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

SK NEXILIS CO., LTD., *Plaintiff,* v. **SOLUS ADVANCED MATERIALS CO., LTD., VOLTA ENERGY SOLUTIONS S.A.R.L., VOLTA ENERGY SOLUTIONS EUROPE KFT., VOLTA ENERGY SOLUTIONS HUNGARY KFT., AND VOLTA ENERGY SOLUTIONS CANADA INC.,** *Defendants.*	**Civil Action No. _____** **JURY TRIAL DEMANDED**

COMPLAINT

Plaintiff SK nexilis Co., Ltd. ("SKn" or "Plaintiff"), by and through the undersigned attorneys, complains and alleges the following against Defendants Solus Advanced Materials Co., Ltd, Volta Energy Solutions S.A.R.L., Volta Energy Solutions Europe KFT., Volta Energy Solutions Hungary KFT., and Volta Energy Solutions Canada Inc. ("Defendants").

NATURE OF THE ACTION

1. This is an action for patent infringement. These claims arise under at least the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*.

2. SKn has filed this lawsuit to respond to Defendants' unlawful infringement of SKn's patented inventions, including U.S. Patent Nos. 10,480,090 ("the '090 Patent), 10,811,689 ("the '689 Patent"), 11,346,014 ("the '014 Patent"), and 11,591,706 ("the '706 Patent") (collectively, the "Asserted Patents"), and to obtain damages and other relief as appropriate.

THE PARTIES

3. Plaintiff SKn is a corporation organized and existing under the laws of the Republic of Korea, with its principal place of business at 2 3sandan 2-gil, Buk-myeon, Jeongeup-si, Jeollabuk-do, 56137, Republic of Korea. SKn is a market leader in the research, development, and manufacture of battery copper foils.

4. Upon information and belief, Solus Advanced Materials Co., Ltd. ("Solus") is a corporation organized and existing under the laws of the Republic of Korea with its principal place of business located at 627 Seodong-ro, Iksan-si, Jeollabuk-do, 54584 Republic of Korea.

5. Upon information and belief, Volta Energy Solutions S.A.R.L. ("Volta") is a company organized and existing under the laws of Luxembourg, with its principal place of business at 6, Salzbaach, Wiltz, Luxembourg. Solus owns a controlling stake in Volta Energy Solutions S.A.R.L. *See* Ex. 1, Solus Advanced Materials Co., Ltd. 2023 2Q Earnings Report, July 2023 ("Solus 2Q Earnings Report"), at 17 ("Domestic & Overseas Corporations"), https://www.solusadvancedmaterials.com/download/ir/%EC%86%94%EB%A3%A8%EC%8A%A4%EC%B2%A8%EB%8B%A8%EC%86%8C%EC%9E%AC_2Q.'23%20%EC%8B%A4%EC%A0%81%EC%9E%90%EB%A3%8C_20230726_EN_vf.pdf (last visited November 21, 2023). Upon information and belief, Volta is directed and controlled by Solus.

6. Upon information and belief, Volta Energy Solutions Europe KFT. ("Volta Europe") is a company organized and existing under the laws of Hungary, with its principal place of business at Környe, Üveggyár u., 2851, Hungary. Upon information and belief, Volta Europe is a wholly-owned subsidiary of Volta Energy Solutions S.A.R.L., and is directed and controlled by Solus and/or Volta Energy Solutions S.A.R.L. *Id.*

7. Upon information and belief, Volta Energy Solutions Hungary KFT. ("Volta Hungary") is a company organized and existing under the laws of Hungary, with its principal place

of business at Környe, Üveggyár u., 2851, Hungary. Upon information and belief, Volta Hungary is a wholly-owned subsidiary of Volta Europe, and is directed and controlled by Solus, Volta Energy Solutions S.A.R.L., and/or Volta Europe. *Id.*

8. Upon information and belief, Volta Energy Solutions Canada Inc. ("Volta Canada") is a company organized and existing under the laws of Canada, with its principal place of business at 625 rue du Luxembourg, Granby, Quebec, J2J 2S9, Canada. Upon information and belief, Volta Canada is a wholly-owned subsidiary of Volta Energy Solutions S.A.R.L., and is directed and controlled by Solus and/or Volta Energy Solutions S.A.R.L. *Id.*

9. Defendants act in concert or individually to design, manufacture, sell, and offer for sale in the United States and/or import into the United States battery copper foils including standard battery copper foil (BF-PLSP), high-elongation battery copper foil (SR-PLSP), and high-strength battery foil (HTS-PLSP) products (the "Accused Products"). *See* Ex. 2, https://www.solusadvancedmaterials.com/en/business/b-foil/#anchor-1 (last visited November 21, 2023); *see also* Ex. 1 at 7 ("Battery copper foil_Expansion of the battery copper foil production capacity in North America and the EU"), 12 ("Consolidated Statement of Comprehensive Income"), 14 ("Company & Business Introduction"), and 16 ("Business Sites").

10. Both SKn and Defendants compete in the market supplying battery copper foils for use in electrical vehicle ("EV") batteries. *See, e.g.*, https://www.kedglobal.com/batteries/newsView/ked202309060002 ("The ground-breaking ceremony held in Granby, Quebec comes as South Korean EVs and battery makers, including its bigger rival SK Nexilis Co., are ramping up production in North America so that buyers of their cars are eligible for US tax credits under the US Inflation Reduction Act.") (last visited November

21, 2023); *see also* https://www.just-auto.com/news/solus-breaks-ground-on-canada-copper-foil-plant (last visited November 21, 2023).

JURISDICTION AND VENUE

11. This Court has subject matter jurisdiction over the claims for patent infringement (COUNTS I-IV) pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this is a civil action arising under the Patent Act.

12. This Court has personal jurisdiction over Defendants. Defendants have established minimum contacts with the United States as a whole and with Texas such that subjecting them to personal jurisdiction in this Court will not offend traditional notions of fair play and substantial justice. Defendants purposely availed themselves of the laws and protections of the United States and the State of Texas by knowingly supplying, contracting to supply, shipping, distributing, offering for sale, selling, and/or advertising battery copper foils in State of Texas. Defendants have targeted the United States and the State of Texas by conducting regular business therein, and have placed and continue to place their products into the stream of commerce through an established distribution channel with the expectation and/or knowledge that they will be purchased by consumers in the United States, the State of Texas, and this District. SKn's claims for patent infringement arise directly from and/or relate to this activity.

13. For example, Defendants have offered for sale and sold the Accused Products to EV manufactures, such as Tesla, Inc, located in Texas. *See* https://www.kedglobal.com/battery-materials/newsView/ked202202160014 ("Tesla to use Solus' products to meet 70% of its demand for next-generation battery production in Texas.") (last visited November 16, 2023); *see also* https://www.kedglobal.com/batteries/newsView/ked202309060002 ("The ground-breaking ceremony held in Granby, Quebec comes as South Korean EVs and battery makers, including its

bigger rival SK Nexilis Co., are ramping up production in North America so that buyers of their cars are eligible for US tax credits under the US Inflation Reduction Act.") (last visited October 12, 2023); https://www.mk.co.kr/economy/view.php?sc=50000001&year=2022&no=152967 (last visited November 21, 2023).

14. Defendants have also entered into contracts with existing U.S. customers to increase the supply of the Accused Products into the United States, including in Texas. *See* Ex. 3, Solus Advanced Materials, https://www.solusadvancedmaterials.com/download/main/2023_%EC%86%94%EB%A3%A8%EC%8A%A4%EC%B2%A8%EB%8B%A8%EC%86%8C%EC%9E%AC_%ED%9A%8C%EC%82%AC%EC%86%8C%EA%B0%9C%EC%84%9C_(EN)_v2.pdf (last visited November 21, 2023), at 15 (stating that Solus expects to "make additional long-term supply agreement with existing customers" and "[i]ncrease local demand at existing/new plants in North America under USMCA.").

15. As another example, Defendants' 2023 First Quarter Earnings Report states that they are engaged in a "[c]onsistent pursuit[] of new and additional supply contracts for North American and EU customer" as part of their "[e]xpansion of operational capacity for Battery copper foil." Ex. 4, Solus Advanced Materials Co., Ltd. 2023 1Q Earnings Report, April 2023, https://www.volta-energysolutions.com/download/ir/(USD)%201Q%2023%20Earnings%20Report.pdf, at 7 ("Battery Copper Foil_Hungary PH2 Status and Plans"). Similarly, Defendants' 2023 Second Quarter Earnings Report states: "[a]fter the USA IRA announcement, North America demands for EV batteries soared, and thus we must prepare to cope with such changes and conquer the local markets and maintain close relations with customers to gain a competitive edge." Ex. 1 at 7 ("Expansion of the battery copper foil production capacity in North America and the EU").

