Trials@uspto.gov
571-272-7822

Paper 72
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CQV CO., LTD.,
Petitioner,

v.

MERCK PATENT GMBH,
Patent Owner.

PGR2021-00054
Patent 10,647,861 B2

Before JO-ANNE M. KOKOSKI, KRISTINA M. KALAN, and JON B. TORNQUIST, *Administrative Patent Judges.*

KALAN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision on Remand
Determining No Challenged Claims Unpatentable
35 U.S.C. §§ 144, 328

I. INTRODUCTION

We address this case on remand after a decision by the United States Court of Appeals for the Federal Circuit in *CQV Co., Ltd. v. Merck Patent GmbH.*, 130 F.4th 1344 (Fed. Cir. 2025) (Paper 67, "*CQV*"). For the reasons discussed herein, we determine that CQV Co., Ltd. ("Petitioner") has not shown, by a preponderance of the evidence, that any of the challenged claims are unpatentable.

A. Procedural History

Petitioner filed a Petition (Paper 2, "Pet.") requesting post-grant review of claims 1–22 of U.S. Patent No. 10,647,861 B2 (Ex. 1001, "the '861 patent"). Merck Patent GmbH ("Patent Owner") filed a Preliminary Response to the Petition, Paper 6. We instituted post-grant review of claims 1–22 of the '861 patent on the grounds of unpatentability alleged in the Petition. Paper 7 ("Decision" or "Dec."). Patent Owner filed a Request for Rehearing of our Decision instituting post-grant review. Paper 9. We denied Patent Owner's Request for Rehearing. Paper 16.

After institution of trial, Patent Owner filed a Patent Owner Response. Paper 24 ("PO Resp."). Petitioner filed a Reply. Paper 33 (sealed version); Paper 34 (public version) ("Reply"). Patent Owner filed a Sur-Reply. Paper 41 ("Sur-Reply"). We held an oral hearing on June 1, 2022, and a transcript of the hearing is included in the record. Paper 54 (sealed version); Paper 63 (public version) ("Tr.").

On August 11, 2022, we issued a Final Written Decision in this proceeding in accordance with 35 U.S.C. § 328(a). Paper 56 (sealed version); Paper 61 (public version) ("Final Written Decision" or "Final Dec."). We concluded that Petitioner had not established by a

preponderance of the evidence that claims 1–22 of the '861 patent were unpatentable as obvious, or that Xirallic® Sample C qualifies as prior art to the '861 patent. Final Dec. 13–33. Petitioner appealed the Final Written Decision to the United States Court of Appeals for the Federal Circuit. Paper 64.

The Federal Circuit vacated and remanded our patentability determinations concerning claims 1–17 and 21, stating that "[o]n remand, the Board should carefully consider and explain whether, taken as a whole, the evidence establishes that Sample C was more likely than not available as of the alleged critical dates." *CQV* 9.

On May 5, 2025, the Board, via email, authorized the parties to file supplemental briefing, stating: "No additional evidence or briefing is authorized, nor shall any additional oral argument take place." Ex. 3002. Pursuant to this authorization, Petitioner filed Supplemental Briefing After Remand (Paper 70, "Pet. Br. Rem.") in support of its contentions. Patent Owner filed a Response to Petitioner's Supplemental Briefing After Remand (Paper 71, "PO Br. Rem.") in support of its contentions.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision on Remand is issued pursuant to 35 U.S.C. § 328(a). For the reasons that follow, we determine that Petitioner has not shown unpatentability of any challenged claim by a preponderance of the evidence.

B. The '861 Patent

The '861 patent is directed to alumina ("Al_2O_3") flakes, and in particular, alpha-alumina ("α-Al_2O_3") flakes, and their use in paints, industrial coatings, automotive coatings, printing inks, cosmetic formulations, and, particularly as a transparent substrate for effect pigments.

Ex. 1001, 1:3–6. The Specification explains that "[i]mparting a pearlescent luster, metallic luster, color flop or multicolor effect can be achieved by using pearlescent pigments based on natural or synthetic transparent flakes." *Id.* at 1:7–9. According to the Specification, "[p]earlescent pigments based on α-Al_2O_3 flakes are well-known in the literature and commercially available under the trademark XIRALLIC® from Merck KGaA." *Id.* at 1:10–12.

Important factors of a substrate for an effect pigment include particle size, shape, surface property, and refractive index. Ex. 1001, 1:13–15. For example, "the smaller the particle size, the larger the surface area, thereby increasing the coloration and enhancing reflectivity, and offering a more vivid color." *Id.* at 1:21–23. Uniform particle size is essential to achieve a vivid and uniform color because different sized particles exhibit different proportions of reflection and transmission of light on the particle surface. *Id.* at 1:15–18.

According to the Specification, prior art Al_2O_3 flakes are disadvantageous because they do not have high chemical stability and/or do not have the desired smoothness for use in cosmetic and paint applications. Ex. 1001, 1:54–57. "The object of the present invention is to provide improved Al_2O_3 flakes having at the same time a high chemical stability, a smooth surface and high whiteness." *Id.* at 1: 58–60. The Specification states: "Surprisingly, it has now been found that the properties of the alumina flakes as such and of effect pigments based on alumina flakes can be increased by using alumina flakes with precisely defined dimensions and particle size and thickness distribution." *Id.* at 1:59–65. In particular, "the optical properties of the alumina flakes and the effect pigments based on

alumina flakes can be influenced by altering particle size distribution." *Id.* at 1:65–67.

The transparent alumina flakes of the present invention are "distinguished by the fact that they have a thickness of less than 500 nm, a D_{90}-value of 30-45 μm and a D_{50}-value of 15-30μm." Ex. 1001, 2:1–4. The Specification explains:

> The particle size distribution D_{50} is also known as the median diameter or the medium value of the particle size distribution, it is the value of the particle diameter at 50% in the cumulative distribution and is one of the important parameter[s] characterizing the particle size of pigments.
>
> Correspondingly, the D_{90} value indicates the maximum longitudinal dimensions of the Al_2O_3 flakes, as determined again by means of laser granulometry in the form of sphere equivalents, which 90% of the particles attain at maximum, or fall below, out of the entirety of all Al_2O_3 particles.

Id. at 2:27–33. The flakes are also described in terms of the D_{10} value, which "indicates the value of the longitudinal dimension of the Al_2O_3 flakes, as determined by means of laser granulometry in the form of the sphere equivalent, which 10% of the flakes attain at most, or fall below, out of the entirety of all the Al_2O_3 flakes." *Id.* at 2:40–44.

The Specification states that the "desired size and thickness distribution can be obtained by suitable classification of the flakes, such as by classifying through selected screens and the like." Ex. 1001, 2:57–59. The addition of one or more dopants may also be useful to control particle size, thickness, optical properties and/or surface morphology. *Id.* at 3:50–53. Such dopants are "preferably selected from the following group of compounds: TiO_2, ZrO_2, SiO_2, In_2O_3, SnO_2, ZnO and combinations thereof." *Id.* at 3:54–56.

According to the Specification, when compared to the prior art, the alumina flakes of the present invention provide improved optical properties, in particular, increased chroma, higher luster, lower haze and excellent finishing, as well as a high chemical stability. Ex. 1001, 2:5–9.

C. Illustrative Claim

Independent claim 1 of the '861 patent is illustrative of the claimed subject matter we consider on remand and is reproduced below:

> 1. Al_2O_3 flakes having a particle thickness of 130-400 nm, a D_{50}-value of 15-30 μm, a D_{90}-value of 30-45 μm, a D_{10}-value of <9.5 μm and wherein the flakes are α-alumina flakes.

Ex. 1001, 13:53–56.

D. Instituted Grounds of Unpatentability

We instituted post-grant review of claims 1–22 (Dec. 7–8, 29) and, in the Final Written Decision, limited the review to the following grounds:

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1–13, 15–17, 21	103	Xirallic product,[2] Masuko,[3] Pfaff,[4] Teaney[5]

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because applications from which the '861 patent claims priority were filed after this date, the AIA version of § 103 applies.

[2] Xirallic product allegedly in public use, on sale, or otherwise available to the public prior to the critical date (referred to herein as "Xirallic" or "Xirallic product."). *See* Pet. 1 n.1, 11–25.

