

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**EVERLIGHT ELECTRONICS CO., LTD,**  
*Plaintiff-Cross-Appellant*

**EMCORE CORPORATION,**  
*Plaintiff*

**EVERLIGHT AMERICAS, INC.,**  
*Counterclaim Defendant-Cross-Appellant*

v.

**NICHIA CORPORATION, NICHIA AMERICA  
CORPORATION,**  
*Defendants-Appellants*

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2016-1577, 2016-1611

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Appeals from the United States District Court for the  
Eastern District of Michigan in No. 4:12-cv-11758-GAD-  
MKM, Judge Gershwin A. Drain.

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Decided: January 4, 2018

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RAYMOND N. NIMROD, Quinn Emanuel Urquhart &  
Sullivan, LLP, New York, NY, argued for plaintiff-cross-  
appellant and counterclaim defendant-cross-appellant.

Also represented by RICHARD WOLTER ERWINE, ANASTASIA M. FERNANDS, MATTHEW A. TRaupMAN.

KENNETH A. GALLO, Paul, Weiss, Rifkind, Wharton & Garrison LLP, Washington, DC, argued for defendants-appellants. Also represented by DIANE GAYLOR; DANIEL KLEIN, CATHERINE NYARADY, PETER SANDEL, New York, NY.

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Before WALLACH, CHEN and HUGHES, *Circuit Judges*.

CHEN, *Circuit Judge*.

Everlight brought a declaratory judgment suit against Nichia seeking a determination of non-infringement, invalidity, or unenforceability of U.S. Patent Nos. 5,998,925 (the '925 patent) and 7,531,960 (the '960 patent) (together, the Patents-in-Suit). Nichia filed counterclaims for infringement against Everlight. In April 2015, a jury returned a verdict that claims 2, 3 and 5 of the '925 patent and claims 2, 14, and 19 of the '960 patent<sup>1</sup> were invalid due to obviousness. In June 2015, the district court held a bench trial and determined that Everlight failed to establish its inequitable conduct claim. *See Everlight Elecs. Co. v. Nichia Corp.*, 143 F. Supp. 3d 644, 646 (E.D. Mi. 2015); J.A. 65–66 (Final Judgment). Following the trials, Nichia moved for judgment as a matter of law (JMOL) of validity and/or a new trial, which the district court denied, holding that substantial evidence supported the jury verdict of invalidity. *See Everlight Elecs. Co. v. Nichia Corp.*, No. 12-cv-11758, 2016 WL 8232553, at \*1 (E.D. Mi. Jan. 19, 2016); J.A. 34–35 (Final Judgment). Nichia appeals this ruling. Everlight cross-

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<sup>1</sup> Nichia does not appeal the verdict with respect to claims 14 and 19 of the '960 patent. *See* Appellant's Br. 1–2.

appeals the ruling of no inequitable conduct. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1). Because the jury verdict is supported by substantial evidence, and because the district court did not err in denying Everlight’s inequitable conduct claim, we *affirm* on all grounds.

## DISCUSSION

### I. The Jury Verdict of Invalidity

We review a denial of JMOL under the law of the regional circuit. *Comcast IP Holdings I LLC v. Sprint Commc’ns Co., L.P.*, 850 F.3d 1302, 1309 (Fed. Cir. 2017). “[The Sixth Circuit] review[s] de novo a district court’s denial of a motion for judgment as a matter of law.” *Imwalle v. Reliance Med. Prod., Inc.*, 515 F.3d 531, 543 (6th Cir. 2008). “This court reviews a jury’s conclusions on obviousness de novo, and the underlying findings of fact, whether explicit or implicit in the verdict, for substantial evidence.” *Pregis Corp. v. Kappos*, 700 F.3d 1348, 1354 (Fed. Cir. 2012). Substantial evidence is “such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.” *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

A patent claim is unpatentable when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a).<sup>2</sup> Obvi-

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<sup>2</sup> Congress amended § 103 when it passed the Leahy-Smith America Invents Act (“AIA”). Pub. L. No. 112-29, § 3(c), 125 Stat. 284, 287 (2011). However, because the application that led to the Patents-in-Suit never contained (1) a claim having an effective filing date on or after March 16, 2013 or (2) a reference under 35 U.S.C.

ousness “is a question of law based on underlying findings of fact.” *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). The underlying factual findings include (1) “the scope and content of the prior art,” (2) “differences between the prior art and the claims at issue,” (3) “the level of ordinary skill in the pertinent art,” and (4) the presence of secondary considerations of nonobviousness such “as commercial success, long felt but unsolved needs, failure of others,” and unexpected results. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17 (1966); see *United States v. Adams*, 383 U.S. 39, 50–52 (1966).

