

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CAIHONG DISPLAY DEVICES CO., LTD.,  
Petitioner

v.

CORNING INCORPORATED,  
Patent Owner

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Case IPR2025-00937  
U.S. Patent No. 8,640,498

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**PATENT OWNER'S DISCRETIONARY DENIAL BRIEF**

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**PATENT OWNER'S EXHIBIT LIST**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                             |
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| 2001               | <i>Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same II</i> , Inv. No. 337-TA-1441, Order Setting the Procedural Schedule (ITC March 31, 2025)                        |
| 2002               | Display of the Year Award Archive, accessed at <a href="https://www.sid.org/Awards/Display-Industry-Awards/DIAAwardsArchive">https://www.sid.org/Awards/Display-Industry-Awards/DIAAwardsArchive</a> (last accessed Apr. 9, 2025)              |
| 2003               | “Corning wins awards for EAGLE XG(TM),” accessed at: <a href="https://www.glassonline.com/corning-wins-awards-for-eagle-xgtm/">https://www.glassonline.com/corning-wins-awards-for-eagle-xgtm/</a> (last accessed Apr. 9, 2025) (May 23, 2007) |
| 2004               | Bocko, Peter L., “Handbook of Visual Display Technology,” Chapter 5.1.1: Glass Substrates for AMLCD, OLED and Emerging Display Platforms, pp. 599-623 (2012)                                                                                   |
| 2005               | Prosecution History of U.S. Patent Application No. 11/478,493 (now U.S. Patent No. 7,851,394)                                                                                                                                                  |
| 2006               | <i>See Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same</i> , Inv. No. 337-TA-1441, Order 2 (ITC March 7, 2025)                                                      |
| 2007               | <i>Gestures Tech. Partners LLC. v. Apple Inc. et al.</i> , Petition for Writ of Certiorari, Case. No. 24- (filed June 11, 2025)                                                                                                                |
| 2008               | Interim Processes for PTAB Workload Management Memorandum (March 26, 2025)                                                                                                                                                                     |

## I. INTRODUCTION

U.S. Patent No. 8,640,498 (“the ’498 patent”) expires in just over 15 months (which would be during an instituted IPR). It claims industry-recognized, innovative improvements to the production of alkali-free boroaluminosilicate glass. The ’498 patent is one of five patents that have been challenged in IPRs and asserted in the ITC. *See Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same*, Inv. No. 337-TA-1433; *Certain Glass Substrates for Liquid Crystal Displays, Products Containing the Same, and Methods for Manufacturing the Same II*, Inv. No. 337-TA-1441. It is in the same family as U.S. Patent Nos. 7,851,394 (“the ’394 patent”) (challenged in IPR2025-00439), where institution was discretionarily denied based on the copending ITC investigation and the issue date of the patent. *See Caihong Display Devices Co. Ltd. v. Corning Inc.*, IPR2025-00439, Paper 18 (PTAB July 10, 2025). Related IPRs were filed for U.S. Patent Nos. 9,512,025 (“the ’025 patent”) (challenged in IPR2025-01040), 8,642,491 (“the ’491 patent”) (challenged in IPR2025-01017), and 8,627,684 (“the ’684 patent”) (challenged in IPR2025-01137). As each of these five IPRs have the same procedural issues identified as requiring discretionary denial in the ’394 patent IPR, each should also be discretionarily denied for at least the same reasons, as well as the reasons presented in their respective briefs.

The '498 patent claims recite methods of making glass that are free from certain toxic fining agents, and yet still achieve the high liquidus viscosity and defect-free quality that is desired for certain sophisticated glass applications (like LCD screens). The Petition purports to present four invalidity Grounds, none of which present prior-art methods with glass that achieves the claimed liquidus viscosity. Moreover, the Petition suffers from numerous flaws that compel discretionary denial under 35 U.S.C. §§ 314(a), 325(d), and 312(a)(3).

First, the *Fintiv* Factors and recent Acting Director guidance on discretionary denial weigh strongly in favor of denial. The parallel ITC litigation between the same parties, and involving the challenged patent, cannot be stayed and will be completed several months before a Final Written Decision in this proceeding. And the challenged patent issued over a decade ago and relates to a product that has led the market for even longer, such that settled expectations, economic and public-interest considerations, and judicial economy all favor denial.

Second, the Petition itself fails to identify its challenges with particularity, mixing concepts of anticipation and obviousness, relying on references that are not part of the grounds, and omitting essential parts of the *KSR* and *Graham* analyses. The technical arguments are largely conclusory and rely heavily on an expert declaration to fill gaps in the prior-art disclosures and in the argumentation. This shortcoming of the Petition is compounded by the facts that (1) Petitioner's expert

lacks the qualifications of a POSA and (2) the declaration is riddled with errors that render it unreliable, including incorrect citations, mixing up prior-art references, confusing basic scientific concepts, and mistaking legal principles. Individually, these errors defeat the expert's respective conclusions. Collectively, they render the entire Petition unsupported by competent evidence.

Finally, two of the Grounds rely on art and arguments already considered by the original Examiner, without identifying any error in prosecution and without explaining the basis to modify and combine the references. The other two Grounds present new art, but are glaringly deficient in disclosing all of the claim limitations, relying on alleged knowledge in the art to supply missing elements. None of the Grounds challenge all claims. Instituting review of the Petition would not be a good use of the Board's limited resources.

## **II. STATEMENT OF PRECISE RELIEF REQUESTED**

Pursuant to 35 U.S.C. §§ 314(a), 325(d), and 312(a)(3), and the Memorandum on Interim Processes for PTAB Workload Management issued March 26, 2025 (EX2008, "Memo Factors"), Patent Owner Corning Incorporated respectfully requests that the Board exercise its discretion to deny institution of *inter partes* review of the '498 patent.

### **III. FACTUAL BACKGROUND**

The '498 patent is directed to a method of producing boroaluminosilicate glasses that can be used for displays, such as LCDs. EX1001, Abstract. The '498 patent teaches that “arsenic raises environmental and health issues, and thus there has been a continuing effort in the art to produce glasses with lower arsenic levels and, preferably, glasses which are substantially arsenic free,” and that while efforts have been made to replace arsenic with antimony, “antimony has its own environmental and health issues.” EX1001, 3:26-39. The boroaluminosilicate compositions in the methods claimed by the '498 patent allow for the fining (the removal of bubbles) of glass suitable for LCD screens without either of these toxic elements. EX1001, 11:57-12:51. This improvement is made possible through precise control of certain metal oxides within the boroaluminosilicate compositions, which is reflected in the claims.

#### **A. Overview of the Technology**

The '498 patent identifies and improves upon a method of producing silicate glass to solve a critical problem: the production of nearly defect-free glass without the use of harmful chemicals such as arsenic or antimony. During glass manufacturing, materials such as  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ , or  $\text{B}_2\text{O}_3$  are melted to create molten glass, which can produce gas bubbles. If gas bubbles are not removed, they can create defects in the glass product. Removing gas bubbles from glass is called

“fining.” Historically, arsenic and antimony were used as “fining agents” to remove gas bubbles from molten glass, but they present environmental and health risks.

Two of the key innovations of the '498 patent glass composition are (1) the specified MgO mol% and (2) the ratio of the concentration of the divalent metal oxides (MgO, CaO, SrO, and BaO; collectively, RO) to  $\text{Al}_2\text{O}_3$  ( $\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$ ) of greater than 1. Although MgO had been used in display-glass compositions before the '498 patent, doing so was known to increase the liquidus temperature of the glass, making it more difficult to prevent crystals from forming prematurely during a glass-sheet manufacturing process. The inventor discovered that this effect could be counteracted by controlling the amount of MgO along with the ratio of RO to  $\text{Al}_2\text{O}_3$ . Within the claimed range of RO to  $\text{Al}_2\text{O}_3$  ratio, adding MgO actually *decreases* the liquidus temperature, rather than increasing it as expected at the time. EX1001, 10:13-48.

These claimed glass compositions are formed using a fusion downdraw process, which allows for tightly controlled and reproducible glass dimensions, and glass sheets that are flat, smooth, defect-free, and thermally and mechanically durable, without further mechanical surface processing such as grinding or polishing. EX1001, 3:55-60, 4:54-67, 10:39-48, 12:52-67. The claimed glass compositions, lacking arsenic or antimony for fining, represent a substantial

improvement over the prior-art glass compositions. EX1001, 3:55-4:2.

Commercially, key innovations of the '498 patent led to the launch of Corning® EAGLE XG® glass, a best-selling product for Corning Incorporated (“Patent Owner”).

## **B. Overview of the Claims**

The '498 patent, entitled “Fining of Boroalumino Silicate Glasses,” issued on February 4, 2014 to inventor Adam J.G. Ellison. *See* EX1001, (54), (45), (75). It shares a specification with the '394 patent and '491 patent. It issued from U.S. Patent Application No. 12/965,004, filed on December 10, 2010, which is a division of U.S. Patent Application No. 11/478,493, filed on June 28, 2006 (now the '394 patent), and claims the benefit of U.S. Provisional Application No. 60/694,478, filed on June 28, 2005. It is subject to a terminal disclaimer over U.S. Patent Nos. 7,696,113 and 7,946,128, and has an expiration date of November 13, 2026, about 16 months from the date of this Brief.

## **C. Prosecution History**

The '498 patent examination applied or at least considered several of the references presented in the Petition. First, the primary reference featured in Ground 2, Japanese Publication No. 2004-189535 (EX1005, “Miwa '535”), was cited by Patent Owner and specifically considered by the Examiner. EX1002, 33, 76, 80. In

fact, Miwa '535 was cited in a § 103 rejection overcome by Patent Owner during prosecution. EX1002, 46-47, 72-73.

Further, the primary reference featured in Ground 3, U.S. 6,319,867 (EX1008, "Chacon"), was cited in the '498 patent, EX1001, 2:48, and in an IDS, EX1002, 156. The Examiner initialed the statement, indicating that she considered the reference. EX1002, 80. The Office also applied the child application of Chacon (U.S. Patent No. 6,831,029, which contains identical disclosure to that of Chacon) in a rejection of the claims of the related '394 patent, further demonstrating the Office's familiarity with Chacon and its substantive teachings, as well as its relevance to the technology at issue. EX2005, 0216-22.