[3] Masuko, JP2001-232284A, published Aug. 28, 2001 (Certified English Translation) ("Masuko," Ex. 1029).

[4] Pfaff, *Special Effect Pigments: Technical Basics and Applications*, 2d Rev. Ed. 2008, EUROPEAN COATINGS TECH FILES, 72–75 ("Pfaff," Ex. 1034).

[5] Teaney et al., *New effect pigments using innovative substrates: Silica and alumina flakes extend the product variety and performance range of pearlescent pigments*, 4 EUROPEAN COATINGS J. 90 (1990) ("Teaney," Ex. 1032).

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
14	103	Pfaff, Masuko, Applicant's Admissions,[6] Xirallic product[7]
18–20	103	Masuko, Shimizu, Teaney, Pfaff, Schumacher,[8] Lee-445,[9] Lee-225,[10] Lee-719[11]
22	103	Lee-225

Two additional grounds were asserted in the Petition and were initially part of this proceeding, as discussed in the Institution Decision. *See* Pet. 5–6; Dec. 7–8, 25–27. The additional grounds combined: (a) Masuko, Shimizu, Teaney, Pfaff, and Schumacher to challenge claims 1–3, 5–13, 15–17, and 21; and (b) Masuko, Shimizu, Teaney, Pfaff, Schumacher, and Lee-719 to challenge claim 4. Pet. 5; Dec. 7. At the oral hearing, Petitioner confirmed its withdrawal of these two grounds. *See* Tr. 9:5–10:7.

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[6] Prosecution History of the '861 patent, Appeal Brief for Application No. 14/264,431 ("the '431 Application"), filed Apr. 29, 2014 ("Applicant's Admissions," Ex. 1003).

[7] Petitioner argues this ground based upon Pfaff, Masuko, Applicant's Admissions, and Xirallic product. *See* Pet. 85–88. As noted in the Institution Decision, *see* Dec. 7 n.9, we consider that combination rather than the combination set forth in the list of challenges at page five of the Petition, which we found mistakenly included Lee-445 and mistakenly omitted Pfaff and Masuko. Petitioner has not argued otherwise in the Reply. *See* Reply.

[8] Schumacher et al., US 2011/0226161 A1, published Sept. 22, 2011 ("Schumacher," Ex. 1035).

[9] Lee et al., US 2010/0015445 A1, published Jan. 21, 2010 ("Lee-445," Ex. 1043).

[10] Lee et al., US 2009/0186225 A1, published Jul. 23, 2009 ("Lee-225," Ex. 1044).

[11] Lee et al., US 2009/0320719 A1, published Dec. 31, 2009 ("Lee-719," Ex. 1042).

Accordingly, the Final Written Decision did not address the two withdrawn grounds, and we do not address them here.

Petitioner relies on the Declarations of Jack A. Ladson (Ex. 1002), Byung-Ki Choi (Exs. 1004, 1058, 1066), SeungHoon Mo (Exs. 1018, 1065), KwangChoong Kang (Ex. 1021), Kyeong Youl Jung (Ex. 1056), and Carrie Gardner, Ph.D. (Ex. 1059). Patent Owner relies on the Declarations of Christopher S. Palenik, Ph.D. (Ex. 2005), Masayuki Momose (Ex. 2006), and Hans-Peter Fritsch (Ex. 2007).

In the Final Written Decision, we determined Petitioner had not met its burden of establishing, by a preponderance of the evidence, that the challenged claims were unpatentable. Final Dec. 13–33. *CQV* only affects our Final Written Decision regarding claims 1–17 and 21. *CQV*, 9. Accordingly, as directed by *CQV*, we assess Petitioner's challenge of claims 1–13, 15–17, and 21 as obvious over Xirallic product, Masuko, Pfaff, and Teaney, and Petitioner's challenge of claim 14 as obvious over Pfaff, Masuko, Applicant's Admissions, and Xirallic product. We maintain our decision regarding claims 18–20 and 22. *See* Final Dec. 31–33 (analysis of claims 18–20 and 22).

II. DISCUSSION

A. The Issue on Remand

In *CQV*, the Federal Circuit considered whether the Board's determination that Xirallic® Sample C does not qualify as prior art is supported by substantial evidence. *CQV*, 2, 6–9. Petitioner argued that the Board erred by failing to consider certain evidence. *Id.* The Federal Circuit agreed and found that "the Board erred by failing to consider the whole record." *Id.* at 7. The Court found, for example, that the "Board omitted

from its opinion any discussion of Mr. Fritsch's testimony that Xirallic® can generally 'be grabbed by . . . a customer order' 'after being released by . . . quality control,'" and "testimony that '[t]he quality control process for Adamas products requires an average of two to three weeks.'" *Id.* at 8. The Federal Circuit noted that Patent Owner made "some plausible arguments for why the Board may have disregarded the quality control evidence: perhaps the Board thought that Sample C was only an experimental batch, or perhaps the Board believed that Sample C was treated differently," but the Federal Circuit found that those arguments failed "because the Board did not make these findings, nor did it provide any basis for [the Federal Circuit] to make those inferences on its behalf." *Id*.

The Federal Circuit remanded the case to the Board "for further consideration and explanation of its analysis" because the Court could not "discern whether the relevant evidence was properly evaluated." *CQV*, 7. The Court directed the Board to

> carefully consider and explain whether, taken as a whole, the evidence establishes that Sample C was more likely than not available as of the alleged critical dates. In so doing, it should be careful not to overstate the required degree of certainty. *See* Decision at 29. The party with the burden of persuasion loses on a point only if the fact trier of the issue is left uncertain "as required by the applicable standard." *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378–79 (Fed. Cir. 2015). In other words, a party with the burden of persuasion must convince the factfinder to the degree of certainty required by the standard (here, preponderance of the evidence), and no further. *Id.*

Id. at 9.

B. Xirallic® Product Summary

Xirallic® is a product line sold by Patent Owner that includes T60-10, T60-20, T60-21, T60-23, F60-50, and F60-51 variants, as well as SW and WII variants. PO Resp. 8–9. Indeed, Merck KGaA disclosed in its 2005 Annual Report that "the success of high-intensity crystal effect pigments of the Xirallic® range continued unabated. A new pigment was added to the range in 2005. Sales of the aluminum-oxide-based Xirallic® pigments have nearly reached the level of the classic mica-cased products." Ex. 1028, 63.[12] US Patent No. 6,641,874 B2 ("Kuntz"), issued in 2003,[13] refers to "Xirallic" as a commercially available pigment from Merck KGaA that is an example of a particularly suitable pearlescent pigment for its invention. Ex. 1026, 5:10–12. Xirallic pigments are also referred to in Masuko as commercially available alumina flake pigments sold by Merck Japan. Ex. 1029 ¶ 21. Pfaff also describes "Xirallic" pigments as being available on the market. Ex. 1034, 72–73. The record also includes: Merck KGaA Technical Data Sheets for a number of Xirallic® pigments (*see* Exs. 1005–1010, collectively, "the Technical Data Sheets");[14] Merck KGaA Certificates of Analysis for certain batches of Xirallic® pigments (*see* Exs. 1011–1017, collectively "the

[12] Merck KGaA, 2005 Annual Report, dated February 16, 2006 (Ex. 1028, "Annual Report").
[13] Kuntz et al., US Patent No. 6,641,874 B2, issued Nov. 4, 2003 (Ex. 1026, "Kuntz").
[14] Exhibits 1005–1009 reflect a "Date of Issue" of October 2002. Exhibit 1010 reflects a "Date of Issue" of January 2003.

Certificates of Analysis");[15] and a Merck KGaA Material Safety Data Sheet for a Xirallic® pigment (*see* Ex. 1025).[16]

Petitioner and Mr. Choi identify "Sample C" as the code for Xirallic® product F60-50 SW with lot number H07022030S that was subjected to acid treatment for analysis. *See* Pet. 19–20; Ex. 1004 ¶ 7; Ex. 1018 ¶ 5; Ex. 1019, 2–7. At the oral hearing, counsel for Petitioner confirmed that Petitioner primarily relied on Sample C, among the number of samples referenced, to satisfy each and every claim limitation. *See* Tr. 19:8–21. Petitioner's counsel agreed that it would be acceptable for the Board to focus its analysis on Sample C in the Final Written Decision. *See id.* at 19:22–20:4. Accordingly, the Board focused on Sample C as the representative Xirallic® sample asserted by Petitioner in the Final Written Decision (*see* Final Dec. 25) and continues to do so herein. We note that the parties often refer to "Samples B and C" together throughout the record. Samples B and C were taken from the same lot (H070220305) of the same product (F60-50SW). PO Resp. 13. A distinction between the two is in the particle composition: Sample B is Al_2O_3 coated with Fe_2O_3, whereas Sample C is Al_2O_3 only (due to acid treatment). Ex. 1004 ¶ 7. Patent Owner argues that "evidence and testimony concerning the sale of Sample B is equally relevant to Sample C, and vice versa." PO Br. Rem. 1 n.1.

