

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAIHONG DISPLAY DEVICES CO., LTD.,
Petitioner

v.

CORNING INCORPORATED,
Patent Owner

Case IPR2025-01017
U.S. Patent No. 8,642,491

PATENT OWNER'S DISCRETIONARY DENIAL BRIEF

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
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	<i>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)
2003	Display of the Year Award Archive, accessed at https://www.sid.org/Awards/Display-Industry-Awards/DIAAwardsArchive (last accessed Apr. 9, 2025)
2004	“Corning wins awards for EAGLE XG(TM),” accessed at: https://www.glassonline.com/corning-wins-awards-for-eagle-xgtm/ (last accessed Apr. 9, 2025) (May 23, 2007)
2005	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)
2006	<i>Gestures Tech. Partners LLC. v. Apple Inc. et al.</i> , Petition for Writ of Certiorari, Case. No. 24- (filed June 11, 2025)

I. INTRODUCTION

U.S. Patent No. 8,642,491 (“the ’491 patent”) claims innovative, non-obvious improvements to alkali-free boroaluminosilicate glass compositions. The ’491 patent is one of five patents that have been challenged in IPRs and are 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. That litigation will conclude several months before a decision here.

The ’491 patent is in the same family as U.S. Patent No. 7,851,394 (“the ’394 patent”), challenged in IPR2025-00439, where institution was discretionarily denied based on the co-pending 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 No. 9,512,025 (“the ’025 patent”), challenged in IPR2025-01040; U.S. Patent No. 8,640,498 (“the ’498 patent”) challenged in IPR2025-00937; and U.S. Patent No. 8,627,684 (“the ’684 patent”) challenged in IPR2025-01137. Each of these five IPRs have the same procedural issues found to support discretionary denial in IPR2025-00439. Each should also be discretionarily denied for at least the same reasons, as well as the reasons presented in their respective briefs.

As a preliminary matter, the *Fintiv* Factors and recent Acting Director guidance on discretionary denial weigh strongly in favor of denial here. 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. Furthermore, 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.

Additionally, the Petition purports to present three invalidity Grounds, all of which suffer from numerous flaws that compel discretionary denial under 35 U.S.C. §§ 314(a), 325(d), and/or 312(a)(3). For instance, two of the Grounds rely on art and arguments already considered by the Examiner, without identifying any error in prosecution and without providing meaningfully new evidence to modify and combine the references. *See* 35 U.S.C. § 325(d). The Petition 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. *See* 35 U.S.C. § 312(a)(3). The technical arguments are largely conclusory and rely on unsubstantiated expert testimony to fill gaps in the prior-art disclosures and in the argumentation. Instituting review of

the Petition based on these facially deficient Grounds would not be a good use of the Board's limited resources. *See* 35 U.S.C. § 314(a).

On the merits, the '491 patent claims recite alkali-free boroaluminosilicate glass compositions 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). None of the Grounds present prior art (or prior-art combinations) teaching a glass composition having the claimed liquidus viscosity. This missing limitation precludes any likelihood of success in showing the claims unpatentable. The obviousness Grounds also fail to establish a motivation to combine and a reasonable expectation of success in achieving the claimed compositions.

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, Patent Owner Corning Incorporated respectfully requests that the Board exercise its discretion to deny institution of *inter partes* review of the '491 patent.

III. FACTUAL BACKGROUND

The '491 patent is directed to boroaluminosilicate glasses that can be used for displays, such as LCDs. EX1001, Abstract. The '491 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, 3:26-38. The compositions claimed by the ’491 patent allow for the fining (the removal of bubbles) of glass suitable for LCD screens without either of these toxic elements. EX1001, 11:63-12:32. This improvement is made possible through precise control of various metal oxide ratios, which is reflected in the claims.

A. Overview of the Technology

The ’491 patent identifies and improves upon a composition of silicate glass to solve a critical problem: the need for nearly defect-free glass without the use of harmful chemicals such as arsenic or antimony. During glass manufacturing, materials such as SiO_2 , Al_2O_3 , or B_2O_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 ’491 patent glass compositions 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 Al_2O_3 ($\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$) of greater than or equal to 1.00. Although MgO had been used in display-glass compositions before the '491 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 of the '491 patent discovered that this effect could be counteracted by tightly controlling the amount of MgO along with the ratio of RO to Al_2O_3 . Within the claimed range of RO to Al_2O_3 ratio, adding MgO actually *decreased* the liquidus temperature rather than increasing it as expected at the time. EX1001, 10:12-64.

These claimed glass compositions are designed to be formed using a fusion downdraw process, which allows for tightly controlled and reproducible glass dimensions and allows for 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, 4:52-5:3, 10:54-64, 12:49-64. The claimed glass compositions, suitable for the fusion downdraw process and 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 '491 patent led to the launch of Corning® EAGLE XG® glass, a best-selling product for Corning Incorporated ("Patent Owner" or "Corning").

B. Overview of '491 Patent Claims

The '491 patent, entitled "Finishing of Boroalumino Silicate Glasses," issued on February 4, 2014 to inventor Adam J.G. Ellison. It shares a specification with the '394 patent and the '498 patent. It issued from U.S. Application No. 12/965,032, filed on December 10, 2010, which is a continuation of U.S. 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 No. 7,534,734 and the '394 patent, and has an expiration date of October 7, 2026, less than 14 months from the date of this Brief.

Independent claim 1 of the '491 patent recites an alkali-free glass for a downdraw process comprising, in mole percent (mol%) on an oxide basis, the following: SiO₂: 64.0-71.0, Al₂O₃: 9.0-12.0, B₂O₃: 7.0-12.0, MgO: 1.0-3.0, CaO: 6.0-11.5, SrO: 0-2.0, and BaO: 0-0.1, wherein: (a) the ratio of the concentration of the divalent metal oxides to Al₂O₃ ($[RO]/[Al_2O_3]$) in the glass is greater than or equal to 1.00, (b) the glass has at least 0.01 mol% SnO₂ and at most 0.05 mol% As₂O₃ and Sb₂O₃, respectively, and (c) the glass has a liquidus viscosity greater than or equal to 100,000 poise. EX1001, 19:36-62. Independent claim 13 recites an alkali-free glass sheet produced by a downdraw process comprising a glass that comprises SiO, Al₂O₃, B₂O₃, MgO, and CaO, wherein (i) $[RO]/[Al_2O_3]$ is greater

than or equal to 1.00, (ii) the MgO content is greater than or equal to 1.0 mol%, (iii) the glass has at least 0.01 mol% SnO₂ and at most 0.005 mol% As₂O₃ and Sb₂O₃, respectively, and (iv) the glass has a liquidus viscosity greater than or equal to 100,000 poise. EX1001, 20:61-21:12.

C. Prosecution History of the '491 Patent

The '491 patent examination applied or at least considered several of the references presented in the Petition. First, the primary reference featured in Ground 1, Japanese Publication No. 2004-189535 (EX1004, "Miwa '535"), was cited by Patent Owner and applied in a § 103 rejection overcome by Patent Owner during prosecution. EX1002, 16-17, 47-48, 63-64. Second, the U.S. equivalent of the primary reference featured in Ground 2, Japanese Publication No. 2002-308643 (EX1007, "JP '643"), was cited by Patent Owner and specifically considered by the Examiner. EX1002, 68. The U.S. equivalent of JP '643, U.S. Patent No. 6,881,692, shares the same family as JP '643 and contains substantively identical disclosure.