16. Additionally, Defendants have purposefully availed themselves of the laws and protections of the United States and the State of Texas by filing and maintaining U.S. patents and trademarks. For example, Solus is the assignee of 51 unique U.S. patents and patent applications.

17. As another example, Defendants have 14 registered U.S. trademarks and trademark applications, including "Solus," "Solus Advanced Materials," "Volta Energy Solutions," and Volta's logo. all registered to Solus. *See e.g.*, SOLUS, Serial No. 90716913; SOLUS ADVANCED MATERIALS, Serial No. 90210109; SOLUS ADVANCED MATERIALS, Serial No. 90510553; VOLTA ENERGY SOLUTIONS, Registration No. 7159864; VOLTA ENERGY SOLUTIONS, Registration No. 7117560; Volta Two Triangle Design, Registration No. 7110030. These trademarks and trademark applications are registered to cover goods and services related to the Accused Products.

18. Venue is proper in this District under 28 U.S.C. §§ 1391(a)-(d) and 1400(b). Each of Solus, Volta, Volta Europe, Volta Hungary, and Volta Canada is a foreign corporation that does not reside in the United States, and thus may be sued in any judicial district pursuant to 28 U.S.C. § 1391(c)(3).

19. Defendants are jointly and severally liable for infringing one or more of the claims of the Asserted Patents. Defendants' liability stems from the same transactions or occurrences regarding the use, sale, and/or offer for sale in the United States and/or importation into the United States of the Accused Products. Consequently, this action involves questions of law and fact common to all Defendants.

SKn BATTERY COPPER FOIL

20. SKn is a market leader in the research, development, and manufacture of battery copper foils. *See* http://www.sknexilis.com/en/nexilis/introduction.php#self.

21. Battery copper foil is a key material of lithium-ion battery anodes for EVs and serves as a pathway for the electric current and the source to emit the heat generated by a battery. *See* https://www.skc.kr/m/eng/creation/detailView.do?menuCd=002005&lang=eng&cate1=289&cate2=293&cate3=&cate4=#:~:text=CopperfoilisanAnode,copper20foilthinnerandwider.

22. With the rising demand for electric vehicles, the demand for lithium-ion batteries with higher capacity and reliability has also increased. The thinner the copper foil, the more active material that can be loaded into the anode. In turn, this reduces the weight of the battery, increases the battery capacity, reduces manufacturing costs, and minimizes environmental impact. The higher performing batteries lead to better and longer performance of EVs. The global copper foil market for EV batteries is expected to experience an annual growth rate of over 40 percent over the next several years. *See* https://www.businesskorea.co.kr/news/articleView.html?idxno=203628.

23. SKn has created industry-leading thin, long, and wide battery copper foils, which are critical for producing high-capacity, lightweight, and cost-efficient batteries. *See* http://www.sknexilis.com/en/product/copper.php.

24. SKn has expended considerable time, labor, skill, and money to create its market leading battery copper foils. SKn manufactures battery copper foils in a variety of types and sizes including standard battery property battery copper foil (in thicknesses varying between 6-12μm), high elongation after high tensile strength battery copper foil (in thicknesses varying between 6-12μm), heat resistant high tensile strength battery copper foil (in thicknesses varying between 6-12μm), and ultra-thin battery copper foil (thicknesses less than 5μm). SKn's commitment to research and development and use of its proprietary innovation has allowed SKn to provide to the

market the industry leading secondary battery copper foils that can be manufactured for use in various types of lithium-ion batteries such as pouch type, cylindrical type, and prismatic type.

25. SKn's innovations, which include optimization of key material properties associated with a battery copper foil such as peak count roughness, peak density and coefficient of thermal expansion, are instrumental in maintaining high charge/discharge capacity and reducing common manufacturing defects such as curls, bagginess, tearing, fusilli, MD buckles, and wrinkles. SKn's innovations also enable manufacturing of wider and longer battery copper foils, which lead to increased production output and decreased production losses. For example, over the last decade, SKn's manufacturing capacity has increased from 600-800 mm-wide and 8 km-long battery copper foil to 1200-1400 mm-wide and 77 km-long battery copper foil. Further, SKn's innovations improve the transportation efficiencies of battery copper foil by enabling more material to be transported per drum, which in turn results in reduced risks of damage during transportation.

26. SKn's battery copper foil innovations have earned widespread recognition and praise. For example, in 2013 SKn was awarded the Silver Tower Order at the International Material & Components Industry Show for producing the world's first 6μm copper foil. *See SK Nexilis, History*, http://www.sknexilis.com/en/nexilis/introduction.php#self (last visited November 21, 2023). In 2017, SKn was awarded the Ministry of Trade, Industry and Energy Prize for its development of 4μm copper foil. *Id*. In 2018, SKn was awarded the "Korean World-Class Product Award" for its copper foil products. *Id*. In 2020, the Korea Record Institute certified SKn's battery copper foils as the longest, widest, and thinnest ever made in Korea. *See* https://www.skc.kr/m/eng/Conmmunication/news/newsDetail.do?seq=1187. Through its innovations, by 2021, SKn established itself as the world's largest copper foil maker and has

earned the largest market share in the global copper film market. *See* https://www.kedglobal.com/batteries/newsView/ked202208030007.

THE ASSERTED PATENTS

27. U.S. Patent No. 10,480,090 is titled "Electrolytic copper foil, current collector comprising the same, electrode comprising the same, secondary battery comprising the same, and method for manufacturing the same." The '090 Patent was filed as PCT Application on April 28, 2016 and issued by the United States Patent and Trademark Office on November 19, 2019. The inventors of the '090 Patent are Seung Min Kim and Dae Young Kim. A true and correct copy of the '090 Patent is attached as Exhibit 5.

28. SKn is the sole owner by assignment of all right, title, and interest in the '090 Patent.

29. U.S. Patent No. 10,811,689 is titled "Easily handleable electrolytic copper foil, electrode comprising the same, secondary battery comprising the same, and method for manufacturing the same," and was filed with the United States Patent and Trademark Office on September 6, 2017 and issued on October 20, 2020. The inventor of the '689 Patent is Seung Min Kim. A true and correct copy of the '689 Patent is attached as Exhibit 6.

30. SKn is the sole owner by assignment of all right, title, and interest in the '689 Patent.

31. U.S. Patent No. 11,346,014 is titled "Electrolytic copper foil, method for producing same, and high-capacity Li secondary battery negative electrode including same." The '014 Patent was filed as a PCT Application on August 24, 2018 and issued by the United States Patent and Trademark Office on May 31, 2022. The inventors of the '014 Patent are Seung Min Kim and Ho Gun Kim. A true and correct copy of the '014 Patent is attached as Exhibit 7.

32. SKn is the sole owner by assignment of all right, title, and interest in the ’014 Patent.

33. U.S. Patent No. 11,591,706 is titled “Electrolytic copper foil having excellent handling characteristics in postprocessing, and manufacturing method therefor.” The ’706 Patent was filed as a PCT Application on January 25, 2019 and issued by the United States Patent and Trademark Office on February 28, 2023. The named inventors of the ’706 Patent are Seung Min Kim and Shan Hua Jin. A true and correct copy of the ’706 Patent is attached as Exhibit 8.

34. SKn is the sole owner by assignment of all right, title, and interest in the ’706 Patent.

35. On September 27, 2023, SKn sent a letter to Solus, notifying it that Solus’ battery copper foil products were infringing SKn’s patents. Upon information and belief, Defendants should have therefore had knowledge of the Asserted Patents and their infringement of those patents at least since receiving the September 27, 2023 letter.

36. Defendants have also had knowledge of the Asserted Patents at least since the filing of this Complaint.

THE ACCUSED PRODUCTS

37. The Accused Products are battery copper foil products used, made, sold, offered for sale, and/or imported by Defendants, including battery copper foil products incorporated into EV batteries. The Accused Products include standard battery copper foil (“BF-PLSP”), high-elongation battery copper foil (“SR-PLSP”), and high-strength battery foil (“HTS-PLSP”) products. *See Solus Advanced Materials, Battery Copper Foil: Main Product*, https://www.solusadvancedmaterials.com/en/business/b-foil/#anchor-1 (last visited November 21, 2023).

