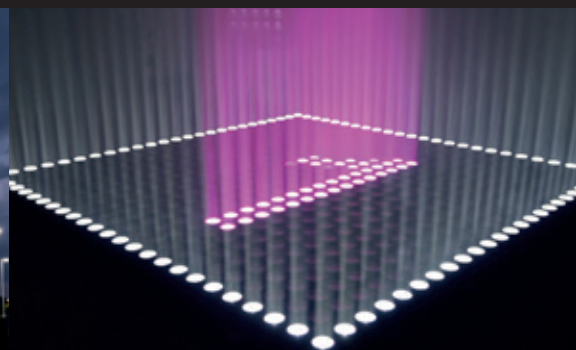# #Ayrton live

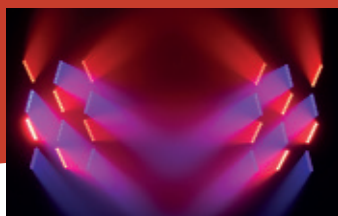*Photo credit: Monique Cussigh*

STROMAE *lit square by Paul Chappet...*

...with MagicPanel

NINE INCH NAILS *Tension Tamer*

OSRAM *Driven to Perfection*

INTELLIPIX-R *by SoundLightUp*

Editorial

Dear reader,

Since its successful introduction in 2013, the MagicPanel™-602 has confirmed its status as an industry game changer, continuing to make an impact throughout 2014.

No fewer than 220 units were specified by Bob Barnhart for the SuperBowl half-time show last February in the largest deployment to date; lighting designer LeRoy Bennett was the first to use the new fixtures on the Nine Inch Nails tour in 2013, followed by LD Jason Bullock with Wiz Khalifa and LD Dimitri Vassiliu for Mylène Farmer. Stage legends such as Beyoncé, Jay-Z, Rihanna, Eminem, Black Sabbath, Metallica, Stromae and TriggerFinger are amongst others who are now touring with MagicPanel™.

Following their introduction at Prolight+Sound in March 2014, our new Radical and NandoBeam™ series of products are starting their career on the same basis: no doubt you will hear about them very soon in these pages!

Ayrton's innovation never stops and, since the only limit to our products is your imagination, we expect to be surprised by some fantastic lighting designs involving our new creations in the near future!

You will discover all these new products in this issue. But feel free to contact us if you are looking for information regarding any of our products. We will always be happy to help you.

Yours faithfully,

Valère Huart.
International Sales Manager.

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Summary

AYRTON MAGICPANEL-602 WINS PRODUCT OF THE YEAR AWARD AT LDI

Released in April this year, the instant success of Ayrton's MagicPanel™-602 has been acknowledged at the LDI show in Las Vegas where it received the 2013 LDI Award for Best Debuting Product of the Year in the Projection category.

Ayrton MagicPanel™-602 is a moving head LED beam projector equipped with thirty-six 15W Osram RGBW emitters in a 6 x 6 array. Each emitter projects a tight, powerful 7.5° beam and can be controlled individually or used collectively to produce a coherent 12,000 lumen shaft of light. Under individual control, the emitters can be pixel mapped or driven by video via Art-Net or Kling-Net. To supplement the graphic possibilities this control provides, MagicPanel™-602 can be continuously rotated on both pan and tilt axes, which adds a dynamic dimensional effect to beams individually projected by mapped emitters. MagicPanel™ is obviously also controllable via DMX-512 and is RDM compatible.

The LDI Awards judges chose Ayrton MagicPanel™-602 as the winner because: "This array of 36 RGBW LEDs on a continuous moving yoke blurs the line between lighting and projection in what the judges feel is the future of combined light/fx/projection technology."

The dynamic LDI Awards ceremony, which took place on the show floor of the Las Vegas Convention Center on the Saturday, always generates a buzz as the industry gathers to see what's hot in current technology. Accepting the Award were Ayrton's Valère Huart and Yvan Péard, and Morpheus Lights' Mark Fetto and Paul Weller. Morpheus Lights is Ayrton's US distributor.

"It is an honour to receive this award that means a lot to us," says Ayrton's Export Manager, Valère Huart. "We have been delighted by how quickly MagicPanel™ has been adopted by the major lighting designers from the moment it was launched. To receive the acknowledgement of the American market with the award for Best Debuting Product of the Year is extremely exciting.

"The team at Morpheus has done a great job and we are delighted to see major American companies such as Upstaging, Inc. using MagicPanel™ units on major tours including those of Nine Inch Nails, Wiz Khalifa and Kelly Clarkson. We would like to thank the very talented lighting designers like Leroy Bennett, Jason Bullock, Bryan Barancik, Benoit Richard and others who have been pioneers in the first use of MagicPanel™-602 and shown the world the kind of things it can do. It looks like they, and we, are only going to get busier!"

WORLD TELEVISION PREMIERE FOR MAGICPANEL-R AT GERMANY'S DEIN SONG

The world's first television usage of the new Ayrton MagicPanel™-R came in the final live broadcast of *Dein Song* 2014, a song-writing competition for children run by Germany's ARD and ZDF-owned children's channel, KiKa.
The MagicPanel™-R fixtures were used to light the top act of the evening, the appearance of Sunrise Avenue, with the band presenting the new *Dein Song*, 'Little Bit Love'.
To support the visual effect, the MagicPanel™-R units were placed in groups of three directly behind the band from where they projected clearly defined, powerful beams to underline the strong stage presence of Sunrise Avenue.
Matthias Allhoff, Project Manager at *Dein Song*, was very impressed with the MagicPanel™-R units stating, "I especially like the versatility of effects and the rich beam they produce."

The lighting design and realization of *Dien Song* was the responsibility of mo2 design from Cologne.
Manfred Ollie Olma, founder and designer at mo2 design, said of the new Ayrton fixtures: "The MagicPanel™-R is an effective and smart LED design element. We find its effects work best in banks of twelve and more devices."
mo2 design is a planning office for lighting and media design, which is active in the areas TV / broadcast, special events, music and architecture, both at home and abroad.

www.castinfo.de

MAGICPANEL-R SHINES IN THE 'MOTHER OF ALL TALENT SHOWS'

Complete with a new stage design and a new lighting concept, Germany's *Linus Talentprobe* recently opened at Cologne Tanzbrunnen for its 43rd season. Attracting over 2 million viewers, the show is rightly considered to be the "Mother of All Talent Shows" and provides its audience with a series of exciting shows in one of the most beautiful open-air exhibition centres in Germany.

Technical support for these dazzling events is the responsibility of Müllermusic Event Technology of Cologne which has introduced the new Ayrton MagicPanel™-R into its show design for the first time. "It is exactly the right choice for the new stage design," says Tanzbrunnen's Till Stolpe.

One of the leading companies in Germany, Müllermusic Event Technology invested in the Ayrton MagicPanel™-R LED panel after seeing it presented for the first time at this year's Prolight+Sound in Frankfurt.

"We were looking for a new stage design and lighting concept when we discovered the MagicPanel™-R at the Pro Light+Sound. We are very enthusiastic about the many lighting design possibilities that MagicPanel's flexibility and brightness offers, and we put the new equipment into our inventory after only a few weeks of regular use," says Müllermusic project manager, Frigger Daniel.

Müllermusic (www.muellermusic.com) is an integrated technical service company handling all major areas of event technology. With qualified staff and high-quality equipment, this Cologne-based company offers a complete service for events of every type, from planning to implementation, and represents outstanding commitment and first-class reliability.

www.castinfo.de

JEFF RAVITZ RECEIVES PARNELLI LIGHTING DESIGNER OF THE YEAR AWARD

Jeff Ravitz, of Intensity Advisors, was honored with the Parnelli Lighting Designer Of The Year award on Saturday, November 23, 2013 at the annual Parnelli Awards ceremony held at the Mirage Hotel in Las Vegas as part of the LDI Convention. The accolade was for his design of the Bruce Springsteen & The E Street Band tour that performed internationally from 2012 through May of 2014.

Ravitz comments, "I share this award with our touring Lighting Director, Todd Ricci, who makes sure the lighting is executed flawlessly every night, John Hoffman, who operates our automated lighting, crew chief, Brad Brown and his entire team, Morpheus Lights, who very thoroughly support the design, and of course, George Travis, the show's tour director."

Ravitz, who received the Primetime Emmy for Bruce Springsteen and the E Street Band's HBO television special, Live From NYC, has two additional tours on the road this summer: Ringo Starr and His All-Starr Band, and the Styx/Foreigner show. Ravitz just completed a special live broadcast of Jimmy Buffett and his band performing in Fort Worth, Texas.

This year, Ravitz was also honored with a regional Emmy Award for his lighting design for the awards program, A Salute To Teachers.

Intensity Advisors is a lighting design firm based in North Hollywood, CA, which specializes in live entertainment, concerts, and events being shot for television, webcasts, film and 3D capture. The company also designs studio-based broadcasts and lighting system installations. For more information, please visit www.intensityadvisors.com.
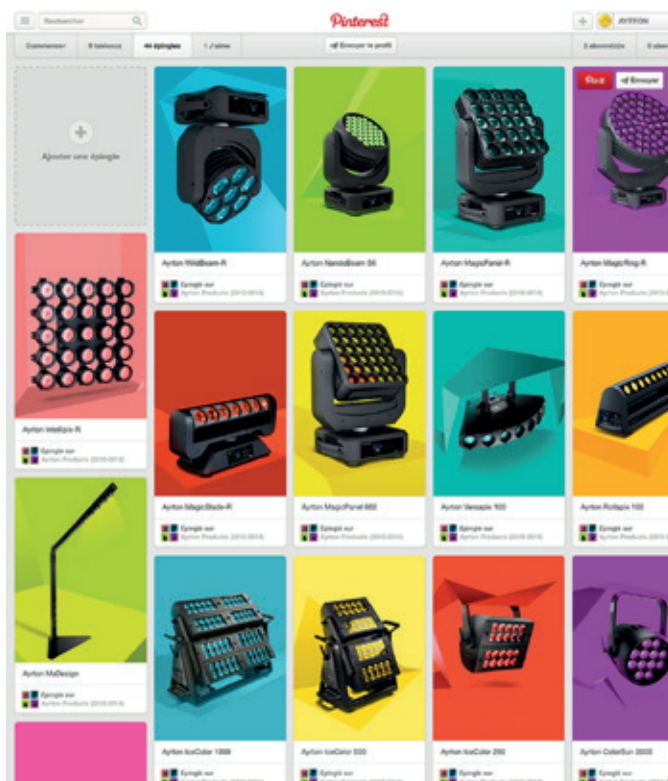
AYRTON ON THE SOCIAL NETWORK

FACEBOOK

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PROLIGHT+SOUND 2014
A visual revolution as Ayrton launches NandoBeam-S6 and the Radical Series

AYRTON astonished and delighted visitors to Prolight+Sound with the launch of several major new products: NandoBeam™-S6 and Ayrton's new range of lighting fixtures, the Radical Series (R Series).

NandoBeam™-S6, the Big Brother of the NandoBeam™-S3, received its official launch at the show. Twice as powerful as its little brother, NandoBeam™-S6 is a very compact, ultra-fast moving head. Equipped with 37 RGBW LED emitters, NandoBeam™-S6 shares the S3's same lightweight optical system and ultra fast 5:1 zoom.

Designed primarily for use on concert stages, events and in television production, NandoBeam™-S6 exhibits quick, dynamic movement along with Ayrton's fabulous colour palette and a powerful 8° to 40° beam spread.

Ayrton's new Radical Series has been developed to maximise the potential of each product, without compromise, to deliver the best performance possible.

Taking its name and inspiration from the world of high-performance vehicles, the Radical range exhibits a honed and streamlined appearance, a very narrow and intense beam, state-of-the-art thermal management and an incredible output which increases its scope to suit from small to large arenas and stadiums.

The major power under the bonnet comes from the unique new 67mm optics in association with ultra efficient RGBW multi-chip LED sources. This creates an intensive 4.5° beam with a massive output and a centre beam luminous intensity of over 100 candela per lumen. The result is a range of fixtures with long throw capacity but low power consumption, all encased in a light-weight, compact housing.

Aesthetically, Ayrton's Radical Series is minimalist in design, reducing the visual footprint of each luminaire: the gap between each optic has been reduced to a minimum and the integration of the rotation system driving the famed continuous PAN and TILT for MagicBlade™-R, MagicRing™-R and MagicPanel™-R has been improved to reduce the arm thickness.

Reliability is ensured by the stringent selection of LED sources which guarantee constant colour reproduction and a considerable lumen output. Longevity is enhanced by the improved thermal management system.

Speed is increased by the incorporation of a new generation of faster 32-bit circuit board which allows complete management of the large numbers of channels required for 'point-by-point' control and across hundreds of fixtures within large-scale installations. Powerful three-phase stepper motors ensure dynamic, fast and precise movements across the PAN/TILT axes.

Radical Series features:

- 67mm collimated optics
- 4.5° beam
- Increased centre beam intensity of 100 candela per lumen
- Continuous PAN and TILT rotation (for MagicBlade™-R, MagicRing™-R9 and MagicPanel™-R)
- Reduced visual footprint
- Fast 32-bit circuit board
- Improved thermal management
- Control via DMX-RDM, Art-Net, KlingNet, Lumen Radio DMX-RDM wireless

The Radical Series:

Tantalising hints of the new WildBeam™-R and IntelliPix™-R fixtures were disclosed in pre-show publicity, but the remainder of the R Series, MagicPanel™-R, MagicBlade™-R and the spectacular MagicRing™-R9, were launched as a complete surprise to the public at Prolight+Sound.

WILDBEAM™-R

WildBeam™-R is the smallest of the Radical range and the most efficient compact LED luminaire on the market. Highly compact, lightweight, super-fast and powerful, WildBeam's seven 15W LED RGBW sources and 67mm optics produce 3200 lumens with a central beam intensity of 380,000 candela from a mere 130W of power. The distinctive finish and arrangement of the optics and individual control of each source affords numerous original graphic effects.

"We like to keep a little back for the show to give our customers the excitement of discovering for themselves the latest innovative products Ayrton has created for them," - says Ayrton Export Manager, Valère Huart.

MAGICPANEL™-R

MagicPanel™-R is the Radical sibling of the famous MagicPanel™-602 which enjoys huge international success following its launch at Prolight + Sound 2013. Fitted with twenty-five 15W LED RGBW sources in a 5 x 5 matrix, MagicPanel™-R integrates the R-Series signature features with continuous double rotation on two axes. More clearly defined, cleanly separated beams from the 4.5° optics reinforce 3D volumetric effects and triple its range.

The original 'Stage Classic' MagicPanel™-602, by contrast, is formed of a 6 x 6 matrix using 45 mm optics that feature a 7.5° beam aperture. MagicPanel™-602 presents 40% more emitters on the same surface area which makes it perfect for video display as well as the dramatic feature/effects lighting seen on recent large scale tours and events.

MAGICBLADE™-R

MagicBlade™-R presents a totally new design that, just like MagicPanel™-602 and MagicPanel™-R, offers continual double rotation on the PAN/TILT axes. Its unique feature is the arrangement of its seven RGBW LED sources in-line which, paired with the intensive angle of the optics, creates light curtains with a genuine overall consistency.

MagicBlade™-R can be installed in any position, where its fast and accurate movement and individually-controlled LED sources can be used to create of a multitude of new effects.

Like MagicPanel™-R, MagicBlade™-R benefits from extensive connectivity and can be controlled by DMX-RDM, Art-Net™, KlingNet™ or via Lumen Radio™DMX-RDM wireless connection.

MAGICRING™-R9

MagicRing™-R9 is the most powerful and extravagant member of the Series and certainly the most Radical in terms of its dimensions. With an overall flux of 28,000 lumen and a centre beam intensity in excess of 3,200,000 candela, it is reserved for extreme uses.

MagicRing™-R9's sixty-one 15W RGBW LED sources are arranged in four rings and can be controlled in modes using from 18 to 256 channels. The power, beam concentration, point-by-point control and LED layout provide numerous new graphic options including multi-colour volumetric modeling of the beam. MagicRing™-R9 is simultaneously a thing of extravagance and beauty!

INTELLIPIX™-R

IntelliPix™-R is a semi-transparent IP65 5 x 5 matrix of RGBW LED sources and the only non-moving member of the Radical Series. Designed for the creation of suspended screens, poles and ceilings, IntelliPix™ can also be installed on the ground with a specific accessory as a 3D luminous floor.

