United States District Court,
D. Minnesota.

INTERCAT, INC,
Plaintiff.
v.
NOL-TEC SYSTEMS, INC., and W.R. Grace & Co.-Conn., Inc,
Defendants.

No. Civ. 03-4886 RHK/AJB

Jan. 7, 2005.

Michael E. Florey, Fish & Richardson, PC, PA, Minneapolis, Minnesota; and George P. McAndrews, Thomas J. Wimbiscus, Patrick J. Arnold Jr., and Patricia J. McGrath, McAndrews, Held & Malloy, Ltd., Chicago, Illinois, for Plaintiff.

David A. Allgeyer and Mark R. Privratsky, Lindquist & Vennum, PLLP, Minneapolis, Minnesota, for Defendant Nol-Tec Systems, Inc.

William A. Dossett, Dorsey & Whitney, LLP, Minneapolis, Minnesota; and Gary H. Levin and David R. Bailey, Woodcock Washburn, LLP, Philadelphia, Pennsylvania, for Defendant W.R. Grace & Co.-Conn ., Inc.

MEMORANDUM OPINION AND ORDER

KYLE**, J.**

Introduction

Plaintiff Intercat, Inc. ("Plaintiff") owns United States Patent No. 5,389,236 ("the '236 patent"), which describes a method of controlling the addition of catalyst into fluid catalytic cracking units used in the oil refining industry. It has brought suit against Defendants Nol-Tec Systems, Inc. ("Nol-Tec") and W.R. Grace & Co.-Conn., Inc. ("Grace") (collectively "Defendants") alleging that they have infringed several claims of the '236 patent. Presently before the Court is the parties' request, made pursuant to Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed.Cir.1995), *aff'd* 517 U.S. 370 (1996), to have the Court construe several terms of Claim 1 of the '236 patent.

Background

I. The Parties

Plaintiff owns the '236 patent and manufactures catalyst loading systems. FN1 Nol-Tec also manufactures catalyst loading systems.FN2 Grace distributes Nol-Tec's catalyst loading systems and supplies catalyst

additives to oil refineries.FN3

FN1. (*See* Am. Compl. para. 8; Pl.'s Claim Construction Br. at 4 n. 5.)

FN2. (*See* Def. Nol-Tech Second Am. Answer and Countercl. para. 36.)

FN3. (*See* Answer of Def. Grace to First Am. Compl. para. 23; Def.'s Opening Claim Construction Br. at 28 n. 9.)

II. The Technology and the '236 Patent

In the oil refining industry, crude oil is turned into gasoline and other useful products by a process called fluid catalytic cracking. *See* '236 patent, col. 1, ll. 17-18, col. 2, ll. 35-41. A fluid catalytic cracking unit ("FCC unit"), depicted below, uses specially designed catalysts to break down, or "crack," petroleum feedstock into more desirable hydrocarbon products such as gasoline. *See* id., col. 1, ll. 9-12, col. 2, ll. 3-18.

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To "crack" the petroleum feedstock, the FCC unit utilizes two general kinds of catalysts: "bulk" or "fresh" catalysts, which carry out the cracking function, and "catalyst additives," which control such performance parameters as pollutant emissions and product yields. *See* id., col. 2, ll. 20-25, 33-41. Generally, catalyst is loaded into the FCC unit through a "fresh catalyst loader" or an "additive loader" and circulates through a "regenerator" where it comes into contact with the oil feedstock in the "riser" reactor. Within the "riser" reactor, catalyst "cracks" the large molecules of the oil feedstock into smaller molecules of the desired product.

Figure 1 of the '236 patent, reproduced below, depicts a "loader" or "catalyst addition apparatus" (10):

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'236 patent, Fig. 1; *see* id. col. 14, ll. 29-35. A loader can be used to load fresh catalyst, catalyst additives, or both into a FCC unit according to specific schedules that maintain a desired catalyst concentration. *See* id., col. 5, ll. 32-40. Desired concentration levels are achieved through the combination of introduction schedules and catalyst quantity verification procedures. *See* id., col. 5, ll. 40-47.

Generally, the '236 patent purports to improve the efficiency with which catalyst is introduced into the FCC unit as compared to the prior art. *See* id., col. 3, l. 31-col. 5, l. 29; col. 5, ll. 32-52. The patent describes a method for delivering catalyst, especially catalyst additives, in a way that maintains a given catalyst concentration and produces the desired performance. *See* id., col. 5, ll. 32-40, col. 15, ll. 45-49. This method comprises "obtaining data ... in order to establish" certain operating parameters, "entering the data ... into a programmed computer in order to determine" an injection schedule, and then "placing the FCC unit under control of a computerized control device and thereby" operate the FCC unit. *See* id., col. 15, l. 50-col. 16, l. 38. According to Plaintiff, placing the FCC unit under the control of a computerized control device which "implement[s] a correction system" is "a breakthrough in the industry." FN4

FN4. (*Markman* Hr'g Tr. at 5.)

The preferred embodiment of the '236 patent uses a loader adapted to carry out the patent's processes. As noted in Figure 1, a suitably sized hopper (12) contains the catalyst (14). Catalyst is added into the hopper through a loading valve (26) and a catalyst injection pipe (28). Underneath the hopper, weighing devices (18) weigh both the hopper and the catalyst it contains. Air (34) is then delivered into the loader through hoses or pipes (36) in order to entrain, or collect and transport, the catalyst and transfer it into the FCC unit. Catalyst is transferred into the FCC unit through two valves (56, 58) located at the bottom of the hopper. Catalyst is withdrawn from the hopper and entrained into the air stream when valve (56) is open. Catalyst entrainment is controlled by valve (58), which is, in turn, regulated and monitored by a computer memory and control device (70). *See* id., col. 14, l. 35-col. 16, l. 37.

