

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

NINGDE AMPEREX TECHNOLOGY §
LIMITED, §

Plaintiff, §

v. §

ZHUHAI COSMX BATTERY CO., LTD., §

Defendant §

Civil Action No. 2:24-CV-728-JRG

JURY TRIAL DEMANDED

**DECLARATION OF DR. QUINN HORN
CONCERNING CONSTRUCTION OF CERTAIN TERMS IN
U.S. PATENT NOS. 11,769,910; 11,575,148; AND 11,923,498**

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I. INTRODUCTION

1. My name is Dr. Quinn Horn.

2. I have been retained by counsel for Plaintiff Amperex Technology Limited (“ATL”) as an expert in this case to provide opinions concerning certain claim terms in U.S. Patent Nos. 11,769,910 (“the ’910 Patent”); 11,575,148 (“the ’148 Patent”); and 11,923,498 (“the ’498 Patent”). Should I be asked to evaluate additional claim terms, I reserve the right to supplement the opinions expressed in this Declaration accordingly.

3. Exponent bills my time at a rate of \$705 per hour for time spent on this matter, which is in no way dependent on the outcome of the case.

4. I am competent to testify to the matters stated in this Declaration and have personal knowledge of the facts and statements herein. Each of the statements is true and correct.

5. As part of my preparation for writing this Declaration, I reviewed the Asserted Patents, their prosecution histories, and the parties’ proposed constructions.

II. BACKGROUND AND QUALIFICATIONS

6. I have summarized in this section my educational background, career history, publications, and other relevant qualifications. A more detailed account of my work experience, qualifications, and publications is included in my curriculum vitae, attached as Appendix A to this declaration.

7. I am a Principal Engineer in the Materials Science and Electrochemistry practice at Exponent, Inc., a scientific and engineering consulting firm based in Menlo Park, California. I am based out of Exponent’s office in Natick, Massachusetts and my current work address is 1075 Worcester Street, Natick, MA 01760.

8. I earned a Ph.D. in Metallurgical and Materials Engineering from Michigan Technological University in 1998. I also earned an M.S. and B.S. in Metallurgical Engineering from Michigan Technological University in 1995 and 1993, respectively.

9. Throughout my professional career I have worked on solving technical problems in the areas of metallurgy and electrochemistry specifically related to battery technology. In the field of metallurgy, I work on topics related to failure analysis, corrosion, material degradation, and material selection for electrochemical systems. In the field of battery technology, my work addresses a broad range of issues including material selection and testing, cell design, cell manufacturing, performance degradation, accelerated life testing, due diligence technology evaluation and failure analysis.

10. After earning my Ph.D. in 1998, I was hired by Energizer/Eveready Battery company in Westlake, Ohio where I was employed through 2002. At Energizer I was responsible for the Microscopy and Materials Group, where I conducted failure analysis studies to solve problems related to battery failures and battery manufacturing issues. Additionally, I worked closely with Energizer's lithium-ion cell division to help solve problems related to raw material quality characterization, manufacturing defects, cell design, materials selection and performance. My work at Energizer led to a patent and several peer-reviewed publications on lithium and alkaline batteries.

11. From 2002 to 2004 I was employed as a Principal Scientist at Physical Sciences, Inc. ("PSI") in Andover, Massachusetts. At PSI, I designed, developed, and tested high-energy and high-power electrodes for lithium-ion batteries. My work at PSI led to a patent on high power electrode design for lithium-ion cells.

12. I am a Research Affiliate at the Massachusetts Institute of Technology, where I collaborate with researchers in the Electrochemical Energy Laboratory on projects related to electric vehicles and new gas diffusion electrodes for metal-air batteries and fuel cells. My work with MIT has led to a patent in the area of air electrode design for lithium-air batteries and fuel cells.

13. Since 2004, I have been employed by Exponent, where my work focuses on solving problems relating to safety, performance, and reliability of lithium-ion cells and battery packs. I am involved in evaluation of battery cell and battery pack designs, and correlation of battery cell design and manufacturing issues to problems related to safety, performance, and reliability. I have been involved in hundreds of such projects focused on supporting clients in a wide range of industries, including power tools, consumer electronics, military, medical devices, hybrid and electric vehicles, and large grid-scale energy storage systems. My problem-solving methodology at Exponent continues to be based in large part on understanding the correlation between cell design and manufacturing, and battery performance, reliability, and safety characteristics. I have published and presented numerous times on how electrode and cell design impact safety, performance, and reliability in lithium-ion cells. I have also designed and conducted detailed technical audits on lithium and lithium-ion battery manufacturing facilities in the United States, Europe, Korea, Japan, and China.