After considering the cited prior art, the Examiner concluded that the "prior art fail to disclose or suggest with sufficient specificity an alkali-free glass comprising in mole percentages the recited components, wherein the glass has the specific recited relationship of the alkaline earth metal oxides to the Al₂O₃ content, the glass has greater than or equal to 1 mole percent MgO, and the glass limits the

amounts of As₂O₃ and Sb₂O₃ content present in the glass” such that the “glass has a liquidus viscosity that is greater than or equal to 100,000 poise and is made for the downdraw process.” EX1002, 17.

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 THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION

The facts and circumstances here warrant denying review under at least one of 35 U.S.C. §§ 325(d), 312(a)(3), and 314(a). 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 the parallel ITC investigation.

On March 24, 2025, the Office issued new guidance clarifying how the Board will apply *Fintiv* and *Sotera* decisions 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 its 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 (PTAB July 10, 2025). 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 pending IPRs.

Fintiv factor 2: Factor 2 weighs in favor of discretionary denial. The projected statutory deadline for issuing a FWD in this IPR would be December 16, 2026. Trial in the co-pending ITC litigation is scheduled to be completed the week of January 6, 2026—over eleven months before FWD. EX2001, 3. Further, a final initial determination in the co-pending ITC litigation is scheduled to issue on April 7, 2026 (over eight months before FWD) and the target date for completion of the ITC investigation is August 7, 2026 (over four months before FWD). EX2001, 3. The ITC’s trial schedule thus weighs in favor of denial. *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 13th through June 16th), and completed the *Markman* hearing (June 23rd), and the Administrative Law Judge has already issued a *Markman* opinion (July 17th). The deadline for issuing a Decision on Institution (DI) in this IPR is December 16, 2025. By that time, the parties will have completed fact discovery (August), exchanged expert reports on all issues, including any invalidity defenses (September), and exchanged trial exhibits (October - November). EX2001, 1-2. Because the parties and the ITC will have expended significant resources by the December 16, 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. All 24 claims of the patent are challenged in this IPR, while only claims 2, 3, 5, 6, and 9 are at issue in the ITC litigation. The mere fact 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* EX2002, 4-5 (Ground Rule 3). 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 untenable result would undermine the Board's *Fintiv* Guidance.

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.C. Petitioner provides nothing more than cursory rationale and arguments for why the claims of the '491 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. To the extent Petitioner provides support from its expert, Dr. Ernst, that evidence should be disregarded because Dr. Ernst does not meet his own definition of a POSA. *See* Section VI.A.4.

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 four 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 '491 patent issued in February 2014 (over eleven years 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 June 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 '491 patent expires in October 2026 (less than 14 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,¹ committing substantial Board and party resources to adjudicate an

¹ The Supreme Court is currently being asked to review the issue of whether

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”).

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

expired patents can be subject to PTAB review. EX2006 (*Gestures Tech. Partners LLC. v. Apple Inc. et al.*, Petition for Writ of Certiorari, Case. No. 24- (filed June 11, 2025)).

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 ’491 patent (and other Corning patents). Corning has also spent decades developing glass compositions, including those recited in the ’491 patent, to be manufactured using this fusion-draw process. The patented boroaluminosilicate glass compositions of the ’491 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. EAGLE XG has also won multiple industry awards. *See, e.g.*, EX2003, 14 (2007 Display Component of the Year; Gold Award: Corning Inc. Eagle XG™ Glass Substrate); EX2004 (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 Petitioner Caihong Display Devices Co., Ltd.'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. EX2005, 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. EX2005, 612, 616. Corning's customers wanted an alternative that was free from this hazardous material. "The elimination of heavy metals from the glass composition was seen as necessary in the long term because of emerging environmental regulations worldwide." EX2005, 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. EX2005, 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 with a similarly toxic material like antimony or halides. The compositions covered by the '491 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 '491 patent will not serve the fundamental purpose of the IPR process—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 '491 patent reflects its contributions to research and development. The Director should exercise discretion to deny institution.

4. The Petition relies on an expert declaration that cites unreliable and unauthenticated test data and lacks the requisite expert qualifications.

Petitioner's obviousness and anticipation arguments are largely conclusory and rely heavily on the say-so of Petitioner's supporting expert declaration. There are 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. 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 (Fed. Cir. 2019) (reversing PTAB obviousness finding regarding motivation to combine based only on conclusory expert testimony as not

supported by substantial evidence). The Petition therefore fails to cite evidence sufficient to warrant institution.

Second, Petitioner's expert does not meet Petitioner's own definition of a POSA. Petitioner's expert, Dr. Ernst, is a ceramic engineer and metallurgist. He identifies no significant experience with glass chemistry or material science specifically dealing with the "design, synthesis, and characterization of silicate, borosilicate, aluminosilicate, and boroaluminosilicate glasses." *Compare* Pet., 11-12 (defining level of skill for a POSA), *with* EX1012 (Ernst CV). Indeed, the description of Dr. Ernst's background credentials in his expert report does not describe *any* years of experience with design, synthesis, and characterization of silicate, borosilicate, aluminosilicate, and boroaluminosilicate glasses. *See* EX1003, ¶¶5-7 (describing experience in ceramic engineering, ceramic/metal interfaces, and microscopy).

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, and does not even claim to have, what the Petition has identified as the level of ordinary skill in the relevant art. 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 id.*

Finally, Dr. Ernst purports to rely on extrinsic test data to support his opinions for Ground 1 of the Petition. *See* EX1003 ¶¶99-108, 197-202. Specifically, Dr. Ernst opines that data presented in EX1010, a Chinese-language “Test Report,” shows that a composition similar to that of Embodiment 15 of Miwa ’535—as modified per Petitioner’s obviousness theory—has a liquidus viscosity of $10^{6.2}$ dPa. Dr. Ernst concludes that a modified version of Embodiment 15 therefore satisfies claims 1 and 13 of the ’491 patent. There are several problems with this proposition.

First, Dr. Ernst does not purport to know the reliability of the test data or their origins. The foreign-language document appears to have been generated for litigation, but there is no competent sponsoring witness who can authenticate it. The Test Report is not self-authenticating. *See* Fed. R. Evid. 902; 29 C.F.R. § 18.902. It is signed by a Wei Peng, an apparent third party who did not provide a sworn declaration in this proceeding. Assuming Wei Peng is a Chinese national, any declaration would not be subject to penalty of perjury or 18 U.S.C. § 1001 and the PTAB could not compel the declarant to testify at a deposition in the United States. *See* 35 U.S.C. § 24 (deferring the PTAB’s subpoena power to federal courts); Fed. R. Civ. P. 45(c) (limiting the subpoena power of federal courts).