While the Office did not expressly consider Miwa '377, JP '741, Peuchert '469, Takase, or Peuchert '293, these references are irrelevant to the overall obviousness arguments presented in the Petition. For example, Ground 2 relies on JP '741 as alleged motivation to reduce the amount of  $\text{As}_2\text{O}_3$  in an embodiment of Miwa '535 that already contained no  $\text{As}_2\text{O}_3$ —making the citation of JP '741 in Ground 2 useless. As another example, Ground 3 relies on Takase to purportedly modify Chacon, but does not explain how Petitioner proposes modifying Chacon in view of Takase. It is not surprising that these additional references were not found by the Examiner, cited, or disclosed during original prosecution because they are even less relevant than the prior art that was considered.

#### **IV. PERSON OF ORDINARY SKILL IN THE ART (“POSA”)**

Only for the purposes of this Discretionary Denial Brief, Patent Owner does not dispute Petitioner’s level of skill for a person of ordinary skill in the art (POSA) as articulated in the Petition.

#### **V. CLAIM CONSTRUCTION**

The Board need not construe any term in order to determine that institution should be discretionarily denied. Patent Owner reserves the right to contest Petitioner’s implicit or explicit constructions during any further proceedings.

#### **VI. REASONS TO EXERCISE DISCRETION TO DENY INSTITUTION.**

The facts and circumstances here warrant denying review under at least one of §§ 314(a), 325(d), and 312(a)(3). The Petition contains several procedural defects that make its ultimate success on the merits unlikely, and various facial flaws on the merits that make institution an inefficient use of the Board’s limited resources.

##### **A. The Director should use discretion under § 314(a) to deny the Petition.**

At least *Fintiv* factors 1-3, 5, and 6 weigh in favor of discretionary denial and factor 4 is neutral. Furthermore, Memo Factors concerning the settled expectations of the parties, economic and public health interests, and the Petition’s reliance on testimony of an unreliable expert further favor discretionary denial.

**1. *Fintiv* factors weigh in favor of Patent Owner and denial in view of parallel ITC investigation.**

On March 24, 2025, the Office issued new guidance clarifying how the Board will apply *Fintiv* and *Sotera* to parallel proceedings, including those before the ITC (“*Fintiv* Guidance”). *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (“*Fintiv*”) (articulating six nonexclusive factors for determining whether to institute an AIA post-grant proceeding where there is parallel litigation).

Here, the Director should exercise discretion to deny the Petition both because (i) at least factors 1–3 and 5 support discretionary denial, and (ii) the Petition does not provide a strong meritorious challenge (factor 6). The facts here align with those in related proceeding IPR2025-00439, which was discretionarily denied by the Acting Director under *Fintiv* in view of the parallel ITC proceeding. *See* IPR2025-00439, Paper 18. If anything, the facts here more strongly support denial under *Fintiv* because the projected FWD date is later than that in IPR2025-00439.

**Fintiv factor 1**: Factor 1 weighs in favor of denying institution. The ITC is under a congressional mandate to conclude its investigations and make determinations “at the earliest practicable time.” 19 U.S.C. § 1337(b)(1). The ITC does not stay its proceedings based on a pending IPR.

**Fintiv factor 2**: Factor 2 weighs in favor of discretionary denial. The projected statutory deadline for issuing a FWD in this IPR would be November 27, 2026. Trial in the co-pending ITC litigation is scheduled to be completed the week of January 6, 2026—over eleven months before the FWD deadline. EX2001, 3. Further, a final initial determination in the co-pending ITC litigation is scheduled to issue on April 7, 2026 (over 7 months before the FWD deadline) and the target date for completion of the ITC investigation is August 7, 2026 (over 3 months before the FWD deadline). EX2001, 3. The ITC’s trial schedule thus weighs strongly in favor of denial. *See Fintiv* Guidance, 2 (“[I]nstituting an IPR or a PGR where the ITC has set a target date for completing its investigation (i.e., the full Commission’s final determination) to occur earlier than the Board’s deadline to issue a final written decision in a challenge involving the same patent claims means that multiple tribunals may be adjudicating validity at the same time, which may increase duplication and expenses for the parties and the tribunals.”).

**Fintiv factor 3**: Factor 3 weighs in favor of denying institution. In factor 3, the Board “consider[s] the amount and type of work already completed in the parallel litigation by the court and the parties at the time of the institution decision.” *Fintiv*, 9. In the parallel ITC litigation, the parties have already exchanged expert reports and briefs on claim construction (May 13<sup>th</sup> through June 16<sup>th</sup>), and completed the *Markman* hearing (June 23<sup>rd</sup>), and the Administrative Law

Judge has already issued a *Markman* opinion (July 17<sup>th</sup>). The deadline for issuing a Decision on Institution (DI) in this IPR is November 27, 2025. By then, the parties will have (i) completed fact discovery (August 26<sup>th</sup>), (ii) exchanged expert reports on all other issues, including any invalidity defenses (September 10<sup>th</sup> and 30<sup>th</sup>), and (iii) exchanged hearing exhibits (October 22<sup>nd</sup> through November 12<sup>th</sup>). EX2001, 1-2. Because the parties and the ITC will have expended significant resources by the November 27, 2025 DI deadline, factor 3 weighs in favor of denying institution.

**Fintiv factor 4**: Factor 4 is—at best for Petitioner—neutral with respect to denying institution. To date, the parties have not exchanged validity or invalidity contentions in the co-pending ITC litigation. All 11 claims of the patent are challenged in this IPR, while only dependent claims 2-3, 5-6, and 9 are being asserted against Respondents in the ITC Investigation. That the claims at issue between the two proceedings are not identical, without more, does not warrant institution. It is common in ITC investigations that the patent owner will (and often must) reduce the number of claims that are ultimately adjudicated. *See* EX2006. As a practical result, there will never be substantial correspondence between the claims that the ITC adjudicates and the claims challenged in a co-pending IPR. Accordingly, if differing claim sets between an IPR and an ITC investigation presented a valid reason for granting institution, then co-pending ITC

investigations could never weigh in favor of discretionary denial. That result would flatly conflict with the Board’s *Fintiv* Guidance.

Petitioner has nominally offered a *Sotera* stipulation. *See* Pet., 17; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB Dec. 1, 2020) (precedential as to § II.A). The effect of this stipulation, however, is unclear because Petitioner will likely assert obviousness combinations of system prior art in the ITC together with prior-art references relied on in its Petition, and other invalidity theories. *See* EX2008, Q.14 (“The Director will take into account whether the stipulation materially reduces overlap between the proceedings. Where the petitioner is relying on corresponding system art in a copending proceeding and/or several other invalidity theories, a stipulation may not be particularly meaningful because the efficiency gained by any AIA proceeding will be limited.”). As the Acting Director recently recognized, such stipulations do not ensure that the IPR proceedings would be a “true alternative” to litigation. *See Motorola Sol’ns, Inc. v. Stellar, LLC*, IPR2024-01205, Paper 19 at 3–4 (PTAB March 28, 2025). Because Petitioner’s stipulation preserves the right to present invalidity grounds based on prior-art systems and products, it suggests Petitioner’s intent to raise the kinds of duplicative arguments that the Director identified as a cause for concern in *Motorola*. *Id.* Factor 4 favors denial.

**Fintiv factor 5**: Factor 5 weighs in favor of denying institution. Petitioner is the first-named respondent in the co-pending ITC litigation.

**Fintiv factor 6**: Factor 6 weighs in favor of denying institution. Every one of the Grounds presented in the Petition is fatally flawed, as discussed in detail below. *See* Section VI.D. Petitioner provides nothing more than cursory rationale and arguments for why claims of the '498 patent are allegedly anticipated and/or obvious without specifying a motivation to combine references or an expectation of success in doing so. In many instances, Petitioner fails to provide any supporting rationale and/or evidence. Any alleged support from Petitioner's expert, Dr. Ernst, should be disregarded because (1) Dr. Ernst does not meet his own definition of a POSA because he lacks experience with design, synthesis, and characterization of silicate, borosilicate, aluminosilicate, and boroaluminosilicate glasses, and (2) Dr. Ernst's declaration is so riddled with errors and misstatements, it is not clear he even read it before signing. *See* Section VI.A.4 (listing examples of obvious errors and blatant misstatements in Dr. Ernst's declaration).

In sum, the ITC's trial is scheduled to commence eleven months before the FWD deadline in this IPR, with the ITC's initial determination expected on April 7, 2026 and the proceeding expected to conclude on August 7, 2026 (over three months before the FWD deadline). Institution would lead to unnecessary duplication and the potential for inconsistent results. Based on these facts and

Petitioner's weak, unsupported unpatentability arguments, the Director should exercise discretion to deny the Petition under § 314(a).

**2. The settled expectations of the parties weigh against institution.**

The '498 patent was filed December 10, 2010 (over 14 years ago). It issued February of 2014 (over a decade ago). The Office has indicated that it is not a good use of resources, and upsets the settled expectations of patent owners and the marketplace, to review patentability challenges for patents that have been in force for many years. *See, e.g., Dabico Airport Solutions Inc., v. AXA Power ApS*, IPR2025-00408, Paper 21 at 2 (PTAB June 18, 2025) (discretionarily denying review for a patent that had been in force for “almost eight years”); *Intel Corp. v. Proxense LLC*, IPR2025-00327, Paper 12 at 2 (PTAB Jun. 26, 2025) (“[T]he challenged patents have been in force over nine years, creating settled expectations, and Petitioner does not provide any persuasive reasoning why an *inter partes* review is an appropriate use of Board resources.”). The patent challenged here has been in force for even longer.

