

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

U.S. WATER SERVICES, INC. and
ROY JOHNSON,

Plaintiffs,

v.

OPINION & ORDER

13-cv-864-jdp

NOVOZYMES A/S and NOVOZYMES
NORTH AMERICA, INC.,

Defendants.

This is a patent infringement suit between competing suppliers of materials for fuel ethanol processing. Plaintiff U.S. Water Services, Inc., holds two patents related to a method of using an enzyme, phytase, to reduce deposits that build up in ethanol processing equipment. Plaintiffs accuse defendants Novozymes A/S and Novozymes North America, Inc. of indirectly infringing those patents by selling a phytase-based product. Both sides have moved for summary judgment on a multitude of issues. This opinion and order reaches only two issues, which will dispose of this suit.

First, validity. The use of phytase to break down phytic acid—the basic chemical reaction claimed by the patents-in-suit—was known in the prior art, and defendants have shown that the patents-in-suit merely claim a new use for known techniques and materials. Each element of the asserted claims in both of the patents-in-suit was disclosed, either expressly or inherently, in a single prior art reference. Thus, those claims are invalid as anticipated under 35 U.S.C. § 102. The court will grant summary judgment to defendants on this issue.

Second, inequitable conduct. Defendants have not adduced evidence sufficient to sustain their burden to show either the materiality of the withheld information or the deceptive intent of the patentee. The court will grant summary judgment to plaintiffs on this issue.

BACKGROUND

The following facts are undisputed, except where noted.

A. The parties

U.S. Water Services is a water treatment company, headquartered in St. Michael, Minnesota. Roy Johnson is the company's Chief Innovation Officer and a co-inventor of the patents-in-suit. Mr. Johnson assigned his rights in these patents to U.S. Water. In this opinion, the court will refer to plaintiffs collectively as U.S. Water, except when separately identifying them. Novozymes A/S is a global biotechnology company, based in Bagsvaerd, Denmark. Novozymes North America is a subsidiary of Novozymes A/S, incorporated in New York and based in Franklinton, North Carolina. In this opinion, the court will refer to defendants as Novozymes.

B. Technology at issue

The technology at issue relates to an enzyme, phytase, which is useful in fuel ethanol production. The essential aspects of ethanol production are undisputed, although the parties disagree on some details that are not material to this decision.

Ethanol is commonly produced by using yeast to ferment starchy grains, such as corn, wheat, or sorghum. In “dry grind” ethanol plants, these grains are milled to produce a meal, which is then mixed with water in a slurry tank to form a mash.¹ Enzymes are added to the mash, which then travels to liquefaction tanks to sit for a few hours, and to allow the enzymes to begin breaking down the starches into sugars. Following liquefaction, the mash moves into fermentation tanks, where yeast digests the sugars, producing alcohol and carbon dioxide. In

¹ The parties agree that fuel ethanol can also be produced using a “wet milling” process, which is similar in overall concept. Dkt. 267, at 17-18. According to the parties, there are no corn wet milling facilities that are dedicated exclusively to the production of fuel ethanol. *Id.* at 18.

some ethanol plants, yeast is added directly into the fermentation tanks; in others, the yeast is added through a propagator tank, which hydrates the yeast before transferring it to the fermentation tank.

When fermentation is complete, the resulting product—referred to as beer—is transferred to a distillation column, called a beer column. Some ethanol plants use a holding tank, called a beer well, to store the beer before it enters the beer column, but others transfer the beer directly to the beer column. In plants that use beer wells, the beer passes through a beer mass heat exchanger before entering the beer column. Regardless of whether a plant uses a beer well, distillation begins once the beer reaches the beer column. Beer enters near the top of the beer column, and then cascades down over a series of horizontally stacked trays. Meanwhile, steam is added to the bottom of the column and works its way upward, capturing vaporized ethanol from the beer as it does so. The ethanol-containing vapor exits the beer column at the top to be concentrated using molecular sieves. The product remaining in the beer column is called whole stillage. Whole stillage can be further broken down into several products, including backset and thin stillage. Ethanol plants recycle these products for use as process water for the next batch of mash. Other byproducts can be used in animal feed.

A common problem in fuel ethanol production is “fouling,” wherein deposits form on the machinery that contacts the mash, fermenting broth, or ethanol processing fluid that has poorly converted starch. These deposits impede heat transfer and fluid flow, decreasing the efficiency of the affected machinery. Fouling is a significant problem: according to a Novozymes presentation produced during discovery, fouling results in downtime that costs the ethanol industry in the United States \$71 million per year.²

² Novozymes objects to this evidence on the grounds that U.S. Water has not identified a witness with personal knowledge of the presentation through whom the evidence could be

Traditional solutions to fouling include physically removing the deposits using a high pressure water jet and cleaning machinery with sulfuric acid or caustic cleaners. Alternatively, ethanol plants can increase the solubility of deposit-forming material, allowing the material to dissolve in the beer rather than form deposits on the machinery. A common way of doing this is adding sulfuric acid at one or more points during the production process. Sulfuric acid reduces the pH of the beer which, in turn, increases the solubility of deposit-forming material. Physically cleaning the machinery and using sulfuric acid to lower pH are expensive: U.S. Water estimates that these measures may cost individual plants hundreds of thousands of dollars per year.³

This case is about a different type of solution to the problem of fouling, which uses the enzyme phytase. The processing fluid used during ethanol production contains phytic acid, and its metallic salts, which are a prime cause of fouling. Phytic acid and its metallic salts precipitate out of the ethanol processing fluid, forming deposits as the fluid travels through the machinery. Phytase helps prevent these deposits from forming by chemically breaking down the phytic acid. Once broken down, phytic acid byproducts are more readily dissolved in the processing fluid. Using phytase to control deposits is cheaper than using sulfuric acid or physically cleaning fouled machinery.

C. The patents in suit

There are two patents in suit: U.S. Patent No. 8,415,137, “Preventing Phytate Salt Deposition in Polar Solvent Systems,” to Roy Johnson and Paul R. Young; and U.S. Patent No.

introduced at trial. Dkt. 234, at 12. Whatever the merit of the evidentiary objection, Novozymes does not contend that the information contained in its presentation is inaccurate.

³ Novozymes quibbles that the actual cost depends on the size and set-up of the plant, the frequency of cleanings, market conditions, and other variables. Dkt. 234, at 14. This dispute is immaterial: the parties generally agree that physical cleaning and sulfuric acid are expensive responses to fouling.

8,609,399, “Reducing Insoluble Deposit Formation in Ethanol Production,” also to Johnson and Young. Both patents claim priority to U.S. Patent Application 11/873,630, which issued as U.S. Patent No. 8,039,244. The parent ’630 application was filed on October 17, 2007, which is thus the priority date of the patents-in-suit.

The three patents share a common specification which teaches the value of using phytase to reduce deposits in ethanol production equipment and describes methods of doing so. The ’244 patent claimed a method of reducing deposits by adding phytase to thin stillage or backset, which is to say, adding phytase *after* fermentation.⁴ The ’137 patent and the ’399 patent contain broader claims. Both patents claim adding phytase to “an ethanol processing fluid,” thus apparently extending the scope of the invention by claiming methods in which phytase is added before or during fermentation. The asserted claims of the ’137 patent and the ’399 patent also include limitations on the conditions for adding the enzyme, identifying ranges for dosage, temperature, and pH level. The asserted claims include limitations that require breaking down phytic acid and reducing deposits substantially without adding an acidic compound.

The court will defer a more detailed discussion of the asserted claims to the validity analysis below.