Claim 1 of the '236 patent, which describes the patented method, reads as follows with the language that is at issue underlined:

1. A method for controlling addition of a catalyst into a fluid catalytic cracking unit (FCC unit) in order to maintain a given concentration of the catalyst in said FCC unit and thereby produce a desired performance from said FCC unit, said method comprising:

obtaining data concerning the fluid catalytic cracking unit in order to establish:

(1) an upper concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit,

(2) a lower concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit,

(3) a rate of consumption of the catalyst by the FCC unit, and

(4) an addition rate at which catalyst is introduced into the FCC unit;

entering the data concerning the FCC unit into a programmed computer in order to determine:

(1) a basic cycle time for introducing an addition amount of the catalyst into the FCC unit,

(2) a first period of the basic cycle time wherein the addition amount of the catalyst is introduced into the FCC unit,

(3) a second period of the basic cycle time wherein the catalyst is not introduced into the FCC unit,

(4) *an addition amount of the catalyst which is capable of raising the concentration of the catalyst from the lower concentration limit to the upper concentration limit* and which also is capable of being introduced into the FCC unit during the first period of the basic cycle time, given the addition rate at which catalyst is introduced into the FCC unit,

placing the FCC unit under control of a computerized control device and thereby:

(1) operating the FCC unit for a given period of time which contains a series of basic cycle times,

(2) introducing *a nominal addition amount of the catalyst (having a nominal weight)* into the FCC unit during the first period of a given basic cycle time by injecting said catalyst into the FCC unit at an addition rate which is between about three times and about ten times the rate of consumption of the catalyst by said FCC unit,

(3) determining a weight difference between the nominal weight of the nominal addition amount and an actual weight of the catalyst introduced into the FCC unit by weighing a container holding an inventory of the catalyst before and after the nominal addition amount is introduced into the FCC unit,

(4) sending analog information concerning the weight difference between the nominal weight of the nominal addition amount and the actual weight of the catalyst introduced into the FCC unit as determined by weighing the container holding the inventory of the catalyst to the computerized control device in order to take any needed corrective action with respect to subsequent introduction of the catalyst into the FCC unit.

'236 patent, col. 15, l. 45-col. 16, l. 38 (emphasis added).

III. The Lawsuit

Plaintiff alleges that Defendants' catalyst loading system infringes the '236 patent.FN5 Nol-Tec denies infringement and has counterclaimed for a declaration of noninfringement.FN6 Grace also denies infringement and has counterclaimed for declarations of patent invalidity, noninfringement, and unenforceability.FN7 All parties request construction of several terms of Claim 1.FN8

FN5. (*See* Am. Compl. para.para. 10-16.)

FN6. (*See* Def. Nol-Tec's Second Am. Answer and Countercl. para.para. 10-16, 31-40.)

FN7. (*See* Answer of Def. Grace to First Am. Compl. para.para. 10-16, 23-26, 27-36.)

FN8. Although the parties dispute much of the language of Claim 1, they have stipulated to the definitions of the following terms:
-> computer-"a programmable electronic device that can store, retrieve, and process data";

-> inventory-"a quantity of material held in supply for future needs";

-> analog information-"information represented by voltage or other measurable variable(s)";

-> catalyst-"fresh catalyst and/or catalyst additive";

-> nominal-"approximate or assumed (but not necessarily actual)";

-> nominal weight-"an approximate or assumed (but not necessarily actual) weight";

-> basic cycle time-"the time period between the start of an injection of the catalyst/additive and the start of the next successive injection of catalyst/additive";

-> FCC unit-"FCC unit and/or other equipment normally associated with an FCC unit."

(Joint Claim Construction Br. at 1-2.)

Standard of Review

Claim construction is a question of law and it is simply a way of elaborating the usually terse claim language in order to understand and explain, but not to change, the scope of the claim. Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d. 1193, 1201 (Fed.Cir.2002); Embrex, Inc. v. Ser. Eng'g Corp., 216 F.3d 1343, 1347 (Fed.Cir.2000). In construing claims, the focus begins and remains centered on the claim language, "for it is that language that the patentee chose to use to 'particularly point[ ] out and distinctly claim[ ] the subject matter which the patentee regards as his invention." ' Interactive Gift Express, Inc. v. Compuserve, Inc., 256 F.3d 1323, 1331 (Fed Cir.2001) (quoting 35 U.S.C. s. 112, para. 2).

"The terms used in the claims bear a 'heavy presumption' that they mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art." Texas Digital, 308 F.3d at 1202 (citations omitted); *see* Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1298 (Fed.Cir.2003). The presumption of ordinary and customary meaning can be rebutted if the patentee has "clearly set forth" an alternative definition or if the patentee has "disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." Brookhill-Wilk 1, 334 F.3d at 1298-99 (citation omitted); *see* Texas Digital, 308 F.3d at 1204. "In the absence of an express intent to impart a novel meaning in the claim terms, the words take on the full breadth of the ordinary and customary meanings attributed to them...." NTP, Inc. v. Research In Motion, Ltd., 392 F.3d 1336, 2004 WL 2861370, at (Fed.Cir. Dec. 14, 2004); *see* Brookhill-Wilk 1, 334 F.3d at 1302; Texas Digital, 308 F.3d at 1202.