Moreover, the '498 patent expires in November 2026 (about 16 months from this brief). It will therefore expire before the projected FWD deadline in this proceeding. Proceeding with an IPR on an expired patent is an inefficient use of the Board's and the parties' resources. While the Board has jurisdiction to do so in

its discretion,<sup>1</sup> committing substantial Board and party resources to adjudicate an expired patent, especially where the same claims are already pending in the ITC, is contrary to the goals of improving PTAB efficiency and managing workload.

There is also little potential benefit to the industry or the public at large in the PTAB canceling a patent that has already expired. The subject matter of this patent will shortly be available to the public. Instituting review of this Petition is therefore unlikely to expand the industry’s freedom to operate in this space, and therefore does not promote the legislative purpose of IPR proceedings. *See* Changes to Implement *Inter Partes* Review Proceedings, Post-Grant Review Proceedings, and Transitional Program for Covered Business Method Patents, 77 Fed. Reg. 48680-01 (Aug. 14, 2012); *see also* *Hunting Titan, Inc. v. DynaEnergetics Europe GmbH*, 28 F.4th 1371, 1381 (Fed. Cir. 2022) (observing that the “basic purpose of IPR proceedings” is to reexamine an earlier agency decision to “[keep] patent monopolies ... within their legitimate scope”).

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<sup>1</sup> The Supreme Court is currently being asked to review the issue of whether expired patents can be subject to PTAB review. EX2007 (*Gestures Tech. Partners LLC. v. Apple Inc. et al.*, Petition for Writ of Certiorari, Case. No. 24- (filed June 11, 2025)).

Expired patents do not implicate the right to exclude or the public's interest in policing a patentee's exercise of that right. *See Kimble v. Marvel Ent., LLC*, 576 U.S. 446, 451 (2015) (“[W]hen the patent expires, the patentee's prerogatives expire too, and the right to make or use the article, free from all restriction, passes to the public.”) (citing *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225, 230 (1964)). The end of the inventor's exclusive monopoly likewise ends the need for an administrative process to protect the public interest by maintaining that monopoly within its legitimate scope. *See Oil States Energy Services, LLC v. Greene's Energy Group, LLC*, 584 U.S. 325, 336–37 (2018); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 279–80 (2016). This factor thus weighs strongly in favor of discretionary denial.

**3. Compelling economic and public-health interests weigh against institution.**

Corning has spent decades and invested approximately one billion dollars in developing the fusion-draw glassmaking process discussed in the '498 patent (and other Corning patents). Corning has also spent decades developing glass compositions, including those recited in the '498 patent, designed to be manufactured using this fusion-draw process. The patented methods of making boroaluminosilicate glass compositions of the '498 patent, developed at Corning's upstate New York headquarters, cover Corning's flagship LCD glass product EAGLE XG Glass. Corning has facilities and employees in the United States

where it makes the machinery, develops the technologies, and provides support for the production of EAGLE XG Glass. For example, Corning produces, manufactures, and assembles components for its fusion manufacturing systems that make EAGLE XG Glass at a manufacturing facility in Erwin, New York, near its headquarters in Corning, New York.

Corning has invested and continues to invest in U.S.-based research, development, manufacturing, and engineering to make EAGLE XG Glass and its next-generation fusion-draw products. Those investments paid off in the form of EAGLE XG Glass' popularity in the marketplace. Corning has sold more than 25 billion square feet of EAGLE XG Glass—enough to pave the Great Wall of China 25 times or cover nearly 390,000 football fields. EAGLE XG Glass has also won multiple industry awards. *See, e.g.*, EX2002, 0014 (2007 Display Component of the Year; Gold Award: Corning Inc. Eagle XG™ Glass Substrate); EX2003 (Advanced Display of the Year (ADY) award).

Corning continues to reinvest the proceeds from EAGLE XG Glass in significant research and development, including composition-related work, attribute improvements, equipment manufacturing, cost-reduction programs, and process improvements for its next generation of LCD fusion-draw glass. Those investments are threatened by Caihong's importation of infringing glass from China and its retaliatory challenges to Corning's patents (like the present Petition).

In addition to economic investments, there are also important public health concerns at stake. Corning developed its patented EAGLE XG Glass in response to a long-felt need in the art for non-toxic glass LCD panels, i.e., glass LCD panels without significant amounts of added heavy metals or halides. EX2004, 612, 616. In the 1990s, the only feasible way to make glass smooth enough and high-quality enough for LCD screens was to use highly toxic materials like arsenic in the manufacturing process. EX2004, 612, 616. Corning's customers wanted an alternative that was free from this hazardous poison. "The elimination of heavy metals from the glass composition was seen as necessary in the long term because of emerging environmental regulations worldwide." EX2004, 616. So in 2006, Corning commercialized EAGLE XG Glass, which offers incredible flatness and dimensional stability, all while being amazingly defect-free and free of added arsenic and antimony. EX2004, 616. Through these properties, EAGLE XG Glass enables manufacturers of display panels to provide thinner, lighter, and more environmentally friendly products.

Corning worked extensively to design a defect-free glass composition suitable for use in LCD panels that was free of added arsenic, and did not merely substitute arsenic for a similarly toxic component like antimony or a halogen. The methods of producing the glass compositions covered by the '498 patent overcame the problems with toxic elements and manufacturing defects. But they did not

come cheap. It took nearly four years of diligent work, hundreds of experiments, and a cost of about \$3 million every six months (not including raw material costs). The only way to recoup that kind of investment is through patent protection. It is also the only way Corning can continue to fund research into the next generation of fusion-draw glass that remains free of toxic chemicals.

Accordingly, instituting review of the '498 patent will not serve the fundamental purpose of the IPR process in eliminating counterproductive patents that stifle innovation. *See* 37 C.F.R. § 42.100 (2017) (observing the purpose of IPR as streamlining the patent system, improving patent quality, and thereby promoting innovation). Corning is a leading American innovator, and the '498 patent reflects its contributions to research and development. The Director should exercise discretion to deny institution.

**4. The Petition relies heavily on an expert declaration that is riddled with errors from an expert who is not qualified in the relevant art.**

Petitioner's obviousness and anticipation arguments in the Petition are largely conclusory and rely heavily on the say-so of Petitioner's supporting expert declaration. For example, Petitioner argues obviousness based on routine optimization without providing any analysis or support for how the modification would have been routine. *See, e.g.,* Pet., 33. Elsewhere, the Petition states that every limitation of the claims is taught in the prior art, and then bulk-cites to

“EX1003, ¶¶ 121-155,” over 30 paragraphs of the expert opinion, without providing further analysis. Pet., 34. Petitioner’s expert often purports to fill gaps in the allegations regarding what one of skill in the art would know and be motivated to do, but the declaration is devoid of evidence at crucial junctures. *See, e.g.*, EX1003, ¶76 (lacking citation or analysis), ¶158 (statements presented as fact with no citation or analysis), ¶¶186-188 (lacking analysis), ¶197 (lacking citation or analysis). There are other significant problems with Petitioner’s approach.

*First*, aside from Petitioner’s expert’s *ipse dixit*, the Petition has no evidentiary support for a POSA’s alleged knowledge and motivation to combine. *See* Pet., 29 (citing EX1003, ¶76). The Federal Circuit has made clear that the *ipse dixit* of an expert is not sufficient to support obviousness challenges at the PTAB. *See, e.g., TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (reversing PTAB obviousness finding regarding motivation to combine based only on conclusory expert testimony as not supported by substantial evidence). This is particularly troubling where, as here, Petitioner’s expert does not even possess the qualifications that the Petition ascribes to a POSA.

Specifically, Dr. Ernst completely lacks “experience with design, synthesis, and characterization of silicate, borosilicate, aluminosilicate, and boroaluminosilicate glasses.” *Compare* Pet., 21 (defining level of skill for a POSA), *with* EX1011 (Ernst CV).

The Federal Circuit has made clear that “to be qualified to offer expert testimony on issues from the vantage point of an ordinarily skilled artisan in a patent case, an expert must at a minimum possess ordinary skill in the art.”

*Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1377 (Fed. Cir. 2022). Petitioner’s expert does not have what the Petition has identified as the level of ordinary skill in the relevant art. Although Dr. Ernst claims that “[b]ased on [his] education and experience, [he] meet[s] the criteria for a POSITA,” he fails to point to any specific education or experience in his CV or otherwise to support this claim. EX1003, ¶25. Without a qualified expert, the Petition has no competent evidentiary support and the PTAB cannot render a FWD granting the Petition that would be supported by substantial evidence. *See Kyocera*, 22 F.4th at 1377.

*Second*, the expert declaration is so riddled with glaring errors and blatant misstatements that it could not have been carefully reviewed and approved by Dr. Ernst (or anyone). As just a few examples, the declaration argues that one would combine Miwa ’535, JP ’741, and Peuchert ’469, or Chacon and Takase, because it would have been within the skill of a POSA to optimize the combined fraction of SrO and BaO to obtain low-density alkali-free substrate glasses. EX1003, ¶76. But substituting BaO for SrO only pertains to the Petition’s use of the Peuchert ’469 reference cited against dependent claim 4. Pet., 37. The Miwa ’535/JP ’741 and Chacon/Takase combinations cited against independent claim 1 have nothing to do

with substituting BaO for SrO. There is therefore no given reason to combine those references.

As another example, for Ground 2 the declaration states, without support, that it was known “for an alkali-free glass substrate to be fabricated using downdraw technique, the liquidus viscosity should be greater than or equal to 100,000 P (poise), equivalent to  $10^{5.0}$  dPa·s (decipascal–seconds) in SI units.” EX1003, ¶158. Presumably, Dr. Ernst intended to cite the liquidus viscosity discussion in Miwa ’377 (cited in ¶¶117-119 of the declaration as supporting Ground 1). However, the correct Miwa—Miwa ’535 (the reference that forms the basis for the Ground 2)—has no such teaching. The Petition contains a similar error. *See* Pet., 36-37 (citing ¶119 of the declaration discussing Miwa ’377 in support of Ground 2 based on Miwa ’535). Further, Ground 1 in the Petition contains the following quote: “The preferred viscosity of  $10^{5.5}$  dPa·s specified by **Miwa** corresponds to 316,000 P ( $\pm$  36,000), which is greater than or equal to 200,000 poise. EX1003, ¶ 119. Thus, **Miwa** ‘377 discloses Claim 11. EX1003, ¶ 120.” Pet., 33-34 (emphasis added). It therefore appears that one of the Petition’s (and Dr. Ernst’s) theories of invalidity accidentally conflates two different Miwa references in Ground 2, and thus fails to identify a coherent obviousness combination. That is not the kind of error that can be fixed. *See, e.g., Nanobebe US Inc. v. Mayborn (UK) Ltd.*, IPR2023-00465, Paper 21 (PTAB Aug. 17, 2023);

*Sweegen, Inc. v. Purecircle SDN BHD*, PGR2020-00070, Paper 9 (PTAB Sept. 22, 2020).