Furthermore, neither the Test Report itself nor Dr. Ernst's declaration explain how the test was performed. There is no materials and methods section, no explanation of testing conditions or assumptions, no account for the source of ingredients, no description of the type of equipment used, and no discussion of the significance of the results. There is no basis for Dr. Ernst or the Board to consider the Test Report reliable. *See* Fed. R. Evid. 702. If review is instituted, Patent Owner will file a motion to strike this evidence, and in the alternative, a motion for additional discovery. *See* 37 C.F.R. § 42.224(a); *Bloomberg, Inc. v. Markets-Alert Pty. Ltd.*, CBM2013-00005, Paper 32 (PTAB May 29, 2013). Adjudicating those motions and the merits of the Petition without EX1010 will further tax the Board's limited resources for a Petition that is ultimately not worth the burden.

Finally, even if the test data were admitted over PO's objections, Dr. Ernst's use of the test data is fundamentally flawed. Dr. Ernst acknowledges that the composition tested is only "similar" to the glass described in Miwa '535's Embodiment 15 (modified to replace BaO with SrO). EX1003, ¶198. Setting aside the issues with Dr. Ernst's allegedly obvious substitution of BaO for SrO (discussed below in Section VI.C.1), Dr. Ernst does not explain why other differences in the composition would not meaningfully affect the measured liquidus viscosity. For example, Dr. Ernst summarily concludes that the difference in Sb₂O₃ content "has little impact on the liquidus viscosity." EX1003, ¶198. No

rationale or evidence is provided to support this statement. Even “little impact” does not mean no material impact. *Id.*

The insufficiency and inconsistency in Dr. Ernst’s analysis is further highlighted by Dr. Ernst’s conclusion that “glasses with the composition specified in Miwa ‘535’s Embodiment 15 meet the requirement of Limitation 1[m].” EX1003, ¶107. A similar conclusion with respect to claim 13 can be found in paragraph 201 of Dr. Ernst’s declaration. In drawing these conclusions, Dr. Ernst appears to have forgotten that the composition specified in Miwa ‘535’s Embodiment 15 is *not* the composition that was tested. It is therefore unclear which composition (the original or modified composition) Dr. Ernst relies on for allegedly having a liquidus viscosity as recited in claims 1 and 13.

The Board should not institute review of a Petition that is so fundamentally flawed and devoid of competent supporting evidence.

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

The facts here support denial under § 325(d) because Grounds 1 and 2 of the Petition rely on art that was expressly considered during prosecution. Both Miwa ‘535 and the U.S. counter-part of JP ‘643 (the primary references cited in Grounds 1 and 2, respectively), were squarely in front of the Examiner during examination. And the secondary references cited in Grounds 1 and 2 are either cumulative of the primary references for the purposes they are relied upon, or add nothing

meaningful to the obviousness analysis. While the art cited in Ground 3 was not squarely before the Office during prosecution, Petitioner's blatantly deficient anticipation arguments (described in Section VI.C.5) 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”); *Microsoft Corp. v. AlmondNet, Inc.*, IPR2022-01319, Paper 9 at 11 (PTAB Jan. 30, 2023) (denying institution under § 325(d) where Petitioner did not sufficiently address whether the Office materially erred). “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 1.

Petitioner does not contest that the primary reference for Ground 1, Miwa ’535 (EX1004) was cited, considered by the Examiner, and applied in a rejection overcome during prosecution. The secondary reference cited against claim 1 in Ground 1, Peuchert ’469 (EX1006), was not cited during prosecution.

However, for purposes of Ground 1, Peuchert ’469 does not actually add any substantive teaching to Miwa ’535. The only disclosure in Peuchert ’469 cited by Petitioner relates to the “sum of the two heavy alkaline earth metal oxides SrO and BaO [being] preferably limited to a maximum of 4% by weight.” Pet., 26. This

disclosure does not teach or suggest substituting BaO for SrO at all, much less making this substitution in Miwa '535 as proposed by Petitioner. Further, 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 (PTAB Jan. 13, 2025) (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.

As such, while the Petition purports to present “combinations of these references” not previously considered by the Office (Pet., 8), in reality, Petitioner's challenge for claims 1 and 13 in Ground 1 is based entirely on Miwa '535's disclosure, which is identical to the obviousness rejection based on Miwa '535 overcame during prosecution. Petitioner's own characterizations of the cited references describes them as cumulative, and Petitioner has identified no error in the Office's previous consideration of this art. Petitioner therefore has not met its burden under *Advanced Bionics* for Ground 1.

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

Petitioner states that the “USPTO has not, however, previously considered ... JP '643.” Pet., 8. While this may technically be true, the relevant disclosure was

undeniably in front of the office during examination. The U.S. counter-part of JP '643 was cited in an IDS and considered by the Examiner during examination. EX1002, 68. There is therefore no reasonable dispute that the Office fully considered JP '643.

While the secondary references cited in Ground 2 (JP '741 and Peuchert '469) were not cited during prosecution, neither reference adds anything meaningful to the merits of Ground 2. JP '741 is cited solely for its suggestion of substituting Sb_2O_3 for SnO_2 . But, in fact, JP '741 does not specifically teach such a substitution. *See* Section VI.C.3.b. And Peuchert '469 is cited solely for its suggestion of substituting BaO for SrO. But, again, the only disclosure in Peuchert '469 cited by Petitioner relates to the “sum of the two heavy alkaline earth metal oxides SrO and BaO [being] preferably limited to a maximum of 4% by weight.” Pet., 45. This disclosure does not teach or suggest substituting BaO for SrO at all, much less making this substitution in JP '643 as proposed by Petitioner. *See* Section VI.C.3.a. Accordingly, similar art and arguments were already considered during prosecution. Petitioner has not met its burden under *Advanced Bionics* for Ground 2.

C. 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. For obviousness Grounds 1 and 2, Petitioner fails to articulate a sufficient motivation

to modify the primary reference (Miwa '535 for Ground 1 and JP '643 for Ground 2), or even attempt to establish a reasonable expectation of success for modifying Miwa '535 or JP '643 to arrive at what is claimed. Petitioner bases the entirety of its obviousness arguments on the overly simplistic proposition that a POSA would have been motivated to substitute one oxide (e.g., BaO) for another (e.g., SrO) in isolation of the references' disclosures as a whole. With respect to anticipation Ground 3, Petitioner purports to present a theory of anticipation, but fails to identify all of the independent claim elements in Miwa '377.

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).

Finally, 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.*, 1369-70. For an 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).

Here, Petitioner falls short of carrying its burden of establishing a reasonable likelihood of prevailing to show that the claims challenged in Grounds 1-3 are anticipated or obvious for multiple reasons.

1. Ground 1 fails to show obviousness of claim 1.

Ground 1 relies on the combination of Miwa '535 and Peuchert '469 for obviousness of independent claim 1. Pet., 21-28. Petitioner cites Miwa '535's Embodiment 15 as the basis for its unpatentability ground. Pet., 22. Petitioner acknowledges that the mol% for BaO in Embodiment 15 is 0.21 mol%, which is above the claimed maximum value of 0.1 mol%. Pet., 23-26.