Dictionaries, encyclopedias, and treatises are particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms. Texas Digital, 308 F.3d at 1202. "Such references are unbiased reflections of common understanding not influenced by expert testimony or events subsequent to

the fixing of the intrinsic record by the grant of the patent, not colored by the motives of the parties, and not inspired by litigation." Id. at 1203. However, "[b]ecause words often have multiple dictionary definitions, some having no relation to the claimed invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor." *Id*. (citations omitted); *see* Ferguson Beauregard/Logic Controls v. Mega Sys., LLC, 350 F.3d 1327, 1338 (Fed.Cir.2003) ("The words used in the claims must be considered in context ...." (citation omitted)). But "claim terms may be construed to encompass *all* dictionary definitions not inconsistent with the intrinsic record." Nystrom v. Trex Co., 374 F.3d 1105, 1112 n. 2 (Fed.Cir.2004) (emphasis in original) (citations omitted)).

The intrinsic record consists of the claim language, the written specification, drawings, and prosecution history. *See* DeMarini Sports, Inc. v. Worth, Inc., 239 F.3d 1314, 1323 (Fed.Cir.2001); Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). The intrinsic record "must be examined in every case to determine whether the presumption of ordinary and customary meaning is rebutted." Texas Digital, 308 F.3d at 1204 (citation omitted). "[W]here the claim language is unambiguous on its face ... consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the clear language of the claims is specified." Union Carbide Chemicals & Plastics Tech. Corp. v. Shell Oil Co., 308 F.3d 1167, 1180 (Fed.Cir.2002) (citations and internal quotations omitted).

"If the meaning of the claim limitations is apparent from the totality of the intrinsic evidence, then the claim has been construed. If however a claim limitation is still not clear, [the court] may look to extrinsic evidence to help resolve the lack of clarity." Interactive Gift, 256 F.3d at 1332 (footnote omitted). Relying on extrinsic evidence to construe a claim is proper only when the claim language is ambiguous after consideration of the intrinsic evidence. *Id*. While extrinsic evidence may be consulted to assist in understanding the underlying technology, it cannot be used for the purpose of varying or contradicting the terms in the claims. *Id*.

Analysis

I. "obtaining data concerning the fluid catalytic cracking unit in order to establish ..." '236 patent, col. 15, ll. 50-51.

Plaintiff asserts that this phrase means "obtaining factual or other experimental information of any kind (such as by trial and error) concerning the FCC unit in order to arrive at...." FN9 Defendants contend that it means "gathering data from the FCC unit for which catalyst addition is sought to be controlled for the purpose of determining or setting the four parameters recited thereafter." FN10 The Court will examine each of the disputed terms in turn.

FN9. (Pl.'s Claim Construction Br. at 15.)

FN10. (Defs.' Opening Claim Construction Br. at 17.)

A. "obtaining"

The first disputed word is "obtaining." Plaintiff contends that "obtaining" needs no construction, but it alternatively defines "obtain" as "to gain or attain possession," "to arrive at," or "attain." FN11 Defendants

define "obtain" as "gain or attain usu[ally] by planned action or effort." FN12 However, relying upon the specification, they also define "obtaining" as "gathering." FN13

FN11. (Pl.'s Claim Construction Br. at 15, Ex. E at I-31101 (*Webster's Third New International Dictionary* (1993)).)

FN12. (Defs.' Opening Claim Construction Br. at 16, Ex. 5 at WRG-51159 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

FN13. (Id. at 17 (citing '236 patent, col. 8, ll. 1-4).)

The Court finds that "obtaining" requires no construction. The Court could substitute "gaining" or "attaining" for "obtaining," as both dictionaries cited by the parties define "obtain" in those ways, or the Court could substitute "gathering" for "obtaining," as the specification states that "[e]mployment of the methods ... of this patent disclosure will normally begin with a *gathering* of certain hereinafter described operating data." '236 patent, col. 8, ll. 1-4 (emphasis added). But none is an improvement over "obtaining." In fact, in a circularity common among similar words, each word is defined by the others. For example, *Webster's Third New International Dictionary* (1986) defines "gain" as "to get or attain" and "obtain"; it defines "attain" as "gain" and "obtain"; and it defines "gather" as "to gain gradually." Id. at 140, 928, 940. Given this circularity, the Court presumes that "obtaining" speaks for itself and carries its ordinary meaning. *See* Texas Digital, 308 F.3d at 1202 ("The terms used in the claims bear a 'heavy presumption' that they mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art." (citations omitted)). Nothing in the specification or the prosecution history rebuts this presumption. *See* Brookhill-Wilk 1, 334 F.3d at 1298-99; Texas Digital, 308 F.3d at 1204.

B. "data"

The second disputed word is "data." Plaintiff defines "data" as "factual or other experiential information of any kind." FN14 Defendants define "data" in their brief as "numerical or qualitative values derived from scientific experiments," but their proposed construction leaves "data" undefined.FN15

FN14. (Pl.'s Claim Construction Br. at 15, 16, Ex. E I-31087 (*Webster's Third New International Dictionary* (1993)).)