We discuss below the parties' dispute regarding whether Xirallic® Sample C is available as prior art in this proceeding.

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[15] Exhibits 1011–1017 reflect various "Dates of Release" in 2011 and 2012.
[16] Exhibit 1025 reflects a "Print Date" and "Effective Date" of November 22, 2006.

C. Whether Xirallic® Sample C is Prior Art

1. Legal Standards

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware*, 800 F.3d at 1378. Petitioner must demonstrate unpatentability by a preponderance of the evidence, i.e., that it is more likely than not that the claims are unpatentable. 35 U.S.C. § 326(e); 37 C.F.R. § 42.1(d); *see also Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). Petitioner bears the burden of establishing by a preponderance of the evidence that its alleged prior art was available to the public. *See, e.g.*, *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 11 (PTAB Dec. 20, 2019) (Precedential Opinion Panel decision); *Nobel Biocare Servs. AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1375 (Fed. Cir. 2018) (citing *Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1380 (Fed. Cir. 2018)); *In re Wyer*, 655 F.2d 221, 227 (CCPA 1981).

Under § 102(a)(1), an invention is unpatentable if "the claimed invention was . . . in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention." 35 U.S.C. § 102(a)(1). The Supreme Court describes "otherwise available to the public" as a "catchall clause" that "captures material that does not fit neatly into the statute's enumerated categories but is nevertheless meant to be covered." *Helsinn Healthcare S.A. v. Teva Pharms. USA, Inc.*, 586 U.S. 123, 131–132 (2019). It is within this framework that we analyze whether Xirallic® Sample C qualifies as prior art.

2. The Parties' Positions

Petitioner contends "Merck KGaA's Xirallic® pigments have been commercially available since well before the effective filing date of the '861 patent." Pet. 12. According to Petitioner, "Xirallic® has been commercially available since at least March of 2000." *Id.* at 11. Petitioner argues that the "pertinent date is not when *CQV* obtained the samples but, rather, when product from the tested lots" was "first 'in public use, on sale, or otherwise available to the public.'" Reply 7 (citing 35 U.S.C. § 102(a)(1)). Petitioner argues that with "respect to Samples B and C, Xirallic®F60-50 SW (H07022030S) was manufactured in 2007" (*id.* at 5), and "a preponderance of the evidence shows that Xirallic® F60-50 SW (H07022030S) was commercially available before the April 30, 2012 critical date asserted by Merck" (*id.* at 6).

Patent Owner contends that "Petitioner has failed to sufficiently evidence a *prima facie* case that the tested products and lots are prior art." PO Resp. 8. Patent Owner argues that Petitioner's arguments are insufficient because "Xirallic® is a broad product line containing many products" and "Petitioner's argument fails to distinguish between the Xirallic® product line, particular Xirallic® products within the product line, and the specific lots of product that Petitioner tested." *Id.*

Regarding Samples B and C, Patent Owner contends that Petitioner fails "to provide the requisite evidence to prove the product was purchased prior to the April 2013 effective filing date" (PO Resp. 13) and has no evidence that the lot of Sample C "was manufactured before the April 2012 critical date" (*id.* at 14). Patent Owner argues that Petitioner "does not provide enough detail necessary to prove there was a 'commercial sale'" and

that there is "no information to determine when a contract was established, that there was consideration for the exchange, that the product was available to be delivered when the alleged transaction took place, or even when the product was delivered." Sur-Reply 24–25. According to Patent Owner, "Petitioner's arguments that a product would be made available soon after manufacture assumes that the product was, indeed, manufactured for sale – a point on which Petitioner provides no evidence or argument for any of the tested lots." *Id.* at 26. Moreover, the "circumstances by which Petitioner obtained the product was by no means conventional, and does not suggest its lots were products made for sale." *Id.*

With the *CQV* decision and the parties' arguments and evidence before us, we consider the issue on remand below. As discussed above, Petitioner bears the burden of proving Xirallic® Sample C is prior art. For the reasons discussed below, we find that Petitioner has not met its burden to demonstrate that Sample C is available as prior art under 35 U.S.C. § 102(a)(1).

a) Asserted Public Availability of Xirallic®

(1) Petitioner's Arguments and Evidence

Petitioner contends that the Xirallic® product line of pigments was "commercially available since at least March of 2000." Pet. 11. Petitioner asserts that in "Kuntz [Ex. 1026], Merck identified Xirallic® as a 'commercially available' pearlescent pigment 'from Merck KGaA.'" *Id.* (quoting Ex. 1026, 5:10–13). Petitioner notes that Patent Owner's 2005 Annual Report states:

> In the Coating Pigments business field, the success of high-intensity crystal effect pigments of the Xirallic® range continued unabated. A new pigment was added to the range in 2005. Sales

> of the aluminum-oxide-based Xirallic® pigments have nearly reached the level of the classic mica-based products.

Id. (quoting Ex. 1028, 63). Petitioner refers to Masuko as "identif[ying] Xirallic® as a commercially available alumina flake pigment," examples of which "are found in the 'Xirallic' series such as 'Xirallic T60-20WII Sunbeam Gold' (trade name) sold by Merck Japan.'" *Id.* (quoting Ex. 1029 ¶ 21). Petitioner next asserts that Pfaff "describes the α-Al_2O_3 flakes of Xirallic® in detail, and stated that '[t]he effect pigments so described are available on the market as 'Xirallic' pigments.'" *Id.* at 11–12 (quoting Ex. 1034, 72–73).

Petitioner contends that Exhibits 1003, 1005–1015, 1025, 1040, and 1041 show that the Xirallic® product line of pigments was commercially available before the effective filing date of the '861 patent. Pet. 12–17. Petitioner asserts that Exhibits 1005–1010 are "Technical Data Sheets directed to Xirallic® pigments published by Merck KGaA in 2002 and 2003." *Id.* at 12 (citing Ex. 1004 ¶¶ 9, 19). More specifically, Petitioner asserts that Exhibits 1005–1009 are Technical Data Sheets for Xirallic® T60-10 SW Crystal Silver, T60-20 SW Sunbeam Gold, T60-21 SW Solaris Red, T60-50 SW Fireside Copper, and T60-51 SW Radiant Red, respectively, and that each of these Technical Data Sheets were published in October 2002. *Id.* at 12–13. Petitioner asserts that Exhibit 1010 is a Technical Data Sheet for Xirallic® T60-23 SW Galaxy Blue that was published in January 2003. *Id.* at 13. According to Petitioner, each of the Technical Data Sheets "appears on its face as promotional material for Xirallic® that is reasonably understood to have been offered for sale to the public by Merck KGaA"

because "each of the Xirallic® Technical Data Sheets includes customer advisory language." *Id.* at 13–14.

The "customer advisory language" quoted by Petitioner reads as follows:

> We advise our customers regarding technical applications to the best of our knowledge within the scope of the possibilities open to us, but without obligation. Current laws and regulations must be observed at all times. This also applies in respect of any protected rights of third parties. Our suggestions do not relieve our customers of the necessity to test our products, on their own responsibility, for suitability for the purpose envisaged.

Pet. 14 (citing Exs. 1005–1010).

Petitioner contends that in an Opposition filed against the European counterpart to the '861 patent, Patent Owner did not dispute that the Technical Data Sheets (1) were published by Patent Owner in October 2002 and were prior art; (2) "served as evidence that Merck had sold the Xirallic® pigments and put them on the market before the filing date of EP2799398, (April 30, 2013)"; and (3) contained accurate data. Pet. 14–15 (citing Ex. 1040, 3–9, 17, 23, 25–30; Ex. 1041, 7). Petitioner contends further that Patent Owner "submitted the Technical Data Sheets in an Information Disclosure Statement (IDS) during prosecution of the '861 patent" by identifying "the 'Publication data' for five of the Technical Data Sheets as 'Publication data:Merck, 20021001' and 'Publication data:Merck, 20030101' for the sixth Technical Data Sheet." *Id.* at 15 (citing Ex. 1003, 102–104).