IntelliPix™-R is the culmination of careful development of ultrasensitive, large-size optics which work with the Radical LED attributes to enable the creation of volumetric colour graphic effects. Its integrated power supply means IntelliPix™-R can be installed and cabled easily.

"The response to our new Radical Series and the NandoBeam™-S6 has been tremendous," says Huart.

"Every year we attract more and more visitors to our stand at Prolight+Sound and every year most of them become clients!"
"The industry recognizes AYRTON as a fast-growing company with a long history of innovations which delights in creating the tools that enable lighting designers to realise their design dreams."

"Our product ranges continue to innovate and to excite while our high-profile presence on some great tours and events like the Nine Inch Nails tour and Bruno Mars' appearance on the Super Bowl Halftime Show has raised Ayrton's profile and gained our fixtures a lot of credibility."
"Lighting designers see the potential and reliability of AYRTON products and the release of our new R Series has extended the possibilities still further."

PUSH THE ENVELOPE

MAGICPANEL-R AUTOMATED LUMINAIRE

MagicPanel™-R represents a declension pattern over the famous MagicPanel™-602. The integration of the features specific to the RADICAL range paired with continuous rotation on two axes and a 5 x 5 matrix once again allows us to push the boundaries of imagination. The 4.5° optics generates clearly defined beams with a clean separation between them. This reinforces the visual rendering of the volumetric effects.
Contact us at : contact@ayrton.eu

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FRENCH ROCK STAR BERNARD LAVILLIERS
Tours with the MagicPanel-602

True to his artistic principles, Laurent Chapot, visual designer for French rocker Bernard Lavilliers, decided to add the Ayrton MagicPanel™ to the four totems/windows on the stage at the singer's recent Paris Olympia concert.

For a number of years now, he has been using an eclectic choice of gear that is not only energy-efficient but also economically configured for optimum setup and teardown time and transport. Above all, the gear must be adaptable to a wide range of concert venues.

He has chosen low power consumption LED luminaires that, besides being lighter in weight and less costly to operate, are faster and more efficient especially when using primary colors. These savings allow him to indulge himself a bit in specifying the latest equipment for his lighting design concepts. As a result, when Laurent discovered that the MagicPanel™-602 was available with an optional mirror on the reverse side to create a big beam moving LED head plus moving mirror fixture, he naturally chose to equip his four totems with two of these combination fixtures per column.

"I wanted to use both LED matrices and moving mirrors," Chapot explains, "and with the MagicPanel™, with a mirror on the back, I have two machines in one, and even more! Better than a big wash light, this unit leaves me plenty of options and has magnificent colors, and I really love having it as part of my gear. The addition of a mirror is perfect for deflecting or reversing the beams."

The totems are like windows that add light to the sparse and lean stage decor preferred by Lavilliers. Wary of using video on stage, the singer finally bought into Chapot's design concept, which uses "Black Face" video panels hung invisibly in the dark alongside the Ayrton MagicPanel™ units. This rig is totally integrated into the stage lighting, showing a perfect sense of proportion and taste.

«The totems must be used with discretion, as I said, to comply with the artist's vision and also give the impression that you're in a concert hall with windows that reveal all the media content.

Between the two columns of screens that form each totem, we hang two Ayrton MagicPanel™ luminaires that act as big fat washes but can also react to the video and spot lights that house them. Thanks to the optional mirrors, we can create some original and highly animated effects by deflecting and splitting the projector beams."

"At first, we used the MagicPanel™ sparingly," Chapot goes on to say, "mostly as a scenic element and for the mirrors, using just a few internal macros, always aware of the artist's desire for simplicity. But then, we pushed the fixture to its full potential. It would have been a shame not to. The audience really enjoyed it. It is a super machine, even if the number of DMX channels is high in this utilization."

On stage, to complement the mix of high tech, magnificent video panels, and the always amazing Ayrton MagicPanel™-602, this ingenious visual designer and his collaborators, like decorator Philippe "the Squirrel" Ducouret, have added brilliant creative touches to the lighting.

While Laurent Chapot's lighting concepts spring from his ever-changing creative imagination, the realizations of his designs are precise to the millimeter, always graphically exact and appropriate.

He has a talent for getting the most out of his luminaires, and the proof is in what he does with MagicPanel™: creating incredible graphic columns of white light, and using infinite pan/tilt rotation with mirrors to generate multiple intense beams that completely fill the beautiful Paris Olympia concert hall with incredible light.

SUPER BOWL XLVIII HALF-TIME SHOW :
Ayrton dazzles at the Metlife Stadium, New Jersey

REUTERS/Brendan McDermid

Bruno Mars and the Red Hot Chilli Peppers were given a dazzling backdrop to their performances at the Super Bowl XLVIII Half Time show at the MetLife Stadium, New Jersey, on 2 February by Bob Barnhart's spectacular lighting. Barnhart, of Full Flood, LA, incorporated 220 Ayrton MagicPanel™-602 fixtures into his design to enhance the vibrancy and dynamism of the performances on stage.

Ayrton MagicPanel™-602, which was awarded the 2013 LDI Award for Best Debuting Product in the Projection category, is a moving head LED beam projector equipped with thirty-six 15W Osram RGBW emitters in a 6 x 6 array. Each emitter projects a tight, powerful 7.5° beam and can be controlled individually or used collectively to produce a collimated 14,000 lumen shaft of light. Under individual control, the emitters can be pixel mapped or driven by video via Art-Net or Kling-Net. To supplement the graphic possibilities this control provides, MagicPanel™-602 can be continuously rotated on both pan and tilt axes, which adds a dynamic dimensional effect to beams individually projected by mapped emitters. MagicPanel™ is obviously also controllable via DMX-512 and is RDM compatible.

The MagicPanel™ fixtures were arrayed in two massive, raked banks which flanked the performance area and served to extend the visual impact of the stage within the massive 82,500-seat stadium. The MagicPanel™ banks were arranged in two 'chevron' shapes which were mounted on custom-made risers that rose from 4" at the front of the stage to 11" at the back with each row staggered to sit 6" (15cm) higher than the one in front. At Mars' request, the show was to replicate an atmosphere as close to a live rock concert as possible, a factor which helped determine the high-octane style of Barnhart's design. The MagicPanel™ banks gave Barnhart a blank canvas which he could use to amaze the audience or integrate with the rest of the lighting - possibilities which he used to the full by employing MagicPanel™ as both a lighting fixture and a projector through which to run video content.

Throughout the show MagicPanel™ ran the gamut of appearances: a subtle of a sea of golden light, which echoed the gold jackets of Mars and his band, accompanied 'Treasure'

as the MagicPanel™ units turned slowly and independently with random sparkle patterns radiating from each independently controlled LED emitter. This gave way to the drama of red blocks of light blasting at full power into the sky with the arrival of the Red Hot Chili Peppers on stage for 'Give it Away'.

"I think at some point in the 13-minute show, everything the MagicPanel™ could do, they did!" says Barnhart. "We also ran video through them in addition to using them like lighting instruments." The video content, such as a simulated fire effect, which ran through the MagicPanel™ units, was simultaneously fed out to the LED videoscreen backdrop, forestage and even the hats of the audience for an all-encompassing look.

The MagicPanel™ units were controlled by a PRG V676 console operated by lighting director, Peter Radice. "I had control of the continuous pan and tilt, and could also over-ride the video feed with colour," says Radice, who did not use any of MagicPanel's on-board effects, but rather treated each panel as a « pixel » when writing colour chases. "Jason Rudolph fed the MagicPanel™ units video via a GrandMA2 and Hippotizer media servers. There were several times when I would over-ride the video to run colour chases through them, or use them to bump to accent the music."

Super Bowl XLVIII was the first Super Bowl to be played outdoors in cold weather, but despite their IP20 rating, the MagicPanel™ fixtures were able to cope with the harsh conditions. "The potential for severe weather was all the challenge we needed," says Barnhart. "We covered the MagicPanels when we were not working with them but they did seem to hold up ok." Barnhart chose to use Ayrton MagicPanel™-602 following a recommendation by lighting designer LeRoy Bennett who had used them to great effect on 2013's Nine Inch Nails tour and currently has them on tour with Bruno Mars.

Following his experience with the MagicPanel™ units on the Super Bowl half-time show, Barnhart agrees that he would choose them again: "The continuous 360° rotation and the intensity of the MagicPanel™ gives it a unique place in lighting right now," he says.

BELGIAN ROCKBAND TRIGGERFINGER
On tour with Ayrton MagicPanel-R

In 2012, Triggerfinger achieved a major international breakthrough with their unplugged glasses, cup and knife percussion riff cover of "I Follow Rivers" and earlier this year released a new album, "By Absence of the Sun".

The release is supported by their 2014 European tour, hitting both venues & festivals, and needing a brand new light show. As the band has a well-respected live reputation they asked their longtime LD, Michiel De Clerq, to create a new visual design for the tour.

Michiel states that, after a heavy search and comparison of different products, the Ayrton MagicPanel™-R really fulfilled his utmost creative dreams. This compact fixture combines a fabulous feature set in one unit: video effects, full colour strobe, wash light, endless 360° pan/tilt, RGBW colour pallet and, to top it, a beautiful native warm white with utterly subtle dimming curves — why look further…?

The gear is rented for the tour by VCL Productions, a Belgian rental company. Owner Vincent Clerinx states that, as he has followed the Ayrton product lines for a while, he was happy to invest in a new product with this spec sheet and believes in the long-term potential of the MagicPanelTM-R.

The design is based around 3 matrix grids each consisting of 9 fixtures, one grid per musician, giving each of them 225 x 15W / 4.5° RGBW LEDs to make them shine individually or glow together under a massive, dynamic wall of light. During pre-programming at the FACE studio, Michiel discovered how easy it was to create a setting that gave him the option to control speed, positions, colours and changes with his MA2 faders so he can follow the bands music on the fly, as they switch between quiet, intimate moments to emerged heavy riff and beats in a split second. He insisted on keeping live control without losing the versatile possibilities of the MagicPanel™-R. With the assistance of Geert Custers of FACE, the company which distributes Ayrton in Belgium, it took them 2 days to figure out the best way to achieve this, but the result is as magic as the name suggests.

Michiel De Clerq operates his MagicPanel units on a GrandMA console that is networked with 3 MA Nodes on stage. Short setup times on festivals called for a quick setup procedure, and a secure way to control all parameters. In order to achieve this, VCL Productions built a custom connection system that allows them to set up the 3 matrix units in no time.

From habit, Michiel De Clerq treats his lighting kit as a traditional parcan show, using only four colours throughout his entire show, but the extra options to play with the individual pixels, and the continuous rotation of both pan and tilt, gives him the extra flexibility he needs to make a diverse lighting show. Extremely secure timing makes it a very strong lightshow. After the first show, many video shoots of the Triggerfinger concert became popular on the media and got praiseworthy comments from Tokyo to Los Angeles, and of course it helps to have a stunning band too…thanks Ruben, Mr. Paul & Mario !

BLACK SABBATH ON TOUR
With MagicPanel-602

Ayrton's MagicPanel™-602 fixtures joined the big boys once again, touring Europe in late 2013 as part of a powerful lighting rig for legendary rock band and reputed 'creators' of heavy metal, Black Sabbath. Equally-legendary rock music journalist, Steve Moles, caught up with them at Sheffield Arena for Lighting & Sound International where he spoke to lighting designer, Michael Keller:

"The design is actually by Baz Halpin at Silent House," Keller begins, "but the cue structure and how we light each song is basically me. Baz is very generous in that respect - yes, he certainly provided some colour keys for specific songs and contributed comments throughout the programming, but I did all the programming and had a lot of freedom within that context."

The show's stage set defines the stage and lighting rig, in that three screen areas are framed by faux cave entrances, which create a clear uphill slant from stage right to left. This is mimicked by the lighting structure with the trusses following the slope across the stage. There is a lot of LED screen across backstage, enough to fill the full stage, though only around 70% is visible to the audience, peeking as it does through the 'cave' portals of the scenic backdrop. Keller bemoans the fact that the video 'is so bright', but neglects to mention how well he corrals the lighting gear to counter the three beady eyes of LED.

The three main elements to the fixture inventory add to the challenge of the super-bright LED screens. These are MAC Viper Pros, VL3500 Wash FX, and Clay Paky Sharpys, amongst which the Ayrton MagicPanel™ must hold its own, and does so admirably.

"The original design also had other fixtures for the Torms and some floor positions," said Keller, "but Neg Earth, who supply the system for Europe, gave me some Ayrton Magic Panels to replace the fixtures on the Torms: this was my request, I've wanted try these yoke-mounted LED light panels for some time. I've known Dave Ridgeway [Neg Earth] for a long time and he generously agreed to let me try them. I've been tempted by them because it's a new tool.

Six by six LED panels, you can continuously rotate them - not quite so useful in this design where we're playing a conventional house, but were this an in-the-round show that facility alone would be well worth it."

Keller demonstrated the effect; the panels are extremely bright and project a powerful but slightly diffuse beam. To watch them is akin to seeing a four-cell Molefay spinning endlessly. "Of course you can address each pixel, which means 144 channels for control, but that makes no sense in this show. However, used in their primitive mode (fewer DMX channels) they make for intense blobs of light, that suits the show."

While Keller didn't contemplate streaming video through them to create lighting effects, he did use facilities that are pre-programmed into the panels - like swirling colour changes sweeping across the face of each panel - and to great effect. "They're also pretty heavy so on a Torm, once you start rotating or panning, the hanging structure begins to oscillate, so you have to be cautious and time your moves. In the end I just wanted to play with a new fixture and this was a non-contentious environment in which to do so; in that respect, Neg Earth have been brilliant."

Keller uses a GrandMA2 Lite to operate the show: "We use ArtNet-to-DMX boxes on the truss; I've used the MA Net and don't really see any difference except you can run bigger systems." He paused and considered his own words: "Well, I guess now I'm thinking about those Magic Panels at 144 channels each, maybe MA Net makes more sense?"

Moles, who first saw Black Sabbath in 1970, concludes: "The lighting for this tour is positively 21st century compared to what was available in 1970… It looked great: Keller made Halpin's design zing with all the visual vigour the band lacked."

Sourced from Steve Moles' article published in Lighting & Sound International, February 2014.

NEW YEAR'S EVE PARTY
Ayrton MagicPanel-602 in Amsterdam

Ayrton's award-winning MagicPanel™-602 fixtures saw in New Year 2014 in brilliant style at the famous Awakenings EMD New Year's Eve party. Held in Amsterdam's Gashouder, an old gas storage plant renowned for its events, Awakenings has a well-earned reputation for its fabulous party nights.

Production and Set Designer, Jasper Schimmel, of Amsterdam-based Monumental Productions BV specified 25 Ayrton MagicPanel™-602 units for use as unmissable feature lighting at the pivotal central position behind the venue's all-important DJ desk.

The MagicPanel™ fixtures were rigged in a 5 x 5 matrix on a custom-built truss framework and used to stunning effect throughout the night.

"We made a real feature of the Ayrton MagicPanels," says Schimmel. "We mounted a video screen behind the MagicPanel™ matrix to create more depth and contrast. We also lit the units themselves in such a way as to focus on the fixtures so the audience could see these things were moving for real. Their movement became part of the visual entertainment."

The special effects created by Schimmel using the MagicPanel™ matrix produced a spectacular show which really highlighted the fixtures' versatility and dynamism. The bank of brilliant light was used alternately as audience blinders, to highlight the DJ and to add dramatic sweeps across the revellers. Full use of the individually controlled pixels and the continuous pan and tilt features were employed as Schimmel created abstract geometric and random patterns across the face of each panel, used banks of single pixels to send out pin-sharp shafts of light, and cranked up the power across the full panels to shoot powerful omni-directional beams out into the auditorium. Most crucially, Schimmel used the fixtures to show the numbers in the countdown to New Year 2014.

Schimmel and his show team employed many of MagicPanel's on-board effects throughout the night, but customised the majority of looks using a Pixel Perfect system controlled by a Green Hippo Hippotizer. "A lot of hours were spent in the preparation of what would we like to do with this bright fixture rack," says Schimmel. "EML crew chief, Martijn Roosen, created a network of nodes in pre-production and our 'LED Hippotizer' operator, Menno Velders, programmed the show and found the MagicPanel™ units easy to work with."