FN15. (Defs.' Opening Claim Construction Br. at 16, Ex. 6 at WRG-51962-63 (*McGraw-Hill Dictionary of Scientific and Technical Terms* (2d ed.1978)).)

The Court finds that "data" requires no construction. The word is unambiguous and there is a " 'heavy presumption" ' that "data" means what it says "and [has] the ordinary meaning that would be attributed to [it] by persons skilled in the relevant art." Texas Digital, 308 F.3d at 1202. Nothing in the specification or the prosecution history rebuts this presumption of ordinary meaning. *See* Brookhill-Wilk 1, 334 F.3d at 1298-99; Texas Digital, 308 F.3d at 1204.

C. "in order to"

The third disputed phrase is "in order to." Plaintiff contends that "in order to" needs no construction, but it alternatively defines this phrase as "in regard or reference to" and "for the purpose of." FN16 Defendants define "in order to" as "for the purpose of." FN17 The Court finds that "in order to" means "for the purpose of." Both dictionaries cited by the parties define "in order to" in this way. This ordinary meaning is presumed and nothing in the specification or prosecution history rebuts this presumption. *See* Brookhill-Wilk 1, 334 F.3d at 1298-99; Texas Digital, 308 F.3d at 1204.

FN16. (Pl.'s Claim Construction Br. at 19, Ex. E at I-31093 (*Webster's Third New International Dictionary* (1993)).)

FN17. (Defs.' Opening Claim Construction Br. at 17, Ex. 5 at WRG-51177 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

D. "establish"

The fourth disputed word is "establish." Plaintiff defines "establish" as, among other things, "to arrive at (as a result)." FN18 It also argues that one may "establish" the four values listed thereafter by "trial and error." FN19 Defendants define "establish" in various ways,FN20 but at oral argument they settled on "to determine." FN21

FN18. (Pl.'s Claim Construction Br. at 16, Ex. E at I-31088 (*Webster's Third New International Dictionary* (1993)).)

FN19. (*Id*. at 18.)

FN20. (Defs.' Opening Claim Construction Br. at 17, Ex. 5 at WRG-51922 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

FN21. (*Markman* Hr'g Tr. at 75; Defs.' Hr'g Presentation at 34-37 .)

The Court finds that "establish" requires no construction. There is a " 'heavy presumption" ' that "establish" means what it says "and [has] the ordinary meaning that would be attributed to [it] by persons skilled in the relevant art." Texas Digital, 308 F.3d at 1202. The parties' proposals, while acceptable, provide no more clarity than "establish."

The Court also finds that one may "establish" the four values listed thereafter by "trial and error." "Trial and error" is defined as "a finding out of the best way to reach a desired result or a correct solution by trying out one or more ways or means and by noting and eliminating errors or causes of failure." *Webster's Third New International Dictionary* 2439 (1986). The specification's teachings and prosecution history are consistent

with the "trial and error" approach. For example, the specification teaches that the evaluation of "operating data" will "commence with a taking of a series of successive (e.g., every 1/2 hour) samples from the FCC unit's total bulk catalyst." '236 patent, col. 8, ll. 3, 8-10. The specification also teaches that desired "maximum and minimum levels" of a particular catalyst "can be determined by overdosing or withholding catalyst from the FCC unit under otherwise controlled conditions of operation." '236 patent, col. 8, ll. 46-49. Both the evaluation of data "with a taking of a series of successive ... samples" and the ebb and flow of "overdosing or withholding catalyst" to reach desired maximum and minimum levels are in line with a "trial and error" view. Finally, the prosecution history refers to the " 'establishment' step" as "empirical in nature." (Pl.'s Claim Construction Br. Ex. G at I-3151.) Although not defined in the intrinsic record, "empirical" is defined in *Webster's Third New International Dictionary* (1986) as "proceeding strictly experimentally or by the trial and error method." Id. at 743.

E. "concerning"

Perhaps overshadowing the previous disputes, however, is the dispute over "concerning." Claim 1 reads: "obtaining data *concerning* the fluid catalytic cracking unit in order to establish ...". '236 patent, col. 15, ll. 50-51 (emphasis added). Defendants contend that data must be obtained " *from* the FCC unit for which catalyst addition is sought to be controlled." FN22 They argue that use of the definite article "the" in "the fluid catalytic cracking unit" indicates that the denoted FCC unit was previously introduced in the preamble to the claim.FN23 The preamble states, in pertinent part: "A method for controlling addition of a catalyst into *a* fluid catalytic cracking unit .... " '236 patent, col. 15, ll. 45-46 (emphasis added). Thus, according to Defendants, "the 'data' is obtained from the particular FCC unit into which the catalyst will be added." FN24

FN22. (Defs.' Opening Claim Construction Br. at 17 (emphasis added).)

FN23. (Id. at 16-17.)

FN24. (Id. at 17.)

Plaintiff contends that data need only be obtained "concerning" the FCC unit, not "from" it.FN25 It argues that had the patentee intended to limit the claim by requiring that the data must come "from" the particular FCC unit to which catalyst is to be added, he would have said so and would not have said "concerning" the FCC unit.FN26 It further argues that "concerning" needs no construction, but it alternatively defines "concerning" as "relating to: regarding, respecting, about." FN27

FN25. (*See* Pl.'s Claim Construction Br. at 19.)

FN26. (Id.)