Petitioner asserts that Exhibits 1011–1015 are Certificates of Analysis directed to Xirallic® pigments published by Merck KGaA in 2011 and 2012. Pet. 12, 16 (citing Ex. 1004 ¶¶ 9–11). More specifically, Petitioner asserts

that Exhibits 1011–1015 are Certificates of Analysis for Xirallic® T60-10 SW Crystal Silver Batch No. N120046S28, released 25.06.2012 (June 25, 2012); T60-20 SW Sunbeam Gold Batch No. H120167S29, released 27.06.2012 (June 27, 2012); F60-50 SW Fireside Copper Batch No. H120075S30, released 28.03.2012 (March 28, 2012); F60-50 SW Fireside Copper Batch No. H120314S30, released 30.10.2012 (October 10, 2012); and F60-51 SW Radiant Red Batch No. N11008831S, released 08.08.2011 (August 8, 2011), respectively. *Id.* at 16–17 (citing Exs. 1011–1015).

Petitioner contends "Exhibit 1025 is a Material Safety Data Sheet directed to Xirallic® pigments published by Merck KGaA in 2006." Pet. 12 (citing Ex. 1004 ¶ 18). More specifically, Petitioner asserts that "Exhibit 1025 is a Material Safety Data Sheet for Merck's Xirallic® F60-51 SW Radiant Red pigment" that was published by EMD Chemicals, Inc. (a subsidiary of Patent Owner), and has "a 'Print Date' of November 22, 2006." *Id.* at 17 (citing Ex. 1004 ¶ 14; Ex. 1025; Ex. 1038, 17 (listing the corporate structure of Merck KGaA and its subsidiaries)).

(2) Patent Owner's Arguments and Evidence

Patent Owner contends that Petitioner's arguments regarding the public availability of Xirallic® fail because they do not "distinguish between the Xirallic® product line, particular Xirallic® products within the product line, and the specific lots of product that Petitioner tested." PO Resp. 8. For example, Patent Owner notes that none of Kuntz, the Annual Report, or Pfaff mention a particular Xirallic® product or a particular lot of a Xirallic® product. *Id.* (citing Exs. 1026, 1028, 1034). Patent Owner recognizes that Masuko "mentions a specific Xirallic® product, T60-20WII," but states that

"this product is neither a product that Petitioner tested" nor that Petitioner discussed. *Id.* (citing Ex. 1029).[17]

Patent Owner argues that the Technical Data Sheets (Exs. 1005–1010) and Certificates of Analysis (Exs. 1011–1017) are for products Petitioner did not test and "have no bearing on whether the products and lots tested were prior art." PO Resp. 8–9. Patent Owner contends that the Technical Data Sheets "are not specific to any particular lot of product, and therefore are not proof that the particular lots tested are prior art." *Id.* at 17–18 (citing Exs. 1005–1010). Patent Owner argues that "Petitioner offers no evidence, nor does Petitioner's declarant Choi even aver, that any of the products of the Technical Data Sheets are the same, unevolved or unchanged, as those tested." *Id.* at 18 (citing Ex. 1004 ¶ 19).

Moreover, Patent Owner argues that Mr. Choi "asserts the Technical Data Sheets 'indicate on their faces that they were published by Merck KGaA in 2002 and 2003[]'" but "the documents say nothing of being 'published,' and each only identifies a 'DATE OF ISSUE.'" PO Resp. 18 (citing Ex. 1004 ¶ 19; Exs. 1005–1010). Patent Owner contends that Mr. Choi "does not aver to have ***actual knowledge*** of when the Technical Data Sheets were published, and provides no explanation of when, how and from where these particular Technical Data Sheets were obtained." *Id.* at 19 (citing Ex. 1004 ¶ 19). According to Patent Owner, Mr. Choi "speculates that the particular documents provided were issued to the public because

[17] We also note that Patent Owner argues that the exception under 35 U.S.C. § 102(b)(1)(A) applies (PO Resp. 9–10; Sur-Reply 22–24); however, we do not address the exception because Sample C predates Patent Owner's alleged critical date.

they look similar to others he has seen, but neither he nor Petitioner address the fact that the documents are each labeled 'preliminary Datas'" and "Petitioner provides no evidence that these particular documents, labeled 'preliminary,' were ever issued to the public as opposed to just issued internally." *Id.* at 18–19 (citing Ex. 1004 ¶ 19; Exs. 1005–1010 (labeled "preliminary Datas")). Patent Owner contends that other, "later dated Technical Data Sheets, in fact, do lack this 'preliminary' label" and "show different characteristics from those that Petitioner supplies", which indicates that the Technical Data Sheets labeled "preliminary" are preliminary and are not representative of the released product. *Id.* at 19 (citing Ex. 2012 (T60-10SW); Ex. 2013 (F60-51 SW); *comparing, e.g.*, Ex. 1009 *and* Ex. 2013 (showing different chemical composition and pH); Ex. 1005 *and* Ex. 2012 (showing different chemical composition and pH)).

Patent Owner contends that the Certificates of Analysis have similar issues to the issues identified with the Technical Data Sheets, and notes that "Petitioner provides no Certificate for the lots tested as Samples A-C, H, and I." PO Resp. 21 (citing Exs. 1011–1015). Patent Owner argues that Mr. Choi only "asserts these publication dates because the Certificates 'indicate on their faces that they were published by Merck KGaA in 2011, 2012, and 2013[]'", but "the Certificates say nothing of being 'published,' and only identify a 'Date of release.'" *Id.* at 21–22 (citing Ex. 1004 ¶ 10). Patent Owner contends "it is unclear what the 'Date of release' signifies," that Mr. Choi does not claim to have actual knowledge of when the Certificates of Analysis were published, and that Mr. Choi "does not explain when, how and where the Certificates were obtained, or provide any testimony on when a Certificate would have been published relative to the

product being first made available to the public." *Id.* at 22 (citing Ex. 1004 ¶ 10).

(3) Analysis

We have considered the parties' arguments and supporting evidence. We agree with Patent Owner that Petitioner's evidence in Kuntz (Ex. 1026), the Annual Report (Ex. 1028), Masuko (Ex. 1029), and Pfaff (Ex. 1034) is insufficient to show that Xirallic® Sample C was available to the public before the effective filing date of the '861 patent. Petitioner has not asserted, nor do we find, that any of these documents refer to or describe the lot of Xirallic® from which Sample C was taken. *See* Final Dec. 26. Kuntz, the Annual Report, Masuko, and Pfaff may support a finding that the Xirallic® line of products was available to the public, but these documents do not support a finding that the lot of Xirallic® from which Sample C was taken was available to the public.

We also agree with Patent Owner that the Technical Data Sheets (Exs. 1005–1010), Certificates of Analysis (Exs. 1011–1017), and Material Safety Data Sheet (Ex. 1025) are insufficient to show that Xirallic® Sample C was available to the public. Petitioner has not asserted, nor do we find, that any of these documents refer to or describe the lot of Xirallic® from which Sample C was taken. *See* Final Dec. 26–27. Regardless of how the Technical Data Sheets were used in the Opposition against the European counterpart of the '861 patent (Exs. 1040, 1041) and during the prosecution of the application from which the '861 patent issued (Ex. 1003, 102–104), the Technical Data Sheets do not refer to or describe the lot of Xirallic® from which Sample C was taken.

Moreover, as noted by Patent Owner, the Technical Data Sheets (Exs. 1005–1010) indicate that they are "preliminary" and Petitioner has not provided any evidence that the Technical Data Sheets were ever issued to the public, as opposed to just issued internally. *See* PO Resp. 18–19. We also find persuasive Patent Owner's argument that the Technical Data Sheets are preliminary because other, later-dated technical data sheets (Exs. 2012, 2013) lack the "preliminary" label and list characteristics that are different from those in Exhibits 1005–1010. *See* PO Resp. 19 (*comparing, e.g.*, Ex. 1009 *and* Ex. 2013; Ex. 1005 *and* Ex. 2012). The Technical Data Sheets may support a finding that the Xirallic® products they describe existed as of the dates on the documents, but they do not support a finding that the lot of Xirallic® from which Sample C was taken was available to the public.

