Neutral Citation Number: [2022] EWHC 708 (Ch)

Claim No: HP-2016-000018

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
INTELLECTUAL PROPERTY LIST (ChD)
PATENTS COURT

Rolls Building
Fetter Lane
London, EC4A 1NL

29 March 2022

Before :

MRS JUSTICE BACON

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Between :

(1) ANAN KASEI CO. LTD **(2) RHODIA OPERATIONS S.A.S.**	**Claimants**
- and -	
(1) NEO CHEMICALS & OXIDES (EUROPE) LTD **(2) NEO PERFORMANCE MATERIALS, INC** **(a company incorporated under the laws of Ontario, Canada)** **(3) NEO CAYMAN HOLDINGS LTD**	**Defendants**

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Tom Mitcheson QC, Miles Copeland and Jacob Turner (instructed by **Hogan Lovells International LLP**) for the **Claimants**
Hugo Cuddigan QC and Adam Gamsa (instructed by **Bird & Bird LLP**) for the **Defendants**

Hearing dates: 28, 31 January, 1–4, 7, 10–11 February 2022

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Approved Judgment

NON-CONFIDENTIAL VERSION

Note: Excisions in this Judgment marked "[✂]" relate to commercially confidential information.

I direct that no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

Mrs Justice Bacon:

Introduction

1. This is an inquiry into damages for the infringement of a patent for high surface area ("HSA") cerium oxide, a product used in the manufacture of catalyst systems for vehicle exhausts. The first Claimant (now named Solvay Special Chem Japan, Ltd) is the proprietor of the relevant patent, EP (UK) 1 435 338, which was filed in September 2002, granted in February 2011 and expires in September 2022. The Second Claimant is the exclusive licensee for the patent. Both Claimants are part of the Solvay group of companies. I will refer to the Claimants collectively as "Rhodia".

2. The Defendants, who I will refer to collectively as "Neo", are companies within the Neo Group. Following a liability trial which took place in January 2018, Roger Wyand QC (sitting as a Deputy High Court Judge) held that the patent was valid, and found that the First Defendant's C100 and C100N cerium oxide products infringed the patent: *Anan Kasei v Molycorp* [2018] EWHC 843 (Pat). The Court of Appeal dismissed Neo's appeal against the finding of validity: *Anan Kasei v Neo Chemicals* [2019] EWCA Civ 1646.

3. Following those judgments, the issue for this damages inquiry is the extent to which Rhodia can recover damages for Neo's supply of its C100N product to a particular customer, Johnson Matthey ("JM"), displacing sales of Rhodia's patented cerium oxide product HSA20 which Rhodia says that it would otherwise have made to JM.

4. Rhodia's damages claim originally pleaded nine heads of loss. The first, Head 1, was a conventional damages claim for loss suffered by Rhodia in the UK as a result of the infringing supply of C100N in the UK between 2014–2017. That head of damages was settled in late 2020, for a sum of £85,000. Heads 2 and 5–8 are no longer pursued. The only distinct heads of claim that are now before me are therefore Heads 3 and 4, which claim losses said to have been suffered as a result of sales outside the UK, in countries where Rhodia's product did not have patent protection. Those include, in each case, claims for losses from sales post-patent expiry, the basis for which is set out under Head 9.

5. The claim is therefore for losses from sales outside the territorial scope of the patent, but which are said to have been caused by the supply of infringing development samples of both C100 and C100N to JM in the UK between 2011–2013, and subsequently by the infringing commercial supplies of C100N within the UK. Rhodia contends that the overseas sales were caused by Neo's infringing supplies within the UK. Those sales were vastly greater than the UK sales, and Rhodia claims damages amounting to over €24m on this basis.

6. Rhodia's primary case is that absent the infringements Rhodia would have made all the sales to JM that Neo made, such that the infringement caused it to lose profits. In the alternative, if it would not have made those sales (or some of those sales), it says that it has lost out on royalties under a licence that it would otherwise have negotiated with Neo.

7. Neo says that it should not have to pay any damages at all. It contends that the overseas sales fell outside the scope of duty altogether; alternatively that they were not caused, sufficiently proximately, by the infringing UK supplies; alternatively that Neo could have supplied a non-infringing alternative to JM in the UK. In any event, Neo contends that Rhodia has not established that it had sufficient capacity to supply Neo's volumes during the relevant period (or that it would have sufficient capacity to supply Neo's future volumes). As to any licence royalties, Neo contends that these are largely precluded by the settlement of Head 1, and that in any event Rhodia's claim for global royalties under a UK licence is unsustainable. On that basis Neo's position is that any licence fee should reflect only the supply of the initial development samples to JM in the UK.

8. Mr Mitcheson QC, Mr Copeland and Mr Turner represented Rhodia; Mr Cuddigan QC and Mr Gamsa represented Neo. The trial was conducted principally in person, with two exceptions: (i) the cross-examination of Dr Richards was conducted as a hybrid hearing, with Dr Richards giving evidence remotely by videolink from France but the remainder of the parties present in the courtroom; and (ii) Dr Rohe was recalled for a further short cross-examination on 7 February 2022, which was conducted entirely remotely. Following the trial I received further written submissions from the parties on the issue of the Enforcement Directive and TRIPS.

9. The confidential nature of much of the material addressed in the witness evidence meant, unfortunately, that large parts of the cross-examination and some of the submissions of counsel had to take place in private session. For the same reason, parts of this judgment are redacted in the non-confidential version for publication.

Witnesses

10. I heard oral evidence from both witnesses of fact and experts. Unsurprisingly, JM refused to assist either party by providing evidence for the purposes of this hearing. It did not, however, object to evidence being provided by two of its ex-employees, Dr O'Sullivan and Dr Winterborn.

Practice Direction 57AC

11. Before I comment on the evidence given by the individual witnesses, it is appropriate to make some general observations on the requirements of Practice Direction 57AC, in light of Mr Cuddigan's objections that I should dismiss the evidence of certain of Rhodia's witnesses for failure to comply with that Practice Direction.

12. Paragraph 3.2 of PD 57AC provides that:

> "A trial witness statement must set out only matters of fact of which the witness has personal knowledge that are relevant to the case, and must identify by list what documents, if any, the witness has referred to or been referred to for the purpose of providing the evidence set out in their trial witness statement."

13. The purpose of the first part of that rule is to ensure that the evidence given by a witness is confined to relevant factual matters that are within the knowledge of that witness, rather than extending improperly to commentary, argument or speculation. The requirement to list documents is to provide transparency in respect of documents used to refresh the memory of the witness, for the benefit of both the court and the other side: see the comments of O'Farrell J in *Mansion Place v Fox Industrial Services* [2021] EWHC 2747 (TCC), §59.

14. These are important requirements, reinforced by the stipulation in paragraph 4.1 that the witness must specifically confirm their understanding and compliance with these requirements, and the further requirement in paragraph 4.3 for a witness statement to be endorsed with a certificate of compliance signed by the relevant legal representative. Breach of these requirements may lead the court (among other sanctions) to strike out part or all of a witness statement, or order that a witness statement be redrafted. In other cases, however, the appropriate course will be for the court to place less (or no) weight on witness evidence or parts of that evidence which fails to comply with the requirements of the Practice Direction.

15. In the present case, Mr Cuddigan objected that Rhodia's witnesses Dr Rohe, Mr Mackay and Dr Richards had failed to comply with PD 57AC, in various respects. While not making any formal application for any of Rhodia's evidence to be struck out, Mr Cuddigan submitted in closing that the court should completely disregard the evidence of Dr Rohe and Mr Mackay.

16. For the reasons set out below, I do not accept that submission. Rather, I have considered the specific objections to the evidence and the extent to which that might render certain parts of the evidence unreliable or insufficiently probative.

Rhodia's witnesses of fact

17. Dr Rohe has been the market and development manager for the automotive catalyst activity of Solvay since 2011. The focus of his evidence was on the question of Rhodia's capacity during the period in which Neo has supplied C100N to JM, and specifically whether Rhodia had sufficient capacity to supply JM with its high surface area cerium oxide product, HSA20, in place of Neo's volumes during that time. By the start of the trial he had provided three witness statements for the purposes of this part of the proceedings, and he was cross-examined on that evidence.

18. Around lunchtime on 4 February 2022, just before the conclusion of the oral evidence, Rhodia sent to Neo a further (very short) witness statement from Dr Rohe. In that statement Dr Rohe said that Mr Cuddigan had put to Mr Bezant during cross-examination an inaccurate summary of the oral evidence given by Dr Rohe. Dr Rohe therefore sought to correct the point. I admitted the new witness statement *de bene esse* on the basis that Dr Rohe would be recalled for cross-examination on that statement if Neo wished. On that basis there was a further short cross-examination of Dr Rohe on 7 February 2022.

19. Having considered the material in the further statement, and the oral evidence given by Dr Rohe when recalled, it is in my judgment appropriate to permit

Rhodia to rely on this evidence. The point is a very short one as to whether his capacity figures took into account the use of the relevant production hardware for the production of other materials. The further evidence did not contradict or seek to retract Dr Rohe's earlier evidence, but sought to correct Neo's interpretation of some passages of his cross-examination. The issue could have been addressed by submissions from counsel, but it was helpful (in case of any doubt) to have Rhodia's position set out by the relevant witness on the point. Neo was able to address the evidence in its closing submissions, did not seek to recall any of Rhodia's other witnesses for cross-examination, and did not suggest that there was any relevant point that it had been unable to explore with Rhodia's other witnesses in respect of the further evidence.

20. The main issues with Dr Rohe's evidence were different ones: that while Dr Rohe could give general evidence, from his own knowledge and experience, of the constraints upon capacity and Rhodia's means of increasing capacity where required, it was apparent that he did not have personal knowledge of Rhodia's actual spare capacity at its plants in Anan and La Rochelle during the relevant period. His role was in product development, not production, and the capacity figures had therefore been provided to him by a colleague Dr Moissonnier, who was not called to give evidence. Nor did Dr Rohe provide any of the underlying data on which those figures were based. Moreover, those figures were limited to setting out theoretical spare capacity on an annual basis, rather than actual spare capacity on a day to day basis at Rhodia's plants in France and Japan. Dr Rohe's evidence was also inconsistent with the contemporaneous documents, in ways that Dr Rohe was wholly unable to explain. In these circumstances. While not rejecting it outright, I have been able to place very little weight on substantial parts of Dr Rohe's evidence.

21. Mr Mackay is the senior business controller in the Special Chem unit at Rhodia. His evidence, set out in four witness statements, addressed Rhodia's annual contribution margins for the supply of HSA20 to JM during the relevant period. I do not accept Neo's criticisms of the general reliability of his evidence. As I will discuss further below, it was in my view legitimate for someone in Mr Mackay's position to give evidence of Rhodia's costs drawn from Rhodia's management system, using data that he disclosed and was able to explain to the court. Neo also criticised some specific aspects of Mr Mackay's evidence, which I will address in due course.

22. Dr Richards was from 2012 until his retirement at the end of 2021 the global key account manager for JM at Rhodia. His witness statement addressed Rhodia's actual pricing of HSA20 in its sales to JM, and the factors that would have influenced Rhodia's pricing in the counterfactual cases in which it had supplied Neo's volumes to JM, or had negotiated a licence for Neo to supply JM. He also discussed the supply of samples to JM for the purposes of development of commercial catalysts. When cross-examined he was a straightforward witness who was clearly doing his best to assist the court. Neo objected that Dr Richards' recollection of a price increase by Rhodia in 2014 was not supported by any documentary evidence. In the event, however, nothing turned on this point.

23. Dr O'Sullivan worked at JM from 1989–2016. With the exception of the last two years of that time, he worked in JM's automotive catalyst business and was

responsible, from 2010, for dealings with two of the European car manufacturers. His witness statement addressed, in particular, JM's testing and development process for its catalyst systems, the way in which JM competed to supply its catalysts to its car maker customers, and the commercial scale manufacture of JM's catalyst systems. He was a reliable and knowledgeable witness, who gave clear and measured answers and was not seriously challenged on any aspect of his evidence.

24. Dr Winterborn worked at JM from 1986–2020 in various roles, in particular the position of manufacturing technology director from 2008 onwards. His witness statement addressed JM's process for procuring raw materials developing catalyst formulations. His evidence was not disputed and he was not cross-examined by Neo.

25. Rhodia also relied, by way of a hearsay notice pursuant to section 2 of the Civil Evidence Act 1995, on certain paragraphs of a 2017 affidavit of Karen Brown served in proceedings in the Netherlands. She was at the time (and until September 2021) the Managing Director of the First Defendant, but is no longer employed by Neo.

Neo's witnesses of fact

26. Mr Noll has been employed as a sales manager at Neo since 1999, and has been the sales director for the chemicals and oxides part of the business since 2013. His first witness statement addressed the way in which Neo dealt with its customers in the industry, such as JM, including an overview of the procurement process for a product to be used in an automotive catalyst, and the process by which car manufacturers would qualify a catalyst on their platforms. He also provided some information as to Neo's pricing. His second witness statement addressed the way in which Neo prepares its sales forecasts for C100N. He was a reliable witness who gave clear and straightforward answers when cross-examined, and his evidence was not disputed on any significant point.

27. Mr Williams worked at JM developing catalysts between 2005–2007. Since then he has worked at Neo's Abingdon laboratory, with the role of technical development manager since 2010, and technical director since October 2021. His role has included the management of product development programmes with Neo's customers, including JM, and his first witness statement addressed Neo's process of sending development samples to customers in general, the particular HSA cerium oxide samples sent to JM from 2008 onwards, the initial commercial production stage for C100N. His second witness statement addressed a point that was ultimately not pursued by Neo. His third witness statement addressed the question of what he considered he could and would have done if he had been instructed to avoid infringing Rhodia's patent.

28. When cross-examined, Mr Williams was a clearly knowledgeable witness, who gave detailed answers to some very technical questions. I consider that his evidence was generally reliable, subject to two points concerning Neo's ability to produce a non-infringing product, and the dual-qualification of Neo's and Rhodia's cerium oxide products on automotive platforms. I discuss both points further below.

The expert evidence

29. Both parties relied on expert evidence on the quantum of Rhodia's losses, on the basis of a claim for lost profits or in the alternative a claim for royalties under a hypothetical licence.

30. Rhodia's expert was Mr Bezant of FTI Consulting; Neo's expert was Mr Boulton of Berkeley Research Group. Both experts had extensive experience in the assessment of damages for infringement of intellectual property rights, and had acted as expert witnesses in hundreds of cases before courts and tribunals in the UK and internationally. Each of them provided an initial first report, followed by a further report which responded to the initial comments of the other expert. Before the trial, both experts produced amended versions of their reports, making minor corrections to the figures in those reports. At the end of the hearing I was provided with a summary of the expert evidence, agreed between the parties, and a joint statement from the experts summarising the key issues in dispute relevant to their evidence.

31. The evidence of both experts at the hearing was straightforward and measured. Ultimately, the different calculations produced by the respective experts turned almost entirely on differences in the factual assumptions underpinning those calculations.

Factual background

The patented product

32. Automotive catalyst systems (colloquially known as catalytic converters) have been used for some time to reduce the emission from vehicle exhausts of noxious gases such as nitrogen oxide. The European market for automotive catalysts is driven by the EU emissions standards that car manufacturers are legally required to meet. The current Euro 6 standard was introduced from 2014, and tightened emissions requirements particularly with regard to nitrogen oxide ("NOx") emissions from diesel vehicles. This standard is set to be replaced by the Euro 7 emissions standard in 2025.

33. Cerium oxides, made from the rare earth metal cerium, are often added to automotive catalysts to enhance their performance. They have the property of absorbing, storing and desorbing oxygen, which allows for the conversion of NOx elements in exhaust gases. To function efficiently in catalyst systems, however, the cerium oxide materials need to maintain a high surface area at the temperatures encountered in those systems.

34. In the production of a catalyst system, the cerium oxide materials are mixed with the other catalyst components to form what is called a "washcoat", which is coated onto a substrate that is typically a ceramic cylinder. The coated substrate is then encased in steel by a "canner", before being incorporated into the vehicle exhaust system by the car manufacturer. The three main "washcoaters" in Europe are BASF, Umicore and JM; their customers are in turn the car manufacturers, often referred to as Original Equipment Manufacturers, or OEMs.

35. Rhodia manufactures HSA cerium oxide products, including in particular HSA20, which it sells to JM. Its HSA cerium oxide products are manufactured in two plants: the Anan Kasei plant at Anan in Japan, and a plant at La Rochelle in France. Its patent has five product claims followed by three method claims, and a final claim to a catalyst for purifying exhaust gas with a co-catalyst consisting of ceric oxide of claim 1. Claim 1 is for a ceric oxide with a surface area of not smaller than $30m^2/g$ when subjected to calcination at 900ºC for 5 hours.

36. Neo is also a supplier of cerium oxide products, which it manufactures at its facility in China, Zibo Jiahua Advanced Material Resources ("ZAMR"). For the purposes of this damages inquiry, the relevant cerium oxide products supplied by Neo to JM were referred to as C100 and C100N. Roger Wyand QC found in his liability judgment that both products infringed claims 1, 3, 4 and 5 (but not 2) of Rhodia's patent.