FN27. (Id. at 19, Ex. E at I-31102 (*Webster's Third New International Dictionary* (1993)).)

Defendants are correct in asserting that " *the* fluid catalytic cracking unit" refers back to " *a* fluid catalytic cracking unit" introduced in the preamble. A patent treatise describes how a patentee refers back to elements previously named in a claim:

The first time an element or part is mentioned, it should not be preceded by a definite article ("the") or by "said." Instead the indefinite article ("a" or "an") should be used, as in ... "a container," "a base,' etc.... When each previously identified element or part is referred to again, the definite article should be used, as "the container," "the base"....

Robert C. Faber, *Landis on Mechanics of Patent Claim Drafting* s. 23 (2002) (footnote omitted); *see Zenith Elec. Corp. v. Exzec, Inc.,* No. 93 C 5041, 1995 U.S. Dist. LEXIS 6177, at (N.D.Ill. May 5, 1995) ("An indefinite article ('a' or 'an') is used to introduce an element. A definite article ('the' or 'said') is used when a term has already been introduced, thereby making mention of the earlier recitation of the element." (citation omitted)).

But Defendants are incorrect in asserting that data must be obtained "from" the particular FCC unit for which catalyst addition is sought to be controlled. "From" is not used in the claim language. And "from" is not a synonym for "concerning." While "concerning" means "relating to: regarding, respecting, about," "from" is a function word indicating "a starting point," "the act, fact, or condition of removal, withdrawal," and "the source or original or moving force of something." *Webster's Third New International Dictionary* 470, 913 (1986). It is presumed that "concerning" carries its ordinary meaning of "relating to" and does not mean "from" as Defendants contend. *See* Brookhill-Wilk-1, 334 F.3d at 1298; Texas Digital, 308 F.3d at 1202. Had the patentee intended the data to be obtained "from" the particular FCC unit, he could have explicitly said so. *See* SuperGuide Corp v. DirecTV Enter., Inc., 358 F.3d 870, 880 (Fed.Cir.2004) ("Had the patentees intended to limit the disputed claim terms to 'analog' technology, they could have easily done so by explicitly modifying the disputed claim language with the term 'analog." '). Nothing in the specification or prosecution history rebuts the presumption that "concerning" carries its ordinary meaning of "relating to." *See* Brookhill-Wilk 1, 334 F.3d at 1298-99; Texas Digital, 308 F.3d at 1204.

F. Summary

Accordingly, the Court concludes that the phrase "obtaining data concerning the fluid catalytic cracking unit in order to establish ..." means "obtaining data relating to the fluid catalytic cracking unit for the purpose of establishing (such as by trial and error) ...".

II. "(1) an upper concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit" and "(2) a lower concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit" '236 patent**, col. 15, ll. 52-54, 55-57.**

Plaintiff construes each of these phrases separately. It contends that the first defines "a concentration [area] within an upper boundary which is capable of producing the desired performance from the FCC unit. It need not be the maximum tolerable value." FN28 It contends that the second defines "a concentration [area] within a lower boundary which is capable of producing the desired performance from the FCC unit. It need not be the minimum (or lowest) tolerable value." FN29

FN28. (Pl.'s Claim Construction Br. at 20.)

FN29. (Id. at 24.)

Defendants combine the two phrases and contend that together they define "a particular range of concentrations for the catalyst that has a defined upper limit and a defined lower limit (each expressed as weight percentage) and that is capable of producing or maintaining a desired level of performance from that FCC unit." FN30

FN30. (Defs.' Opening Claim Construction Br. at 20.)

Before addressing the areas of disagreement, it should be noted that there are at least two general areas of agreement. First, the parties agree that the "upper concentration limit" and the "lower concentration limit"-whatever those phrases mean-denote catalyst concentration "that is capable of producing a desired level of performance from the FCC unit." FN31 Second, they agree that "upper" and "lower" require no construction, as both of their proposed constructions leave those words unchanged. Thus, the main disagreements are over "concentration" and "limit."

FN31. While Defendants would substitute "*the* FCC unit" with "*that* FCC unit," there is no support for the substitution of "the" for "that." *See supra* Analysis Part I.E.

A. "concentration"

As an initial matter, the parties agree that "concentration" requires no construction-Plaintiff asserts that the word needs no further definition, while Defendants' proposed construction leaves "concentration" undefined. FN32

FN32. (Pl.'s Claim Construction Br. at 20; Defs.' Opening Claim Construction Br. at 20.)

But the parties disagree on how the "concentration" must be expressed. Defendants contend that it is "expressed in percentage by weight." FN33 Plaintiff objects to such a narrow construction.FN34

FN33. (Defs.' Opening Claim Construction Br. at 18, Ex. 7 at WRG-51152, 51917 (*Webster's Third New International Dictionary* (1986)).)

FN34. (Pl.'s Rebuttal Br. at 6.)

The Court finds that although concentration may be expressed in percentage by weight, nothing in the intrinsic record requires such an expression. The claim does not express concentration as a weight percentage. And the specification repeatedly refers to a catalyst "amount, percentage *or* concentration." *See, e.g.,* '236 patent, col. 8, ll. 38-61 (emphasis added). By distinguishing between "percentage" and "concentration," the specification reveals the patentee's intent not to categorically express concentration as a weight percentage. Although the prosecution history expresses catalyst concentration as a weight

percentage, there is no clear disclaimer that a weight percentage is required or that other expressions of concentration are forbidden. *See* Brookhill-Wilk 1, 334 F.3d at 1301 ("Absent a clear disclaimer of particular subject matter, the fact that the inventor anticipated that the invention may be used in a particular manner does not limit the scope to that narrow context." (citations omitted)).