Schimmel chose the MagicPanel™ fixtures after he was introduced to them by his video provider, LEDlease. "When I saw it I recognized that MagicPanel™ was something new and exciting with the promise of a magically brilliant – and extremely bright – effect," he says. "They certainly did not disappoint! We were able to create some really spectacular effects for the party and were really happy to be able to surprise our visitors with something totally new. The whole crew loved working with something new and it is cool to get so many dedicated reactions to a fixture!"

The MagicPanel™ units were supplied by Ayrton Benelux distributor, Face, to Belgian-based Art of Confusion, and thence sub-rented to PRG/EML Productions for the party.

BRUNO MARS OPENS THE CHELSEA
At the Cosmopolitan Hotel in Las Vegas

The opening of The Chelsea, the latest performance space at The Cosmopolitan, Las Vegas, was marked at New Year with a performance by Bruno Mars, who returns throughout 2014 for eight more spectacular dates.

The sell-out shows take place on a show stage with set and lighting designed by Roy Bennett and Cory FitzGerald of Seven Design Works. Bennett specified no less than 108 Ayrton MagicPanel™-602 fixtures which were programmed by Jason Baeri and supplied by Video Equipment Rentals (VER).

Initially, only 80 Ayrton MagicPanel™ units were planned, which were rigged on three sets of truss, each of which were hung 12" apart and cascaded down to frame a triangular video screen backdrop; the whole was fronted by a video screen border. But the MagicPanel™ proved so successful that more were added for the subsequent shows: an additional downstage truss was added carrying yet more MagicPanel™ units and ground units put in to frame the stage, bringing the total to 108 MagicPanel™ fixtures in all.

"The MagicPanel™ units are so damn bright that although we originally intended to use them as effects lighting, we were able to bring them in as illumination for the band themselves," says Baeri. "At times we were able to create a band wash using only one pixel from each of the MagicPanels. We spent a lot of time holding them back - there's a lot of muscle behind those units on this show!"

Baeri chose not to use many of the in-built effects integral to MagicPanel™-602, preferring instead to customize his own looks on the panels' individually controllable pixels via a GrandMA 2 control desk. "The effects were close to what I wanted but needed some small tweaks, and creating my own effects was something I could do myself in two seconds on the desk.

"Once you get the hang of how to deal with MagicPanel™, you can do a lot with not a lot of effort. For example, with a conventional moving head, there is only one direction of light which moves as a solid beam. With MagicPanel™ there are thirty-six separate emitters with which to redefine the beam, and new effects such as a chase within a moving head unit.

"In this way, MagicPanel™ gives lighting design a layer of shape and texture which is new and unique and offers a third layer of 'look' which has not been possible before. Now a designer can play with the aerial look, the look on stage and the look of the pattern on the face of the MagicPanel™."

FitzGerald used the MagicPanel™ fixtures on most of Mars' numbers during the show, with 'Marry You' being the first to use all the pixels en masse at full intensity and colour. "If the audience hadn't noticed them before, they were certainly aware of them after this number," says Baeri. "The MagicPanels just punched!"

"I consider MagicPanel™ as a 'no frills' fixture in that it is very straight forward to use. For example, other manufacturers have attempted to make fixtures with a continuous pan and tilt, but Ayrton's MagicPanel™ is very simple. It is easy to set up, the layout of channels is clear and it's an easy fixture to programme."

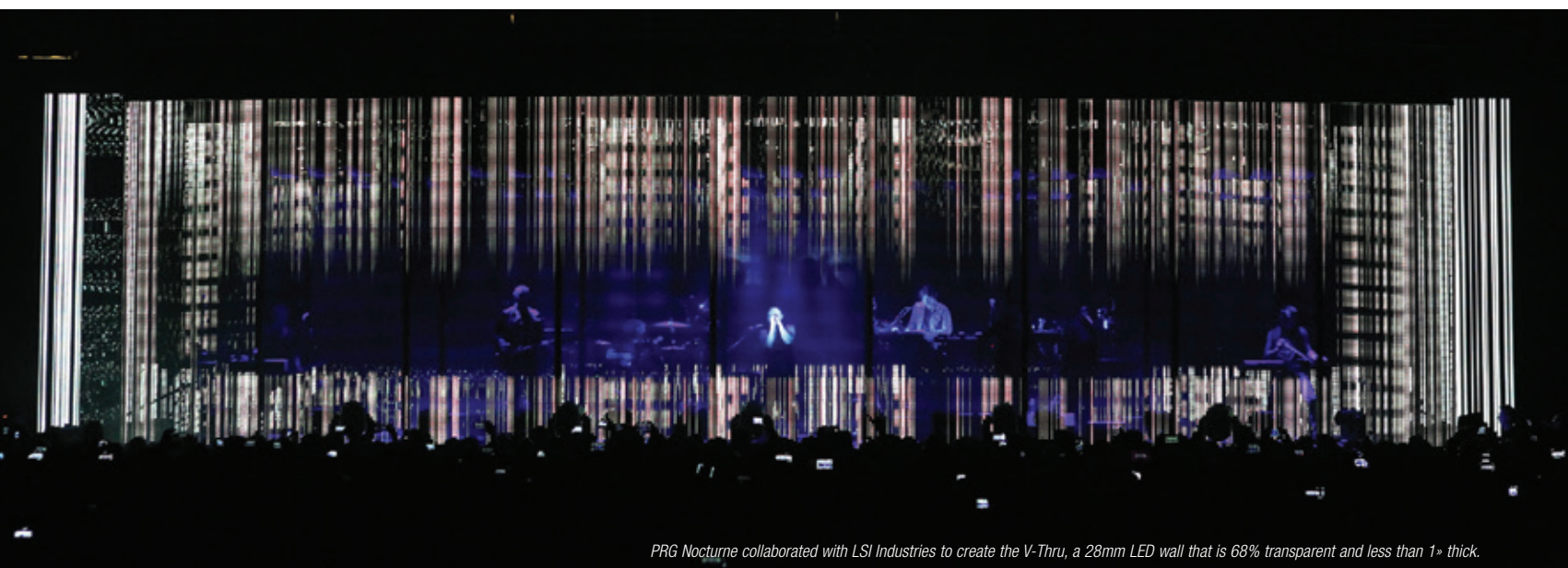FitzGerald and Bennett continue to include Ayrton MagicPanel™ fixtures in their designs for the likes of Demi Lovato' Neon Lights tour and Jay-Z and Beyoncé On The Run tour.

NINE INCH NAILS TENSION TAMER

Roy Bennett brings new technology to bear on Nine Inch Nails' latest tour

It's a visual experience, it's an emotional experience, and it's an art statement at times. It is high art, it is installation art, and a piece of performance art as well." So states production designer Roy Bennett, of Seven Design Works. The visual, emotional, and instinctual experience he is describing is the current Nine Inch Nails Tension Tour, which concluded its US run last month. The designer adds, "Trent Reznor's [lead singer of Nine Inch Nails] music is not like anyone's stuff, and anything I do with Trent and Rob [Sheridan, Reznor's art director] is not just a rock show—it's a combination of many things. For me, this is a production where I can push the design envelope and the artist understands it."

The beginning and end of the production design for Tension were two utterly different places, stylistically. "Originally, it was a very physically interactive and interesting concept. However, it was more than what could be dealt with on this tour at the time," Bennett says. So Reznor and Sheridan suggested a completely different direction. "They wanted to revisit the Lights In the Sky [Tour] production but do a more advanced version of it. And so that's what we ended up with," explains Bennett.

PRG Nocturne collaborated with LSI Industries to create the V-Thru, a 28mm LED wall that is 68% transparent and less than 1» thick.

The Lights In the Sky Tour, mounted in 2008, was based around three automated LED walls: one high-resolution upstage and lower-resolution, semi-transparent walls midstage and downstage. For the current tour, the upstage wall is a 16'-high-by-70'-wide V9 9mm wall, while the two transparent walls are 13' high x 54' wide. The transparent walls used for the last production "had so much structure to them and bulk on the backside, so the marching orders for this one were to make it the least amount of structure as possible and as transparent as possible," Bennett says.

Those marching orders went to PRG Nocturne, located in DeKalb, Illinois. Bob Brigham, co-president of PRG Nocturne, explains, "No existing screen would work for their needs, so Ron Proesel, my co-president, working in conjunction with LSI Industries—formerly Saco Technologies—created what we now refer to as V-Thru. From the date Trent approved moving forward, we designed and built V-Thru, from scratch to the first day of rehearsals, in 87 days." Typically, a product of this nature could indeed take years to bring to market, but, Brigham says, "We have a very special relationship with Roy and Trent. The words 'can't be done' and 'not possible' are never used. If a product doesn't exist and the investment makes sense, Ron will custom-build what they need."

The V-Thru is a 28mm LED wall that is 68% transparent and less than 1" thick. Brigham explains, "Trent and Roy needed both screens to be as transparent as possible but still maintain really good resolution, and 28mm was the perfect pixel pitch that allowed us to achieve

both goals." Currently, the V-Thru screens on the tour are the only ones in the world. The video content is controlled via two Green Hippo Hippotizer HD units. The video content, much of which is abstract, comes from Sheridan as well as from the Montreal-based firm Moment Factory.

Automation is also an integral part of the design. The walls move in and out, as do various elements of the lighting rig. The Los Angeles office of SGPS ShowRig provided the XLNT CyberHoists that enable the automated movement. "I've been using CyberHoists for quite a while; it's always been a reliable system for me over the years," Bennett says. The stage was supplied by All Access of Torrance, California and facilitated by Nine Inch Nails' production manager, Chris Fussell.

For me, this is a production where i can push the design envelope... - Bennett

Bennett's production design for the 2008 tour featured a ceiling; this time, it was comprised of 14 automated pods of Ayrton MagicPanel-602 units, which are distributed in the US by Morpheus Lights. Bennett says he originally planned to use pods of SGM X-5 white LED strobes. After learning more about the MagicPanel, he gave them the overhead position and the SGMs were moved elsewhere within the lighting rig. The MagicPanel "is a fascinating fixture," he says.

The upstage wall is a 16'-high-x-70'-wide V9 9mm wall with abstract video content from Sheridan and Moment Factory.

"John Huddleston at Upstaging [the show's lighting vendor] had some in the shop. He called me and said, 'They're super-bright and they function great.' I haven't found anything I don't like about them yet. They're bright, they're seemingly quite reliable, and they have continuous 360° pan and tilt. It's an extremely flexible light." The MagicPanel also has another advantage as a luminaire, he notes: "You can pixel-map and get one pixel lit up and it looks like a small moving light, but it's also a 1'-square panel of LEDs that sends out a square beam of light." Each pod consists of nine MagicPanel units, with a total of 126 on the production.

The MagicPanel is a moving head LED beam projector that configures thirty-six 15W Osram RGBW emitters in a six-by-six array. Each emitter projects a 7.5° beam, which can be controlled individually or as a group to produce a 15,000-lumen shaft of light. They provided Bennett with a dual solution in terms of lighting and video. "The MagicPanel units gave me a lot more flexibility to do what I planned on in my original design, which had video elements in the air at varying heights," he says.

Bennett's media programmer, Loren Barton, and operator, Morgan Brown, managed the video content driven through the MagicPanels. Barton explains, "We had two Hippotizer HippoCritter machines that we used to run a pixel map that gave us the option to drive the MagicPanel pods with video. [The HippoCritter is a small rack-mount media server that can be used on projects requiring four layers or less.] The pixel map only sent data to the Art-Net addresses of the RGB functions of each MagicPanel pixel, enabling us to merge the color data within the [MA Lighting] grandMA2 console and switch between conventional and video control of the pixels while maintaining control over the rest of the fixture functions, such as the white channel and pan/tilt. This gave us a much more dynamic effect and tie-in with the content being run on the main LED screens."

Programming was complex. "The MagicPanel units use a large number of addresses, and driving that many universes over Art-Net in broadcast mode from one pixel map in the Hippotizer gave us some steppy results when running initial video tests," Barton says. "Since the master grandMA2 is the device doing the Art-Net merge, we didn't have the option to multicast the data and keep a fully functional backup console. We ended up splitting the rig into three different pixel maps in the Hippotizer to achieve smooth video playback."

The rig also includes upstage columns comprised of the previously mentioned SGM X-5 white LED strobes, Martin Professional MAC Auras, and Clay Paky Sharpys, which are revealed when the upstage screen is flown. There are also two automated side trusses that run up and downstage. "The side trusses are all [Clay Paky] Sharpys; there are also [Philips Vari*Lite] VL3500s on the side and on the floor and some Vari*Lite VL3015 Spots on the downstage edge of the stage," Bennett says. The show has no front-of-house spotlights. "If there's front light, it's off the floor, its downstage, or it's from the sides. There have never been any spots on a Nine Inch Nails production," he says.

*The show's side trusses are filled with Clay Paky Sharpys, with Philips Vari*Lite VL3500s on the side and on the floor*

Programming was "cue-intensive, as always," Bennett says. His lighting programmer was Jason Baeri, who also worked with the band on this summer's festival tour. The production uses two full-size grandMAs as well as a significant quantity of MA Lighting Network Processing Units. "There are 40 universes just for the MagicPanel units," Bennett says.

As a band, Nine Inch Nails has a reputation for having drama within its camp; this tour was no exception. "Trent had added three new musicians into the band pretty much last minute in the last two weeks of rehearsals. That's not a problem. He was making new arrangements of some songs and trying to figure out the running order because of the new musicians and how it was going to work." Reznor's tinkering with the set list, structure, and transitions continued until the last moment.

"Within the last three hours of rehearsals before loading out of LA, he came out with a new set list," Bennett explains. Because the set list changed drastically, the transitions had to be changed; in fact, the entire show had to be changed. Bennett says, "It was completely different, and once you've done that, if you start swapping songs around when you've already programmed some things, the dynamics and choreography of how everything works, and it throws everything off. So we had to do that in Minneapolis overnight before the first show. We got most of it done, but I had to leave at that point because of other obligations."

If there's front light, it's off the floor, it's downstage, or it's from the sides. There have never been any spots on a Nine Inch Nails production. - Bennett

With 95% of the show completed, Bennett needed someone else to come in for the last 5%. That someone was Paul "Arlo" Guthrie, who worked with Bennett and the band over the summer during the band's festival tour. Bennett says, "Because I was not there anymore, Trent knew Arlo was the last person who was there who knew what I was thinking and could fix the things that needed to be fixed." Guthrie was out with the tour for about a week as an operator; the show is now in the hands of Brian Jenkins.

Nine Inch Nails' Tension Tour ended in North America in November; it continues in Australia and New Zealand in March.