As another example, the Petition cites Embodiment 8 of Miwa '377 for disclosing a “liquidus viscosity” of 1089 °C. Pet., 31-32. But Miwa '377 Embodiment 8 has a liquidus *temperature* of 1089 °C. Celsius is not even a measure of viscosity. The declaration repeats this error verbatim. EX1003, ¶101. It is concerning that Dr. Ernst would confuse two physical properties so central to glass chemistry, especially in the portion of the opinion comparing the prior art directly to the liquidus temperature claim limitation.

Indeed, confusing basic principles is part of a consistent pattern throughout the Ernst declaration. Dr. Ernst repeatedly conflates SO<sub>3</sub> (sulfate) and CO<sub>3</sub> (carbonate). See EX1003, ¶¶216-218. These are distinct chemical species with different molar masses, properties, and effects on glass compositions. The Petition and declaration also contain identical errors stating that “693 °C, [] is less than 650 °C,” when obviously 693 °C is *greater than* 650 °C. Pet., 32; EX1003, ¶104. Additional errors throughout the declaration are noted in Section VI.C.

The only plausible explanation for an expert declaration with so many egregious errors—errors that also appear *verbatim* in the Petition—is that Dr. Ernst had little involvement in preparing the declaration and was not given adequate time to review the declaration before signing it. The Board should not institute review

of a Petition that is devoid of competent supporting evidence, including an expert declaration that cannot be trusted as accurate or reliable. This is especially true in view of the Director's concern about reliance on expert reports that would benefit from the kind of live cross-examination available in the co-pending litigation but not in the PTAB. *See* EX2010, 2-3.

**5. Institution would not reflect an efficient use of the Board's limited resources.**

The Supreme Court has provided that IPR institution is an all-or-nothing proposition, and that the PTAB must institute on and adjudicate all claims and grounds (or deny institution). *See SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 363–66 (2018). As a result, where only a small subset of grounds and claims in the Petition present meritorious challenges, it is appropriate for the Board to deny institution and avoid expending its limited resources on deficient arguments. *See Chevron Oronite Co. LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 at 9–11 (PTAB Nov. 7, 2018) (denying institution on all claims under §314(a) when petitioner's arguments and proofs were deficient with respect to a subset of claims); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 at 41–43 (PTAB Jan. 24, 2019) (denying institution because “instituting a trial with respect to all twenty-three claims and on all four grounds based on evidence and arguments directed to only two claims and one ground would not be an efficient use of the Board's time and resources”).

As discussed in detail below, each of the Grounds of the Petition is flawed in multiple different ways. All four grounds have failures under § 312(a)(3) but for different kinds of errors. *See* Section VI.C.1-2. Grounds 2 and 3 also fail under § 325(d). *See* Section VI.B.1-2. Grounds 1 and 4 present new art but are even weaker on the merits—blatantly failing to establish anticipation of the claimed liquidus viscosity. *See* Section VI.D.1-4. In the event that the Director finds that certain identified flaws are less compelling, it would not change the overall conclusion that the vast majority of the arguments and challenged claims cannot succeed on their merits. Accordingly, even if one Ground presented a reachable merits issue for a subset of claims, it would not be an efficient use of the Board’s resources to institute on all grounds and claims for a Petition that only presents a coherent challenge on small minority of issues. The Director should discretionarily deny institution.

**B. The Director should use discretion under § 325(d) to deny the Petition.**

The facts here support denial under § 325(d) because Grounds 2 and 3 of the Petition rely on art that was expressly considered during prosecution. Specifically, both Miwa ’535 and Chacon, the primary references cited in Grounds 2 and 3, respectively, were squarely in front of the Examiner, who would have appreciated the totality of both references at the time of examination. The secondary references cited in Grounds 2 and 3 are either cumulative of the primary references for the

purposes they are relied upon, or irrelevant to the alleged obviousness combination. Either way, they do not add anything to the merits of Grounds 2 and 3. While the art cited in Grounds 1 and 4 was not squarely before the Office during prosecution, other errors in those grounds (described in Sections VI.C, VI.D.1, and VI.D.4) confirm the conclusion that institution would not be a good use of the Board's resources.

The Board has discretion to deny review where “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Board's two-part framework considers:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and
- (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

*Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential March 24, 2020). The Board considers the *Becton, Dickinson* factors when applying the framework. *Advanced Bionics*, IPR2019-01469, Paper 6 at 9; *see also Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (informative).

Under the second part of the *Advanced Bionics* framework, Petitioner carries the burden of demonstrating material error: “If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8–9; *see also Becton, Dickinson*, IPR2017-01586, Paper 8 at 17–18 (explaining that factor (e) asks “whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art”). Notably, “[i]f reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability. At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 9.

**1. The Examiner fully considered the art and arguments raised in Ground 2.**

Petitioner does not contest that the primary reference for Ground 2 of the Petition, Miwa ’535 (EX1005) was cited, considered by the Examiner, and applied in a rejection that was overcome during prosecution. The two secondary references cited in Ground 2, JP ’741 and Peuchert ’469, were not cited in the prosecution history. However, as discussed below, for purposes of Ground 2, Peuchert ’469 is entirely cumulative of art already considered and JP ’741 fails to add any substantive teaching to the prior-art combination.

Specifically, the only disclosure in JP '741 cited by Petitioner is cumulative of Miwa '535, and Petitioner identifies no teaching in that reference that is allegedly missing from Miwa '535. *Compare* EX1003, ¶141 (describing Miwa '535's Embodiment 15 as disclosing a glass comprising an As<sub>2</sub>O<sub>3</sub> mass/weight/mole fraction of zero), *with* EX1003, ¶143 (describing JP '741's entire contribution to the obviousness analysis as disclosing a glass comprising an As<sub>2</sub>O<sub>3</sub> mass/weight/mole fraction of zero). The Petition purports to present “combinations of these references” not previously considered by the Office against claim 1 of the '498 patent. Pet., 11-12. But, in reality, Petitioner's challenge for claim 1 in Ground 2 is based entirely on Miwa '535, which is identical to the obviousness rejection based on Miwa '535 overcome during prosecution. Ground 2 presents the exact reasoning Patent Owner already overcame before the Examiner.

Peuchert '469 is purportedly cited for its teaching that BaO can be substituted for SrO. However, Petitioner has already argued in a related IPR that it would have been obvious to modify Miwa '535 in this regard, independent of Peuchert '469. *See* IPR2025-00439, Paper 1 at 24-25 (alleging that Miwa '535 discloses substituting BaO for SrO in a glass composition). That Petitioner takes an inconsistent position here corroborates that its use of Peuchert '469 is solely for the optics of presenting a new combination of art—and not because Petitioner's argument actually uses the additional teachings.

While Patent Owner does not concede that either reference teaches a POSA to modify a glass composition with a reasonable expectation of success, it is nonetheless Petitioner's burden to establish that (1) the same or similar art and arguments were not previously before the Office or (2) the Office erred in its prior consideration of this art and argument. Petitioner's own characterizations of these references describes them as cumulative, and Petitioner has identified no error in the Office's previous consideration of this art. *Compare* IPR2025-00439, Paper 1, 22-25, *with* Pet., 37 (describing Peuchert '469). Petitioner therefore has not met its burden under *Advanced Bionics* for Ground 2.

**2. The Examiner fully considered the art and arguments raised in Ground 3.**

The primary reference for Ground 3 of the Petition, Chacon (EX1008), was cited in the '498 patent, EX1001, 2:48, and in an IDS initialed by the Examiner during prosecution, EX1002, 80. The Office also applied the child application of Chacon (U.S. Patent No. 6,831,029, which contains identical disclosure to Chacon) in a rejection of the '394 patent claims, further demonstrating the Office's familiarity with Chacon and its substantive teachings, as well as its relevance to the technology at issue. *See* EX2005, 0216-22 (Final Office Action mailed Nov. 28, 2008). There is therefore no reasonable dispute that the Office fully considered Chacon.

While the secondary reference cited in Ground 3, Takase, was not cited during prosecution, it is entirely cumulative of Miwa '535, which (as discussed in VI.B.1 above) the Office undisputedly fully considered. Takase is cited solely for its suggestion of SnO<sub>2</sub> as a fining agent, which Miwa '535 also teaches: “[T]he present inventor has found that the addition of SnO<sub>2</sub> to the glass yields the desired transmittance and those proposes this as the present invention. ... SnO<sub>2</sub>, which is added to increase the transmittance, also acts as a clarifying [fining] agent ... .” EX1005, ¶¶13, 19. There is no teaching in Takase that Petitioner points to as not previously considered in prosecution. Accordingly, similar art and arguments were already considered during prosecution. Petitioner has not met its burden under *Advanced Bionics* for Ground 3.

**C. The Director should use discretion under § 312(a)(3) to deny the Petition.**

All four Grounds fail to identify each claim challenged with particularity, due to the numerous errors in the Petition and supporting declaration. Under the governing statute, a petition must identify “with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.” 35 U.S.C. § 312(a)(3). Indeed, “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify with particularity the evidence that supports the grounds for the challenge to each

claim.” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (internal quotes omitted). That is because “the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute.” *Id.* at 1369–70.