B. "limit"

Before addressing the areas of disagreement over "limit," it should be noted that there are three areas of agreement. First, there appears to be no dispute that "limit" denotes a "boundary"-Plaintiff defines "limit" as "the place or area enclosed within a boundary: bounds," while Defendants define "limit" as, among other things, "something that bounds, restrains, or confines." FN35

FN35. (Pl.'s Claim Construction Br. at 20, Ex. E at I-31089 (*Webster's Third New International Dictionary* (1993)); Defs.' Opening Claim Construction Br. at 18, Ex. 5 at WRG-51164-65 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

Second, there appears to be no dispute that the claim depicts a concentration "range"-Plaintiff consistently referred to a "concentration range" at oral argument and Defendants' final proposed construction refers to a "range of concentrations." FN36

FN36. (*See* Pl.'s *Markman* Presentation at 53-59; Defs.' Opening Claim Construction Br. at 20.)

Finally, there appears to be no dispute that the upper and lower boundaries can change over time. Plaintiffs argue that the boundaries can change and Defendants agreed at oral argument.FN37 Nothing in the claim language or in the rest of the intrinsic record indicates that the boundaries are immutable. In fact, the claim speaks of upper and lower boundaries which are capable of producing a "desired" performance from the FCC unit. '236 patent, col. 15, ll. 53, 56. As the "desired" performance changes, so may the boundaries.

FN37. (Pl.'s Rebuttal Br. at 3-4; *Markman* Hr'g Tr. at 8, 41, 43, 48, 52, 95, 106-07.)

But there is a dispute over whether the "upper" and "lower" boundaries denote absolute maximum and minimum catalyst concentration levels that a FCC unit can tolerate. Defendants assert that "upper concentration limit" means "a higher, maximum weight percentage of the catalyst as expressed as the percentage of overall FCC unit inventory." FN38 They make similar arguments with respect to "lower concentration limit." FN39 Plaintiff rejects any argument that the "limit" is the absolute maximum or minimum or the only possible limit.FN40

FN38. (Joint Claim Construction Br. at 13.)

FN39. (*Id*. at 15.)

FN40. (*Id*. at 21.)

Nowhere in the claim do the words "maximum" or "minimum" appear. Instead, the claim introduces "an upper concentration limit" and "a lower concentration limit" which is capable of producing "the desired performance." '236 patent, col. 15, ll. 52-57. It does not state that these are the maximum or the minimum limits that can be tolerated by a FCC unit. Similarly, while the specification and prosecution history refer to "maximum" and "minimum" "amounts," these are the maximum and minimum concentrations for "desired" or "acceptable" performance. *See* id., col. 8, ll. 40-44; (Defs.' Opening Claim Construction Br. Ex. 4 at I-3151). Absent a clear disclaimer to the contrary, "the fact that the inventor anticipated that the invention may be used in a particular manner does not limit the scope to that narrow context." Brookhill-Wilk 1, 334 F.3d at 1301 (citation omitted); *see* Texas Digital, 308 F.3d at 1204.

C. Summary

Accordingly, the Court concludes that "(1) an upper concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit" means "(1) an upper boundary (but not necessarily the maximum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) that is capable of producing the desired performance from the FCC unit." Similarly, the Court concludes that "(2) a lower concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit" means "(2) a lower boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) that is capable of producing the desired performance from the FCC unit."

III. "(3) a rate of consumption of the catalyst by the FCC unit" '236 patent**, col. 15, ll. 58-59.**

Plaintiff contends that this phrase means "a fixed proportion or (approximate) relationship or ratio of the average loss of catalyst additive by the FCC unit (including, for example, a ratio of loss of catalyst additive relative to loss of fresh catalyst)." FN41 Defendants assert that it means "the total weight of catalyst lost in a given period divided by the duration of the period." FN42 The key words are "consumption" and "rate."

FN41. (Pl.'s Claim Construction Br. at 25.)

FN42. (Defs.' Opening Claim Construction Br. at 21.)

The parties agree that "consumption" means "loss" or "lost." FN43 But they pointedly disagree on the meaning of "rate ." FN44 Defendants view "rate" as only a change in quantity over time. Relying on the *McGraw-Hill Dictionary of Scientific and Technical Terms,* they define "rate" as "the amount of change of some quantity during a time interval divided by the length of the time interval." FN45 Plaintiff views "rate" not only as a change in quantity over time, but also as the ratio of one material to another, such as the ratio of catalyst additive to fresh catalyst.FN46 Relying on *Webster's Third New International Dictionary,* it defines "rate" as, among other things, "a fixed relation (as a quantity, amount or degree) between two things: ratio ." FN47 At oral argument, Plaintiff's counsel illustrated how catalyst loss can be depicted on a relative basis of one catalyst to another: If catalyst "X" is lost over time "t" and catalyst "Y" is also lost over time "t," the equation would be X/t/Y/t. If the "t's" are cancelled out, then a relative ratio of X/Y remains.FN48

FN43. (Pl.'s Claim Construction Br. at 27; Defs.' Opening Claim Construction Br. at 20.)