14. I am the first author in the failure analysis chapter in the 4th edition of the Handbook of Batteries published in 2010. I have given numerous technical presentations on topics relating to battery performance and failure analysis at professional conferences and taught the short course on lithium-ion battery technology at the 219th Meeting of the Electrochemical Society. In addition,

I have prepared and frequently been invited to teach seminars on methods for investigating battery fires by fire investigation agencies around the world. .

III. MATERIALS REVIEWED

15. I have reviewed U.S. Patent Nos. 11,769,910 (“the ’910 Patent”); 11,575,148 (“the ’148 Patent”); and 11,923,498 (“the ’498 Patent”) along with their prosecution histories.

16. I have also reviewed the IPR filings made by CosMX and ATL for these patents. This includes the briefing and exhibits in IPR2025-00405 related to the ’910 patent, IPR2025-00432 related to the ’148 Patent and IPR2025-00389 related to the ’498 Patent.

17. My opinions expressed in this declaration are based on my review of these materials, and are based on my education, training, research, personal and professional experience, industry experience, and specific knowledge of the underlying technologies.

18. My work on this matter is ongoing. As I examine additional materials and perform further analyses on information that become available through discovery, I reserve the right to revise and/or supplement my opinions in this Declaration.

IV. APPLICABLE LEGAL STANDARDS

A. Principles for Claim Construction

19. Although I am not an expert on patent law, I have been instructed on certain aspects of patent law relevant to this matter by counsel. My understanding of the relevant legal principles as they apply to this matter are summarized below.

20. I am informed that a United States utility patent must conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention. I understand that the claims define the scope of what is protected by the patent and that they must be written so that their limits can be understood with

reasonable certainty by a hypothetical person of ordinary skill in the technical field of the invention.

21. I understand that claim construction and indefiniteness are matters of law to be decided by the Court.

22. I understand that claim terms are presumed to have their plain and ordinary meaning, as understood by a person of ordinary skill in the art (“POSITA”) at the time of the invention, in the context of the patent specification, the prosecution history, and any other relevant evidence. I am informed that to determine the plain and ordinary meaning of claim terms, the Court may consider the claims themselves, the specification, the prosecution history, relevant dictionaries and treatises, and expert testimony.

23. I also understand that a patentee may (1) act as his own lexicographer and define claim terms in the patent’s specification, or (2) disclaim in the specification or prosecution history certain scope that would otherwise be within the plain and ordinary meaning of the claims. I understand that when the patentee so defines a term or disclaims scope, that definition or disclaimer controls the construction of the claim term, even if it is not the plain and ordinary meaning.

24. However, I also understand that a definition or disclaimer must be clearly made in the specification or prosecution history in order to limit a claim term. I understand that it is not otherwise proper to read limitations from the specification or elsewhere into the claims or to read limitations out of the claims.

25. I am informed that claim indefiniteness is decided from the viewpoint of persons skilled in the field of the invention.

26. I also understand that patent claims are viewed and understood in light of the specification, the prosecution history, and other relevant evidence, as would have allowed a skilled artisan to know the scope of the claimed invention with reasonable certainty.

27. I understand that United States patents are accompanied by a presumption of validity, and invalidity—including by reason of indefiniteness—must be established by clear and convincing evidence.

28. I understand that the patent specification may save a term in the claim from indefiniteness by disclosing additional information about the invention that clarifies meaning.

29. I understand that terms of degree may render a claim indefinite where the intrinsic evidence (or relevant extrinsic evidence) provides insufficient guidance as to any objective boundaries for the claim.

30. I also understand that judicial correction of a patent claim is permitted and may apply retroactively if the error is not subject to reasonable debate based on the claim language and specification, and the prosecution history does not suggest a different interpretation. I am further informed that these determinations must be made from the point of view of one skilled in the art.

B. Persons of Ordinary Skill In The Art

31. For the '910 Patent, I understand that CosMX proposed in its IPR petition that a person of ordinary skill in the art would have had an advanced degree in chemistry, chemical engineering, materials science, or a related field, and two or more years of experience related to the design, research, evaluation, preparation, and/or manufacture of electrochemical energy storage devices. This level of skill is approximate, and more experience may compensate for less formal or different education, and *vice versa*.

