



Local Division Mannheim
UPC_CFI_706/2025
(CCfR: UPC_CFI_1816/2025)

Decision

of the Court of First Instance of the Unified Patent Court

Local Division Mannheim

delivered on 23 October 2026

CLAIMANT:

SK nexilis Co., Ltd.,
2, 3sandan 2-gil, -, Buk-myeon, Jeongeup-si, Jeonbuk-
do, KR

represented by: Rechtsanwalt Dr. Marcus GROSCH

DEFENDANTS:

- 1) **Volta Energy Solutions S.à r.l.,**
Rue Isaac Newton 1, 2242 Luxembourg

- 2) **Volta Energy Solutions Europe Kft.,**
Han folyó utca 1, 2851 Környe, Hungary

- 3) **Volta Energy Solutions Hungary Kft.,**
Han folyó utca 1, 2851 Környe, Hungary

represented by: Rechtsanwalt Niels SCHUH

PATENT AT ISSUE: EP 3 316 363

PANEL/DIVISION:

Panel of the Local Division in Mannheim

DECIDING JUDGES:

This decision is delivered by the Presiding Judge Tochtermann, the Judge-rapporteur Sender, the legally qualified Judge Johansson and the technically qualified Judge Perronace.

LANGUAGE OF THE PROCEEDINGS: English

SUBJECT OF THE PROCEEDINGS: Patent infringement action and conditional Counterclaim for revocation

DATE OF THE ORAL HEARING: 24 September 2026

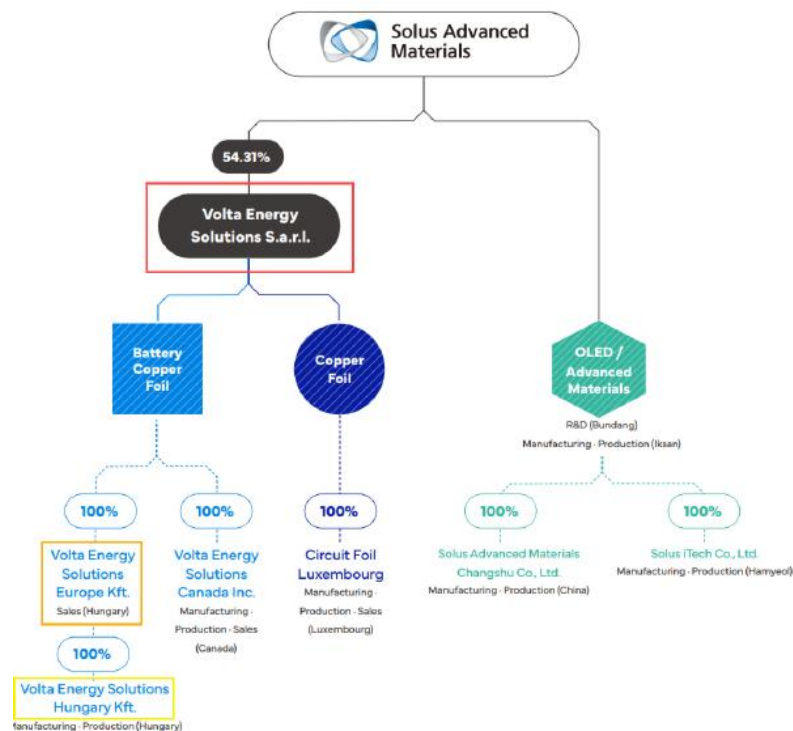
SUMMARY OF FACTS:

1. Claimant is suing Defendants for the alleged direct infringement of the European patent EP 3 316 363 (patent-in-suit, Exhibit C6), which relates to an electrolytic copper foil for a secondary battery. The mention of the grant of the patent-in-suit was published on 11 May 2022. It was filed on 28 April 2016, claiming the priority of a Korean patent application of 24 June 2015 (Exhibit MB2). An opt-out from the exclusive jurisdiction of the UPC has not been declared.
2. Claimant, a developer and manufacturer of copper foil based in the Republic of Korea, is the sole registered proprietor of the patent-in-suit, which is in force in France, Germany, Italy, Luxemburg, and Sweden (cf. Exhibit C7). For these UPCA contracting member states, Claimant is seeking injunctive relief, recall, definite removal and destruction of infringing products, communication of information, interim awards of damages and a declaration on Defendants' liability for damages.
3. Claim 1 of the patent-in-suit, on which the alleged direct infringement is based, reads as follows in the language of the patent:
 1. An electrolytic copper foil (11) for a secondary battery, the electrolytic copper foil (111) comprising: a first surface (111a); and a second surface (111b) opposite to the first surface (111a), wherein each of the first and second surfaces (111a, 111b) has a peak count roughness R_{pc} of 10 to 100 wherein the peak count roughness R_{pc} of each of the first and second surfaces (111a, 111b) is an average of peak count roughness R_{pc} values measured at randomly-selected three points, the peak count roughness R_{pc} value of each point is the number of effective peaks per unit sampling length of 4 mm in a surface roughness profile obtained according to steel-iron test schedule (SEP 1940), the effective peaks are peaks rising above an upper criteria line of 0.5 μm in the surface roughness profile, and there is at least one valley deeper than a lower criteria line of -0.5 μm between adjacent ones of the effective peaks; and wherein each of the first and second surfaces (111a, 111b) has a ten-point mean roughness R_{z10} of 2 μm or less.
4. Claim 11, which is additionally subject to Defendants' conditional Counterclaim for revocation (CCfR), reads as follows:

11. A method of producing the electrolytic copper foil (111) of claim 1 by allowing a current to flow between an anode plate and a rotational cathode drum spaced from each other in an electrolytic solution so as to electrodeposit a copper on the rotational cathode drum, the method comprising:

polishing a surface of the rotational cathode drum with a polishing brush having a grit of #800 to #1500;
heat-treating a copper wire at a temperature of 600 to 800 °C;
acid-cleaning the heat-treated copper wire;
dipping the acid-cleaned copper wire in the electrolytic solution;
conducting electroplating, while the copper wire is dipped in the electrolytic solution, at a current density of 10 to 80 A/dm²; and
conducting continuous filtration to remove solid impurities including organic impurities and metal impurities from the electrolytic solution during the electroplating such that concentrations of the organic impurities and metal impurities are maintained at 1 g/L or less and at 10 g/L or less, respectively, during the electroplating, wherein the electrolytic solution comprises 50 to 100 g/L of a copper ion, 50 to 150 g/L of sulfuric acid, 50 ppm or less of a chlorine ion and an organic additive, and
wherein the organic additive comprises hydroxyethyl cellulose, organic sulfide, organic nitride, and/or thiourea-based compound.

5. Defendants are subsidiaries of *Solus Advanced Materials Co., Ltd.*, a South Korean based corporation (hereinafter: *Solus*) that, amongst others, produces, offers, and distributes battery copper foil for electric vehicle rechargeable batteries.
6. Defendant 1 is a Luxembourgian corporation that serves as a European holding company. The mother company *Solus* owns a controlling stake of 54.31 % in Defendant 1. Defendant 1 holds 100 % of the shares in Defendant 2.
7. Defendant 2 is a Hungarian corporation, and a wholly owned subsidiary of Defendant 1. It is responsible for the offer and distribution of battery copper foil in Europe. Defendant 2 holds 100 % of the shares in Defendant 3.
8. Defendant 3 is also a Hungarian corporation and is responsible for the production of battery copper foil in Hungary, which is delivered to Defendant 2 and afterwards distributed – *inter alia* – in Europe.
9. The structure and distribution of tasks is shown in the following diagram, which is contained in a presentation titled “*Solus Advanced Materials – Introduction to the Company*” that is available on the Defendants’ website (cf. Exhibit C5; red, orange and yellow squares added by Claimant, which mark Defendants 1 to 3):



10. Claimant aims with its infringement action at copper foils distributed by Defendants, which exhibit the claimed features. As an accused product, Claimant names Defendants' *BF-PLSP*-copper foil ([standard] Battery-Foil Plain Stain Proof). However, Claimant emphasised in its Statement of Claim (SoC, pp. 26 et seq.) that *"The Claimant does not limit the present action to this accused product, but also accuses any products of the Defendants of infringement that leave the core of the prohibition defined by claim 1 of EP 363 unaffected, i.e. the technical features of which do not materially differ from the accused products explicitly named above as far as relevant for the subsumption under claim 1 of EP 363"*. Moreover, in its Reply concerning the Infringement action (Reply IA, p. 23 et. seq.), Claimant reiterated this definition of the accused products and asserted that *"The Claimant tested samples of two different versions of the Defendants' BF-PLSP product (with thicknesses of 6 μ m and 8 μ m) as well as the Defendants' HTS-PLSP, SR-PLSP, and MTS-PLSP products (all with a thickness of 6 μ m) during the course of the U.S. proceedings and all but the SR-PLSP product had R_{pc} and R_{z115} values within the claimed ranges"*.
11. To substantiate its allegation of infringement, Claimant has commissioned a test report (Exhibit C16) of Defendants' group of companies *BF-PLSP*-copper foil by the Korea Polymer Testing & Research Institute (KOPTRI) to analyse, in particular, the surface roughness of a sample that was manufactured in Defendant 3's Hungarian factory. The

sample, which was intended for the U.S. and the South Korean market, was obtained from “BlueCapCan”, a South Korean based company, which violated an NDA with Defendants’ group of companies by submitting the sample to Claimant, and tested by KOPTRI with a MarSurf M 300 device. For further details, reference is made to Exhibit C16.