Neo's supply of C100 and C100N development samples to JM

37. The production of an automotive catalyst system involves a long development process. In the present case the timeline began in around 2008 when Neo sent JM (in the UK) a development sample of a C100-type cerium oxide product. A further sample may have been sent in 2009. In mid-2010 a modified C100 sample was sent to JM following a request from the latter. It is common ground that these supplies were outside the limitation period and Rhodia does not, therefore rely upon them. They mark, however, the beginning of Neo's discussions with JM as to the provision of an HSA cerium oxide product that would compete with HSA20.

38. Several years later, on 7 February 2011, a chemist who worked in the NOx development group at JM's Royston facility sent an email to Mr Williams, saying

> "I am interested in your ceria products. We received a couple of years ago a ceria called C-100 … As our current amount of C-100 is running low, I wanted to know if this material is still available to order … Alternatively do you have other ceria with high surface area?"

39. That resulted in the supply of 5kg of C100 to JM in mid-February 2011. A further supply of 1.5kg of C100 was sent in July 2012, and another 25kg in October 2012.

40. JM considered the C100 product to be too expensive. It was, however, willing to consider an alternative version of the product, provided that the product satisfied its requirements as to the surface area, particularly when "aged". As Mr Williams recorded in an email to ZAMR in December 2012:

> "JM are concerned about the price of C100 which is high because of [REDACTED]. They are willing to test alternative materials. The aged SA [surface area] at 800/3hr must be at least about 45m2–50m2 if we are going to have any chance of getting them to test a new sample."

41. The comment as to aged surface area reflected the fact that JM's benchmark requirements for the aged surface area of the product were based on calcination

at 800ºC. During Neo's development process, Neo typically tested its product following calcination at that temperature for 3 hours, whereas it appears that JM's laboratory tests were based on calcination at 800ºC for 24 hours. In both cases, those measurements differed from the benchmark used in claim 1 of the patent of 900ºC for 5 hours (although as explained below Neo did test some of its C100N commercial product against the claim 1 benchmark in 2016).

42. Following JM's comments as recorded above, Mr Williams and ZAMR went on to develop a lower cost version of C100, which is what became C100N. On 18 February 2013 Mr Williams sent ZAMR a request for a 15kg sample of that "new process" C100 product, "Specs as per standard c100 product". That sample was sent on to JM in March 2013, with the sample number of **AB0888Z**.

43. Following tests on that sample, JM's feedback in May 2013 noted that "the NO2 uptake for AB0888 was similar to our reference" but commented that "the surface area measurements showed collapsing upon oven ageing (800/24) and also showed a lower surface area in comparison to our reference material. Any improvements you could make to enhance the surface area, particularly after ageing would be desired".

44. Accordingly, Mr Williams asked ZAMR whether it would be possible for the "new" C100-type material to be made with a higher fresh surface area. On 1 July 2013 he submitted a request for a 10kg sample of "new process c100 [REDACTED] to give fresh SSA > 200m2/g. all specs as per standard C100 production spec." That produced a sample with a reference **AB0931Z**.

45. Meanwhile, however, on 28 June 2013 Mr Williams had a meeting at JM Royston at which Neo's new C100 product was one of the topics for discussion. His internal note following that meeting recorded that

> "• C100 is a hot topic. There is an urgent and current need for our new-C100 processed material.
> • New C100 has equivalent aged performance to competitor but higher fresh surface area desirable.
> • Brings delta SA [surface area] drop in line with current benchmark (Rhodia material) so like-for-like replacement.
> • Bulk volumes for pure cerium oxide will come on-line Q4'13 and increase incrementally from ballpark [REDACTED].
> • European platforms are driver in near-term in line with EuroVI tier legislation.
> • ZAMR must meet this demand. By August, line will be completed. R&D have reduced reflux time from 20hr to 10hrs, so new submissions will use the latter."

46. Shortly after that meeting, on 15 July 2013 JM sent Mr Williams an email asking "Is there any chance that we could order from you around 50kg of AB0888Z?" It appears from this that JM had by then decided that Neo's new product might indeed be suitable for it to use, notwithstanding the earlier misgivings. That is consistent with JM's comments at the meeting that Neo's product had equivalent aged performance to Rhodia's competing product.

47. The following day, Mr Williams sent an email to ZAMR saying that "JM need 50kg of new c100 (10hr reflux, normal standard Fresh surface area like ab0888z) ASAP for customer test". That was followed with a formal sample request for 50 kg "New process c100 WITH 10HR REFLUX. Reference specs as per AB0888Z". The sample provided was given a reference number of **AB0936Z**.

48. The AB0931Z and AB0936Z samples appear to have been received by Mr Williams at Abingdon around the end of July. They were then despatched to JM, with each sample (as was Neo's practice) accompanied by a Certificate of Analysis ("CoA") recording JM as the customer. The CoA for AB0931Z recorded the product as being "new C100 HIGH FRESH SA"; for AB0936Z the CoA recorded the product as simply "new C100".

49. In addition to the sample reference numbers, each CoA listed a Technology Sample Reference ("TSR"): these were given as AB0931Z and AB0936Z respectively. Mr Williams explained that the TSR for a product is a reference used for Neo's internal purposes, and should in principle record the AB number of the first development sample made from a particular process. Accordingly, if a customer asked for more of a certain development sample, the new material would bear a new AB development sample number, but its TSR should match the number of the original development sample. Mr Williams said, however, that this process was applied inconsistently, and Neo's position (disputed by Rhodia) was that the TSR for sample AB0936Z should have been given as AB0888Z.

50. On 5 August 2013 Mr Williams sent JM an email entitled "Samples on way …" which went on to say:

> "Quick heads up. Make sure you have your weetabix Wednesday morning!
>
> 21 tubs will be delivered to Gate 16 by DHL courier, including the 2 x 50kg [REDACTED] + 10kgs (high FSA new C100) + 50kgs (new C100 standard SA as 888z) + 2 x 10kgs [REDACTED].
>
> COAs and MSDS documents enclosed."

51. It is common ground that the reference to the 10kg of "high FSA new C100" referred to AB0931Z, and the reference to the 50kg of "new C100 standard SA as 888z" referred to AB0936Z.

52. An email from Karen Brown at Neo, who managed the commercial relationship with JM, to Mr Williams on 25 September 2013 reported back:

> "Speaking to the buyer side of JM
> …
> But the last sample of c100 has been giving good results and is going for further tests, hopeful platform for next year.
> Also another sample tested by Dan S, looks promising, the person at the buyer side will give me the exact sample number later today, did not have it in front of her"

53. A follow-up email later that day to Ms Brown from someone in the purchasing department at JM (presumably Ms Brown's contact referenced in her email to Mr Williams) said "The material that I was referring to is AB0888Z and is looking quite positive."

54. Around this time, Neo appears to have given its "new C100 process" product with the "standard" surface area as on AB0888Z the product number C100N. An internal Neo R&D slide deck, which was updated on 3 October 2013, had a slide referring to C100N with JM as the customer, noting:

> "• Samples: Submitted C100N process material
> • Status: Performing well
> • Next steps: Need to assure JM that this material is IP-Free. Define what is needed for this."

55. On 28 October 2013 JM sent Mr Williams an email asking for another "couple of tubs of AB0888Z CeO2 – 50Kg?" and added "trying to push through characterisation of your latest materials, so hopefully some results soon". The same day, Mr Williams emailed ZAMR:

> "JM need 50kg of new c100 (TSR-AB0888Z).
> Do we have production material available?
> Please confirm a leadtime.
> This is for prototyping samples for their customers."

56. The next day Mr Williams emailed the formal sample request to ZAMR, asking for "New process c100 WITH 10HR REFLUX. Reference specs as per AB0888Z/937z". In the cover email he added:

> "This is very important sample. If this material works well, we get the business for ZAMR.
>
> Make sure material selected to send to JM is best we can make. Do not rush it."

57. The CoA for that sample, dated 15 November 2013, gave a sample reference of **AB0954Z** and a TSR of AB0888Z. It is common ground that this sample was made on ZAMR's production facilities, whereas the previous samples had been made on the pilot plant.

58. An internal Neo slide deck which appears to have set out results from November 2013 recorded "C100 / old-new process: JM happy with C100N performance and continue to move toward certification".

59. On 4 December 2013 JM sent Mr Williams a set of data on the materials provided by Neo. The covering email stated:

> "Please find attached some data on the latest batch of raw materials you sent us – apologies for the delay with this – finally got stuff I needed from characterisation so I had a mammoth plotting session."

60. The presentation recorded data for tests of what was referred to as "AB0888Z", AB0931Z and a further sample, against an unspecified reference product which was understood to be Rhodia's HSA20. The conclusion was that the "standard" cerium oxide product, i.e. the sample referred to as AB0888Z, had similar surface area to the reference product, whereas AB0931Z had a much higher fresh surface area, "but suffers significantly upon ageing".

61. JM did not, therefore, pursue development of the AB0931Z product, but proceeded with what it referred to as AB0888Z.

62. I need at this point to address Mr Mitcheson's submission that the product tested at that stage was the original batch of AB0888Z rather than the subsequent batches of AB0936Z (sent in August 2013) and AB0954Z (sent in November 2013). He said that there was no evidence to show that JM had tested those two later samples, or even that it had received AB0954Z.

63. I accept that the batch of AB0954Z sent in November 2013 may well have been received by JM too late to be included in this analysis. But I reject the suggestion that the product tested at this point was the original AB0888Z sample rather than AB0936Z. The "Weetabix email" of 5 August 2013 made clear that JM was about to receive the 50kg AB0936Z sample of Neo's standard surface area product, corresponding to the AB0888Z specification, which JM had requested, in the same delivery as the sample of AB0931Z which had a higher fresh surface area. JM's email on 28 October 2013 which said "trying to push through characterisation of your latest materials" was, in my judgment, obviously a reference to that delivery of materials.

64. That is entirely consistent with the similar reference to tests being carried out on "the latest batch of raw materials", in the 4 December 2013 emails. Given that AB0931Z was undoubtedly one of the samples in those tests, the product referred to as AB0888Z in the analysis can only have been AB0936Z, which was received alongside AB0931Z. It would certainly have made no sense for JM to have been referring (on either 28 October or 4 December) to the original AB0888Z sample, which had been sent to it in March 2013 and which had already been tested.

65. It is, moreover, clear from the correspondence that both JM and Neo used AB0888Z as a shorthand for the desired specification of the product. That is why JM asked Neo for "50kg of AB0888Z" on 15 July 2013, and Mr Williams' subsequent email to ZAMR referred to "Fresh surface area like ab0888z". When sample AB0936Z was received, the "Weetabix email" likewise described that sample as being "new C100 standard SA as 888z". It is therefore not surprising that when JM analysed that material it referred to it as AB0888Z. That did not, however, mean, that it was referring specifically to the original batch of AB0888Z sent in March.

66. As for the AB0954Z sample, as indicated above that may well not have been included in the tests recorded on 4 December 2013. But it is, in my judgment, very unlikely that this was not delivered to and tested by JM. It is apparent from Mr Williams' email to ZAMR on 28 October 2013 that JM had asked for the 50kg sample for use in prototyping samples for JM's customers. Mr Williams was at pains to emphasise that this was a "very important sample" that would be key to

winning the business for ZAMR. There is no doubt that the sample was received by Neo in Abingdon, since it was tested for the purposes of these proceedings. Given the evident importance of the sample, I consider it highly improbable that once received by Neo it was not dispatched to JM, especially as the contemporaneous documents show that a CoA was prepared for that sample, listing JM as the customer.

67. If JM had (for some reason) not received that batch, I would have expected to see an email chain recording that fact and asking for more product to test. The absence of any such correspondence, and the fact that the next order from JM was an order for 200kg in December 2013, apparently for fleet trials, indicates that JM did indeed receive the AB0954Z sample, used it for prototyping as Mr Williams had understood to be the case, and on that basis had determined that Neo's product was suitable for use in fleet trials.

68. The contemporaneous evidence therefore indicates that both the AB0936Z and AB0954Z samples were indeed received and tested by JM.

Neo's supply of commercial C100N to JM

69. From 2014 onwards Neo's supplies to JM were of the commercial product C100N, made on Neo's production facility. As with C100, it follows from the liability judgment that all of the supplies of C100N made to the UK were infringing.

70. On 4 December 2013, the same day as the email from JM with the test results for Neo's materials, Neo received an order for 200kg of "AB0888Z". Mr Williams' email to ZAMR recorded:

> "Good news. You will receive an order for 200kg new c100 from JM within next week. This material is to be used for customer fleet trials, the last step in the catalyst certification programme in Europe.
>
> It will open the door to bulk production in 2014.
>
> Please can we prepare 200kg of new production c100 ready for shipment to JM.
>
> Make sure the material we send is from the best lot!!!!!"

71. That order was supplied by Neo to JM in two batches, with the first 150kg sent around the end of January 2014, and the balance in April 2014. Thereafter, Neo supplied various further quantities of C100N to JM in the UK, and an initial specification for the product was agreed between JM and Neo in September 2014. This provided for a minimum aged surface area of $65m^2/g$, with a target of $70m^2/g$. The specification was revised in around March 2016, to require an aged surface area of $60–90m^2/g$.

72. The first overseas supplies were made in May 2015 (to Macedonia) and July 2015 (South Africa). In each case Neo sent 500kg which, it is common ground, was used for the first production batches (also known as the validation batches) from

those factories. Following those initial supplies, Neo continued to supply JM's overseas facilities with C100N, in volumes that are the subject of the present damages inquiry. Supplies were also made to JM via a third party "toll location" in the Netherlands. Alongside those overseas supplies, Neo continued to supply smaller quantities of C100N to the UK until 2017.

The tested surface area of the relevant development samples and commercial C100N

73. For the purposes of this damages inquiry, the focus of the parties' arguments was on the infringement of claim 1 of the patent, which specified a specific surface area of at least $30m^2$ after calcination at 900ºC for 5 hours.

74. The liability judgment in this case found that certain samples of Neo's C100 product infringed that claim. The subsequent development samples of the "new" C100 process product, which became C100N, were tested by an independent laboratory for the purposes of these proceedings; the results were that AB0888Z infringed, but the other two development samples of that type did not (nor did AB0931Z, which was not ultimately pursued by JM for the reasons given above).

75. As for the commercial product C100N, the liability judgment found that this infringed claim 1 of the patent. I was also shown an Excel spreadsheet prepared by Mr Williams dated February 2016, which showed tests on 66 batches of C100N. All 66 batches had been tested against the criteria in the 2014 working specification; four of the 66 batches had been tested against the claim 1 benchmark of 900ºC/5 hours. All four of those infringed claim 1 of the patent. The average surface area across the four samples, at 900ºC/5 hours, was $38.625m^2/g$.

76. The results of the laboratory tests on the AB0888Z-type development samples, and Neo's own tests on C100N, can be summarised as follows.

Sample reference	*Amount*	*Area 800ºC/3 hrs (m^2/g)*	*Area 900ºC/5 hrs (m^2/g)*	*Infringing*
AB0888Z	15kg	70.62	29.5±1	Yes
AB0936Z	50kg	75.98	26.9±1.5	No
AB0954Z	50kg	73.45	16.2±0.8	No
C100N lot 3		68.81	35.96	Yes
C100N lot 13		77.30	41.14	Yes
C100N lot 32		80.34	44.28	Yes
C100N lot 60		71.58	33.12	Yes

77. When asked about the anomalous result for AB0954Z (shaded in the table above), Mr Williams said in his oral evidence that this must have been an error. On the

basis of the figures set out above, that comment was in my judgment clearly correct. I note, however, that in the order of Mr Wyand QC following the liability trial that sample was found to be non-infringing, and there was a debate as to whether I am bound by that finding given the evidence of Mr Williams. I do not need to resolve that question given my findings below as to the relevance of that sample.

Issues for determination

78. The heads of damage pursued by Rhodia distinguish between losses consequential to the supply of C100N commercial products in the UK (Head 3), losses consequential to the supply of development samples in the UK (Head 4), and losses from sales post-patent expiry in both cases (Head 9). In practice, however, these heads of loss have been addressed together by both parties. The issues arising for determination, in respect of these three heads of loss, are as follows.

Overarching issues

79. The overarching issues are whether Neo should be liable for damages at all in respect of the overseas supplies of C100N, on any of the following bases contended for by Neo:

    i) That as a matter of principle, the overseas sales fell outside the territorial scope of duty under the UK patent.

    ii) That Neo could have supplied a non-infringing alternative to JM in the UK, such that in the counterfactual case without the infringement Rhodia would still not have captured the sales of the Neo volumes.

    iii) That although the overseas sales were admitted to be foreseeable, the most proximate causes of those sales were the manufacture in China, export and overseas sales of C100N, all of which were non-infringing acts, and that the procurement decisions taken by JM at its individual production plants were a further break in the chain of causation. Neo also said that insofar as the overseas sales were causally linked to the development samples supplied in the UK, the "critical tipping point" resulted from the supply of the apparently non-infringing samples AB0936Z and AB0954Z.

Loss of profits

80. If the overarching arguments all fail, the next question is the extent to which Neo should pay damages on a lost profit basis. This involves consideration of the following issues:

    i) Whether Rhodia had the capacity to supply Neo's volumes during the relevant period.

    ii) The reliability of Rhodia's evidence of its costs of manufacturing HSA20.

    iii) Whether the price of the counterfactual sales by Rhodia should be Neo's price for C100N, or Rhodia's HSA20 prices.

iv) Whether any damages for future trade with JM should be calculated on the basis of Neo's sales forecasts, or JM's factory forecasts.