32. For the '148 Patent, I understand that CosMX proposed in its IPR petition that a person of ordinary skill in the art would have had at least a bachelor's degree or equivalent degree

from an accredited institution in chemistry, chemical engineering, materials science, or a similar discipline covering relevant principles of organic and inorganic chemistry, polymer processing, ceramic materials, and ceramic processing, as well as three or more years of experience in electrochemical energy storage devices, lithium-ion battery technology, separators, characterizations and analyses of particle size, film thickness, and/or materials compositions, battery performance characterization, or other applications of polymer chemistry, ceramic chemistry, and ceramic processing. More education could substitute for less experience, and *vice versa*.

33. For the '498 Patent, I understand that CosMX proposed in its IPR petition that a person of ordinary skill in the art would have had a Bachelor's Degree in Physics or an Engineering field relevant to battery technology (e.g., Electrical or Mechanical Engineering) and at least two years of industry experience in lithium-ion battery manufacturing and/or design.

34. I adopt these definitions for the purposes of this Declaration only. I meet and exceed the qualifications for a person of ordinary skill in the art for all three of these patents and for all relevant time periods

V. THE '910 PATENT

A. Disputed Terms

1. "Only a single-sided coating or a double-sided coating present on the same electrode" (Claim 14)

Plaintiff's Proposed Construction	Defendant's Proposed Construction
Plain and ordinary meaning, with the correction: "only a single-sided coating or double sided coating is present on the same electrode."	Indefinite.

35. In my opinion, the '910 patent contains sufficient disclosure for a person of ordinary skill to understand that the term "[o]nly a single-sided coating or a double-sided coating

is present on the same electrode” should have its plain and ordinary meaning with the proposed correction. I note that the verb “is” is currently missing from the claim as written and should be added to the claim for grammatical completeness. I understand that Defendant contends this term is indefinite. For the reasons below, I disagree with Defendant’s contention.

36. Claim 13, from which Claim 14 depends upon, reads:

The electrochemical device according to claim 12, wherein the electrode comprises a cathode, the cathode comprises a current collector, a single-sided coating and a double-sided coating;

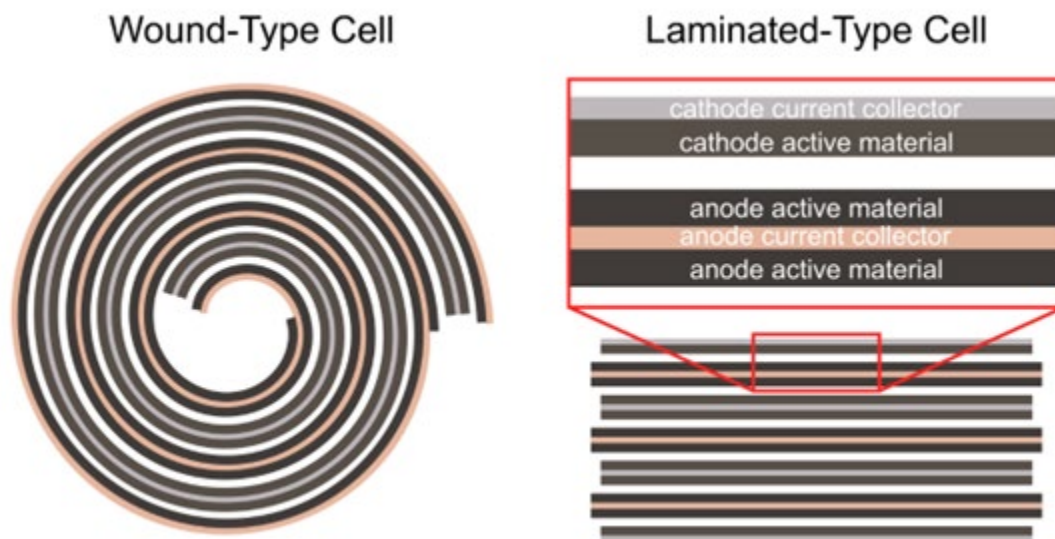
a first part of the current collector is provided with the single-sided coating and a second part of the current collector is provided with the double-sided coating; an electrode compaction density of the single-sided coating is D1, and,

an electrode compaction density of the double-sided coating is D2, wherein, about $0.8 \leq D1/D2 \leq \text{about } 1.2$; and, $3.5 \text{ g/cm}^3 \leq D2 \leq 4.3 \text{ g/cm}^3$.