Petitioner cites various portions of Mr. Choi's testimony in support of its arguments regarding the Technical Data Sheets (Exs. 1005–1010), Certificates of Analysis (Exs. 1011–1017), and Material Safety Data Sheet (Ex. 1025). *See* Pet. 12–17 (citing Ex. 1004 ¶¶ 9–11, 14, 18–19). In his declaration, Mr. Choi testifies that Petitioner maintains the Certificates of Analysis, Technical Data Sheets, Material Data Safety Sheets, and other promotional, marketing, and advertising materials in its competitor files as a routine practice, "[a]s is common practice among many companies across many industries." Ex. 1004 ¶ 9. Mr. Choi also testifies that it is routine practice for Petitioner to "gather and store physical samples of commercially available competitor products." *Id.* Moreover, Mr. Choi testifies that "Merck KGaA and other pigment manufacturers, including CQV, routinely provide certificates of analysis to their customers to confirm the quality and

integrity of each batch of product that is made commercially available." *Id.* ¶ 10.

According to Mr. Choi, the Certificates of Analysis (Exs. 1011–1017) demonstrate Patent Owner's "practice of identifying the year of manufacture in its Lot numbers." Ex. 1004 ¶¶ 9, 11. Mr. Choi posits that the Certificates of Analysis "appear on their faces to be typical certificates of analysis that Merck KGaA would have published and that its customers would have expected" and "indicate on their faces that that they were published by Merck KGaA in 2011, 2012 and 2013." *Id.* ¶ 10. Mr. Choi posits further that the first two numerical digits of the batch numbers listed on the Certificates of Analysis correspond to the year of release. *Id.* ¶ 11 (comparing the first two digits of the batch numbers to the years in the dates of release).

We have reviewed Mr. Choi's testimony, including the portions summarized above. While we agree that the Certificates of Analysis (Exs. 1011–1017) and Mr. Choi's testimony (Ex. 1004 ¶¶ 9–11) appear to show that Patent Owner includes the two-digit year of the "date of release" in the first two digits of the batch number, we do not find this evidence sufficient to show that Xirallic® Sample C was available to the public. As noted above, the Certificates of Analysis do not refer to or describe the lot of Xirallic® from which Sample C was taken, and there is no evidence in the record that shows that lot was ever released, that a certificate of analysis existed for it, or that the lot was intended for sale. We find that paragraphs 14 and 18 of Mr. Choi's testimony are insufficient to show that Sample C was available to the public, because the paragraphs discuss lots of Xirallic®

that were used as Samples A, H, and I, rather than the lot of Xirallic® from which Sample C was taken. *See* Ex. 1004 ¶¶ 14, 18.

In his declaration, Mr. Choi testifies that "Merck KGaA and other pigment manufacturers, including CQV, routinely provide technical data sheets as instructive and promotional materials for customers and users of their products." Ex. 1004 ¶ 19. Mr. Choi posits that the Technical Data Sheets (Exs. 1005–1010) "appear on their faces to be typical technical data sheets that Merck KGaA would have published and that its customers would have expected" and "indicate on their faces that that they were published by Merck KGaA in 2002 and 2003." *Id.*

We do not find Mr. Choi's testimony (Ex. 1004 ¶ 19) or the Technical Data Sheets (Exs. 1005–1010) sufficient to show that Xirallic® Sample C was available to the public. Mr. Choi's testimony regarding the Technical Data Sheets does not address Sample C in particular, nor does it show that the Technical Data Sheets apply to the lot from which Sample C was taken. As discussed above, the Technical Data Sheets themselves appear to be preliminary, and also do not refer to or describe the lot of Xirallic® from which Sample C was taken.

b) Manufacture Date and Public Availability of Xirallic® Sample C

(1) Petitioner's Arguments and Evidence

Petitioner contends that it "analyzed Xirallic® product that was commercially available prior to the effective filing date of the '861 patent." Pet. 17; *see also id.* at 18–19 (citing Ex. 1004 ¶¶ 6–18; Ex. 1018 ¶¶ 4–8; Ex. 1019, 1–21). According to Petitioner, "during the period from March 1, 2020 through April 10, 2020, CQV analyzed four (4) samples of Xirallic® product that were manufactured in 2007, 2011, and 2012", and the

"methodology and results of CQV's analysis are set forth in the Choi and Mo declarations and the reports prepared by Mr. Mo." *Id.* at 17 (citing Exs. 1004, 1018–1020). Petitioner represents that the samples it analyzed included Samples B and C, and alleges that those samples are Xirallic® F60-50 SW from Lot No. H07022030S, which was purportedly manufactured in 2007. *Id.* at 19–20 (citing Ex. 1018 ¶ 5); Reply 5 (citing Ex. 1004 ¶¶ 8–12).

Petitioner contends that it "established that Merck's practice of identifying the year of manufacture in the first two numbered digits of its lot numbers is demonstrated in Merck's own Certificates of Analysis" and "showed that identifying the year of manufacture in a lot number is common practice in the industry." Reply 5–6 (citing Ex. 1004 ¶¶ 11–12); *see also* Pet. Br. Rem. 2 (citing Ex. 1004 ¶¶ 8–12; Exs. 1011–1017). For example, Petitioner argues that the Certificate of Analysis for Xirallic® T60-10 SW Crystal Silver, which shows a Batch number of "N120046S28" and a "Date of release" of "25.06.2012" (i.e., June 25, 2012) demonstrates Patent Owner's "practice of identifying the year of manufacture in the first two numbered digits of its lot numbers." Pet. Br. Rem. 2 (citing Ex. 1004 ¶ 11; Ex. 1011).

Moreover, Petitioner contends that Mr. Fritsch, Patent Owner's witness, "confirmed that the year of manufacture is identified in the lot number but said he did not know which digits correspond to the year of manufacture." Reply 5 (citing Ex. 2021, 46:10–18, 50:12–16); *see also* Pet. Br. Rem. 1–2 (citing Ex. 2021, 46:10–18, 50:12–16). According to Petitioner, Mr. Fritsch works for Patent Owner "in sales and marketing capacities"; "has never been a member of Merck's R&D or manufacturing departments"; "has no technical training or know-how relating to the

development of Xirallic®"; and "admitted he has no knowledge of the information that was purportedly disseminated from Pfaff's team to the manufacturing department." Reply 3–4 (citing Ex. 2007 ¶ 1; Ex. 2021, 19:8–20:18, 22:22–23:11, 40:17–42:4).

Petitioner contends that the lot of Xirallic® F60-50 SW from which Samples B and C were taken "was commercially available before the April 30, 2012 critical date asserted by" Patent Owner, relying on testimony from Mr. Choi and Mr. Fritsch. Reply 6–7; Pet. Br. Rem. 2–5. According to Petitioner, Mr. Choi's testimony that Petitioner "purchased the sample in October 2011" is "unrebutted evidence" establishing "that Xirallic® F60-50 SW, Lot. No. H07022030S was publicly available prior to the critical date, whether it be April of 2012 or 2013." Reply 6 (citing Ex. 1004 ¶ 16; Ex. 2011, 49:8–58:11). Petitioner contends further that "Sample A was manufactured in 2011 and Samples D, E, H, and I were manufactured in 2012" and Mr. Choi testified that "product from these respective lots would likely have been commercially available before April 2013." *Id.* at 7 (citing Ex. 1004 ¶¶ 15, 18). Petitioner argues that Mr. Choi's testimony "is based on well-reasoned, logical inferences derived from his many years of experience and his in-depth knowledge of the industry" and "is unrebutted with any actual evidence." *Id.* at 8 (citing Ex. 1004 ¶¶ 15, 18).