Licence fee damages

81. Insofar as Rhodia would have not had the capacity to make Neo's sales (for the whole or any part of the period claimed) such that damages are to be calculated on a licence fee basis, the issues are:

i) Whether the settlement of Head 1 of Rhodia's damages claim precludes any further claim for licence fee damages arising from the commercial supply of C100N in the UK.

ii) Whether Rhodia's pleaded licence fee claim was consistent with the evidence of its expert Mr Bezant, and if not whether that requires the rejection of the global royalty claim altogether.

iii) Insofar as a global royalty claim is sustainable, whether the hypothetical negotiation for a licence fee should assume that Neo could have charged Rhodia's price for the relevant volumes.

iv) The percentage of the relevant contribution margin which Rhodia would have obtained in that hypothetical negotiation.

Legal framework: general approach

82. The general approach to the assessment of damages resulting from patent infringement is by now well established. It was summarised by Kitchin J in *Ultraframe (UK) v Eurocell Building Plastics* [2006] EWHC 1344 (Pat) at §47 as follows:

> "(i) Damages are compensatory. The general rule is that the measure of damages is to be, as far as possible, that sum of money that will put the claimant in the same position as he would have been in if he had not sustained the wrong.
>
> (ii) The claimant can recover loss which was (i) foreseeable; (ii) caused by the wrong; and (iii) not excluded from recovery by public or social policy. It is not enough that the loss would not have occurred but for the tort. The tort must be, as a matter of common sense, a cause of the loss.
>
> (iii) The burden of proof rests on the claimant. Damages are to be assessed liberally. But the object is to compensate the claimant and not to punish the defendant.
>
> (iv) It is irrelevant to a claim of loss of profit that the defendant could have competed lawfully.
>
> (v) Where a claimant has exploited his patent by manufacture and sale he can claim (a) lost profit on sales by the defendant that he would

> have made otherwise; (b) lost profit on his own sales to the extent that he was forced by the infringement to reduce his own price; and (c) a reasonable royalty on sales by the defendant which he would not have made.
>
> (vi) As to lost sales, the court should form a general view as to what proportion of the defendant's sales the claimant would have made.
>
> (vii) The assessment of damages for lost profits should take into account the fact that the lost sales are of 'extra production' and that only certain specific extra costs (marginal costs) have been incurred in making the additional sales. Nevertheless, in practice costs go up and so it may be appropriate to temper the approach somewhat in making the assessment.
>
> (viii) The reasonable royalty is to be assessed as the royalty that a willing licensor and a willing licensee would have agreed. Where there are truly comparable licences in the relevant field these are the most useful guidance for the court as to the reasonable royalty. Another approach is the profits available approach. This involves an assessment of the profits that would be available to the licensee, absent a licence, and apportioning them between the licensor and the licensee.
>
> (ix) Where damages are difficult to assess with precision, the court should make the best estimate it can, having regard to all the circumstances of the case and dealing with the matter broadly, with common sense and fairness."

83. The principles set out in that summary were common ground before me, save for point (iv) as to the irrelevance of the fact that the defendant could have competed lawfully. That was disputed by Neo and is one of the overarching issues of principle that I have to determine. As to point (v), while there is some evidence of a price constraint on Rhodia due to competition from Neo, that does not form any part of Rhodia's claim, which as set out above is put solely on the basis of a claim for lost profits on sales that it would otherwise have made, or alternatively a licence fee claim for sales that it would not have made.

84. The parties were also in agreement that while the principles set out by the Supreme Court in relation to the tort of negligence, in the cases of *Manchester Building Society v Grant Thornton* [2021] UKSC 20, [2021] 3 WLR 81 and *Meadows v Khan* [2021] UKSC 21, [2021] 3 WLR 147, are of some relevance in considering the assessment of (in particular) scope of duty and causation, they do not substantially modify the established framework for a damages inquiry in the specific context of patent infringement.

85. As to the approach to the court's assessment of what would have happened if the infringement had not been committed, the following principles emerge from the authorities:

i) The assessment of what would have happened in the counterfactual case is not a matter susceptible of precise estimation: "one cannot expect much in the way of accuracy when the court is asked to re-write history": *Gerber v Lectra* [1995] RPC 383, 395.

ii) The court's task is therefore to do the best it can with the material available to it: *General Tire and Rubber Company v Firestone Tyre and Rubber Company* [1975] WLR 819, 826; *Original Beauty Technology v G4K Fashion* [2021] EWHC 3439 (Ch), §75.

iii) Where the defendant's wrongdoing has created uncertainties, those should where necessary be resolved by making assumptions generous to the claimant: *Gary Fearns v Anglo-Dutch Paint* [2010] EWHC 1708 (Ch), §70. Green LJ commented to similar effect in *NTN Corp v Stellantis* [2022] EWCA Civ 16, §26 that where a claimant has a justiciable right the procedural and evidential rules governing the enforcement of that right should not be so onerous that it makes the right too hard to vindicate.

iv) The court should also have regard to the extent to which it was in the power of one or other party to produce evidence on a particular point: see the principle stated by Lord Mansfield in *Blatch v Archer* (1775) 1 Cowp 63, 65, cited with approval by Lord Bingham in *Fairchild v Glenhaven* [2002] UKHL 22, [2003] 1 AC 32, §13.

86. With those general principles in mind, I turn to the specific issues for determination in this case.

Extraterritorial sales

87. The first point is whether, as a matter of principle, Rhodia should be able to recover losses in respect of Neo's sales overseas, which were outside the territorial scope of the UK patent. Neo's primary argument was put as a matter of policy: that the scope of patent protection under s. 60 of the Patents Act 1977 is strictly limited to the territory of the UK, and that a claim for damages for extraterritorial sales therefore falls outside the scope of duty of the defendant. Neo contended that its argument was, conceptually, analogous to arguments concerning the scope of duty in the tort of negligence in cases such as *Banque Bruxelles Lambert v Eagle Star Insurance ("SAAMCO")* [1997] AC 191, and more recently the *Manchester Building Society* and *Meadows v Khan* cases.

88. Neo also contended that overseas sales should be excluded pursuant to the provisions of Article 3(2) of Directive 2004/48/EC on the enforcement of intellectual property rights [2004] OJ L157/45 (the "Enforcement Directive"). During the hearing and in his post-hearing written submissions Mr Cuddigan relied additionally on Article 41 of the TRIPS Agreement.

The scope of duty point

89. I have some doubt as to whether the concept of the scope of duty in the tort of negligence (which arises because of the requirement under common law for a duty of care, as a central element of that tort) can readily be transposed to the

context of an infringement of intellectual property rights, which involves the breach of statutory rights – in this case an infringement defined by the Patents Act 1977.

90. Nor does the Patents Act itself circumscribe the scope of damages that may be claimed for an infringement of a patent. While an infringement itself under s. 60 is undoubtedly territorially limited, s. 61(1)(c) of the Patents Act provides simply that a claim may be made "for damages in respect of the infringement", without limiting the types of loss that may give rise to those damages.

91. In principle, therefore, the question of damages for a patent infringement should fall to be addressed on the basis of the general tortious principles of causation and remoteness. Indeed, in the present case Neo frames the point, in the alternative, as a question of remoteness.

92. In any event, however, whatever the nomenclature, the scope of damages that may be claimed from the infringement of a patent cannot in my judgment be limited *a priori* and as a matter of principle to losses arising from sales made within the UK.

93. The starting point is that it is well-established that a patentee can recover damages in respect of lost sales of goods that are not covered by the patent that has been infringed. The classic case is that of *Gerber v Lectra*, where sales of the patented CAM machined gave rise to associated (or "convoyed") sales of non-patented CAD machines, as well as follow-on sales of spare parts and servicing. Jacob J at first instance found that damages could be recovered in respect of the associated and follow-on sales, and his judgment in that regard was upheld on appeal: [1997] RPC 443.

94. As Staughton LJ recorded in the appeal, the defendant had contended that "the activities of the infringer that do not in themselves constitute infringements cannot form part of a claim for lost profits", again by analogy with the scope of duty concept in the tort of negligence, as set out in *SAAMCO*: see pp. 451–3.

95. That argument was robustly rejected, on the grounds that no such limitation was to be found in the Patents Act, which was aimed at protecting patentees from commercial loss resulting from the wrongful infringement of their rights, with no distinction drawn between profit on the sale of patented articles and profit on the sale of convoyed goods (pp. 451 and 453). Nor, in the previous cases, was there any rule of law which limited the damages for infringement in a patent case in such a way as to exclude the loss claimed by the patentees (p. 455).

96. Staughton LJ concluded at p. 456 that:

> "the assessment of damages for infringement of a patent is in my judgment a question of fact. There is no dispute as to causation or remoteness in the present case; nor can I see any ground of policy for restricting the patentees' right to recover. It does not follow that, if customers were in the habit of purchasing a patented article at the patentee's supermarket, for example, he could claim against an infringer in respect of loss of profits on all the other items which the

> customers would buy in the supermarket but no longer bought. The limit there would be one of causation, or remoteness, or both. But the present appeal, in so far as it seeks to restrict the scope of recovery, should be dismissed."

97. The only difference between Neo's argument in the present case and the argument that was rejected in *Gerber* is that Neo's objection is to losses claimed in respect of non-infringing overseas sales. That is, however, simply a subset of the more general proposition regarding sales of non-infringing products, which was considered and rejected as set out above. While the facts of *Gerber* involved convoyed sales within the UK, the reasoning of Staughton LJ is general in nature and applies equally to sales made outside the UK, subject to the assessment of causation and remoteness.

98. That was also the conclusion reached by Birss J in *IPCom v HTC* [2020] EWHC 2914 (Pat), noting at §17 that:

> "*Gerber* is important for establishing that losses caused by infringement of a patent may arise from acts which were not themselves infringements. A good example is convoyed goods sold along with the patented product. A patentee may sell the patented article for (say) little profit but at the same time sell another highly profitable product or a service along with the patented article. Sale of an infringing article by the defendant may cause the patentee lost sales of patented articles and thereby also cause loss of the large profits on the goods or services convoyed with them. Whether that is so in a given case is a question of fact. *Gerber* put to bed the argument which had been made before that, that damages for these non-infringing activities were 'parasitic' and not available as a matter of law. Note that this principle is capable of applying to acts overseas too, in the sense that the fact the convoyed sale happened to take place outside the territory of the patent would be no answer as long as the act was in fact caused by an act of infringement of the UK patent."

99. Birss J also commented at §38 that in a case where the defendants manufactured in the UK but sold overseas, damages calculated by reference to the economic consequences of acts done abroad might well be recoverable, where those acts were caused by infringements of the UK patent.

100. Neo rightly points out that these comments were *obiter*, since on the facts of *IPCom* the judge found that the relevant overseas sales were *not* caused by the infringements of the UK patent. I consider, however, that those comments correctly summarise the effect of the ruling in *Gerber v Lectra*.

101. Similar comments have been made in cases concerning the grant of so-called "springboard" injunctions. In *Kirin-Amgen v Transkaryotic Therapies (No. 2)* [2002] RPC 3 the question arose as to whether Amgen could prevent the use of infringing material made in the UK being used in clinical trials abroad to obtain European regulatory approvals. While Neuberger J refused Amgen permission to amend its claim to include an extraterritorial injunction, he accepted at §57 that "there might be a valid claim for damages in respect of activities abroad if they

result from infringement in the jurisdiction". The question would have to be decided, he said, by reference to "normal tortious principles" in accordance with the guidance given in *Gerber v Lectra*.

102. More recently, in *Smith & Nephew v Convatec* [2014] RPC 2, Birss J considered at §130 that in an appropriate case the court could grant an injunction restraining the defendant from making sales in the UK and elsewhere in the EU after the expiry of the relevant UK patent. He reasoned that damages in respect of those sales might in principle be recoverable, on the basis of *Gerber v Lectra*, and that if that was the case then there was no reason why an injunction could not be granted to prevent the harm occurring in the first place. It was not suggested that the fact that the claim extended to sales throughout Europe would in principle bar any claim for either damages or an injunction.

103. I was also referred to a judgment of the Scottish Court of Session in *Bayer Cropscience v Charles River Laboratories* [2010] CSOH 158, the court ordered an account of profits in relation to sales in the United States of insecticide products made after the expiry of the relevant UK and US patents, but which were said to have been enabled by the (infringing) testing of the product in the UK prior to the expiry of the patent. The court considered that there was nothing which in principle precluded the grant of "springboard" relief on this basis. Again following the reasoning in *Gerber v Lectra*, the court said that the basic issue was simply "whether there is a sufficient link or nexus between the wrong and the ultimate financial consequences" (§8).

104. Finally but by no means of least importance, both parties referred me to the 2018 judgment of the US Supreme Court in *WesternGeco v Ion Geophysical* 138 S. Ct. 2129, in which the court considered whether damages could be claimed in respect of extraterritorial sales of an ocean floor surveying system. The system used components that had been manufactured in the US before being exported to various companies abroad.

105. The claim was based on s. 271(f)(2) of the US patent statute, which covers the exportation of components that are adapted for an invention which would, if combined within the US, infringe a US patent. The Federal Circuit had rejected the claim on the basis that s. 271(f)(2) did not allow patentees to recover for lost foreign sales. That decision was reversed by the Supreme Court, with the majority finding that the relevant conduct regulated by the statute was the domestic act of supplying the components that infringed WesternGeco's patent. The damages awarded on that basis were simply the means by which the statute remedied infringements. The court noted, however, that in reaching this conclusion "we do not address the extent to which other doctrines, such as proximate cause, could limit or preclude damages in particular cases".

106. The ruling of the majority followed the position taken in the *amicus curiae* brief submitted by Professor Stephen Yelderman, in support of WesternGeco. Rhodia also referred me to an article by Tom Cotter, "Extraterritorial Damages in Patent Law", 39 1 (2021), endorsing the majority ruling. In a dissenting judgment, however, Gorsuch J and Breyer JJ considered that WesternGeco should *not* be entitled to lost profits caused by conduct outside the US, since that would

effectively allow US patentees to extend their patent protection to foreign markets.

107. Rhodia unsurprisingly relied upon the conclusion of the majority of the Supreme Court; Neo effectively asked me to adopt the dissenting position.

108. In my judgment, the majority ruling of the Supreme Court in *WesternGeco* is consistent with the position taken in the domestic authorities that I have referred to above. As the majority of the Supreme Court commented, it is important not to conflate the infringement with the damages arising from that infringement. While patent protection under the Patents Act 1977 is limited to the territory of the UK, that does not mean that the patentee should be unable in principle to recover damages in respect of losses arising from sales outside the UK, if there is a sufficiently direct causal nexus between the patent infringement and those losses, and the losses are not regarded as too remote to be recoverable.

109. I therefore reject Neo's argument that recovery by Rhodia in respect of losses arising from the overseas sales in this case should be excluded *a priori* on the basis of the territorial scope of the protection conferred by a UK patent.

Enforcement Directive/TRIPS

110. Article 3 of the Enforcement Directive provides:

> "1. Member States shall provide for the measures, procedure and remedies necessary to ensure the enforcement of the intellectual property rights covered by this Directive. Those measures, procedures and remedies shall be fair and equitable and shall not be unnecessarily complicated or costly, or entail unreasonable time-limits or unwarranted delays.
>
> 2. Those measures, procedures and remedies shall also be effective, proportionate and dissuasive and shall be applied in such a matter as to avoid the creation of barriers to legitimate trade and to provide for safeguards against their abuse."

111. Article 41(1) of the TRIPS Agreement likewise provides that enforcement procedures in relation to the infringement of intellectual property rights covered by the Agreement "shall be applied in such a manner as to avoid the creation of barriers to legitimate trade", and Article 42(2) provides that such procedures shall be "fair and equitable".

112. Neo's submission was that an award of damages based on overseas sales would be contrary to either or both of Article 3 and Article 41, on the basis that it would create a barrier to legitimate trade. Neo also said that the principle of proportionality would be infringed, since Neo's UK sales of commercial C100N amounted to only around 4.5 tonnes, whereas Rhodia was seeking damages on past and future sales amounting to [✂] tonnes. The volume of non-infringing product was therefore [✂] times the volume of infringing product.

113. An initial question that arose from those submissions was the status of Article 3 of the Enforcement Directive following the withdrawal of the UK from the EU, in circumstances in which Article 3 was not transposed into domestic legislation under the Intellectual Property (Enforcement, etc) Regulations 2006. Rhodia said that Article 3 was, on that basis, not retained EU law and therefore no longer part of UK law. Neo contended that the domestic courts have consistently recognised the obligation to give effect to Article 3 of the Enforcement Directive when considering the remedies for intellectual property infringement: see for example *Merck v Merck Sharp & Dohme* [2017] EWCA Civ 1834, [2018] ETMR 10, §307 and *Cartier International v BSkyB* [2018] UKSC 28, [2018] 1 WLR 3259, §28.

114. Both parties, however, realistically recognised that this debate was of limited significance given that Article 41 of TRIPS contains very similar obligations to those relied upon by Neo by reference to the Enforcement Directive, and there was no dispute that the remedies sought in these proceedings are subject to the provisions of TRIPS.

115. In any event, and more importantly, I do not consider that the remedy sought by Rhodia in this case is inconsistent with either Article 3 of the Enforcement Directive or Article 41 of TRIPS. There is no obvious reason why a claim for lost profits from overseas sales should be regarded as any more disproportionate than a claim for lost profits from the domestic sale of a non-patented convoyed product. In both cases the sale of the non-infringing product may well turn out to be more profitable than the supply of the infringing product. In both cases recoverability of damages is limited by the usual principles of causation and remoteness. If the claimant is able to show that the loss was foreseeable and that there is a sufficiently proximate causal connection between the infringement and the loss claimed, then it is difficult to see why the claimant's recovery of that loss should be regarded as disproportionate.