37. Claim 14 in its entirety reads:

The electrochemical device according to claim 13, wherein, both the single-sided coating and the double-sided coating are present on the same electrode; or, only a single-sided coating or a double-sided coating present on the same electrode.

38. A POSITA reading claim 14 in light of the specification would understand claim 14 to cover the coating present on electrodes of two different types of cells: wound-type and laminated-type cells. These two types are depicted schematically below with anodes identifiable due to their copper-colored current collectors, and cathodes identifiable due to their aluminum-colored current collectors:



39. In a wound-type cell, the anode, cathode, and separator layers are rolled together into a “jelly roll” or “spiral” shape to create a compact cell. These cells feature only two electrodes (one cathode and one anode). For a wound-type cell, because there are only two electrodes which are rolled into the jelly roll, the electrode is coated such that it comprises both a single-sided and double-sided coating, as shown by FIG. 4 of the patent (reproduced below).

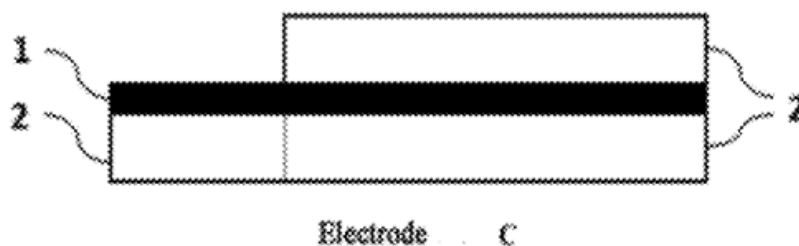


FIG. 4

40. As the specification of the '910 Patent teaches: “The electrode includes a current collector and a coating on the current collector. *The coating includes a single-sided coating, a double-sided coating, or a combination thereof.*” '910 Patent at 20:47-50 (emphasis added).

Furthermore, the specification goes on to teach the exact coating applications for a wound-type cell: “[i]n a wound electrochemical device, the cathode and the anode are usually each formed by winding an elongated electrode, so that *both a single-sided coating and a double-sided coating are present on the elongated electrode.*” ’910 Patent at 21:04-07 (emphasis added). Based on this disclosure and a POSITA’s general knowledge of cell design, a POSITA would reasonably understand the first part of claim 14 to refer to wound-type cell electrode design (“both the single-sided coating and the double-sided coating are present on the same electrode”).

41. For wound-type cells, the fact that claim 14 emphasizes that both types of coating are on the *same* electrode would indicate to a POSITA that the singular electrode has one region that is covered by a single-sided coating and one region that is covered by a double-sided coating.

42. Contrastingly, a laminated cell is a type of lithium-ion battery cell where the positive and negative electrodes are stacked in layers with a separator between them, instead of being wound together. Unlike a wound-type cell which usually contains only two electrodes (*i.e.*, one anode and one cathode), a laminated cell can have many electrodes (*i.e.*, multiple cathodes and multiple anodes) which are laid on top of one another with a separator layer in between. A visual representation of a laminated cell is reproduced below:



43. For a laminated type cell, the electrode is coated such that it comprises only either a single-sided (FIG. 2) or double-sided coating (FIG. 3), as shown by FIGs. 2-3 of the patent (reproduced below):

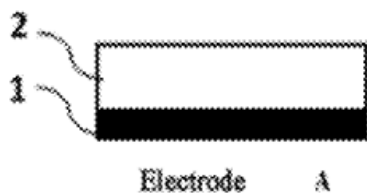


FIG. 2

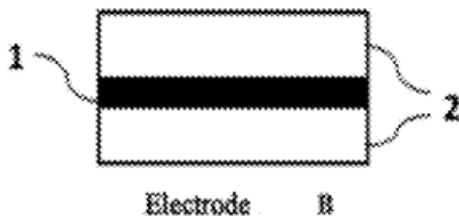


FIG. 3

44. The '910 Patent further teaches that in instances of a laminated cell, the electrodes only possess one type of coating (*i.e.*, single-sided or double-sided): “[i]n a laminated electrochemical device, the cathode and the anode are usually formed by laminating shaped electrodes, and *there is only a single-sided coating or a double-sided coating on the same electrode.*” ’910 Patent at 21:07-11 (emphasis added). Based on this disclosure and a POSITA’s general knowledge of cell design, a POSITA would have understood the second part of claim 14 to refer to laminated-type cell electrode design (“only a single-sided coating or a double-sided coating present on the same electrode”).