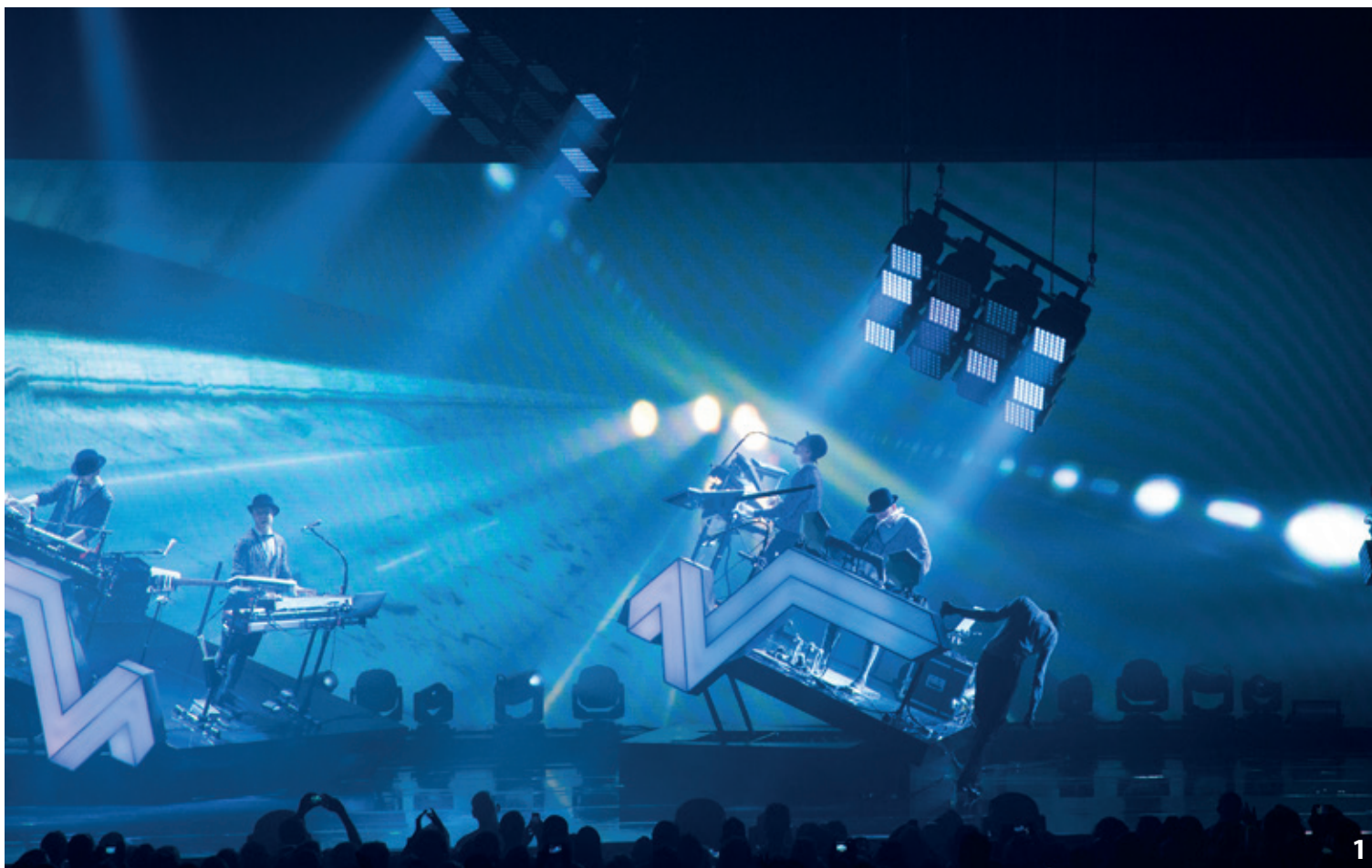*The 14 automated pods of Ayrton MagicPanel-602 units float above the band*

STROMAE LIT UP WITH SQUARES
by Paul Chappet using MagicPanel-602
At the Paris Zenith - La Villette

By associating with the biggest French-language album seller of the year for his sold-out tour, Paul Chappet, the lighting designer, left his favourite stomping ground, the clubs, to accompany the bouncy Belgian on a major world tour with customised lighting design.
And as both the Pauls (a beautiful name also borne by Stromae) have known each other since the artist's first tour, the lighting of which was done by the young lighting designer, they share the Paris Zenith stage with full confidence and complicity, one filling it with his incredible presence and the other dressing it up with beautiful floodlights in their element, appropriate for the show, completely new and electric.

It is a few hours before the dimming of the lights, and we met Paul Chappet and his team backstage in a very warm and committed atmosphere.
It was the opportunity to learn a little more about the lighting of the «Racine Carrée» album and a remarkable artist if there ever was one.

From the Trianon to the Zenith, a continuous adventure.

By already having designed the lighting for the previous tour that would clearly showcase Stromae to the general public and having accompanied him earlier on stages of clubs all over the country, Paul Chappet has developed a close relationship with the artist, his teams and his production.
It was therefore only natural for him to put his mark on the lighting

2

Paul Chappet
Lighting designer

It was during his adolescent days that Chappet Paul began organising concerts within an association. He was especially attracted to the world of lighting.
Thus, after obtaining his baccalaureate, he took training in lighting techniques to quickly secure an internship at the Cooperative de Mai, a cult concert hall in France.
There he worked as a lighting technician for two years and met the French lighting designer Pierre Pasquet aka Pedro and became his assistant. He thus kick-started his first club tour with Diams, the successful rapper.
He learned a lot by alternately being followspot operator and assistant, and really understood live lighting techniques.
It was also during this tour that he met with Auguri Production, who subsequently offered him a few replacements, including lighting designer for Keny Arkana, or for Thomas Dutronc, Amel Bent and Oxmo Puccino.
Finally, he was offered the lighting design job for the first Stromae tour, which resulted in a partnership that has since endured.

design of a new club tour launched last year, which took the duo to the Trianon, among others, and is now performing a more important part in the Zenith, at French festivals, as also at European ones as well as in the United States.
Similarly, it was unimaginable for the lighting designer not to use the lighting provider who has been his constant companion since his beginnings in clubs, Régie Lumière, to fit-out the largest stages. Trust, loyalty and work, these are values common to the designer, to his artist and his technical service providers, which result in a creation designed with a free hand.

SLU: Paul, have you had carte blanche to design the lighting for this show?
Paul Chappet: "I would rather speak of constant collaboration. Stromae is an artist who knows what he wants, but with whom I can communicate very easily and intuitively because we know

each other very well by now. I have in fact accompanied him on two tours, which helps in understanding each other!
Therefore, I would not use the word «carte blanche», but rather the freedom of choice and suggestions."

SLU: Therefore the «common» idea was based on what?
Paul Chappet: "The key feature was a stage uncluttered and free of any obstacles or floodlights. We have almost no trusses and very little floor space. We wanted a large stage with minimum items above, on the side and outside. And thanks to Stromae it is far from being empty! We were opposed to a «big production», this is not at all pejorative, but this was not the intention here, we did not want to exaggerate."
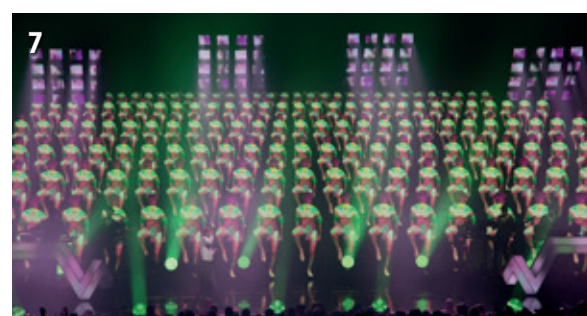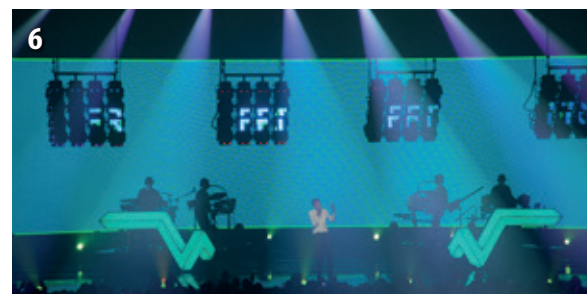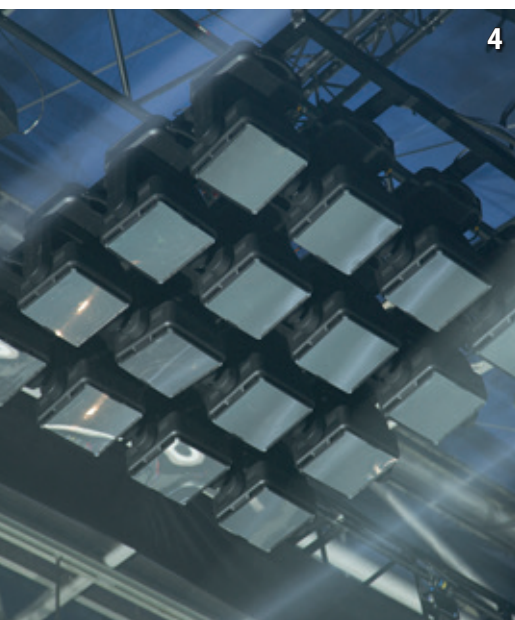
SLU: However there is a large video screen upstage.
Paul Chappet: "Yes, and we have chosen an invisible black

1. A scene that fully justifies the use of risers and motors to literally turn the Zenith Paris stage inside out, it is graphically very effective and really clever.

2. The 4 moving matrices of MagicPanel™-602

3. A fine exemple of Paul's work between the use of washes and colours, and the actual contribution of a fully moving rig enabling positions of MagicPanel™-602 matrices that transform the Paris Zenith stage at every new scene

4. MagicPanels were fitted with a mirror film on their inner side.

5. Paul Chappet wanted to fit the Ayrton MagicPanel™-602 moving heads with a mirror face to reflect beams. .

6. A beautiful colourful atmosphere with MagicPanel™-602 mapping, and a video screen in monochrome.

7. Stromae did not invite all his dancers in person on stage. No problem, the LED video display and time-coded media is here to fix it!

screen just to be in sync with this desired simplicity. We also have risers on the stage and totems on the sides with another key item of the concept: everything on stage can be controlled. Everything can and will move during the show, in accordance with the scenes, the square roots and decorative elements, as well. Thus, depending on what we want, we can have an almost empty and uncluttered stage with the curtain in front of the stage or even in front of the screen, or on the contrary the presence of the Magic-Panel™-602 pratos and matrices (also controlled)."

SLU: This was also Stromae's choice?
"He likes to challenge himself, such as, for example, starting the show with an empty stage, or dressing up all the technicians and musicians in costumes. With risers that move, and silhouettes, we searched in many directions.

To get a sober but rich scenography, we are not separating important elements, like the video, the tulles for rear projection, the controls and the beautiful floodlights."

Paul's comfortable «little kit».

And in addition to the 64 Ayrton MagicPanel™-602 organised in matrices of 16 elements, it is not at all surprising to come across beautiful innovations in the kit.
Having toured the clubs with a small but already effective list including the Ayrton MagicPanel™-602, Paul Chappet's lighting team is fussing over a kit, a small one at the Zenith (… in the words of the designer!), containing some 160 floodlights with LEDs or lamps, each one selected for its specific qualities.

Lighting Crew

Lighting Designer: **Paul Chappet**

Lighting Tech chief:
Boussad Brahimi

Lighting Tech followspot :
Clément Laurent

Lighting Tech moving head:
Michel Malinge

GrandMA 2 Programmer:
Cédric Babin

Lighting Contractor:
Régie Lumière

Video Crew

Catalyst manager:
Vincent Leroy

LED screen manager:
Anthony Toraldo

Video tech: **Matthieu Demetz**

Video Contractor: **Sky Night**

LED setting provider:
All Access Design

Rigging Crew

C-Rigging Manager:
Nicolas Meyer

Rigging tech: **Vincent Lorentz**

Truss tech: **Thibault Bastian &
Jacques Pfleger**

Machinery &
scenery Crew:

Tech: **Régis Guillemot,
Benoit Pithon**

SLU: Tell us about your choice of floodlights, there are a lot of the latest LEDs on the stage such as the Ayrton MagicPanel™?
Paul Chappet: "Although the stage is as uncluttered as possible, we nevertheless have a front truss and rear trusses, and washes on the floor in the front and rear as well.

The Ayrton MagicPanels are organised in matrices of 16 floodlights, we have 4 of them, controllable, which form an integral part of the show. They are moreover covered with a mirror film on their rear side to give the reflection effects of beams.

I've also chosen them for their square design, which went well with the album's name and visual and the atmosphere of the concert, based around square roots.

(Roots also present as part of the stage setting. Also lit up with the integrated LED panels, they reflect the media being played on the video screen and totems).

I especially wanted a big wash above, while making use of the mapping and the video in response to the one broadcast on the invisible giant screen. Since I saw the video on the Ayrton website, I couldn't wait to try them!

And I am very happy! For example, when they pick up the media of the video screen or when they dish out powerful and mobile washes. On the other hand, we do not use infinite rotation that much, which can quickly turn into a «beacon»."

Video as the dressing.

SLU: How did you integrate the video into your light design?
Paul: "I think that we should not fear the video and all those sources. I do not succumb to this feeling.

I measure, I constantly monitor the levels, especially from the

8. *A pink monochrome where focus is on the LEDs with beautiful Ayrton MagicPanel™-602 washes in the atmosphere coupled with LED elements of the square roots that become a little more than just light decorations.*

9. *A nice presence of LEDs on this scene, with Ayrton MagicPanels™-602 assembled as matrices suspended in the air and changing, quite magically with the help of motors!*

10. *You have clearly reproduced a wash shower?*

11

Dmx Magic Panel
1 @ 4 + 19 @ 22

NPU 1
192.168.0.101 / 255.255.255.0

Dmx Magic Panel
7 @ 10 + 13 @ 16

NPU 2
192.168.0.102 / 255.255.255.0

Dmx Magic Panel
5+6+11+12+
17+18+23+24

NPU 3
192.168.0.103 / 255.255.255.0

Dmx Autos/Trad
25 à 32

NPU 4
192.168.0.104 / 255.255.255.0

NPU Spare
192.168.0.105 / 255.255.255.0

Gigaswitch Truss Spare Regie/Blocs

Gigacore 14R Blocs
192.168.1.2 / 255.255.255.0

VLan 0 : ISL (13+14)
Vlan 1: Manage (12)
Vlan 2 : MA Net (1à6)
Vlan 3 : Art Net (7à11)

Gigacore 14R Regie
192.168.1.1 / 255.255.255.0

Catalyst Mapper
2.0.0.21 / 255.0.0.0

Catalyst Video
2.0.0.22 / 255.0.0.0

GigaSwitch Catalyst

GigaSwitch Racines
2.0.30.XXX / 255.0.0.0

GigaSwitch Totems
2.0.30.XXX / 255.0.0.0

Node Spare
2.0.0.11 / 2.0.0.12
255.0.0.0

Console 1
IP MA-Net : 192.168.0.11 / 255.255.255.0
IP Art Net : 2.168.0.11 / 255.0.0.0

Console 2
IP MA-Net : 192.168.0.12 / 255.255.255.0
IP Art Net : 2.168.0.12 / 255.0.0.0

━━ RJ 45 MA NET   ━━ RJ 45 ARTNET   ━━ DMX   ━━ FIBRE OPTIQUE

11. Lighting and video networks

However, good part of the video is managed in time code with kick-off, the rest is controlled via the console."

SLU: You're behind the console?

Paul: "Yes, I definitely cannot do without live reproduction of the show and rhythm. This year we have two grandMA2 MA Lighting in the system, and we have encoded the show with Cedric, whom I did not know, and we immediately got along well. We share the scenes but without preference of machines or anything else. We have a large network of data with many DMX universes (about thirty) and the optical fibre between the production and the blocks."

And it is precisely when he is behind the console that the «comfort» that the young designer can feel on this tour, is perceived. A word choice entirely relative for this first really big design that he is again developing with Stromae's lights, or for his lighting team that mounts and dismantles a not-so-modest kit every night for 3 hours, since it includes a wide variety of sources, floodlights as well as video and decorative features.

No, when Paul Chappet speaks of «comfort», it evokes a design with which he is comfortable, the floodlights that he wanted and selected freely thanks to a relationship of trust with Auguri, the production company, Stromae, the artist, and also Régie lumière, service provider and committed partner on the journey, who did not hesitate to buy the pretty sources of the designer's dreams.

The visual result is obviously enjoyable!

Firstly, thanks to Stromae, an incredible artist with a rarely seen stage presence, and then a Zenith stage that became disproportionately large with a stage devoid of any technical obstacles and constantly in motion.

Not a single minute is boring, everything moves, the risers light up, appear and disappear, the tulles fall or rise, playing with silhouettes with a video screen fully used as a light source, the lively Belgian running everywhere, his technicians even more so and the MagicPanel™-602 rise above the stage majestically!

It must be said that these 4 matrices with 16 moving heads do not go unnoticed, especially since they are motorised and take on highly surprising and frankly beautiful positions, such as during a scene in which they can be found at 45 degrees above the square roots that are also suspended, while sweeping the room with heavy batons of blue light. Or another one where they illuminate themselves this time forming fixed luminous masses: light ceiling never seen before. Sides with mirrors are a nice bonus, with which Paul does not go overboard.

It is graphic, but always appropriate, sometimes (very) electro, we are also there to dance! And finally, contrary to expectations, scenes without any video, in purified light, will be those that thrilled us the least, despite some good ideas, such as the use of gobos, less original, but still as powerful and remarkable. ■

upstage screen, so that the video playbacks from the totems and roots go hand-in-hand and that light is present on stage. All these LED elements are also floodlights after all!

It is primarily about dressing, the important thing is not to attract all the attention but rather to support the artistic intention on stage. For this, the 6-mm pitch of the invisible upstage screen is ideal."

SLU: The media that are broadcast on this screen are very real, how were they selected?