38. Solus was founded in October 2019, and Defendants did not begin manufacturing battery copper foils on a commercial scale until 2020—years after Plaintiff filed patent applications covering its battery copper foil innovations. *See* https://www.solusadvancedmaterials.com/en/intro/history/; Ex. 9, Solus Advanced Materials Company Profile, at 4 ("Overview – Company Profile"), https://www.volta-energysolutions.com/download/main/3Q%20%EC%86%94%EB%A3%A8%EC%8A%A4%EC%B2%A8%EB%8B%A8%EC%86%8C%EC%9E%AC%20%ED%9A%8C%EC%82%AC%EC%86%8C%EA%B0%9C%EC%84%9C_EN.pdf (last visited November 16, 2023).

39. Defendants' BF-PLSP products, for example, are used in electric vehicle batteries, are of "cylindrical," "prismatic," or "pouch" type, and have a thickness of 6-18μm. *See* https://www.solusadvancedmaterials.com/en/business/b-foil/#anchor-1(last visited November 16, 2023).

40. Defendants' SR-PLSP products are of "cylindrical" and "prismatic" type, and have a thickness of 6-12μm. *Id*. Defendants characterize these products as "contributing to yield improvement by upgrading processability within the battery production process with high strength properties before heat treatment and increasing the life and stability of cylindrical and square batteries with high elongation properties after heat treatment." *Id*. Defendants further characterize the "SR-PLSP" products as capable of "load[ing] much more active materials with high strength properties, contributing to the minimization of deformation at the time of battery charge and discharge by maintaining strength after heat treatment." *Id*.

41. Defendants' HTS-PLSP products are of "pouch type" and have a thickness of 6-12μm. *Id*. Defendants represent that the HTS-PLSP products can "load much more active

materials with high strength properties, contributing to the minimization of deformation at the time of battery charge and discharge by maintaining strength after heat treatment." *Id*.

42. Defendants "[m]anufacture [ ] battery copper foil products to individual customer specifications" and "[m]anufacture [ ] a wide range of battery copper foil products (e.g., thickness of 8μm or 6μm, high-strength, or high-elongation characteristics)." Ex. 4 at 6 ("Battery Copper Foil/Copper Foil_Production Capacity Status & Plan").

43. Defendants' 6μm battery copper foil products "can wind more than 30 km." Ex. 9, at 11 ("Battery Copper Foil"), https://www.volta-energysolutions.com/download/main/3Q%20%EC%86%94%EB%A3%A8%EC%8A%A4%EC%B2%A8%EB%8B%A8%EC%86%8C%EC%9E%AC%20%ED%9A%8C%EC%82%AC%EC%86%8C%EA%B0%9C%EC%84%9C_EN.pdf (last visited November 16, 2023).

44. Defendants' Accused Products are designed to address the same problems solved by the Asserted Patents. For example, Defendants state that the Accused Products "[e]nhanc[e] yield by improving machining in battery manufacturing with high-strength battery copper foil before heat treatment" and "[m]inimiz[e] deformation during the charging/discharging of batteries by maintaining its high-strength properties even after heat treatment." *Id*.

45. The Accused Products are developed, manufactured, and assembled by or for Defendants at facilities in Korea, Canada, and Hungary. *Id*. 6 ("Battery Copper Foil/Copper Foil_Production Capacity Status & Plan"), 14 ("Company & Business Introduction"), 16 ("Business Sites").

46. Defendants, directly or indirectly through their affiliates, subsidiaries, agents, customers, or other representatives, sell and/or offer for sale the Accused Products in the United States, and/or import the Accused Products into the United States, including in connection with

supplying and selling the Accused Products to U.S. businesses for incorporation into products, such as EV batteries. Defendants manufacture the Accused products and sell them directly to "[g]lobal-tier battery manufacturer[s]" and "[g]lobal OEM company." *Id*. at 6 ("Battery Copper Foil/Copper Foil_Production Capacity Status & Plan").

COUNT I

DEFENDANTS' INFRINGEMENT OF U.S. PATENT NO. 10,480,090 (35 U.S.C. § 271)

47. SKn incorporates by reference the preceding paragraphs as if fully set forth herein.

48. Defendants have infringed and continue to directly infringe the '090 Patent by using, selling, and offering for sale in the United States and/or importing into the United States the Accused Products.

49. For example, independent claim 1 of the '090 Patent recites:

> 1. An electrolytic copper foil for a secondary battery, the electrolytic copper foil comprising:
>
> a first surface; and
>
> a second surface opposite to the first surface,
>
> wherein each of the first and second surfaces has a peak count roughness Rpc of 10 to 100,
>
> wherein the peak count roughness Rpc of each of the first and second surfaces is an average of peak count roughness Rpc values measured at randomly-selected three points,
>
> the peak count roughness Rpc of each point is the number of effective peaks which rise above an upper criteria line of 0.5 μm per unit sampling length of 4 mm in a surface roughness profile obtained according to steel-iron test schedule (SEP 1940), and
>
> there is at least one valley deeper than a lower criteria line of −0.5 μm between adjacent ones of the effective peaks.

50. The Accused Products meet each limitation of at least claim 1 of the '090 Patent.

51. For example, the Accused Products are electrolytic copper foil products for use in secondary batteries such as the EV batteries. *See* https://www.solusadvancedmaterials.com/en/business/b-foil/. As shown below (Figs. 1-3), the Accused Products comprise a first surface and a second surface opposite to the first surface. *Id*.