Petitioner contends "it is much more likely than not that Xirallic® manufactured in 2007 would be commercially available before April 2012." Reply 6. According to Petitioner, Mr. Fritsch testified that "a given batch of Xirallic® is made commercially available as soon as the quality control process is complete, at which point 'it can be grabbed by–by a customer order.'" *Id.* at 7 (citing Ex. 2021, 53:8–14); *see also* Pet. Br. Rem. 2–3

(citing Ex. 2021, 53:8–14, 57:21–25). Petitioner contends that Mr. Fritsch "testified that he did not know how long the quality control process takes but, clearly, it can be reasonably inferred that it takes far less than four years." Reply 7; *see also* Pet. Br. Rem. 3 (citing Ex. 2021, 57:12–19). According to Petitioner, its own "quality control process for similar products requires an average of about 2-3 weeks." Reply 7 (citing Ex. 1065 ¶ 34); Pet. Br. Rem. 3 (citing Ex. 1065 ¶ 34).

Petitioner contends further that Mr. Fritsch testified that "the shelf-life of Xirallic® is ten years" and, once a batch of the product expires, it "is 'blocked by the system' and '[c]annot be sold anymore.'" Reply 6 (citing Ex. 2021, 52:14–53:7); Pet. Br. Rem. 3 (citing Ex. 2021, 52:24–53:7). Moreover, Petitioner contends that Mr. Fritsch "testified that the expiration date of purchased batches is of interest to customers". Reply 6 (citing Ex. 2021, 51:3–14, 52:14–20); Pet. Br. Rem. 3 (citing Ex. 2021, 52:14–20). Thus, Petitioner argues that Patent Owner "is incentivized to sell a batch as soon as possible after manufacture so as not to waste shelf-life." Reply 6.

Petitioner contends Mr. Fritsch's testimony comports with Mr. Choi's testimony that "[p]urchasers of effect pigments typically want the purchased product to have as long a shelf life as possible." Pet. Br. Rem. 3 (citing Ex. 1004 ¶ 15). Mr. Choi also testified that in the case of Samples B and C, "based on his many years of experience in the industry of effect pigments, '[i]t would not be standard practice for a pigment manufacturer to manufacture a batch of pigment and then wait for over *five* years to make that batch commercially available.'" *Id.* at 4 (citing Ex. 1004 ¶ 16). Petitioner contends Mr. Choi testified that, instead, "'a manufacturer would typically make a batch commercially available as soon as possible in order

to generate revenue' and, further, 'a manufacturer certainly would not want to 'waste' over five years of shelf life by waiting over five years to make a given batch commercially available.'" *Id.* (citing Ex. 1004 ¶ 16).

(2) Patent Owner's Arguments and Evidence

Regarding Samples B and C, Patent Owner argues that Mr. Choi "baldly asserts the lot was purchased 'in about October 2011'" but "provides no details of the supposed sale, nor has Petitioner offered any evidence corroborating the date." PO Resp. 14 (citing Ex. 1004 ¶ 16). Patent Owner contends Mr. Choi's testimony is insufficient to show when Petitioner purchased the lot of Xirallic® from which Samples B and C are taken, because Mr. Choi "says only that the product was 'purchased. . . in about October 2011.'" Sur-Reply 24 (citing Ex. 1004 ¶ 16). Patent Owner argues that this testimony is insufficient because "it does not aver the necessary detail to show public availability or sale/offer of sale", such as "information to determine when a contract was established, that there was consideration for the exchange, that the product was available to be delivered when the alleged transaction took place, or even when the product was delivered." *Id.* at 24–25.

Patent Owner argues that Petitioner's evidence relating to the availability of lots based on their alleged manufacturing dates relies heavily on speculation and "assumes that the product was, indeed, manufactured for sale" (Sur-Reply 26), "rather than for some other use such as experimentation" (PO Br. Rem. 2). Patent Owner contends that Mr. Choi's and Mr. Fritsch's testimony "assumes the best case conditions for a product made for sale", but Petitioner's evidence is not consistent with such a conclusion. Sur-Reply 27; *see also* PO Br. Rem. 2. For example,

"Petitioner's own evidence shows an example of a lot Petitioner alleges was manufactured in 2011 (Sample A) not being at a distributor ready for sale three years later in 2014." Sur-Reply 27. Moreover, "Petitioner alleges that Samples B and C were manufactured in 2007, but purports to have purchased the sample four years later in 2011." *Id.*

Patent Owner contends further that "[t]he circumstances by which Petitioner obtained the product was by no means conventional, and does not suggest its lots were products made for sale." Sur-Reply 26–27 (citing Ex. 2011,[18] 51:10–20, 62:20–66:8, 72:17–22[19]); *see also* PO Br. Rem. 2. Instead, Patent Owner contends, "the record evidence indicates that Sample B/C, its existence, and Petitioner's obtaining Sample B/C was atypical." PO Br. Rem. 2. For example, "Mr. Choi admits the circumstances around obtaining Sample B/C were atypical" and testifies "that he had not obtained the material from Merck or an authorized distributor, nor did Mr. Choi know how his source had obtained the material." *Id.* at 2–3 (citing Ex. 2011, 51:25–52:19). Moreover, Mr. Choi testifies "that 'the company we purchased the material from didn't want to be identified,' and admits to having, but withholding, an email with details about the transaction, because 'the person who wrote the email did not want to be identified.'" *Id.* at 3

[18] Exhibit 2011 bears two sets of page numbers: one set from the original transcript located in the lower right-hand corner of the document, and one set added by Patent Owner located at the bottom center of the page. We cite the page numbers added by Patent Owner.

[19] Because Patent Owner's citation range starts in the middle of an answer, we understand this citation to be to Ex. 2011, 73:17–22, based on the page numbers at the bottom center of the page.

(citing Ex. 2011, 49:5–9, 51:10–20); *see also* Sur-Reply 25 (citing Ex. 2011, 49:5–25, 51:10–20).

Furthermore, Patent Owner contends that Mr. Choi's testimony is unreliable because it is contradictory. PO Br. Rem. 3. According to Patent Owner, Mr. Choi "declares only that the product was 'purchased. . . in about October 2011.'" *Id.* (citing Ex. 1004 ¶ 16). Patent Owner contends that Mr. Choi provided the same testimony for several other samples, and then recanted his testimony at his deposition. *Id.* "For example, in his declaration, Choi testifies 'CQV purchased Samples D and E.' Yet, when asked at his deposition 'How much did CQV pay AKZO for sample D?' Mr. Choi responded 'We didn't pay.'" *Id.* (citing Ex. 2011, 66:7–9[20]). Patent Owner contends Mr. Choi "similarly contradicted himself again, testifying in his declaration that 'CQV purchased Samples H and I' and then, when asked at his depo admitting 'No, we didn't pay.' . . . When asked how much he paid for Samples B and C, Choi responded 'I don't remember.'" *Id.* (citing Ex. 2011, 55:4–5[21], 72:12–13[22]). Patent Owner argues that Mr. Choi "has no memory of what was paid for the product" and does not specify "what the 'October 2011' date represents," such as the date the product was received, or the date Mr. Choi asked his marketing manager to

[20] Because Patent Owner's citation range starts in the middle of a question, we understand this citation to be to Ex. 2011, 67:7–9 based on the page numbers at the bottom center of the page.
[21] Because Patent Owner's citation range includes an answer followed by half of a question, we understand this citation to be to Ex. 2011, 56:4–5 based on the page numbers at the bottom center of the page.
[22] Because Patent Owner's citation range starts in the middle of an answer, we understand this citation to be to Ex. 2011, 73:12–13 based on the page numbers at the bottom center of the page.

obtain the product. *Id.* at 4 (citing Ex. 2011, 56:2–5); *see also* Sur-Reply 25 (citing Ex. 2011, 48:21–49:4, 56:2–5).

(3) Analysis

We have reviewed the parties' arguments and their supporting evidence. As support for its argument that the lot of Xirallic® from which Sample C was taken was manufactured in 2007 and made "commercially available," Petitioner relies on testimony from Mr. Choi (Ex. 1004 ¶¶ 6–18; Ex. 2011, 49:8–58:11[23]), Mr. Mo (Ex. 1018 ¶¶ 4–8; Ex. 1065 ¶ 34), and Mr. Fritsch (Ex. 2007; Ex. 2021, 19:8–20:18, 22:22–23:11, 40:17–42:4, 46:10–18, 50:12–16, 51:3–14, 52:14–53:7, 53:8–14, 57:12–19, 57:21–25). Petitioner also relies on the Certificates of Analysis (Exs. 1011–1017), Experimental Report (Ex. 1019, 1–21), and Pretreatment for SEM record (Ex. 1020). In disputing Petitioner's arguments, Patent Owner relies on testimony from Mr. Choi (Ex. 1004 ¶ 16; Ex. 2011, 48:21–49:25, 51:10–20, 51:25–52:19, 56:2–5, 62:20–66:8, 67:7–9, 73:12–13, 73:17–22).