Paul: "They were mostly all ready and we added some textures and flat tints. We have three Catalysts to manage the media and sources, one for pure video, one for mapping (on MagicPanel™-602 in particular) and one as a backup.

FAST & FURIOUS

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Driven to perfection

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The exceptional 15W OSRAM OSTAR Stage RGBW is one of today's most widely used multi-chip LED emitters. OSRAM has always closely collaborated with its innovative and responsive customers to identify their needs and develop great solutions. With feedback from preferred customers like Ayrton, OSRAM optimized the Ostar SMT in the current four color form. (Ayrton was one of the first to bring an OSTAR Stage based fixture to market, in the Wildsun™-500S, a powerful wash light. This was followed by a whole family of beam-projector luminaires, like the award winning MagicPanel™-602.) OSRAMs customer policy has paid off: since the OSTAR Stage was launched two years ago, the world's biggest manufacturers of moving luminaires have switched over to this SMT LED component.

How did the OSRAM OSTAR Stage come into being and what makes this LED different from the competition?
We decided to ask the German manufacturer's technology and marketing team. They were happy to answer our questions.
The headquarters of OSRAM Opto Semiconductors is in Regensburg, Germany. We went there with Yvan Peard, founder and CEO of Ayrton and Antoine Leveau, Sales Manager for OSRAM West Europe.
The company's sole focus over the last 40 years has been on developing a variety of Optoelectronic components for all types of market, as evidenced by thousands of international patents filed under its name.
We were met by Marion Reichl, Media Relations Manager, who organized a meeting with the technical and marketing staff and a visit to one of the four chip production facilities.

A world leader in LED technology

During the meeting, Michael Wohs, Vice President, Sales, Europe & Emerging Markets, with 2013 sales figures in hand, told us that OSRAM Opto Semiconductors' was one of the leading manufacturers of optoelectronic semiconductors in the world. The company is the sales leader in the automotive industry, in optical sensors, and industrial lighting and is in the top five in sales of urban, industrial and domestic lighting. It ranks in the top two suppliers for the projection and stage lighting industry. The company generated over €1 billion in sales for 2013 (up from €899 million in 2012). This represents 18% of OSRAM's total turnover. OSRAM Opto semiconductors employs a staff of more than 7,300 worldwide and has three production sites: Regensburg in Germany (~ 2,000), Penang, Malaysia (~ 5,000), and the new

remaining competitive in a highly aggressive market.

With 40 years of experience and know-how and awards to prove it has mastered all phases of LED manufacturing, OSRAM Opto Semiconductors invests more than 10% of annual turnover in R&D. It also explains why this company holds thousands of international patents and reinforces its world-class position in technology and quality—the company is indeed growing faster than the market.

Antoine Leveau told us, "Today, in 2014, we have already reached 150lm/W, with a potential from 180 to 210lm/W, depending on the color temperatures. OSRAM has already gone beyond the potential of many other light sources, including metal halide. The use of LEDs is already widespread, and let's not forget some of its more interesting features such as resistance to shock and

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100,000 square meter facility in Wuxi, China, which opened in early summer 2014. The company expects to employ up to 2000 more people by 2017. Customer support, marketing strategy, quality assurance, procurement, human resources and purchasing, are integrated at "Application Centers" located in the US (Sunnyvale, California and Northville, Michigan), China (Hong Kong, Shanghai, Wuxi), Japan (Yokohama), and Europe (Regensburg). The company has undergone a startling evolution, from the first radial LED in 1977, used as a simple red or yellow indicator light, to the innovative blue LED with SiC technology in 1988, and then to the first soldered surface-mounted LED in 1990. OSRAM also beat the world record for efficacy the 2008 with a white LED generating 136 lumens / Watt, (lm/W), at 350mA, and again in 2011 with a warm white LED at 142lm/W. The manufacturer is also one of the first to have perfected 6-inch epitaxial wafers,
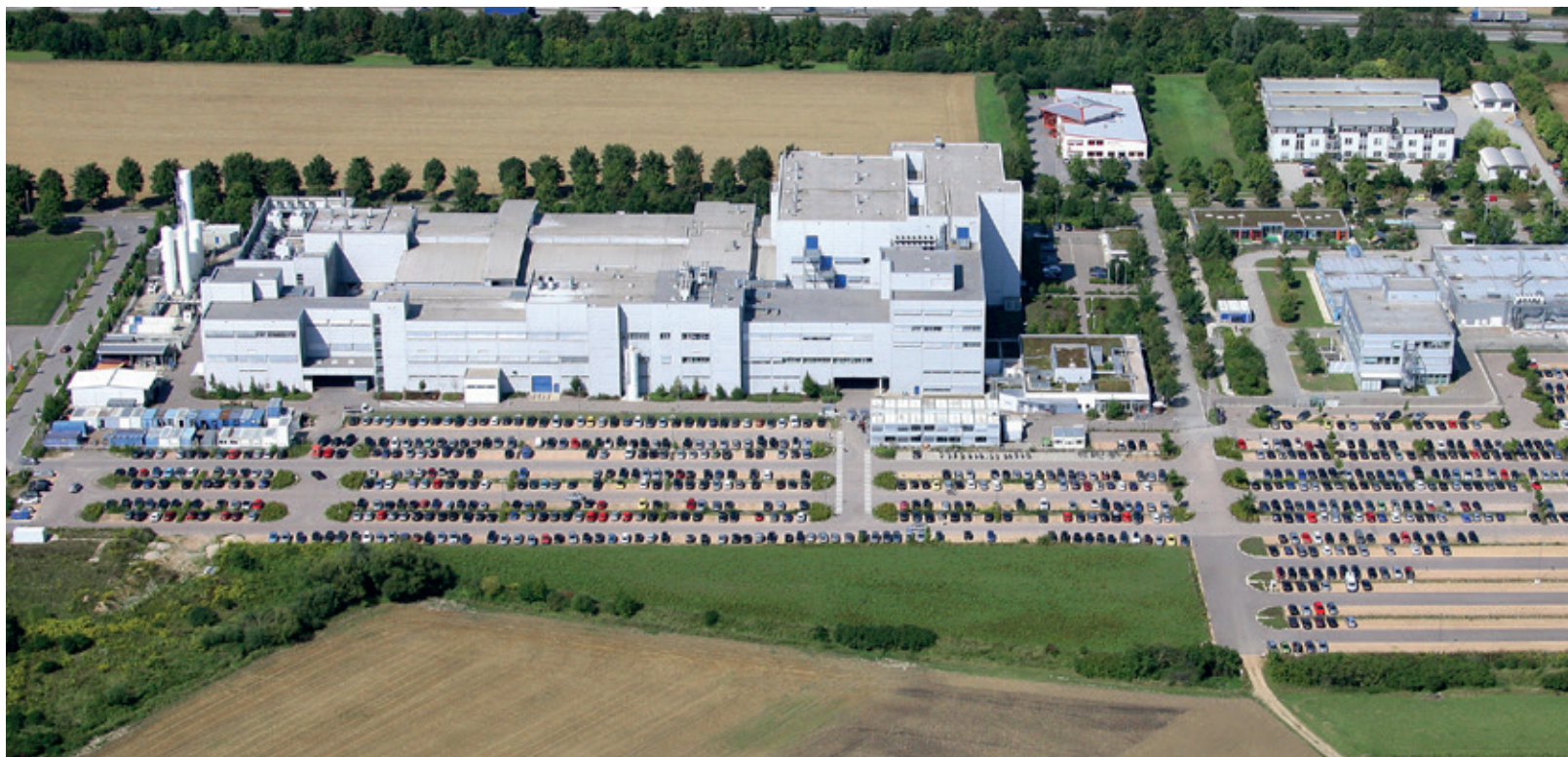
vibration, which simplifies transport, the absence of fragile filaments, and a greater life expectancy than with traditional lamps…

We have a very strong position in conversion technology for LEDs and lasers, as OSRAM has always used them (phosphors) in lamps and fluorescent tubes. They are similar to the types of phosphors used in making white LEDs. They are covered in the patents we hold and also are strongly tied to the manufacture of chips and their encapsulation. This has allowed us to hold our strong IP position as well as sign licensing agreements with various other important market players."

OSRAM in all the LED markets

Wolfgang Lex, Vice President & General Manager Visible LED, emphasizes just how much LEDs have become a part of our

1. *A new converter mix that OSRAM is currently testing in its development laboratory provides a pleasant warm white light.*

2. *Warm white light or cold white light can be produced depending on the ratio of the phosphors. A lab technician at OSRAM Opto Semiconductors carefully weighs the different phosphors.*

3. *A technician checks the crystal structure of a substrate material*

More than a century of development

Created in 1906, the OSRAM brand was registered by the Auer-Gesellschaft, who manufactured a line of tungsten lamps. OSRAM is a contraction of two materials necessary for the production of filaments—Osmium and Wolfram (today commonly called tungsten). In 1919 Siemens became a shareholder with AEG and Auer-Gesellschaft. The three companies then combined their lamp production efforts. Siemens, who continued development in other sectors, created a semiconductor business in 1960, producing its first LED in 1972. In 1978 the company became the sole shareholder of OSRAM, and in 1999, hoping to get out of the semiconductor business, started up OSRAM Opto Semiconductors, who in 2003 became a division of OSRAM. In late 2012, OSRAM separated from Siemens and went public on the Frankfurt Stock Exchange.

daily lives with this piece of trivia: "Do you know how many LEDs you encounter in one day from the moment you get up in the morning until bedtime?

By the time you're done with breakfast, you have already seen 27 LEDs just by using your appliances. Then you can count 15 more in your car. A single traffic light is made up of 15 LEDs, and there are several hundred in a highway traffic sign. You arrive at your workplace. Then there's the lift, your computer screen, and your mobile phone… In other words, by sunset you will have come across 140,000 LEDs if you live in a large European city and certainly many more if you are in Asia.

Since 1990, OSRAM Semiconductors' turnover has doubled and the LED market continues to create new applications. By transporting photons, we transport emotions—and in color. Stefan Morgott, Senior Expert in Application, helps our customers optimize use of our LEDs and orients them toward solutions that they have never even dreamed of.

This service is the key to our business model because we are not limiting ourselves merely to selling as many LEDs as possible. A close relationship with the customer is really essential for doing business. We are the only ones to provide the full spectrum of light colors - and additionally infrared light—efficiently and in a compact format. We are amongst the biggest manufacturers worldwide to cover all important lighting markets."

Birth of the OSTAR Stage RGBW

When it comes to stage lighting, the OSRAM OSTAR Stage LED is clearly the industry leader. Wolfgang Schnabel, Marketing

Manager Industry & Visible LED, has shown us that the quest for efficiency focuses primarily on light projection applications and notably the miniature video projectors, or being integrated into mobile phones, among others. Moreover, there is a full synergy between the applications, as you might guess.

Wolfgang Schnabel: "The study of projection applications started in 2002. We had a 4x1mm² lightsource that could be used in LED projection, that time in big size projector cases, but with only 25 lumens. This was a start in 2005, and further on we developed a complete portfolio around this LED, because we needed higher output.

For example, today, only nine years later, LED projectors achieve more than 1000 lumens. Using a diffrent OSRAM OSTAR for another application the projectors can be incorporated into phones. During projection, they encounter a problem called "etendue." This is a characteristic of a projector's optical system that determines how much area (mm²) and respective luminous flux from an LED source you can actually project onto the wall. Etendue is a fixed relationship, which never decreases, in any optical system. Our product was developed to offer the best possible etendue for a certain image size. The same problem exists with stage lighting systems.

So we developed and promoted our OSRAM OSTAR Projection (RGGB) product to help stage lighting customers solve the problem of zooming the LED. At that time, the minimum spot angle they could obtain with an LED source was around 18°. Using our source instead, they were able to reduce this to 9° and double the light in this smaller area.

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This was only possible because we covered our chips with a flat glass instead of silicone, to preserve the etendue. All of the other competitors at that time used silicon encapsulation on top, which destroys the etendue of the chip.

Suddenly people like Yvan at Ayrton came to us and said: 'your LED line is very good. It offers optic benefits, but one color is missing.' So they asked us to build the RGBW.

This was the real starting point. From then on we produced OSRAM OSTAR Stage (RGBW), red, green, blue and white. That's our history: and so we were involved in both projection and stage lighting.

But we are not only talking about projection and stage lighting: We now have a medical product using OSTAR technology, which is a multi color LED source achieving a very high CRI, and our OSTAR products found the way to the automotive industry. Today we are creating headlamps for cars, and we have a similar wide portfolio for the whole industry. We have used the synergy of our OSTAR technology package in all areas."

SLU: "What more is Ayrton asking you to do?"

Wolfgang Schnabel: "They are asking us to double or triple the power of the current models. This is currently a 15W package, but they are asking for a 45W package. We are following Ayrton's request, because Yvan Peard is very creative. He's very innovative. He has one product idea after the other and he is always asking, 'can you do this? Can you do that?'"

SLU: "So, is Yvan the best in his field?"

Wolfgang Schnabel: "I would say that he is the most creative and the quickest. […] Sometimes he had product ideas that he worked on for three years, and he was always ahead of the technology. When finally we were able to develop a source he needed, he could then go back to projects he'd thought of years ago. He is very, very creative.

I just wanted to show you an example of the projector inside this phone…

Using a mobile phone from a distance of about 1.5m, Wolfgang Schnabel projected a video onto the 60cm x 45cm wall of the meeting room, and the result was very bright, and with very good contrast. Really impressive!

"Even here where it is not very dark, you can get quite a nice picture… I can even do a presentation with slides directly from this phone. This phone has been on the market for a year and a half. All of this is incorporated into a phone, but this clearly requires a very efficient LED. What this means for Ayrton is that, as we work on the efficiency of our LEDs, we are continually developing more efficient systems with more output, using less power. Our whole current product range for entertainment and projection uses this same technology."

SLU: "How can you increase efficiency?"

Wolfgang Schnabel: "Basically, we buy substrates from vendors. Then we are doing the epitaxy, where we structure the chip, process it, and put it into a package and the result is that today we have 55% output efficiency with a white 1mm² LED. We will never get 100%, because one hundred percent efficiency would be like a perpetual mobile. But we work to eliminate the losses. We are working on better epitaxial design. We work on reducing

4. *OSRAM Opto Semiconductors in Regensburg.*

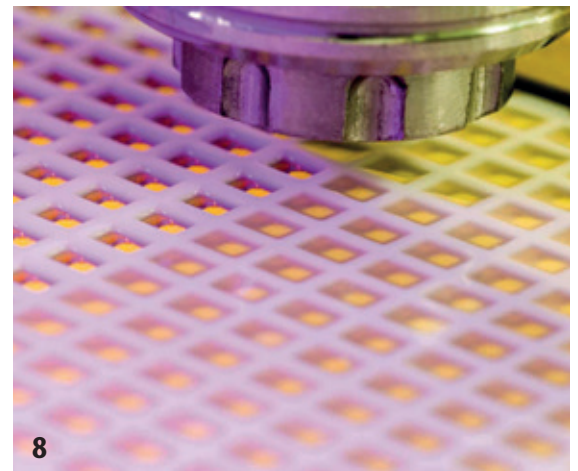**5.** *The OSRAM Opto Semiconductors Headquarters*

Antoine Leveau,
Sales Manager for OSRAM West Europe

Wolfgang Lex,
Vice President & General Manager Visible LED

Stefan Morgott
Senior Key Expert Application Engineering Visualization

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6. *An OSRAM employee shows the new wafer size: left- a new 6 inch wafer, right – the conventional 4 inch wafer.*

7. *An employee performs a visual check on the electrical connection between an LED and the substrate.*

8. *LED are automatically encapsulated in the LED assembly of OSRAM Opto Semiconductors.*

extraction losses from the chip by improving the chip's surface design. There are also electrical losses, like contact and resistance, so we work on the contact design. No one knows how close we can get to 100%

But every step toward100% helps the application either to save energy or getting brighter. So it is crucial to work on the technology."
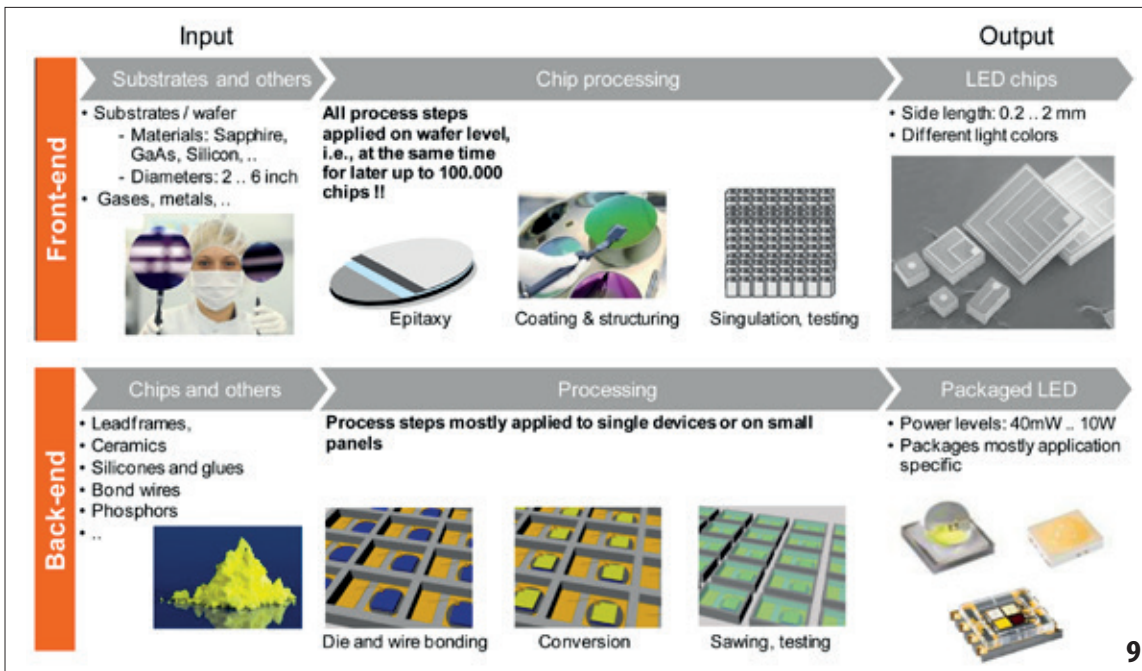
What distinguishes OSTAR Stage products from the rest of the market?