#### A. The '925 Patent

Both Patents-in-Suit are directed to the combination of a blue light-emitting diode (LED) and a blue-to-yellow phosphor—a chemical which absorbs one color of light and emits another—to produce a white LED. Claim 2 is representative of the '925 patent claims and can be written in independent form as follows:

**2.** A light emitting device, comprising a light emitting component and a phosphor capable of absorbing a part of light emitted by the light emitting component and emitting light of wavelength different from that of the absorbed light;

wherein said light emitting component comprises a nitride compound semiconductor represented by the formula:  $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$  where  $0 \leq i$ ,  $0 \leq j$ ,  $0 \leq k$  and  $i+j+k=1$ ; and

wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Y and Al.

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§§ 120, 121, or 365(c) to any patent or application that ever contained such a claim, the pre-AIA § 103 applies. See *id.* § 3(n)(1), 125 Stat. at 293.

'925 patent col. 31, ll. 25–40. At the jury trial, Everlight presented Japanese Patent Application No. H05-152609 (Tadatsu) and U.S. Patent No. 6,600,175 (Baretz) to demonstrate that the use of phosphors with blue LEDs to alter the light profile emitted by the LED was known in the art. Tadatsu discloses use of a phosphor with a gallium nitride blue LED to achieve “conversion of a light of a number of wavelengths” or “color correction of blue LED.” J.A. 19827–28. Baretz discloses a “monochromatic blue or UV” LED which is “down-converted to white light by packaging the diode with . . . inorganic fluorescers and phosphors in a polymeric matrix.” J.A. 19759; *see also* J.A. 19768 col. 9, ll. 9–29 (disclosing use of phosphors to produce white light from a gallium nitride blue LED).

In conjunction, Everlight presented Mary V. Hoffman, *Improved color rendition in high pressure mercury vapor lamps*, 6 J. Illuminating Engineering Soc’y 89 (1977) (Hoffman), and U.S. Patent No. 4,727,283 (Philips) to demonstrate that the use of yttrium-aluminum-garnet (YAG) phosphors to downconvert blue light to yellow light was known in the context of mercury vapor lamps. Hoffman discloses use of a YAG phosphor to downconvert blue light with a wavelength of 436nm to yellow light with a wavelength of 560nm. J.A. 20408–09. Philips discloses use of a YAG phosphor to absorb “radiation having a wavelength between about 400 and 480 nm and convert it into radiation in a wide emission band . . . with a maximum [wavelength] at about 560 nm.” J.A. 19785 col. 2, ll. 51–55. Based on the above references and expert testimony from both parties, the jury rendered its verdict of obviousness.

The district court determined that the jury verdict was supported by substantial evidence because (1) the prior art demonstrated that both gallium nitride blue LEDs and YAG phosphors were known in the art; (2) evidence was presented at trial that a person of ordinary skill in the art would have desired to combine a blue-

to-yellow phosphor with a blue LED to produce a white LED; and (3) a reasonable jury could have found secondary considerations to fail to weigh in favor of patentability. See *Everlight*, 2016 WL 8232553, at \*8–9. In particular, the court noted evidence presented at trial that blue LEDs were “well known in the art,” that “it was known that blue LEDs could be combined with phosphors to change the color of the light emitted by the LED,” that “it has been known for over 300 years that mixing blue and yellow light results in white light,” and that “YAG was used in conjunction with blue light sources, including cathode ray tubes, blue lasers and blue mercury vapor lamps, to make white light.” *Id.* at \*9. Thus, the court concluded that substantial evidence supported the conclusion that all of the elements of claims 2, 3, and 5 of the ’925 patent were present in the prior art.

As to motivation to combine, the district court noted that evidence was presented to the jury that (1) there was a large market demand for white LEDs; (2) the gallium nitride blue LED was a revolutionary breakthrough which was necessary to the development of a white LED; (3) testimony from both parties indicated that the invention of the blue LED naturally led to the use of a blue-to-yellow phosphor to produce a white LED; (4) there were a limited number of blue-to-yellow phosphors; and (5) YAG’s properties were well-known to skilled artisans at the time of the alleged invention. *Id.* at \*10. Thus, the district court found that a reasonable jury could have concluded that the alleged invention was no more than the “combination of familiar elements according to known methods” to “yield predictable results.” *Id.* (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007)).