45. Unlike with the wound-type cell above, the second part of claim 14 states that the *same electrode only* has either a single-sided coating *or* a double-sided coating. This would

indicate to a POSITA that this portion of claim 14 was likely intended to cover laminated cells, in which there are multiple (*i.e.*, more than two) electrodes each having only a single-sided or double-sided coating.

46. To the extent CosMX claims that the indefiniteness of claim 14 stems from claim 13's recitation that "the electrode comprises a cathode, the cathode comprises a current collector, a single-sided coating and a double-sided coating," it is my understanding that claim 13's recitation of "the electrode" may refer only to the cathode, whereas claim 14 does not specify whether its electrode is a cathode or an anode. Thus, one could theoretically have a cell that has a cathode with both a single-sided and double-sided coating as well as an anode that has the same mixed coatings or an anode that has only a single-sided or a double-sided coating.

47. Even if claim 14's language refers solely to the cathode, it is still consistent with claim 13's disclosure because claim 13's teachings regarding "the electrode" could refer to multiple cathodes rather than a singular cathode. A POSITA would know that laminated type-batteries often have multiple cathodes, therefore claim 14's disclosure of the *same* electrode having only a single-sided or a double-sided coating is consistent with what is claimed in claim 13. When claim 13 is read in the context of a laminated battery, the multiple cathodes of a laminated cell will indeed have both a single-sided and a double-sided coating. And to measure the compaction density ratio between the different coatings, a POSITA would understand that one would compare the D1 value of a cathode in a laminated cell which only has a single sided coating with the D2 value of another cathode in the same cell which has a double-sided coating.

48. For the reasons above, it is my opinion that a POSITA would have understood this term to have its plain and ordinary meaning.

2. “wherein the electrode comprises an anode” (Claim 15)

Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
The claim should be corrected so claim 15 refers to claim 12, not claim 13.	Indefinite.

49. I understand that the Plaintiff has stated that claim 15 contains a patent drafting error in which it mistakenly refers back to claim 13 instead of claim 12. This correction is consistent with claim 13 and claim 15 describing two different electrodes, the electrodes in the electrochemical devices described in claim 12. I do not agree with CosMX’s proposed construction that this term is indefinite for the reasons proposed below.

50. In my opinion, a POSITA would have known that claim 15 in the ’910 Patent is not referring to the same electrode as claim 13. Claim 12 states “An electrochemical device, wherein the electrochemical device comprises electrodes [...]” Claim 13 describes the properties of one of the electrodes in the device, the cathode. Claim 15 describes the properties of a different electrode in the device, the anode. In the context of the electrochemical device described by the ’910 Patent, the terms “anode” and “cathode” clearly describe different electrodes with different properties. By convention, the anode is the negative electrode and the cathode is the positive electrode in such electrochemical devices. In addition, the ’910 Patent specification describes the anode and cathode as two different electrodes. The ’910 Patent specification provides an example where the anode is described to consist of a mixture of graphite, conductive carbon black, styrene-butadiene rubber, and sodium carboxymethyl cellulose coated on copper foil, and the cathode is described to consist of a mixture of lithium cobalt oxide, conductive carbon black, and polyvinylidene fluoride coated on aluminum foil.

51. Further, I note that in CosMX’s IPR Petition against the ’910 Patent (IPR No. 2025-00405), the petition assumes that claim 15 solely teaches an anode which meets the limitations of

claim 12, and it does not discuss any possibilities of an electrode being simultaneously an anode and a cathode. *See, e.g.*, Ex. A (Petition from IPR2025-00405) at pp. 37-41.

VI. THE '148 PATENT

A. Disputed Terms

1. “the pores at least comprises a part of the inorganic particles” (Claims 1, 10)

Plaintiff's Proposed Construction	Defendant's Proposed Construction
Plain and ordinary meaning, with the correction: “the pores at least comprises a part of the inorganic particles.”	Indefinite.

52. In my opinion, it would be clear to a POSITA, based on the claim language and the specification of the '148 Patent, that claims 1 and 10 erroneously use the singular verb “comprises” when it should instead use the plural form “comprise” as the claim refers to multiple “pores” instead of a singular “pore.” My review of the prosecution history does not suggest a different interpretation.

53. It is also my opinion that the '148 patent contains sufficient disclosure for a person of ordinary skill to understand that the term “the pores at least comprise[] a part of the inorganic particles” should have its plain and ordinary meaning. I understand that Defendant contends this term is indefinite. For the reasons below, I disagree with Defendant's contention.