Antoine Leveau talked about the advanced technology that went into the OSRAM OSTAR Stage: "We've developed specific color wavelengths that allow us to obtain very good saturation for scenic applications. Another feature supported by our chips' clean

technology is their surface emission: more than 95% of the light is emitted towards the top of the chip and not to the sides, unlike the competition. This makes it possible to use the center of the chip itself and endows it with incomparable optical properties.

We have developed a flat glass surface to protect the semiconductor that allows not only very good coupling with secondary optics but also optimized flow extraction. The stage lighting market requires a very tight beam and, ideally, very effective zoom dynamics. Thanks to the flat optics, the chip yields the most faithful image possible, and the ratio between the size of the chip and the secondary optic, i.e. the collimator, is the lowest possible. We still need to protect the semiconductor, usually either with resin or with a ceramic casing, and there are various technologies available in terms of material.

	Input		Output

Front-end

Substrates and others — Chip processing — LED chips

- Substrates / wafer
  - Materials: Sapphire, GaAs, Silicon, ..
  - Diameters: 2 .. 6 inch
- Gases, metals, ..

All process steps applied on wafer level, i.e., at the same time for later up to 100.000 chips !!

- Side length: 0.2 .. 2 mm
- Different light colors

Epitaxy   Coating & structuring   Singulation, testing

Back-end

Chips and others — Processing — Packaged LED

- Lead frames,
- Ceramics
- Silicones and glues
- Bond wires
- Phosphors
- ..

Process steps mostly applied to single devices or on small panels

- Power levels: 40mW .. 10W
- Packages mostly application specific

Die and wire bonding   Conversion   Sawing, testing

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Marion Reichl,
Media Relations Manager

Wolfgang Schnabel,
Marketing Manager Industry & Visible LED

Michael Wohs,
Vice President, Sales, Europe & Emerging Markets

Our OSTAR Stage is exposed to the air, protected only by a glass surface. This saves changing the index between the different environments. The light emitted by the chip travels through the air, then the glass, and the air once again, before reaching the plastic of the secondary optics. And if we had used resin (common in approximately 99.5% of components produced worldwide), there would be a loss of luminous flux and emission toward the sides, hence less efficiency.
This is why our OSTAR Stage is quite successful.

SLU: "What binning* do you guarantee your customers?"
Antoine Leveau: "They have a choice. In the Stage application for Ayrton for example, we deliver well-defined binning to meet their need for consistency: wavelength mono bin for blue, green and white because red is less sensitive, and flux mono bin on the red and white. We also produced two to three flux groups on the green and blue. This optimizes Ayrton's an optimum response in terms of the production process and ensures delivery of a fairly low number of configurations. With a four-color mix, there is always a problem of making the products homogeneous.
The requirement is that all the luminaires produced have good color response. If a customer needs to add to his fleet of fixtures, the new models will have the same color and flux characteristics as the ones that were supplied maybe a year before."

SLU: "At an extra cost, obviously."
Antoine Leveau: "Yes, because this is the customer's choice. Ayrton anticipated this need, and the discussions I had with Yvan Peard helped establish this system in Germany."

SLU: "Do all your customers who manufacture stage projectors choose this option?"

Antoine Leveau: "Some have found another solution and others have a work-around using different calibration systems. Everyone finds what works best for him."

SLU: "What percentage of variation are we talking about?"
Antoine Leveau: "We make wavelength groups with a 3-nm gap and flux groups of $\pm 11\%$. There are thus very few software corrections to implement. In one delivery, the characteristics of a component are very accurate with a single color bin and a single flux bin. In one reel delivered, there is one single component characteristic.
Then from one delivery to the next, there may be a small variance which will be corrected by the product software."

Power increase

To meet the demand for a greater luminous flux, OSRAM has developed a new diode called the OSRAM OSTAR Projection Compact.

Antoine Leveau: "The OSRAM OSTAR Projection Compact meets this requirement for more and more flux. We must increase the efficiency with greater light extraction and this is a thoroughly technological issue, so we are doubling the size of the chips. The Ostar Projection Compact is a 2mm^2 chip per color as compared to 1mm^2 for the Stage, which will respond to other stage luminaire applications. When we double the surface of a chip, we quadruple its capacity in terms of current, which produces more flux. Finally, the same response must occur on the optical chain. If the flux is higher, it has to be used effectively by the optical chain, whether for an interface with secondary optics or a mixer according to the application."
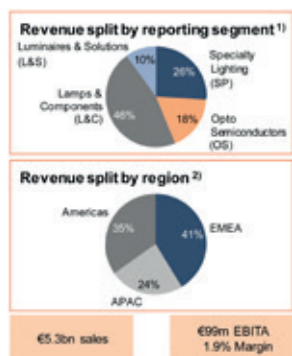
Revenue split by reporting segment[1)]

Revenue split by region[2)]

€5.3bn sales | €99m EBITA 1.9% Margin

OSRAM operates in a number of areas: "Special Lighting" departments to create products for the automotive industry and the stage lighting market, and make specific lamps for microscopes and video projectors; "Fixtures and solutions" for lamps integrated into complete luminaire solutions; "Lamps & components" for large-scale distribution; and Opto Semiconductors for LEDs. With overall sales of 5.3 billion euros in 2013 and 6.4% devoted to R&D, OSRAM employs more than 35,000 people worldwide. Its global presence ensures 35% of the turnover in the Americas, 41% in Europe, Middle East and Africa, and 24% in Asia.

SLU: "What happens to the thermal drift in terms of flux and colorimetry?"

Antoine Leveau: "This is an important point. We are working on optimizing the thermal resistance of our component enclosures. We are already 20% lower in thermal resistance than the competition. For our customers this means saving 20% in the sizing of materials and in energy expended to extract heat. This is not negligible. Our solution is the choice of materials. On the ceramics we use, we solder the chips on their substrate rather than glue them. This makes for optimal heat extraction. Sometimes this choice of materials is more costly, but the solution meets the needs of our customers. Often, people only look at the initial flux and don't take into account all the related parameters. You can decide to use one type of silicone for the best possible light extraction, but this choice could impact the life expectancy or persistence of the color."
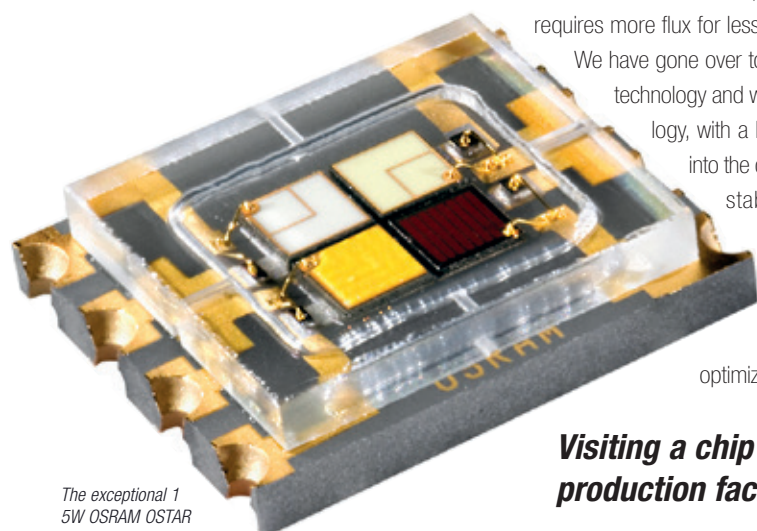
SLU: "Has this technology been used in the OSRAM OSTAR Stage?"

Antoine Leveau: "Yes of course. We know that these products are confined to very small environments. They have to be fairly simple to implement. And since these products can be used for video projection and integrated into mobile phones, you can be sure that we're not trying to squeeze a giant aluminum radiator inside (laughing)! Lowering thermal resistance is a permanent challenge for our R&D department."

SLU: "Any other innovations?"

Antoine Leveau: "We are working on a "Converted Green" which consists of depositing green phosphor on a blue LED. We obtain a green light by secondary emission whose spectral characteristics shows a peak in the blue range and a significant rebound effect in the green. This is not a saturated color with a very narrow peak but with wide green coverage. The flux is almost twice as high. This is useful, either for an application involving mir- rors and therefore a loss of flux, or for an application that requires more flux for less power and heat.
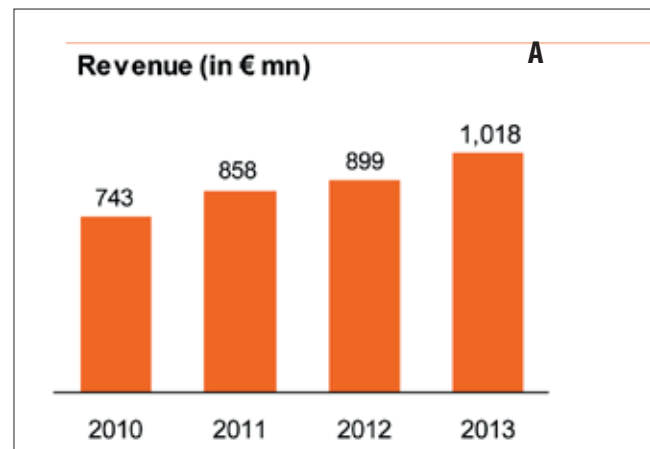
We have gone over to thin-film for the AllnGaP technology and we are using UX3 technology, with a better injection of current into the chip. This achieves greater stability when hot. So we decrease the flux variations between cold and hot with purely a surface emission that is always optimized for more efficiency.

The exceptional 1 5W OSRAM OSTAR Stage RGBW.
You can see its flat glass surface that allows an optimized flow extraction

Visiting a chip production facility

Marion Reichl offered us a guided tour of one of the production facilities, notably where epitaxy is carried out. This is the initial

Revenue (in € mn)

A

743 | 858 | 899 | 1,018
2010 | 2011 | 2012 | 2013

stage of structuring the chip: depositing layers of semiconductors on substrate. Epitaxy, the growing achievement of 40 years of experience, is performed only in Germany. We could only see the machines from a distance, down a corridor protected by glass. This floor was occupied by a huge white room where technicians wore antistatic clothing and sometimes full-coverage outfits that were color-coded to differentiate between the men and the women. The building had three levels, with two production floors separated by a floor reserved for air-renewal filtration systems and gas containers used in epitaxy. We spoke to Johannes Völkl, Director LED Production.
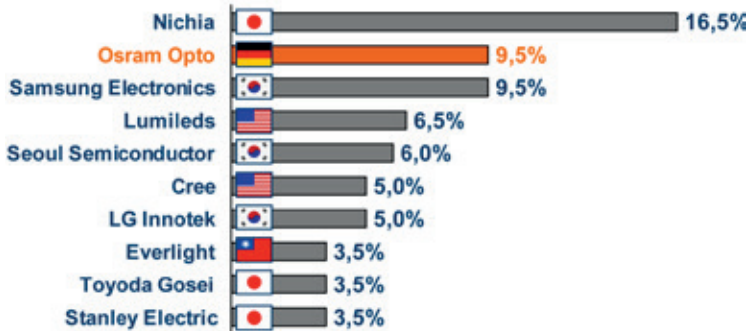
Seeing that we were disappointed in being denied access, he explained just how clean this room was, he commented, "The cleanroom class" is 100—this means that there are less than 100 particles bigger that ½ micron in one cubic foot of air. In reality, if the machinery is working properly, we should have less than 10. This is continuously being monitored. This cleanroom has holes at the top and bottom so that clean air can flow in through the top and take all the dust and remove it through the other holes. Then the air crosses a double-layered floor, comes up and passes through a number of filters. It is condensed and evaporated several times and then mixed with fresh air. This means we completely change the air in the room six times every hour."

SLU: "What is the chip production process?"

Johannes Völkl: "We bring in the sapphire wafers from outside and make several thin layers on them to produce the light. It is basically a p–n junction, but actually much more complicated. For these tiny layers we need huge, expensive machines. The key is that no oxygen is involved. There is no vacuum because we need certain gases to react to form the layers. We use ammonia, which is nitrogen mixed with hydrogen, and also gallium or indium with hydrogen. We bring these gases together and place them on the hot surface of the wafers. The hydrogen is removed and the gallium and the nitrogen stick to the wafers. It is very simple. Not easy, but simple. The problem is removing the hydrogen. It is very difficult to remove the hydrogen and leave the gallium and nitrogen. Then we have to mix very small amounts of other gases to form the light emitter.
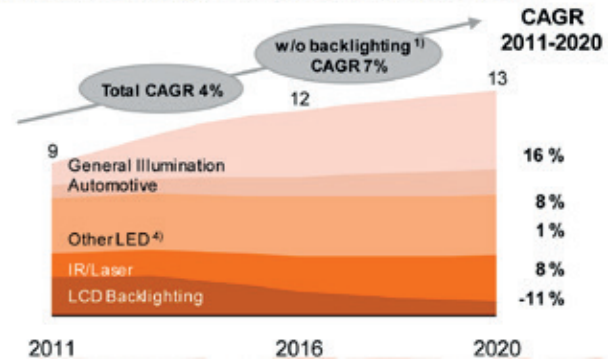
Market Share for LEDs **B**

Nichia	16,5%
Osram Opto	9,5%
Samsung Electronics	9,5%
Lumileds	6,5%
Seoul Semiconductor	6,0%
Cree	5,0%
LG Innotek	5,0%
Everlight	3,5%
Toyoda Gosei	3,5%
Stanley Electric	3,5%

Opto Semiconductor Component Market (in €m) [3] **C**

CAGR 2011-2020

Total CAGR 4%   w/o backlighting [1] CAGR 7%

General Illumination Automotive	16 %
	8 %
Other LED [4]	1 %
IR/Laser	8 %
LCD Backlighting	-11 %

2011   2016   2020

An epitaxy machine is made of five segments: One is for temperature control; two segments are gas cabinets (the gases enter from the bottom into these cabinets where the mixing occurs); another is the reactor segment; and the fifth is the "handkerchiefs" segment, which the operator opens to place the wafers on the plate. Then the plate is transferred to the reactor. The reactor rotates, the gasses enter, and it heats up to a temperature between 600°C and 1000°C. On the wafer you obtain a layer, and in the center of the area is the light emitting area. For example, this can be based on gallium arsenide or gallium nitride. It is very difficult to make it homogeneous, but I think we are among the best in the world at it. Our LEDs are very high quality with nearly no failure rate, and we are competing with the best. We have been making epitaxy for LEDs since 1970… I think we know our stuff!