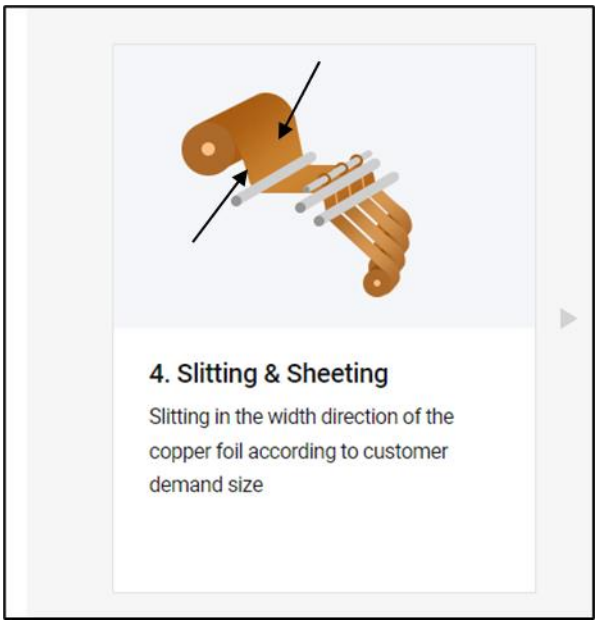

Figure 1

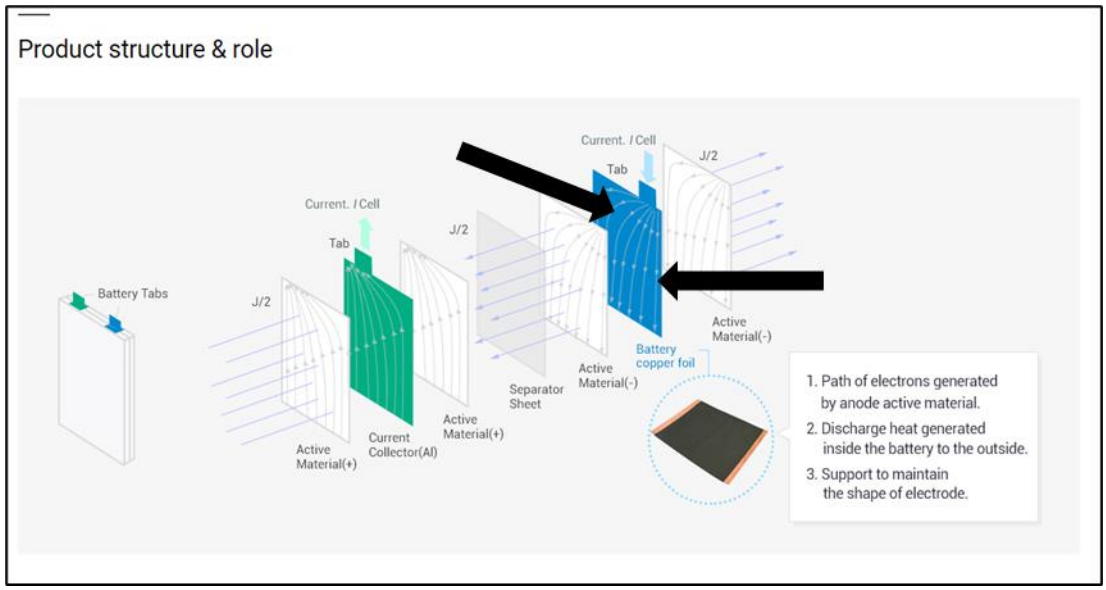

Figure 2

52. As shown below in Fig. 3, the Accused Products have a "drum side" and an "electrolyte side." *Id*.

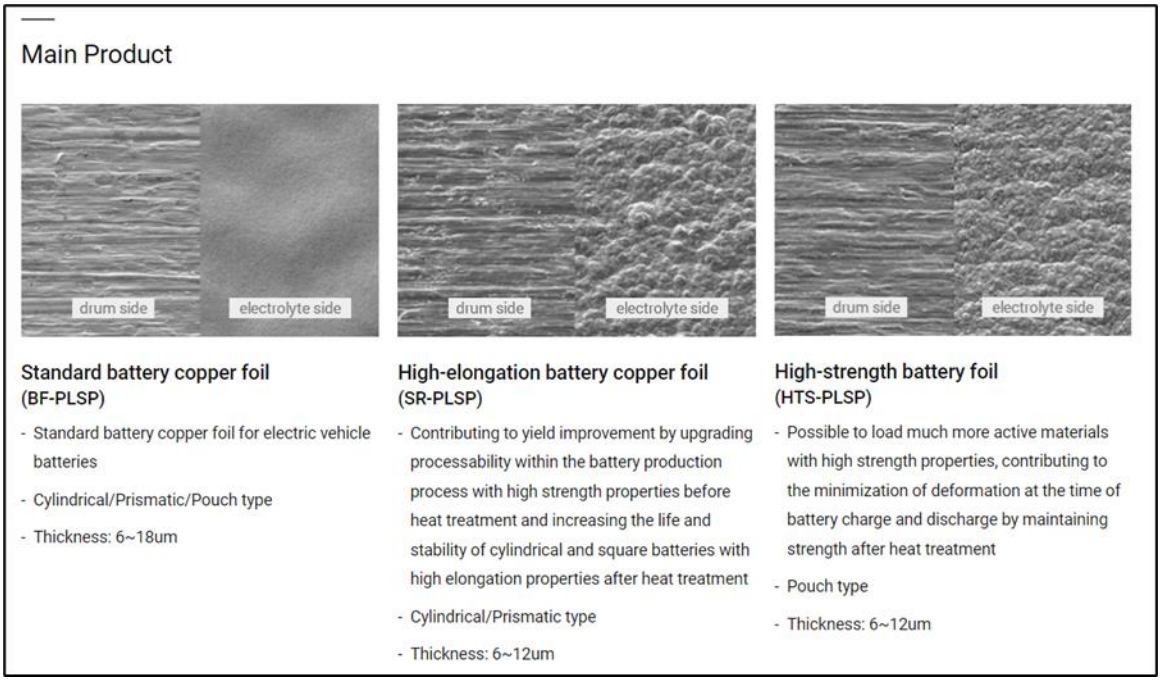

Figure 3

53. Moreover, in each Accused Product, the first and second surfaces of the Accused Products have a peak count roughness (R_{pc}) of 10 and 100. For each Accused Product, measuring the peak count roughness R_{pc} values of each of the first and second surfaces at randomly-selected three points and averaging the three values results in peak count roughness R_{pc} of each of the first surface and second surfaces between 10 and 100 where the peak count roughness R_{pc} was the number of effective peaks which were above an upper criteria line of 0.5 μm per unit sampling length of 4 mm in a surface roughness profile obtained according to steel-iron test schedule (SEP 1940), and there was at least one valley deeper than a lower criteria line of −0.5 μm between adjacent ones of the effective peaks.

54. By using, selling, and offering the Accused Products for sale in the United States and/or importing the Accused Products into the United States, Defendants directly infringe at least claim 1 of the ’090 Patent.

55. Defendants have derived substantial income from the manufacture and sale of their infringing battery copper foils in at least 2020, 2021, 2022, and 2023. *See e.g.* Ex 1, at 12 (“Consolidated Statement of Comprehensive Income”).

56. Defendants have induced infringement of the ’090 Patent under 35 U.S.C. § 271(b) by knowingly and intentionally inducing others to directly infringe the ’090 Patent. Despite having notice of the ’090 Patent, Defendants have actively encouraged others to infringe the patent. For example, upon information and belief, Defendants have knowingly and intentionally induced third-party manufacturers, shippers, distributors, retailers, and/or customers to directly infringe (literally and/or under the doctrine of equivalents) the ’090 Patent by importing into the United States, using, and/or selling and offering to sell in the United States products containing the Accused Products. The Accused Products are specially designed to include features that infringe the ’090 Patent and have no substantial uses other than ones that infringe the ’090 Patent.

57. Moreover, upon information and belief, Defendants take active steps, directly and/or through contractual relationships with others, with the specific intent to cause such persons to import, use, sell, and/or or offer to sell products containing the Accused Products. Upon information and belief, such steps by Defendants include, among other things, making and selling the Accused Products for importation into or sale in the United States, knowing that such importation or sale would occur.

58. Defendants have also contributorily infringed the ’090 Patent under 35 U.S.C. § 271(c) through its supply of the Accused Products and non-staple constituent parts thereof, which

are not suitable for substantial non-infringing use and which embody a material part of the inventions described in the '090 Patent. Defendants have engaged in these activities despite having notice of the '090 Patent and knowing that the constituent parts are especially made and adapted for use in a manner that would infringe the '090 Patent. Defendants' contributory infringement of the '090 Patent is ongoing.

59. Defendants' infringement has been, and continues to be, willful. For example, Defendants have known or should have known about the '090 Patent and their infringement of the '090 Patent since at least their receipt of SKn's September 27, 2023 notice letter. Yet, Defendants have continued their infringing activities.

60. SKn has suffered irreparable harm to its market share and its business opportunities as a result of Defendants offering competing battery copper foil products that infringe the '090 Patent.

COUNT II

DEFENDANTS' INFRINGEMENT OF U.S. PATENT NO. 10,811,689 (35 U.S.C. § 271)

61. SKn incorporates by reference the preceding paragraphs as if fully set forth herein.

62. Defendants have infringed and continue to directly infringe the '689 Patent by using, selling, and offering for sale in the United States and/or importing into the United States the Accused Products.

63. For example, independent claim 1 of the '689 Patent recites:

> 1. An electrolytic copper foil, which includes a first surface and a second surface opposite the first surface, the electrolytic copper foil comprising:
>
> a copper layer including a matte surface facing the first surface and a shiny surface facing the second surface;
>
> a first protective layer on the matte surface of the copper layer; and

a second protective layer on the shiny surface of the copper layer, wherein:

> a coefficient of thermal expansion of the electrolytic copper foil, which is measured using a thermomechanical analyzer (TMA) while heating the electrolytic copper foil from 30° C. to 190° C. at a speed of 5° C./min, ranges from 16 to 22 μm/(m° C.),
>
> a tensile strength of the electrolytic copper foil, which is measured after a heat treatment at a temperature of 190° C. for 1 hour, ranges from 21 to 36 kgf/mm^2,
>
> a weight deviation of the electrolytic copper foil is 5% or less,
>
> a peak count (Pc) of each of the first and second surfaces of the electrolytic copper foil ranges from 3 to 92, and
>
> each of the first and second surfaces has a surface roughness (Rz) of 3.5 μm or less.

64. The Accused Products meet each limitation of at least claim 1 of the ’689 Patent.

65. For example, the Accused Products are electrolytic copper foil products for use in secondary batteries such as EV batteries. *See* https://www.solusadvancedmaterials.com/en/business/b-foil/. As shown below (Figs. 4-6), the Accused Products comprise a first surface and a second surface opposite to the first surface. *Id*.