D. Prior art

There are two prior art references pertinent to this opinion. The first is a World Intellectual Property Organization application, No. WO 01/62947 for “Fermentation with a Phytase,” to Chris Veit and others, published on August 30, 2001. The court will refer to this

⁴ The scope of the claims of the ’244 patent was previously litigated. *U.S. Water Servs., Inc. v. ChemTreat, Inc.*, No. 11-cv-0895, 2013 WL 173736, at *1 (D. Minn. Jan. 16, 2013), *appeal transferred*, 570 F. App’x 924 (Fed. Cir. 2014), *and aff’d*, No. 14-3057, 2015 WL 4491398 (8th Cir. July 24, 2015). For purposes of this case it is thus established that the ’244 patent claims only the addition of phytase after fermentation. Facts related to this litigation are a central part of Novozymes’s allegation of inequitable conduct, addressed below.

published application as “Veit.” Veit has an extensive prosecution history, which is generally immaterial to the court’s decision because Veit’s priority over the patents-in-suit is clear. According to Veit’s specification, the “invention relates to a process of fermenting phytic acid-containing materials; a process of alcohol and other fermented compounds production, in particular ethanol production; the use of phytase activity for saccharification and/or fermentation; and a composition suitable for ethanol production.” Veit, 1:4-9.

The second pertinent prior art reference is United States Patent No. 5,756,714, for “Method for Liquefying Starch,” to Richard L. Antrim and others. The court will refer to this patent as “Antrim.” Antrim issued in 1998, claiming priority to an application filed March 27, 1995. As with Veit, Antrim’s priority over the patents-in-suit is clear and undisputed. Antrim’s claims describe a method for treating “starch prior to or simultaneously with liquefying said starch to inactivate and/or remove an enzyme inhibiting composition present in said starch to form treated starch.” Antrim, 20:10-13.

E. Novozymes’s phytase products

Novozymes’s alleged infringement is not material to the validity of the patents-in-suit. But to provide a reasonably complete background to the case, the court provides a brief overview of the activities that U.S. Water alleges to be infringing. U.S. Water has developed a phytase-based product, which it has marketed under the brand name pHytOUT. Since 2009, U.S. Water has offered pHytOUT to its ethanol plant customers as part of a method for deposit control.

Novozymes started offering a phytase-based fouling-reduction product for ethanol processing in 2011, which it branded as Phytaflo beginning in 2013. U.S. Water alleges that Novozymes’s customers directly infringe the patents-in-suit by practicing the claimed methods of deposit reduction, and that Novozymes indirectly infringes these patents by inducing its

customers to directly infringe, or by contributing to their direct infringement by supplying them with Phytaflow. U.S. Water has identified eight ethanol plants—none of which are parties to this action—that it contends use Novozymes’s Phytaflow to reduce fouling. Some of these plants are former U.S. Water customers, and U.S. Water has adduced evidence that these plants switched to Novozymes’s product because it was less expensive.

ANALYSIS

A. Jurisdiction and basic legal principles

The case arises under the patent laws of the United States, and the court has subject matter jurisdiction under 28 U.S.C § 1338. The court looks to Federal Circuit precedent when considering substantive issues of patent law, and to the regional circuit for procedural law. *Aero Products Int’l, Inc. v. Intex Recreation Corp.*, 466 F.3d 1000, 1016 (Fed. Cir. 2006). But as in standard civil cases, summary judgment in a patent case is appropriate if “the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). The court views all facts in the light most favorable to the non-moving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). “Only disputes over facts that might affect the outcome of the suit under the governing law will properly preclude the entry of summary judgment.” *Id.* at 248. Where there are cross-motions for summary judgment on issues of infringement and invalidity, as is true in this case, “the court views the record evidence through the prism of the evidentiary standard of proof that would pertain at a trial on the merits.” *SRAM Corp. v. AD-II Eng’g, Inc.*, 465 F.3d 1351, 1357 (Fed. Cir. 2006) (citations omitted).

U.S. Water’s patents are presumed valid under 35 U.S.C. § 282(a). That presumption is overcome on anticipation grounds only if Novozymes adduces clear and convincing evidence that at least one piece of prior art anticipates the patents-in-suit. Anticipation is a question of

fact, which may be decided on summary judgment “if no genuine issue of material fact exists [and] if no reasonable jury could find that the patent is not anticipated.” *OSRAM Sylvania, Inc. v. Am. Induction Technologies, Inc.*, 701 F.3d 698, 704 (Fed. Cir. 2012) (internal citations and quotation marks omitted).

“Under 35 U.S.C. § 102[,] a claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference.” *King Pharm., Inc. v. Eon Labs, Inc.*, 616 F.3d 1267, 1274 (Fed. Cir. 2010) (internal citations and quotation marks omitted). Determining whether claims are anticipated involves two steps: (1) construing the claims of the patents-in-suit; and (2) comparing the construed claims to the prior art. *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1332 (Fed. Cir. 2010). Although a prior reference must arrange or combine the elements of the claimed invention in the same way as the claim, the reference need not disclose the elements in precisely the same language. *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 21 (Fed. Cir. 2012). This case primarily involves the principle of inherent disclosure, according to which “a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted).

B. Anticipation by Veit and Antrim

1. The asserted claims

U.S. Water asserts 29 claims in this case: from the '137 patent, one independent and three dependent claims; from the '399 patent, four independent and 21 dependent claims. Dkt. 204, at 102.⁵ The validity of each of these claims must be separately evaluated, because the

⁵ On June 9, 2015, the parties stipulated to dismiss U.S. Water’s claims of infringement relating to four of the originally asserted claims in the '399 patent. Dkt. 307.

invalidity of an independent claim does not, by itself, entail the invalidity of those claims that depend from it. 35 U.S.C. § 282(a).

Although each claim must in some sense be separately considered, the claims share common elements. Novozymes proposes (and U.S. Water does not disagree) that the asserted claims, collectively, contain various combinations of seven limitations. Those limitations are:

- (1) adding phytase to a fuel ethanol processing fluid containing phytic acid or phytic acid salts;
- (2) at a dosage of 10 ppm less or 50 U/L or less;
- (3) at a temperature between 20°C and 80°C;
- (4) at a pH of 4.5 or higher in the beer column; and
- (5) without the addition of an acidic compound, an oxidizer, and oxidizing agent, or ultraviolet light;
- (6) breaking down phytic acid;
- (7) thereby reducing the formation of insoluble deposits.

Dkt. 200, at 66.

Claim 1 of the '399 patent is a representative independent claim:

1. A method of reducing formation of insoluble deposits of phytic acid and/or salts of phytic acid in fuel ethanol processing plant equipment or a portion thereof during the production of a quantity of ethanol, wherein the production of a quantity of ethanol comprises a fermentation step and wherein the fuel ethanol processing plant comprises a piece of heat transfer equipment, the method comprising:

providing an additive in an ethanol processing fluid in the plant, wherein the ethanol processing fluid comprises an amount of phytic acid and/or salts of phytic acid, and wherein the additive comprises phytase,

wherein the phytase reduces the amount of phytic acid and/or phytic acid salts in the ethanol processing fluid by breaking down the phytic acid and/or phytic acid salts,

wherein providing the additive comprising phytase in the ethanol processing fluid causes a reduction of the formation

of insoluble deposits of phytic acid and/or salts of phytic acid in a piece of heat transfer equipment in the plant, and wherein the reduction in the formation of insoluble deposits of phytic acid and/or salts of phytic acid in fuel ethanol processing plant equipment or a portion thereof during production of the quantity of ethanol is accomplished substantially without the addition of an acidic compound that can break down organic phosphates and phosphonates into soluble inorganic phosphates in the presence of an oxidizer, oxidizing agent, or ultraviolet light.

'399 patent, at 12:30-57.