Petitioner here has not identified “with particularity” the evidence relied upon for Grounds 1-4. At a high level, the Petition conflates anticipation and obviousness analysis, fails to explain the rationale or motivation for its combination of references, fails to follow the *KSR* or *Graham* framework, and is so riddled with technical errors that the reader must correct and reconstruct Petitioner’s presumably intended arguments at every turn. As detailed below (and further in Section V.I.A.4. above), the collective effect of these errors is to render the Petition statutorily inadequate. The Board should not use its limited resources to decipher Petitioner’s or its expert’s intent and correct the record.

**1. The Petition does not explain the reference combinations in Grounds 2 and 3.**

The Petition fails to explain how or why the references are being combined in Grounds 2 and 3. As a preliminary matter, the Petition addresses “motivation to combine” only once, Pet., 29, paying lip service to the legal requirements with no explanation or support for its conclusion. The Petition promises that motivation-to-combine analysis will be “set forth [] in more detail with respect to certain specific

[claim] limitations,” but it never does. That introductory paragraph is the entirety of the analysis. Pet., 29.

The declaration does not provide any further insight into why one of skill in the art would have combined the cited prior-art references as proposed in the Petition to arrive at the challenged claims. First, as discussed above, the declaration argues that one would combine Miwa '535, JP '741 and Peuchert '469, or Chacon and Takase to optimize the combined fraction of SrO and BaO—a motivation that only applies to Peuchert '469 and has nothing to do with the other references. EX1003, ¶76. Even worse, the only purported reasonable expectation of success discussion in the declaration refers to ionic field strength and radii, and the allegedly similar role of  $\text{Sr}^{2+}$  (ionic field strength of  $28 \text{ nm}^{-2}$ ) and  $\text{Ba}^{2+}$  (ionic field strength of  $24 \text{ nm}^{-2}$ ), in the silicate glass structure. That discussion cites to “EX##.” EX1003, ¶76. In other words, Dr. Ernst forgot to provide any citation for his analysis and just cites a placeholder for an exhibit number. As a result, there is no evidence in the record to support the keystone of his obviousness analysis. The Petition does not reveal what exhibit Dr. Ernst may have had in mind, if any.

In its discussion of the Grounds, the Petition purports to identify some limitations of the claims in the primary references, and others in the secondary references, without ever explaining what was missing from the primary reference, why one of skill would look to the secondary reference, and why one of skill

would combine the references with an expectation of success. *See, e.g.,* Pet., 35-36. Indeed, Petitioner cites Miwa '535's Embodiment 15 as including 0 mol% As<sub>2</sub>O<sub>3</sub>, and then cites JP '741 as "ample reason for a POSITA to reduce the concentration of As<sub>2</sub>O<sub>3</sub> in an alkali free glass." Pet., 35-36. But this argument makes no sense. If Miwa '535's Embodiment 15 had no As<sub>2</sub>O<sub>3</sub> to start with, there would have been no reason for a POSA to modify that embodiment to remove As<sub>2</sub>O<sub>3</sub>.

In a properly formulated multi-reference obviousness ground, where a patent challenger identifies a primary reference that allegedly discloses some (but not all) limitations of the claims, the challenger must also identify which limitations are missing from the primary reference and where they can be found in the secondary reference. *See, e.g., Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (providing that identifying the differences between the prior art and the claims is a required step in the obviousness analysis). The challenger must also explain why a POSA would modify the primary reference to incorporate the teachings of the secondary reference. *See Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 888 (Fed. Cir. 2024) (emphasizing that the mere existence of the claim limitations in the prior art is not enough without a clear motivation to modify and combine). The Petition fails to do this for Grounds 2 or 3.

**a. Numerous drafting errors in Ground 2 further cause the Ground to fail the particularity requirement.**

Ground 2 alleges that claims 1 and 3-11 would have been obvious in view of Miwa '535, JP '741, and Peuchert '469 even though the arguments for claim 1 do not rely on Peuchert '469. Instead, Petitioner relies on Miwa '535 for all of the limitations of claim 1, and cites JP '741 only for teaching the need to reduce As<sub>2</sub>O<sub>3</sub>, even though Miwa '535 already has zero As<sub>2</sub>O<sub>3</sub>. There is no analysis as to why a POSA would look to JP '741 or what that reference contributes to the obviousness analysis. It appears that JP '741 was added to the Ground solely so Petitioner could claim that the cited prior art *combination* was not previously considered by the Office. *See* Pet., 11-13. Miwa '535 was applied in a rejection and overcome during prosecution. *See* Section VI.B.1.

In any event, the combination nominally alleged in Ground 2 is Miwa '535 in view of JP '741 and Peuchert '469. Pet, 34. The Petition then goes on to cite 34 *paragraphs*, paragraphs 121-155, of the declaration as support for Ground 2's obviousness theory. Pet., 34. The declaration, however, does not match the Petition regarding the proposed combination of references. For instance, paragraph 150 of Exhibit 1003 discusses Takase, which is not listed as reference involved in Ground 2. Paragraph 151 of Exhibit 1003 goes further to discuss a proposed Miwa '535/Takase combination, which again is not part of Ground 2 in the Petition. Paragraph 152 discusses a Chacon/Takase combination, which is also not listed in

the Petition as part of Ground 2. Paragraph 153 is insolubly ambiguous and it is impossible to parse what references are even discussed. Paragraph 154 again discusses a Miwa '535/Takase combination, which is not listed as part of Ground 2. Finally, paragraph 155 discusses a combination of Chacon and another unspecified reference, with no indication as to whether it is Takase, Miwa '535, or JP '741. Taken in sum, it is impossible to parse paragraphs 150-155 of Exhibit 1003. It is impossible to determine the proposed references, what Petitioner relies on for each reference, or how the references are proposed to be combined for Ground 2.

Furthermore, the Petition and Declaration repeatedly cite to Miwa '535's Table 4 in support for the proposition that Miwa '535 discloses a glass with a density of 2.39 g/cm<sup>3</sup>. *See, e.g.*, Pet., 37-38; EX1003, ¶166. Miwa '535's Table 4 has no such teaching and does not relate to the Embodiment cited in the Petition. It is possible that the Petition and declaration intended to cite Table 3, which relates to the enumerated embodiment, but the Board should not correct Petitioner's citations. Further adding to the confusion, Miwa '535's Table 3 is not cited a single time in the Petition or the Declaration.

Similar errors were made in Ground 1, which discusses Miwa '377's Embodiment 8 and cites to "Table" without specifying what table. The Petition states: "Miwa '377 includes ... Embodiment 8. *EX1004, Table*; EX1003, ¶ 48."

Pet., 22 (emphasis added). It is likely that the Petition intended to cite to Miwa '377's Table 3 but, once again, Petitioner fails to identify the table being cited in Ground 1 at any point in the Petition.

Finally, the Petition attempts to fill gaps in the prior art with alleged knowledge in the art, without providing any evidence or citation. For example, the Petition states, "[i]t is well-known that the slot-die draw method and overflow-die draft method are fusion processes." Pet., 40. There is no citation for this statement. The corresponding paragraph in the expert declaration contains no discussion of whether or not the slot-die draw method and overflow-die draft method are (or were known to be) fusion processes.

**b. The collective effect of the drafting errors in Ground 3 causes the Ground to fail the particularity requirement.**

Ground 3 takes a similar approach to Ground 2 in relying entirely on a reference previously considered by the Office, and then purporting to combine it with a secondary reference that does not appear to add anything to the analysis. Pet., 43 (relying on Chacon as the primary reference). The entirety of the analysis identifying the purportedly relevant teaching in Takase for claim 1, and combining it with Chacon, is three sentences. *Id.* None of those sentences explain what is missing from Chacon, why one would look to the SnO<sub>2</sub> amount in Takase, how or why one would modify or be motivated to modify Chacon in view of Takase, or

why one would have an expectation of success in doing so. *Id.* There is simply no analysis or explanation in the Petition or Declaration as to why this purported combination satisfies the legal standards for obviousness.

Additionally, the Petition relies on Miwa '535 for the proposition that Chacon discloses the production of alkali-free glass by a downdraw process, even though Miwa '535 is not part of the Ground, does not relate to what Chacon discloses, and does not support the statements for which it is cited. *See* Pet., 42-43 (citing EX1005, col. 5, lines 42-49; EX1003, ¶¶202, 203). In view of these errors, Petitioner has failed to identify the basis for its challenge in Ground 3 with sufficient particularity.

**2. The Petition fails to differentiate its purported anticipation and obviousness theories for Grounds 1 and 4.**

The Petition characterizes all of its arguments in Grounds 1 and 4 as anticipation and/or obviousness without explaining how the analysis proceeds or how those alternative theories interact.

**For Ground 1**, despite calling itself an anticipation argument for claims 1, 2, 7, 9, and 11, the Petition seems to mix and match embodiments of Miwa '377 or use obviousness rationales to close gaps in the disclosure. For example, the Petition cites paragraph 12 of Miwa '377 as disclosing the same liquidus viscosity as found in claim 1 of the '498 patent. Pet., 31. But paragraph 12 of Miwa '377 describes the “prior art,” and not any of Miwa’s embodiments. None of the

embodiments of Miwa '377 are disclosed as having the claimed viscosity, and indeed, there is no evidence to support that the liquidus viscosity of Miwa '377's embodiments was even measured at all.

The only claim for which Ground 1 identifies itself as an obviousness analysis is claim 10, but the entirety of that analysis is: "If not anticipated, Claim 10 would at least have been obvious over Miwa '377 as requiring no more than routine optimization of the parameters disclosed therein. EX1003, ¶¶ 114-115." Pet., 33. This cursory statement does not satisfy the Petitioner's burden of identifying an obviousness theory with particularity. Obviousness is its own legal theory, not a one-sentence fallback for a poorly formulated anticipation challenge.

