focused to spot
Spectral Bandwidth	nm	"Narrow" - 0.01-1	"Wide" - 60-80/color
Étendue (<i>spread of light</i>)	mm ² -sr	Very small - 0.001-1	High relative to laser 4-20
Lifetime	Hours to end of life	5,000-100,000 to 80% 25,000-50,000 hrs (target)	200-2000 hours to 50% 500-1000 hours (typical)
Efficiency	lm/wall plug watt	5-10	2-6

Cinema Transition Path

Laser Illuminated Projector Association

The motion picture exhibitor business is already well advanced in its transition from conventional film to digital cinema projection. More than half the global exhibition base will likely be converted to digital by the time laser illumination systems are commercially introduced in late 2013.

The massive capital investment required to shift to digital is not directly affected by laser illumination advancements, and the industry is developing product designs that will include retrofit options for existing D-cinema projections systems – reducing concerns about overall transition costs.

Retrofit engines can be included in the projector system box, or “off-board” as a separate component. For “in the box” laser light sources, the products will be model-specific, and restricted in size and production volumes. The units can be upgraded onsite instead of being taken off-line and shipped to a factory or depot. The light engine will readily couple into existing lamp-based projectors. The optical block (the lamp and reflector housing) will simply be swapped out. For light sources located outside the projector housing, component units will be universal, stackable and produced in higher production volumes.

New laser-based digital cinema projector designs will combine the benefits of both retrofit designs.

Future Projection Rooms

Laser light sources will introduce many benefits to exhibitors. Along with capital, maintenance and energy consumption savings, a laser-based system will allow for simplified theatre designs with IT closets, laser light source “farms” and “boothless” multiplex cinemas. It will be possible to drive projected light over fiber optic cabling from a separate, central room.

New laser technology also introduces scalable lighting power, with projector brightness “on demand” through stackable light sources that can drive a single projector. For example, extra lighting power can be easily switched on for 3D movies that demand extra brightness.

Future cinema projectors, using lasers, hold the multiple promises of being smaller, lighter, cheaper, cooler, and quieter. Lasers reduce optics and imaging chip costs, and solid state designs brought on by the dramatically reduced need for cooling and ventilation mean projectors that are now 13 sq. ft. and 250 pounds will be 2 sq. ft. and 50 pounds.

Members

Laser Illuminated Projector Association

LIPA operates under the following principles:

1. Use its critical mass to foster a positive and receptive business environment for laser based projectors;
2. Focus on professionally operated laser illuminated projectors that produce light greater than 5,000 lumens;
3. Be open to all participants that wish to contribute to the stated mission and subject to the governing board's approval;
4. Provide guidelines and promote adoption of laser-related standards, but not seek a voice in the standards-setting process;
5. Expect members at the Board and Participant level to dedicate staff resources and actively participate in LIPA activities;
6. Promote education and best practices throughout the value chain;
7. Not impede current product sales or current product shipments, focusing efforts on communicating the benefits of lasers and realistic product timelines.

Leader Level Members



Barco

An international company with headquarters in Belgium. You will find Barco where images are critical to professionals.



Christie Digital Systems Canada Inc

Christie, a global visual technologies company, offers diverse solutions for business, entertainment, and industry. With expertise in film projection since 1929 and professional projection systems since 1979, we've established a reputation as the world's single source manufacturer of a variety of display technologies and solutions for cinema, large audience environments, control rooms, business presentations, training facilities, 3D and virtual reality, simulation, education, media and government. As a market leader, Christie has installed over 100,000 projection solutions worldwide.



Dolby Laboratories, Inc

Dolby Laboratories is a recognized innovator in audio entertainment. Established by Ray Dolby, the company first developed noise reduction systems to improve recorded sound quality. Now, the name Dolby is synonymous with quality audio throughout the world. Dolby technologies can be found in cinemas, professional recording studios, video games, laser discs, DVDs, mobile media, digital broadcast TV, digital cable, and satellite systems.



IMAX

IMAX develops, manufactures, markets and services large format motion picture projection and audio systems.



Laser Light Engines Inc.

LLE develops, manufactures and markets high brightness, laser driven RGB illumination systems to projection OEMs and integrators worldwide.



NEC Display Solutions of America, Inc.

NEC Display Solutions designs, produces, and delivers leading-edge visual display technology for a wide variety of markets. We specialize in desktop and large-screen LCD displays, and a diverse line of projectors for customers who demand the most high-quality, reliable display solutions to meet their needs.



Necsel Intellectual Property, Inc.

Necsel is a designer and manufacturer of high power visible lasers and laser systems.



Phoebus Vision Opto-Elev Tech. Co., Ltd.

As the first Chinese company dedicated to laser display technology R&D and industrialization, Phoebus Vision has achieved many breakthroughs in this area and applied for over 140 patents, which holds 90% of all laser display related patents in China. Phoebus Vision's laser display technology has reached the world advances level, especially in the industrializing capacity.



Sony Corporation

Sony Electronics is the largest component of Sony Corporation of America, the U.S. holding company for Sony's U.S.-based electronics and entertainment businesses. SEL is a leading provider of audio/video electronics and information technology products for the consumer and professional markets. Operations include research and development, design, engineering, manufacturing, sales, marketing, distribution and customer service.



USHIO Inc.

USHIO was established in 1964 and has cultivated optical technologies to create a wide array of light sources, units, and systems.