12. Claimant submitted the following results (highlighting added by Claimant, cf. SoC, p. 41 et. seqq.) concerning R_{pc} [feature group 1.3] and R_{zJIS} [feature 1.4], whereby R_{pc} (count) is normalized to a length of 1 cm, which corresponds to the instant output of a MarSurf M300 device, which, *inter alia*, effectively measures over a length of 4 mm but normalizes the result internally to 10 mm = 1 cm by applying a factor of 2.5 to the result measured over 4 mm:

4. Analysis Result

Table 2. Analysis results of Surface roughness

Koptri ID	Measurement area	Run	Rz (μm)	RzJIS (μm)	RPc (count)
Koptri-25-06-08083-1	S side	1	2.953	1.447	15
		2	2.947	1.455	12
		3	3.080	1.269	15
		Average	2.993	1.390	14
	M side	1	2.344	1.068	15
		2	2.660	1.143	15
		3	2.902	1.279	15
		Average	2.635	1.163	15

Note)
a) Rz: Mean peak-to-valley height
b) RzJIS: Ten-point mean roughness
c) RPc: Roughness Peak count

13. When divided by divisor 2.5, the S side of the tested sample has an average R_{pc} value of 5,6 and the M side one of 6 over the length of 4 mm.
14. Furthermore, Claimant sued Defendants and their Korean parent company *Solus* before the United States District Court for the Eastern District of Texas (U.S. Court) for the alleged infringement of several of its U.S. patents (case no. 2:23-cv-00539-JRG-RSP), including the U.S. counterpart of the patent-in-suit, U.S. Patent No. 10 480 090 (not submitted as an Exhibit in the present proceedings). The U.S. Court issued claim construction orders in May 2025 (Exhibit C12) and February 2026 (Exhibit C23). Patent claim 1 of the U.S. counterpart of the patent-in-suit (U.S ’090) includes feature group 1.3 of the patent-in-suit in almost identical wording (cf. Exhibit C12, p. 40). For further details, reference is made to the aforementioned claim construction orders.

15. Following the jury's unanimous verdict, the U.S. Court entered a judgment on 2 June 2026. The judgment concerns, among others, the aforementioned U.S. counterpart to the patent-in-suit, and records, *inter alia*, that the U.S. Defendants, including the present Defendants, defined in the judgment as "Volta," infringed the asserted claims, failed to prove invalidity, and acted wilfully (cf. Exhibit C66). In the parallel U.S. proceedings, according to Claimant's undisputed contentions, the Defendants relied on essentially the same products and grounds with regard to (alleged) public prior use.
16. Moreover, the U.S. Court issued a "Protective Order" on 8 October 2024 (cf. Exhibit C63) in those proceedings that restricts the access to certain materials and documents exchanged between the parties in that case to attorneys ("attorneys' eyes only") and the use of those materials and documents to purposes of the U.S. litigation only. The protected documents relate, *inter alia*, to several test reports and private expert opinions regarding foil samples relevant to the alleged public prior use products, which are also subject to the present UPC proceedings. After initiating the present proceedings, Claimant unsuccessfully asked Defendants to jointly modify the "Protective Order" and to allow all parties to use those materials produced in the U.S. proceedings in the present UPC proceedings as well. Moreover, Claimant's motions filed before the U.S. Court to de-designate certain documents with respect to the present proceedings also remained unsuccessful.
17. On 6 March 2026, after a mutual agreement with Defendants had failed and together with the submission of the Reply to the Defence to the SoC and the Defence to the CCfR, Claimant requested in the present proceedings to order Defendants pursuant to R. 190 RoP to produce – *inter alia* – an unredacted version of their private experts' deposition regarding foil samples relevant for the alleged prior public use. By order of 1 June 2026, after the exchange of further submission concerning Claimant's production request, the judge-rapporteur (JR) postponed the decision on Claimant's request until after the oral hearing at the latest and explicitly highlighted:

„Moreover, it must [be] assessed whether and, if so, to what extent it may work to the Defendants' detriment that they have refused to de-designate Mr. [...] deposition in the parallel U.S. proceedings while simultaneously relying on other documents from him in the context of prior public use (cf. Exhibit CCBM 1 and related appendices) and submitting parts of their private experts' test reports without requesting protection under R. 262A RoP despite the Protective order issued by the U.S. court.”

18. In the further course of the proceedings, Defendants did not submit the respective further details. For additional details, reference is made to the Order of the JR of 1 June 2026 on the R. 190 request. Furthermore, this aspect of the dispute was highlighted as a potential point of importance for the exchange in the oral hearing in the preparatory Order of the Judge-rapporteur of 10 September 2026, to which additional reference is made.

REQUESTS OF THE PARTIES

19. Claimant requests:

- I. The Defendants are ordered,

to cease and desist from

offering, placing on the market, using or importing or storing for these purposes, electrolytic copper foils for a secondary battery, in the territory of the Agreement on a Unified Patent Court in which EP 3 316 363 has effect, namely France, Germany, Italy, Luxemburg, and Sweden,

- 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 R_{pc} of 10 to 100 and a ten-point mean roughness $R_{z1/5}$ of 2 μm or less,
- wherein the peak count roughness R_{pc} of each of the first and second surfaces is an average of peak count roughness R_{pc} values measured at randomly-selected three points,
- the peak count roughness R_{pc} value of each point is the number of effective peaks per unit sampling length of 4 mm in a surface roughness profile obtained according to steel-iron test schedule (SEP 1940),
- the effective peaks are peaks rising above an upper criteria line of 0.5 μm in the surface roughness profile, and
- there is at least one valley deeper than a lower criteria line of -0.5 μm between adjacent ones of the effective peaks;

(direct infringement of claim 1)

especially if,

a difference in peak count roughness R_{pc} between the first and second surfaces is 60 or less;

(direct infringement of claim 2)

and/or

the electrolytic copper foil (111) has a thickness of 3 to 20 mm and tensile strength of 294.1995 to 588.399 MPa.

(direct infringement of claim 3)

II. The Defendants are further ordered, within a period of 30 days after service of the notification within the meaning of R. 118.8 sentence 1 RoP and, if applicable, the certified translation,

1. to provide Claimant with information in the form of an Excel spreadsheet on the extent to which the Defendants have committed the acts referred to under I. since 11 June 2022, the information being provided for each month of a calendar year and the infringing products referred to under I. and specifying:
 - a) the origin and distribution channels of the infringing products, including names and addresses of suppliers and other prior owners as well as of commercial customers and points of sale for which the infringing products were destined;
 - b) the quantities delivered, received or ordered, as well as the price paid or received for the infringing products:
 - aa) the individual deliveries, broken down by delivery quantities, times and prices and the respective product designations as well as the names and addresses of the customers;
 - bb) the turnover, the gross margin and the contribution margin generated by the Defendants with the sale of these products;
 - cc) the individual offers, broken down by quantities, times and prices and product designations as well as the names and addresses of the commercial offer recipients;
 - c) the identity of any third person involved in the production or distribution of the infringing products, the number and dates of the products offered;
 - d) the advertising carried out, broken down by advertising medium, its distribution, the distribution period and the distribution area; including evidence of these advertising activities; and
 - e) the costs, broken down by individual cost factors and the profits achieved,

whereas copies of the relevant purchase documents (namely invoices, alternatively delivery receipts) are to be submitted as proof of the information, whereas confidential details beyond the information identified above may be redacted;

2. to recall the infringing products referred to under I. and placed on the market since 11 May 2022 from the channels of commerce by requesting third parties that have been supplied with the infringing products to return the products to the Defendants, pointing out that this Court has found that the products infringe EP 3 316 363, and to bindingly assure the third parties that the Defendants will reimburse the costs incurred, bear the packaging and transport costs incurred, reimburse the customs and storage costs associated with the return of the products and take back the products;
3. to remove the infringing products referred to under I. and placed on the market since 11 May 2022 from the channels of commerce definitively by informing third parties that are in the possession of the infringing products to return the products to the Defendants, pointing out that this Court has found that the products infringe EP 3 316 363, and to cancel all orders relating to the products referred to under I.;
4. to destroy at their own expense the products in their direct and/or indirect possession and/or owned by the Defendants in the Contracting Member States referred to under I., or, at their option, to hand them over to a bailiff to be appointed by the Claimant for the purpose of destruction at the Defendants' expenses;
5. and to provide the Court and the Claimant, within the aforementioned period of 30 days from the service of the notification within the meaning of Rule 118.8 sentence 1 RoP and, where applicable, the certified translation, with written proof of the actions taken under II. 2.-4.

III. The Defendants are ordered to pay to the Court

1. a recurring penalty payment for each act of non-compliance with the order under I. of at least EUR 2,000.00 for each infringing product;
2. a recurring penalty payment of at least EUR 1,000.00 per day for each day of non-compliance with the order under II.

IV. The Defendants are jointly and severally liable for all damages resulting from the patent infringement referred to under II. 1. that occurred since 11 June 2022.

V. The Defendants are ordered to pay to Claimant EUR 1,000,000.00 as an interim award of damages.

VI. The Defendants have to compensate the Claimant for any further damages incurred since 11 June 2022 or to be incurred in the future as a result of all past and future actions under I.

VII. The Defendants bear the costs of the proceedings.

20. Defendants request:

- I. to dismiss the lawsuit,
- II. as an auxiliary request, to reserve the right, in the event of the conviction of the Defendants 1)-3) to provide accounts, to disclose the names and addresses of their non-commercial customers and recipients of offers to a certified public accountant designated by the Claimant and bound to secrecy vis-à-vis the Claimant, instead of to the Claimant, provided that the Defendants bear the costs thereof and authorize the accountant to provide the Claimant with information as to whether a particular delivery, customer, offer, or recipient of an offer is included in the accounting;
- III. that the Claimant shall bear the costs of the proceedings.

CONDITIONAL COUNTERCLAIM FOR REVOCATION

21. With regard to their Counterclaim for revocation (UPC_CFI_1816/2025) Defendants request:

1. to revoke EP 3 316 363 B1 to the extent of claims 1, 2, 3 and 11 in the territory of France, Germany, Italy, Luxemburg, and Sweden;
2. to order that the Claimant shall bear the costs of the proceedings.

22. During the oral hearing, after the question of proper construction of feature group 1.3 had been discussed and even before the Court had expressed its preliminary view that, on the basis of the correct interpretation of feature group 1.3, there was most likely no patent infringement, Defendants made this request conditional upon the Court finding for infringement.