116. Nor (in similar vein) is there any reason why a claim for damages in respect of non-infringing overseas sales should be regarded as creating any more of a barrier to legitimate trade than a claim in respect of non-infringing domestic sales, which might equally involve an international supply chain. There was, notably, no suggestion by the courts in *Kirin-Amgen*, *Smith & Nephew v Convatec* or *Bayer Cropscience* that extraterritorial relief would be contrary to the Enforcement Directive; on the contrary in *Smith & Nephew*, Birss J explicitly commented at §130 that the order sought by Convatec (restraining post-patent expiry sales in the UK and elsewhere in the EU) would in a proper case fall within Article 3 of the Enforcement Directive, noting also that the ECJ had recognised in Case C-316/95 *Generics v Smith Kline & French* [1997] RPC 801 that such a remedy can be proportionate and would not be a barrier to intra-Community trade. As for TRIPS (whose signatories include the US), that did not preclude the award of damages in respect of extraterritorial sales in *WesternGeco*.

117. Irrespective of any question as to the ongoing application of Article 3 of the Enforcement Directive, therefore, I am satisfied that neither that provision nor Article 41 of the TRIPS Agreement precludes the award of the damages sought by Rhodia in the present case.

Non-infringing alternative

118. Neo's second overarching contention was that "but for" the infringement it would have been able to supply JM – and would in fact have supplied JM – with a version of C100N that did not infringe Rhodia's patent, and that JM would have accepted that product. On that basis, Neo contended that in the counterfactual case in which there was no infringement, it would have continued to make all the overseas sales to JM that it has in fact made since 2014.

119. That contention raises two questions. The first is whether, as a matter of law, it is open to Neo to rely on a "non-infringing alternative" argument as a defence to a claim for lost profits. That turns on the question of whether I can and should depart from the long-standing principle first established by the House of Lords in a Scottish appeal, *United Horse Shoe and Nail v John Stewart* (1888) 13 App Cas 401. The second question is whether Neo could and would in fact have supplied JM with a non-infringing alternative version of C100N in the counterfactual case.

The United Horse Shoe rule

120. The question as to the correct approach in law to a plea of "non-infringing alternative" was the subject of an application by Neo for summary judgment in this case, which was dismissed by Fancourt J in May 2021: [2021] EWHC 1035 (Ch). Among other reasons, the judge considered that this was an issue that should be decided on the basis of the actual facts of the case. On that basis the issue arises for determination now.

121. The *United Horse Shoe* case was a patent infringement dispute relating to machinery for making nails. The appellants sued for the infringement of two relevant patents, and obtained an injunction. In the subsequent damages inquiry, the respondents had admitted infringement of the patents, but said that they did not derive any material advantage from the infringement because the patented invention added no real value to the nails that they had sold. They also said that the appellants would not have captured their sales in any event.

122. Reversing the decision of the Court of Session in Scotland, the House of Lords (Lords Halsbury, Watson and Macnaghten) unanimously held that the utility of the patent could not be denied, given the admissions of infringement. As to the separate question of whether the appellants would have sold the nails that were in fact sold by the respondents, different views were expressed. Lord Halsbury said this (p. 409):

> "I think it is nothing to the purpose to shew, if it is shewn, that the defenders might have made nails equally good and equally cheap without infringing the pursuers' patent at all. I will assume that to be proved, but if one assumes that the nails which were, in fact, made by the pirated machines injured the pursuers' sales, what does it matter if it is ever so much established that the loss which the pursuers have sustained by the unlawful act of the defendants might also have been sustained by them under such circumstances as would give the pursuers no right of action?

> Your Lordships have to deal with the facts as they exist, and those facts, as I say, are that the defenders have in derogation of the pursuers' rights sold cases of nails which they had no right to sell, and for which to the extent to which they have interfered with the sale of the pursuers' patented nails the pursuers are entitled to damages."

123. Lord Macnaghten also considered that it was "beside the mark to say that the respondents might have arrived at the same result by lawful means, and that, without infringing the appellants' rights, they might have produced a nail which would have proved an equally dangerous rival of the 'Globe' nail". The sole question was, rather, what was the loss sustained by the pursuers by reason of the unlawful sale of the respondents' nails (p. 416).

124. Lord Watson, by contrast, thought that it was relevant to take account of the fact that, if the respondents had not sold the infringing brand of nails, they would have been in the market (as they had been previously) selling other nails. To ignore that "would be tantamount to giving the appellants not compensation merely, but profits which they would never have earned if the respondents had not infringed". He did not, however, consider that the defenders had proven that they would indeed have produced non-infringing nails of similar quality (p. 414).

125. In *Catnic v Hill & Smith* [1983] FSR 512, Falconer J reviewed the judgment in *United Horse Shoe*, as well as the *General Tire* case [1976] RPC 197, where Lord Wilberforce referred to *United Horse Shoe*. He also cited various parts of the judgments in *Meters v Metropolitan Gas Meters* (1911) 28 RPC 157, including the comment of Lord Cozens-Hardy MR at p. 160 that:

> "We are asked to say that there is no interference of any damage resulting from that because the plaintiffs' patent was not for the whole article, but merely for something quite trivial and unimportant, which the defendants might easily have got round by a slight substitution, as in fact they have got round it now, and obtained something better. That seems to me to be a wholly irrelevant consideration. The fact, admitted and proved, is that this very large sum of money has been received in respect of infringing instruments, and I am entirely unable to accept the view that this invention was of little importance, even if that had been a relevant fact, because the defendants, who had a meter known as the 'Plunger' meter, deliberately abandoned that, and deliberately took to making the new meter, called the 'Simplex' meter, which has been established to be an infringement of the plaintiffs' patent."

126. From those authorities Falconer J derived four principles as to the assessment of damages for patent infringement, including at (d) the principle that it was "immaterial" that in the case of a sale of an infringing product, the defendants could have sold a non-infringing product instead of the infringing one (p. 521). At pp. 524–5 the judge applied that proposition to the defendants' contention that if the defendants had not made and sold infringing lintels they would have made and sold non-infringing lintels and retained their share of the market. He considered that that argument was not open to the defendants in law, on the basis of his principle (d). He continued:

> "The *United Horse Shoe and Nail Co Ltd* case … is authority for the proposition that an infringer is barred from defeating a plaintiff patentee's claim for damages for loss of profits by saying: 'Yes, I infringed but I could have taken this market from you by not infringing.' … [A]s in my view the argument is wrong in law the evidence directed to it is irrelevant and I need not consider it further."

127. That proposition was considered to be settled law by Jacob J in *Gerber v Lectra*, commenting at p. 394 that the courts have "consistently rejected" the argument that liability can be avoided by a contention that the infringer could have competed with a non-infringing alternative product. The principles set out by Jacob J and the Court of Appeal in *Gerber v Lectra* were the main source of the principles summarised by Kitchin J in *Ultraframe*.

128. In *Coflexip v Stolt Offshore (No. 2)* [2003] EWCA Civ 296, [2003] FSR 31, the Court of Appeal was asked to review the status of the rule in *United Horse Shoe*, in the context of a question as to whether the appellants should be allowed to rely on amended points of claim. The Court allowed the appellants to amend their pleading in the manner indicated, holding that it was at least arguable that *United Horse Shoe* was still good law, such that it was irrelevant that the infringer might have performed the contracts in a non-infringing way (see in particular Aldous LJ at §§14, 21, 25, 32, 35, 37, 41).

129. More recently still in *MVF 3 APR (formerly Vestergaard Frandsen) v Bestnet Europe* [2016] EWCA Civ 541, where the appellant criticised the first instance damages award in a breach of confidence action as being in breach of the rule in *United Horse Shoe*, Floyd LJ rejected that criticism on the basis that the *United Horse Shoe* rule was not a "rule of universal application" (§90). He accepted, however, that the rule would apply in the context of claims for lost profits following a patent infringement, and described the rule as being, in that context, that "the court does not allow the defendant to seek to establish that it could have caused the same damage without infringing the patent" (§81).

130. Mr Cuddigan launched two main lines of attack on the application of the *United Horse Shoe* rule in this case. First, he referred to the headnote of *United Horse Shoe* itself for the submission that the *ratio* of the decision in that case was simply that the "mere possibility" that the respondents might have manufactured and sold similar nails without infringing the patent was not a ground for rejecting the damages claim. He said that if a defendant proves that but for the infringement it would nevertheless have captured sales from a patentee with a non-infringing product, that is a proper ground for declining to award lost profits for that sale.

131. I disagree. It is clear from the speeches of Lords Halsbury and Macnaghten that their conclusions were not reached on the basis that a "possibility" of non-infringing sales was not sufficient, whereas proof thereof would have been relevant. Rather, they considered that even if it were proven that the infringers could have made equivalent nails without infringing the patent, that was irrelevant in principle to the assessment of the patentee's loss. That is the interpretation which has been adopted consistently by both first instance and appellate courts in the subsequent cases set out above, and was also the interpretation of Fancourt J in the summary judgment application in these proceedings, at §99.

132. Mr Cuddigan's second line of attack was more fundamental. He said that the principle articulated in *United Horse Shoe* was wrong as a matter of policy, as a departure from the normal principles of causation, and that I should not follow it. As a matter of precedent, he said that as an appeal from the Court of Session in Scotland the decision was not technically binding on me, and the more recent Court of Appeal judgments in *Coflexip* and *Vestergaard*, while acknowledging the principle, did not determine its application in a patent damages context.

133. Mr Cuddigan pointed out that the principle has not been applied to claims for damages assessed on the basis of a notional licence fee: *32Red v WHG (International)* [2013] EWHC 815 (Ch), §§34–42. In principle, he said, the same should apply to a claim for loss of profits.

134. He also referred to the judgment of the Canadian Supreme Court in *Monsanto v Schmeiser* [2004] 1 SCR 902, 204 SCC 34, in which the court considered a claim for an account of profits following infringement of a patent for a genetically modified form of canola. The court ruled that it was necessary to make a comparison between "the defendant's profit attributable to the invention and his profit had he used the best non-infringing option" (§102). In that case the appellants' profits were precisely what they would have been had they planted and harvested ordinary canola; those profits therefore arose solely from qualities of their crop that could not be attributed to the invention (§104).

135. *Monsanto v Schmeiser* was applied in the context of a damages claim for patent infringement (as opposed to an account of profits) by the Canadian Federal Court of Appeal in *Apotex v Merck* [2015] FCA 171. Giving the leading judgment, Dawson JA reviewed and declined to follow the *United Horse Shoe* judgment, noting that the House of Lords had rejected non-infringing alternatives for policy reasons (§63). The same approach was taken by that court in *Apotex v Eli Lilly* [2018] FCA 217.

136. Completing his roundup of the North American jurisprudence, Mr Cuddigan referred me to the position taken in the US, as set out in the decision of the Court of Appeals for the Federal Circuit in *Grain Processing v American Maize* 185 F 3d 1341 (Fed. Cir. 1999), in which the court found that the "but for" test of causation in the context of a claim for damages for patent infringement:

> "must take into account, where relevant, alternative actions the infringer foreseeably would have undertaken had he not infringed. Without the infringing product, a rational would-be infringer is likely to offer an acceptable non-infringing alternative, if available, to compete with the patent owner rather than leave the market altogether. … only by comparing the patented invention to its next-best available alternative(s) – regardless of whether the alternative(s) were actually produced and sold during the infringement – can the court discern the market value of the patent owner's exclusive right …"

137. It is apparent from these authorities that the US and Canadian courts have adopted a quite different position to the approach taken in *United Horse Shoe* and the subsequent domestic authorities that I have cited above. There is also no doubt

that the *United Horse Shoe* rule represents a departure from (or as Floyd LJ described it in *Verstergaard*, a "rider" to) the basic compensatory principle that damages for a patent infringement should seek to place the patentee in the position that it would have been in if the infringement had not occurred. In that counterfactual or "but for" world, if the infringer could and would have made and sold a non-infringing alternative, those sales might also have displaced the patentee's sales, in which case an award of damages which ignored those displaced sales would overcompensate the patentee.

138. One incongruous effect of the *United Horse Shoe* rule is, as Mr Cuddigan submitted, that the court can take into account competition from third parties in the counterfactual world, whereas competition from the defendant is regarded as irrelevant. Another incongruity is that the rule is (as I have noted) not applied in the assessment of damages on the basis of a notional licence fee, which means that causation is assessed differently depending upon whether the claim is for lost profits or the loss of notional licence royalties.

139. These issues may well merit further consideration by a higher court. I have, however, resisted Mr Cuddigan's siren call to depart from the *United Horse Shoe* rule in this case. That is for two reasons. The first is that, as Fancourt J also noted at §106, even if not technically binding upon me, the decision of the House of Lords in *United Horse Shoe* is strongly persuasive, particularly in circumstances where the principle adopted by the majority in that case has been consistently recognised and restated by courts in numerous subsequent cases, including judgments of the Court of Appeal. It reflects a policy decision that an infringer should not be able to escape liability by reliance on a non-infringing alternative product when, in the event, the relevant sales were made of the infringing product.

140. Secondly, for reasons which I will now address, my finding on the facts is that Neo has not established that it could and would have been able to produce a non-infringing version of C100N that JM would have accepted in the development phase of its catalysts in the UK.

Whether Neo could have provided JM with a non-infringing alternative

141. Neo's original pleaded case was that there were two ways in which it could have supplied JM with a non-infringing alternative: (i) it would have satisfied JM's requirements for initial supplies through the manufacture of non-infringing material; (ii) JM could have carried out the initial assessment of Neo's product at its facilities in Japan and/or the USA.

142. By the time of the trial, Neo no longer pursued the second of those cases. Its sole claim was therefore that it could have provided sufficient non-infringing material to the UK to satisfy JM, such that its product would have been certified by JM for the relevant OEM platforms leading to the overseas sales from 2015 onwards. In support of that submission, Mr Williams said in his third witness statement that he would have expected that it would have been possible to make a "minor modification" to the process for producing C100N, so as to render it non-infringing. He maintained that position in his oral evidence, and Mr Cuddigan made the same assertion in his closing submissions.

143. The fundamental problem with that submission, however, is that Mr Williams' evidence as to the minor nature of the modification that would have been required rested on his observation that the original AB0888Z sample was on the boundary of the claim of the patent. But there were various changes in Neo's process after the original AB0888Z sample was sent to JM in March 2013. One change was to reduce the reflux time from 20 to 10 hours, which was implemented before samples AB0936Z and AB0954Z were produced.

144. Mr Williams also confirmed that there were further process changes made when the product was scaled up from the pilot facilities to the production plant. In particular, Mr Williams confirmed in his oral evidence that the commercial C100N product was produced in different kilns to the pilot facilities used for the earlier development samples AB0888Z and AB0936Z.

145. Mr Cuddigan argued that AB0954Z was taken from a production batch of the product, showing that Neo was capable of manufacturing non-infringing product on a commercial scale. The force of that submission was somewhat undermined by the evidence of his own witness Mr Williams, set out above, that the 900ºC/5 hours figure given by the laboratory test for sample AB0954Z was likely to have been an error.

146. Moreover, even if AB0954Z *was* non-infringing, it is clear that changes continued to be made to improve the production process thereafter. Mr Williams accepted that those process changes could have explained the fact that all four samples of C100N that Neo tested were infringing, with an average surface area well above the minimum claim of the patent (38.625m^2/g as compared with 30m^2/g): see §§75–76 above.

147. Those test results indicate that a quite substantial change to the process for the production of commercial quantities of C100N would have been required even to reduce the aged surface area to the minimum level of claim 1 (30m^2/g). Quite evidently, however, a product that tested on the margin of claim 1 would not have been sufficient in the non-infringing counterfactual scenario. Mr Williams thus accepted that if he had been tasked to produce a non-infringing alternative he would have been aiming for a surface area some margin below the claim of the patent, such as 26m^2/g.

148. While I accept that Neo could in principle have modified its process to bring the surface area of the product down to that level, there is no guarantee that such a change would have produced a product acceptable to JM. As I have explained above, the maintenance of a sufficiently high aged surface area was a key concern expressed by JM throughout the development process for C100N. Neo therefore needed to demonstrate that its product met JM's specifications not only when produced on a small scale but also when produced on commercial scale. That is why when Mr Williams sent ZAMR the request for sample AB0954Z, he asked whether ZAMR had production material available. As he commented in his first witness statement:

> "I was stressing … the need for the material to be representative of mass scale production, ideally produced on the commercial line as part of a larger trial … Ultimately it is the sample requests for these

> larger development samples that dictates the process used for the commercial product since we can assume that JM are also performing scalability tests on their production lines and sampling fully formulated catalyst parts to the OEMs for vehicle testing."

149. Mr Williams sought to emphasise that the JM specification was based on calcination at 800ºC/3 hours rather than 900ºC/5 hours as claimed in the patent. But a reduction in the latter would inevitably have reduced the former, as is apparent from the table at §76 above, in which the C100N samples with the lowest surface area at 900ºC/5 hours (samples 3 and 60) also had a lower surface area at 800ºC/3 hours than the other two samples. That table also shows that samples 3 and 60 were already close to the lower bound for the aged surface area ($65m^2/g$) agreed in the 2014 working specification for JM.