Claims 5 and 6 are representative dependent claims:

5. The method of claim 1, wherein the plant further comprises a beer column and wherein providing the ethanol processing fluid comprising phytase also causes the amount of insoluble phytic acid and/or salts of phytic acid deposited in the beer column to be reduced.

6. The method of claim 5, wherein when the phytase reduces the amount of phytic acid and/or phytic acid salts in the ethanol processing fluid, the phytase is present in the ethanol processing fluid in an amount of 500 ppm or less.

Id. at 13:21-29.

2. Claim construction

The parties do not identify anticipation-specific claims construction issues, although they have contested four claim terms in the context of infringement. Two of these contested terms are arguably material to the question of anticipation, and thus the court will construe those terms.

A “bedrock principle” of patent law is that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (citations and quotation marks omitted). The patent’s intrinsic evidence is the “primary basis for construing” a claim and “the best source for understanding a

technical term.” *Id.* at 1315 (citations and quotation marks omitted). Intrinsic evidence includes the patent and its prosecution history, related patents and their prosecution histories, and the prior art that is cited or incorporated by reference in the patent-in-suit and prosecution history. *Id.* at 1315-17. Of these sources, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* at 1315 (internal citations and quotation marks omitted).

The court may also consider extrinsic evidence, which refers to all other types of evidence, including inventor testimony, expert testimony, documentary evidence of how the patentee and alleged infringer have used the claim terms, dictionaries, treatises, and other similar sources. *Id.* at 1317-18. Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* at 1317-19. However, extrinsic evidence is less reliable and less useful in claim construction than the patent and its prosecution history. *Id.* Intrinsic evidence trumps any extrinsic evidence that would contradict it. *Id.* at 1314.

a. “Wherein the pH of the ethanol processing fluid in the beer column is 4.5 or higher during production of the quantity of ethanol”

The first disputed term relates to the pH range that the patents-in-suit claim. According to the parties, proper construction of this term turns on the word “during.” Novozymes contends that it means “at all times during,” so that the claim requires the pH in the beer column to always be above 4.5. U.S. Water proposes a less rigid construction, contending that the term “during” means “at some point in.” The specification confirms that the claimed invention covers more than a method for combating deposits that occur *exclusively* at pH levels above 4.5, although this was a principal focus of the invention. And the extrinsic evidence supports a less rigid construction as well. A person of ordinary skill in the art would understand

the practical impossibility of maintaining a consistent pH level in the beer column, and would not read the term as requiring that the pH always stay above 4.5 for the invention to work.

The word “during” appears throughout the specification and the asserted claims, sometimes referring to a continuous event or condition, and sometimes referring to a single occurrence. For example, the specification teaches that “[a] small amount of phytic acid is naturally broken down into soluble byproducts . . . during fermentation,” ’399 patent, 4:24-26, which presumably refers to an ongoing reaction. But the specification also describes introducing mash “into [a] fermentation tank during ethanol processing,” *id.* at 2:11-15, and it provides an aspect of the invention wherein phytase is introduced “into thin stillage or backset-containing equipment during ethanol processing,” *id.* at 6:21-24. These are both events that are started and completed in ethanol processing, and that therefore do not occur “at all times” throughout the process.

The substance of the common specification helps resolve any ambiguity. According to the patents-in-suit, fouling occurs at a range of pH levels. “[D]eposits tend to be most severe or tenacious on hot surfaces, and where the pH of the processing liquid is highest (about 4.5), but deposits may also form at lower pH values and on cooler surfaces.” ’399 patent, 1:38-43. The specification includes a table disclosing that when phytic acid is in a solution containing ethanol (as it would be in a beer column), precipitate becomes visible at a pH of 4.35 and a temperature of 40°C. *Id.* at 5:7-19. Thus, the specification acknowledges that the pH does not need to be above 4.5 for the claimed invention to successfully reduce deposits. Indeed, even the targeted “tenacious” deposits occur at *about* 4.5, which would include lower values. Given the breadth of the specification, as well as its disclosure that phytase can reduce deposits at lower pH levels, it would be inconsistent to construe this term in a way that would not cover a process in which the pH level in the beer column dipped below 4.5 at some point. Moreover, the specification does

not disclose a method for maintaining the pH above 4.5 once the ethanol processing fluid enters the beer column, an instruction that practitioners would expect to see if the inventors truly meant to claim an invention that required a pH above 4.5 at all times.

Novozymes's intrinsic evidence is meager in comparison. While prosecuting the '137 patent, the inventors at one point informed the PTO that they wished to "restrict" pH in the beer column because that is one of the sites at which deposits are reduced. Dkt. 208-4, at 49. But even in this statement, the inventors did not indicate that the pH must stay above 4.5 *at all times*. Considered along with the specification, the inventors' response merely confirms that they wanted to emphasize how phytase could prevent fouling that occurs at higher pH levels.

The extrinsic evidence supports construing the disputed term to mean "at some point in." U.S. Water has provided comprehensive and generally undisputed expert evidence regarding how a person of ordinary skill in the art would read the term. Courts must construe claims to give them "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention." *Phillips*, 415 F.3d at 1313. The parties agree that a person of ordinary skill in the art would have an understanding of the operation of fuel ethanol processing plants. Dkt. 267, at 259. For example, someone skilled in the art would know that some plants monitor pH levels in the beer column and set target pH levels to accomplish deposit reduction, while other plants do not monitor pH levels. But even the plants that monitor pH levels do not always have precise control systems, and so the actual pH of the beer frequently fluctuates above and below any target that the plant sets. And finally, adjusting the pH takes time; it does not happen instantaneously. Given this inherent variability, U.S. Water's expert, Mr. Simms, opines that a person of ordinary skill in the art would not construe "during" to mean "at all times." Dkt. 174, ¶ 70. Instead, Mr. Simms suggests that a person of ordinary skill in the art would understand "during" to require that the pH in the beer column be above 4.5

“for a reasonable period of time.” *Id.* ¶ 72. U.S. Water explains that the expert’s construction, although using different words, is substantively the same as its own proposed construction because neither interprets “during” in a way that would allow U.S. Water to claim de minimus infringement. Dkt. 265, at 78. U.S. Water’s construction is based on the practicalities of ethanol production that a person of ordinary skill in the art would incorporate into his or her reading of the disputed term. Thus, the extrinsic evidence supports construing the term to mean “at some point.”

The court construes the claim “wherein the pH of the ethanol processing fluid in the beer column is 4.5 or higher during production of the quantity of ethanol” to mean that the pH must be 4.5 or higher at some point during production.

b. “Wherein the reduction . . . is accomplished substantially without the addition of an acidic compound”

The second claim that the court must construe concerns the extent to which plants must be able to reduce deposits with phytase, as opposed to with an acidic compound and an oxidizing agent or with an acidic compound and ultraviolet light. Novozymes contends that this term means that plants practicing U.S. Water’s invention must accomplish deposit reduction without using an acidic compound at any time in the production process. U.S. Water contends that the plain meaning is sufficient and no further construction is necessary. In the alternative, U.S. Water proposes that the court construe the term to mean that deposit reduction is accomplished substantially by phytase and not by the addition of an acid compound.

The intrinsic evidence does not support Novozymes’s construction. The specification discloses three ways to reduce deposits by adding an “agent” to ethanol processing fluid. ’399 patent, 5:21-37. In the first two methods, the agent is an acidic compound (*e.g.*, sulfuric acid); one method combines the acid with an oxidizer or oxidizing agent, the other method combines

the acid with ultraviolet light. In the third method, the agent is an enzyme capable of degrading organic phosphates (*e.g.*, phytase). During the prosecution of the '137 patent, the applicants included a claim that limited the invention to cover reductions “accomplished substantially without the addition of *an acid*.” Dkt. 280, at 102 (emphasis added). The applicants relied on the above-cited portion of the specification to support the limitation. *Id.* But the PTO initially rejected the limitation, concluding that it lacked support in the specification. *Id.* In response, the applicants re-emphasized the above-cited language, and they informed the PTO that they meant to claim a method for using the phytase-based agent to the exclusion of the two agents. *Id.* at 103-04.