**For Ground 4**, the Petition is similarly ambiguous regarding which claims are allegedly obvious and which are allegedly anticipated by Peuchert '293. The Petition appears to present primarily obviousness rationales despite calling its theories anticipation. *See, e.g.*, Pet., 50-51 (stating that processes not disclosed in the allegedly anticipating reference would be well known). Meanwhile, the expert declaration appears to contain both anticipation and obviousness analyses that are not reflected in the Petition. *Compare, e.g.*, Pet., 20 (describing Ground 4 as an anticipation argument for claims 1, 2, 4, and 9, and an obviousness argument for claim 10), 48 (describing Ground 4 as a purely anticipation argument for claims 1, 2, 4, and 9, without any analysis of claim 10), *with* EX1003, iv, ¶¶ 285-290

(describing Ground 4 as an anticipation argument for claims 1, 2, 4, and 9, and an obviousness argument for claim 10, with several paragraphs of analysis that appear to be an inherency-type argument but are labeled as obviousness in the heading and table of contents).

Additionally, the Petition points to Peuchert's Example 7 as disclosing the claimed SnO<sub>2</sub> limitation, but is unclear as to what SnO<sub>2</sub> concentration—0.13 or 0.1—it attributes to Peuchert's Example 7. *See* Pet., 50-51. The corresponding declaration paragraphs contain no reference to the value 0.13 mol%. It is therefore unclear how Peuchert allegedly discloses this limitation. Similarly, the Petition states that “[t]he liquidus viscosity of a glass is a direct consequence of the glass composition” and “Peuchert ‘293 describes substantially similar compositions [as the ‘498 patent] having the same properties and, consequently, a POSITA would expect that Example 7 of Peuchert ‘293 has a liquidus viscosity that is greater than or equal to 100,000 poise.” Pet., 50-51. There is no citation for this technical argument and no proof provided. It is not clear what technical basis Petitioner has for such a statement. And, if anything, such technical basis comes *from the ‘498 patent*, which cannot be cited in support of Petitioner's invalidity challenge. As a result, the Petition fails to identify the basis of its challenge in Grounds 1 and 4 with the requisite particularity.

**D. The weakness of Petitioner’s unpatentability arguments weighs against institution under § 314(a).**

Each of the Grounds is facially and fatally flawed on the merits. Grounds 1 and 4 purport to present a theory of anticipation, but fail to identify all of the independent claim elements in Miwa ’377 (Ground 1) or Peuchert ’293 (Ground 4). Obviousness Ground 2 also fails to show every independent claim element in the cited art, in addition to failing to provide any substantive analysis of motivation to modify and combine the cited art or a reasonable expectation of success in doing so. Ground 3 fails to provide any substantive analysis for motivation to combine or reasonable expectation of success.

In an IPR, “the burden of proving a proposition of unpatentability” is borne by (and remains at all times with) the petitioner. 35 U.S.C. §§ 314(a), 316(e); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016). Defects in establishing a ground of unpatentability in a petition are not curable during trial since the petition cannot be corrected or enhanced during trial. *See Sirona Dental Sys. GmbH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018). The Board makes its determination regarding institution based on what the petition actually presents and not what it could have reasonably contained had it been drafted differently. *Magnum Oil*, 829 F.3d at 1381 (holding that the Board is not “free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during [a post-grant proceeding]”). The Board cannot

“deviate from the grounds in the petition and raise its own” theories of invalidity.

*Sirona Dental*, 892 F.3d at 1356.

For anticipation, the petitioner must establish that “every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). A claim element argued as being inherent must be “necessarily present” in the prior art, and “may not be established by probabilities or possibilities.” *Allergan, Inc. v. Apotex Inc.*, 754 F.3d 952, 960 (Fed. Cir. 2014); *PAR Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014); *Cont’l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991).

For obviousness, a petitioner must “articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness”—“mere conclusory statements” will not suffice. *Magnum Oil*, 829 F.3d at 1380. Indeed, “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” *Intelligent Bio-Sys.*, 821 F.3d at 1369 (quoting 35 U.S.C. § 312(a)(3)).

“An obviousness determination requires finding that [a Skilled Artisan] would have been motivated to combine or modify the teachings in the prior art *and* would have had a reasonable expectation of success in doing so.” *Regents of the*

*Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018); *Intelligent Bio-Sys.*, 821 F.3d at 1367–68; *see also, e.g., NJOY, LLC v. JUUL Labs, Inc.*, IPR2024-00536, Paper 17 (PTAB Aug. 12, 2024) (denying institution where petitioner did not show a reasonable expectation of success in combining the asserted references); *Honeywell Int’l Inc. v. DSM IP Assets, B.V.*, IPR2024-00493, Paper 7 (PTAB Aug. 21, 2024) (same).

Here, Petitioner falls short of carrying its burden of establishing a reasonable likelihood of prevailing to show that the claims challenged in Grounds 1-4 are anticipated or obvious for multiple reasons.

**1. Ground 1 fails to show that Miwa ’377 anticipates, expressly or inherently, the claimed liquidus viscosity in claim 1.**

Ground 1 fails to show anticipation of claims 1, 2, 7, 9, and 11 (or obviousness of claim 10) because Miwa ’377 does not disclose (or suggest) the claimed liquidus viscosity. Petitioner relies on the disclosed method of making Miwa ’377’s Embodiment 8 as anticipating claim 1. Pet., 29-31. In doing so, Petitioner argues that the glass of Miwa ’377’s Embodiment 8 has a liquidus viscosity of greater than or equal to 100,000 poise. Pet., 31.

Petitioner does not make clear whether it relies on a theory of express or inherent anticipation to establish that the unspecified liquidus viscosity of Embodiment 8 is greater than or equal to 100,000 poise. But since Embodiment 8

has no express disclosure of a liquidus viscosity, it can only anticipate inherently.

Indeed, Miwa '377 is silent with respect to the liquidus viscosity for any of its disclosed embodiments.

A finding of inherent anticipation requires more than “probabilities or possibilities.” *Cont’l Can Co.*, 948 F.2d at 1269. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art). Rather, “a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is *necessarily* present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (emphasis added). It is not enough that the allegedly inherent result would occur often, usually, or typically—the allegedly inherent result “must inevitably result from the disclosed steps.” *In re Montgomery*, 677 F.3d 1375, 1380 (Fed. Cir. 2012).

In purported support for the liquidus viscosity of Embodiment 8, Petitioner cites a discussion in paragraph 12, which is in the “*prior art*” heading of Miwa '377, and paragraphs 95, 101, and 117 of Dr. Ernst’s declaration (EX1003). Pet., 31. The translation provided by Petitioner states, “in consideration of the

temperature at which glass is formed using the downdraw method, the liquid phase temperature of the glass is preferably less than 1200 °C, and more preferably less than 1150 °C, and the liquid phase viscosity is preferably less than 10<sup>5</sup> dPa·s, and more preferably 10<sup>5.5</sup> dPa·s.” EX1004, ¶12. This citation to Miwa ’377’s discussion of the prior art falls well short of establishing that Miwa ’377’s Embodiment 8 inherently has a liquidus viscosity of greater than or equal to 100,000 poise for the following reasons.

First, a disclosure of what was “preferable” in the prior art does not imply that Embodiment 8 has a liquidus viscosity of greater than or equal to 100,000 poise. Miwa ’377 never discloses that Embodiment 8 has a certain liquidus viscosity, nor does Miwa ’377 specify that Embodiment 8 has a liquidus viscosity consistent with what is “preferable” in the prior art.

Second, the quoted portion of Miwa ’377’s prior art description says that “the liquid phase viscosity is preferably *less than* 10<sup>5</sup> dPa·s [100,000 poise], and more preferably 10<sup>5.5</sup> dPa·s.”<sup>2</sup> EX1004, ¶12 (emphasis added). So, even if this

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<sup>2</sup> The English translation of Miwa ’377 submitted with a related Petition in IPR2025-01017 says the opposite: “liquid phase viscosity is preferably *no less than* 10<sup>5</sup> dPa·s, and more preferably *no less than* 10<sup>5.5</sup> dPa·s.” See IPR2025-01017, EX1008, ¶12. To the extent the exhibit submitted here may be a mistranslation,

“prior art” discussion would inform a POSA’s understanding of Embodiment 8—which it likely would not—it suggests that the liquidus viscosity would be less than 100,000 poise, which would *not* fall within the claimed range.

Third, the citation to paragraphs 95, 101, and 117 of Dr. Ernst’s declaration on page 31 of the Petition does not cure the deficiencies in the Petitioner’s arguments. Paragraphs 95 and 117 simply quote paragraph 12 of Miwa ’377 verbatim. And paragraph 101 mistakenly refers to the liquidus viscosity as equal to 1089 °C, which, as discussed above, does not disclose even a valid unit of viscosity.

Not once does Petitioner or Dr. Ernst provide technical evidence or rationale to establish that the glass of Miwa ’377’s Embodiment 8 necessarily has a liquidus viscosity as claimed. Petitioner has not met its burden of showing inherent anticipation because it has not even purported to demonstrate that the liquidus viscosity of Embodiment 8 is *necessarily* greater or equal to 100,000 poise.

For at least these reasons, the claimed liquidus viscosity limitation is missing from Miwa ’377’s Embodiment 8, and there can be no anticipation.

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that failure is resolved against Petitioner as the party bearing the burden of proof.

**2. Ground 2 fails to show obviousness.**

Ground 2 fails to show obviousness of claims 1 and 3-11 for three reasons. First, the proposed prior-art combination fails to disclose or suggest the claimed liquidus viscosity. Second, the Petition fails to provide a motivation to modify or combine the references as proposed. Third, the Petition does not even attempt to establish a reasonable expectation of success for Ground 2.

**a. Petitioner fails to establish the combination of Miwa '535 and JP '741 discloses or suggests a glass comprising the liquidus viscosity recited in claim 1.**

Ground 2 presents a combination of Miwa '535 and JP '741 for claims 1, 3, and 5-11, and adds Peuchert '469 only for claim 4. In any case, Petitioner relies *only* on Miwa '535 for the recited method of making a glass with “a liquidus viscosity of greater than or equal to 100,000 poise.” Pet., 36-37. But Miwa '535 does not disclose or suggest the claimed liquidus viscosity. Indeed, Miwa '535 does not disclose or discuss liquidus viscosity values or the concept of liquidus viscosity at all. To the extent Petitioner is relying on a theory of inherent disclosure, the Petition does not provide sufficient rationale to establish that the glass of Miwa '535 (or the glass resulting from the combination of Miwa '535 and JP '741) necessarily has a liquidus viscosity of greater than or equal to 100,000 poise.