Walt Disney Imagineering Research & Development, Inc

Walt Disney Imagineering is the unique, creative force behind Walt Disney Parks and Resorts that imagines, designs and builds all Disney theme parks, resorts, attractions, cruise ships, real estate developments, and regional entertainment venues worldwide. Imagineering's unique strength comes from the dynamic global team of creative and technical professionals, representing more than 140 different disciplines, building on the Disney legacy of storytelling to pioneer new forms of entertainment through technical innovation and creativity.

Participant Level Members



Display Solution Business Unit (Delta)

Delta has developed a wide range of digital projectors using DLP™ microdisplay technology. These projectors offer brightness ranging from entry-level 1500 lumens up to 5000 lumens, and weight factors varying from Pico Portable (2lbs) up to Large Venue (33lbs).



Mitsubishi Electric Corporation

Mitsubishi Electric is dedicated to home electronics, power plants, information and communications, factory automation, and semiconductor devices.



Schneider Kreuznach

The Schneider Group specializes in developing and producing high-performance photographic lenses, cinema projection lenses, as well as industrial optics and precision mechanics. The group comprises Jos. Schneider Optische Werke, founded in Bad Kreuznach in 1913, and its subsidiaries Pentacon (Dresden), ISK Optics GmbH (Göttingen), Schneider-Optics (New York, Los Angeles), Schneider Badno (Seoul), Schneider Asia Pacific (Hong Kong) and Schneider Optical Technologies (Shenzhen). The company's main brand is "Schneider-Kreuznach". It has around 660 employees worldwide, with 360 based in its German headquarters. For years now the group has been a world market leader in the area of high-performance lenses.



THX

From the big screen to your screen, THX ignites your passion for exciting entertainment experiences. Founded by George Lucas and recognized by audiences around the globe, THX is synonymous with the design and certification of world-class cinemas, premium audio systems, HDTVs, and blockbuster movies and games. Products featuring THX defy convention and define quality in their class, whether in the cinema, home or on the road.

Observer Level Members



Corning Specialty Materials

Corning Specialty Materials is a globally recognized leader in advanced optics and material solutions, with a diversified technology portfolio of products and processes that enable high-technology systems for customers worldwide. Our capabilities include sophisticated technologies in forming, coating, and finishing that deliver high-performance, versatile, and durable solutions to multiple markets.



JDSU

JDSU is one of the world's largest independent providers of optical thin film filters, thin film coatings, and components. We have a diverse portfolio, including visual, near infrared (IR), and IR filters, antireflection coatings, custom waveplates, polarization components, laser protection filters, wavelength selective filters, and more. JDSU's advanced optical filter technology enables Dolby 3D Digital Cinema.



Eastman Kodak Company

Eastman Kodak Entertainment Imaging business supports the motion picture industry with film, digital hardware, and services. Kodak has developed a prototype 3D laser projector for the Cinema Industry.



HARKNESS SCREENS

Harkness Screens

Harkness Screens is a specialist manufacturer of projection screens for a wide variety of applications such as cinema, simulators, pro AV, live theater, special events, convention centres, TV studios and theme parks. The company is headquartered in Ireland and has regional sales offices and facilities in the UK, USA, France, Canada, and China.



Philips Electronics

Philips is a world leader in solid state and conventional lighting technology, with global sales and manufacturing operations.



Projection Design

Projection Design is a manufacturer of digital projectors and systems components, headquartered in Fredrikstad, Norway.



RealD Inc.

RealD is a leading global visual technology licensing company and provider of the world's most widely used 3D projection technology for movie theaters. Our extensive intellectual property portfolio enables a premium 3D viewing experience in the cinema, on consumer electronics and elsewhere.



Texas Instruments

Texas Instruments' DLP Cinema offers lamp-free projection solutions with over 15 years of leadership in digital displays worldwide.

Management/Chairs

Laser Illuminated Projector Association

Governing Board

Chairman	Pete Ludé	Sony
Vice Chairman	Michael Biber	Dolby
Board Member	Peter Gerets	Barco
Board Member	Zhihua Gong	Phoebus Vision
Board Member	Michael Esch	Christie Digital
Board Member	Greg Niven	Necsel/Ushio
Board Member	Bill Beck	Laser Light Engines
Board Member	Richard McPherson	NEC Displays
Board Member	Steven Read	IMAX
Board Member	Dave Schnuelle	Dolby
Board Member	Scott Watson	Walt Disney Imagineering Research & Development, Inc
Board Advisor	Casey Stack	Laser Compliance Inc.

Committee Chairs

Communications	Rich Reames	Sony
Regulatory Technology Issues	Dave Schnuelle	Dolby
Regulatory Business Issues	Pete Lude	Sony
Membership and Recruitment	Bill Beck	Laser Light Engines
Finance	Greg Niven	Necsel/Ushio

LIPA Management

Managing Director	Michael Ciesinski
Co-managing Director	Heidi Hoffman
Project Coordinator	Monica Newman
Communications Manager	Denise Rael



How To Join

Laser Illuminated Projector Association

Any organization involved in digital cinema that wants to help realize the relaxation of regulations and the advancement of this new technology is encouraged to join the LIPA. Here's how:

1. Visit www.LIPAINfo.org
2. Download Membership Application, Participation Agreement, and Antitrust Guidelines from the website Membership page
3. Select membership level
4. Complete Membership Application and Participation Agreement
5. Return documents to Monica Newman at email: monica.newman@LIPAINfo.org, or fax: 1-408-577-1301



Media Contact

Laser Illuminated Projector Association

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