FN44. (Pl.'s Claim Construction Br. at 25-27; Defs.' Opening Claim Construction Br. at 20-21.)

FN45. (Defs.' Opening Claim Construction Br. at 20, Ex. 6 at WRG-51913.)

FN46. (*See* Pl.'s Claim Construction Br. at 25-27; *Markman* Hr'g Tr. at 100.)

FN47. (Pl.'s Claim Construction Br. at 25, Ex. E at I-31090.)

FN48. (*Markman* Hr'g Tr. at 101.)

The Court finds that neither of the proposed definitions is inconsistent with the intrinsic record and will construe "rate" to encompass both. *See* Nystrom, 374 F.3d at 1112 n. 2; Texas Digital, 308 F.3d at 1203. While the claim does not express "rate" in any terms whatsoever, the examples in the specification and prosecution history express "rate" as quantity over time-i.e., "tons/hr," "1 ton/hr," "one ton per hour." *See* '236 patent, col. 8, ll. 19, col. 10, ll. 16-17; (Defs.' Opening Claim Construction Br. Ex. 4 at I-3151). But neither the specification nor the prosecution history clearly disavows other expressions of "rate," such as the ratio of catalyst additive over fresh catalyst. *See* Texas Digital, 308 F.3d at 1204. Absent a clear disclaimer disavowing other expressions of "rate," the fact that the patentee anticipated that "rate" may be expressed as a change in weight over time does not limit the claim's scope to that narrow context. *See* Brookhill-Wilk 1, 334 F.3d at 1301. As such, the Court is "constrained to follow the language of the claims ... and to give the claim term its full breadth of ordinary meaning as understood by persons skilled in the relevant art." Id . at 1301-02 (citations and internal quotations omitted).

Defendants assert that the full breadth of dictionary definitions are rejected "even though they are not expressly disavowed where the term is unvaryingly used in the specification according to a narrow definition," relying on Searfoss v. Pioneer Consol. Corp., 374 F.3d 1142 (Fed.Cir.2004). FN49

FN49. (Defs.' Reply Br. at 2-3.)

Defendants' reliance on *Searfoss* is misplaced. In *Searfoss,* the court was called upon to construe the meaning of "connecting" in a patent for movable truck bed cover systems. 374 F.3d at 1144, 1149. The plaintiffs argued that the dictionary definitions they cited defined "connecting" as encompassing both direct and indirect connections. Id. at 1149. But the court determined that "connecting" meant only a direct connection because the patent referred to "connecting" as synonymous with "attaching" and because a contrary construction would lead to a problematic reading of the claim "such that the cover ... is exerting a downward force upon itself." Id. at 1150. In reaching this construction, the court looked to the specification to determine which dictionary definition was consistent with the use of the claim term. However, the court did not hold that the "unvarying use" of a term in the specification narrowed the claim's scope. Nor did it overrule, *sub silentio,* the longstanding rule that when the specification and prosecution history fail to

manifestly exclude or restrict a claim term, the claim is given the "full breadth" of its ordinary meaning. *See, e.g.,* NTP, 392 F .3d 1336, 2004 WL 2861370, at *6; Ferguson, 350 F.3d at 1338; Brookhill-Wilk 1, 334 F.3d at 1302.

Defendants also assert that the specification and prosecution history express "rate" in no terms other than weight over time.FN50 This may be so, FN51 but as the Federal Circuit has observed: "That a specification describes only one embodiment does not require that each claim be limited to that one embodiment." SRI Int'l v. Matsushita Elec. Corp., 775 F.2d 1107, 1121 n. 14 (Fed.Cir.1985) (en banc); *see* SuperGuide, 358 F.3d at 875; Texas Digital, 308 F.3d at 1204. While claims must be construed in light of the specification, "limitations from the specification are not to be read into the claims ... for '[i]t is the *claims* that measure the invention." ' Golight, Inc. v. Wal-Mart Stores, Inc., 355 F.3d 1327, 1331 (Fed.Cir.2004) (emphasis in original) (citations omitted).

FN50. (*See* Defs.' Opening Claim Construction Br. at 21; Defs.' Reply Br. at 8-9.)

FN51. It is arguable, however, that the specification does teach that "rate" may be expressed on a relative basis. For example, it notes that the consumption rate can be determined by analyzing samples taken from the FCC unit's total bulk catalyst "on the basis of changes in their weight percentages or concentrations over time with respect to the weight of the FCC unit's bulk catalyst."'236 patent, col. 8, ll. 13-16.

Accordingly, the Court concludes that the phrase "(3) a rate of consumption of the catalyst by the FCC unit" means "(3) a ratio of the catalyst lost by the FCC unit over time, or a ratio of the catalyst additive lost by the FCC unit over the fresh catalyst lost."

IV. "(4) an addition rate at which catalyst is introduced into the FCC unit " '236 patent**, col. 15, ll. 60-61.**

Plaintiff contends that this phrase means an "addition rate at which catalyst additive is introduced into the equipment normally associated with the FCC unit." FN52 Defendants contend that it means "the weight of material added to the FCC unit in a given period divided by the time over which the addition was actually made ." FN53 The Court will examine "addition" and "rate."

FN52. (Pl.'s Claim Construction Br. at 28.)

FN53. (Defs.' Opening Claim Construction Br. at 22.)