Mr. Choi works as a Chief of Lab for Petitioner. Ex. 1004 ¶ 2. In his declaration, Mr. Choi posits that the "year of manufacture for each sample is provided in Merck KGaA's respective Lot numbers (also commonly referred to as the Batch number). More specifically, the first two numerical digits of each Lot number or Batch number indicates the year of manufacture." *Id.* ¶ 8. According to Mr. Choi, "it is clear that the year of manufacture of a given sample of Xirallic® is identified in the Batch number (or Lot number)" because "it is standard practice among manufacturers in my

[23] Because Petitioner's citation range starts in the middle of an answer, we understand this citation to be to Ex. 2011, 50:8–59:11 based on the page numbers at the bottom center of the page.

industry to identify the year of manufacture of a product in the product's Lot or Batch number. Indeed, CQV does this itself." *Id.* ¶ 12; *see also id.* ¶ 11 (citing Exs. 1011–1017).

Mr. Fritsch works as a Commercial Director for Patent Owner. Ex. 2007 ¶¶ 1–2. In his deposition, Mr. Fritsch testifies that alphanumeric lot numbers are assigned to batches of Xirallic®, and that the lot numbers include information regarding the production location and the year of manufacturing (Ex. 2021, 46:4–18). Mr. Fritsch also testifies, however, that he does not know which digits in the lot numbers correspond to the year of manufacturing (*id.* at 48:1–10, 50:12–51:2).

Because both Petitioner's and Patent Owner's witnesses testify that Patent Owner's lot numbers include the year of manufacture of Patent Owner's products (*see* Ex. 1004 ¶¶ 8, 12; Ex. 2021, 46:4–18), and the Certificates of Analysis include batch numbers that appear to include the year of manufacture as the first two digits (*see* Ex. 1004 ¶ 11; Exs. 1011–1017), we find persuasive Petitioner's argument that Patent Owner's lot numbers include the year of manufacture in the first two digits. Given this information, we also find persuasive Petitioner's arguments that the lot of Xirallic® from which Sample C was taken was manufactured in 2007. Our analysis, however, does not end there. A date of manufacture is insufficient on its own to show that the lot of Xirallic® from which Sample C was taken was available to the public. As noted above, the Certificates of Analysis (Exs. 1011–1017) do not refer to or describe the lot of Xirallic® from which Sample C was taken. There is no evidence in the record that shows the lot was ever released or that a certificate of analysis existed for that lot, nor any

evidence in the record that the lot was intended for sale. *Id.* Petitioner relies on testimony from Mr. Choi to fill these gaps, as discussed below.

In his declaration, Mr. Choi testifies that Mr. Mo performed the analyses of Xirallic® discussed in the Experimental Report (Ex. 1019, 1–21) and Pretreatment for SEM (Ex. 1020) at his instruction and under his oversight. Ex. 1004 ¶ 6; *see also* Ex. 1018 ¶¶ 4–8. Mr. Choi explains that the "specific Xirallic® samples measured by Mr. Mo are listed in the Experimental Report by product name and lot number" and lists the samples Mr. Mo measured. Ex. 1004 ¶ 7 (identifying Samples B and C as originating from lot number H07022030S; citing Ex. 1019, 1–2, 12). Mr. Choi represents that Petitioner obtained the Xirallic® samples Mr. Mo tested from various commercial sources. *Id.* ¶ 13. Mr. Choi explains how Petitioner purchased the material used as Sample A and provides corroborating evidence, including email communications between Petitioner and a distributor of Patent Owner's products. *Id.* (citing Ex. 1047). Mr. Choi represents that Petitioner maintained the sample "in storage since 2014 and tested samples of it in 2020." *Id.* ¶ 14. Mr. Choi states that "the Lot number of Sample A (Xirallic TS0-10) is H11041749X, thereby indicating that it was manufactured in 2011." *Id.* ¶ 15.

Mr. Choi posits that "Xirallic that was manufactured in 2011 would certainly have been commercially available well before April of 2013" because it

> would not be standard practice for a pigment manufacturer to manufacture a batch of pigment and then wait for over a year to make that batch commercially available. Rather, a manufacturer would typically make a batch commercially available as soon as possible in order to generate revenue. Moreover, as noted in Merck KGaA's Certificates of Analysis, Xirallic® has a finite

> shelf life on the order of ten years. *See* EX1011-1017 (Date of release and Minimum shelf life). Purchasers of effect pigments typically want the purchased product to have as long a shelf life as possible. Therefore, a manufacturer certainly would not want to "waste" over a year of shelf life by waiting over a year to make a given batch commercially available.

Ex. 1004 ¶ 15.

Mr. Choi explains how Petitioner purchased the material used as Sample C, Xirallic® F60-50 SW, Lot number H07022030S. Ex. 1004 ¶ 16. Mr. Choi represents that Petitioner purchased the product in "about October 2011" from a former distributor of Patent Owner's products and "maintained the Xirallic F60-50 SW in storage since 2011 and tested samples of it in 2020." *Id.* Mr. Choi states that "the Lot number of Samples B and C is H07022030S, thereby indicating that it was manufactured in 2007." *Id.* Mr. Choi posits that for "the same reasons as I discussed above in connection with Sample A, based on my years of experience and knowledge of industry practices, Xirallic that was manufactured in 2007 would certainly have been commercially available well before April of 2013." *Id.* Mr. Choi posits further:

> It would not be standard practice for a pigment manufacturer to manufacture a batch of pigment and then wait for over *five* years to make that batch commercially available. Rather, as noted above, a manufacture would typically make a batch commercially available as soon as possible in order to generate revenue. Moreover, as also noted above, a manufacturer certainly would not want to "waste" over five years of shelf life by waiting over five years to make a given batch commercially available.

Id.

Regarding the purchase of other samples, Mr. Choi explains, for example, how Petitioner purchased the material used as Samples D and E. Ex. 1004 ¶ 17. In paragraph 18, Mr. Choi also explains how Petitioner purchased the material used as Samples H and I and provides corroborating evidence, including a Chain of Custody Form provided by Axalta (Ex. 1024) and a Material Safety Data Sheet for Xirallic® (Ex. 1025). *Id.* ¶ 18.

As the trier of fact, the Board is entitled to weigh the credibility of witnesses. *See Elbit Systems of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1358 (Fed. Cir. 2018) (citing *Trs. of Columbia Univ. v. Illumina, Inc.*, 620 F. App'x 916, 922 (Fed. Cir. 2015); *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 844, 856 (1982)). We have reviewed the witness testimony in the record and, more particularly, Mr. Choi's deposition answers regarding Petitioner's purchase of the lot of Xirallic® from which Sample C came. We find that Mr. Choi's responses cast doubt on the credibility of his declaration testimony, namely with regard to the public availability of Sample C. Mr. Choi represented that he was involved in the purchase of the lot of Xirallic® from which Sample C was taken. Ex. 2011, 48:1–23. Mr. Choi stated that he instructed Petitioner's marketing team manager to buy the sample from a distributor of Patent Owner's products located in Europe. *Id.* at 48:24–49:4. Mr. Choi stated that he has evidence of the transaction, but refused to reveal the name of the company from which Petitioner purportedly purchased the lot of Xirallic® (*id.* at 49:5–50:3) and refused to produce an email in his possession that would corroborate his testimony regarding Petitioner's acquisition of the product (*id.* at 50:8–16, 51:10–23). Mr. Choi represented that he does not remember how much Petitioner paid for Sample B. *Id.* at 56:4–5.