23. Claimant, who did not object to this condition, requests

The counterclaim for revocation of the Defendants is dismissed and the asserted parts of European Patent EP 3 316 363 are maintained as granted.

24. In its conditional Application to amend the patent, Claimant relies on seven auxiliary requests 1, 2, 3, 0', 1', 2' and 3' (cf. Exhibit C54).

25. Defendants request,

to dismiss patentee's application to amend the patent in suit and thus reject all auxiliary requests.

POINTS AT ISSUE

26. The parties are in dispute about different aspects of the case at hand. The following account of the essence of the dispute is limited to points that are decisive for the decision at hand and, where appropriate, also includes the broader context.

INFRINGEMENT

27. Claimant opines, the accused product realised feature group 1.3. The tested sample of the *BF-PLSP*-copper foil had a peak count roughness R_{pc} of 14 on average on the first surface (labelled “S side” in the tests) and of 15 on the second surface (labelled “M side” in the tests), i.e. within the claimed range of 10 to 100.
28. Since R_{pc} , according to Claimant’s interpretation of the claim, was a value normalized to 1 cm, the R_{pc} value of each side according to the above test results could not be narrowed down to the number of peaks over the unit sampling length of 4 mm. Rather, the “unit sampling length” according to feature 1.3.1 was identical to the “evaluation length” as known in prior art, i.e. the length over which the actual measurement takes place. Accordingly, the value measured over the “unit sampling length of 4 mm” had additionally to be normalized to the length of 1 cm, the so-called “reference length”, as – *inter alia* – evidenced by the instant output of the MarSurf device, which the patent-in-suit expressly mentioned as the preferred profilometer to measure R_{pc} and only provides an output of R_{pc} counts per cm (#/cm; or inch, depending on its configuration).
29. Defendants were jointly responsible for the direct patent infringement. Defendant 3 manufactured the accused product in its factory in Hungary, which was distributed to battery makers worldwide without any relevant differences regarding its roughness properties, including within the territory of the UPCA Contracting Member States in which EP’ 363 has effect. The Defendants also knew that the battery makers they supply outside the UPCA territory manufacture secondary batteries with the accused product and sell these secondary batteries to automotive OEMs (“original equipment manufacturers”) both in the UPCA Contracting Member States in which EP’ 363 has effect and outside those UPCA Contracting Member States. These automotive OEMs then incorporated these secondary batteries into electric vehicles that were sold within the UPCA Contracting Member States in which EP’ 363 has effect, as Defendants also knew.
30. Defendant 2 controlled Defendant 3 and was responsible for the sales of the accused

product within the territory of the UPCA. Further, Defendant 1 not only controlled Defendant 2's and Defendant 3's business decisions and activities, but it also participated directly in the sales and distribution of the accused product in Europe.

31. Defendants argue that the subject matter of the present proceedings was only the *BF-PLSP*-copper foil. Aside from this foil, Defendant 2's and 3's product portfolio comprised substantially different copper foil products, which were subjected to additional post-treatment and had very different characteristics and properties. The portfolio comprised, amongst others, *SR* (Stress Release), *HTF* (High Tensile Strength) and *Improved HTF* copper foils, which were not subject matter of the present proceedings.
32. The *BF-PSLP* foil made no use of feature group 1.3. Claimant could only assert an R_{pc} value above 10, because it inadmissibly referenced the effective peak count measured over a 4 mm foil section to 1 cm by multiplying the values with factor 2.5. Accordingly, the whole infringement read of Claimant was based on an improper construction of feature group 1.3. The patent-in-suit indeed self-defined a parameter in that feature group, which deviated from common knowledge in the field and, therefore, Claimant was bound to the precise definition it gave in the patent itself as properly construed. The actual (averaged) counts over 4 mm of each side, i.e. (averaged) 5,6 and 6,0 counts, were well below the relevant lower threshold of 10.
33. Apart from that, Claimant had failed to provide sufficient evidence, let alone concrete evidence, to substantiate its allegations of infringement for the accused products. Accordingly, the infringement action had to be dismissed due to a lack of any evidence for infringing acts. In particular, Claimant failed to describe a specific patent infringing action for one of the territories in which the patent-in-suit is in force, let alone for all of the *raised territories*, as it was required by the applicable case law.
34. In any case, Defendant 1 merely held the shares of Defendant 2. Holding shares of a company, however, was not an infringing act under Art. 25 UPCA. Defendant 1 would not influence the product portfolio, product design, or distribution of Defendants 2 and 3 or any other business decisions made by Defendants 2 and 3.
35. For further details, it is referred to the parties' briefs and the corresponding Exhibits.

36. Defendants base their conditional Counterclaim for revocation on the following grounds of Art. 138 EPC in conjunction with Art. 65 (2) UPCA:

- lack of novelty (Art. 138(1)a) in conjunction with Art. 54 EPC),
- lack of inventive step (Art. 138(1)a) in conjunction with Art. 56 EPC),
- lack of disclosure in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art (Art. 138(1)b) EPC).

37. Defendants argue that the subject-matter of the patent-in-suit lacks novelty in view of

Public prior use

- Circuit Foil Luxembourg (CFL) - 12µm Foils/CFL-12
- Circuit Foil Luxembourg (CFL) - 18µm Foils/CFL-18
- Apple iPhone1
- Apple iPad4
- Samsung Eternity
- Samsung Galaxy S II
- Samsung Galaxy Tab

Written prior art

- M. B. Griesi, *Characterization of Electrodeposited Copper Foil Surface Roughness for Accurate Conductor Power Loss Modeling*, Master's Thesis, University of South Carolina/Columbia (Exhibit D3/Griesi)
- EP 2 615 196 A1 (EP'196/Exhibit D2)
- M. Carano, *Achieving Fine Lines and Spaces: Part 2*, the PCB Magazine, December 2013 (Exhibit D4/Carano)
- US 2014/342178 A1 (US'178/Exhibit D5)
- EP 0 851 944 B1 (EP' 944/Exhibit D6)

38. Defendants further argue that its subject-matter does not involve an inventive step,

starting from any one of the documents D5 or D6 in conjunction with common general knowledge as reflected in several other prior art documents, particularly in JP 2001 011684 A (Exhibit D7/submitted as a machine translation as Exhibit D7a); JP 2000 182623 A (Exhibit D8/submitted as a machine translation as Exhibit D8a); A. Wolsky, *Electrodeposited Copper Foil for Printed Circuits*, Foil Technology Development Corporation (Exhibit D17); EP 1 221 498 A1 (Exhibit D18); EP 0 632 146 A1 (Exhibit D19) and/or EP 0 857 402 B1 (Exhibit D20).

39. Claimant rejects the attacks on the validity of the patent-in-suit as unfounded. Furthermore, by application of 5 August 2026, Claimant requests to disregard Defendants' statements in their Rejoinder concerning the Application to amend the patent (Rejoinder AaP), in the alternative at least parts of it, as late filed.
40. For further details, it is referred to Claimant's request of 5 August 2026, the parties' briefs concerning the conditional CCfR and the corresponding Exhibits.

REASONS FOR THE DECISION

41. The admissible infringement action directed against Defendants 1 to 3 is unsuccessful. Consequently, the conditional Counterclaim for revocation had not to be decided, as the permissible condition set out by Defendants was not fulfilled.

ADMISSIBILITY

Jurisdiction and competence for the infringement action

42. The international jurisdiction of the UPC for the infringement action finds its basis in Art. 31 UPCA, Art. 71b (1), Art. 4 (1), Art. 63 Brussels Ia Reg. for Defendant 1 domiciled in a UPCA member state. For Defendant 2 and 3 domiciled in Hungary, it follows from Art. 31 UPCA, Art. 71b (2), Art. 7 (2) Brussels Ia Reg., because Claimant asserts that Defendant 2 and 3 infringes upon the national parts of the patent-in-suit in relation to the relevant UPCA member states by manufacturing the attacked products and distributing them to customers in those UPCA member states (cf. Court of Appeal, order of 30 March 2026, UPC_CoA_899/2025, Sinocare et al v Abbot Diabetes Care, paras. 32 et seq.). The question whether there is actual infringement has to be dealt with in the decision on the merits of the case. Apart from that, the international jurisdiction also follows from Art. 26 Brussels Ia Reg. in the absence of any objection in this regard.

43. The local competence of the Local Division Mannheim for Defendants follows from Art. 33 (1) (a) UPCA in view of the alleged infringement of the German national part of the patent-in-suit, and, for all Defendants, from R. 19.7 RoP in the absence of a preliminary objection pursuant to R. 19 RoP.

Admissible conditional Counterclaim for revocation

44. The condition set out by Defendants for deciding on their Counterclaim for revocation, namely that the Court finds for infringement, is admissible under R. 263.3 RoP, which applies by analogy (cf. CoA, Order of 17 August 2026, UPC_CoA_40/2026, AorticLab v Emboline).

SUBSTANTIVE SCOPE OF THE PATENT-IN-SUIT

45. The patent-in-suit relates – *inter alia* – to an electrolytic copper foil for a secondary battery.
46. A secondary battery, as already known in prior art, is an energy conversion and storage device that converts electrical energy into chemical energy, stores the chemical energy, and generates electricity by converting the chemical energy into electrical energy when the electricity is needed, and is also referred to as a “rechargeable battery” (para. [0002]). In contrast, so-called primary batteries can only be used once.
47. Secondary batteries are economically and environmentally advantageous compared to single-use primary batteries. In prior art, lithium secondary batteries are preferred in the field of information communicative apparatuses, which require portability and mobility as essential factors, and have an extended applicability as energy storage devices for hybrid cars and electric cars (cf. paras. [0003] and [0004]).
48. As already known, such secondary batteries comprise at least two electrodes, a separator and an electrolyte (cf. paras. [0019] and [0026]). The electrodes are called “positive” and “negative” based on their polarity. Despite the change in polarity between charging and discharging, the terms “cathode” and “anode” are still used for secondary batteries, even though they actually only relate to the situation while discharging a secondary battery. In between the electrodes lies the separator, which ensures that the electrodes do not touch each other, i.e. avoids a short-circuit, while at the same time ensuring that [lithium] ions can pass from one electrode to the other. Secondary batteries can essentially “reverse”

the discharge process to recharge the battery by applying a current to the cathode (during charging actually the anode).