Claim 1 of the '399 patent illustrates the import of the applicants' statements to the PTO. The preamble claims “[a] method of reducing formation of insoluble deposits.” '399 patent, 12:30. The preamble is followed by four clauses that delineate the method, one of which contains the disputed term. Clause one claims adding phytase. Clause two claims that the phytase will reduce the amount of phytic acid. Clause three claims that adding phytase “causes a reduction of the formation of insoluble deposits.” *Id.* at 12:45-46. Finally, clause four claims that the reduction (*i.e.*, the one claimed in clause three) “is accomplished substantially without the addition of an acidic compound that can break down organic phosphates and phosphonates into soluble inorganic phosphates in the presence of an oxidizer, oxidizing agent, or ultraviolet light.” *Id.* at 52-57. Read in its entirety, and against the backdrop of the specification, this claim aligns with what the applicants told the PTO. The claim states that the reduction in deposits will be accomplished by phytase, rather than by acid in combination with an oxidizer or by acid in combination with ultraviolet light. Construing the disputed term as Novozymes proposes ignores this prosecution history and does not conform to the claim language.

The court will construe the term “wherein the reduction . . . is accomplished substantially without the addition of an acidic compound” to mean that deposit reduction is accomplished substantially by phytase and not by the addition of an acid compound with an oxidizer or with ultraviolet light. But the term does not preclude all use of acidic compounds in ethanol processing.

3. Comparison of the claims with Veit and Antrim

Novozymes contends that Veit and Antrim each expressly disclose the first six of the claim elements listed above and that both references inherently disclose the seventh element, which concerns the purpose of the invention. U.S. Water contends that the references do not disclose elements two, four, and seven. *See generally* Dkt. 226, at 95-119. The evidence of record shows beyond genuine dispute that the expressly disclosed elements, one through six, are disclosed in Veit and Antrim. Thus, the critical issue in this case is the inherent disclosure of adding phytase for the purpose of reducing deposits.

The fundamental flaw in U.S. Water’s argument is that “[n]ewly discovered results of known processes directed to the same purpose are not patentable because such results are inherent.” *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1376 (Fed. Cir. 2001) (citations omitted). Here, the evidence of record establishes that, at best, U.S. Water discovered a new use for the method expressly disclosed in Veit and in Antrim. U.S. Water therefore cannot genuinely dispute that its asserted claims are invalid under 35 U.S.C. § 102, and the court will enter summary judgment in Novozymes’s favor.

c. Express disclosure

Veit and Antrim expressly disclose the first six elements of the above-identified list. U.S. Water challenges only whether Veit discloses the dosage range and the pH of 4.5 or higher in the beer column, *see* Dkt. 226, at 98-108, and for Antrim, U.S. Water challenges only whether

the reference expressly discloses a pH of 4.5 or higher in the beer column, *id.* at 108-13. Before addressing each element, the court notes that three of these claim elements concern ranges for the conditions under which phytase is added to ethanol processing fluid. “[W]hen a patent claims a chemical composition in terms of ranges of elements, any single prior art reference that falls within each of the ranges anticipates the claim.” *Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999). Thus, it is enough for Veit or Antrim to expressly disclose values or ranges of values that fall within the ranges contained in the patents-in-suit. The ranges do not need to precisely overlap, nor does the prior art’s range need to fit entirely within the range claimed by the patents-in-suit. *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1377 (Fed. Cir. 2005) (holding that a range of amounts of acid that did not exactly correspond to prior art was nonetheless anticipated by the prior art because the prior art range entirely encompassed the range of the patent-in-suit and did not significantly deviate from it).

1. Elements one, three, five, and six

The court will succinctly address elements one, three, five, and six because U.S. Water does not challenge Novozymes’s contention that Veit and Antrim each expressly disclose these elements.

The first element of the asserted claims is adding phytase to a fuel ethanol processing fluid containing phytic acid or phytic acid salts. Both Veit and Antrim expressly disclose this element. Veit, 19:2-4; Antrim, 20:8-19. Although U.S. Water identifies semantic discrepancies, the language of the prior art precludes any genuine dispute on this point. Veit discloses “a process including a fermentation step, wherein phytic acid-containing material is fermented in the presence of a phytase.” Veit, 19:2-4. Veit also discusses ethanol production. *Id.* at 2:15-29. Antrim teaches adding phytase while converting “grain starch to downstream products, such as dextrose, fructose[,] and alcohol.” Antrim, 1:10-16. rim primarily teaches using phytase to

improve liquefaction, *id.* at 4:6-8, although U.S. Water does not suggest that this emphasis render's Antrim inapplicable to ethanol production. Instead, U.S. Water merely notes that Antrim is directed to a process that occurs well before the fermentation and distillation steps of ethanol production. Dkt. 226, at 109. But Antrim does not teach removing phytase after liquefaction is complete, and U.S. Water does not otherwise explain how adding phytase earlier during ethanol production will prevent the enzyme from operating in accordance with the claimed invention later in the process.

The third element limits the range of temperatures within which phytase is added to ethanol processing fluid. There is no dispute that Veit and Antrim each disclose the temperature range claimed by the patents-in-suit. Veit states that “[i]n a preferred embodiment[,] the phytase has a temperature optimum in the range from 25-70°C, preferably 28-50°C, especially 30-40°C.” Veit, 8:4-6. Indeed, Veit claims a method wherein the optimal range is “20-70°C, in particular above 50°C.” *Id.* at 19:8-9. Antrim states that “[f]or microbial phytase, a suitable temperature will generally be between about 20°C and about 60°C, and preferably between about 30°C and about 40°C.” Antrim, 7:60-62. Both references disclose sets of ranges that overlap completely with the 20-80°C range that the patents-in-suit claim, and both references therefore expressly disclose element three. *See Atlas Powder Co.*, 190 F.3d at 1346.

Applying U.S. Water's proposed claim construction, the fifth element of the asserted claims requires adding phytase without also adding: (1) an acidic compound and an oxidizer; or (2) an acidic compound in the presence of ultraviolet light. It is undisputed that both Veit and Antrim disclose adding phytase. Veit's claimed invention does not require adding an acidic compound, let alone adding an acidic compound with an oxidizer or in the presence of ultraviolet light. U.S. Water does not contend that an express statement exclusion is required, and so the court is satisfied that Veit discloses this element. Likewise, Antrim does not require

adding an acidic compound along with phytase. Indeed, the reference teaches that by adding phytase, “the need to undesirably adjust the pH level . . . is eliminated.” Antrim, 7:43-45. And if Antrim discloses not adding acid, then it necessarily discloses not adding acid with an oxidizer or in the presence of ultraviolet light. Both references expressly disclose the non-addition of an acidic compound.

The sixth element describes what phytase does, and both Veit and Antrim expressly disclose that the enzyme breaks down phytic acid. Veit states that the phytase is “capable of effecting the liberation of inorganic phosphate from phytic acid (myo-inositol hexakisphosphate) or from any salt thereof (phytates).” Veit, 7:31-34. Antrim describes “a phytate degrading enzyme” that “catalyze[s] the conversion of phytate to inositol and inorganic phosphate.” Antrim, 6:41-52. As U.S. Water observes, the purpose for which Veit and Antrim direct using phytase is not deposit reduction. But element six is not concerned with purpose; what matters is whether the references explicitly describe using phytase to break down phytic acid. Here, both Veit and Antrim satisfy this requirement.