In a failed attempt to argue Miwa '535 discloses the claimed liquidus viscosity, Petitioner alleges that a liquidus viscosity of greater than or equal to 100,000 poise is required for a glass to be fabricated using a downdraw technique allegedly disclosed by Miwa '535. Pet., 36. But Petitioner provides no support for this assertion. Instead, Petitioner copies and pastes language from its expert declaration, which similarly fails to provide any corroborating evidence. As such, there is nothing other than the *ipse dixit* of the expert to support the proposition that Miwa '535 uses a downdraw technique that requires a liquidus viscosity of greater than or equal to 100,000 poise. *Cf. TQ Delta*, 942 F.3d at 1362.

To make matters worse, a citation provided in the Petition for allegedly supporting Petitioner's arguments cites to the *wrong* Miwa reference—Miwa '377, rather than Miwa '535. In the sentence bridging pages 36 and 37 of the Petition, Petitioner states “[t]he preferred viscosity of  $10^{5.5}$  dPa·s specified by Miwa corresponds to 316,000 [poise].” However, Miwa '535 does not disclose this allegedly preferred viscosity. The only possible source for Petitioner's citation is Miwa '377, which is not part of Ground 2. This erroneous citation not only fails to support Petitioner's Ground 2, it also makes unclear what prior art is actually being cited in this Ground. It is possible that Petitioner intended to add Miwa '377 to create a three-reference obviousness combination, but never provided the requisite

analysis. Because Miwa '535 does not disclose or even discuss liquidus viscosity values at all, the mix-up cannot simply be a typographical error.

Finally, in an even more blatant failure to establish Miwa '535 discloses the claimed liquidus viscosity, Petitioner states that a “liquidus temperature of 1120 °C also indicates a viscosity of higher than 100,000 poise *as demonstrated in the specification of the '498 patent,*” implying that the liquidus temperature disclosure suggests a liquidus viscosity as claimed. Pet., 37 (emphasis added). Once again, Petitioner provides no evidentiary support for the proposition that liquidus temperature and liquidus viscosity are connected in this way. The Petition fails to even cite to the expert declaration for this technical statement. And to the extent Petitioner is relying on disclosure from the '498 patent, this is improper.

The Board cannot credit conclusory assertions about highly technical properties of glass without any corroborating evidentiary support. Much less can the Board determine what a POSA would or would not have understood about these properties in the absence of disclosure in the cited art, without some evidentiary basis beyond a naked expert statement.

The Petition does not purport to rely on the teachings of any other reference in the combination for that limitation. JP '741 is only used to allegedly teach an As<sub>2</sub>O<sub>3</sub>-free glass composition and thus does not cure the issues with Miwa '535 for

at least this claim element. Pet., 35-36. The combination therefore fails. This missing limitation precludes any likelihood of success for Ground 2.

**b. Petitioner's arguments in Ground 2 lack the required rationale to establish that it would have been obvious to combine Miwa '535 with JP '741 to arrive at claim 1.**

Petitioner provides cursory, irrelevant, and uncited evidence regarding motivation to combine Miwa '535 and JP '741 to arrive at the claimed invention. This flawed analysis cannot support Petitioner's burden of proving obviousness.

The full extent of Petitioner's *KSR* rationale is simply that "a POSITA would have found combining those references as described herein to be a small set of a finite number of identified means for obtaining the desired non-alkali low-density glass useful as substrates in display technologies and would have had a reasonable expectation of success in making such combinations. EX1003, ¶ 76." Pet., 29. When reviewing the cited paragraph 76 of Exhibit 1003, however, the only discussion therein relates to the substitution of BaO and SrO for one another. That substitution is completely irrelevant to the proposed combination of Miwa '535 and JP '741, which concerns (nominally) modifying the mol% for As<sub>2</sub>O<sub>3</sub>, and not BaO or SrO. Compounding this problem, the cited paragraph cites an unidentified "EX##." EX1003, ¶76. It is not even clear whether Dr. Ernst actually has relevant testimony on this point or what it might be.

With specific reference to the Miwa '535 and JP '741 combination, Petitioner cites JP '741 as “describ[ing] the need to reduce the use of  $\text{As}_2\text{O}_3$ ” in Miwa '535. Pet., 35-36. But the cited embodiment of Miwa '535 in Ground 2 (Embodiment 15) already contains no  $\text{As}_2\text{O}_3$ . Pet., 35; EX1005, 10, Table 3. Petitioner thus provides no *Graham* analysis as to what is actually lacking in Miwa '535's Embodiment 15, or why a POSA would look to JP '741 to modify Embodiment 15 to arrive at what is claimed. Because Miwa '535's Embodiment 15 does not contain any  $\text{As}_2\text{O}_3$  to start with, there is no reason a POSA would have modified it to reduce  $\text{As}_2\text{O}_3$ . It is unclear how Petitioner proposes to combine the two references and what role JP '741 plays in the combination.

Relatedly, Petitioner provides no motivation for why it would have been obvious to modify Miwa '535 Embodiment 15 to have “at most 0.005 mole percent  $\text{Sb}_2\text{O}_3$ ” as recited in claim 1. The Petition states that Miwa '535 describes that the glass can have a mass% of 0-1%, Pet., 36, but fails to provide any motivation that a POSA would have to reduce the  $\text{Sb}_2\text{O}_3$  content of Miwa '535's Embodiment 15. Petitioner also fails to describe how or why a POSA would have modified Embodiment 15 to have “at most 0.005 mole percent  $\text{Sb}_2\text{O}_3$ ,” while also staying within all of the other numeric ranges that Embodiment 15 allegedly discloses, including the liquidus viscosity limitation.

Making matters worse, Petitioner cites paragraphs 150-155 of Dr. Ernst's declaration in support of Ground 2. Pet., 34, 37. These paragraphs of the declaration are directed to the prior-art references Takase and Chacon, which are not part of Ground 2. This only confuses the issue of what is actually lacking in Miwa '535 Embodiment 15, or why a POSA would look to JP '741 to modify Embodiment 15 to arrive at what is claimed. Petitioner does not provide a motivation to combine Miwa '535, JP '741, Takase, and Chacon. This four-reference combination is not set forth in the Petition or Declaration.

**c. Petitioner does not even attempt to establish a reasonable expectation of success for Ground 2.**

The Board properly denies institution where the petitioner does not show a reasonable expectation of success in combining asserted references. *See, e.g., NJOY*, IPR2024-00536, Paper 17; *Honeywell*, IPR2024-00493, Paper 7; *see also Eli Lilly & Co. v. Teva Pharm. Int'l GmbH*, 8 F.4th 1331, 1344 (Fed. Cir. 2021) (finding that a patent challenger in an *inter partes* review had demonstrated a motivation to combine references does not necessarily imply that the challenger had also met its burden of showing a reasonable expectation of success in achieving a claimed method of treatment). Further, importantly, the literature need not demonstrate an expectation of *failure* in the claimed features in order for the patent to withstand Petitioner's challenge—it is enough that the prior art supports no expectations one way or the other. *See Honeywell Int'l Inc. v. Mexichem*

*Amanco Holding S.A.*, 865 F.3d 1348, 1355 (Fed. Cir. 2017) (reversing a PTAB obviousness finding for improperly requiring the patentee to show an expectation of failure, instead of properly finding no expectation of success—and thus nonobviousness—where the prior art gave no expectations one way or the other).

Petitioner gives lip service to a reasonable expectation of success only once in the Petition, arguing simply that “a POSITA ... would have had a reasonable expectation of success in making such combinations.” Pet., 29. Petitioner surmises, without evidence, that combining the references would have been “a small set of a finite number of identified means” to obtain non-alkali, low-density glass for display technologies. Pet., 29. This falls well short of establishing a reasonable expectation of success in modifying Miwa ’535 in view of JP ’741 as proposed by Petitioner.

Indeed, as discussed above, Petitioner does not substantiate how or why the mol% for  $\text{As}_2\text{O}_3$  and/or  $\text{Sb}_2\text{O}_3$  in Miwa ’535’s Embodiment 15 would be modified. “[T]o have a reasonable expectation of success, one must be motivated to do more than merely to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (cleaned up). Petitioner does not offer any

evidence to show that a POSA would have been guided to modifying Miwa '535 in view of JP '741 to arrive at the claimed glass composition.

“Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *see also Qiagen North American Holdings, Inc. v. HandyLab, Inc.*, 2021 WL 5024387, at \*2-4 (Fed. Cir. 2021) (affirming Board’s denial of obviousness when “Petitions offered only a single conclusory statement regarding the POSA’s alleged reasonable expectation of success”). Here, Petitioner does not provide a single meaningful articulation or rational underpinning to support a finding of a reasonable expectation of success.

For at least these reasons, Petitioner’s unpatentability arguments for Ground 2 are facially deficient. It would be a waste of Board resources to institute trial based on Petitioner’s cursory and unsupported arguments.

### **3. Ground 3 fails to show obviousness.**

Ground 3 fails to show obviousness of claims 1 and 4-11 for at least two reasons. First, Petitioner fails to provide valid *KSR* analysis regarding how Chacon is modified in view of Takase. Second, Petitioner does not even attempt to establish a reasonable expectation of success for Ground 3.

**a. Petitioner's arguments in Ground 3 lack the required rationale to establish that it would have been obvious to combine Chacon with Takase to arrive at claim 1.**

Petitioner fails to identify a starting point (for example, a specific embodiment or example) in Chacon, the differences between that starting point and claim 1, or the proposed modification of that starting point in view of Takase. Pet., 42-43. Without these crucial components of the legal analysis, Ground 3 cannot prevail.