49. Commonly, copper foil is used as a current collector on the anode side of a secondary battery. To form such an anode, the copper foil is typically coated with negative active material (para. [0028]), usually graphite in the commonly used lithium-ion secondary batteries. Aluminum is generally used as current collector for the cathode side (para. [0029]).
50. As a result of repeated charge/discharge of secondary batteries, the active material alternately contracts and expands, which induces separation of the active material layer from the current collector of the electrodes, causing deterioration in charge/discharge efficiency of secondary batteries (cf. para. [0036]).
51. Copper foils in the context of secondary batteries were known in the prior art, for example in the form as disclosed by the Japanese patent application JP2000182623 (A), which relates to an electrolytic copper foil used as a current collector of a secondary battery (para. [0007]). The electrolytic copper foil contains not more than 5 ppm carbon and not more than 3 ppm sulfur. The secondary battery is furnished with a negative electrode and positive electrode of such a structure that an electrode constituting substance layer is formed on the surface of the current collector in plane form, wherein at least one of the plane current collectors of the positive and negative electrodes consists of the electrolytic copper foil.
52. US 2014/0342178 A1 (cf. Exhibit D5) discloses an electrodeposited copper foil for a flexible wiring board and a method for producing the same, wherein the method includes, according to the patent-in-suit, a step of one-time filtration of the electrolyte before the start of the electroplating process and a drum polishing step (para. [0007]).
53. Although already known secondary batteries have a sufficiently high charge/discharge capacity, when charge/discharge capacity of the secondary batteries rapidly decreases (that is, when capacity maintenance is low or lifespan is short) with repeated charge/discharge cycles, users frequently need to change secondary batteries, causing users' discomfort and energy waste (cf. para. [0006]). Accordingly, there is a continuous demand for research to satisfy users' increasing needs for charge/discharge capacity of [lithium] secondary batteries (cf. para. [0004]).

54. Against this background, the objective task of the patent-in-suit is to provide an improved secondary battery, which is capable of maintaining a high charge/discharge capacity over a longer time, hereby minimizing frequent changes of secondary batteries and resulting waste (see also paras. [0008], [0009], [00022]).
55. As a solution, the patent-in-suit proposes with claim 1 an electrolytic copper foil for a secondary battery and with claim 11 a method to produce the same, the features of which can be structured as follows, whereby the panel follows the feature breakdown as used by both parties:

Claim 1

1.	An electrolytic copper foil (111) for a secondary battery, the electrolytic copper foil (111) comprising:
1.1	a first surface (111a); and
1.2	a second surface (111b) opposite to the first surface (111a),
1.3	wherein each of the first and second surfaces (111a, 111b) has a peak count roughness R_{pc} of 10 to 100
1.3.1	wherein the peak count roughness R_{pc} of each of the first and second surfaces (111a, 111b) is an average of peak count roughness R_{pc} values measured at randomly-selected three points,
1.3.2	the peak count roughness R_{pc} value of each point is the number of effective peaks per unit sampling length of 4 mm in a surface roughness profile obtained according to steel-iron test schedule (SEP 1940),
1.3.2.a	the effective peaks are peaks rising above an upper criteria line of 0.5 μm in the surface roughness profile, and
1.3.2.b	there is at least one valley deeper than a lower criteria line of -0.5 μm between adjacent ones of the effective peaks; and
1.4	wherein each of the first and second surfaces (111a, 111b) has a ten-point mean roughness R_{z15} of 2 μm or less.

Claim 11

11	A method of producing the electrolytic copper foil (111) of claim 1
11.1	by allowing a current to flow between an anode plate and a rotational cathode drum spaced from each other in an electrolytic solution so as to

	electrodeposit a copper on the rotational cathode drum, the method comprising]
11.2	polishing a surface of the rotational cathode drum with a polishing brush having a grit of #800 to #1500;
11.3	heat-treating a copper wire at a temperature of 600 to 800 °C;
11.4	acid-cleaning the heat-treated copper wire;
11.5	dipping the acid-cleaned copper wire in the electrolytic solution;
11.6	conducting electroplating, while the copper wire is dipped in the electrolytic solution, at a current density of 10 to 80 A/dm ² ; and
11.7	conducting continuous filtration to remove solid impurities including organic impurities and metal impurities from the electrolytic solution during the electroplating
11.8	such that concentrations of the organic impurities and metal impurities are maintained at 1 g/L or less and at 10 g/L or less, respectively, during the electroplating,
11.9	wherein the electrolytic solution comprises 50 to 100 g/L of a copper ion, 50 to 150 g/L of sulfuric acid, 50 ppm or less of a chlorine ion and an organic additive, and
11.10	wherein the organic additive comprises hydroxyethyl cellulose, organic sulfide, organic nitride, and/or thiourea-based compound.

56. Some features require further explanation.

57. The average person skilled in the art, a person with an advanced degree in materials science or chemical engineering, having several years of professional experience in battery electrode manufacturing, will understand the relevant features as follows:

Claim 1

Features 1 to 1.2

Means plus function

58. According to feature 1, the claimed electrolytic copper foil must be objectively suitable (copper foil ... for a secondary battery) to be used in a secondary battery (means-plus-function feature), for example, but not limited to, as the current collector in a secondary

battery (para. [0029]; dependent claim 4). In that case, the electrolytic copper foil may be coated with the anode active material, either on one or both sides (para. [0028]).

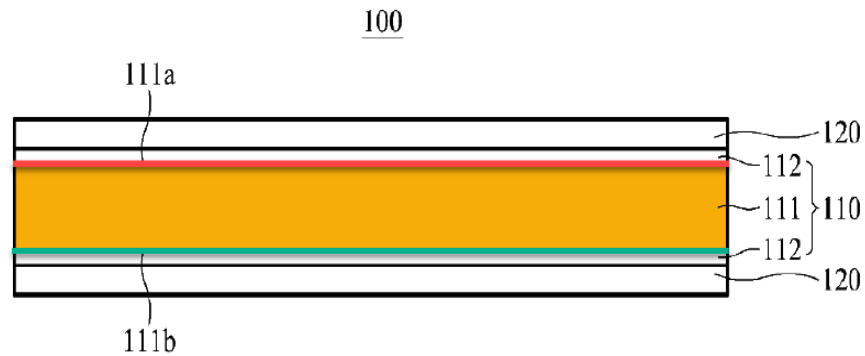
59. In this regard, it is irrelevant whether the copper foil is originally intended for other purposes, e.g. for use as a conductor for printed circuit boards (PCBs) applications, provided it is nevertheless objectively suitable to be also used in a secondary battery without physical modification. In particular, claim 1 is not limited to copper foils that allow a secondary battery to maintain a discharge/charge capacity of 90 % or higher (cf. paras. [0039], [0041], [0073]) over a long time, as this requirement is not reflected in claim 1 of the patent-in-suit.

Electrolytic copper foil

60. Claim 1 allows any suitable manufacturing process of the copper foil as long as it is produced by carrying out electrolysis and exhibits the properties according to feature group 1.3 and feature 1.4. Electrolysis is a known technique in which a current is applied to an electrolytic solution containing positively charged metal ions. The positively charged metal ions are attracted to a negatively charged cathode, e.g. a rotating drum, and form a metallic film thereon (the resulting copper foil). In that way very thin foils can be produced.
61. In particular, the electrolytic copper foil may be formed on a rotational cathode drum by electroplating/electrodeposition, thereby having a first surface (also called a “shiny surface” or “S-side”), which contacts the rotational cathode drum, the surface of which may be very even, in the process of electroplating, and a second surface (also called a “matte surface” or “M side”) opposite to the first surface (cf. para. [0032], paras. [0049] et. seqq. and independent method claim 11).

First surface and second surface

62. According to features 1.1 and 1.2, the electrolytic copper foil has two surfaces opposite to each other, as exemplarily shown in Fig. 1 of the patent-in-suit (coloured by Claimant, SoC p. 20):



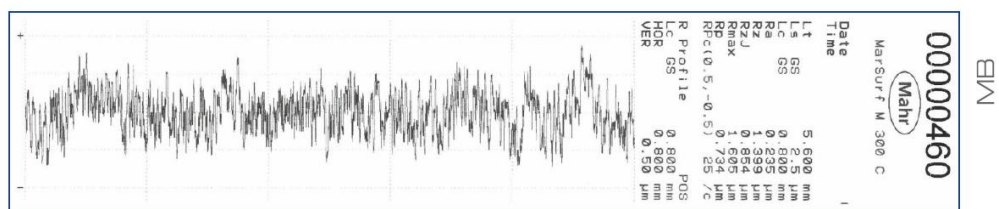
63. FIG 1 is a sectional view of an exemplary electrode 100 of a secondary battery with an electrolytic copper foil 111 in the middle (marked in orange), having two surfaces 111a (marked in red) and 111b (marked in green) on opposite sides, forming a current collector 110 with protective layers 112 and coated on both sides with active material layers 120 (cf. paras. [0027] and [0028]).
64. According to the patent description, in order to improve the maintenance of a high charge/discharge capacity and the lifespan of secondary batteries, the current collector should have *excellent coatability* to the active material so that *adhesion strength* between the current collector 110 and the active material layer 120 can be increased (cf. para. [0036]).
65. According to the technical teaching of the patent-in-suit, to achieve these purposes, the two surfaces (shiny and mate surface) of the copper foil must have the roughness attributes as specified in feature group 1.3 and feature 1.4 (cf. paras. [0037] et. seqq.)), as will be explained in detail below.