In an attempt to cure this deficiency in Embodiment 15, Petitioner argues that a POSA would have been motivated to reduce the 0.21 mol% for BaO to 0.00 mol%. Pet., 24 (Table 1). To account for the reduction of BaO, Petitioner argues that a POSA would have found it obvious to add 0.31 mol% SrO to the composition of Embodiment 15, thereby increasing the total mol% of SrO from

0.63 mol% to 0.94 mol%. Pet., 24 (Table 1). Petitioner surmises that only the amount of SrO would be changed, with all the other ten possible oxides listed for Embodiment 15 on page 10 of EX1004—SiO₂, Al₂O₃, B₂O₃, MgO, CaO, ZnO, ZrO₂, SnO₂, As₂O₃, and Sb₂O₃—remaining essentially unchanged.

Petitioner bases the entirety of this argument on the overly simplistic proposition that a POSA would have been motivated to substitute all 0.21 mol% of the BaO for 0.31 mol% SrO because BaO and SrO have a similar ionic field strength. Pet., 25. According to Petitioner and Dr. Ernst, the similarity in ionic field strength indicates that BaO and SrO “play a similar role of network modifiers in the silicate glass structure,” presumably meaning that these two oxides can be freely substituted for each other in all instances. Pet., 20-21, 25; EX1003, ¶84. Dr. Ernst cites to only a single table on page 60 of Exhibit 1015, listing ionic field strengths, to support this argument. EX1003, ¶73. Without any meaningful explanation or evidence, Dr. Ernst surmises that the allegedly similar ionic field strength mean that BaO and SrO can be freely substituted for each other as long as their “combined fraction” within a glass composition remains constant. EX1003, ¶75.

Petitioner further attempts to bolster its argument by citing Peuchert '469. According to Petitioner, Peuchert '469's disclosure of glass compositions with the “sum of the two heavy alkaline earth metal oxides SrO and BaO [being] preferably

limited to a maximum of 4% by weight” would have helped motivate a POSA to change the mol% of BaO in Miwa ’535’s Embodiment 15. Pet., 26. Aside from citing Peuchert ’469 as disclosing a maximum wt% of SrO and BaO, Petitioner provides no actual reason for why Peuchert ’469 would have motivated a POSA to modify Miwa ’535’s Embodiment 15. Indeed, Petitioner could not have provided an actual reason. Peuchert ’469 does not disclose or suggest substituting BaO with SrO, much less does Peuchert ’469 disclose any interplay between these two oxides.

Simply put, Petitioner’s motivation to combine Miwa ’535 and Peuchert ’469 hinges solely on the proposition that, because both references disclose glass compositions comprising BaO and SrO and because these two oxides have a similar ionic field strength, it would have been obvious to modify Miwa ’535 in view of Peuchert ’469. This kind of cursory analysis falls well short of establishing that a POSA would have been motivated to combine Miwa ’535 and Peuchert ’469 to arrive at what is claimed. *See Virtek*, 97 F.4th (reversing PTAB obviousness decision for lacking articulation of motivation to modify or combine). “It does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements ... were both known in the art.” *Id.* at 886. Rather, the patent challenger must show that a skilled artisan would swap the element in one reference for an element in another reference.

Petitioner does not even attempt to establish that a POSA would have been motivated to modify the BaO mol% in Miwa '535's Embodiment 15 in view of Peuchert '469 to achieve any of the glass properties touted by Miwa '535. Indeed, Petitioner does not cite any particular portion of Peuchert '469's disclosure as providing motivation to modify Miwa '535. Obviousness, however, requires "a reason that would have prompted a person of ordinary skill in the relevant field *to combine the elements in the way the claimed new invention does.*" *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (emphasis added).

Critically, Petitioner also does not establish that a POSA would have been motivated to modify the BaO and SrO in Miwa '535's Embodiment 15 while preserving the disclosed mole percentages for the other ten possible oxides listed for Embodiment 15. This is critical to establishing obviousness in Ground 1 for multiple reasons. First, claim 1 requires specified mole percentages for eight additional oxides—SiO₂, Al₂O₃, B₂O₃, MgO, CaO, As₂O₃, Sb₂O₃, and SnO₂. EX1001, 19:35-60. Second, claim 1 requires that $\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$ be greater than or equal to 1.00. EX1001, 19:49-51. Petitioner cannot assume, without evidence, that the mole percentages for BaO and SrO can be freely adjusted while preserving (i) the amount for eight additional oxides and (ii) the desired glass characteristics touted by Miwa '535. Petitioner does not consider or address the interplay among a multitude of different oxides and oxide ratios in Miwa '535.

In fact, Miwa '535 makes it clear that modifying the mole percentage for BaO and/or SrO results in multiple other changes within the glass composition. Tables 1A and 1B below show all 20 embodiments² from Miwa in terms of mol% on an oxide basis calculated according to Dr. Ernst's methodology, along with the ratio of $\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$ ("RO/Al"). Embodiment 15 is highlighted orange and the embodiments in which BaO is within the claimed range of 0 to 0.1 mol% are highlighted blue.

Em.	1	2	3	4	5	6	7	8	9	10
SiO ₂	69.45	69.45	69.45	69.45	69.36	69.36	68.77	68.74	68.67	69.38
Al ₂ O ₃	10.39	10.39	10.39	10.39	10.38	10.38	10.29	10.29	10.28	10.22
B ₂ O ₃	10.47	10.46	10.46	10.46	9.50	9.50	11.31	11.30	11.29	10.29
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	8.27	8.27	8.27	8.27	9.44	9.44	9.36	9.35	9.34	9.29
SrO	0.96	0.96	0.96	0.96	0.64	0.64	0.00	0.00	0.00	0.31
BaO	0.22	0.22	0.22	0.22	0.43	0.43	0.00	0.00	0.00	0.04
As ₂ O ₃	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sb ₂ O ₃	0.20	0.20	0.20	0.20	0.20	0.20	0.18	0.20	0.17	0.00
SnO ₂	0.04	0.04	0.04	0.04	0.04	0.04	0.09	0.02	0.07	0.09
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZrO ₂	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.37
Fe ₂ O ₃	0.0033	0.0041	0.0050	0.0062	0.0083	0.0104	0.0062	0.0062	0.0082	0.0082
RO/Al	0.91	0.91	0.91	0.91	1.01	1.01	0.91	0.91	0.91	0.94

Table 1A

² Embodiments 21 and 22 are not included here because Miwa describes them as comparative embodiments.