2. Element two: “at a dosage of 10 ppm less or 50 U/L or less”

The first challenged element is whether Veit or Antrim expressly disclose the claimed dosage. The patents-in-suit claim a dosage for phytase of less than 10 ppm or 50 U/L. Veit states that “[t]he dosage of the phytase may be in the range 5.000-250.000 FYT/g DS, particularly 10.000-100.000 FYT/g DS. A preferred suitable dosage of the phytase is in the range from 0.005-25 FYT/g DS, preferably the 0.01-10 FYT/g, such as 0.1-1 FYT/g DS.” Veit, 8:11-15. Antrim describes a dosage of “from about 0.1 to 100 units of phytase (phytase unit) per gram of starch. More preferably, the concentration of phytate degrading enzyme is from about 1 to about 25 units of phytase per gram of starch.” Antrim, 7:6-11. Because the patents-in-suit use different units to measure dosage, Novozymes’s expert, Dr. Kohl, translated these units to

compare them to the units used in the patents-in-suit. His translation is expressed in the following table.

137 Patent Claims	399 Patent Claims	Asserted Patents (ppm phytase)	Asserted Patents (U/L)	Veit app. (FYT/g DS)	Antrim patent (units phytase /g starch)
12	6, 17, 25	500	550,110	1667	2,381
		160	176,000	476	680
	7, 18, 28	100	109,890	333	476
		75	82,500	250	357
		30	33,000	100	143
		21	23,100	70	100
	8, 19, 23, 29	20	22,000	67	95
	9, 20, 30	10	11,000	33	48
		3	3,300	10	14
13	10, 21, 25	2.3	2,500	7.6	11
		1.6	1,779	5.4	7.7
	11, 22, 31	0.5	500	1.52	2.2
		0.16	176	0.53	0.76
	12, 32	0.09	100	0.30	0.43
	13, 24, 33	0.05	50	0.152	0.22
		0.021	23	0.07	0.10
		0.002	1.8	0.00539	0.008
		0.0015	1.65	0.005	0.007

As Dr. Kohl's table shows, both Veit and Antrim disclose dosage ranges that overlap with the range claimed by the patents-in-suit.

U.S. Water attempts to dispute that the dosage concentrations of the patents-in-suit are disclosed by Veit and Antrim by citing inaccuracies in Novozymes's expert's conversion calculations.⁶ Dkt. 235, at 227-30. But U.S. Water's challenges to some of the details of the

⁶ Part of U.S. Water's contention is based on its speculation that Veit used the European numbering convention in which a period is used as the thousands separator and a comma is used as a decimal point. Dkt. 226, at 108 and Dkt. 235, at 211. This does not raise a genuine dispute because there is nothing in Veit that suggests it used the European convention. Veit uses periods for pH values, confirming the traditional English numbering convention. Veit's

conversion are immaterial because U.S. Water concedes that the prior art discloses dosages that fall within the ranges claimed by the patents-in-suit. *See* Dkt. 200, at 88; and Dkt. 279, at 213-15 (U.S. Water’s response to Novozymes’s proposed fact 300).

3. Element 4: “at a pH of 4.5 or higher in the beer column”

The patents-in-suit claim a pH range of 4.5 and higher in the beer column. Following U.S. Water’s own construction of this term, the limitation requires only that the pH in the beer column exceed 4.5 at some point during ethanol production. Veit discloses a process wherein fermentation is completed in the presence of phytase and when “the pH is from pH 3-6, preferably around pH 4-5.” Veit, 4:7-9, 19:1-4. Antrim discloses liquefying starch with a pH “between 4 and about 6, . . . [p]referably between about 4.5 and about 5.2.” Antrim, 7:39-53. As with the temperature and dosage ranges, this overlap is enough to expressly anticipate the asserted claims. *Perricone*, 432 F.3d at 1377; *Atlas Powder Co.*, 190 F.3d at 1346. U.S. Water therefore cannot genuinely dispute that the prior art discloses using phytase when the pH is 4.5 or higher.

But this element has a second component. The claimed pH must occur in the beer column. U.S. Water suggests that a person of ordinary skill in the art would change the pH after liquefaction (as described in Antrim) and after fermentation (as in Veit). Thus, U.S. Water contends that Veit and Antrim do not necessarily disclose a pH of 4.5 or higher at some point in the beer column. This argument is not persuasive for two reasons. First, U.S. Water improperly relies on an untimely declaration of one of its experts. According to Mr. Simms, “it was well

published U.S. application, US 2007/0155001 A, Dkt. 243-8, is immaterial. And the ranges cited in that document (5,000-250,000 FYT/g DS and 10,000-100,000 FYT/g DS) are probably mistaken, for reasons explained by Novozymes. Dkt. 279, at 213-15 (reply to proposed fact 300). The rest of U.S. Water’s argument is that the calculations are based on assumptions that are not accurate. *Id.* at 212-15, 221-23. Despite this quibbling, U.S. Water does not dispute the larger point: Veit and Antrim’s dosages overlap with the patents-in-suit.

known that fuel ethanol plants prior to 2007 [when U.S. Water applied for the '244 patent] routinely added sulfuric acid to their beer feed in order to reduce the pH of the beer going into their beer mash heat exchangers and beer columns to well below 4.5.” Dkt. 230, ¶ 16. Thus, a pH of 4.5 during fermentation may not necessarily mean a pH of 4.5 in the beer column during distillation. Indeed, Mr. Simms opines that “one of ordinary skill in the art would not read any prior art [including Veit and Antrim] to describe the pH of the ethanol processing fluid in a beer column to be 4.5 or higher.” *Id.* Because the court must consider whether one skilled in the art would reasonably understand the prior art to disclose every element of the asserted claims, *see Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368-69 (Fed. Cir. 2003) (citing *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991)), U.S. Water contends that its expert’s declaration is sufficient to defeat Novozymes’s anticipation defense.

Novozymes has moved to strike Mr. Simms’s declaration as untimely. Dkt. 273. Opening expert disclosures in this case were due November 18, 2014, with rebuttal reports due December 18, 2014. Dkt. 275-2 (amending the expert disclosure dates, pursuant to the court’s Preliminary Pretrial Conference Order). In his opening report on invalidity, Novozymes’s expert explained that Veit and Antrim disclose a pH of 4.5 or higher in the beer column because “[f]ermentation pHs between 5.5 and 6.0 will result in post-fermentation fluid in the beer column with a pH above 4.5.” Dkt. 177, ¶ 145. Mr. Simms’s rebuttal validity report did not respond to these opinions, instead emphasizing that the prior art references did not expressly disclose the same dosage range and did not inherently disclose using phytase for the purpose of reducing deposits. *See* Dkt. 174, ¶¶ 356-75, 389-401. Mr. Simms’s supplemental declaration therefore improperly injects a brand new expert opinion regarding validity.⁷

⁷ U.S. Water effectively concedes that Mr. Simms’s supplemental declaration ventures into different territory than his initial report covered. As U.S. Water acknowledges, the “implicit”

The Preliminary Pretrial Conference Order explicitly warned the parties that “[s]upplmentation [of expert reports] pursuant to Rule 26(e) is limited to matters raised in an expert’s first report. . . . Failure to comply with these deadlines and procedures could result in the court striking the testimony of a party’s experts pursuant to [Federal Rule of Civil Procedure] 37.” Dkt. 37, at 3. Under Rule 37(c)(1), a party may not use information that it should have, but failed to, disclose under Rule 26(a), unless such failure was substantially justified or harmless. Here, U.S. Water’s non-disclosure of this aspect of Mr. Simms’s validity opinion is neither. As justification, U.S. Water offers that “[t]he preparation of expert reports was an enormous undertaking,” and that it should “come as no surprise” that an issue addressed in an initial expert report might require further elaboration. Dkt. 288, at 8. This is a poor excuse. Novozymes has made no secret of its contention that Veit and Antrim are anticipating prior art, and the opening invalidity report of its expert walked through each limitation of the asserted claims and explained how Veit and Antrim expressly disclose those limitations. Contrary to U.S. Water’s assertion, the additional information presented in the Simms declaration is not “minor;” it goes directly to the issue of anticipation. The fact that this case took considerable effort to prepare and present simply does not justify allowing U.S. Water to present an expert opinion on validity well beyond the deadline for doing so.