Feature group 1.3 - Peak Count Roughness (R_{pc})

66. Feature group 1.3 specifies a peak count roughness R_{pc} of 10 to 100 for the two surfaces according to features 1.1 and 1.2.
67. As defined by the further features of feature group 1.3, the relevant (final) R_{pc} value of 10 to 100 of each side (feature 1.3.) is an average of three peak count roughness R_{pc} values measured at three randomly-selected points (feature 1.3.1) of each side. To measure R_{pc} for the three points of each side, the number of effective peaks that rise above $0.5 \mu\text{m}$ per unit sampling length of 4 mm in the surface roughness profile, obtained according to

steel-iron test schedule (SEP 1940), are counted (1.3.2 and 1.3.2.a). To count as an effective peak, there has to be at least one valley deeper than $-0.5\text{ }\mu\text{m}$ between adjacent effective peaks (feature 1.3.2.b; para. [0043]). The two values $0.5\text{ }\mu\text{m}$ and $-0.5\text{ }\mu\text{m}$ of the features 1.3.2.a and 1.3.2.b therefore define the so-called “criteria lines” (C1 and C2, cf. para. [0043]).

68. Accordingly, if there is no valley deeper than the lower criteria line (C2) of $-0.5\text{ }\mu\text{m}$ between adjacent peaks rising above the upper criteria line of $0.5\text{ }\mu\text{m}$ (C 1), all of the adjacent peaks cannot be “effective peaks” used for measurement of the peak count roughness R_{pc} and, thus, the relatively lower one is excluded in determining the number of “effective peaks” (cf. para. [0043]; see also: para. [0065]).
69. In summary, the peak count roughness R_{pc} quantifies the number of peaks within a defined horizontal length of a surface profile, i.e. how frequent irregularities in the surface appear – the higher the peak count, the rougher the surface with more frequent and sharper peaks. As such, the peak count R_{pc} indicates the density of peaks of a certain height over a certain horizontal length.
70. R_{pc} may be measured using a *MarSurf M300* roughness tester available from Mahr company (cf. para. [0064]). This commonly known device uses a diamond stylus that is drawn across the target surface and creates a surface profile that visually indicates peaks and valleys identified in the surface.
71. An exemplary printout of the MarSurf M300 of a measurement over 4 mm is shown below (SoD, para. 75):

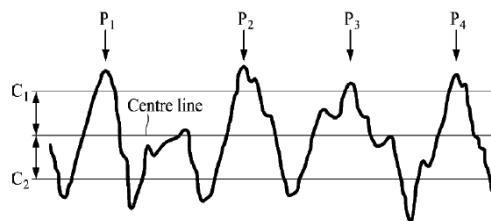


Here, the R_{pc} output is “25/c”, which is a value automatically normalized to 1 cm by the MarSurf M300 device without further ado of the user. The parties agree that the “real” number of peaks over the actually measured length of 4 mm can be obtained by dividing 25 by 2.5 (= 10). Moreover, Defendants undisputedly argued that *“The person skilled in the art can simply count the number of effective peaks [over the length of 4mm] on the*

printed paper” to determine the peaks over the length of 4mm (SoD, para. 76). Accordingly, measuring the effective peaks over 4 mm is possible without undue burden in both ways.

72. Figure 2 of EP’ 363 (which corresponds to Figure 2 of the SEP 1940 specification, Exhibit C 10, p. 7) shows an example of a surface profile obtained according to SEP 1940 that has four effective peaks P1 to P4:

FIG. 2



73. The criteria lines C 1 and C 2 indicate the $\pm 0.5 \mu\text{m}$ thresholds measured from the centre line for defining a peak and a valley, respectively (para. [0043]). In Figure 2, for example, there is no peak immediately after P1 because the measurement line barely crosses the centre line coming from the valley just right from P1. Having established these peaks, they can be counted for this sample and form the R_{pc} value of this specific point of the surface (i.e. the effective peaks of the sampling unit with a length of 4 mm).
74. Together with the ten-point-mean roughness according to feature 1.4 (see below), R_{pc} precisely defines the roughness properties of the two surfaces of the claimed electrolytic copper foil and determines how well they can be coated with active material as well as how the active material adheres to the copper foil during charge/discharge of the secondary battery. As such, according the description of the patent-in-suit, these values influence the deterioration in charge/discharge efficiency of the secondary battery in which the copper foil is used (cf. in particular paras. [0036], [0037], [0041], [0045] and [0046]).
75. Consequently, para. [0039] emphasizes that feature group 1.3 and feature 1.4 technically interact as only having a ten-point mean roughness R_{zJIS} of $2 \mu\text{m}$ or less (feature 1.4) does not always secure – a desired – capacity maintenance of a secondary battery of 90 % or higher. Rather, a peak count roughness R_{pc} outside of the claimed range also leads to deteriorations (paras. [0039] and [0045] et seq.).

76. More specifically, the patent-in-suit explains, when the R_{pc} is less than 10, capacity maintenance is deteriorated because the stress caused during charge/discharge is concentrated on [too less] “mountains” of the copper foil which locally protrude. On the other hand, if the R_{pc} exceeds 100, the active material cannot be uniformly coated on the copper foil due to the excessive number of “mountains” (cf. paras. [0045] and [0046]; [0074] and [0075]). The difference in R_{pc} between the first and second surface is preferably 60 or less (dependent claim 2 and para. [0047]), particularly when both sides are coated with active material. A bigger difference could lead to negative effects on battery efficiency due to (too) different surface appearances.
77. As this is explained in the description in detail as a new finding of the technical teaching of the patent and as the two parameters described in features 1.3 and 1.4 are addressed as interdependent factors, the skilled person understands, that a precise definition of the morphology of the copper foil is of utmost importance and that the criteria described will have to be realized on the surface of the copper foil so as to produce the desired results.

R_{pc} = the number of actually existing peaks over a length of 4 mm

78. Consequently, and contrary to Claimant’s opinion, the (final) peak roughness R_{pc} value between 10 to 100, i.e. the number of effective peaks as defined by the patent-in-suit, has to be actually present over the “unit sampling length” of 4 mm (feature 1.3.2), without referencing/normalizing a measured (lower) number of effective peaks over this particular length to a reference length of 1 cm, e.g. by multiplying the measured (lower) value over the length of 4 mm by factor 2.5.
79. The wording of claim 1, which is not only the starting point, but the decisive basis for determining the scope of protection, does not indicate that the relevant (final) R_{pc} value between 10 to 100 has to be obtained by referencing the actually measured number of effective peaks over 4 mm to 1 cm. Rather, feature group 1.3 establishes a binding consecutive definition of how to determine the (final) R_{pc} value of 10 to 100 for each side.
80. Given that the established principles of claim construction aim to combine adequate protection for the patent proprietor with sufficient legal certainty for third parties (cf. most recently: CoA, decision of 28 August 2026, UPC_CoA_678/2025, para. 37, HUROM v Nuc and WARMCOOK), and, thus, must ensure that the patent claim does not merely serve as a guideline and that its subject-matter does not extend to what, after examination of the

description and drawings, appears to constitute the patent proprietor's desired scope of protection (cf. CoA, order of 26 February 2024, UPC_CoA_335/2023, rectified by order of 11 March 2024, UPC_CoA_335/2023), this binding definition of R_{pc} in the patent-in-suit is decisive and, for the sake of legal certainty, cannot be interpreted in a broader sense to align it with other definitions used in (commonly known) technical specifications, to which the patent-in-suit does not refer in this specific context and from which it deviates.

81. Firstly, feature 1.3.1 defines by using clear wording that the final R_{pc} value between 10 to 100 (feature 1.3) is an average of peak counts roughness R_{pc} values measured at randomly-selected three points (of each side). Building on that definition, feature 1.3.2 further defines that the peak count roughness value at each point (i.e. the three values according to feature 1.3.1) is the number of effective peaks per unit sampling length of 4 mm in a surface roughness profile obtained according to steel-iron test schedule (SEP1940).
82. According to this definition of the three R_{pc} values of each side, which are averaged to determine the final (single) R_{pc} value, the skilled person understands that the number of effective peaks, the latter defined by features 1.3.2a and 1.3.2b, have to be actually present over the “unit sampling length” of 4 mm, since this length is the only relevant parameter that is defined in claim 1 to determine the respective R_{pc} values (is the number of effective peaks). By referencing a measured lower number of effective peaks over a length of 4 mm to 1 cm, e.g. by multiplying 4 effective peaks over a length of 4 mm by factor 2.5, the resulting R_{pc} value of 10 would not reflect the actual number of effective peaks over the specific length of 4 mm, which is decisive according to the language used in the definition of claim 1.
83. In line with this understanding, the description of the patent-in-suit, which must always be considered as an aid for interpretation, not just to resolve any ambiguities in the claim language, defines the R_{pc} value in the exact same way (cf. paras. [0016], [0043] and [0065]).
84. In particular, para. [0043] introduces the relevant consecutive definition of R_{pc} , which is identical to feature group 1.3, as “as used herein”, i.e. – as recognized by a skilled person – as a definition that is decisive in the context of the patent-in-suit, without any references

to a (common) approach to reference a measured R_{pc} value of a specific length [here 4 mm] to a reference length of 1 cm.