Em.	11	12	13	14	15	16	17	18	19	20
SiO ₂	67.56	68.47	69.05	67.97	67.19	68.70	66.50	67.96	68.64	69.80
Al ₂ O ₃	10.44	9.76	10.33	10.34	10.22	10.28	11.85	10.98	11.59	9.96
B ₂ O ₃	11.47	8.96	11.35	10.41	10.29	8.94	10.13	9.46	9.21	8.47
MgO	0.00	0.82	0.00	0.00	2.10	0.00	0.00	0.49	0.00	1.14
CaO	8.31	8.28	8.22	9.40	9.29	10.52	9.58	9.98	6.62	7.60
SrO	1.22	2.56	0.64	0.32	0.63	0.63	0.00	0.32	2.28	1.26
BaO	0.43	0.02	0.13	0.64	0.21	0.21	1.31	0.64	0.22	0.00
As ₂ O ₃	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sb ₂ O ₃	0.11	0.16	0.11	0.00	0.02	0.06	0.03	0.00	0.21	0.09
SnO ₂	0.04	0.11	0.07	0.07	0.04	0.07	0.07	0.07	0.04	0.04
ZnO	0.41	0.41	0.00	0.40	0.00	0.40	0.41	0.00	0.83	0.81
ZrO ₂	0.00	0.22	0.00	0.08	0.00	0.00	0.11	0.00	0.16	0.27
Cl	0.00	0.19	0.09	0.37	0.00	0.18	0.00	0.09	0.19	0.55
Fe ₂ O ₃	0.0063	0.0062	0.0062	0.0041	0.0041	0.0041	0.0042	0.0041	0.0063	0.0062
RO/Al	0.95	1.20	0.87	1.00	1.20	1.10	0.92	1.04	0.79	1.00

Table 1B

As shown in Tables 1A and 1B, relative to Embodiment 15, Miwa '535 teaches that reducing the mole percentage for BaO results in numerous other changes within the glass compositions. The embodiments make it clear that BaO is not simply replaced with an increased amount of SrO as proposed by the Petitioner. For example, in each of Embodiments 7-9 where BaO is set to 0 mol%, both MgO and SrO are also set to 0 mol%, which is a significant *reduction* from the corresponding mole percentages for MgO and SrO in Embodiment 15. In Embodiment 10 where BaO is set to 0.04 mol%, MgO is again reduced to 0 mol% and the mole percentage of SrO is *reduced* to 0.31 mol%. In Embodiment 12 where BaO is set to 0.02 mol%, MgO is reduced to 0.82 mol% and SrO is

increased to 2.56 mol%. And finally, in Embodiment 20 where BaO is set to 0 mol%, the mole percentage of MgO is cut almost in half (2.10 mol% to 1.14 mol%) and the mole percentage of SrO is *doubled* (from 0.63 mol% to 1.26 mol%).

At least these embodiments in Miwa '535 make it clear that there is no simplistic one-to-one correlation between oxides as suggested by Petitioner. Rather, the embodiments show that modifying even one oxide results in numerous changes to other oxides within the compositions. Changes to MgO and SrO are noted above, but a comparison of all the embodiments shows numerous changes to other oxides relative to Embodiment 15.

Notably, the changes to SrO do not follow a simple, predictable pattern, as suggested by Petitioner. In Embodiments 7-10, a reduction in BaO results in a reduction of SrO, while in Embodiments 12 and 20, a reduction in BaO results in an increase for SrO.

Furthermore, Miwa '535's embodiments show that reducing the BaO relative to Embodiment 15 creates a composition that falls outside the claimed composition. In Embodiments 7-10 and 12, the mole percentage for MgO is 0.82 mol% or less, which falls outside the claimed range of 1.0 to 3.0 mol%. In Embodiments 7-10, $[RO]/[Al_2O_3]$ is less than claimed minimum of 1.00. And in

Embodiment 12, the amount of SrO exceeds the claimed maximum value of 2.0 mol%.

Petitioner ignores the variability within Miwa '535's embodiments, and instead focuses on substituting one oxide for another with complete disregard to how substituting oxides would affect the overall glass composition. Indeed, Petitioner does not even attempt to explain how increasing SrO and/or reducing BaO would affect the other ten possible oxides in Miwa '535's embodiments. This is legal error. "Focusing on the obviousness of substitutions and differences, instead of on the invention as a whole, is a legally improper way to simplify the often difficult determination of obviousness." *Gillette Co. v. SC Johnson & Son, Inc.*, 919 F. 2d 720, 724 (Fed. Cir. 1990). It is telling that Petitioner and its expert consider only Embodiment 15 in isolation without a discussion or analysis of the other embodiments in the context of Miwa '535's disclosure as a whole.

Petitioner fails to appreciate (or even consider) that glass compositions are not a system that allows for independent change of one oxide with little or no material effect on other oxides and/or glass properties. Petitioner fails to appreciate this despite the fact that Miwa '535 exemplifies the opposite—glass compositions are a system where a change to one oxide must result in numerous changes to other oxides to maintain desired glass properties. What effect Petitioner's BaO/SrO

substitution has on Miwa '535's desired glass properties is left entirely unaddressed by Petitioner.

Miwa '535 and Peuchert '469 disclose broad ranges for at least MgO, CaO, BaO, and SrO, and Petitioner does not provide any guidance on how to choose within the disclosed ranges. What is more, Petitioner does not provide any guidance on how to choose the mole percentage for MgO, CaO, BaO, and SrO to achieve a $\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$ value of at least 1.00. When there is no provided guidance on what modifications or steps would motivate a POSA to arrive at a claimed composition, modifying the prior art cannot be based on a simplistic optimization of one variable in insolation of other variables shown to be dependent on that variable. *See Pfizer Inc. v. Mylan Pharms. Inc.*, 71 F. Supp. 3d 458, 468–69 (D. Del. 2014), *aff'd* 628 F. App'x 764 (Fed. Cir. 2016) (“The [prior art] did not indicate that these steps would yield better [results], nor is the court convinced that the one skilled in the art would have found these ‘optimization’ steps obvious without some data to support it.”). “[G]iven the sheer volume of possible combinations and the additional subsequent chemical alterations necessary to arrive at the claimed compound, the court cannot say that one skilled in the art would have had a reason to alter [the prior art]” to arrive at the claim. *Id.*

Indeed, to establish obviousness of claimed ranges, Petitioner must establish that a POSA would have had a reason to attempt to get within the claimed ranges.

See Chemours Co. FC v. Daikin Indus., 4 F.4th 1370, 1377 (Fed. Cir. 2021) (citing *Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 995 (Fed. Cir. 2009)). Petitioner provides no reason for *why* a POSA would attempt to modify the BaO mole percentage in Miwa '535's Embodiment 15 to get within the claimed range of 0 to 0.1 mol%. Petitioner alludes only to the ionic field strength of SrO and BaO. Petitioner does not explain, or offer evidence to explain, why a POSA would have been motivated to (i) isolate Miwa '535's Embodiment 15, (ii) modify the mole percentage for a single oxide within Embodiment 15, and (iii) retain the mole percentages for all the other oxides within Embodiment 15.

Petitioner's silence on the evident interplay between different oxides in the hypothetical Miwa '535-Peuchert '469 composition is fatal to the alleged motivation to combine. Simply arguing that a combination of art would have been obvious, without some articulated rationale, "is inadequate to support a finding that there would have been a motivation to combine." *In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017).

What is more, Petitioner does not even attempt to establish a reasonable expectation of success for modifying Miwa '535 in Ground 1. Petitioner gives lip service to a reasonable expectation of success only once in the Petition—on page 21. Petitioner surmises, without evidence, combining Miwa '535 and Peuchert '469, and replacing BaO with SrO, "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.” Pet., 21. This falls well short of establishing a reasonable expectation of success in modifying Miwa as proposed by Petitioner.