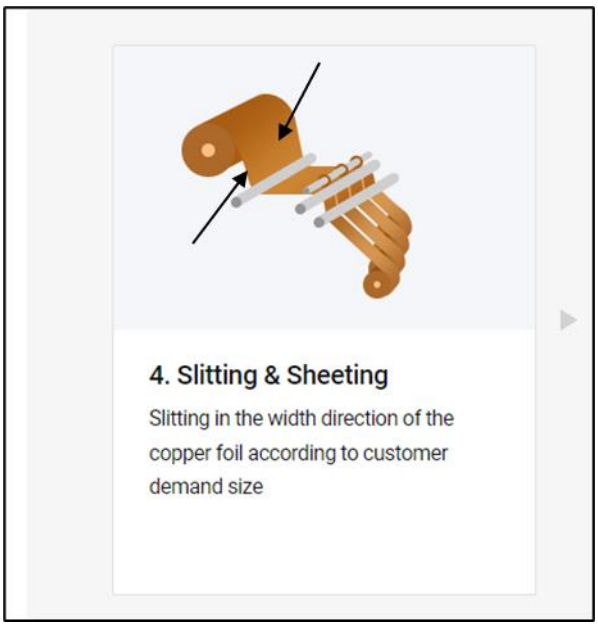

Figure 4

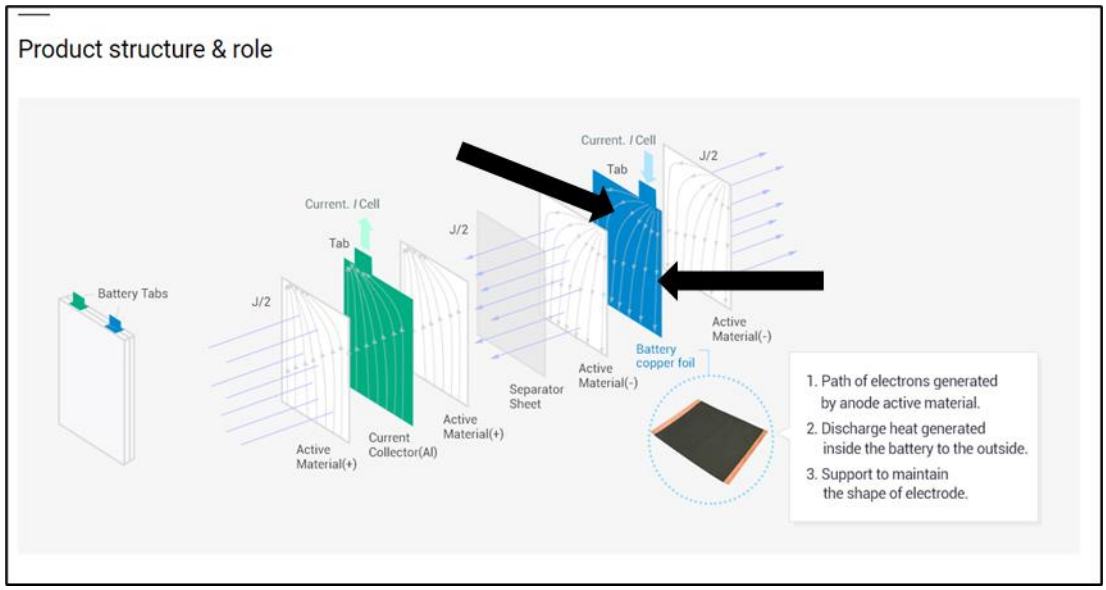

Figure 5

66. As shown below in Fig. 6, the Accused Products have a "drum side" and an "electrolyte side." *Id*. Moreover, the Accused Products have a copper layer including a matte surface facing the first surface and a shiny surface facing the second surface, a first protective layer on the matte surface of the copper layer, and a second protective layer on the shiny surface of the copper layer. *Id*.

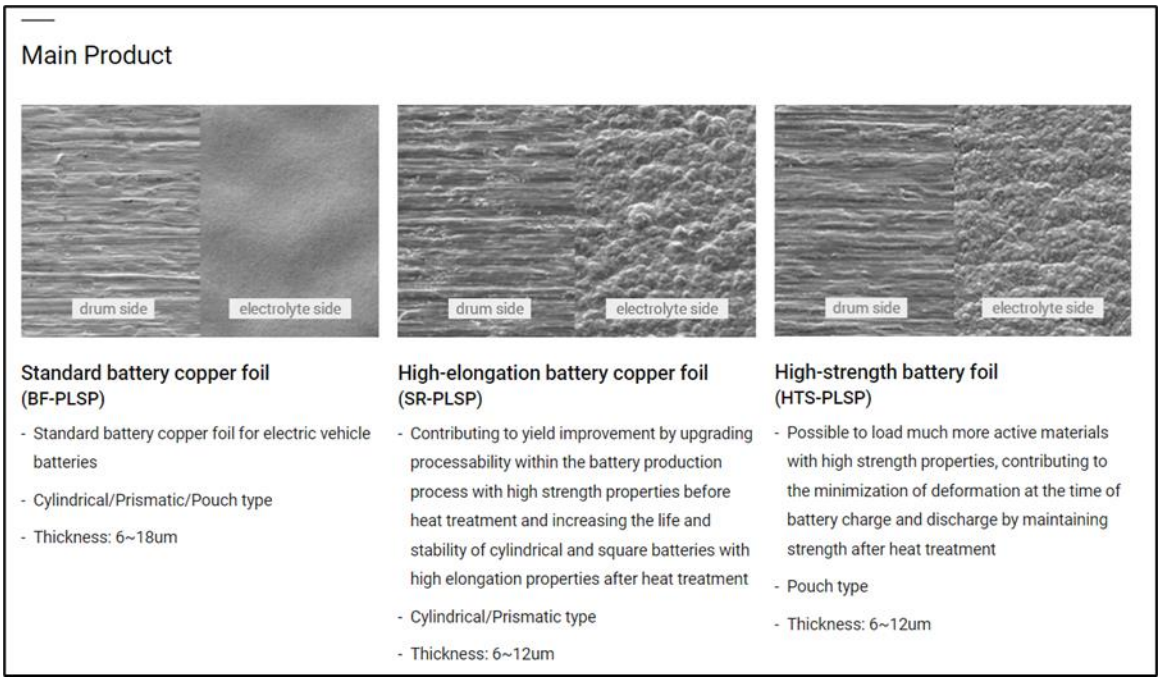

Figure 6

67. In each Accused Product, the coefficient of thermal expansion of the electrolytic copper foil ranges from 16 to 22 μm/(m·° C.) where the coefficient of thermal expansion of the electrolytic copper foil is measured using a thermomechanical analyzer (TMA) while samples of the electrolytic copper foils are heated from 30° C. to 190° C. at a speed of 5° C./min. and the coefficient of thermal expansion is calculated using the equation: CTE=ΔL[LO×ΔT], where, CTE denotes a coefficient of thermal expansion, LO denotes an initial length (m) of a sample, ΔL denotes a change (μm) of the length of the sample, and ΔT denotes a temperature change (° C).

68. In each Accused Product, the tensile strength of the electrolytic copper foil, measured after a heat treatment at a temperature of 190° C. for 1 hour, ranges from 21 to 36 kgf/mm^2.

69. In each Accused Product, the weight deviation of electric copper foil is 5% or less.

70. In each Accused Product, each of the first surface and second surfaces of the electrolytic copper foil has a peak count between the range from 3 to 92, and each of the first surface and second surface of the electrolytic copper foil has a roughness (R_z) of 3.5μm or less.

71. By using, selling, and offering the Accused Products for sale in the United States and/or importing the Accused Products into the United States, Defendants directly infringe at least claim 1 of the '689 Patent.

72. Defendants have derived substantial income from the manufacture and sale of their infringing battery copper foils in at least 2020, 2021, 2022, and 2023. *See e.g.* Ex 1, at 12 ("Consolidated Statement of Comprehensive Income").

73. Defendants have induced infringement of the '689 Patent under 35 U.S.C. § 271(b) by knowingly and intentionally inducing others to directly infringe the '689 Patent. Despite having notice of the '689 Patent, Defendants have actively encouraged others to infringe the patent. For example, upon information and belief, Defendants have knowingly and intentionally induced third-party manufacturers, shippers, distributors, retailers, and/or customers to directly infringe (literally and/or under the doctrine of equivalents) the '689 Patent by importing into the United States, using, and/or selling and offering to sell in the United States products containing the Accused Products. The Accused Products are specially designed to include features that infringe the '689 Patent and have no substantial uses other than ones that infringe the '689 Patent.

74. Moreover, upon information and belief, Defendants take active steps, directly and/or through contractual relationships with others, with the specific intent to cause such persons to import, use, sell, and/or or offer to sell products containing the Accused Products. Upon information and belief, such steps by Defendants include, among other things, making and selling

the Accused Products for importation into or sale in the United States, knowing that such importation or sale would occur.