85. Accordingly, the description repeatedly and expressly refers to a “count” of R_{pc} values (cf. Table 1, Table 2, para. [0074] and para. [0075]) instead to a referenced value with the unit cm^{-1} (like in the SEP 1940 standard, cf. Exhibit C10, Table 1) or expressed as $\#/c$ (like in the MarSurf device, whereby c stands for cm , cf. Exhibit C9, p. 33). In particular, paras. [0074] and [0075] define the R_{pc} value in brackets as a “count”, rather than a referenced value with the unit cm^{-1} or expressed as $\#/c$.
86. This claim interpretation is also in line with the technical function associated by the patent-in-suit with an R_{pc} value defined in this particular way. Para. [0045] emphasizes [underlined only here], *“when the peak count roughness R_{pc} is less than 10, capacity maintenance of the secondary battery is deteriorated. This is because the stress caused during charge/discharge of the secondary battery is concentrated on mountains which locally protrude”*. With regard to the upper threshold of the R_{pc} value, para. [0046] explains [underlined only here], *“when the peak count roughness R_{pc} exceeds 100, capacity maintenance of the secondary battery is also deteriorated. This is because the active material cannot be uniformly coated on the electrolytic copper foil 111 due to the excessive number of mountains”*.
87. That is, the patent-in-suit emphasizes advantageous roughness properties of the claimed copper foil by defining very specific thresholds values that must not be fallen below or exceeded. In conjunction with the consecutive definition in feature group 1.3, which expressly relates to the **“number of effective peaks per unit sampling length of 4 mm”**, the skilled person acknowledges that the lower and upper thresholds deliberately refer to actually present, i.e. counted, peaks over that specific length.
88. If, for instance a multiplication by factor 2.5 of the effective number over 4 mm would be applied, the effective number of peaks over 4 mm could (just) be 4 (for all three measured points), while para. [0045] clearly emphasises the importance of not falling below the lower threshold of 10, which is defined in the patent-in-suit only with regard to the unit sampling length of 4 mm. Conversely, if the counted number of effective peaks over 4 mm were additionally referenced to 1 cm by multiplication with factor 2.5, only a maximum

of 40 peaks would be permitted over a length of 4 mm. This would result in an “admissible” number of effective peaks over the length of 4 mm of 4 to 40, which is not addressed in the patent-in-suit at all and contradicts the unambiguous wording of feature group 1.3 and the associated technical effects with the claimed range of 10 to 100 (cf. paras. [0045] and [0046]).

89. No different conclusion can be drawn from the fact that feature 1.3.2 refers to the steel-iron test schedule (SEP1940), which defines R_{pc} as follows (Exhibit C10, sec. 3.8):

3.8 Peak count R_{pc}

The number of profile irregularities of the filtered profile within the reference length that consecutively intersect a lower section line c_2 and upper section line c_1 , where the distance of both section lines is parallel and symmetrical to the centre-line (**Figure 2**). The reference length is 1 cm.

90. As Defendants correctly assume, claim 1 and the description of the patent-in-suit only refer to SEP1940 to specify how to obtain the surface roughness profile, i.e. how the basis for the determination of R_{pc} has to be obtained (feature 1.3.2: “in a surface roughness profile **obtained** according to steel-iron test schedule (SEP1940)”). The wording of Claim 1 deliberately chooses the word “obtained” when it refers to the general conditions how to determine the basis of the measurement to be carried out on the foil, which the skilled person knows from SEP 1940, in contrast to “is”, the latter being used when the specific way is described, how the decisive peaks are counted over the distance of 4 mm (i.e. that the value “is the number of effective peaks” and that the effective peaks “are peaks rising above an upper criteria line”).
91. Accordingly, only the roughness profile itself, which forms the basis to measure R_{pc} according to feature group 1.3, has to be obtained according to the specification of SEP1940, in particular according to its sec. 3.1, sec. 3.3 and sec. 3.4, to, for instance, taking waviness of the sample into account, which may influence the results of the measurement.
92. However, the determination of the R_{pc} values of each side, once the roughness profile according to SEP1940 has been obtained, has to be carried out according to the definition of feature group 1.3, which does not refer to SEP1940 in this regard, but introduces its

own definition (see also para. [0043] "as used herein"). In particular, there is no indication to express R_{pc} as a value referenced to 1 cm, as defined in the above sec. 3.8 of SEP1940.

93. This is particularly true since the patent-in-suit introduces the term "unit sampling length", and not "evaluation length", as the relevant length to measure R_{pc} , which is not used in the SEP1940 specification in terms of how to determine R_{pc} . Rather, SEP 1940 introduces an "evaluation length" of 12,5 mm (cf. Exhibit C10, section 6.1). Here again, the skilled person understands that the patent-in-suit deliberately uses terminology not contained in SEP1940, deviates from it and therefore gives its own definition. Contrary to Claimant's opinion, given the clear wording of claim 1 and the aforementioned paragraphs of the description, which reiterate this definition and emphasize the advantageous technical effects of the number of effective peaks over a length of 4 mm, the skilled person would therefore not consider the term unit sampling length to be – according to Claimant – an "imprecise way" of introducing – in fact – the relevant evaluation length, whereby the number of effective peaks over 4 mm must additionally be referenced to 1 cm.
94. Accordingly, the skilled person acknowledges that, while the basis for determining R_{pc} , i.e. the surface roughness profile, has to be obtained according to the specifications of SEP1940, the determination of R_{pc} itself has to be performed as defined by patent claim 1. As SEP1940 directly applies to cold rolled steel plates, the skilled person understands that in the context of electrolytic copper foils the patent-in-suit gives its own definition as – due to the described findings of the inventors – precision in defining the morphology of the copper foil is of utmost importance.
95. No different conclusion can be drawn from the further technical specifications introduced by Claimant. First, the panel notes that a skilled person would not consider those documents as relevant for claim interpretation, since they are neither mentioned in claim 1 nor referenced in the description of the patent-in-suit. As explained above, the reference to SEP1940, which – in Claimant's opinion – further references to ISO 4287:1997 (Exhibit C22) and ISO 4288:1996 (Exhibit C21), in particular how to determine R_{pc} , only relates to the way how to obtain the roughness profile as the basis for measuring R_{pc} .
96. But even if the skilled person would be generally aware of further technical specifications, which use a reference length of 1 cm to determine R_{pc} , as argued by Claimant, the mere

fact that, for instance, according to section 3.1.10 of ISO 4287:1997 (Exhibit C22) “[the] evaluation length, l_n , [is the] length in the direction of the X-axis used for assessing the profile under evaluation”, i.e. a different length than the reference length of 1 cm, does not justify a different conclusion in Claimant’s favor.

97. Also in this regard, the patent-in-suit does not refer to these documents to specify how to determine R_{pc} , and in particular not to a reference length of 1 cm. Moreover, it is noted that the following table 2 of ISO 4288:1996 (Exhibit C21), to which ISO 4287:1997 (Exhibit C22) and – in Claimant’s opinion – SEP 1940 (indirectly) refer and which introduces applicable default evaluation lengths when determining, *inter alia*, R_{pc} of non-periodic profiles, does not support Claimant’s argumentation:

Table 2 — Roughness sampling lengths for the measurement of R_z , R_v , R_p , R_c and R_t of non-periodic profiles (for example ground profiles)

$R_z^{1)}$ $R_{z1max}^{2)}$ μm	Roughness sampling length l_r mm	Roughness evaluation length l_n mm
$(0,025) < R_z, R_{z1max} \leq 0,1$	0,08	0,4
$0,1 < R_z, R_{z1max} \leq 0,5$	0,25	1,25
$0,5 < R_z, R_{z1max} \leq 10$	0,8	4
$10 < R_z, R_{z1max} \leq 50$	2,5	12,5
$50 < R_z, R_{z1max} \leq 200$	8	40
1) R_z is used when measuring R_z, R_v, R_p, R_c and R_t .		
2) R_{z1max} is used only when measuring $R_{z1max}, R_{v1max}, R_{p1max}$ and R_{c1max} .		

98. While the 4 mm evaluation length for smooth copper foils ($0.5 < R_z \leq 10 \mu m$) may be technically sound, as argued by Claimant, the 4 mm sampling length according to feature 1.3.2 is a fixed condition in the patent-in-suit, whereas standard metrology under ISO 4288 is adaptive depending on a different roughness parameter R_z . For ultra-smooth foils ($R_z \leq 0.5 \mu m$), the 4 mm mandate according to the patent-in-suit represents a deviation from the 1.25 mm evaluation length (or 0,4 mm evaluation length) according to ISO 4288 for thinner foils, as explicitly acknowledged by Claimant during the oral hearing.
99. Accordingly, the skilled person, even when considering ISO 4288, would again understand that the patent-in-suit defines its own approach how to determine R_{pc} , i.e. by always counting the actual number of peaks over a length of 4 mm, irrespective of R_z , which is not mentioned in claim 1 or the description of the patent-in-suit as a relevant roughness parameter, or other (roughness) properties of the respective copper foil and without any further multiplication by factor 2.5 or other suitable technique to reference the actual number of effective peaks over 4 mm to 1cm.

100. By contrast, had the patent-in-suit intended to specify that the R_{pc} value has to be determined/measured according to the parameters of an already known standard, it would have said so expressly, as the comparison with feature 1.4 (see below) shows, which references to the commonly known Japanese Industrial Standard (JIS) for determining R_{zJIS} , without any further explanation, whereas feature group 1.3 introduces a consecutive definition, which, contrary to Claimant's opinion, does not merely clarify the applicable "evaluation length" for measurement according to a known standard, but rather, as admitted by Claimant itself, uses a different wording ("unit sampling length") compared to SEP1940 and other standard documents.
101. Against this background it is irrelevant that R_{pc} is undisputedly commonly expressed as a value referenced to 1 cm in the relevant technical field, since the patent-in-suit, as explained above, deliberately deviates from this approach by introducing its own different and binding definition, i.e. it constitutes its own lexicon (cf. CoA, decision of 27 May 2026, UPC_CoA_622/2025, Hefei v Grundfos, para. 36; LD Mannheim, decision of 16 June 2026, UPC_CFI_86/2025, Interdigital v Disney, para. 79 with further references).
102. Moreover, based on the R_{pc} results put out by the MarSurf as "#/c" (cf. Exhibit C9, p. 33), the relevant R_{pc} value according to the patent-in-suit can be determined by dividing that referenced value through divisor 2.5 or, alternatively, as undisputedly put forward by Defendants, the number of peaks can be counted on the print of the MarSurf. Conversely, the actual number of peak counts over the unit sampling length of 4 mm can, if needed, be referenced to 1 cm by multiplying it with factor 2.5.
103. However, in both cases, it is apparent that the "unit sampling length" has an actual count of effective peaks, which exists within the length of 4 mm, to which the claim refers and which is decisive to define the R_{pc} value of each point according to claim 1. Therefore, and contrary to Claimant's assumption, the R_{pc} value as defined by the patent-in-suit would not lead to a result incomparable to "other R_{pc} values" known in the state of art. Rather, it specifies how many peaks have actually to be present in the "unit sampling length" in average.
104. Against this background the reference in para. [0064] to the MarSurf device does not lead to a different conclusion in Claimant's favour. This is because this paragraph only states that R_{pc} was measured by this particular device and that the results are shown in Table 1

of the patent-in-suit. However, as explained above, using a MarSurf device is one technical possibility to determine the decisive R_{pc} value according to the definition of feature group 1.3 over a length of 4 mm. Consequently, the immediately following para. [0065] repeats the relevant definition of R_{pc} in the context of the patent-in-suit, which is already introduced in para. [0043], to underline the specific approach of the patent-in-suit in contrast to express R_{pc} as a value referenced to 1 cm.