Contrary to Petitioner’s overly simplistic and unsupported arguments, Miwa ’535 itself shows that a POSA would *not* have been motivated to substitute all 0.21 mol% of the BaO with SrO while simultaneously preserving the amount of all the other oxides in Miwa ’535’s glass. Not once does Petitioner provide any reason for *why* a POSA would have expected modifying Miwa ’535’s Embodiment 15 in view of Peuchert ’469 would retain the glass properties touted by Miwa ’535, much less offer an improvement a POSA would have been motivated to pursue. This is fatal to Petitioner’s ground. The Board in *Juniper Networks* agreed that the petitioner must “direct us with particularity to ... ‘specific explanations’ of ‘expected results.’” *See Juniper Networks, Inc. v. Correct Transmission, LLC*, IPR2021-00682, Paper 26 at 26 (PTAB Oct. 3, 2022). And 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 Pharms. 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).

The burden of proof is on Petitioner, not Patent Owner.

Petitioner does not address the variability of oxides within Miwa '535's embodiments, or how substituting oxides would affect Miwa '535's overall glass composition and properties. And Petitioner does not offer any evidence to show that a POSA would have been guided to modify Miwa '535 in view of Peuchert '469 to arrive at the claimed glass composition. This is legal error. "[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).

For at least these reasons, Petitioner's unpatentability arguments for claim 1 in Ground 1 are facially deficient. It would be a waste of Board resources to institute trial based on Petitioner's cursory and unsupported arguments.

2. Ground 1 fails to show obviousness of claim 13.

Ground 1 purportedly relies on Miwa '535's Embodiment 15 alone for obviousness of claim 13. Pet., 21 ("Claims 13 ... would have been obvious over Miwa '535"), 36 (arguing "*all* of the limitations of Claim 13 are described by

Miwa '535" (emphasis added)). However, Petitioner modifies Miwa '535's Embodiment 15 two separate times on page 35 of the Petition. First, Petitioner combines JP '741 with Miwa '535 to address limitations 13[b]-[f]. Pet., 35. Second, Petitioner replaces the BaO in Embodiment 15 with SrO to address limitation 13[g]. Pet., 35.

To the extent Petitioner intended to rely on Miwa '535 alone for obviousness of claim 13, Petitioner's argument flatly contradicts itself by admitting the Miwa '535 alone fails to teach limitations 13[b]-[f] and limitation 13[g]. To the extent Petitioner intended to modify Miwa '535 in view of JP '741 and in view of some other unidentified reference to replace BaO with SrO, Petitioner fails to establish motivation to combine and/or a reasonable expectation of success for such a three-reference combination. Petitioner is entirely silent on both issues for claim 13.

And in any event, Petitioner's ambiguous argument for claim 13, fails to "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.

For at least these reasons, Petitioner's unpatentability arguments for claim 13 in Ground 1 are facially deficient. It would be a waste of Board resources to institute trial based on Petitioner's inconsistent, cursory, and unsupported arguments.

3. Ground 2 fails to show obviousness of claim 1.

Ground 2 relies on the combination of JP '643, JP '741, and Peuchert '469 for obviousness of independent claim 1. Pet., 41-47. Petitioner cites JP '643's Sample 5 as the basis for its unpatentability ground. Pet., 42-44. Petitioner acknowledges that the mol% for BaO in Sample 5 exceeds the claimed maximum value of 0.1 mol%. Pet., 44-45; EX1003, ¶¶258-262. The table on page 43 of the Petition shows Sample 5 having 0.2 mol% BaO (two times more than the claimed maximum value). Petitioner also acknowledges that the mol% for Sb₂O₃ in Sample 5 exceeds the claimed maximum value of 0.05 mol%. Pet., 46; EX1003, ¶¶266-272. The table on page 43 of the Petition shows Sample 5 having 0.2 mol% Sb₂O₃ (four times more than the claimed maximum value).

In an attempt to cure the first deficiency in JP '643, Petitioner argues that it would have been obvious to modify the Sample 5 composition in view of Peuchert '469. Pet. 44-45; EX1003, ¶¶260-263. In attempt to cure the second deficiency in JP '643, Petitioner argues that it would have been obvious to modify the Sample 5 composition in view of JP '741. Pet., 46; EX1003, ¶¶267-273.

Petitioner fails to establish that a POSA would have been motivated to modify JP '643 as proposed with a reasonable expectation of success in achieving the claimed composition for at least the following reasons.

- a. **Peuchert '469 does not support Petitioner's overly simplistic proposition that a POSA would have been motivated to completely substitute BaO for SrO in JP '643.**

In modifying JP '643 to address limitation 1[g] (BaO: 0-0.1 mol%), Petitioner argues a POSA would have been motivated to reduce the 0.2 mol% for BaO in Sample 5 to 0 mol%. Pet., 45; EX1003, ¶262 (“[t]hen, the mole fractions of SrO and BaO become $X_{\text{SrO}} = 0.64$ mol% and $X_{\text{BaO}} = 0$ mol%, respectively”). To account for the reduction of BaO, Petitioner argues that a POSA would have found it obvious to add 0.34 mol% SrO to the composition of Sample 5, thereby increasing the total mol% of SrO from 0.3 mol% to 0.64 mol%. EX1003, ¶262. Petitioner surmises that only the amount of SrO would be changed, with all the other eleven possible oxides listed for Sample 5 on page 10 of EX1007—SiO₂, Al₂O₃, B₂O₃, MgO, CaO, ZnO, P₂O₅, As₂O₃, SnO₂, Sb₂O₃, and ZrO₂—remaining unchanged.

Just like for Ground 1, Petitioner bases the entirety of this argument on the overly simplistic proposition that a POSA would have been motivated to substitute all 0.2 mol% of the BaO for SrO because BaO and SrO have a similar ionic field strength. Pet., 45 (citing EX1003, ¶¶261-263). According to Petitioner and Dr. Ernst, the similarity in ionic field strength indicates that BaO and SrO “play a similar role of network modifier in the silicate glass structure,” presumably meaning that these two oxides can be freely substituted for each other in all

instances. Pet., 20-21; EX1003, ¶261. Without any meaningful explanation or evidence, Dr. Ernst surmises that the allegedly similar ionic field strength mean that BaO and SrO can be freely substituted for each other as long as their “combined fraction” within a glass composition remains constant. EX1003, ¶75.

Also just like Ground 1, Petitioner attempts to bolster its argument by citing Peuchert '469. But again Petitioner provides no actual reason for why Peuchert '469 would have motivated a POSA to modify JP '643's Sample 5. Peuchert '469 does not disclose or suggest substituting BaO with SrO, much less does Peuchert '469 disclose any interplay between these two oxides.

Simply put, Petitioner's motivation to combine JP '643 and Peuchert '469 hinges solely on the proposition that, because both references disclose glass compositions comprising BaO and SrO, and because these two oxides have a similar ionic field strength, it would have been obvious to modify JP '643 in view of Peuchert '469. This kind of cursory analysis falls well short of establishing that a POSA would have been motivated to combine JP '643 and Peuchert '469 to arrive at what is claimed.

Petitioner does not even attempt to establish that a POSA would have been motivated to modify the BaO mol% in JP '643's Sample 5 in view of Peuchert '469 to achieve any of the glass properties touted by JP '643. Indeed, Petitioner does not cite any particular portion of Peuchert '469's disclosure as providing

motivation to modify JP '643. Obviousness, however, requires “a reason that would have prompted a person of ordinary skill in the relevant field *to combine the elements in the way the claimed new invention does.*” *KSR*, 550 U.S. at 418 (emphasis added).