150. In those circumstances, while it is conceivable that a significant change in the commercial scale production process might have produced a product that remained within JM's minimum specification for calcination at 800ºC/3 hours, I do not consider that the evidence before me is sufficient to establish, on the balance of probabilities, that it would have done so, bearing in mind that Neo bears the burden of proof on this point.

151. Mr Mitcheson also pointed out that Neo apparently knew about Rhodia's patent during the development process for C100N, but did not seek to modify its product to avoid the patent. In 2011 Rhodia had brought infringement proceedings against Neo in the Netherlands in relation to four different patents. Mr Noll accepted that following those proceedings Neo was on notice that Rhodia might assert other patents against Neo's products, including C100 and C100N. Mr Williams also agreed that as a group Neo was aware of competitor patents, although he himself was not involved with intellectual property issues.

152. It seems that JM was also aware that there might be patent issues with Neo's product, given the reference in the 3 October 2013 slide deck to "Need to assure JM that this material is IP-Free. Define what is needed for this". That could, in my judgment, only have been a reference to Rhodia's HSA20 patent.

153. Despite, therefore, being aware of both Rhodia's patent and JM's concern regarding that patent, there is no suggestion in the evidence that Neo sought to amend the process for its AB0888Z-type product so as to bring that outside the claims of the patent. It is odd that Neo did not do so if a non-infringing product could, as Mr Williams suggested, have been made with only a minor modification to the production process.

154. The most likely reason why Neo did not make such a change was that it knew that JM had analysed its samples as having equivalent aged performance to that of the competitor product – i.e. Rhodia's HSA20 (see for example Mr Williams' note of the 28 June 2013 meeting with JM), and it also knew that any reduction in the aged surface area would inevitably have diminished the performance of Neo's product against that benchmark. That further undermines the contention that JM would have accepted a product that was modified so as to fall outside the claims of the patent.

155. On the facts, therefore, Neo has in my judgment not established that it could have produced a non-infringing version of C100N that JM would have accepted.

Causation

Preliminary comments

156. It is well established that, for the purposes of the assessment of damages for infringement of a patent, it is not sufficient to show that "but for" the infringement the loss would not have occurred. Rather, it is also necessary to show that the infringement was, as a matter of common sense, a cause of the loss: see Kitchin J in *Ultraframe* at §82, point (ii).

157. This was explained by Lord Nicholls in *Kuwait Airways v Iraqi Airways (Nos 4 and 5)* [2002] 2 AC 883, §§70–71, as reflecting a value judgment as to the extent to which the defendant ought fairly or reasonably or justly to be held liable:

> "The law has to set a limit to the causally connected losses for which a defendant is to be held responsible. In the ordinary language of lawyers, losses outside the limit may bear one of several labels. They may be described as too remote because the wrongful conduct was not a substantial or proximate cause, or because the loss was the product of an intervening cause. …
>
> In most cases, how far the responsibility of the defendant ought fairly to extent evokes an immediate intuitive response. This is informed common sense by another name. Usually, there is no difficulty in selecting, from the sequence of events leading to the plaintiff's loss, the happening which should be regarded as the cause of the loss for the purpose of allocating responsibility. In other cases, when the outcome of the … inquiry is not obvious, it is of crucial importance to identify the purpose of the relevant cause of action and the nature and scope of the defendant's obligation in the particular circumstances. What was the ambit of the defendant's duty? In respect of what risks or damage does the law seek to afford protection by means of the particular tort?"

158. The concept of "common sense causation" is essentially the same as the proximate cause requirement in the US jurisprudence. That requirement was referred to by the Supreme Court in *WesternGeco* as being one of the relevant factors that would, in an appropriate case, limit the extent to which damages could be claimed for losses arising from extraterritorial sales.

159. In the present case there is no doubt that Neo's supplies to JM of infringing samples of C100, subsequent development samples, and C100N set in train the events that led to the overseas sales to JM. As I have described, following some early samples of a C100-type product in 2008–2010, JM asked Neo to send it some more C100 in 2011. That led to further samples in 2012, which in turn led to the exploration of whether a cheaper version of that product could be produced which nevertheless had the aged surface area that JM sought for its catalysts. Mr Williams' work on that cheaper process led to the AB0888Z sample, which

became the reference for the specification ultimately pursued by JM to commercial scale testing.

160. It is therefore clear that "but for" the infringing development samples, and the subsequent infringing commercial C100N product, the overseas sales would not have been made. The key question is, however, whether the infringing supplies were the "common sense" or proximate cause of the overseas sales.

161. I can in that regard immediately discount Mr Cuddigan's primary position, which was that the common sense cause of Rhodia's losses was the non-infringing manufacture of the relevant quantities of C100N at ZAMR in China, and the non-infringing transportation of that product to JM's facilities in Macedonia and South Africa (as well as the third party facility in the Netherlands). If that were a good argument, it would preclude any claim for losses in relation to secondary non-patented products, such as the losses claimed in *Gerber v Lectra*. The fact that such products will have been manufactured and transported to their place of sale does not prevent a claim for losses arising from their sale, if those losses are sufficiently directly linked to the sale of an infringing product.

162. I also reject Mr Cuddigan's argument that insofar as the initial samples supplied to JM were a cause of the overseas sales, the "critical tipping point" came from the apparently non-infringing samples AB0936Z and AB0954Z. Even leaving aside the question as to whether AB0954Z was indeed non-infringing, it is clear from the chronology set out above that those samples were part of a continuum of samples provided as part of an ongoing development and testing process that led, ultimately, to JM's approval of Neo's C100N product for use in its catalysts. It would be wholly artificial to extract those specific samples and attribute dominant causal significance to those, to the exclusion of the prior infringing sample of AB0888Z which served as the reference point for those samples, or the subsequent supplies of infringing C100N, which were apparently used for customer fleet trials, and which Mr Williams described as being supplies that would "open the door" to bulk production of the product.

163. Equally, however, I do not accept Mr Mitcheson's argument that the fact that the overseas sales were the "intended and natural consequence" of the infringements is sufficient to establish common sense causation. As to intention, Mr Mitcheson relied upon Neo's recorded admission that its intention and objective in importing and supplying development samples and commercial C100N product to JM was to procure a commercial contract with JM. But intention alone, it seems to me, cannot create a sufficiently direct link between infringing and non-infringing sales so as to establish that the latter have been caused by the former, although it may well be relevant to the assessment of whether such a link exists.

164. As to whether the overseas sales were the "natural" consequence of the infringing supplies, if that simply means that those sales were foreseeable, then that is not denied by Neo, but that likewise does not mean that causal link between the infringement and those sales was sufficiently direct. A more direct link is, in my judgment, required for the infringing supplies to be regarded as the "common sense" or proximate cause of the overseas sales.

165. In that regard, it seems to me that the crucial question is the importance of the infringing supply in influencing the customer's decision to purchase the non-infringing product. That is likely to involve a spectrum of possibilities. On one end of the spectrum, if an infringing product is supplied as part of a single transaction that includes the sale of a non-infringing product, in circumstances where the non-infringing sale is inextricably related to the infringing sale, causation will very likely be established. The sale of convoyed products, as in *Gerber v Lectra*, where the secondary (non-patented) product is functionally related to the infringing product, or is a spare part for the infringing product, invokes a similar analysis.

166. A less direct link, but one where causation might also be established, would be a case where the non-infringing sale is not inextricably or functionally related to the infringing sale, but where the customer requires both products for a single purpose and therefore seeks to purchase both products from the same source.

167. An example of the latter is *Xena Systems v Cantideck* [2013] EWPCC 1, [2013] FSR 41, where one question was whether the proprietor of a patent for a rolling platform used in the construction industry could recover damages not only in relation to infringing supplies of rolling platforms, but also in relation to the supply of non-patented fixed platforms in competition with the patentee. HHJ Birss QC commented at §99 that:

> "I can believe that in a case in which a customer wanted a fixed and a rolling platform for the same job and arranged the hire contract at the same time, they might well have sought to hire both platforms from the same source. Insofar as any of Cantideck's hires of fixed platforms fell into that category then Xena's case to claim that fixed hire as a loss would at least get off the ground."

168. On the other hand, the judge did not regard it as sufficient that Cantideck's rolling platform led its entry into the market for fixed platforms (§98). The mere fact, therefore, that the supply of an infringing product allows the infringer to enter the market for a non-infringing product does not in itself create a sufficiently direct causal link between the infringing and non-infringing sales. Put another way, the fact that an infringement creates an *opportunity* to sell a non-infringing product does not mean that the infringement *causes* the non-infringing sale.

169. In similar vein, if an infringing supply brings a product to the attention of a customer, who subsequently decides to purchase a non-infringing version of that product instead of a competing patented product on the grounds that the former is cheaper and more widely-available, then it seems to me that an intuitive analysis would regard the cause of the sale as being the customer's decision based on price and availability, those factors being decisive in influencing the choice between the two products. The infringing supply would in that example have undoubtedly created the opportunity for the non-infringing sale, but would not be regarded as the common sense cause of that sale.

170. The question is whether in the present case Neo's supplies of infringing samples and commercial product to JM in the UK were a sufficiently significant driver of the overseas sales that they should be regarded as the "common sense" or

proximate cause of those sales, or whether the infringing supplies simply created an opportunity for those sales to be made.

The evidence as to the factors influencing JM's purchasing decisions

171. The major evidential problem in the present case is the absence of any evidence directly from JM as to its decision-making processes in relation to the purchase of Neo's C100N product and Rhodia's competing HSA20 product. I therefore have to do the best that I can with the material available, which comes from four main sources:

    i) Evidence from Drs O'Sullivan and Winterborn, who had worked during the relevant period in JM's automotive catalyst business. While they were not able to give evidence specifically about JM's procurement processes for C100N and HSA20, or the use of those specific products in JM's catalysts during the relevant period of time, they were able to provide evidence as to the typical stages in JM's development of an automotive catalyst, including JM's procurement of raw materials for use in the catalyst formulation and the competition process to supply catalysts to car manufacturers.

    ii) Evidence from Neo's employees Mr Noll and Mr Williams. Mr Noll's evidence included, in particular, a discussion of the way in which Neo's products were used by customers to compete for automotive platforms, and the factors that customers would consider in selecting suppliers. Mr Williams' evidence focused on the technical development of C100N, but his oral evidence touched upon the way in which he understood that the product was typically used on vehicle platforms.

    iii) The 2017 affidavit of Karen Brown of Neo. This discussed, among other things, the supply of raw materials such as cerium oxides for use on automotive catalyst platforms, and the selection of suppliers by a customer such as JM. As with the other witnesses, however, her evidence did not cover JM's purchasing decisions specifically for C100N and HSA20.

    iv) The contemporaneous documents.

172. Much of that evidence was uncontroversial and common ground. The parties were agreed that after JM had satisfied itself that a raw material was in principle suitable for its requirements, it would use that material to make sample catalysts which were then offered to the car makers for testing. In some cases, the car maker would ask for sample catalysts from several suppliers, which would then be tested against each other in a "shootout". Once a car maker had chosen JM's catalyst, JM would make up prototypes that would then be used for vehicle testing, including in fleet trials. Assuming that the catalysts performed satisfactorily, JM would then commence industrial scale manufacture of catalysts. That would translate to commercial scale orders of the raw materials from its chosen suppliers for each catalyst.

173. It was also common ground that a car maker would select a single catalyst (whether from JM or one of the other washcoaters) for a particular platform (i.e. a particular type of engine manufactured by that car maker). Being the catalyst

supplier on that platform would therefore secure the selected supplier years of business for the life of that platform, including making catalysts for spare parts after the platform came out of manufacture.

174. What was less clear was the extent to which JM might seek to qualify multiple suppliers of raw materials for use in a particular catalyst. Ms Brown's 2017 affidavit said that it is prohibitively expensive to qualify two or more suppliers for each component of the catalyst, since each catalytic converter has at least five components, and each combination of components from different suppliers would need to be tested separately. But she did not comment on whether JM ever qualified multiple suppliers of a single component on a catalyst, such as cerium oxide.

175. Mr Noll did, however, address that question. He said that Neo's customers might wish to dual-qualify suppliers in order to ensure security of supply, such as the capacity of a supplier to meet demand and to mitigate any risk of supply chain failures, especially on large volume platforms. Other factors that customers might consider would be the relative prices and performance of the competing products. His experience was that Neo's customers did not tend to discuss openly whether Neo was or would be the only supplier for a product on a particular platform, but it was sometimes possible to tell from technical or commercial discussions whether Neo's product was being qualified with a competitor product.

176. In that regard Mr Noll referred to a note dated 6 March 2015, written by Ms Brown, which reported on a meeting with JM. He confirmed that he would have been sent that note at the time. The note recorded that JM had told Neo that it was using C100N in four different platforms, giving a forecast for its volume requirements for each of those platforms over the next five years to 2020. The note commented that Ms Brown had been told that:

> "Rhodia is supplier number 1 we will be number 2, starting in Macedonia. Also it let in [sic] the conversation, Rhodia had difficulty to supply cerium … Could that explain so much order from Umicore?"

177. Mr Mitcheson put to Mr Noll that this indicated that Neo and Rhodia were dual-qualified on each of the four platforms referred to, with Rhodia as the majority supplier of cerium oxide and Neo as the secondary supplier for each of those platforms. Mr Noll agreed that this was his interpretation of the note.

178. Mr Mitcheson also put to Mr Noll that there was an obvious advantage for a customer in dual-qualifying two products for the same platform, because it meant that the customer could play the suppliers off against each other on price and conditions of supply, allowing the customer to be more robust in commercial negotiations. Mr Noll agreed. He also agreed that the fact that Neo was supplying alongside Rhodia on the four platforms referred to in the meeting note meant that there was less pressure on JM to enter into a long-term supply agreement with Neo.

179. Mr Williams took a different position, when asked about this in his oral evidence. He thought that typically each platform would have a single supplier of cerium

oxide, and disagreed with Mr Noll's evidence on this point. Dr O'Sullivan did not comment on JM's purchases of C100N from Neo, or the platforms on which that product was used, but said in general terms that JM would have only one source of supply for a given raw material in a given catalyst for a specific customer.

180. I consider Mr Noll's evidence to be the most reliable on this point. I accept that JM may in general have preferred to qualify single raw material suppliers for any given platform, but the March 2015 meeting note clearly implies that both Rhodia and Neo were suppliers on the four platforms on which JM was (by then) using Neo's product. Mr Noll was in a better position than Mr Williams to interpret that, given his position as sales director for the relevant part of Neo's business at the time in question, and the fact that he would therefore have received the meeting note. I have no doubt that Mr Williams' evidence was an honest account of what he understood to be the case. But his role was on the product development rather than the sales side of the business, and he was not able to give a clear explanation of how his understanding was consistent with the comments of Ms Brown in her meeting note.

181. Insofar as JM did indeed use Rhodia and Neo's products for the same platforms, that would have allowed JM to decide what quantities to purchase from each supplier. Mr Noll agreed, when asked by Mr Mitcheson, that one factor that would be relevant to that decision would be the prices offered by the respective suppliers. Another obvious factor to take into account would have been supplier capacities. The March 2015 meeting note indicated that Rhodia had capacity constraints, which Ms Brown suggested was a possible explanation for an increase in the orders coming from another cerium oxide customer, Umicore. As I discuss further below, the evidence showed that Rhodia also had significant difficulty meeting JM's orders that year, with a large backlog having built up by the end of 2015. If Rhodia was unable to make timely supplies of the quantities that JM required, JM would inevitably have turned to Neo for the shortfall.

182. The commercial substitutability of Neo's and Rhodia's products, and the fact that capacity considerations played an important part in JM's procurement decisions as between the two products, was also evident from an internal note written by Ms Brown on 8 April 2015, recording a telephone meeting with JM's purchasing director in Royston, and consequential action items:

> "**C100N**
> • Johnson Matthey has informed us they will buy 20 mt/mo C100N starting from July through 2016.
> • The 20 mt/month from July onwards is for existing platform that we will replace Rhodia …as JM-Macedonia will produce for first time; however, we will get also extra business by every single new platform they (JM global) will make … volume not quantified yet. …
> • I need to give them an answer if we can supply.
>
> **Action Items**
> 1. Operations/Technical must determine how/when to install capacity to meet this requirement for new C100N business …

> 2. Communicate with JM status of our ability to meet demand – Karen."

183. JM's overall purchasing decisions were also, obviously, driven by the orders from its car maker customers, which were not predictable with any degree of certainty. The evidence showed that Neo had hoped to obtain a supply contract with JM, but none was in fact concluded.

184. Rhodia was likewise unable to secure a contract with JM for the supply of HSA20 until [✂]. Even then, the agreement (which covered a range of products including HSA20) did not commit JM to any minimum purchases of HSA20 (whether in absolute volumes or in terms of any percentage of Rhodia's requirements), consistent with JM's position from the outset that the product was going to be used in new applications that would be subject to "a great degree of demand volatility". Rhodia was therefore in the same position as Neo in that orders would be placed from time to time on an ad hoc basis. One factor that caused a significant and unexpected increase in JM's requirements for both HSA20 and C100N was the VW emissions scandal, which was publicised in September 2015.

Discussion and analysis

185. It is undoubtedly the case that the infringing supplies of development samples and initial commercial C100N to the UK created an opportunity for Neo to make substantial subsequent overseas supplies of the product. Neo was not only aware of the possibility of those future overseas supplies, but intended that.