54. The relevant portion of claims 1 and 10 containing the term at issue reads: “. A porous film, comprising: a binder; and inorganic particles; wherein the porous film comprises pores formed by the binder, the pores at least comprises a part of the inorganic particles....” '148 Patent at claims 1 and 10. Based on the plain language of the claims alone, a POSITA would reasonably understand that there are two requirements for what comprises a pore: (1) it must be “formed by the binder,” meaning that the outer perimeter of the pore's geometry (*i.e.*, the shape

and boundaries of the pore wall) is defined by the binder itself; and (2) the pores must “comprise a part of the inorganic particles” meaning that some part of the inorganic particles must extend into the empty space of the pore.

55. The '148 Patent provides explicit disclosure on how the porous film is formed.

See '148 Patent at 8:33-58:

A method for preparing a porous film is provided, which is used for preparing the porous film according to the first aspect of the present application, including steps of: (1) mixing inorganic particles with a binder, and then adding a first solvent and uniformly stirring the mixture to obtain a coating solution, wherein the binder is dissolved in the first solvent; (2) uniformly coating the coating solution on at least one surface of a substrate to form a wet film; (3) immersing the substrate with the wet film into a coagulation solution for phase transformation, wherein the coagulation solution includes a second solvent and a third solvent, and the second solvent and the third solvent are miscible with each other; (4) performing a drying process after the phase transformation is completed, to obtain the substrate whose surface is provided with a porous film, wherein the average wall thickness between adjacent pores in the porous film is in a range of 20 nm to 500 nm, and the average pore size of the porous film is not less than 0.3 μm .

56. It is my opinion that a POSITA would have understood the above-described methodology to explain how the pores are formed. The language above explains that the inorganic particles are first mixed with a binder before solvent is added to the mixture, which dissolves the binder. This slurry containing particles, binder, and a solvent are then coated onto a substrate which is then submerged into a weaker solvent solution which the claim refers to as “a coagulating solution”. When submersed in the coagulating solution, the binder forms a web-like film with pores whose boundaries are defined by the binder as it precipitates from the solution. Thus, this defines the first requirement of “formed by the binder.” In addition, because the solvent solution contained both binder and inorganic particles, as the binder film precipitates, some particles remain inside the binder (*i.e.*, the pore walls), and others become partly exposed within the empty spaces of the pores. As such, the empty spaces necessarily include part of the inorganic particles. In other

words, the particles are not completely hidden inside the binder, they can be visibly observed within the space of the pores themselves.

57. Indeed, this is consistent with Figure 2 of the '148 Patent, which shows the pores formed by the binder with inorganic particles within the empty space of the pores after the film has gone through the coagulation and drying process. *See* '148 Patent at FIG. 2 (annotated version reproduced below) and 2:65-67 (“FIG. 2 is an electronic microscope image (5000 times magnification) of the pore structure of the lower surface of the porous film according to example 3.”)