The layer itself has a thickness of 3-5 microns, or one–tenth the thickness of a hair. On this layer you need to have contact so that current can flow from the front to the back. Therefore, we first need metals on these layers—special metals that can form a contact. Then there are more layers, and a final one for soldering. This results in a complete wafer. Then this has to be cut. Some LEDs types are still cut with a blade that can split a human hair. The more recently developed LED types are now cut with lasers. We can cut across a very tiny distance, even a few micrometers away from the chip, and it is very stable and very straight. Each operator must sign off and comment on every operation being processed. This so that we can evaluate any production deviation.

Over here you have the testing equipment for the layers, which uses lasers to measure the thickness of the layers.

We also have chemical machines that etch and clean the wafers. 50% of the success of the semiconductor production process is in cleanliness.

We are one of the most environmentally friendly production sites. We have received prizes from the government for our high environmental protection rating.

This is also true for our recycling of water, heat, air and metals. We recycle our exhaust heat."

Quality control

Antoine Leveau satisfied our curiosity about quality assurance, which we assumed was strict.

Antoine Leveau: "We have implemented programs such as "Zero Tolerance To Defect" with the objective of applying this quality philosophy to all phases of component manufacturing, both in engineering as well as production. We take into account all elements that could affect our products. Today we are below 1 ppm at the production level (one product failure per million parts), so it is very low. Often, in conventional industry we often refer to about 100 ppm. We consider that as either a direct initial failure or a flux variation (Vf) of ± 50% or 20%.

In the development cycle, we single out three production batches that we sample from. And on these samples, we then perform a qualification test: 1000h at 85°, 1000h with a thermal cycling from −40° to +85°, 1000h at 85° with 85% humidity. We also test their ability to be re-soldered five times. Thus we conduct a battery of tests beforehand to ensure that the product is reliable. Then it is put into production.

At the end of the process, we systematically test all of the nearly 10 billion components produced, twice. We perform two tests to verify the binnings and to ensure that they meet the specs on the data sheet. We then perform a rather complicated qualification procedure on our components. We subject them internally to stress tests using thermal cycles at high temperatures and levels of humidity. This is make sure that they will continue to function properly regardless of the application environment."

Armed with solid know-how and the ability to come up with new projects in new application environments for greater performance, OSRAM Opto Semiconductors is a future-oriented company that is always prepared for change.

The company has therefore decided to invest in its industrial production capacity in Asia to maintain its competitive edge and respond to all types of markets. It wants to increase its output volume while placing a high premium on quality. Its customers, regardless of their market position and size, have expressed satisfaction with the company's high level of service. Ayrton is perfect example. ■
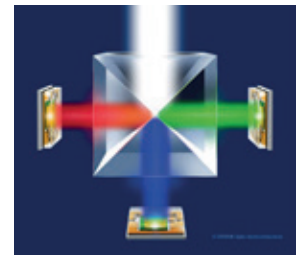
A. OSRAM Opto Semiconductors's turnover evolution from 2010 to 2013

B. OSRAM Opto Semiconductors has a shared#2 in the market for packaged LEDs.

C. Osram estimates based on McKinsey Report 2012

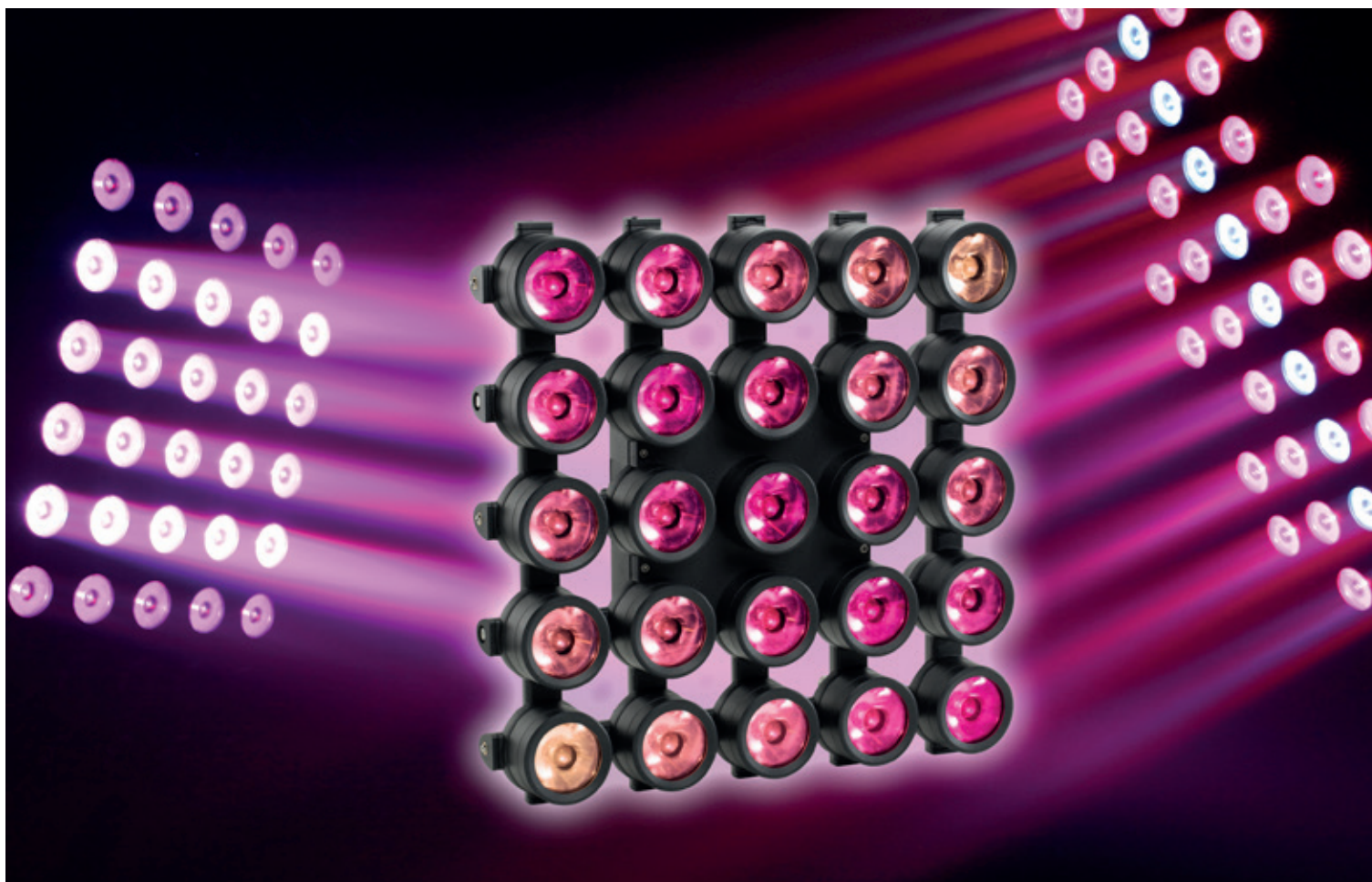An OSRAM employee places 6 inch wafers manually in a plate for a coating unit.

The new OSRAM OSTAR Projection Compact 2x2 version for projection applications expand the performance range at the low and high ends. OSRAM OSTAR Projection Compact is ideal for pico projector applications, whereas it is designed for applications in high-power projectors such as those in home cinema systems and mobile projection systems.

For more information:
Visit our factory:
www.osram-os.com

Semi-transparent LED control panel
AYRTON INTELLIPIX-R, ENTER THE MATRIX!

Launched at LDI 2013, IntelliPix™-R is a semi-transparent panel accommodating 25 LED RGBW 15 W sources linked to a new collimator, which will be available across the entire "RADICAL" range from this French manufacturer. An exclusively orientated effect, with its 25 narrow beams and profile spots to create relief in space. The IntelliPix™-R acts as a link between the light and the video, which will allow designers to give free rein to their imaginations. Just like the toy Meccano, the system of panels allows an infinite range of possibilities at set-up level.

So-called 33

It is Yvan Peard, managing director of Ayrton who told us the story of the origin of his project bearing the number A 33 even though the last one was numbered A 98.

IntelliPix™-R is a project conceived in 2007, the objective of which being the creation of colour graphic and volumetric effects, whilst maintaining the greatest transparency with two essential criteria, such as the correct mixing of LED source colours and a sufficiently narrow beam to obtain the most accurate volume definition possible. Project A33 began with a collection of Moduled, but the monochip LEDs and the collimators did not allow for the desired results to be achieved.

It would mean waiting 6 years to be able to combine LEDs and optics capable of satisfying Ayrton's quality requirements. The last link was discovered in May 2013 on a desk of their optician partner: a 67mm collimator, permitting a narrow beam with an angle less than 5°, whilst multiplying the intensity in the axis by three.

From shadow to light

It is clear that the development of the IntelliPix™-R has not been straightforward, which is what makes it a unique product. Pure design, semi-transparency and sealing to enable exterior use and passive cooling: a spec list worthy of the brand's reputation.

The use of the 25 15 W RGBW LEDs determined the choice of

Text & Photos :
Stéphane Mocret
for Soundlightup

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materials used for the framework. Since the latter had to serve both as the structure and the heat-sink, aluminium appeared to be the best choice.

Two different manufacturing processes were selected; injected aluminium for the panel casing, which had to be perfectly flat and extruded aluminium for the cylindrical body of the light sources. They are screwed and glued to the frame with a waterproof adhesive for perfect watertightness.

To achieve semi-transparency, Ayrton was compelled to develop a special electronic circuit in the form of a trellis to receive the LEDs, whilst limiting the risks of faulty contacts and complicated wiring. To guarantee the insulation of the PCB against humidity, it is immersed in resin and then inserted between the two moulded sections of the panel framework. Assembly is a very delicate stage that requires attention to detail and great care.

The power supply was also the subject of specific development as it is located in a waterproof housing. Its 500 W support the 375 W consumed by the sources in a confined, unventilated space and is also in contact with the frame, ensuring thermal dissipation. It supported our 2 hours of photometric measurements without showing the least sign of weakness, which is remarkable for an effects projector.

The electronics element ensures control, allocation and the selection of options located in the same housing as the power supply. The four sides of this housing receive connectivity. Neutrik powerCON TRUE1 connector on the upper face, which is replicated on the opposite side and etherCON (RJ45) connectors on the lateral sides.

The power and network cables run from panel to panel very neatly without complications.
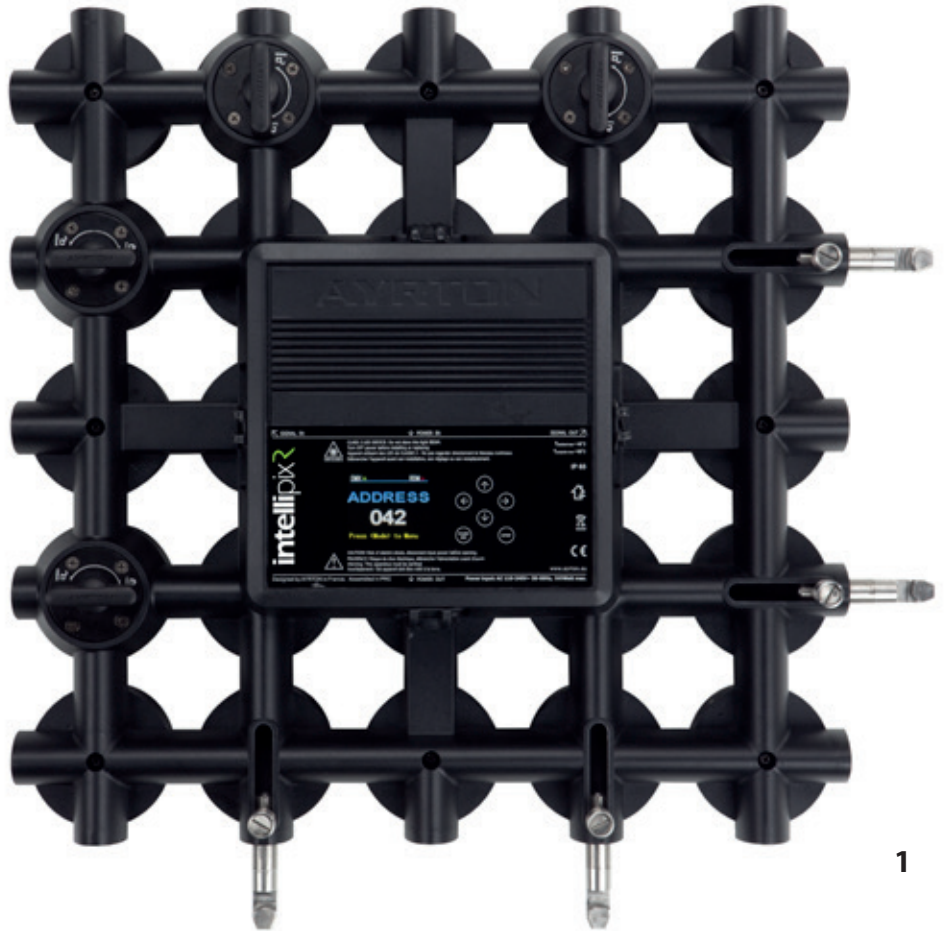
The 67 millimetre collimators are positioned on their support by the lugs situated at the base and the polarising slots at the top. The lugs ensure that the optic is centred in relation to the LEDs; all the sources have the same flux and the same colour mix.

Installation

The panels are easy to assemble. Each one of them is equipped with four bolts, two on the right and two at the bottom and four latches situated on the upper left hand side. It is then no problem to extend the latches at the bottom, which insert into the element underneath and are then locked into place by a half-turn of the safety catch.

A clever system of spring balls between the bolts allows the dismantling or reassembly of a panel located in the IntelliPix™-R screen, without dismantling one or more rows of panels.

Each panel weighs approximately 17.5 kg, therefore it is clearly easier to leave the elements vertically in the transport cases positioned under the panels already rigged, than to carefully lower the truss whilst guiding the elements until the ends of the bolts are in line with their housing. Only a small effort is then required to raise the panel and secure the safety catches.

1

2

3

1. Wild gamble : semi transparency, passive cooling and IP65

2. The aluminium chassis and optical support together with a collimator, the waterproof joint and the cap.

3. The impressive 67 mm collimator, which has enabled the completion of the project.
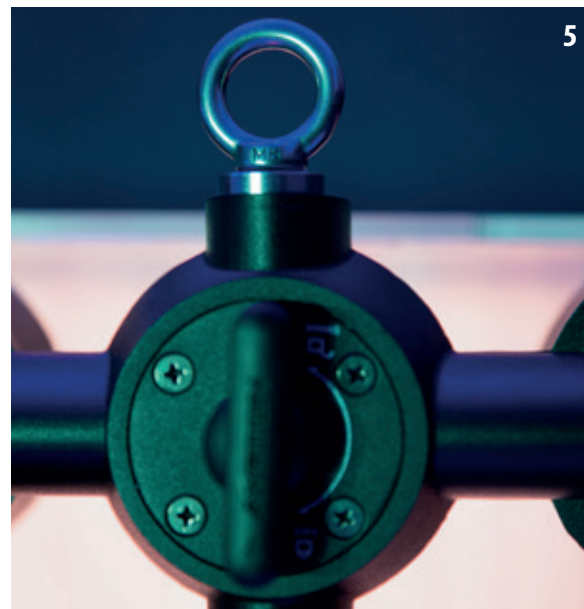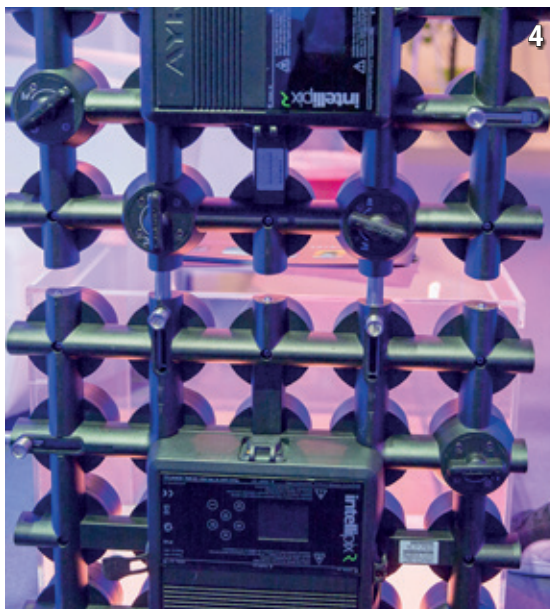
THE PLUSES

- The lighting power
- The tight angle of each beam
- The modularity
- The creatve opportunities

THE MINUSES

- The locking powerCON & etherCON connectors on the frame side

The IntelliPix™-R can be used in any position, wall or ceiling, thanks to its dedicated accessories.