186. In the early stages of the development process, however, that outcome was speculative and uncertain. Thus when Neo supplied initial development samples to JM, neither it nor JM knew whether those would lead to any commercial orders whatsoever. JM had first to test the product, to ascertain whether it was suitable for its requirements, and then had to submit catalysts formulated with the product for approval by car maker customers. As the witnesses made clear, in that process JM was frequently competing in a "shootout" with other catalyst suppliers. Any supplies by Neo were therefore entirely contingent upon JM being selected by a car maker using a catalyst formulation that included C100N – in which the car maker's decision would inevitably turn on the assessment of the performance of the catalyst as a whole rather than any individual assessment of the specific individual components of the catalyst.

187. Even when JM was selected to supply the catalyst for a particular vehicle platform, it would (as I have described above) be necessary to do further vehicle testing including fleet trials before full commercial supplies of the catalyst started. That is why Mr Williams described the 200kg order of C100N on 4 December 2013 as an order that would "open the door to bulk production" thereafter if the product proved to be successful in the customer fleet trials that were intended.

188. The chain of events from the supply of samples for testing (whether laboratory testing by JM or catalyst testing by car makers) to commercial orders for Neo's product therefore involved a series of contingencies resting on decisions taken initially by JM and subsequently by the car makers.

189. It is fair to say that once a catalyst containing Neo's product was ultimately approved by a car maker for use on one of its platforms, Neo could at that point have expected commercial orders to follow, given the evidence that a car maker would select a catalyst for the lifetime of a particular platform. There are, however, two important points to make about those orders.

190. The first is that there was no overarching supply contract, nor any minimum order guarantee, nor were the orders placed together with orders for UK supplies. Rather, orders were placed depending on the requirements from time to time of each of JM's production plants (which in turn depended on the orders placed by the car makers for the vehicles on which Neo's product was a catalyst component).

191. Secondly, where Neo's and Rhodia's products were both approved for use in a catalyst on a particular vehicle platform, the volume of C100N ordered from Neo would have depended upon the allocation of JM's requirements from time to time for that platform as between Neo and Rhodia. That decision would have been made on the basis of factors such as price and capacity, as the evidence set out above indicated.

192. I have concluded on the evidence above that all four of the platforms for which Neo was approved as at March 2015 were platforms on which Rhodia was also qualified. There was no evidence before me as to whether Neo was qualified on any other platforms after that date. On the evidence before me, therefore, all of the platforms for which Neo is known to have been qualified were platforms for which there was a choice as between Neo's and Rhodia's products.

193. Drawing together the strands of the above, this is a case in which (i) there were multiple intervening contingencies between the infringing supplies by Neo and the eventual overseas supplies made by Neo; (ii) the orders that were eventually placed for Neo's product were not made together with or subject to the same contract as any orders for infringing supplies, but were placed for delivery to JM's various production plants from time to time; and (iii) on the evidence before me, it appears that Neo and Rhodia were dual-qualified on the platforms for which Neo was known to have been approved, providing a choice between the two products. Taking all of those factors together, I do not consider that the infringing supplies of Neo's product can be regarded as the "common sense" or proximate cause of the overseas sales that were ultimately made.

194. Rhodia's claim therefore fails for lack of causation. I will, nevertheless, address the quantum aspects of Rhodia's claim, given that these were the subject of extensive evidence and argument, and in case this matter goes further. In that regard, it was agreed that I would determine the disputed issues, on the basis of which the experts could then agree the precise quantum figures.

195. Before doing so, however, I note for completeness that following circulation of my draft judgment Rhodia said that it should be able to maintain a claim for damages for loss of the chance to sell HSA20 as the sole qualified supplier of HSA cerium oxide on the relevant platforms, notwithstanding my conclusion on causation. However, while Rhodia pleaded in the alternative a case of a lost chance of making further profits, Rhodia's opening skeleton argument said that

that it was not clear where such a case would arise, and that "the ascribing of particular chances will have to wait until the evidence has been heard". In written and oral closing submissions, having heard the evidence, Rhodia did not pursue any claim to damages based on loss of a chance; nor is there any other evidence before me as to the basis on which damages could be awarded in this regard. That being the case I consider that it is far too late to raise the point now.

196. In any event, my finding on causation precludes any damages for loss of a chance in the same way as it precludes Rhodia's claims for loss of profits and/or a licence fee.

Loss of profits

197. In respect of Rhodia's claim for loss of profits, there were four main issues of principle in dispute: (i) Rhodia's capacity to supply Neo's volumes; (ii) Rhodia's evidence as to its costs; (iii) Rhodia's prices if it had supplied Neo's volumes; and (iv) future sales forecasts.

Capacity: submissions

198. Neo said that Rhodia should not be entitled to claim damages on a lost profits basis, since it had not established that it had the capacity to supply Neo's volumes to the present date, nor was its evidence sufficient to establish capacity to supply the future volumes forecast to be supplied until the end of the use of C100N on the relevant platforms, which is forecast to occur in 2028 (Neo's case) or 2029 (Rhodia's case).

199. Neo's position was stark, and binary: Mr Cuddigan said that the problems with Dr Rohe's evidence were such that I could not accept his capacity figures for Rhodia at all, for any year during the entirety of the relevant period from 2014 until 2028/29.

200. Mr Mitcheson disputed the alleged problems with Dr Rohe's evidence, saying that they were evidence of occasional minor day to day capacity issues in some years, but that overall Rhodia clearly had sufficient capacity to have supplied Neo's volumes. Alternatively, insofar as there were capacity constraints, he said that the only years in which (realistically) that could have affected Rhodia's ability to supply Neo's volumes were 2015–2017.

201. To address those allegations I will first consider the reliability of the evidence in general, before considering the specific capacity figures for 2015 onwards.

General comments on Rhodia's evidence

202. Dr Rohe provided figures as to the capacity of Rhodia's plants at Anan and La Rochelle to produce HSA20, for each year from 2012–2021. In addition, he said that at the Anan plant it would have been possible to implement "work arrangements" to switch from weekday-only shifts to a shift pattern that included the weekends. That would have increased the annual capacity at Anan. No such increase was possible at La Rochelle which already operates on a weekday and weekend shift pattern. He also said that other arrangements would have been

possible to increase the capacity further at one or both plants, such as stockpiling, prioritising the manufacture of one product over another, using a toll manufacturer, or capital expenditure on large equipment (such as additional reactors).

203. Dr Rohe's evidence was the basis on which Mr Bezant concluded that Rhodia would have had sufficient capacity to supply Neo's volumes, and would continue to do so.

204. There were, however, numerous problems with Dr Rohe's evidence. Starting with his baseline figures of available capacity at the Anan and La Rochelle plants:

i) As I have already noted, Dr Rohe did not have direct knowledge of any of the capacity figures. Instead, those figures were provided to him by his colleague Dr Moissonnier. Dr Rohe said that this was because in such a large company it was not practical to produce documents underpinning the figures calculated by Dr Moissonnier's team. At the very least, however, Rhodia could have asked Dr Moissonnier to give evidence as to the basis on which his capacity figures were calculated, but no such evidence was provided, nor any explanation as to why it could not be provided.

ii) Dr Rohe's figures were theoretical annual figures rather than actual day to day capacity figures. I do not accept Mr Mitcheson's submission that it was only the annual figures that mattered, rather than the granular detail of day to day operating capacity. Orders were not placed on an annual basis, but were placed for delivery to JM's individual plants from time to time throughout the year. Rhodia's [✂] stipulated that JM would place orders for products no less than [✂] in advance of the required shipment date from the relevant manufacturing plant, and specified that time for delivery would be of the essence of the contract; and there was no evidence suggesting that the position was materially different for Rhodia's earlier supplies of HSA20 to JM. On that basis, if Rhodia had been unable to supply the volumes demanded at a particular time, the fact that several months later it had greater capacity would not have assisted it.

iii) Even if theoretical annual figures were in principle acceptable, those would need to be adjusted, as Mr Boulton said, "to take account of the realities of operating life and that one does not normally achieve theoretical capacity". While Dr Rohe said his figures were calculated using 90% of the maximum volume that each piece of equipment could process, I did not have any evidence before me indicating whether that 90% figure reflected the reality of the operational processing capacity at the two relevant plants.

iv) It also became apparent that Dr Rohe's figures represented capacity at the *end* of each of the years for which those figures were reported, whereas Mr Bezant had assumed that they represented capacity available *throughout* the corresponding calendar year. Mr Bezant accepted that his calculations would need to be reworked to take account of that, but did not provide any such reworked figures.

v) Dr Rohe's figures were in any event contradicted by the contemporaneous documentation in several respects, which further undermined their reliability. By way of example, Dr Rohe provided capacity figures for La Rochelle from 2012, but the La Rochelle plant was not in fact qualified to supply HSA20 to any customers until the end of 2015. There were also contemporaneous documents showing that at various times in 2013–2015 there were significant problems meeting JM's orders, even though Dr Rohe said that there was spare capacity in each of those years (especially with the addition of work arrangements). Again, these were not trivial: in late 2015 an internal email reported a backlog at the Anan plant of "108,720 kg which is on average [✂] months consumption". Dr Rohe was asked how that could have happened given his evidence on capacity; his response was that he was not involved in day to day delivery at Anan.

205. Mr Cuddigan submitted that these problems meant that Dr Rohe's capacity figures should be completely discounted as being wholly unreliable. I do not consider that the difficulties I have set out above mean that no weight at all can be placed on Dr Rohe's figures. I do, however, accept that his baseline capacity figures need to be treated with some caution.

206. Mr Cuddigan also initially criticised Dr Rohe's capacity figures for failing to take into account the extent to which the reactors used to make HSA20 were also used to make other products. That was the subject of Dr Rohe's additional witness statement served during the trial, leading to the recall of Dr Rohe for further cross-examination. Dr Rohe's further evidence was that his capacity figures were given specifically for HSA cerium oxide products, excluding the capacity required for non-HSA cerium oxide products. He explained that this was required by Rhodia's normal practice in its capacity planning and forecasting.

207. In his closing submissions, Mr Cuddigan expressed doubt as to the reliability of Dr Rohe's further evidence, given the absence of corroborating documentary evidence. Ultimately, however, I do not think that anything turns on this issue for the purposes of the baseline figures. Whether or not the figures presented by Dr Rohe were designed to exclude the capacity required for other products, the reliability of those figures is already undermined by the problems set out above. There is, however, a specific issue as regards the use of the plant at La Rochelle before it was qualified for JM, which I address below.

208. Turning to the ways in which Rhodia said that additional capacity could have been created, Dr Rohe said that capacity could have been added by work arrangements at Anan. Again, however, the figures he provided for incremental capacity due to work arrangements were entirely theoretical, with no evidential support as to what would actually have been possible to implement at Anan.

209. That problem was highlighted by the fact that Dr Rohe stated that work arrangements were already in place in "certain" months between 2015–2018 and 2020. The position at the trial, however, was that no details were available as to the actual extent to which work arrangements had been implemented during that time. As Mr Bezant accepted, if Dr Rohe's analysis did not take account of the work arrangements already in play, that would overstate the available additional capacity.

210. Following the trial, a redacted spreadsheet was provided by Rhodia to Neo, which recorded that work arrangements were in place at Anan for 11 months in 2016, eight months in both 2015 and [✂], [✂]. It is, to say the least, very unsatisfactory that this spreadsheet was not disclosed before the trial, given that it appears to have formed the basis of Dr Rohe's evidence as to the extent of the work arrangements already in place at Anan during [✂]. The weight that I can place on the content of the document is necessarily limited, since it was not the subject of evidence by any Rhodia witness, other than Dr Rohe's vague comments as to work arrangements having been in place in "certain" months (an assessment that rather understated the true picture, if the spreadsheet is accurate, of work arrangements having been in place during the *majority* of [✂]). On its face, however, the figures in the spreadsheet indicate that Dr Rohe's work arrangement figures are likely to have been substantially overstated, particularly for the years [✂].

211. In all of these circumstances I consider that Dr Rohe's evidence on work arrangements is too unreliable for any weight to be placed on it.

212. Dr Rohe's speculations as to stockpiling, prioritisation and the use of toll manufacturers were likewise, in my judgment, too vague and theoretical to be given any weight. There was also no explanation of why (if these options were available) Rhodia nevertheless experienced the significant capacity problems suggested by the contemporaneous correspondence, at certain points in time.

213. That leaves Rhodia's evidence as to capacity expansion, in relation to which two possibilities were mooted. The first was that while the La Rochelle plant was in fact not qualified to supply HSA20 to JM until the end of 2015, if additional volumes had been required that plant could have been qualified considerably earlier, which would have taken between three to six months.

214. In theory, earlier qualification of the La Rochelle plant to supply JM might have been a possibility. The evidence before me does not indicate that qualification of a product at a new plant was a particularly difficult or complex matter, and La Rochelle had already been offered to JM as a second source of HSA20 as early as 2012.

215. In practice, however, I am unpersuaded that Rhodia would have done this. Rhodia had been aware for some time of its capacity problems leading to difficulties with meeting JM's orders. A slide deck dated April 2013 contained a slide with the following points relating to HSA20:

> "Solutions to ensure better satisfaction of [JM's] needs:
>
> Solvay working on
> - **Short term**: to do our utmost to satisfy growing demand with the possible minimum delays. …
> - Some capacity freeing-up from July onwards most probably
>
> - **Longer term**:
> - Capacity expansion planned from 2014
> - …

> - Actalys HSA 20 to be produced in La Rochelle as well >>>>>2nd supply source"

216. It is apparent from this that Rhodia was considering production of HSA20 at La Rochelle as a means of resolving its capacity difficulties. Despite that, however, La Rochelle was not qualified for JM until the end of 2015, over two years later. That is telling: if Rhodia could have generated additional capacity to satisfy JM's needs through the qualification of La Rochelle earlier than the end of 2015, it should already have done so.

217. The reason why Rhodia did not obtain the earlier qualification of La Rochelle for JM is likely to have been that there was not in fact spare capacity at that plant which could have been used to produce additional volumes prior to the end of 2015. Dr Rohe confirmed in cross-examination that the La Rochelle plant was (at least in 2013) occupied with the production of other products:

> "Q. Let us assume that La Rochelle had been qualified by this stage. The plant at La Rochelle was busy making other products, was it not?
> A. Correct.
> Q. So if it wanted to make HSA20 as well, that was liable to have an effect on the production schedule for other products?
> A. Yes."

218. There is no evidence before me suggesting that this situation changed during the course of 2014 or 2015. Indeed if additional capacity for HSA20 had become available at La Rochelle during that time, it is inexplicable that Rhodia did not make use of that to ameliorate the very significant backlog that had accumulated by late 2015. I do not, therefore, consider that bringing forward the qualification of the La Rochelle plant would have of itself provided any additional capacity.

219. Rather, what was necessary was investment in physical equipment, which was the second means of expansion relied upon by Rhodia. In that regard, Rhodia said that it would have been possible to accelerate the expansion that did in fact take place at La Rochelle during the course of 2016–2018. That would have required planning and capital investment ahead of that time: Dr Rohe said that typically around a year is required to purchase heavy equipment such as large reactors, and a further six months is needed to set it up to make the product to the required specification. Any capital investment would therefore start to be implemented around 18 months before the product was needed.

220. Notably, however, while Dr Rohe addressed the general theoretical possibility of earlier capital investment, he did not confirm that any such specific investment (such as the acceleration of the expansion at La Rochelle) could or would have been made if Rhodia had been supplying Neo's volumes. The contemporaneous documentation provides reason to doubt that this would have occurred: an internal email dated 7 December 2015 showed that even when faced with a substantial backlog by that time Rhodia was unwilling to commit to significant further investment in capacity without a contractual commitment from JM as to volumes:

> "The investment in [La Rochelle] [✂] is the most likely in the short-term, if we get customer (JM) commitment on volume (contract). … we can supply the 370t … in [✂], but no commitment beyond [✂] unless we get a contract that allows us to invest".

221. Dr Rohe assumed that a commercial agreement would in the counterfactual case have been concluded with JM, providing such a commitment. I do not accept that assumption given JM's consistent position that its demands for HSA20 would be volatile because of the unpredictability of demands from its own customers. That unpredictability was highlighted by the substantial increase in volumes ordered by JM from the end of 2015 onwards in the wake of the VW emissions scandal – any advance capacity investment to take account of that would have required a remarkable degree of prescience.

222. In all those circumstances, I am not persuaded that in the counterfactual case Rhodia would have brought forward its physical capacity expansion at La Rochelle to any significant extent.

Conclusions on Rhodia's capacity

223. I now consider the implications of my general comments above for the capacity figures for 2014 onwards.

224. Adjusting Dr Rohe's normal capacity and work arrangements figures by one year to reflect the point in 204.iv) above gives the following figures, to which I have added the volume figures for Rhodia and Neo provided by Mr Bezant:

	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Anan	325	325	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
La Rochelle	200	200	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Work arrangements (Anan)	450	450	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Rhodia's total volumes (JM and others)	419	785	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Neo's JM volumes	-	116	206	249	[✂]	[✂]	[✂]	[✂]

* H1 2021 only

225. These figures show that Rhodia's total capacity by the start of 2015 (525 tonnes) was insufficient to meet the volumes of HSA20 that were ultimately supplied by it during the course of that year (785 tonnes). Additional capacity was added at Anan at some point during the course of 2015, and the evidence indicated that work arrangements were also in place at Anan during that year. But the evidence makes clear that even then Rhodia had a considerable backlog by the end of 2015. The addition of Neo's volumes during that year (116 tonnes) would therefore have required some further measures.