Critically, Petitioner also does not establish that a POSA would have been motivated to modify the BaO and SrO in JP '643's Sample 5 while preserving the disclosed mole percentages for the other eleven possible oxides listed for Sample 5. This is critical to establishing obviousness in view of JP '643 and Peuchert '469 for multiple reasons. First, claim 1 requires specified mole percentages for eight additional oxides—SiO₂, Al₂O₃, B₂O₃, MgO, CaO, As₂O₃, Sb₂O₃, and SnO₂. EX1001, 19:35-60. Second, claim 1 requires that $\Sigma[\text{RO}]/[\text{Al}_2\text{O}_3]$ be greater than or equal to 1.00. EX1001, 19:49-51. Petitioner cannot assume, without evidence, that the mole percentages for BaO and SrO can be freely adjusted while preserving (i) the amount for eight additional oxides and (ii) the desired glass characteristics touted by JP '643. Petitioner does not consider or address the interplay among a multitude of different oxides and oxide ratios in JP '643.

Indeed, JP '643 itself makes it clear that it would not have been obvious to modify the mole percentage for BaO and/or SrO as proposed by Petitioner. Of the **46** non-comparative Samples disclosed by JP '643, ***none of them*** have 0 mol%

BaO. EX1007, ¶¶[0054]-[0069]. This makes sense because JP '643 specifically teaches the following.

Particularly when reducing BaO and SrO to achieve lower density, if the contents of these two components become extremely imbalanced, the effect of improving BHF resistance diminishes. Thus, it is desirable to include both components such that the mass ratio (BaO+SrO)/BaO satisfies the range of 1.1–10 (preferably 1.2–5). The preferred BaO content is 0.3% or more (more preferably 0.5% or more) and 2% or less (more preferably 1% or less), and the preferred SrO content is 0.1–2.7%, more preferably 0.3– 1.5%.

EX1007, ¶[0039]. Driving the amount of BaO to “0” renders JP '643's (BaO+SrO)/BaO ratio mathematically undefined.

Petitioner ignores JP '643's disclosure, and instead focuses on substituting one oxide for another with complete disregard to how substituting oxides would affect the overall glass composition and its properties. Indeed, Petitioner does not even attempt to explain how increasing SrO and/or reducing BaO would affect the other eleven possible oxides in JP '643 samples. This is legal error. “Focusing on the obviousness of substitutions and differences, instead of on the invention as a whole, is a legally improper way to simplify the often difficult determination of obviousness.” *Gillette*, 919 F. 2d at 724. It is telling that Petitioner and its expert consider only Sample 5 in isolation without a discussion or analysis of the other sample in the context of JP '643's disclosure as a whole.

Again, Petitioner fails to appreciate (or even consider) that glass compositions are not a system that allows for independent change of one oxide with little or no material effect on other oxides and/or glass properties. JP '643 and Peuchert '469 disclose broad ranges for at least MgO, CaO, BaO, SrO and Petitioner does not provide any guidance on how to choose within the disclosed ranges. When there is no provided guidance on what modifications or steps would motivate a POSA to arrive at a claimed composition, modifying the prior art cannot be based on a simplistic optimization of one variable in insolation of other variables shown to be dependent on that variable. *See Pfizer*, 71 F. Supp. 3d at 468–69 (“The [prior art] did not indicate that these steps would yield better [results], nor is the court convinced that the one skilled in the art would have found these ‘optimization’ steps obvious without some data to support it.”).

Indeed, to establish obviousness of claimed ranges, Petitioner must establish that a POSA would have had a reason to attempt to get within the claimed ranges. *See Chemours*, 4 F.4th 1370 at 1377. Petitioner provides no reason for *why* a POSA would attempt to modify the BaO mole percentage in JP '643's Sample 5 to get within the claimed range of 0 to 0.1 mol%. Petitioner alludes only to the ionic field strength of SrO and BaO. Petitioner does not explain, or offer evidence to explain, why a POSA would have been motivated to (i) isolate JP '643's Sample 5,

(ii) modify the mole percentage for a single oxide within Sample 5, and (iii) retain the mole percentages for all the other oxides within Sample 5.

What is more, Petitioner does not even attempt to establish a reasonable expectation of success for modifying JP '643 in view of Peuchert '469. Just like Ground 1, Petitioner surmises, without evidence, combining JP '643 and Peuchert '469, and replacing BaO with SrO, “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.” Pet., 21. This falls well short of establishing a reasonable expectation of success for at least the reasons discussed above with respect to Ground 1.

b. JP '741 does not support substituting Sb_2O_3 for SnO_2 in JP '643.

In modifying JP '643 to address limitations 1[i]-[l], Petitioner argues a POSA would have been motivated to reduce the 0.2 mol% for Sb_2O_3 in Sample 5 to 0 mol%. Pet., 46; EX1003, ¶270 (“[r]emove the mass fraction $W_{\text{Sb}_2\text{O}_3} = 1 \text{ ms}\%$ = 0.01 of Sb_2O_3 ”). To account for the reduction of Sb_2O_3 , Petitioner argues that a POSA would have found it obvious to add additional SnO_2 to the composition of Sample 5. Pet., 46; EX1003, ¶271.

Petitioner bases this argument on JP '741's disclosure of glass compositions that use SnO_2 as a fining agent. Pet., 46. But JP '741 is entirely silent on replacing Sb_2O_3 with SnO_2 as a fining agent. Rather, JP '741 explains that “it is an object of

the present invention to provide an alkali-free glass that ***does not use As₂O₃*** as a clarifying agent and does not contain bubbles that cause display defects.” EX1005, ¶[0006] (emphasis added). JP ’741 does not discuss Sb₂O₃ at all.

JP ’741 does not disclose that SnO₂ is a suitable substitute for Sb₂O₃ in a glass composition like that of JP ’643’s Sample 5. And Dr. Ernst provides no evidence to substantiate the idea that SnO₂ could be successfully substituted for Sb₂O₃ in Sample 5. In place of substantiating the argument, Dr. Ernst suggests that JP ’643 and JP ’741 can be combined because “the composition of Embodiment No. 5 in JP ’643 falls within the compositional range described in JP ’741, making it applicable to use the same types and contents of fining agents.” EX1003, ¶268. But this statement is not actually true at least because Sample 5 in JP ’643 contains ZrO₂. EX1007, ¶[0055]. The compositional ranges in JP ’741 do not include a range for ZrO₂ specifically. *See, e.g.*, EX1005, ¶[0022].

Petitioner also does not even attempt to establish a reasonable expectation of success for modifying JP ’643 in view of JP ’741. Petitioner surmises, without evidence, that combining JP ’643 and JP ’741, and replacing Sb₂O₃ with SnO₂, would have been obvious “to avoid the use of toxic fining agents.” Pet., 46. This falls well short of establishing a reasonable expectation of success in modifying JP ’643 as proposed by Petitioner.