75. Defendants have also contributorily infringed the ’689 Patent under 35 U.S.C. § 271(c) through its supply of the Accused Products and non-staple constituent parts thereof, which are not suitable for substantial non-infringing use and which embody a material part of the inventions described in the ’689 Patent. Defendants have engaged in these activities despite having notice of the ’689 Patent and knowing that the constituent parts are especially made and adapted for use in a manner that would infringe the ’689 Patent. Defendants’ contributory infringement of the ’689 Patent is ongoing.

76. Defendants infringement has been, and continues to be, willful. For example, Defendants have known or should have known about the ’689 Patent and their infringement of the ’689 Patent since at least their receipt of SKn’s September 27, 2023 notice letter. Yet, Defendants have continued their infringing activities.

77. SKn has suffered irreparable harm to its market share and its business opportunities as a result of Defendants offering competing battery copper foil products that infringe the ’689 Patent.

COUNT III

DEFENDANTS’ INFRINGEMENT OF U.S. PATENT NO. 11,346,014 (35 U.S.C. § 271)

78. SKn incorporates by reference the preceding paragraphs as if fully set forth herein.

79. Defendants have infringed and continue to directly infringe the ’014 Patent by using, selling, and offering for sale in the United States and/or importing into the United States the Accused Products.

80. For example, independent claim 1 of the ’014 Patent recites:

1. An electrolytic copper foil having a first surface and a second surface, the electrolytic copper foil comprising:

    a first protective layer at the first surface;

    a second protective layer at the second surface; and

    a copper film disposed between the first and second protective layers, wherein

        a binding coefficient of the electrolytic copper foil at the first surface or the second surface, defined as Mathematical Expression 1 below, is 1.5 to 9.4,

        (Mathematical Expression 1) Binding coefficient=Rp/μm+ peak density/30+ amount of attachment of Cr/(mg/m^2)

        (wherein the Rp (μm) is a peak height measured according to JIS B 0601 (2001) standard, wherein the peak density is a number of peaks per unit length of 4 mm, wherein the peak density is measured according to ASME B46.1 (2009) standard with a peak count level of ±0.5 μm and wherein the amount of attachment of Cr (mg/m^2) is measured by dissolving the first surface or the second surface of the electrolytic copper foil (110) with a nitric acid solution to obtain a dissolved solution, diluting the dissolved solution with water to obtain a diluted solution, and analyzing the diluted solution using an atomic absorption spectrometer).

81. The Accused Products meet each limitation of at least claim 1 of the ’014 Patent.

82. For example, the Accused Products are electrolytic copper foil products for use in secondary batteries such as EV batteries. *See* https://www.solusadvancedmaterials.com/en/business/b-foil/. As shown below (Figs. 7-9), the Accused Products comprise a first surface and a second surface opposite to the first surface. *Id*.

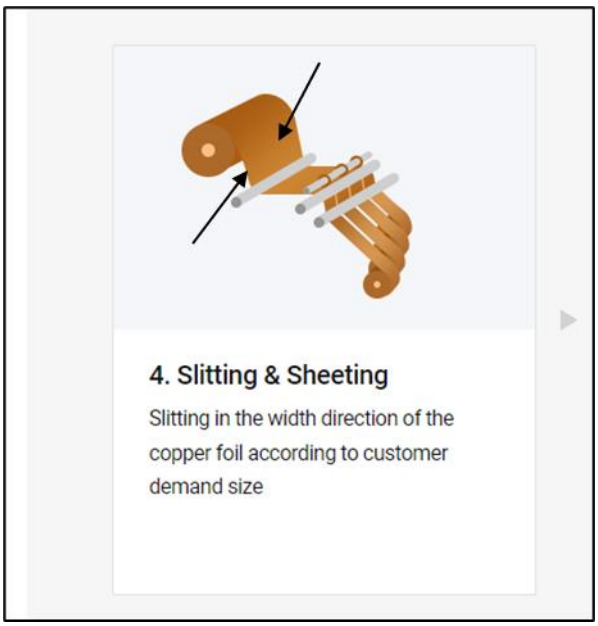

Figure 7

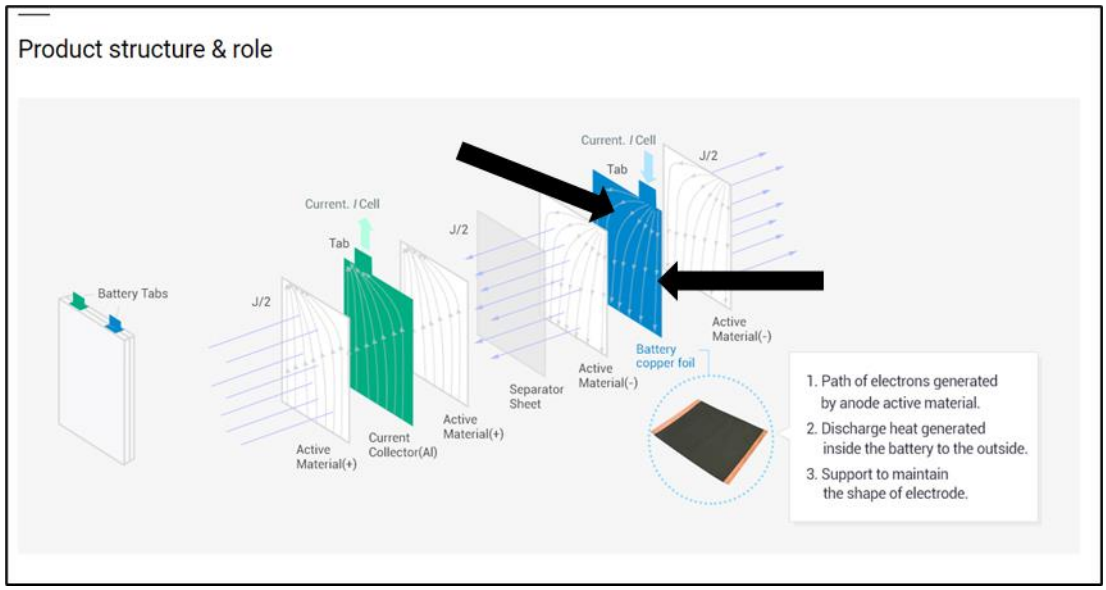

Figure 8

83. As shown below in Fig. 9, the Accused Products have a "drum side" and an "electrolyte side." *Id*. Moreover, the Accused Products have a first protective layer at the first surface, a second protective layer at the second surface, and a copper film disposed between the first and second protective layers.