226. For the reasons give above, I discount the evidence on further work arrangements, and I am not persuaded that Rhodia would have accelerated its capital investment for La Rochelle. Without capital investment, the evidence does not establish that any additional capacity would have been available at La Rochelle even if it had been qualified earlier to supply JM. The evidence does not, therefore, show that it would have been possible to add Neo's volumes during 2015.

227. The figures set out above indicate that during 2016 the total normal capacity at both plants ([✂] tonnes) was again insufficient to supply the volumes that Rhodia in fact supplied during that year ([✂] tonnes). Again, additional capacity came on line, this time at La Rochelle, at some unspecified point in 2016, and it appears that work arrangements were again in place at Anan. The addition of Neo's volumes would, however have required either additional work arrangements, or accelerated expansion, the evidence on both of which I have not accepted. I do not, therefore, consider that Rhodia has met its burden of proof in relation to the availability of capacity during 2016.

228. For 2017, the baseline total capacity reported by Dr Rohe would in principle have covered Rhodia's volumes and the majority (but not all) of Neo's volumes. As set out above, however, considerable caution is required given the unreliability of those baseline figures. I do not consider that the ostensible spare capacity in that year is sufficiently great for me to be able to conclude with any degree of confidence, allowing a suitable margin of error, that Rhodia could have supplied Neo's volumes on the basis of its baseline capacity alone. It is likely, therefore, that work arrangements or accelerated expansion would have been required. Given my conclusions on those options, I do not consider that Rhodia has met its burden of proof in relation to the availability of capacity during 2017.

229. From 2018 onwards the picture changes. In 2018 the total volumes supplied by Rhodia plus Neo's incremental sales to JM amounted to [✂] tonnes, which was below Rhodia's total volumes in both 2016 and 2017. There was no evidence before me suggesting that Rhodia would not have been able, in 2018, to supply the volumes that it had managed to produce during the two previous years. Mr Boulton accepted this point in his oral evidence:

> "Q. If Rhodia were going to be selling the additional Neo volumes in 2018, it would mean selling [✂] tonnes plus the [✂], which is [✂] tonnes; yes?
> A. Mathematically in 2018, yes, that is correct.
> Q. It seems likely, does it not, that it would be able to do that, or likely to be able to do that given that [✂] tonnes is only [✂] tonnes more than the 785 tonnes it sold in 2015 at a time when Rhodia's overall capacity was much lower?
> A. That would be an indicator to suggest that what you are saying may well be correct, and certainly you could also compare it to the actual volumes in 2016 and 2017. So does it appear likely on these figures that in 2018 Rhodia would have had capacity to make those Neo volumes? Yes, it appears likely."

230. If that was true in 2018, it was *a fortiori* the case for the subsequent years in which the volumes supplied by both Rhodia and Neo continued to fall.

231. My conclusion is therefore that Rhodia would have had sufficient capacity to supply Neo's volumes to JM from 2018 onwards, but Rhodia has not established that there would have been sufficient capacity to supply Neo's volumes in 2015–2017.

Rhodia's costs

232. Neo said that Rhodia's evidence as to its variable costs was wholly unreliable. The general argument was similar to the general criticism of Dr Rohe's evidence: Mr Cuddigan objected that the costs data were provided by Mr Mackay, who did not have specific knowledge of the costs of activities at either Anan or La Rochelle. In addition, Mr Cuddigan made various specific criticisms of Rhodia's treatment of variable costs as set out in Mr Mackay's evidence.

233. Rhodia's position was that it was legitimate for Mr Mackay to provide costs data by reliance on Rhodia's management accounting system, and that the specific criticisms were not reasons to reject the entirety of Mr Mackay's evidence.

234. Starting with the general criticism, Mr Mackay explained that the costs data set out in his witness statements were extracted from Solvay's database "Sales CM report", which is used to follow the volume of material sold, amount of sales, variable costs and contribution margin for Solvay's products, including HSA20. Mr Mackay also provided sample invoices and contemporaneous spreadsheets generated by Rhodia's Global Business Unit, and gave some evidence about the basis on which various costs elements were incurred.

235. I do not consider that Mr Mackay's evidence should be rejected on the basis that he did not have personal knowledge of the costs incurred by Rhodia at the Anan and La Rochelle plants. The costs of producing a particular chemical compound at manufacturing facilities operating at multiple locations, alongside a range of similar products, will inevitably be complex, and it was in my judgment in principle legitimate for Rhodia to rely on a witness who was able to extract relevant data from a company-wide database and explain those data to the court. The fact that there may have been some discrepancies in those data does not necessarily mean that the entire data set should be regarded as unreliable.

236. In that regard, Mr Cuddigan raised three specific objections to Mr Mackay's evidence on variable costs. The first was that according to Mr Mackay Rhodia's labour, maintenance and warehouse costs were "fixed up until a certain level of production". That suggested that additional deductions might need to be made if the addition of Neo's volumes crossed that threshold. Mr Mackay did not, however, know what the level was at which costs would no longer be fixed, and Mr Cuddigan said that the court should therefore proceed on the basis that the threshold would have been crossed by the addition of Neo's volumes.

237. The issue does not arise in relation to the years 2015–2017, for which I have already found that Rhodia has not established that it would have had sufficient capacity to produce Neo's volumes. For the subsequent years, the total of Rhodia and Neo's volumes was always lower than the highest recorded Rhodia volumes (2016), for which Rhodia's costs remained fixed.

238. Mr Cuddigan argued that the assumption should nevertheless be that in the remaining years Rhodia's spare capacity was fully occupied with making other products, and that absent further evidence I should assume that Rhodia's total production was at the threshold at which its fixed costs might become variable. That is, in my judgment, wholly speculative. Mr Mackay's evidence shows that despite significant increases in volumes of production of HSA20, its labour, maintenance and warehouse costs have remained fixed. The realistic inference is that those costs are, as Mr Mitcheson said, relatively immune from the levels of output. In addition, insofar as Mr Cuddigan's concern related (in part) to the possible additional labour costs of work arrangements at Anan, I have already rejected the evidence on work arrangements as means of providing additional capacity; the counterfactual case does not, therefore, assume any additional work arrangements at Anan.

239. Mr Cuddigan's second objection was that Mr Mackay had identified, in his fourth witness statement, an additional cost for waste water tolling at Anan in 2015 which had not been included in his variable costs figures, but which he and Mr Bezant accepted should have been regarded as a variable cost. He gave the relevant figure for this (42m yen, or about €300,000), which had been provided to him by the controller for the Anan site.

240. Given my conclusions as to capacity during 2015–2017, the question of this specific cost does not in fact arise. Nor do I regard this point as a reason to reject Mr Mackay's evidence as a whole as being unreliable. Mr Mackay quite properly identified an omission from his figures, which he had discovered while preparing for this hearing. He has given evidence as to the cost that was omitted. Mr Cuddigan suggested that there might be other omitted variable costs of this nature, but again that is entirely speculative.

241. Mr Cuddigan's third objection was that Mr Mackay's variable costs figures did not include allowances for the depreciation of assets. Mr Bezant's response was that it was appropriate to exclude these from the calculation of Rhodia's contribution margin, absent evidence that an increase in production would necessarily have increased maintenance costs, and since those costs would not necessarily be similar to per unit depreciation costs. In any event, to the extent that these costs would have changed due to producing the additional Neo volumes, he would have expected those changes to be small. These are, in my judgment, reasonable assessments to make, particularly in circumstances when the additional volumes in issue exclude the years of Rhodia and Neo's highest volumes in 2015–2017.

242. I do not, therefore, consider that Rhodia's costs figures should be rejected as being unreliable.

Counterfactual prices for sales by Rhodia

243. Rhodia said that the price of any counterfactual sales by Rhodia should be assumed to be Rhodia's actual HSA20 prices during the relevant years. In particular, Mr Bezant said that he would have expected Rhodia's bargaining power to increase, given that it would have been the sole supplier of cerium oxide to JM in the counterfactual case. Indeed, if anything, he considered that Rhodia

would likely have raised the threshold at which volume-based price reductions were offered to JM, such that Rhodia's overall price would have increased.

244. Mr Boulton disagreed, saying that Mr Bezant's assumptions did not reflect JM's substantial bargaining power as a leading participant in the automotive catalyst industry. JM would also have needed to consider its own competitive position in the market on which it sold catalysts, and for that reason may not have been willing or even able to incur costs above the costs that it did in fact incur. Mr Boulton referred in that regard to an email from JM to Rhodia in 2012 in which JM stated that "We have a difficult commercial situation and would be grateful if you could review the HSA 20 price … to see if you are able to reduce the fixed manufacturing price." On that basis Neo said that the relevant price should be taken as being its own prices for C100N.

245. It is very difficult for me to make any assessment of these points without evidence from JM, which was not forthcoming. To a very large extent, the comments made on both sides were speculative and based on general theories concerning the competitive dynamics in a market with a monopoly supplier and a significant purchaser, rather than based on specific evidence as to what JM would have done if Rhodia had been its sole supplier for cerium oxide.

246. There is no dispute that, as a general proposition, a supplier in a monopoly position is likely to be able to charge higher prices than it could do in a competitive market. Equally, however, the ability of a supplier to exercise market power may be constrained by buyer power on the part of the relevant purchaser.

247. The evidence of Rhodia's price negotiations with JM indicates that the exercise of market power on both sides was quite finely balanced, despite Rhodia's strong market position as the patentee of HSA20 and the incumbent supplier of the product. Mr Richards said that Rhodia [✂]. Neo objected that this was not corroborated by any contemporaneous documentation. In any event, however, it does not appear to be disputed that later [✂] that had been in place for HSA20 since [✂]. By [✂], when JM and Rhodia agreed a commercial contract covering a range of products, JM was also able to [✂].

248. Mr Richards said that the concession on the [✂] in [✂] was made because Rhodia suspected that another supplier was competing with it. By that point, however, Neo had not made significant commercial supplies to JM, nor had Neo's product been qualified at JM's overseas facilities, and JM certainly had not confirmed to Rhodia that it had qualified an alternative supplier. I do not, therefore, think that the outcome of the negotiations in [✂] can be regarded as decisively attributable to Neo's market entry. Rather, it is more likely that Rhodia's awareness of the importance of JM as a major customer, not only for HSA20 but also for a range of other products, acted as a constraint on the pricing of HSA20.

249. [✂]. I have not seen anything to indicate that this agreement would have materially differed in the counterfactual case.

250. I do not, therefore, consider that the evidence establishes that in the counterfactual case Rhodia would have been able to increase its prices, whether by maintaining the [✂] or adjusting the [✂].

251. That leaves the question whether in the counterfactual case Rhodia's prices would in fact have reduced. I find that improbable. In the counterfactual case, JM would have had no greater buyer power that it had (and has) in the actual case, and there is no other factor suggesting that Rhodia would have faced greater pressure to reduce its prices in the counterfactual case than in the actual case. Insofar as this issue arises, therefore, I consider that the counterfactual prices should be assessed as being the same as Rhodia's actual prices for the supply of HSA20 to JM.

Future sales forecasts

252. To the extent that, contrary to my primary conclusions on causation, any claim for lost profits in relation to Neo's future trade with JM arises, there will be a question as to how Neo's future sales should be calculated. It is common ground that the starting point is an expected decrease in demand, reflecting the transition to new technologies that will be implemented by car makers to meet the increasingly stringent EU emissions regulations. The parties disagree, however, as to the volume figures that should be used for sales from 2022 onwards.

253. Since this issue does not arise on my primary findings on causation, and since it concerns forecasts as to future sales that are by their nature speculative, I do not consider that it is helpful for me to address this issue now. If the matter does ever arise for determination, it will need to be addressed on the evidence available at the time, which by then will inevitably include both actual figures for some of the sales volumes whose forecasts are currently disputed between the parties, and more accurate forecasts based on the sales that have actually been made by then.

Licence fee damages

254. If I am wrong about causation, but correct in my conclusion that Rhodia has not established that it would have had the capacity to supply Neo's volumes in 2015–2017, the question will then arise as to the basis on which Rhodia would have negotiated a licence for Neo to supply C100N to JM during that period. Rhodia's pleaded case in that regard was that:

> "A licence would have been concluded licensing all the acts of the First Defendant and/or the Neo Group in the UK, with a royalty calculated on the basis of volumes of Commercial Product sold (or to be sold) wherever in the world."

255. The main disputed issues are: (i) whether the settlement of Head 1 of Rhodia's claim precludes any further claim for licence fee damages; (ii) whether Rhodia's global licence fee case is sustainable on the evidence; (iii) whether a hypothetical licence fee should assume that Neo could charge Rhodia's price; and (iv) the percentage of the relevant contribution margin that Rhodia could expect to obtain.

256. There was also some debate between Mr Bezant and Mr Boulton as to the date on which the notional licence would have been negotiated. Rhodia's pleaded

position was that the negotiation would have taken place immediately prior to the first proposed supply by Neo of an infringing development sample to JM. Mr Mitcheson maintained that position in his closing submissions, and I did not understand Mr Cuddigan to disagree. On that basis, given that the first infringing sample was the AB0888Z sample sent in March 2013, the relevant negotiation date should be taken as being February 2013 (to the extent that this is relevant in light of my other conclusions in this case).

257. Before addressing the issues set out above, it is helpful to start out with some general principles as to the assessment of licence fee damages in this kind of case.

General principles

258. The starting point for the assessment of damages on this basis is conventionally taken to be the principles identified by Arnold J in *Force India Formula One Team v 1 Malaysia Racing Team* [2012] EWHC 616 (Ch), [2012] RPC 29, §386. While those principles concerned the assessment of so-called "*Wrotham Park* damages" or "negotiating damages" for the misuse of confidential information in circumstances where the claimant cannot prove orthodox financial loss as a result of the breach of a negative contractual term, they have been adopted in the context of the assessment of a reasonable royalty for the breach of performers' rights and unregistered design rights: *Henderson v All Around the World Recordings* [2014] EWHC 3087 (IPEC), §18; and *Original Beauty*, §77. There was no dispute that those principles likewise apply in the present case. They are as follows:

> "(i) The overriding principle is that the damages are compensatory: see *Attorney-General v Blake* at 298 (Lord Hobhouse of Woodborough, dissenting but not on this point), *Hendrix v PPX* at [26] (Mance LJ, as he then was) and *WWF v World Wrestling* at [56] (Chadwick LJ).
>
> (ii) The primary basis for the assessment is to consider what sum would have [been] arrived at in negotiations between the parties, had each been making reasonable use of their respective bargaining positions, bearing in mind the information available to the parties and the commercial context at the time that notional negotiation should have taken place: see *PPX v Hendrix* at [45], *WWF v World Wrestling* at [55], *Lunn v Liverpool* at [25] and *Pell v Bow* at [48]–[49], [51] (Lord Walker of Gestingthorpe).
>
> (iii) The fact that one or both parties would not in practice have agreed to make a deal is irrelevant: see *Pell v Bow* at [49].
>
> (iv) As a general rule, the assessment is to be made as at the date of the breach: see *Lunn Poly* at [29] and *Pell v Bow* at [50].
>
> (v) Where there has been nothing like an actual negotiation between the parties, it is reasonable for the court to look at the eventual outcome and to consider whether or not that is a useful guide to what the parties would have thought at the time of their hypothetical bargain: see *Pell v Bow* at [51].

> (vi) The court can take into account other relevant factors, and in particular delay on the part of the claimant in asserting its rights: see *Pell v Bow* at [54]."

259. Those principles were endorsed by Newey J in *32Red v WHG* [2013] EWHC 815 (Ch), §25, who then expanded upon them. His further observations were summarised by HHJ Hacon in *Henderson v All Around the World*, §19, as follows (with paragraph references to the *32Red* judgment):

> "(vii) There are limits to the extent to which the court will have regard to the parties' actual attributes when assessing user principle damages. In particular
>
> (a) the parties' financial circumstances are not material;
>
> (b) character traits, such as whether one or other party is easygoing or aggressive, are to be disregarded [29]–[31].
>
> (viii) In contrast, the court must have regard to the circumstances in which the parties were placed at the time of the hypothetical negotiation. The task of the court is to establish the value of the wrongful use to the defendant, not a hypothetical person. The hypothetical negotiation is between the actual parties, assumed to bargain with their respective strengths and weaknesses [32]–[33].
>
> (ix) If the defendant, at the time of the hypothetical negotiation, would have had available a non-infringing course of action, this is a matter which the parties can be expected to have taken into account [34]–[42].
>
> (x) Such an alternative need not have had all the advantages or other attributes of the infringing course of action for it to be relevant to the hypothetical negotiation [42].
>
> (xi) The hypothetical licence relates solely to the right infringed [47]–[50].
>
> (xii) The hypothetical licence is for the period of the defendant's infringement [51]–[52].
>
> (xiii) Matters such as whether the hypothetical licence is exclusive or whether it would contain quality control provisions will depend on the facts and must accord with the realities of the circumstances under which the parties were hypothetically negotiating [56]–[58]."

260. I note in passing that the issue of a non-infringing alternative does not arise in this case on the findings that I have already made. It will, however, be necessary to consider further the relationship between principles (ii) and (viii), which require the court to have close regard to the commercial context and other relevant circumstances of the notional licence negotiation, and principle (iii), as to the

irrelevance of the fact that the parties would not in practice have agreed a licence of this nature. I address this below.