On secondary considerations, the district court noted that although Nichia had presented evidence of commercial success, a reasonable jury could have found that evidence to be undermined by credible doubts raised at trial as to the nexus between the patented features and

the success. *See Pregis*, 700 F.3d at 1356 (“The lack of nexus between the claimed subject matter and the commercial success or purportedly copied features . . . renders [] proffered objective evidence uninformative to the obviousness determination.”). Furthermore, the court noted, Everlight had presented substantial evidence of simultaneous invention of the alleged invention by Osram, a competitor of Nichia. *Everlight*, 2016 WL 8232553, at \*12–13 (citing *Geo. M. Martin Co. v. All. Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1305 (Fed. Cir. 2010)). Thus, a reasonable jury could have found that secondary considerations did not weigh in favor of nonobviousness.

We agree with the district court that substantial evidence supports the jury verdict of invalidity. Every element of the claimed invention was separately present in the prior art, and the jury heard evidence that a person of ordinary skill at the time of invention would have desired to combine a blue-to-yellow phosphor with a blue LED to produce white light, and would have been aware of YAG as a useful blue-to-yellow phosphor. This evidence is sufficient for a reasonable jury to conclude that the asserted claims would have been obvious. As to secondary considerations, the jury heard evidence which weighed in both directions and evidence attacking the credibility of the various asserted secondary considerations. For example, the jury heard evidence of independent development by Osram of a white LED “within weeks of Nichia.” *Id.* at \*12; *see* J.A. 17817–19, 20353–55. Furthermore, the jury heard evidence undermining whether Nichia’s evidence of commercial success and contemporary praise were actually due to the claimed invention and whether Nichia’s expert was unbiased. *See Everlight*, 2016 WL 8232553, at \*12–13; *see also* J.A. 18019, 21808, 22447–49 (awards and licenses that cover products beyond the inventions in the Patents-in-Suit). A reasonable jury could have drawn a variety of conclusions regarding the strength and credibility of the evidence. We

will not reweigh that evidence here. *See In re Inland Steel Co.*, 265 F.3d 1354, 1366 (Fed. Cir. 2001); *cf. Rothman v. Target Corp.*, 556 F.3d 1310, 1322 (Fed. Cir. 2009) (“Because the district court duly instructed the jury to consider and weigh evidence of secondary considerations, this court sees no reason to disturb the jury’s determination that this important factual evidence did not outweigh its assessment of obviousness in light of the prior art.”).

Nichia argues before this court that a person of ordinary skill would not have been motivated to combine a blue LED with a YAG phosphor because (1) the disclosure of blue LEDs in the prior art focused on a so-called “three-color” solution in which multiple phosphors produced a combination of red, green, and blue light to achieve white light rather than the “two-color” solution of the ’925 patent (i.e. blue + yellow), Appellant’s Br. 30–33; (2) a person of ordinary skill would not have recognized useful properties of YAG phosphors such as moisture resistance, *id.* at 30–33, 47–48; and (3) the prior art discouraged use of YAG with a blue light source because of poor color rendering, *id.* at 43–47. We disagree on all points.

First, it is not necessary that the prior art teach a two-color solution in order for the jury verdict to be supported by substantial evidence.<sup>3</sup> It is sufficient that the prior art recognize that blue LEDs can be combined with phosphors to produce varying light profiles,<sup>4</sup> that combi-

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<sup>3</sup> Although we do not reach this point, we recognize that both the district court and Everlight pointed to statements in the prior art which suggest a two-color solution. *See, e.g.*, J.A. 18524–27; J.A. 19759 col. 9, ll. 45–50, col. 10, l. 66 – col. 11, l. 6; *see also* ’925 patent col. 1, l. 56 – col. 2, l. 7 (describing prior art).

<sup>4</sup> We recognize that Everlight’s expert made arguably inaccurate statements at trial regarding whether Baretz and Tadatsu disclose a blue-to-yellow phosphor. *See* J.A.

nation with a blue-to-yellow phosphor would yield white light, and that a strong market demand existed for a white LED. See *Everlight*, 2016 WL 8232553, at \*9 (“[I]t was known that blue LEDs could be combined with phosphors to change the color of light emitted by the LED.” (citing trial exhibits and transcript)), *id.* (“[I]t has been known for over 300 years that mixing blue and yellow light results in white light (citing trial transcript)), *id.* at \*10 (“[It was an] undisputed fact that there was a large market demand for white LEDs. . . . Nichia’s expert conceded [that] the development of a commercially viable blue LED ‘gave everyone the incentive to move forward to create a simple blue plus yellow LED that emits white light.’” (quoting trial transcript)).