Nor is U.S. Water’s failure to disclose this aspect of Mr. Simms’s opinion harmless. Novozymes filed its opening summary judgment brief on January 16, 2015. The Simms declaration was filed on February 6, 2015. U.S. Water is therefore incorrect that Novozymes suffered no prejudice or that it had time to cure any prejudice that it did suffer. Novozymes was

opinion (in his initial report) that Mr. Simms’s declaration purports to supplement is a statement regarding claims construction. Dkt. 288, at 6. Some 100 pages later, when Mr. Simms opines on the issue of validity in view of Veit, he does not refer to his earlier statement about the common practice of lowering the pH of beer before it enters the beer column.

entitled to rely on Mr. Simms's opinions while formulating its summary judgment arguments, and having to scramble to address the issue in a reply brief—due just 17 days after the Simms declaration was filed—is hardly adequate time to reframe its theory of invalidity. For these reasons, the court will grant Novozymes's motion to strike paragraphs four to six and 16 of the Simms declaration.⁸

A second reason to reject U.S. Water's argument is that even Mr. Simms's untimely opinion does not suggest that adding phytase as disclosed in Veit or Antrim will *never* result in a pH above 4.5 in the beer column. Applying U.S. Water's own construction, all that this term requires is that the pH be above 4.5 *at some point* during ethanol production. The common specification for the patents-in-suit does not disclose raising the pH so that it remains constantly above 4.5, and a person of ordinary skill in the art would understand that pH can fluctuate during ethanol production. But the same is true for Veit and Antrim, neither of which teaches lowering the pH after adding phytase.

In fact, the methods disclosed in both pieces of prior art do not appear to require adjusting the pH at all. For example, Veit includes a diagram of the ethanol production process in which beer leaves the fermentation step and proceeds directly to the distillation step, without first going into a beer well or beer mash heat exchanger. Veit, figure 1. U.S. Water contends that this figure inaccurately portrays ethanol plants, and that the missing beer well is a common location for adding sulfuric acid to the beer (to lower pH) before it enters the beer column. Dkt. 226, at 106. But the asserted claims do not require that the beer first travel through the equipment that Veit allegedly omits, and so it is unclear how U.S. Water's disagreement with the figure matters. In fact, Veit's omission of any such machinery merely confirms that the

⁸ Only paragraph 16 is material to invalidity. The other paragraphs relate to infringement. But they are equally untimely and they, too, will be stricken.

reference does not contemplate adjusting pH between fermentation and distillation. Thus, Veit's disclosure of a pH above 4.5 during fermentation is sufficient to disclose a pH above 4.5 during distillation in the beer column. With Antrim, the disclosure is more specific. Not only is the reference silent on lowering pH after liquefaction, but Antrim purports to eliminate "the need to undesirably adjust the pH level." Antrim, 7:43-45.

U.S. Water cannot rely on the supplemental validity opinions of Mr. Simms to revive a point that it has already conceded: Veit and Antrim disclose a method wherein the pH of the ethanol processing fluid is 4.5 or higher in the beer column at some point during ethanol production. True, both references disclose pH ranges at earlier points in the ethanol production process. But like the patents-in-suit, neither reference describes or requires adjusting that pH range before beer enters the beer column. Thus, the prior art expressly discloses this element of the asserted claims.

d. Inherent disclosure

The issue on which this case ultimately turns is whether Veit and Antrim inherently disclose using phytase to reduce deposits in ethanol production machinery. Whether a limitation is inherent in the prior art is a question of fact. *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1343 (Fed. Cir. 2005). But as with all questions of fact, if the non-moving party fails to adduce evidence to genuinely dispute that a reference inherently discloses a limitation, then the issue is appropriately decided on summary judgment. *Id.* In the same way that express anticipation requires the prior art to disclose the exact elements of each claim, "inherent anticipation may not be established by probabilities or possibilities . . . the prior art's disclosure [must be] sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function." *King Pharm., Inc.*, 616 F.3d at 1275 (internal citations and quotation marks omitted); *see also Eli Lilly & Co. v. Barr Labs.*,

Inc., 251 F.3d 955, 970 (Fed. Cir. 2001) (“A reference includes an inherent characteristic if that characteristic is the ‘natural result’ flowing from the reference’s explicitly explicated limitations.”). Here, summary judgment is appropriate because the evidence of record establishes that deposit reduction is a natural result of the methods for adding phytase during ethanol production that Veit and Antrim disclose.

The undisputed evidence establishes that Veit, Antrim, and the patents-in-suit disclose the same chemical process through which phytase breaks down phytic acid. According to one of Novozymes’s experts, Dr. Kohl, “[i]n all of its uses, including all of its industrial uses, phytase breaks down phytic acid or salts of phytic acid by the same mechanism of action, namely, cleaving phosphate groups from the inositol core to free the phosphates and produce more soluble products.” Dkt. 209, ¶ 23.⁹ U.S. Water does not genuinely dispute Dr. Kohl’s conclusion.¹⁰ Indeed, the evidence that U.S. Water cites to contradict Dr. Kohl actually *supports* his conclusion. A report authored by one of U.S. Water’s own experts, Dr. Reed, explains that “[p]hytase is a generic term used to describe several groups of structurally distinct enzymes that catalyze hydrolysis of phosphomonoester bonds of phytic acid . . . thereby liberating inorganic ortho-phosphate. In order for an enzyme to be a phytase, it must display phosphatase activity.” Dkt. 170, ¶ 14. Dr. Reed’s report explains that certain environmental variables can affect the amount of phytase activity in ethanol processing. And although those variables can create

⁹ A molecule of phytic acid has a core of six carbons, in a ring configuration, and six attached phosphate groups. Dkt. 279, at 11-12. When phytase is present in a solution with phytic acid, the enzyme “cleaves” or “hydrolyzes”—both of which are scientific terms for “separates”—one or more of the phosphate groups attached to the core. *Id.* at 13.

¹⁰ The proposed finding of fact that presented Dr. Kohl’s conclusion inadvertently cited to paragraph 24 of Dr. Kohl’s affidavit, instead of paragraph 23. Dkt. 210, ¶ 28. Seizing on this oversight, U.S. Water “disputed” the proposed finding of fact on the grounds that Novozymes failed to cite to supporting evidence. Dkt. 235, at 19. The objection is not well-taken, and U.S. Water has not raised a genuine dispute as to this fact.

conditions that limit how much phytic acid the enzyme can break down, Dr. Reed's report does not suggest that *all* phytase activity would stop if the variables are outside optimal ranges.