Petitioner's conclusory assertions are not supported by any explanation as to why a POSA would have reasonably expected the JP '643-JP '741 combination to succeed. "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* 550 U.S. at 418; *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 example, not once does Petitioner provide any reason for *why* a POSA would have expected modifying JP '643's Sample 5 in view of JP '741 would be capable of avoiding the formation of bubbles within the glass compositions of JP '643, much less offer an improvement a POSA would have been motivated to pursue. Petitioner's cursory arguments cannot support a reasonable expectation of success in combining JP '643 and JP '741.

Silence and assumptions are insufficient for a *prima facie* case of obviousness. *See Orexo AB, v. Actavis Elizabeth LLC*, 903 F.3d 1265, 1273 (Fed. Cir. 2018) (finding that "silence is not a teaching or suggestion," especially where

the beneficial results could not be predicted). Indeed, the Board in *Juniper Networks* agreed that the petitioner must “direct us with particularity to ... ‘specific explanations’ of ‘expected results.’” *See Juniper*, IPR2021-00682, Paper 26 at 26 (PTAB Oct. 3, 2022).

c. Petitioner modifies JP ’643’s Sample 5 twice and assumes, without evidence, that the liquidus viscosity would remain unchanged.

As discussed, Petitioner argues it would have been obvious to modify both the BaO and Sb₂O₃ mole percentages in JP ’643’s Sample 5 in view of Peuchert ’469 and JP ’741, respectively. That said, when addressing the liquidus viscosity recited in claim 1, Petitioner cites to the *original* composition of JP ’643’s Sample 5. Pet. 46. Neither Petitioner nor Dr. Ernst allege the *twice-modified* composition of JP ’643’s Sample 5 has a liquidus viscosity as claimed.

Therefore, Petitioner fails to establish the combination of JP ’643, Peuchert ’469, and JP ’741 teaches a glass comprising the liquidus viscosity recited in claim 1. To the extent Petitioner is relying on a theory of inherency in the obviousness combination, the Petition does not provide sufficient rationale to establish that the glass resulting from the combination of JP ’643, Peuchert ’469, and JP ’741 necessarily has a liquidus viscosity of greater than or equal to 100,000 poise. 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.

For at least these reasons, Petitioner's unpatentability arguments for claim 1 in Ground 2 are facially deficient. It would be a waste of Board resources to institute trial based on Petitioner's cursory and unsupported arguments.

4. Ground 2 fails to show obviousness of claim 13.

Ground 2 relies on the combination of JP '643 and JP '741 for obviousness of independent claim 13. As with claim 1, Petitioner cites JP '643's Sample 5 as the basis for its unpatentability ground. Pet., 52. Petitioner acknowledges that the mol% for Sb_2O_3 in Sample 5 exceeds the claimed maximum value of 0.005 mol%. Pet. 53; EX1003, ¶¶ 322-327. The table on page 43 of the Petition shows Sample 5 having 0.2 mol% Sb_2O_3 (*fourty* times more than the claimed maximum value). In an attempt to cure this deficiency in JP '643, Petitioner argues that it would have been obvious to reduce the 0.2 mol% for Sb_2O_3 in Sample 5 to 0 mol%. Pet., 53, EX1003, ¶ 325 (“[r]emove the mass fraction $W_{\text{Sb}_2\text{O}_3} = 1 \text{ ms}\% = 0.01$ of Sb_2O_3 ”). To account for the reduction of Sb_2O_3 , Petitioner argues that a POSA would have found it obvious to add additional SnO_2 to the composition of Sample 5. Pet., 53, EX1003, ¶ 326.

Petitioner fails to establish that a POSA would have been motivated to modify JP '643 with a reasonable expectation of success in achieving the claimed composition for at least two reasons discussed above for claim 1 in Ground 2. First, JP '741 does not support substituting Sb_2O_3 for SnO_2 in JP '643. *See* Section VI.C.3.b. Second, Petitioner modifies JP '643's Sample 5, but assumes, without evidence, that the liquidus viscosity would remain unchanged. *See* Section VI.C.3.c.

For at least these reasons, Petitioner's unpatentability arguments for claim 13 in Ground 2 are facially deficient. It would be a waste of Board resources to institute trial based on Petitioner's cursory and unsupported arguments.

5. Ground 3 fails to show that Miwa '377 anticipates, expressly or inherently, the liquidus viscosity in claim 13.

Ground 3 fails to show anticipation of claims 13, 14, and 19-21 (or obviousness of claims 16, 22, and 23) because Miwa '377 does not disclose (or suggest) the claimed liquidus viscosity. Petitioner relies on Miwa '377's Sample 8 as anticipating claim 13. Pet., 59-61. In doing so, Petitioner argues that Miwa '377's Sample 8 has a liquidus viscosity of greater than or equal to 100,000 poise. Pet., 61.

Petitioner does not make clear whether it relies on a theory of express or inherent anticipation to establish that the unspecified liquidus viscosity of Sample 8 is greater than or equal to 100,000 poise. But since Sample 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 Sample 8, Petitioner cites a discussion in paragraph 12—which is in the “*prior art*” heading of Miwa '377—and paragraphs 377-379 of Dr. Ernst’s declaration. Pet., 61. The translation of '377 provided by Petitioner states, “the liquid phase viscosity is preferably no less than

10^5 dPa·s, and more preferably no less than $10^{5.5}$ dPa·s.” EX1008, ¶ [0012]. This citation to Miwa ’377’s discussion of the prior art falls well short of establishing that Miwa ’377’s Sample 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 Sample 8 has a liquidus viscosity of greater than or equal to 100,000 poise. Miwa ’377 never discloses that Sample 8 has a certain liquidus viscosity, nor does Miwa ’377 specify that Sample 8 has a liquidus viscosity consistent with what was “preferable” in the prior art.

Second, the citation to paragraphs 377-379 of Dr. Ernst’s declaration on page 61 of the Petition does not cure the deficiencies in the Petitioner’s arguments. Paragraph 377 simply quotes paragraph 12 of Miwa ’377 verbatim. And paragraphs 378-379 are conclusory statements alleging that Miwa ’377’s Sample 8 has a liquidus viscosity as claimed.

Third, it is unclear whether the quoted portion of Miwa ’377 is actually a correct translation. The English translation of Miwa ’377 submitted with the Petition in this case says liquid phase viscosity is “preferably *no less than* 10^5 dPa·s, and more preferably *no less than* $10^{5.5}$ dPa·s.” EX1008, ¶[0012] (emphasis added). However, the translation of Miwa ’377 submitted with a related Petition in IPR2025-00937 says the opposite: “the liquid phase viscosity is preferably *less*

than 10^5 dPa·s, and more preferably $10^{5.5}$ dPa·s.” *See* IPR2025-00937, EX1004, ¶[0012]. To the extent the exhibit submitted here may be a mistranslation, that is resolved against Petitioner as the party bearing the burden of proof.

Neither Petitioner nor Dr. Ernst provide technical evidence or rationale to establish that the glass of Miwa ’377’s Sample 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 Sample 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 Sample 8, and there can be no anticipation.

VII. CONCLUSION

The Director should exercise discretion to deny institution of *inter partes* review of the ’491 patent.

Respectfully submitted,

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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 13,475 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.

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER'S
DISCRETIONARY DENIAL BRIEF** and associated Exhibits 2001-2006 were
served in their entireties on August 18, 2025, upon the following parties via
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