105. In conclusion, the relevant effective peaks according to feature group 1.3 have to actually exist over the “unit sampling length” of 4 mm and cannot be “obtained” by referencing a lower value to 1 cm.
106. Against this backdrop, it can remain open whether the prosecution history of the patent-in-suit, as argued by Defendants, supports this claim construction. At least, the relevant explanations (cf. Exhibits MB3, MB4) provided by the Applicant during the prosecution of the patent-in-suit do not contradict the above claim construction that is already derivable from the patent-in-suit as granted.
107. To the contrary, the claim constructed as outlined above would be confirmed as the reply to the Supplementary European Search Report, submitted by Applicant with the EPO on May 13, 2019 (Exhibit MB3, p.2) reads as follows:



BOTTI & FERRARI

Clarity

Claim 1 itself provides the clear definition of the ‘peak count roughness (R_{pc})’ of the first and second surfaces of the electrolytic copper foil. That is, according to claim 1, the ‘peak count roughness (R_{pc})’ of each surface is determined by:

- (i) obtaining surface roughness profiles of randomly-selected three points of the surface according to steel-iron test schedule (SEP 1940),*
- (ii) counting the number of ‘effective peaks’ per unit sampling length of 4 mm in each surface roughness profile, and*
- (iii) calculating the average of the numbers of the ‘effective peaks’ at the three points.*

The ‘effective peaks’ are also clearly defined in claim 1 as the peaks rising above an upper criteria line of 0.5 μm in the surface roughness profile while satisfying that there is at least one valley deeper than a lower criteria line of -0.5 μm between adjacent effective peaks.

*Since the ‘peak count roughness (R_{pc})’ as defined in claim 1 is the average **number** of ‘effective peaks’ measured at randomly-selected three points of the surface, contrary to the general or conventional roughness value such as R_z , R_a , etc. the unit of which is ‘ μm ,’ it has no unit.*

and, when elaborating on the clarity of the claim, describes a three-step determination. According to step (i) the peak count roughness is determined by obtaining the surface roughness profiles according to SEP1940 and then (ii), without any further reference to SEP1940, the effective peaks are counted per unit sampling length of 4 mm for each point, while lastly (iii) the average of the numbers of the effective peaks at the three points is calculated (see also Exhibit MB4 [underlined only here], p. 3 *“As defined in claim 1, R_{pc} means the number of effective peaks as defined in claim 1 per unit sampling length (4mm) and indicates how many peaks larger than a certain degree exist in the unit sampling length”*). Furthermore, whereas in the priority document of the patent-in-suit the length of 10 mm still appears, expressly with regard to the “unit sampling length”, it was changed to 4 mm in the application of the patent-in-suit (see the discussion between parties in this regard, in particular SoD IA, paras. 82 et. seqq.; CCfR para. 65 et. seq.; Reply IA p. 18, in which Claimant contends that the mention of a 10mm “unit sampling length” in the priority document was *obviously erroneous*).

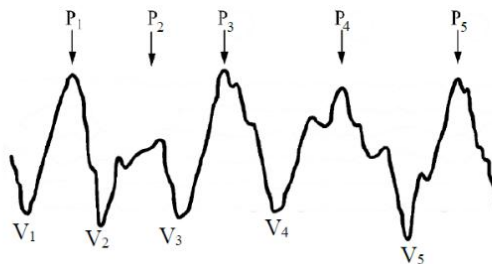
108. Finally, the claim constructions orders issued in the parallel U.S. proceedings do not call in to question the above findings.
109. The first U.S. claim construction order of May 2025 (Exhibit C12) does not address the question whether R_{pc} according to feature group 1.3 has to be understood as a value referenced to 1 cm (cf. the relevant passages: Exhibit C12., p. 40 et. seqq.). Rather, the U.S. Court sticks to the “*plain meaning*” of feature group 1.3 and states, there was no inconsistency/indefiniteness apparent in claim 1 of US ‘090 because – as argued by Defendants – it recites a “sampling length of 4 millimeters,” whereas the recited “test schedule (SEP 1940)” specifies a “reference length” of 1 centimeter, since each value can be expressed corresponding to each other by applying multiplication or division by factor/divisor 2.5, respectively. However, this does not address the decisive question whether the R_{pc} value according to feature group 1.3 is in fact a value referenced to 1 cm or not.
110. In the second U.S. supplemental claim construction order of February 2026 (Exhibit C23), the U.S. court emphasised that *“it noted [in the first claim construction order] a distinction between the sample length and reference length, but did not specify the reference length”*, and finds that the reference length is 1cm. However, that order does not provide any reasoning, given the aforementioned distinction between the two lengths, as to why a reference length should be relevant to determine R_{pc} according to feature group 1.3 of

US'090, to which the second claim construction order does not directly refer. Rather, it encompasses different patents with different claim language (e.g. “a number of peaks per unit length of 4 mm, wherein the peak density is measured according to ASME 46.1 (2009)”).

Feature 1.4 - “Ten-Point Mean Roughness R_{zJIS} ”

111. The ten-point mean roughness R_{zJIS} is the second relevant roughness parameter to improve the lifespan of a secondary battery according to the patent-in-suit.
112. It represents the sum of the mean value for the height of the five tallest peaks and the mean of the depth of the five deepest valleys of a profile within a given sampling length (i.e. 10 points total) and therefore relates to vertical roughness properties of the copper foil, whereas R_{pc} (feature group 1.3) relates to the density of peaks in horizontal direction (x-axis).
113. This can be illustrated by amended Figure 2 of the patent-in-suit, which has been modified for illustration purposes by Claimant (cf. SoC, p. 25):

FIG. 2



114. Over the given sampling length, the peak-to-valley height for the five highest peaks and deepest valleys is determined (i.e. between peak P1 and valley V1, peak P2 and valley V2 and so on until P5 and V5). These values are summed and then averaged to arrive at R_{zJIS} . JIS refers to “Japanese Industrial Standard”, JIS, i.e. a standard called JIS B 0601:2001 (Exhibit C11) published by the Japanese standardization body Japanese Standards Association that explains the meaning of R_{zJIS} in its Annex 1 (Exhibit C 11, p. 24).
115. As Claimant undisputedly argued (Reply IA, pages 21 to 23), the JIS B 0601:2001 specification incorporates the definition of R_{zJIS} according to its predecessors, the JIS B

0601:1994 and JIS B 0601:1998 specifications, so that R_{zJIS} constitutes a definite parameter familiar to a skilled person. The (identical) JIS B 0601:1994 and JIS B 0601:1998 definition, is the definition of the ten-point mean roughness R_{zJIS} that the person skilled in the art used at the priority date and filing date of the patent-in-suit based on the JIS 0601:2001 specification.

116. According to the patent-in-suit, as R_{zJIS} of the shiny and matte surface of the copper foil decreases, deterioration in the charge/discharge efficiency also decreases, i.e. the charge/discharge efficiency is improved. Conversely, with a R_{zJIS} above 2 μm , contact uniformity between the current collector 110, in particular the copper foil forming the current collector, and the active material layer 120 of the electrode does not reach a desired level and the secondary battery thus cannot satisfy a desired capacity maintenance of, e.g., 90 % or higher (cf. para. [0038]), to which claim 1 is not limited to.
117. However, as already explained above in the context of feature 1.3, according to the patent-in-suit it is not sufficient to keep R_{zJIS} of the two sides of the copper foil below this threshold, because it does not “always secure capacity maintenance of 90 % or higher”. (cf. paras. [0039] and [0040]). Therefore, according to the patent description, feature 1.4 technically and functionally interacts with feature 1.3 (cf. para. [0041]) to achieve the desired adhesion between the current collector of the electrode and the active material layer to improve and maintain charge/discharge capacity.

Patent Claim 11

118. Since patent claim 11 is only relevant for the conditional Counterclaim for revocation, which remains undecided, the panel refrains from providing a claim construction in this regard.

INFRINGEMENT ACTION

119. Based on the construction of feature group 1.3 above, the infringement action has to be dismissed.
120. The attacked embodiments would undisputedly only satisfy the “ R_{pc} -range” of 10 to 100 according to feature group 1.3 under Claimant’s preferred claim construction, which is – as explained above – incorrect. When not referenced to a length of 1 cm, the measured R_{pc} values of the attacked embodiments fall outside the claimed range of 10 to 100.

121. Claimant expressly confirmed this upon the Presiding Judge's question during the oral hearing, also with regard to the further copper foils of the Defendants' group of companies that were introduced by Claimant in the Reply concerning the infringement action (see audio protocol).