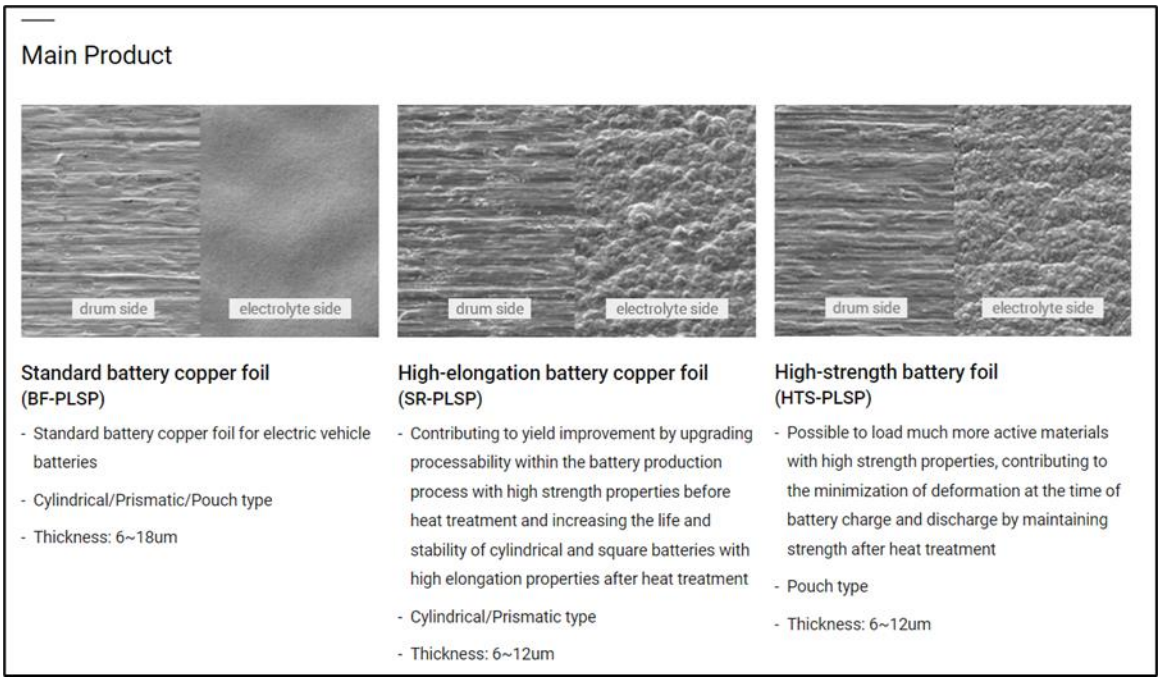

Figure 9

84. In each Accused Product, the binding coefficient of the electrolytic copper foil at the first surface or the second surface is 1.5 to 9.4, where the binding coefficient of the electrolytic copper foil at the first surface or the second surface is calculated based on Rp/μm + peak density/30 + the amount of attachment of Cr/(mg/m^2), where the Rp (μm) is a peak height that was measured according to JIS B 0601 (2001) standard, the peak density is a number of peaks per unit length of 4 mm when measured according to ASME B46.1 (2009) standard with a peak count level of ±0.5 μm, and where the amount of attachment of Cr (mg/m^2) is measured by dissolving the first surface or the second surface of the electrolytic copper foil with a nitric acid solution to obtain a dissolved solution, diluting the dissolved solution with water to obtain a diluted solution, and analyzing the diluted solution using an atomic absorption spectrometer.

85. By using, selling, and offering the Accused Products for sale in the United States and/or importing the Accused Products into the United States, Defendants directly infringe at least claim 1 of the ’014 Patent.

86. Defendants have derived substantial income from the manufacture and sale of their infringing battery copper foils in at least 2020, 2021, 2022, and 2023. *See e.g.* Ex 1, at 12 ("Consolidated Statement of Comprehensive Income").

87. Defendants have induced infringement of the '014 Patent under 35 U.S.C. § 271(b) by knowingly and intentionally inducing others to directly infringe the '014 Patent. Despite having notice of the '014 Patent, Defendants have actively encouraged others to infringe the patent. For example, upon information and belief, Defendants have knowingly and intentionally induced third-party manufacturers, shippers, distributors, retailers, and/or customers to directly infringe (literally and/or under the doctrine of equivalents) the '014 Patent by importing into the United States, using, and/or selling and offering to sell in the United States products containing the Accused Products. The Accused Products are specially designed to include features that infringe the '014 Patent and have no substantial uses other than ones that infringe the '014 Patent.

88. Moreover, upon information and belief, Defendants take active steps, directly and/or through contractual relationships with others, with the specific intent to cause such persons to import, use, sell, and/or or offer to sell products containing the Accused Products. Upon information and belief, such steps by Defendants include, among other things, making and selling the Accused Products for importation into or sale in the United States, knowing that such importation or sale would occur.

89. Defendants have also contributorily infringed the '014 Patent under 35 U.S.C. § 271(c) through its supply of the Accused Products and non-staple constituent parts thereof, which are not suitable for substantial non-infringing use and which embody a material part of the inventions described in the '014 Patent. Defendants have engaged in these activities despite having notice of the '014 Patent and knowing that the constituent parts are especially made and adapted

for use in a manner that would infringe the ’014 Patent. Defendants’ contributory infringement of the ’014 Patent is ongoing.

90. Defendants infringement has been, and continues to be, willful. For example, Defendants have known or should have known about the ’014 Patent and their infringement of the ’014 Patent since at least their receipt of SKn’s September 27, 2023 notice letter. Yet, Defendants have continued their infringing activities.

91. SKn has suffered irreparable harm to its market share and its business opportunities as a result of Defendants offering competing battery copper foil products that infringe the ’014 Patent.

COUNT IV

DEFENDANTS’ INFRINGEMENT OF U.S. PATENT NO. 11,591,706 (35 U.S.C. § 271)

92. SKn incorporates by reference the preceding paragraphs as if fully set forth herein.

93. Defendants have infringed and continue to directly infringe the ’706 Patent by using, selling, and offering for sale in the United States and/or importing into the United States the Accused Products.

94. For example, independent claim 1 of the ’706 Patent recites:

1. An electrolytic copper foil having a first surface and a second surface, wherein

a texture coefficient of (220) plane of the electrolytic copper foil defined by Equation 1 below is 0.4 to 1.32,

$$TC(220) = \frac{\frac{I(220)}{I_0(220)}}{\frac{1}{n}\sum \frac{I(hkl)}{I_0(hkl)}} \quad (\text{Equation } 1)$$

a difference (|Δ(Rz/Ra)|) between Rz/Ra at the first surface of the electrolytic copper foil and Rz/Ra at the second surface of the electrolytic copper foil is less than 2.42, and

a difference (|ΔPD|) between a peak density (PD) at the first surface of the electrolytic copper foil and a peak density (PD) at the second surface of the electrolytic copper foil is 96 ea or less.

95. The Accused Products meet each limitation of at least claim 1 of the ’706 Patent.

96. For example, the Accused Products are electrolytic copper foil products for use in secondary batteries such as EV batteries. *See* https://www.solusadvancedmaterials.com/en/business/b-foil/. As shown below (Figs. 10-12), the Accused Products comprise a first surface and a second surface opposite to the first surface. *Id*.