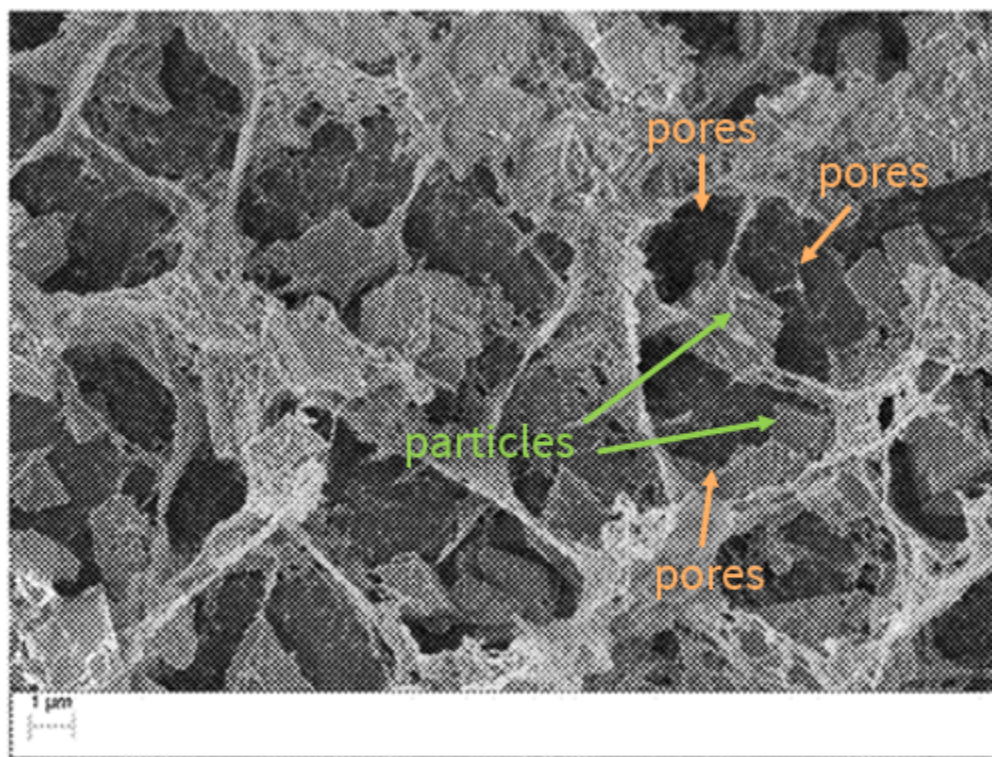


FIG. 2

58. As shown in the image above, a POSITA would have interpreted the figure to show that the binder dictates the geometry of the pore (*i.e.*, “formed by the binder”) while the empty

spaces of the pores themselves contain portions of the inorganic particles (*i.e.*, “comprise a part of the inorganic particles.”)

59. Further, I note that in CosMX’s IPR petition against the ’148 Patent (IPR No. 2025-00432), CosMX alleged—consistent with my analysis above—that the prior art met this limitation because it disclosed “filler particles [that] extend into the pores,” alleging that the prior art’s teachings contain “larger filler particles [that] must protrude into the pore spaces—and/or themselves comprise a part of the pore walls—ensuring that the pores inherently contain portions of the inorganic filler material.” Ex. B (Petition from IPR2025-00432) at 26.

60. For the reasons above, it is my opinion that a POSITA would reasonably understand this term to have its plain and ordinary meaning.

VII. THE ’498 PATENT

A. Disputed Terms

1. “positive plate” and “negative plate”

Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
Judicially corrected to “positive electrode” and “negative electrode” ¹	Indefinite.

61. Each of the independent claims of the ’498 patent recite “a positive electrode” and “a negative electrode.” However, for each independent claim, the last limitation recites “the positive plate” and “the negative plate.” Claims 20, 21, and 22 also recite “the positive plate” and “negative plate.” In my opinion, it would be clear to a POSITA, based on the claim language and the specification of the ’498 Patent, that claims 1, 9, 17, 20, 21, and 22 erroneously use the words

¹ Alternatively, the claim’s use of the term “electrode” could be judicially corrected to “plate”—which is the term used throughout the specification. I note that the original patent application was filed in China, which suggests a possible language or translation issue may be the root of this error. In either case, the scope and meaning of the claims is the same and is easily discerned in view of the claims, the specification, and the prosecution history.

“positive plate” and/or “negative plate” when it should instead use “positive electrode” and/or “negative electrode,” and the prosecution history does not suggest a different interpretation. Accordingly, it is my opinion that the error is not subject to reasonable debate.

62. I understand that Defendant contends this term is indefinite in light of the above-noted error. For the reasons below, I disagree with Defendant’s contention.

63. A POSITA would reasonably understand that the term “plate” in the context of the ’498 patent is synonymous with “electrode.”

64. As an initial matter, the plain meaning of a “plate” in the context of batteries is an “electrode.” Art that was cited during prosecution of the ’498 patent frequently referred to electrodes as “electrode plates.” *See, e.g.*, Ex. C (U.S. Pat. No. 11,329,352) at Abstract (“The secondary battery comprises a first electrode tab and a first electrode plate.”); Ex. D (U.S. Pat. Pub. No. 2012/0052295) at Abstract (“The present invention relates to a pressure-sensitive adhesive tape for protecting an electrode plate”).