To suspend an IntelliPix™-R screen, Ayrton has developed a forged stainless steel ring to support heavy loads. It is positioned like a bolt, secured by a shackle in the ring with a collar on the support.

The second system is a cradle, which allows the panels to be positioned horizontally. Its four feet are height-adjustable in order to cope with floors that are not level but it is advisable to place them on risers. The support consists of platforms that cross the panel, on which a glazed surface is placed, capable of supporting people or objects.

On the menu

There are three control modes for the IntelliPix™-R panels: Basic, Standard or Extend, each comprising 6, 10 and 109 control channels. Clearly, the last mode is the most interesting and the most logical as it allows the light sources to be matrixed and to inject a video source via a console or a media server. It is for this reason that the decision was taken to skip the DMX connectors that require too much cabling, (1 DMX universe for 4 panels) and also because the design office had favoured a control solution via network protocols such as Art-Net and Kling-Net. In order to
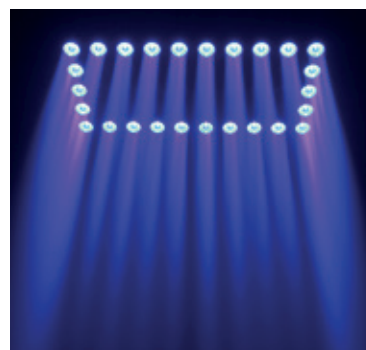
be able to control a large number of sources without reduction in speed, a new 32-bit control card offers the possibility of controlling several hundred IntelliPix™-R units on the same network.

On this projector the very comprehensive Ayrton equipment menu can be found, with items in the following order: address, control mode selection and options including: IP address, RDM PID, control protocol selection, Art-Net universe selection. The menu also provides access to information, test commands and to «Presets» for automatic restoration.
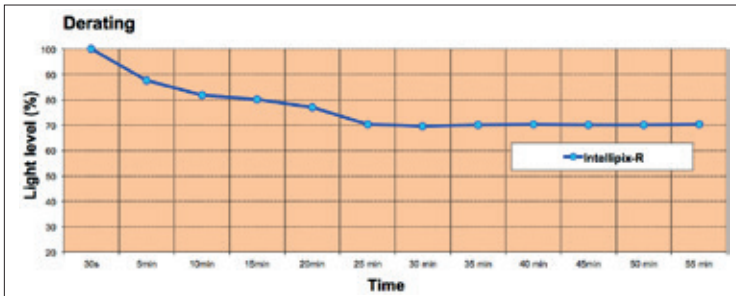
Functions

Once assembled and configured it is time to get started with this new toy!

The number of different parameters being quite limited, getting started is very quick and easy. Borrowed from MagicPanel™ 602, a mini-generator with internal effects on three channels provides the selection of chase, speed and fade. This option fulfilled its purpose and can get you off the hook, but as the same effect is identical for each panel, it does not give you the best rendition of this product's possibilities, especially if all of the panels are combined in a single element.
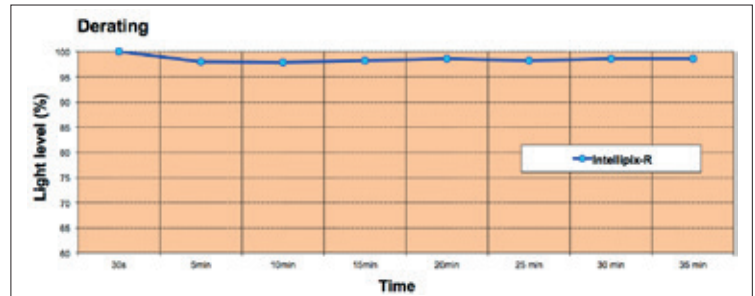
The vast range of colours and the surprise of the good uniformity of the colour mix.

A very correct derating for 25 unventilated LEDs.

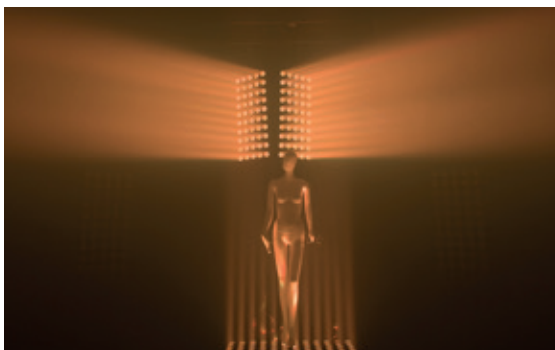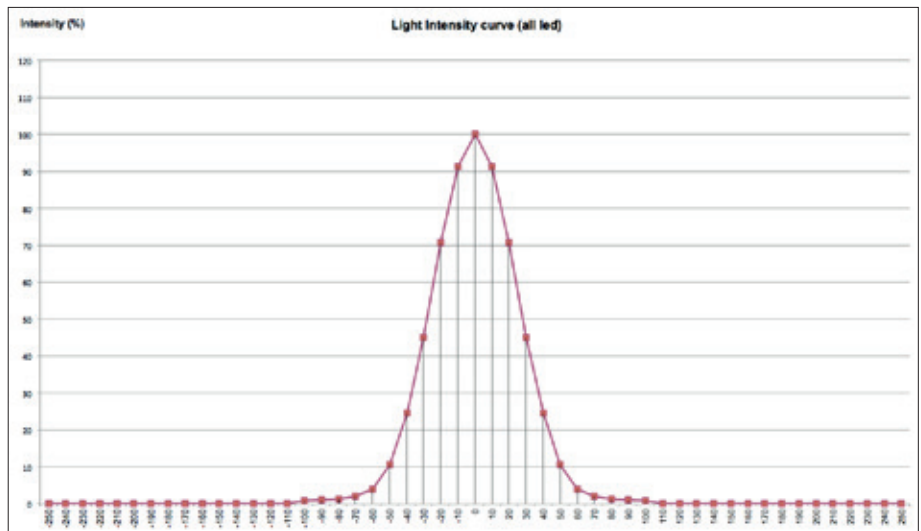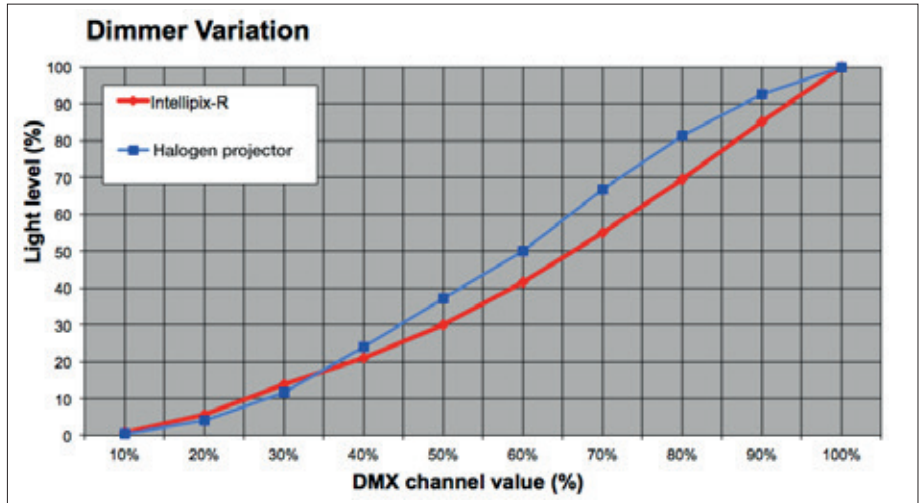*The derating of a single LED, even in full RGBW, is almost no-existent: 1.98%.*

There is another «preset» colour function, in particular with six temperature options of varying whites, which will interest photographic directors. A second colour function, "Color Macro", offers various automatic colour sequences with the RGBW parameters obviously permitting the control of the four chips in the LED. This is one of the greatest surprises of this test: with a narrow angle, we expected a fairly average mix of colours. In fact, this was not the case; although it was not perfect, the result was rather good, or even very good.

If you are face-on or look at the beams one by one, except for a few minor defects in the colours, the mix is uniform. Obviously we are not talking about projection here; the appliance was not developed for that purpose. One of the other very pleasant surprises is the full RGBW white. It is uniform and of a temperature that can be easily used with other types of projectors (neither too blue nor too pink). The last two functions, shutter and dimmer, are parameters that are perfectly controlled by Ayrton.

The biggest, and the only, difficulty is related to the number of panels installed, but it is easily surmountable with the latest generation consoles that have a matrix function and media servers. The door is now open to the wildest of dreams!

Towards infinity and beyond

I have kept the best for last, the rendition! It is mind-blowing: the light beam emitted from each source is of truly superlative precision and power. This allows a beam to reach far whilst remaining completely materialised. It is this which gives this light source its magic. Images in relief come to life in space at the whim of the programming and videos.
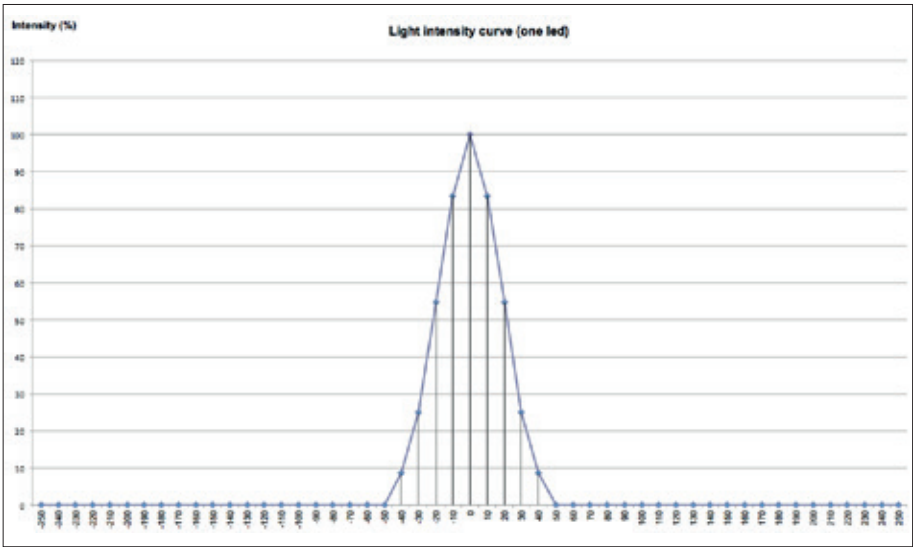

Distance does not scare the powerful beams of the IntelliPix™-R.

MEASUREMENT AT I/2 (Light output at the center/2). ALL LEDs AT FULL POWER	
Beam diameter	**0,56 m**
Corresponding angle	**6,41°**
Light output at the center when switching On	**20 470 lux**
Light output at the center after derating	**14 330 lux**
Flux when switching On	**7 000 lm**
Flux after derating	**4 900 lm**

MEASUREMENTS AT I/2 (Light output at the center/2) . ALL LEDs AT FULL POWER	
Beam diameter	**1,00 m**
Corresponding angle	**11,48°**
Light output at the center when switching On	**20 470 lux**
Light output at the center after derating	**14 330 lux**
Flux when switching On	**7 700 lm**
Flux after derating	**5 390 lm**

MEASUREMENTS AT I/2 (Light output at the center/2) ONLY ONE LED AT FULL POWER	
Beam diameter	0,42 m
Corresponding angle	4,8°
Light output at the center when switching On	1 298 lux
Light output at the center after derating	1 280 lux
Flux when switching On	182 lm
Flux after derating	180 lm

MEASUREMENTS AT I/2 (Light output at the center/2) ONLY ONE LED AT FULL POWER	
Beam diameter	0,79 m
Corresponding angle	9°
Light output at the center when switching On	1 298 lux
Light output at the center after derating	1 280 lux
Flux when switching On	284 lm
Flux after derating	280 lm

Light intensity curve (one led)

INTELLIPIX-R CHARACTERISTICS	
Dimensions and weight	
Lenght	60,5 cm
Height	60,5 cm
Depth	22,5 cm
Weight	17,5 kg
General Characteristics	
Type of projector	25 LED Control Panel
Voltage and power consumption	110-240 V / 50-60 Hz - 375 W max
Protection class	IP 65
Cooling	Natural
Control	Art Net, Kling-Net
number of DMX channels and DMX Modes	6/13/109
Lamp	25 RGBW Led 15 W Ostar Osram
Type of ballast/driver	Electronic
Optical system	67 mm optics
Software update	Yes
Connectors	etherCON RJ 45 + powerCON True1 Neutrik
Control panel	Colour screen + 4 keys
Fixing brackets	Forged stainless steel rigging ring
Transport handles	No
Supplied Accessories	Power cable
Functions	
Pan et Tilt	No
Zoom	No
Dimmer / Shutter	Electronic
Colours	RGBW
Manufacturer	Ayrton from France
Developed in	France/China
Assembled in	China
Warranty period	1 year
Use	Shows, TV, Event

IntelliPix™-R is a projector, screen, set and scene, all at the same time. It can be used individually, in combinations of two or more, in-line or vertically, in square blocks of 2X2, 3X3, 4X4 or more. In a rectangle, pyramid, diamond… Imagination is the only limit.

Measurements

Derating

The required and unofficial derating measurement to which we expose every LED projector consists of lighting all the LEDs in the projector to full power and taking readings of the light value in the centre every five minutes. As and when the LED warms up, the light level diminishes then stabilises when the projector achieves its thermal equilibrium. This is an indicator of the quality of the appliance's temperature control. This test is therefore very useful for a projector that is intended to be switched on for a long time, an architectural luminaire, a wash or a profile projector on a television set. For an effects projector, interest is obviously very debatable, that is a given, but how to carry out reliable photometric measurements if the light is not stabilised when there is no opportunity to use an integration sphere for an instant measurement?

With 25 15 W RGBW LEDs at full power, without active cooling, one would expect an abysmal derating. In reality it does not exceed 30%, which is remarkable. The aluminium mesh fulfils its role as heat-sink perfectly. We also checked the derating of a single source, 4 colours in full. It was almost zero. It is obvious that these LEDs will never be this stressed.

Photometric measures

The measures taken into account for this projector are light value at the centre of 20470 lux and a flux of 7700 lm.
A single illuminated LED, this is the angle of projection announced by Ayrton: less than 5°.
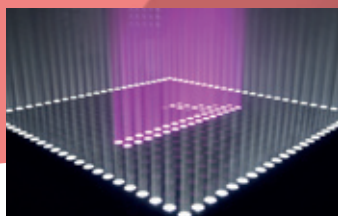
Seven years of reflection

IntelliPix™-R is a radically innovative concept.
The quality is assured, as good in terms of panel construction as light rendition. It was not the simplest idea to put into practice and the challenge of creating a powerful beam of less than 5° with a uniform colour mix was a long way off, but the objective was achieved! This new product has its place in numerous applications: lighting, video, sets both in events and for television and quite obviously in all scenarios where silent operation is a must. ▪

Colours	Relative %
WHITE RGBW	100 %
RED	21,5 %
GREEN	36,45 %
BLUE	4,41 %
ONLY WHITE	50,57 %

A CONSTRUCTION GAME

INTELLIPIX-R IMAGING DISPLAY

Versatile IP65 volumetric high-power semi-transparent screen, IntelliPix™-R is a modular beam projection panel which puts 25 independently controllable 4.5° beam into a 5 x 5 array that projects graphics and media far into the air with power never before imagined. It can be installed on the floor with a specific kit. An Ethernet connection and an ultra-fast secure fastening system allows the connection of a large number of luminaires. Contact us at : contact@ayrton.eu

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THE ULTIMATE EVOLUTION

NANDOBEAM-S9 AUTOMATED LUMINAIRE

The NANDOBEAM™-S9 is the latest development in the NANDOBEAM™ product line, equipped with a new-generation power supply offering over 95% total output efficiency. It is equipped with 55 Osram 15-Watt RGBW LED emitters, and fitted with an advanced active cooling system. The wide 8° to 40° adjustable zoom-spread makes the NANDOBEAM™-S9 highly versatile.

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