



DEPTHQ® 3D PASSIVE POLARIZATION “BEST-IN-CLASS”

FAQ

With superior optics, speed, brightness, sharp focus, low crosstalk, advanced heat protection and six-studio Hollywood approval, DepthQ® 3D Passive Polarization for 3D Digital Cinema is your proven “best in class” investment, today and for the future.

FAQ 1: What factors determine the best 3D experience for my patrons?

With liquid crystal based polarization modulators, the quality of the optics is most important, and determined by several factors: optical efficiency, switching speed, flatness/focus, contrast and heat protection. **DepthQ® 3D's optics are superior to our competitors in these areas.** Other factors include your projector's dark time, lamp life, the glasses you choose and your screen. Read on to see how ALL of these factors affect your Total System Efficiency (how much light your patrons see), proving DepthQ® 3D is “best-in-class”.

FAQ 2: What is DepthQ® 3D's Optical Efficiency?

All LC-based polarization switches start with nearly identical Optical Efficiencies of ~17% (including the 3D glasses). **DepthQ® 3D is actually ~17.5% optically efficient** (i.e. light-efficient) using common low-cost cinema glasses, or up to ~18% with premium (expensive) glasses.



FAQ 3: Can every product benefit from 'premium glasses'?

Yes, 'premium glasses' using higher-quality components can increase everyone's light efficiency, but at 'premium prices' prohibitive to a theater. Know that any marketed brightness values based solely on using premium glasses are not realistic for 3D cinema.

FAQ 4: What is DepthQ® 3D's Switching Time?

DepthQ® 3D has a patented, symmetrical Switching Time of **only 50μsec**, while the competitors' products simply cannot completely switch faster than ~550μsec in each direction.

FAQ 5: What is Dark Time?

'Dark Time' is the time projector light must be turned OFF between Left and Right images to allow a 3D product to switch eyes. **The longer the Dark Time, the less light to the screen.** See the video proof here: <http://bit.ly/ZHMzCr>. At 50μsec, DepthQ® 3D switches far faster than the fastest projector Dark Time available to date of 350μsec, producing the highest Total System Efficiency in our class. A competitor's manual states their modulator requires a Dark Time of 1200μsec while a spinning wheel polarizer requires 1157μsec (for triple-flashed 24FPS content).

FAQ 6: How do Switching Time, Dark Time and Crosstalk relate?

If a 3D product does not finish switching within the projector's Dark Time, one eye will see light meant for the other eye. This is called 'Crosstalk' (ghosting). Setting a projector's Dark Time faster than a product's Switching Time causes excess ghosting. At 50μsec, DepthQ® 3D is DONE switching well within the fastest projector Dark Time of 350μsec. **So you can use the fastest Dark Time available, for the brightest 3D image, with zero chance of excess ghost.**



FAQ 7: What is High Frame Rate (HFR) 3D?

Today's standard for 24FPS captured 3D content is to project it triple-flashed at 144FPS (72FPS per eye). HFR 3D is 3D content captured and projected at even higher frame rates. 'The Hobbit' was captured at 48FPS per eye, to be projected double-flashed at **192FPS (96FPS per eye)**. James Cameron may aim even higher with his 'Avatar' prequels, capturing at 60FPS per eye, and projecting **240FPS**.

FAQ 8: How do Switching Time, Dark Time & HFR 3D relate?

With HFR 3D, the amount of time available to show a single frame decreases, so long Dark Times will use even **more** of the available light. Because of its miniscule 50µsec switching time, **only DepthQ® 3D is truly '100% HFR-Ready'** and can handle authentic **double-flashed HFR at 192 FPS or 240 FPS - even as high as 400 FPS** - while continuing to let you use the shortest available projector dark time. A spinning wheel polarizer's 3D HFR specifications do not exceed single-flash 48FPS (96FPS) and 60 FPS (120 FPS), while a competing modulator's specs max out at double-flashed 48 FPS (192 FPS).

FAQ 9: What is Total System Efficiency?