Petitioner's failure to propose a starting point in Chacon is troubling because none of Chacon's 32 examples summarized in Table 1 come particularly close to meeting the claims. For example, only one of Chacon's 32 examples (#21) has greater than or equal to 1 mol% MgO as claimed. This example has no SnO<sub>2</sub> and a RO/Al<sub>2</sub>O<sub>3</sub> ratio less than 1.0. As another example, only three of Chacon's 32 examples (#27, #29, and #30) have a RO/Al<sub>2</sub>O<sub>3</sub> ratio of greater than or equal to 1.0 as claimed. All three of these examples have no SnO<sub>2</sub> and no MgO.

In fact, each of Chacon's examples would require *multiple* changes to the glass composition disclosed, rather than a single substitution of fining agents. *Contra* Pet., 43. In overlooking what Chacon teaches in its examples, Petitioner fails to identify any of the claim limitations that an embodiment or example of Chacon lacks, or how such an embodiment or example would have been modified in view of Takase. Rather, Petitioner references broad swaths of Chacon's

disclosure and summarily argues it would have been obvious to modify the process in Chacon to avoid the use of toxic fining agents. Pet., 42-43.

Petitioner also does not identify what the final glass composition would be once the proposed modification is made. Petitioner alleges that the combination would “avoid the use of toxic fining agents and, instead, use  $\text{SO}_3$  and  $\text{SnO}_2$  as fining agents,” but does not explain how or why. Pet., 42-43. This is particularly problematic because it fails to explain how the nebulous combination of Chacon and Takase would meet the other claim limitations, such as  $\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$  and liquidus viscosity. Not once does Petitioner attempt to establish that the final, modified glass composition in the Chacon-Takase combination would have a liquidus viscosity of greater than or equal to 100,000 poise as claimed.

What is more, the Petition relies heavily on the declaration of Dr. Ernst to fill the gaps in its analysis. *See, e.g.*, Pet., 47 (one sentence citing to four pages of technical analysis). That reliance is problematic for several reasons stemming from a variety of fatal flaws in the declaration itself. Many of these flaws are discussed in Section VI.A.4, above. Flaws specific to Ground 3 are set forth in detail below.

First, the math that Dr. Ernst uses to justify the statement in the Petition “the  $\text{SnO}_2$  fining agent is 0.05–2 ms%, which overlaps with a mole fraction of at least 0.02 mol%” is tortured at best and incomprehensible at worst. Pet., 43; EX1003, ¶¶214-219, The bulk of this lengthy analysis, including (1) the initial glass

composition allegedly taught by Chacon, (2) the proposed modification in view of Takase, and (3) the composition of the final modified product are not disclosed or even summarized in the Petition. *Compare* Pet., 43, with EX1003, ¶¶214-219.

Second, Dr. Ernst's entire argument is plagued by hindsight bias. The analysis follows the claims as a blueprint to bend the prior art *ad hoc* around each limitation. For example, Dr. Ernst presents "one particular glass composition, chosen by me" as a starting point to which he adds his proposed fining agents. EX1003, ¶218. The numeric values of  $\text{SnO}_2$  and  $\text{SO}_3$  (or  $\text{CO}_3^3$ , as the wording is ambiguous) he adds to the starting point draw no support from the disclosure itself, and are also simply "chosen by [him]." EX1003, ¶218. Dr. Ernst does not explain how or why he (or a POSA) would have selected the particular glass composition featured in his analysis. Dr. Ernst also does not explain why he (or a POSA) would have selected the respective amounts of 0.05% and 0.001% of  $\text{Sn}_2\text{O}_3$  and  $\text{SO}_3$ , or why both  $\text{Sn}_2\text{O}_3$  and  $\text{SO}_3$  would have been selected when only 2 out of 6 Takase samples use both.

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<sup>3</sup> Dr. Ernst consistently conflates  $\text{SO}_3$  and  $\text{CO}_3$ , making the interpretation of his calculations and explanations difficult to follow and incorrect. EX1003, ¶¶217-219.

Dr. Ernst does not even mention that he made the decision to completely remove  $\text{Sb}_2\text{O}_3$  and/or  $\text{As}_2\text{O}_3$  from the original glass composition, further confusing the explanation of his proposed modification. In other words, Dr. Ernst's explanation for his proposed modification to the composition is incomplete because it does not account for (much less justify) all of the changes that he made. Instead of providing the requisite analysis, Dr. Ernst suggests that it would have been reasonable to add 0.02 mol%  $\text{SnO}_2$  to Chacon. EX1003, ¶215. This suggestion is both legally and factually deficient.

Legally, it does not speak to the standard whether it would be “reasonable” to make a particular modification to the prior art. The relevant questions are whether a POSA would have been motivated to do so, and why. *See, e.g., In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (“The mere fact that the prior art may be modified in the manner suggested ... does not make the modification obvious unless the prior art suggested the desirability of the modification.”).

Factually, this addition of 0.02 mol%  $\text{SnO}_2$  would not be enough to replace the at least 0.1 mol%  $\text{As}_2\text{O}_3$  and/or  $\text{Sb}_2\text{O}_3$  within Chacon's examples (.08 mol% is left unaddressed). Dr. Ernst does not explain why he selected the given amounts of fining agents to add to his initial composition or why those amounts of fining agents are sufficient to replace the  $\text{As}_2\text{O}_3$  and/or  $\text{Sb}_2\text{O}_3$ .

**b. Petitioner does not even attempt to establish a reasonable expectation of success for Ground 3.**

As discussed above for Ground 2, Petitioner gives lip service to a reasonable expectation of success only once in the Petition—arguing that simply that “a POSITA ... would have had a reasonable expectation of success in making such combinations.” Pet., 29. This falls well short of establishing a reasonable expectation of success in modifying Chacon in view of Takase as proposed by Petitioner.

Petitioner does not provide a single meaningful articulation or rational underpinning to support a finding of a reasonable expectation of success. For example, as discussed above, Petitioner does not substantiate how or why the proposed amount of  $\text{SnO}_2$  and/or  $\text{SO}_3$  fining agents are sufficient to replace the  $\text{As}_2\text{O}_3$  and/or  $\text{Sb}_2\text{O}_3$  in Chacon’s glass with a reasonable expectation of success. For at least these reasons, Petitioner’s unpatentability arguments for Ground 3 are facially deficient. It would be a waste of Board resources to institute trial based on Petitioner’s cursory and unsupported arguments.

**4. Ground 4 fails to show that Peuchert ’293 anticipates, expressly or inherently, the claimed liquidus viscosity in claim 1.**

Ground 4 fails to show anticipation of claims 1, 2, 4, and 9 because Peuchert ’293 fails to disclose a liquidus viscosity of greater than or equal to 100,000 poise. Petitioner cites the method of making the glass of Example 7 in Peuchert ’293 as

anticipating claim 1. Pet., 50-51. Peuchert '293 does not explicitly disclose a liquidus viscosity of greater than or equal to 100,000 poise for Example 7. Indeed, liquidus viscosity is not measured for any of the embodiments disclosed in Peuchert '293.

Once again, like Ground 1, Patent Owner can only infer that Petitioner means to present an inherent anticipation theory, because there is simply no express disclosure of liquidus viscosity in Peuchert '293. But Petitioner does not provide any meaningful, technically supported rationale to establish that the glass of Example 7 *necessarily* has a liquidus viscosity of greater than or equal to 100,000 poise.

Instead, Petitioner claims, without any citation or supporting evidence, that “[t]he liquidus viscosity of a glass is a direct consequence of the glass composition.” Pet., 36. “The '498 patent describes certain glass compositions in Limitation 1[p] and Limitation 1[a].” Pet., 50-51. The Petition cites no prior art, no portion of the specification, and no technical evidence for the proposition that liquidus viscosity of at least 100,000 poise is a direct consequence of Peuchert '293's Example 7 glass composition. Just because the same oxides listed in Petitioner's identified Limitation 1[a] ( $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{B}_2\text{O}_3$ ,  $\text{MgO}$ ,  $\text{CaO}$ ) are present in a glass composition, does not mean the glass will necessarily have a liquidus viscosity of at least 100,000 poise.

Petitioner cannot simply assume that a limitation is necessarily met by a reference that is silent on that limitation. It is telling that the Petition states “a POSITA would expect that Example 7 of Peuchert ‘293 has a liquidus viscosity that is greater than or equal to 100,000 poise,” Pet., 51, but cited paragraph 276 in Dr. Ernst’s declaration says nothing about an expected liquidus viscosity of Example 7.

For at least these reasons, the claimed liquidus viscosity limitation is missing from Peuchert ‘293’s Example 7, and there can be no anticipation.

## **VII. CONCLUSION**

The Director should exercise discretion to deny institution of *inter partes* review of the ‘498 patent.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason D. Eisenberg/

Jason D. Eisenberg (Reg. No. 43,447)  
Kristina Caggiano Kelly (Reg. No. 58,164)  
Charles D. Hammond (Reg. No. 73,287)  
Maxwell Furigay (Reg. No. 82,104)  
*Counsel for Patent Owner*

Date: July 28, 2025

1101 K Street, NW, 10th Floor  
Washington, DC 20005  
(202) 371-2600

**CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))**

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 13,961 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason D. Eisenberg/

Jason D. Eisenberg (Reg. No. 43,447)  
*Counsel for Patent Owner*

Date: July 28, 2025

1101 K Street, NW, 10th Floor  
Washington, DC 20005  
(202) 371-2600

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mail:

Daniel J. Pereira (Lead Counsel) [dpereira@merchantgould.com](mailto:dpereira@merchantgould.com)  
Donald McPhail (Back-Up Counsel) [dmcphail@merchantgould.com](mailto:dmcphail@merchantgould.com)  
MERCHANT AND GOULD PC

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason D. Eisenberg/

Jason D. Eisenberg (Reg. No. 43,447)  
*Counsel for Patent Owner*

Date: July 28, 2025

1101 K Street, NW, 10th Floor  
Washington, DC 20005  
(202) 371-2600

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