We further disagree that a person of ordinary skill needed to be aware of the moisture-resistant properties of YAG to satisfy the motivation to combine requirement. It is sufficient to support the jury verdict that a person of ordinary skill would desire to combine a blue-to-yellow phosphor with a blue LED and that YAG was one of a limited number of available blue-to-yellow phosphors. See *KSR*, 550 U.S. at 421 (“When there is a design need . . . to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp.”). Given that significant motivation to use a YAG phosphor, it does not matter

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17581–82 (stating that Baretz discloses using blue light and yellow phosphor to achieve white light); see also J.A. 17600–08 (making similar statements with respect to Tadatsu). Because other evidence before the jury was sufficient to support a finding of obviousness, and because Nichia had the opportunity to cross-examine Everlight’s expert, we decline to reweigh the evidence presented to the jury.

that YAG may provide properties unappreciated at the time of invention which are superior to other blue-to-yellow phosphors; even if the prior art did not identify all of the problems identified by Nichia in the '925 patent's specification, we have never required a party to prove that all possible problems solved by an invention were known in the prior art. Proof of one motivation to combine, as shown here, is sufficient.<sup>5</sup>

We also disagree that the statements in the prior art that YAG phosphors provided poor color rendering taught away from the claimed invention.<sup>6</sup> See Appellant's Br. 43 (quoting J.A. 19786 (stating YAG "is detrimental to the colour rendition properties"), 20410 ("The emission contribution of YAG . . . would definitely result in a lower

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<sup>5</sup> Nichia also does not contest that Baretz sought to solve the problem of general degradation by elements such as heat and light, *see* Appellant's Br. 30–31; *see also* Baretz col. 5 ll. 2–8, col. 9 ll. 65–66 (discussing degradation), nor that YAG was known in the prior art to be resistant to at least intense light degradation, *see* Appellant's Br. 12 ("YAG had previously been used in cathode ray tubes but its resistance to light and moisture had not been appreciated because, unlike LEDs, cathode ray tubes are hermitically sealed against moisture."). "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *KSR*, 550 U.S. 398, 420 (2007) (emphasis added).

<sup>6</sup> Nichia makes the same arguments for color rendering with respect to lack of reasonable expectation of success and unrecognized problem in the field as with the moisture resistant properties of YAG. *See* Appellant's Br. 47–48. For the reasons stated above, we find these arguments unpersuasive.

CRI [color rendering index.]”). Teaching away is a question of fact and requires a showing that a skilled artisan “would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012). A person of ordinary skill desiring to create a white LED could plausibly look to the cited prior art references despite their statements on color rendition because they aided in the creation of a white LED, which was a highly desired goal. Without additional evidence, the jury could reasonably have found that the color rendition properties of the prior art would not have taught away from the creation of a white LED.

#### B. The '960 Patent

The '960 patent is directed to a similar LED/phosphor system as the '925 patent without the YAG phosphor limitation. Instead, the '960 patent teaches that the phosphor is concentrated near the surface of the LED chip to minimize environmental degradation. Claim 2 of the '960 patent, the only claim at issue in this appeal, can be written in independent form as follows:

**2.** A light emitting device which comprises;

a light emitting component having a gallium nitride based semiconductor; and

a resin containing at least one phosphor capable of absorbing a part of a first light of blue color emitting from the light emitting component and emitting a second light of wavelength different from that of the absorbed first light, said emission of the second light emitted from at least one fluorescent material and a light of an unabsorbed first light passes through said fluorescent material from said light emitting component, said unab-

sorbed first light and said second light are capable of overlapping each other to make white light;

wherein a concentration of the phosphor increases from the surface of a resin that contains the phosphor toward the light emitting component.

'960 patent col. 30, l. 65 – col. 31, l. 19. In addition to Baretz and Tadatsu, Everlight presented Japanese Patent Publication No. 52-40959 (JP-959) to demonstrate that the fabrication of resins with a phosphor gradient was known in the prior art. JP-959 describes a process for curing phosphor-infused resins in which gravity is allowed to concentrate the phosphor. Figure 1C of that reference shows that when the resin/chip combination is placed with the chip below the resin, the phosphor concentrates on the surface of the chip. The reference further teaches that the phosphor within the resin “settles downward” and “is concentrated.” J.A. 19881–82. Based on JP-959, Baretz, Tadatsu, and expert testimony from both parties, the jury rendered its verdict of obviousness.