Settlement of Head 1

261. Set against the principles set out above, Neo's first argument was that since Rhodia's licence claim (advanced in the alternative to its claim for lost profits) was predicated on infringing acts comprising the supply of C100N commercial products in the UK, that claim is not open to it following the settlement of Head 1, which Neo said "includes a licence to supply HSA cerium oxide products to customers in the UK". Accordingly, Neo said that the notional licence should relate only to the supply of development samples to JM.

262. That argument is, I am afraid to say, utterly hopeless. Neo's offer to settle, made in a without prejudice letter dated 14 October 2020, was explicitly an offer to settle Head 1 of the Rhodia's claim for damages alone: "Neo is willing to offer £85,000 … in respect of Rhodia's claim for damages in the inquiry under Head 1." Following an exchange of correspondence, Rhodia accepted the offer in the following terms, on 5 November 2020:

> "We refer to your clients' part 36 offer dated 14 October 2020 to pay Rhodia £85,000 in respect of Head 1 of damages (the heads of damages are set out in the Points of Claim dated 26 June 2020). In your letter of 22 October 2020 you confirmed that this offer relates solely to the volume of C100N supplied to a customer in the UK and that such volumes are set out in the table of volumes for C100N enclosed in your letter of 13 October 2020. Our clients hereby accept this offer."

263. There is no doubt whatsoever that this agreement solely encompassed Head 1 of Rhodia's heads of damages. In that respect the parties agreed a damages figure that specifically and solely related to the volumes of C100N supplied by Neo to the UK, as set out in the table of volumes referred to by Rhodia. Nothing in that agreement purported to settle any claim for damages in relation to any other supplies of C100N by Neo, whether under Head 1 or (still less) any other head of claim.

264. Nor, in any event, can it be said that the settlement agreement "includes a licence" for Neo to supply cerium oxide products to the UK. No such licence was granted by Rhodia to Neo, at any time. All that happened was that Rhodia accepted a payment of damages in relation to a head of claim quantified by reference to either lost profits or (in the alternative) the grant of a hypothetical licence.

265. Rhodia's licence claim is therefore not precluded, in any way, by the settlement of Head 1 of Rhodia's claim.

Rhodia's global licence fee case

266. Neo's next argument was to say that Rhodia's pleaded case of a UK licence with royalties calculated on the basis of global sales was not the basis on which Mr Bezant had valued the licence. Rather, Mr Bezant had valued a global licence

which would have given Neo worldwide rights to manufacture and sell C100N, such that JM was not exposed to a litigation risk.

267. Mr Bezant's licence valuation was therefore, Neo said, not consistent with Rhodia's pleaded case. Indeed, Rhodia had in January 2021 served an amended licence plea, claiming that a global licence would have been concluded, licensing all of Neo's acts whether in the UK or outside. Neo had, however, objected on the basis that this would entail a licence going beyond the scope of infringement, which would be inconsistent with the principle that the hypothetical licence should relate solely to the right infringed: principle (xi) above; also *Eaton Mansions v Stinger* [2013] EWCA Civ 1308, §§20–21. Rhodia subsequently abandoned that formulation of the claim and confined its pleaded case to a claim based on a UK licence albeit with a worldwide royalty calculation.

268. Neo therefore said that Rhodia's pleaded case was not the notional licence that Mr Bezant had valued; and the notional licence that Mr Bezant had valued was neither pleaded nor sustainable in law. The consequence, Neo said, was that Rhodia's global royalty claim should be rejected in its entirety, and the royalty should be restricted to a valuation of a licence that was confined to a licence for the supply of development samples to the UK.

269. In addressing that submission it is necessary to consider two questions. The first is whether Rhodia's pleaded case is sustainable as a matter of principle. The second is whether that case is supported by Rhodia's expert evidence, and if not the implications for Rhodia's global royalty claim.

270. As to the first of those questions, there is nothing legally objectionable in the notion of a UK licence, the royalty for which is calculated on the basis of the sales outside the UK that are made after the product has been approved in the UK. Nor is such a licence illogical as a matter of fact if the UK licence provides, as Mr Mitcheson put it, the gateway to the overseas sales.

271. In the present case, the precondition to Neo's overseas supplies of C100N was that the product was approved by JM and qualified on the relevant automotive platforms, which required supplies to be sent to the UK. Accordingly, in the counterfactual case in which Rhodia could not supply the total volumes required by JM from 2015–2017, Neo would have had to supply samples to the UK in order for its product to be approved as a substitute for Rhodia's product. The parties would have known, however, that the overwhelming majority of commercial supplies would be made outside the UK, and the notional negotiation would therefore have had to take that into account as forming a relevant and indeed crucial part of the commercial context: principle (ii) above.

272. There is no reason in principle why the overseas sales should be left out of account in the assessment of the notional licence if – contrary to my primary conclusion set out above – the UK supplies are found to have been the "common sense" or proximate cause of those sales. Indeed to do so would create a disjunct between the assessment of damages on a licence fee basis, and the assessment of damages for lost profits, in circumstances where the overarching objective of both is to compensate the claimant for the infringement.

273. Neo objected that a licence confined to the UK rights, but based on the value of subsequent overseas sales, would not have been commercially rational, given the existence of other patents held by Rhodia at the time, in particular the Chinese equivalent of the UK patent (which was revoked following a decision by Rhodia in January 2022 to abandon its appeal against a finding of invalidity). As Mr Boulton pointed out, a UK-only licence would not have prevented Rhodia from objecting to the manufacture by Neo of C100N in China. The notional negotiation would not, therefore, have been for a licence which gave Neo freedom to operate throughout the global market. Rather, Neo would simply have been buying the chance of freedom to operate in that market.

274. Neo is right to say that the notional licence would not have guaranteed it the right to sell throughout the world. But that does not make it impossible to value a licence on the basis pleaded by Rhodia. The identification of a notional licence in this type of case is by definition a somewhat abstract exercise, the purpose of which is simply to form a reference framework for the assessment of a value to be put on the breach of the right in question. The assumption is therefore that there is a willing licensor and a willing licensee, even if the parties would not in practice have agreed a licence on those terms: principle (iii) above. If the result is a rather artificial one, that follows from the nature of the exercise and is not a reason to reject the exercise altogether: the court simply has to do the best that it can on the material available to it.

275. That does not, of course, require the court to ignore a relevant feature of the market on which sales would be made following the grant of the notional licence. On the contrary, the court is required to have regard to the circumstances in which the parties would have found themselves at the time of the hypothetical negotiation: principle (viii). If those circumstances would have included the existence of other intellectual property rights which would have reduced the value of sales by the defendant, that is a matter which can and should be taken into account in the valuation of the licence.

276. I turn, therefore, to the question of whether Rhodia's case was supported by its expert evidence. Given the absence of comparable licences, both experts adopted the same overarching approach of valuing the notion licence on the basis of a simplified economic benefits model, under which the anticipated available profits resulting from the notional licence are split between the licensor and licensee.

277. In that regard Mr Bezant explained why, in his view, it was logical to value the economic benefits resulting from the notional licence on the basis of global sales:

> "I ascribed the value of the notional licence to the UK Patent rights on the basis that, absent testing at Johnson Matthey's facilities in the UK, it would not have been possible for Neo to obtain validation of C100N, and hence enter the HSA cerium oxide market through sales to Johnson Matthey specifically."

278. For the reasons set out above, I do not consider that approach to be incorrect as a matter of principle. The problem with Mr Bezant's evidence was rather that he had valued the licence on the basis that Neo would be providing JM with a globally-licensed product, which meant that JM would not be exposed to

litigation risk and would have been willing to pay a higher price than it did in fact pay to Neo. Mr Bezant concluded on that basis (among others) that Neo would have increased pricing power in the counterfactual scenario, and would have been able to negotiate a price similar to the price that Rhodia actually charged. It follows from the preceding discussion that this overstated the rights that would have been granted under the notional licence.

279. Mr Bezant accepted in cross-examination that if Neo did *not* obtain a global licence, that would reduce the value of the notional licence:

> "Q. What you are saying … is that the licence is valuable to Neo because Neo's customer gets a licensed product which does not expose it to litigation risk?
> A. Right.
> Q. You know – and you have told me – that the principal market is Europe. It must follow that the licensed product does not expose Johnson Matthey to litigation risk throughout Europe?
> A. Yes.
> Q. And in fact … what you are actually valuing is a worldwide licence, or includes a worldwide licence to Johnson Matthey?
> A. I have calculated the royalty on the basis that the sales made by Johnson Matthey, wherever they arise, might be worldwide because, as a practical matter, it might be in Europe, so I have calculated it on the basis that all of those, all of the rights are reflected in the value of that licence.
> Q. All of the rights they need to carry out that economic activity?
> A. Yes.
> Q.That includes the right to manufacture wherever they manufacture?
> A. It includes the rights to manufacture. … [A]s a practical matter, I believe they manufacture in Macedonia, South Africa and the Netherlands.
> Q. It includes the right to sell wherever they sell?
> A. It includes the right to sell but, as I say, as a practical matter, I believe the bulk of their sales are in Europe.
> …
> Q. So if they do not get, under your notional licence, a right to do that then this licence is of nugatory value?
> A. If they do not obtain the rights they need do that, then this licence is of less value. How much less I cannot tell you because I do not know about the rights that they may need."

280. It follows that in the present case any valuation of the notional licence would have to take into account the existence of other patents held by Rhodia, and in particular the Chinese patent.

281. I do not, however, agree with Neo that the only way of doing so is to reject Rhodia's global licence fee claim in its entirety and replace it with a licence fee confined to the licensing of Neo's development samples. Mr Bezant's erroneous assumption that the notional licence would give Neo global rights to manufacture and sell did not taint the entirety of his approach to the quantification of the notional licence, but related specifically to the prices at which he assumed that

Neo would be able to sell its product to JM. As I set out below, that error can be corrected by taking an alternative reference basis for those prices.

282. My conclusion on this point, therefore, is that Rhodia's global royalty claim is sustainable in principle, but the notional licence must be valued on an assumption that the licence would not have given Neo global rights. The notional licence fee would therefore need to price in a continued litigation risk.

Counterfactual price for sales by Neo

283. The starting point for the experts' calculations of the licence fee under the simplified economic benefits model that they adopted was the contribution margin that Neo would have earned on its sales in the counterfactual case. Mr Bezant's calculation of the contribution margin was (as indicated above) premised on the proposition that Neo would in the counterfactual case have been able to negotiate a price similar to the price that Rhodia actually charged.

284. Mr Boulton disagreed, and considered that there was no evidence that JM would have accepted a price higher than Neo did in fact negotiate; ultimately, however, he considered that this was an issue of fact for the court. His calculations of Neo's contribution margin were therefore based on two alternative "illustrative" scenarios: Scenario A using Rhodia's prices and Scenario B using Neo's prices.

285. Mr Bezant's counterfactual scenario was based on various assumptions that, in my judgment, do not stand up to scrutiny. The first is the point already discussed, that Mr Bezant assumed that Neo would have been providing a licensed product, rather than the unlicensed product that it actually provided, and that JM would therefore have been willing to pay a higher price for a product that did not expose it to litigation risk. The correct counterfactual case is, however, that the overseas supplies would have remained unlicensed, giving a continued litigation risk in relation to those supplies.

286. Secondly, since in the counterfactual case Neo would be the only possible source of supply of the relevant volumes for JM, Mr Bezant said that JM would have had reduced bargaining power, which would have enabled Neo to increase its prices towards the level charged by Rhodia. In fact, however, Neo's position as the sole source of supply of the relevant volumes in the counterfactual scenario would not have been discernibly different to the situation that prevailed in reality, given my finding that Rhodia has not established that it could have supplied Neo's volumes before 2018. JM was also, at the relevant time, well aware of Rhodia's capacity problems. I do not, therefore, consider that JM would have had materially greater bargaining power in the counterfactual scenario.

287. Thirdly, Mr Bezant pointed to the higher costs that Neo would have incurred in the counterfactual case due to its royalty payment under the licence, and said that Neo could have sought to charge a higher price than it actually did to reflect those higher costs. In other words Mr Bezant assumed that Neo could have passed on the royalty payments to JM. That is, however, not something that can simply be assumed; rather, it requires analysis of the market conditions. There is in this case no evidence before me which allows me to reach any view on the extent to which Neo would have been able to pass on its increased costs to JM, still less whether

Neo could on that basis have charged the same price as Rhodia. As Mr Boulton also pointed out, in any hypothetical negotiation between the parties Rhodia would not (for competition reasons) have disclosed its prices to Neo, so Neo would not have been aware or Rhodia's prices in any event.

288. I do not, therefore, consider that the evidence supports Mr Bezant's assumptions, and Mr Bezant provided no evidence as to what the counterfactual price might have been if his assumptions did not hold true.

289. The only alternative counterfactual scenario presented in the evidence was therefore Mr Boulton's Scenario B based on Neo's prices. That scenario is consistent with my conclusions that (i) Neo's overseas supplies would have remained unlicensed in the counterfactual case; (ii) Neo's position as the sole source of supply for the relevant volumes would not have been be materially different to the situation prevailing in reality during 2015–2017; and (iii) there is no evidence as to Neo's ability to pass on royalty payments in the counterfactual case. Mr Boulton's Scenario B is, therefore, the scenario which in my judgment should be used for the calculation of Neo's counterfactual contribution margin.

Percentage of contribution margin that Neo could expect to obtain

290. The final issue for me to determine is the percentage of the contribution margin that Neo could expect to have obtained in the notional negotiation.

291. Mr Bezant and Mr Boulton agreed that literature and practice identified an allocation of between 25% and 50% of incremental benefits to the licensor. Mr Bezant considered that Rhodia could expect to receive close to 50%, on the basis of its substantial bargaining power, and on the basis that any licence would have been *de facto* an exclusive licence.

292. Mr Boulton said that an allocation of closer to 50% would normally only be appropriate in highly unusual circumstances where the licence was exclusive and the intellectual property represented the majority of the value implicit in the product, such as a "blockbuster" drug. In his view, this was not the case here, since Rhodia would have continued to compete in the market, thereby constraining the sales that Neo could make, and there were alternative products both in the form of alternative types of catalytic converters and in the possibility of developing alternative cerium oxide products outside the scope of the patent. On that basis he thought that a rate towards the lower end of the range, i.e. 25%, was more appropriate.

293. I do not consider that there would have been easily substitutable alternative products for the relevant platforms, once the car makers of those platforms had selected JM's catalysts that used Rhodia's HSA20 and/or Neo's C100N products. As set out above, qualifying a catalyst for a particular platform is a time-consuming process. Changing the catalyst formulation during the life of an engine platform would, as Mr Winterborn explained, have required a substantial amount of work to test performance, durability and compliance with the relevant emissions standards. That could of course be done in an extreme case, and Mr Winterborn gave the example of a fire at a supplier's production site, which led JM to use a similar competitor material for a period of time. But there was no

evidence suggesting that this would have been a compelling alternative at the time of the notional negotiation.

294. I have also found that Neo has not established that it could have produced a non-infringing version of C100N that JM would have accepted as a substitute for Rhodia's HSA20 product.

295. On the other hand, the notional licence would not have been either in form or substance an exclusive licence. Rhodia would have remained in the market as a competitor to Neo, with the potential to increase its capacity over time (as it did in fact do), and with Neo continuing to bear a litigation risk as discussed above. Those factors would have reduced Rhodia's ability to demand an allocation at the top end of the range.

296. In those circumstances the appropriate allocation lies somewhere between the positions of the two experts. I consider that an allocation of 35% of the contribution margin to Rhodia would have been a reasonable outcome of the notional negotiation.

Conclusions

297. My conclusions, by reference to the issues set out at §§79–81 above, are as follows.

298. As to the overarching issues:

    i) I do not consider that the claim for damages based on overseas sales is *a priori* excluded on the basis of the territorial scope of the UK patent, whether as a matter of common law or on the basis of the Enforcement Directive or TRIPS.

    ii) I do not consider it appropriate to depart from the *United Horse Shoe* rule; accordingly the non-infringing alternative case is not available to Neo in respect of the lost profits claim. Further and in any event on the facts Neo has not established that it could and would have been able to produce a non-infringing alternative version of C100N that JM would have accepted.

    iii) The infringing supplies by Neo of development samples and commercial C100N were not the "common sense" causes of the overseas sales. Rhodia's claim therefore fails for lack of causation.

299. If my primary conclusion on causation is wrong, and Neo is liable to pay damages in relation to its overseas sales of C100N:

    i) Rhodia would have had sufficient capacity to supply Neo's volumes from 2018 onwards, but it has not established that it would have had sufficient capacity in 2015–2017.

    ii) Rhodia's costs figures can be relied upon for the purposes of the lost profits claim.

iii) Rhodia's counterfactual prices for the supply of Neo's volumes to JM (from 2018 onwards) should be assessed as being the same as Rhodia's actual prices during the relevant years.

iv) I have not determined the issue as to future sales forecasts, given my primary conclusion.

300. In relation to licence fee damages during the years 2015–2017, again assuming that my primary conclusion on causation is wrong:

i) I reject Neo's contention that the settlement of Head 1 precludes a claim to licence fee damages.

ii) Rhodia's claim to a notional royalty on a global basis is sustainable in principle.

iii) The notional royalty should be assessed on an assumption that Neo would have supplied to JM at its actual prices rather than Rhodia's prices.

iv) Rhodia should be allocated 35% of the notional contribution margin, based on that assumption.