Total System Efficiency is how much light your paying customer actually sees, after accounting for Optical Efficiency, Dark Time, color calibration, port glass, and screen/eyewear losses. The de facto industry standard was set by RealD®, at ~15%, while **a Total System Efficiency of ~16% is achievable using DepthQ® 3D paired with commercially available, low-cost glasses**. A product's required Dark Time is the most significant factor when it comes to Total System Efficiency, but it is often conspicuously absent from marketing.

FAQ 10: Why do some companies' 'efficiency' comparisons seem skewed?

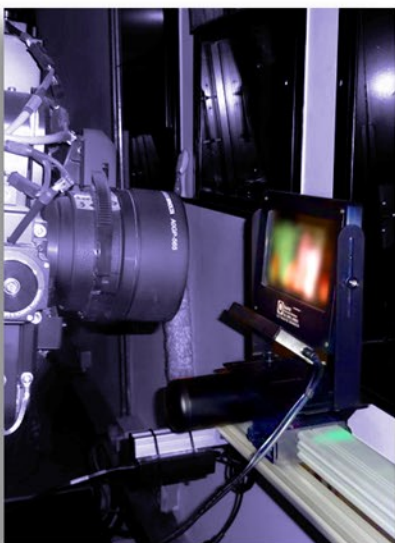
Competitors' marketing sometimes compares their Optical Efficiency against another company's more meaningful Total System Efficiency, creating a misleading impression. The reality is all LC based polarization switches start with nearly identical 'Optical Efficiencies' of ~17%, one factor of many to follow. DepthQ® 3D has consistently stated our efficiency at a conservative ~15%, using the only efficiency that really matters - Total System Efficiency. This follows the industry's de facto standard. But in reality, with a new screen and efficient port glass, **you can hit ~16% Total System Efficiency using DepthQ® 3D, and without resorting to more expensive 'Premium Glasses'**.

FAQ 11: So who's really brighter in the end?

Using our Optical Efficiency of ~17.5%, and our competitors' optical efficiencies and dark times (DT) from their manuals or marketing, **DepthQ® 3D (DT of 350µsec) is ~18% brighter** than a competing modulator (DT of 1200µsec) and **~12% brighter** than a spinning wheel polarizer system (DT of 1157µsec). In a direct measured test using each company's own commercially available low-cost branded glasses, and with the projector set to the same 350µsec dark time for both, DepthQ® 3D proved **~9% brighter** than another competing modulator (DT of 350µsec, true switch time 520µsec) (Tested 3/18/2013).

FAQ 12: How does Total System Efficiency relate to lamp life?

Falling below the recommended end-of-life foot-lamberts for 3D cinema (6 - 4.5ft-L) before your lamp's true end-of-life is costly. **DepthQ® 3D's higher Total System Efficiency allows you to hit your foot-lamberts spec longer, maximizing your lamp investment.**



FAQ 13: What does 'maximizing lamp life' mean in dollars?

Bottom line...DepthQ® 3D saves you money on lamp costs. Using the same products and specifications in the three comparisons in FAQ 11, including a 10K Lumen lamp running 24FPS content at 144FPS 6 hrs/day 6 days/week on a 32' screen, and a 3D end-of-life of 4.5 ft-Lamberts, **DepthQ® 3D will save you approximately \$500 to \$1200 annually.**

FAQ 14: What do you mean by 'Advanced Heat Protection'?

Only DepthQ® 3D protects your investment from heat degradation over time with our advanced heat-rejecting metallic polarizer. See the video proof here: <http://bit.ly/10bmCyb>. **You won't burn it up. It won't yellow. It won't degrade.** All our competitors use...plastic laminated to glass. See the video proof here: <http://bit.ly/18tS7XY>.

FAQ 15: What is the Maximum Projector Power DepthQ® 3D allows?

DepthQ® 3D, with its heat-rejecting metallic pre-polarizer, has **NO** lamp limitations. When lamps get brighter, your DepthQ® will keep protecting your investment. Another reason we're future-proof.

FAQ 16: Other products have a bigger aperture. Isn't that better?

Large aperture devices require their apertures to be filled with light in order to stay cool, often causing you to move your projector back. **DepthQ® 3D's** heat-rejecting metallic polarizer allows a smaller aperture, letting you stay close to the lens, accommodating every DCI lens possible while saving space in your booth.