CONDITIONAL COUNTERCLAIM FOR REVOCATION

122. Since the infringement action is dismissed, the Panel does not have to decide on the conditional Counterclaim for revocation as the relevant condition did not occur. This is clarified in the operative part of this decision, as required according to the relevant case law of the Court of Appeal (cf. CoA, order of 17 August 2026, UPC_CoA_40/2026 para. 32; decision of 2 June 2026, UPC_CoA_880/2025, Fujifilm v Kodak, operational part of the decision under section “M”).
123. Accordingly, the points at issue in this respect, particularly the question whether Defendants fell short of submitting all relevant facts regarding the alleged public prior use products, which were available in the parallel U.S. proceedings, but are protected by the U.S. protective Order, can remain open. Moreover, since the conditional CCfR remains undecided, there is also no need to decide on Claimant’s request to disregard Defendants’ submissions in their Rejoinder AaP (or at least parts of it).

CLAIMANT’S PRODUCTION REQUEST

124. Claimant’s production request of 6 March 2026 is dismissed.
125. Since the infringement action is unsuccessful, there is no basis to order Defendants to produce further documents with regard to non-infringing products and/or acts. Moreover, as the conditional Counterclaim for revocation remains undecided, there is also no justification for ordering the production of documents related to the alleged public prior use.
126. In this respect, Claimant may appeal this order, even though it is contained in the present final decision in the main proceedings, within 15 days after service of the order pursuant to Art. 73(2)(a) UPCA, Art. 59 UPCA and R. 220.1(c) RoP, 224.1(b) RoP (cf. CoA, orders of 17 August 2026 and 9 October 2026, UPC_CoA_69/2026 *et al.* - NST v Qualcomm).

VALUE IN DISPUTE

127. After hearing the parties, the value in dispute for the Infringement action is set at 15.000.000 € and the value in dispute for the Counterclaim for revocation is set at 15.000.000 €, in accordance with the judge-rapporteur's order pursuant to R. 370.6, R. 104 (i) RoP of 10 September 2026.

COSTS

128. The decision on allocation of the (recoverable) costs with regard to both the infringement action and the counterclaim for revocation is based on Art. 69 (1) UPCA, R. 118(5) RoP.

129. The allocation of cost to Claimant corresponds to the degree of success of the parties. Since the infringement action is dismissed, Claimant is the unsuccessful party in this respect. In the present case, the same applies to the conditional Counterclaim for revocation.

130. The CoA has not yet ruled on the legal question of which party should bear the costs incurred for a Counterclaim for revocation made conditional upon a finding of infringement by the Court if the relevant condition does not occur. The CoA clarified that a CCfR can be made conditional subject to a finding of infringement and emphasised that, in such cases, the CFI must decide who shall bear the costs of the conditional CCfR. However, it did not specify which party should bear the costs if the relevant condition does not occur, but left this question open (cf. CoA, Order of 17 August 2026, UPC_CoA_40/2026, AorticLab v Emboline, paras. 32 and 33).

131. Consequently, the Panel does not regard the fact that the CoA ruled *prior* to the aforementioned order (cf. decision of 2 June 2026, UPC_CoA_880/2025, 882/2025, Fujifilm v Kodak, paras. 333 and 341), that a Counterclaimant, who conditionally requested the revocation of the national UK part of a European Patent *“on the basis that it [the Court] should only do so if the Plaintiff first undertakes to consent before the UK Court and Intellectual Property Office to revocation or restriction of the UK designation of the Patent in line with the decision handed down by the Court, a decision that the UK designation is also invalid in its entirety”*, is to be regarded as the unsuccessful party and has to bear the respective costs, since this condition has not been fulfilled, as a general rule that also applies to a Counterclaim for revocation made conditional upon a finding of infringement, which concerns a European Patent with unitary effect or national parts of a European Patent in force in UPCA contracting member states. Rather, the above decision concerns

a specific procedural situation, in which the success of the conditional CCfR in relation to the *UK* designation of a European patent depends solely on the behaviour of Claimant, since the UPC, applying the principles set out by the ECJ in the judgment BSH, cannot invalidate the *UK* designation of a European patent with effect *erga omnes* (cf. CoA, decision of 2 June 2026, *ibidem*, headnote 12 and para. 302), as *de facto* requested by the Defendants/Counterclaimants in those proceedings

132. Rather, a (conditional) Counterclaim for revocation directed against a European patent with unitary effect, or the respective national parts of a European patent in force in UPCA contracting member states, which are also encompassed by the Infringement action, is a direct consequence of the infringement action initiated by the Claimant. Under the system of the UPCA and the RoP, a Defendant is not allowed to bring forward an invalidity defence without at the same time lodging a separate Counterclaim for revocation. In order for a Defendant in an Infringement action to be able to defend itself raising invalidity arguments, it is therefore forced to file a Counterclaim for revocation (cf. CoA, order of 20 June 2025, UPC_CoA_2025, headnote 3 and paras. 25 et. seqq.).
133. In consequence, a Defendant who primarily wants to defend itself against Claimant's allegation of infringement, but who, if the court does not accept its primary non-infringement arguments, wants to rely on the assumed invalidity of the patent-in-suit as a secondary argument, but who does not seek to invalidate the patent-in-suit in any case, is also forced to lodge a Counterclaim for revocation. Accordingly, as clarified by the CoA, in such a case the Defendant has the procedural opportunity to express its primary objective of dismissing the infringement claims on the grounds of non-infringement by making the Counterclaim conditional on the finding of infringement by the Court. In this respect, the conditional Counterclaim is also beneficial to Claimant, since its granted patent is not challenged and therefore not at risk of being invalidated with *erga omnes* effect alongside the dismissed infringement action in (parts of) the UPCA territory
134. However, even if this condition is declared from the outset, i.e. when the conditional Counterclaim for revocation is filed together with the SoD, the parties would still be obliged to elaborate on this conditional CCfR and file the relevant briefs within the time limits set out in the RoP. It is only after the oral hearing that it becomes finally clear whether the CCfR will be decided upon by the Court. Accordingly, a counterclaim made conditional upon infringement and the related costs cannot be deemed as "unnecessary"

in the sense of Art. 69 (3) UPCA (contrary to LD Munich, decision of 13 January 2026, headnote 3 and paras. 69 et seqq.).

135. Since the conditional CCfR is, rather, a permissible procedural means of expressing the hierarchy of the arguments put forward by Defendant and also is a direct consequence of the infringement action, which nevertheless obliges the parties to elaborate on it in detail within the time limits laid down in the Rules of Procedure, it must be examined who the “successful party” is in this respect within the meaning of Art. 69(1) UPCA, if the infringement action is dismissed on the grounds that no infringement has taken place.
136. In this regard, the members of the panel generally consider the Claimant to be the unsuccessful party, even though the conditional Counterclaim for revocation remains undecided (see also: LD Paris, decision of 19 August 2026, UPC_CFI_301/2025, para. 99). This is because the Defendant prevailed with its primary argument/defence (non-infringement) yet was forced to file the conditional Counterclaim to challenge the validity of the patent-in-suit as a secondary argument in case the Court finds infringement. However, if the Court finds that the patent-in-suit is not infringed, in line with Defendant’s primary defence, it is justified to view the Claimant as the unsuccessful party with respect to both proceedings, since the only reason why the conditional CCfR remains undecided is the lack of infringement. The same applies if the conditional CCfR additionally encompasses a method claim (here: Claim 11) for producing a product according to the independent product claim (here: Claim 1). In such a case, even if the method claim is not part of the infringement action, the claimed method for producing an allegedly infringing product is closely related to the infringement action direct against allegedly infringing products. Thus, the conditional CCfR is also a direct consequence of the (unsuccessful) infringement action in this respect.
137. The above principles apply, at least, if the CCfR is made conditional upon a finding of infringement from the outset, i.e. when filing the conditional CCfR with the Statement of defence, or, at the latest, in the oral hearing before the CCfR is discussed in substance, as was the case in the present proceedings.
138. Accordingly, it can remain open whether the same principles would apply or whether, for reasons of fairness, a Defendant would have to bear (a part of) the costs incurred for the

conditional CCfR, if it only declares its Counterclaim for revocation conditional after learning from the exchange of views during the oral hearing and the Court's preliminary opinion, that its Counterclaim for revocation will most likely be unsuccessful.

139. Finally, on 9 September 2026, the parties have informed the Court that they have reached an agreement on the total costs on both sides, namely EUR 1.1 million for both, Claimant and Defendants, in respect of both the infringement action and the counterclaim for revocation. Consequently, based on the above allocation of costs, Claimant is ordered to pay to Defendants the agreed legal costs and other expenses incurred.

DECISION:

- I. The infringement action is dismissed.
- II. It is declared that the condition under which Defendants' Counterclaim for revocation would have had to be decided upon is not fulfilled.
- III. Claimant has to bear the costs of the proceedings.
- IV. Claimant is ordered to pay to Defendants the agreed reasonable and proportionate legal costs and other expenses of EUR 1.1 million.
- V. The value in dispute for the infringement action and the counterclaim for revocation is set at 15.000.000 € each.

Delivered in Mannheim on 23 October 2026

signed by

Presiding judge Tochtermann
Legally qualified judge Sender
Legally qualified judge Johansson
Technically qualified judge Perronace
For the Sub-Registrar: Kranz, Clerk LD Mannheim

Information about appeal

An appeal against the present Decision may be lodged at the Court of Appeal, by any party which has been unsuccessful, in whole or in part, in its submissions, within two months of the date of its service (Art. 73(1) UPCA, R. 220.1(a), 224.1(a) RoP).

An appeal against the order pursuant to Art. 59 UPCA contained in this decision may be brought before the Court of Appeal by any party which has been unsuccessful, in whole or in part, in its submissions within 15 calendar days of the notification of the decision (Art. 73 (2) (a) UPCA, R. 220.1 (c) RoP, R. 224.1 (b) RoP).

Information about enforcement (Art. 82 UPCA, Art. Art. 37(2) UPCS, R. 118.8, 158.2, 354, 355.4 RoP)
An authentic copy of the enforceable decision or order will be issued by the Deputy-Registrar upon request of the enforcing party, R. 69 RegR.