The district court determined that the jury verdict was supported by substantial evidence because JP-959 disclosed a phosphor gradient in Figure 1C and taught that the phosphor “settles downward” and “is concentrated.” With regard to motivation to combine, the district court found that the jury had heard evidence that Baretz discussed various configurations of the phosphor to avoid degradation, and that there were a limited number of ways to disperse the phosphor within the resin. *See Everlight*, 2016 WL 8232553, at \*13.

On appeal, Nichia argues that JP-959 did not in fact disclose the gradient of claim 2 of the '960 patent because Figure 1C was only an intermediate step, and the goal of JP-959 was to concentrate the phosphor on the outer surface of the resin, rather than the inner surface. We agree with Nichia that a person of ordinary skill following the steps of the JP-959 reference to completion would not

produce the '960 patent's claimed gradient. However, we conclude that a reasonable jury could find that an artisan of ordinary creativity would be drawn to use the teachings of the JP-959 patent, including that the phosphor "settles downward" and "is concentrated," and the teachings of Baretz that the phosphor should be configured away from the surface to avoid degradation to produce the phosphor gradient of the '960 patent.

Nichia also argues that a skilled artisan would not be motivated to combine Baretz and JP-959 because Baretz's teachings to avoid "degradation" are insufficient guidance and the specific problem which the phosphor gradient solved, degradation due to moisture, was not identified in the prior art. *See* Appellant's Br. 57–59. We disagree. Baretz teaches that the phosphor should be deployed within the LED assembly in a way that it is "not subject to abrasion, or degradation," and gives several examples of the ways in which it can be so deployed. J.A. 19768 col. 9, l. 51 – col. 10, l. 19. A reasonable jury could conclude that an artisan of ordinary creativity would assess the phosphor location according to the guidance of Baretz and deploy it near the surface of the LED chip according to the teachings of JP-959.<sup>7</sup>

## II. Inequitable Conduct

We review the district court's factual findings regarding inequitable conduct for clear error, and the ultimate

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<sup>7</sup> Nichia also reiterates its arguments regarding the jury's alleged failure to weigh its secondary consideration evidence. We reject these arguments for the same reasons stated above for the '960 patent. Because we conclude that the jury verdict of invalidity is supported by substantial evidence, we decline to address Everlight's argument that the term "white light" in claim 2 of the '960 patent is indefinite.

decision as to inequitable conduct for abuse of discretion. *Star Sci., Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1365 (Fed. Cir. 2008). “If the district court’s inequitable conduct determination rests on a clearly erroneous finding of materiality or intent, it constitutes an abuse of discretion and must be reversed.” *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 651 F.3d 1318, 1334 (Fed. Cir. 2011). Generally, “[t]o prove inequitable conduct, the accused infringer must provide evidence that the applicant (1) misrepresented or omitted material information, and (2) did so with specific intent to deceive the [U.S. Patent and Trademark Office].” *Id.* Intent must be shown by clear and convincing evidence, and must be “the single most reasonable inference able to be drawn from the evidence.” *Therasense Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011) (en banc).

Everlight argued before the district court that statements in the ’960 patent specification submitted to the U.S. Patent and Trademark Office (USPTO) that the inventors achieved an LED with peak wavelengths “near 600 nm” were intentionally false. J.A. 60–61. The district court held that Everlight had not shown but-for materiality because it had not sufficiently questioned the inventors to establish a record that their statements to the USPTO were actually false. *Everlight*, 143 F. Supp. 3d at 658–59. The district court additionally concluded that Everlight had not shown specific intent to deceive the USPTO because the single most reasonable inference to be drawn from the evidence was that “the inventors *should have* been more careful in keeping a record of this information and documenting their findings.” *Id.* at 662 (emphasis in original).

We see no reversible error in the district court’s finding that a mere showing that documents should have been submitted to the USPTO but have been lost, without a showing of additional facts probative of intent to deceive, does not rise to the level of specific intent under this

court's precedent. *See Therasense.*, 649 F.3d at 1290 (“In a case involving nondisclosure of information, clear and convincing evidence must show that the applicant *made a deliberate decision* to withhold a known material reference.”) (emphasis in original). Because we agree that the requisite showing of specific intent is lacking, we need not reach the issue of but-for materiality. *See id.* (“To prevail on a claim of inequitable conduct, the accused infringer must prove that the patentee acted with the specific intent to deceive the PTO.”).

#### CONCLUSION

We have considered all of the parties' other arguments and find them unconvincing. For the foregoing reasons, the opinion of the district court is

#### **AFFIRMED**

#### COSTS

No costs.