FAQ 17: Why do I see image softness and warping in other products?

Our competitors' products are not necessarily flat optically, and can soften or warp your image. **DepthQ® 3D** is laser-tested to meet a precise flatness specification, keeping your images sharp and uniformly focused. See the video proof here: <http://bit.ly/YYHMei>.

FAQ 18: What is your Contrast Ratio?

When it comes to contrast specifications, the true limiting factor is the quality of the silver screens, which are generally around 50:1. All polarized 3D products are subject to this constraint. **Our contrast is >100:1, which exceeds the screen.**

FAQ 19: Is there any real difference between a spinning wheel and DepthQ® 3D?

Besides the significantly longer Dark Time and lower Total System Efficiency, a mechanical spinning wheel that creates static electricity and attracts dust and popcorn oil is a high maintenance device. Additionally, there is a recurring \$500 expense to replace the wheel approximately once per year. **DepthQ® 3D** is a solid state, low-maintenance device that simply delivers more light to your guests.

FAQ 20: Will DepthQ® 3D work with my digital projector?

DepthQ® 3D works with any DCI-compliant DLP projector.

FAQ 21: Can I easily move DepthQ® 3D out of the way for 2D movies?

DepthQ® 3D includes a moving actuator with an easily-implemented IP remote control capability to **automatically** move the unit out of the way for 2D content, and back in place for 3D content...In just 4 seconds.



FAQ 22: Can I install DepthQ® 3D directly to my wall?

DepthQ® 3D includes all hardware necessary to mount directly to a wall, on a table top, or in a rack.

FAQ 23: Active 3D and Dolby® 3D glasses are expensive and uncomfortable. Are Yours?

DepthQ® 3D uses circular polarized 3D glasses, which are significantly lighter, more comfortable and much less expensive than either Dolby® or Active systems. Additionally, DepthQ® 3D is compatible with all circular polarization eyewear brands, so you can make your own choice.

FAQ 24: How does DepthQ® 3D's price compare to other brands?

DepthQ® 3D offers substantial benefits and operations cost savings over other brands, yet remains competitively priced, and is backed by a 3D Cinema 5 year optical and 3 year electronics/mechanical warranty.

FAQ 25: What is DepthQ® 3D's business model?

Buy DepthQ® 3D, and you own it forever. We require no collection of royalty, licensing fees, or participation in the box office. Plus, since our product is compatible with all circular polarization eyewear brands, you have the flexibility to use our glasses or choose your own.

FAQ 26: What do YOU mean by 'Hollywood Approved'?

We have demonstrated to, and been approved by six major Hollywood studios. Others' claims of 'Hollywood Approved', may just represent a single studio. Missing a studio's approval can literally lock you out of content. That's quite a risk.

FAQ 27: Why does your patent matter?

DepthQ® 3D is patented in the US (LC-Tec Displays AB U.S. Patent No. 8023052 B1), and patent-pending in Europe (No. 11818595.8) and China. **This novel patent protects you from claims of IP infringement.** If you buy a RealD® imitation you're taking an unnecessary risk.

FAQ 28: What companies are behind DepthQ® 3D?

With DepthQ® 3D your trust is well-placed. DepthQ® 3D is co-developed by Lightspeed Design, Inc. and LC-Tec Displays AB, two companies with over 40 years combined expertise in stereoscopic design and liquid crystal manufacturing and development. Lightspeed Design, Inc. is an established and trusted 3D provider for many discerning clients including Disney, Christie Digital, DreamWorks, Mercedes-Benz, Microsoft, Boeing, & NASA. LC-Tec invented rugged, fast polarization technology so innovative the original company and patents were purchased by 3M.

When you take in every technical and business factor - superior optics, brightness, speed, sharpness, heat protection, true HFR, six studio approvals, IP protection, simple business model, lamp savings, 3D Cinema five-year optical warranty and client satisfaction –

DepthQ® 3D is truly your "best in class" smart investment.



DepthQ®

by Lightspeed Design, Inc.