65. The specification of the ’498 patent clearly supports this construction. While the specification uses “plate” rather than “electrode,” the specification universally describes this “plate” as having the exact same characteristics as what a POSITA would understand are present in an “electrode.” For example, the Abstract describes the battery as having “a positive plate having a positive film, a negative plate having a negative film, a separator between the positive plate and the negative plate, and electrolyte.” And each of the claimed characteristics of the positive and negative “electrodes” in the claims are also found in the specification as identical characteristics of the positive and negative “plates.” For example, the claims require the “positive *electrode*” to comprise a “positive current collector and a positive electrode active material layer containing LiCoO₂.” Similarly, the specification describes that a “positive *plate* 1 includes a positive current

collector 11” and has a “positive active material LiCoO₂.” ’498 Patent at 5:3-5, 5:56-60. And where the claims require the “negative *electrode*” to comprise a “negative current collector and a negative electrode active material layer containing graphite or silicon,” the specification describes that a “negative *plate* 2 includes a negative current collector 21” and has a “negative active material graphite.” *Id.* at 5:5-8, 6:15-20. I understand that CosMX has not asserted that the terms “positive electrode” and “negative electrode” lack written description support, and thus necessarily concedes these limitations must find written description support in the specification’s description of positive and negative “plates.” Thus, a POSITA would reasonably understand that the specification’s use of the term “plate” is synonymous with “electrode.”

66. The prosecution history also supports this construction and does not suggest a different interpretation. When the application was originally filed, the proposed claims exclusively used the terms “positive plate” and “negative plate.” *See* Ex. E (’498 Patent Prosecution History) at p. 1106-10 (Initial Filed Claims). However, following the examiner’s first rejection, the applicant canceled all pending claims and proposed new claims that exclusively used the terms “positive electrode” and “negative electrode.” *Id.* at 943 (August 08, 2022 Amended Claims). Notably, when the examiner issued a second (final) rejection, he expressly mapped the terms “positive electrode” and “negative electrode” to the prior art’s disclosure of a “positive electrode plate” and “negative electrode plate”:

a positive electrode (positive electrode plate 1a, 1c, 1d, 1f, FIGs. 2a, 4, 5, 7; [029]; while numerous embodiments are cited, reference is made specifically to plate 1a of FIG. 2a below for brevity) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is coated on the current collector, see [027]; e.g., FIG. 2a shows the “film” as the dark portion (no reference sign is provided)) containing LiCoO₂ (lithium cobalt oxide, [060]),

a negative electrode (negative electrode plate 2c, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) containing graphite or silicon ([065], graphite and silicon are both disclosed),

Id. at 857 (October 24, 2022 Final Rejection).

67. In a January 24, 2023 amendment, the applicant added the limitation “across the separator in a thickness direction of the positive plate and the negative plate.” However, the applicant repeatedly treated the term “plate” as synonymous with “electrode.” *Id.* at 814-18 (January 24, 2023 Amended Claims). For example, in the applicant’s June 29, 2023 remarks, the applicant remarked that the Atsuo reference is “directed to the internal short circuit between the uncoated portion of the positive electrode current collector and the **negative electrode plate** coated with the negative electrode active material.” *Id.* at 679-84 (June 29, 2023 Applicant Remarks). The applicant also described a declaration submitted by the inventor, Mr. Tao, referring to the “negative electrode plate in Atsuo.” *Id.*

68. Finally, I note that in its Petition for *inter partes* review challenging the ’498 patent, which I understand constitutes intrinsic evidence, CosMX—consistent with my analysis—also treated the terms “plate” and “electrode” synonymously. For example, in describing

conventional lithium-ion batteries, CosMX stated that “[a] positive electrode lead is attached to the positive *electrode plate*.” Ex. F (Petition from IPR2025-00389) at 4. And for the limitations containing the terms “positive plate” and “negative plate,” Petitioner argued that the limitation is met by the “insulating tape 7 on the positive *electrode’s* active material 3 across a separator 8 opposite a negative lead 2.” *Id.* at p. 34.

69. Thus, in my opinion, the terms “positive plate” and “negative plate” are synonymous with “positive electrode” and “negative electrode,” and therefore the terms “positive plate” and “negative plate” were clearly intended to have an antecedent basis in the claimed “positive electrode” and “negative electrode.” A POSITA would reasonably understand that this is a clear typographical error that is not subject to reasonable debate.

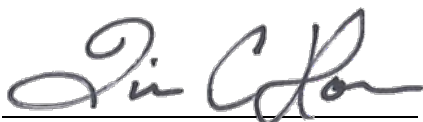
VIII. CONCLUSION

70. For the foregoing reasons, it is my opinion that Plaintiff’s proposed constructions should be adopted.

71. I reserve the right to supplement or amend my opinions in response to additional opinions expressed by Defendant’s expert(s) or in light of any additional evidence, testimony, discovery, or other information that may be provided to me after the date of this declaration.

72. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed in Natick, Massachusetts on this 21st day of October, 2025.


Quinn Horn, Ph.D.

October 21, 2025
Date