Rather than disputing that the patents-in-suit teach a chemical reaction involving phytase, U.S. Water contends that the *purpose* of the patents-in-suit is what distinguishes them from the prior art. One of the co-inventors listed in the '244, '137, and '399 patents discussed Veit during his deposition, and he acknowledged that "[t]he basic reaction of phytase with phytic acid is essentially the same in both cases, but we are directing that reaction to a particular goal, which is different from what Veit was using." Dkt. 166 (Young Dep. 306:2-6). According to U.S. Water, this "particular goal" saves the patents-in-suit from being anticipated by the prior art. The court disagrees.

Contrary to U.S. Water's assertion, the differences between the goals of Veit and Antrim and the goals of the patents-in-suit do not preclude the former from anticipating the latter. *See Leggett & Platt, Inc. v. VUTEk, Inc.*, 537 F.3d 1349, 1356 (Fed. Cir. 2008) ("Finally, [the patent holder] repeatedly compares the purpose of the '823 patent to the purpose of the '518 patent, but we fail to see how this comparison proves that the latter's claim is not anticipated by the former's disclosure."). Both sets of patents teach using phytase during ethanol production, in the same dosages and under the same conditions, to perform the same chemical reaction. Even though Veit and Antrim do not expressly identify the benefit that U.S. Water's patents identify, they nevertheless inherently disclose that benefit.

U.S. Water has adduced evidence that one of ordinary skill in the art would not think to practice Veit or Antrim in a way that reduces deposits and, moreover, that practicing Veit and Antrim will not *always* result in deposit reduction. But these considerations (and U.S. Water's supporting evidence) are not relevant because they misunderstand the law of inherent anticipation. "[I]nherency is not necessarily coterminous with knowledge of those of ordinary

skill in the art. Artisans of ordinary skill may not recognize the inherent characteristics or functioning of the prior art.” *Perricone*, 432 F.3d at 1376 (internal citations and quotation marks omitted); *see also Schering Corp.*, 339 F.3d at 1377 (“[T]his court rejects the contention that inherent anticipation requires recognition in the prior art.”). It is therefore immaterial whether one who is skilled in the art would practice Veit or Antrim for the *purpose* of combatting fouling, or even whether the inventors of these patents appreciated every possible result of using phytase to break down phytic acid in ethanol production. Instead, what matters is whether the prior art discloses the conditions that will necessarily result in phytase reducing deposits. And on that issue, there is no genuine dispute. As discussed above, Veit and Antrim expressly disclose each element of U.S. Water’s claimed invention.

It is also irrelevant that Veit and Antrim enable benefits other than deposit reduction. The cases that U.S. Water cites to support a contrary conclusion are distinguishable. For example, U.S. Water relies on *MEHL/Biophile Int’l Corp. v. Milgraum*, a case in which the Federal Circuit reviewed a district court’s summary judgment that a patent teaching a method for removing hair with a laser was invalid as anticipated. 192 F.3d 1362, 1364 (Fed. Cir. 1999). One of the asserted claims disclosed “aligning a laser light applicator substantially vertically over a hair follicle opening,” but the allegedly anticipatory prior reference did not discuss hair follicles or how to align the laser. *Id.* at 1364-65. At issue was whether the reference, a user manual for a tattoo-removing laser, inherently disclosed such a claim. *Id.* at 1365. The Federal Circuit noted that someone who operated a laser as taught by the prior art *could* align it substantially vertically over a hair follicle, but would not necessarily *have* to do so, and on this basis, the court held that the prior art did not inherently anticipate the patent-in-suit. *Id.*

From this holding, U.S. Water quotes that “[o]ccasional results are not inherent.” Dkt. 226, at 96 (quoting *MEHL/Biophile Int’l Corp.*, 192 F.3d at 1365). But placed in its

appropriate context, the Federal Circuit’s statement is not concerned with the “results” of a chemical process or method, like the one at issue in this case. Instead, the court of appeals was referring to whether the allegedly anticipatory prior art adequately described how to perform the *steps* of the claimed invention (*i.e.*, placing the laser substantially vertically over a hair follicle). As this court has already explained, Veit and Antrim expressly disclose the same steps for using phytase that the patents-in-suit claim. Thus, *MEHL/Biophile* does not support the proposition for which U.S. Water cites it.

Indeed, the case does U.S. Water more harm than good. The Federal Circuit went on to hold that a different prior art reference anticipated the patents-in-suit. *MEHL/Biophile*, 192. F.3d at 1366. The reference was a scientific article that described the nature and extent of pigmented cell injury by documenting how laser pulses damaged tissue in guinea pigs. *Id.* at 1364. The court of appeals rejected several arguments that the patent-holders offered against finding that the article anticipated their patent, noting:

The Polla article concerns itself with guinea pig, rather than human, skin, but that difference is irrelevant to the anticipation analysis. Nothing in the claim limits the method’s reach to human skin. Similarly, *the Polla article’s failure to mention hair depilation as a goal is similarly irrelevant*. *MEHL/Biophile* does not dispute on appeal that the laser operating parameters disclosed in the article substantially coincide with those disclosed in the patent. Accordingly, to the extent the embodiment in the patent achieves hair depilation, so does the Polla method. Where, as here, the result is a necessary consequence of what was deliberately intended, it is of no import that the article’s authors did not appreciate the results.

Id. at 1366 (emphasis added). *MEHL/Biophile* thus confirms the principle that U.S. Water cannot save the patents-in-suit merely by identifying a new “goal” for the phytase process disclosed by a prior art reference.

Equally distinguishable is the case that U.S. Water cites to support its assertion that “[I]f the teachings of the prior art can be practiced in a way that [is lacking] the allegedly inherent property, the prior art in question does not inherently anticipate.” Dkt. 226, at 97 (alterations in original) (quoting *In re Armodafinil Patent Litig. Inc. (2012 Patent Litig.)*, 939 F. Supp. 2d 456, 465 (D. Del. 2013), *appeal dismissed* (May 12, 2014), *appeal dismissed* (June 4, 2014), *appeal dismissed* (June 6, 2014)). U.S. Water’s quotation includes subtle, but significant wordsmithing. The case actually states that “if the teachings of the prior art can be practiced in a way that *yields a product* lacking the allegedly inherent property, the prior art in question does not inherently anticipate.” *In re Armodafinil*, 939 F. Supp. 2d at 465 (emphasis added). Both *In re Armodafinil* and the Federal Circuit precedent that it cited involved patents that claimed chemical compounds, and methods for producing those compounds. *See Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1045 (Fed. Cir. 1995); *In re Armodafinil*, 939 F. Supp. 2d at 460-62.

In re Armodafinil’s results-oriented analysis makes sense in its context. If a prior art reference discloses steps that do not always lead to the creation of a chemical compound, then that method might not inherently anticipate a later method that *does* always produce the compound. Indeed, the compound could hardly be a “natural result” of the prior art’s disclosure. But that is not the situation presented in this case. Here, U.S. Water’s patents do not claim a new product that could only sometimes be produced by practicing Veit or Antrim. The patents-in-suit teach using an already-identified chemical compound, under previously disclosed conditions, to perform a known chemical reaction. Even accepting that U.S. Water has identified a new benefit of that known process, that discovery is not patentable.

Ultimately, the doctrine of inherent anticipation enforces the “basic principle” of patent law that “[t]he public remains free to make, use, or sell prior art compositions or processes, regardless of whether or not they understand their complete makeup or the underlying scientific

principles which allow them to operate.” *Atlas Powder Co.*, 190 F.3d at 1348. The patents-in-suit, if valid, would prevent the public from practicing Veit and Antrim. U.S. Water emphasizes that the key component of its patents is deposit reduction, and that it is unlikely that anyone practicing Veit or Antrim would “stumble on” this result. Dkt. 226, at 115. But what if an ethanol plant *did* stumble upon a reduction in deposits? U.S. Water’s patents, as asserted, would expose the plant to liability for infringement. Indeed, that is the very position that U.S. Water has taken in this case, alleging that several of Novozymes’s customers, who practice Veit and Antrim, have infringed on the patents-in-suit because they experienced a reduction in deposits. “[I]t is axiomatic that that which would literally infringe if later anticipates if earlier.” *Bristol-Myers Squibb Co.*, 246 F.3d at 1378 (citations omitted). U.S. Water does not persuasively explain how the public could continue to practice Veit and Antrim if the patents-in-suit are valid. Because these references preceded the ’137 and ’399 patents, they anticipated the invention on which U.S. Water now claims that Novozymes and its customers have infringed.