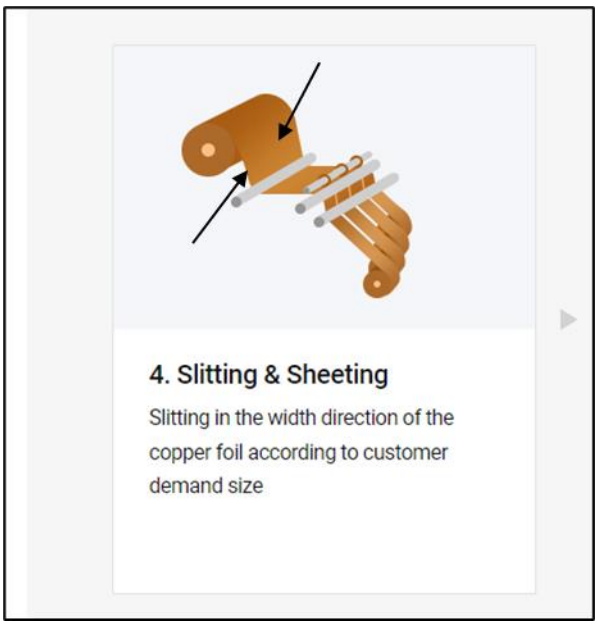

Figure 10

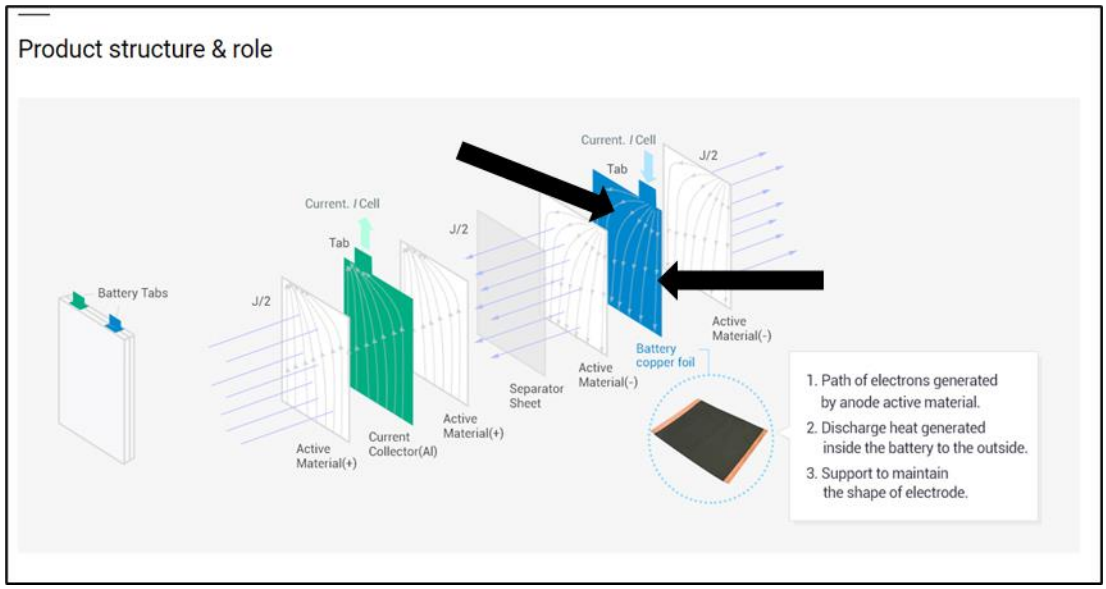

Figure 11

97. As shown below in Fig. 12, the Accused Products have a "drum side" and an "electrolyte side." *Id*.

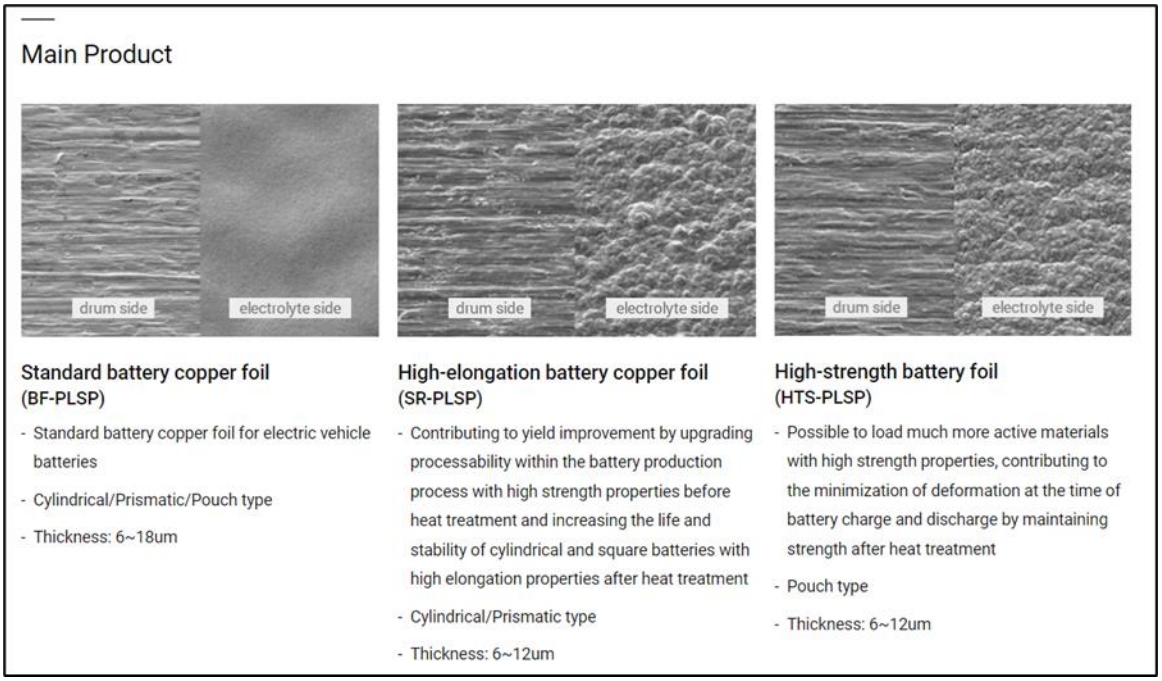

Figure 12

98. In each Accused Product, the texture coefficient of plane (220) of the electrolytic copper foil is 0.4 to 1.32, where the texture coefficient of plane (220) of the electrolytic copper foil defined by Equation 1 below:

$$TC(220) = \frac{\frac{I(220)}{I_0(220)}}{\frac{1}{n}\sum\frac{I(hkl)}{I_0(hkl)}} \quad (\text{Equation } 1)$$

99. In each Accused Product, the difference (|Δ(Rz/Ra)|) between Rz/Ra at the first surface of the electrolytic copper foil and Rz/Ra at the second surface of the electrolytic copper foil is less than 2.42.

100. In each Accused Product, the difference (|ΔPD|) between a peak density (PD) at the first surface of the electrolytic copper foil and a peak density (PD) at the second surface of the electrolytic copper foil is 96 ea or less.

101. By using, selling, and offering the Accused Products for sale in the United States and/or importing the Accused Products into the United States, Defendants directly infringe at least claim 1 of the ’706 Patent.

102. Defendants have derived substantial income from the manufacture and sale of their infringing battery copper foils in at least 2020, 2021, 2022, and 2023. *See e.g.* Ex 1, at 12 (“Consolidated Statement of Comprehensive Income”).

103. Upon information and belief, Defendants have induced infringement of the ’706 Patent under 35 U.S.C. § 271(b) by knowingly and intentionally inducing others to directly infringe the ’706 Patent. Despite having notice of the ’706 Patent, Defendants have actively encouraged others to infringe the patent. For example, upon information and belief, Defendants have knowingly and intentionally induced third-party manufacturers, shippers, distributors, retailers, and/or customers to directly infringe (literally and/or under the doctrine of equivalents) the ’706

Patent by importing into the United States, using, and/or selling and offering to sell in the United States products containing the Accused Products. The Accused Products are specially designed to include features that infringe the ’706 Patent and have no substantial uses other than ones that infringe the ’706 Patent.

104. Moreover, upon information and belief, Defendants take active steps, directly and/or through contractual relationships with others, with the specific intent to cause such persons to import, use, sell, and/or or offer to sell products containing the Accused Products. Upon information and belief, such steps by Defendants include, among other things, making and selling the Accused Products for importation into or sale in the United States, knowing that such importation or sale would occur.

105. Upon information and belief, Defendants have also contributorily infringed the ’014 Patent under 35 U.S.C. § 271(c) through its supply of the Accused Products and non-staple constituent parts thereof, which are not suitable for substantial non-infringing use and which embody a material part of the inventions described in the ’706 Patent. Defendants have engaged in these activities despite having notice of the ’706 Patent and knowing that the constituent parts are especially made and adapted for use in a manner that would infringe the ’706 Patent. Defendants’ contributory infringement of the ’706 Patent is ongoing.

106. Defendants infringement has been, and continues to be, willful. For example, Defendants have known or should have known about the ’706 Patent and their infringement of the ’706 Patent since at least their receipt of SKn’s September 27, 2023 notice letter. Yet, Defendants have continued their infringing activities.

107. SKn has suffered irreparable harm to its market share and its business opportunities as a result of Defendants offering competing battery copper foil products that infringe the '706 Patent.

PRAYER FOR RELIEF

108. WHEREFORE, Plaintiff SKn prays for relief as follows:

A. A judgment that each Defendant has willfully infringed, directly or indirectly, each of the Asserted Patents;

B. A permanent injunction enjoining Defendants and their officers, agents, servants, employees, attorneys, related business entities and those in active concert or participation with them from further infringement of the Asserted Patents.

C. Compensatory damages in an amount commensurate with Defendants' infringement of the Asserted Patents, including without limitation lost profits and no less than a reasonable royalty;

D. Pre-judgment interest on all damages awarded to Plaintiff;

E. Post-judgment interest on all sums awarded to Plaintiff from the date of the judgment;

F. An award of treble damages pursuant to 35 U.S.C. § 284;

G. An award of reasonable attorneys' fees pursuant to 35 U.S.C. § 285; and

H. Any and all other relief that the Court deems just and equitable.

JURY DEMAND

109. Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiff hereby demands a jury trial on all issues raised by this complaint.

Dated: November 21, 2023

Respectfully submitted,

*/s/ Deron R. Dacus*_____

Deron R. Dacus
Texas Bar No. 00790553 Email:
ddacus@dacusfirm.com
THE DACUS LAW FIRM, P.C.
821 ESE Loop 323, Suite 430 Tyler, TX 75701
Phone: (903) 705-1171
Fax: (903) 581-2543

D. James Pak
djamespak@quinnemanuel.com
David M. Elihu
davidelihu@quinnemanuel.com
QUINN EMANUEL URQUHART & SULLIVAN, LLP
865 S. Figueroa St, 10th Floor
Los Angeles, CA 90017
Tel: (213) 443-3000
Fax: (213) 443-3100

David A. Nelson
davenelson@quinnemanuel.com
Brianne M. Straka
briannestraka@quinnemanuel.com
Harrison B. Rose
harrisonrose@quinnemanuel.com
QUINN EMANUEL URQUHART & SULLIVAN, LLP
191 N. Wacker Drive, Suite 2700
Chicago, Illinois 60606
Tel: (312) 705-7400
Fax: (312) 705-7401

Sean Pak
seanpak@quinnemanuel.com
Kevin (Gyushik) Jang
kevinjang@quinnemanuel.com
QUINN EMANUEL URQUHART & SULLIVAN, LLP
50 California Street, 22nd Floor
San Francisco, California 94111-4788
Tel: (415) 875-6600
Fax: (415) 875-6700

Counsel for Plaintiff SK nexilis Co., Ltd.