Mr. Choi admitted that the entity from which Petitioner acquired the lot of Xirallic® from which Sample C was taken is "not currently a Merck distributor" (Ex. 2011, 50:4–7) and was not "a Merck distributor at the time" that "samples B and C were purchased" (*id.* at 51:25–52:2). According to Mr. Choi, the company is a "former distributor" of Patent Owner's products. *Id.* at 52:3–6. Mr. Choi did not know, according to his testimony, when that unnamed entity first obtained the lot of Xirallic® (*id.* at 52:7–10) and he stated that he did not have personal knowledge of how the entity obtained the lot of Xirallic® (*id.* at 52:12–19). Instead, Mr. Choi assumed the entity was "able to obtain the sample through the routine course or process" the entity uses "to take samples or get samples." *Id.* at 52:12–19. Mr. Choi believed the sample of Xirallic® from which Sample C was taken was sealed when Petitioner received it because samples from dealers are sealed, and he remembered observing that the package was from a dealer. *Id.* at 52:24–54:25. However, Mr. Choi admitted that he did not obtain a technical data sheet or certificate of analysis for the lot of Xirallic® from which Samples B and C were taken. *Id.* at 59:6–11.

Mr. Choi also answered questions regarding Petitioner's purchase of Samples D and H. Ex. 2011, 62:20–66:8, 67:7–9, 73:12–13, 73:17–22. Similar to his testimony regarding Samples B and C, Mr. Choi admitted withholding an email regarding the purchase of the lot of Xirallic® from which Sample D was taken. *Id.* at 62:20–63:9. Mr. Choi also admitted that he did not know how Akzo USA or Axalta obtained the Xirallic® the companies sold to him, and admitted that Akzo USA was not a distributor of Patent Owner's products at the time Petitioner purchased the product. *Id.* at 63:10–66:8, 73:17–22. Mr. Choi also admitted that Petitioner did not pay

Akzo USA for the lot of Xirallic® from which Sample D was taken, and did not pay Axalta for the lot of Xirallic® from which Sample H was taken. *Id.* at 67:7–9, 73:12–13.

Although Petitioner presents declaration testimony from Mr. Choi representing that he purchased the lot of Xirallic® from which Samples B and C were taken in October 2011 (Ex. 1004 ¶ 16), Mr. Choi's declaration testimony lacks corroborating evidence, and his deposition testimony does not support that the product was available to the public, as we found in our Final Written Decision. *See* Final Dec. 27–28. Notably, Petitioner produced corroborating evidence for Mr. Choi's acquisition of Samples A, H, and I. *See* Ex. 1004 ¶¶ 13 (citing Ex. 1047), 18 (citing Exs. 1024, 1025). However, Mr. Choi withheld similar evidence for the Xirallic® lots from which Samples B, C, and D were taken. *See* Ex. 2011, 50:8–16, 51:10–23, 62:20–63:9; Final Dec. 28. As Patent Owner argues, there is "no information to determine when a contract was established, that there was consideration for the exchange, that the product was available to be delivered when the alleged transaction took place, or even when the product was delivered. Choi has no memory of what was paid for the product." Sur-Reply 24–25; *see also* PO Resp. 13–14; PO Br. Rem. 2–4.

Moreover, Mr. Choi did not know how the entity that provided the Xirallic® lot from which Sample C was taken obtained the product. *See* Ex. 2011, 52:12–19, 63:10–66:8, 73:17–22. As Patent Owner argues, there is no evidence in the record that shows the Xirallic® lot from which Sample C was taken was available from Patent Owner, or that the lot was intended for sale. *See* Sur-Reply 25–27; PO Br. Rem. 2. The record is similarly

devoid of evidence that the lot of Xirallic® from which Sample C was taken was ever released, or that certificates of analysis existed for the lot.

Similarly, as discussed above, paragraphs 9–11 and 19 of Mr. Choi's declaration are insufficient to demonstrate the public availability of the lot of Xirallic® from which Sample C was taken, because these paragraphs do not refer to or describe the lot of Xirallic® from which Sample C was taken, and there is no evidence in the record that shows the lot was ever released, that a certificate of analysis existed for it, or that the lot was intended for sale.

Petitioner contends Mr. Choi's testimony that companies do not want to waste shelf life (Ex. 1004 ¶¶ 15–16), together with testimony from Mr. Fritsch, shows that "it is much more likely than not that Xirallic® manufactured in 2007 would be commercially available before April 2012." Reply 6–7. In his deposition, Mr. Fritsch testifies that a batch of Xirallic® is "normally offered after being released by -- by quality control. Then it's in our system as getting the status available, and then it can be grabbed by -- by a customer order." Ex. 2021, 53:8–14. Mr. Fritsch testifies further that after a given batch is manufactured, it "is made available for sale after being released by the quality control department"; however, Mr. Fritsch admits he does not know how long the quality control process takes because it "depends on the product and the work that is involved with the checks and testings." *Id.* at 57:12–25. Mr. Fritsch testifies that the shelf life of Xirallic® is ten years from the date of manufacture, and customers sometimes want to know about the expiration dates of batches of Xirallic® because "they need it for determining the shelf life." *Id*. at 52:14–53:3; *see also id.* at 51:3–14. Mr. Fritsch states that a batch of Xirallic® is "blocked by the system" and "[c]annot be sold anymore" after its shelf life has expired. *Id.* at 53:4–7.

We do not find Mr. Fritsch's testimony persuasive of the public availability of the lot of Xirallic® from which Sample C was taken. Petitioner's arguments presuppose that the batch of Xirallic® from which Sample C was taken followed Patent Owner's customary process of manufacturing the batch, releasing it from quality control, and then offering it for sale, but Mr. Fritsch's testimony does not show that he has any knowledge of the particular batch of Xirallic® from which Sample C was taken, or if the batch was ever released from quality control and sold. We do not find Mr. Fritsch's testimony persuasive because he admits he does not have technical training or knowledge of the technical aspects of Xirallic® (*see* Ex. 2021, 19:8–20:18, 22:22–23:11, 40:17–42:4), and he admits that he does not know how long the quality control process takes (*id.* at 57:12–25). Although there is testimony in the record from Mr. Mo that Petitioner's own quality control process for equivalent products requires "an average of about two to three weeks" (Ex. 1065 ¶ 34), as we have discussed above, Mr. Fritsch does not have any knowledge of the lot of Xirallic® from which Sample C was taken.

Based on the evidence discussed above, we are not persuaded that Petitioner has shown by a preponderance of the evidence that Sample C was available to the public. Regardless of whether a company avoids wasting shelf life of its products (Ex. 1004 ¶¶ 15–16), there is no persuasive evidence in the record showing that the lot of Xirallic® from which Sample C was taken was released from quality control and then made available to the public by Patent Owner. Mr. Choi's testimony shows that Petitioner obtained the lot of Xirallic® from which Sample C was taken in an atypical manner (i.e., not from Patent Owner or one of Patent Owner's current

distributors) (Ex. 2011, 49:5–50:7, 50:8–16, 51:10–23, 51:25–52:6, 52:12–19), and there is no evidence in the record to show that the lot of Xirallic® was intended for sale, rather than for experimental use only or for some other restricted use. Accordingly, we determine Petitioner has not demonstrated by a preponderance of the evidence that Sample C qualifies as prior art against the '861 patent, and we determine that Petitioner has not shown by a preponderance of the evidence that the '861 patent is unpatentable over the grounds relying on Sample C.

III. CONCLUSION

For the reasons discussed above, and for the reasons set forth in our original Final Written Decision, we determine Petitioner has not met its burden of establishing, by a preponderance of the evidence, that claims 1–22 are unpatentable, as summarized in the following table:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–13, 15–17, 21	103	Xirallic product, Masuko, Pfaff, Teaney		1–13, 15–17, 21
14	103	Pfaff, Masuko, Applicant's Admissions, Xirallic product		14
18–20	103	Masuko, Shimizu, Teaney, Pfaff, Schumacher, Lee-445, Lee-225, Lee-719		18–20
22	103	Lee-225		22
Overall Outcome				1–22

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner does not establish, by a preponderance of the evidence, that claims 1–22 of U.S. Patent No. 10,647,861 B2 are unpatentable;

FURTHER ORDERED that this is a Final Written Decision; therefore, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

FOR PETITIONER:

Naresh Ramireddy
Andrew C. Ryan
Grant M. Ehrlich, Ph.D.
CANTOR COLBURN LLP
nramireddy@cantorcolburn.com
aryan@cantorcolburn.com
gehrlich@cantorcolburn.com

PATENT OWNER:

Joshua A. Griswold
Christopher C. Bowley, Ph.D.
Kim Leung
Matthew Colvin
FISH & RICHARDSON P.C.
griswold@fr.com
ccb@fr.com
leung@fr.com
PTABInbound@fr.com