For all of U.S. Water’s allegedly “conflicting” evidence—expert or otherwise—the critical facts that are relevant to the court’s anticipation analysis are not in dispute. The patents-in-suit describe a method for using phytase to break down phytic acid; so do Veit and Antrim. The patents-in-suit describe a method for using phytase in terms of ranges for dosage, temperature, and pH; Veit and Antrim disclose the same method, using overlapping and often narrower ranges. According to U.S. Water, the patents-in-suit enable one skilled in the art to practice its claimed invention. Dkt. 204, at 81. Thus, by U.S. Water’s own contention, Veit and Antrim are enabling prior art. Because these references expressly or inherently disclose every element of the patents-in-suit, they anticipate the asserted claims in this case.

C. Inequitable conduct

Novozymes accuses the inventors and their attorney of inequitable conduct, based on their failure to disclose information about the *ChemTreat* litigation to the Patent Office during prosecution of the patents-in-suit. U.S. Water has moved for summary judgment that defendants have not adduced sufficient evidence to sustain an inequitable conduct claim. Although the court's decision on validity will end U.S. Water's infringement case, inequitable conduct is still a live issue that could affect Novozymes's entitlement to attorney fees.

To make its inequitable conduct case, Novozymes has the burden to show, by clear and convincing evidence, that the patentees failed to disclose material information during prosecution with the specific intent of deceiving the Patent Office into issuing the patent. *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011). It is a high standard on both elements. The information must be *but-for* material, which means that the patent would not have issued if the information had been disclosed to the examiner. *Id.* at 1291. And although intent can be, and usually is, shown by circumstantial evidence, the evidence must make the intent to deceive the single most reasonable inference. *Id.* at 1290.

Novozymes's basic theory is that in the course of the *ChemTreat* litigation, U.S. Water pressed for a broad interpretation of the '244 patent, the parent to the patents-in-suit. But the broad interpretation did not fly with the *ChemTreat* court, which limited the '244 patent to processes that added phytase after fermentation, based on a prosecution history estoppel arising from the patentees' characterization of the scope of the '244 patent and the prior art. The narrow construction doomed U.S. Water's infringement case. The applications for the patents-in-suit were then pending as continuations of the '244 patent's application. U.S. Water, learning from its failure in the *ChemTreat* case, realized that it would need broader claims if it wanted to succeed in future infringement cases. So the patentees amended the claims in the pending

applications to remove the limitation that phytase be added after fermentation. But they did not say a word about the *ChemTreat* case to the Patent Office, even though the litigation was fresh in their minds and they had the opportunity to do so. As Novozymes rightly points out, the patentee has the duty to disclose litigation involving the subject matter of a pending application. M.P.E.P. § 2001.06.

The cornerstone of Novozymes's inequitable conduct case is a July 23, 2012, amendment, in which the patentees removed the limitation that phytase be added after fermentation. In presenting the amended claim, so Novozymes's argument goes, the patentees mischaracterized the amended claim as being "generally patterned on issued claim 1" of the '244 patent. According to Novozymes, the patentees knew well that the amended claim was not patterned on claim 1 of the '244 patent, because the *ChemTreat* judge had just made it clear that the '244 patent was limited to processes in which phytase was added after fermentation. If the patentees had set all this out for the examiner, the examiner would have forced patentees to confront all of their previous statements, including their arguments about the prior art, and the patents-in-suit would not have issued because the *ChemTreat* information would have made clear to the examiner that the broader claims could not issue over Veit and Caransa, another reference at issue during prosecution.

Novozyms has shown that U.S. Water was willing to advance some questionable claim construction positions in the *ChemTreat* litigation concerning the scope of the '244 patent. But Novozymes falls short of establishing the but-for materiality of the *ChemTreat* information in the prosecution of the patents-in-suit. The July 23, 2012, amendment set out the amended claim with differences with claim 1 of the '244 patent highlighted. It would have been amply clear to the examiner that the patentees were seeking a claim that was broader in the sense that the after-fermentation limitation was removed. Novozymes is correct that the third-party

submission concerning the amended claims does not relieve the patentees of their own duties of candor. But that third-party submission provides one more reason that the examiner knew she had to evaluate the allowability of the broader claims over the prior art, particularly Veit and Caransa. On this record, there is simply no evidence that information about the arguments made during the *ChemTreat* litigation, or any decision from the *ChemTreat* court, would have had any impact on the claims of the patents-in-suit. Novozymes's argument is, essentially, that without the *ChemTreat* information, the examiner just could not understand the amended claims well enough to do her job. But the examiner was fully aware that the broader claims had to be examined over Veit and Caransa, and a general allegation that the examiner did not pay attention to what was put before her is not enough to sustain an allegation of inequitable conduct. *Fiskars, Inc. v. Hunt Mfg. Co.*, 221 F.3d 1318, 1327 (Fed. Cir. 2000) ("An applicant is not required to tell the PTO twice about the same prior art, on pain of loss of the patent for inequitable conduct.").

Novozyms also falls short of showing deceptive intent. Novozymes shows that the patentees recognized the benefit of securing broader claims in the continuation applications, and thus the patentees had a motive to lie to the Patent Office. But the desire to secure broader claims in a continuation is an utterly routine situation in patent prosecution. Novozymes has no evidence that would make the inference of deceptive intent the single most reasonable inference to be drawn from the patentees' failure to disclose the *ChemTreat* litigation. The inventors and their attorney could have made the reasonable determination that their unsuccessful attempts to broaden the scope of the '244 patent in litigation were not material to their overt attempts to secure broader claims in the continuations. Nor can Novozymes make out a case of inequitable conduct on the basis of U.S. Water's arguments to the Patent Office about the content of the

prior art, when that prior art was before the examiner. *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1379 (Fed. Cir. 2008).

In sum, defendants have failed to adduce evidence sufficient to establish either materiality or deceptive intent. Plaintiff's motion for summary judgment will, in this respect only, be granted.

CONCLUSION

The court's decision that the asserted claims of the patents-in-suit are anticipated and that the defendants have not adduced evidence sufficient to sustain their burden to show inequitable conduct disposes of this case. The court will not reach the issues of whether the patents-in-suit are infringed, or whether those patents are invalid on any other grounds.

All other pending motions will be denied as moot, and the clerk of court will close this case.

ORDER

IT IS ORDERED that:

1. Novozymes's motion to strike certain paragraphs of the Simms declaration, Dkt. 273, is GRANTED.
2. Defendants' motion for summary judgment that claims 1, 6, 12, and 13 of the '137 patent, and claims 1, 2, 5-12, 16-22, 25, 28-32, 34, and 35 of the '399 patent are invalid, Dkt. 199, is GRANTED.
3. Defendants' motion is in all other respects DENIED as moot.
4. Plaintiffs' motion for summary judgment on the issue of inequitable conduct, Dkt. 182, is GRANTED.

5. Plaintiffs' motion is in all other respects DENIED as moot.
6. All other pending motions are DENIED as moot.

Entered July 29, 2015.

BY THE COURT:

/s/

JAMES D. PETERSON
District Judge