A. "addition"

Plaintiff's proposed construction leaves "addition" unchanged, while Defendants define "addition" as "the act or process of adding." FN54 The Court finds that "addition" carries its ordinary and customary meaning of "the act or process of adding." Nothing in the specification or prosecution history contradicts this plain meaning. *See* Brookhill-Wilk 1, 334 F.3d at 1298-99; Texas Digital, 308 F.3d at 1204.

FN54. (*Id.* at 22, Ex. 5 at WRG-51180 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

B. "rate"

The Court has previously construed "rate" to encompass both "the amount of change of some quantity during a time interval divided by the length of the time interval" and "a fixed relation ... between two things: ratio." *See supra* Analysis Part III. "A word or phrase used consistently throughout a claim should be interpreted consistently." Phonometrics, Inc. v. Northern Telecom Inc., 133 F.3d 1459, 1465 (Fed.Cir.1998). Here, "rate" has been used consistently in the claim, both in the "rate of consumption" and in the "addition rate." Thus, the Court will interpret it consistently.

C. Summary

Accordingly, the Court concludes that the phrase "(4) an addition rate at which catalyst is introduced into the FCC unit" means "(4) a ratio of the catalyst added into the FCC unit over time, or a ratio of the catalyst additive added into the FCC unit over the fresh catalyst."

V. "entering the data concerning the FCC unit into a programmed computer in order to determine ..." '236 patent**, col. 15, ll. 62-63.**

Plaintiff contends that this phrase means "causing the information concerning the FCC unit to go into or be received into a programmed computer in order to settle or decide by a choice of alternatives...." FN55 Defendants contend that it means "the act of inputting the data obtained previously in Step I into a computer that contains a sequence of coded instructions for the purpose of fixing, by way of calculating, the recited parameters of the injection schedule." FN56 The Court will examine several words and phrases in turn.

FN55. (Pl.'s Claim Construction Br. at 30.)

FN56. (Defs.' Opening Claim Construction Br. at 25.)

A. "entering"

Plaintiff defines "enter" as "to cause to go into or be received into something" as in "< a boy at a school>." FN57 Defendants define "enter" as "put in: insert" as in "< the new data into the computer>" and ultimately propose "inputting." FN58 "Input" is defined by *Webster's Third New International Dictionary* (1986) as, among other things, "data or similar information fed into a computer or accounting machine." Id. at 1167. It is clear from the claim's context that Defendants' definition is most consistent with the patentee's use of the word and the intrinsic record. *See* Ferguson, 350 F.3d at 1338. ("The words used in the claims must be considered in context...."). The claim speaks of "entering the data ... into a programmed computer. " '236 patent, col. 15, ll. 62-63. And the specification teaches that "by *inserting* [certain] known values *into the following equations* [as provided], an individual or *computer* program can determine an initial or primary schedule for the introduction of catalyst X. " '236 patent, col. 10, ll. 20-23 (emphasis added). Given this context, the Court finds that "entering" means "inputting."

FN57. (Pl.'s Claim Construction Br. at 30, Ex. E at I-31104 (*Webster's Third New International Dictionary* (1993)).)

FN58. (Defs.' Opening Claim Construction Br. at 24, Ex. 5 at WRG-51174 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

B. "data"

The Court has previously found that "data" requires no construction. *See supra* Analysis Part I.B. Because this word is used consistently throughout the claim, no construction is needed here. *See* Phonometrics, Inc., 133 F.3d at 1465.

C. "concerning the FCC unit"

The Court has previously found that "concerning" carries its ordinary meaning of "relating to." *See supra* Analysis Part I.E. Because this word is used consistently throughout the claim, the Court gives it the same construction here. *See* Phonometrics, Inc., 133 F.3d at 1465.

D. "programmed computer"

The parties have agreed that "computer" means "a programmable electronic device that can store, retrieve, and process data." FN59 The Court has no quarrel with this definition, but finds it unnecessarily cumbersome and will provide no construction here.

FN59. (Joint Claim Construction Br. at 1.)

E. "in order to"

The Court has previously construed "in order to" to mean "for the purpose of." *See supra* Analysis Part I.C. Because this phrase is used consistently throughout the claim, the Court gives it the same construction here. *See* Phonometrics, Inc., 133 F.3d at 1465.

F. "determine"

Plaintiff defines "determine" as, among other things, "to settle or decide by choice of alternatives or possibilities" and "to fix the form or character of beforehand." FN60 Defendants define "determine" as "to fix the form, position, or character of beforehand: ordain" and "to find out or come to a decision about by ... calculation." FN61 They ultimately propose that "determine" be construed as "fixing, by way of calculating, the recited parameters of the injection schedule." FN62

FN60. (Pl.'s Claim Construction Br. at 30-32, Ex. E at I-31091 (*Webster's Third New International Dictionary* (1993)).)

FN61. (Defs.' Opening Claim Construction Br. at 24, Ex. 5 at WRG-51178 (*Merriam Webster's Collegiate Dictionary* (10th ed.1995)).)

FN62. (*Id*. at 25.)

Because "determine" has multiple dictionary definitions, "some having no relation to the claimed invention, the intrinsic record must ... be consulted to identify which of the different possible dictionary meanings ... is most consistent with the use of the words by the inventor." Texas Digital, 308 F.3d at 1203 (citations omitted). "[A] common meaning, such as one expressed in a relevant dictionary, that flies in the face of the patent disclosure is undeserving of fealty." Renishaw PLC v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1250 (Fed.Cir.1998). Consulting the intrinsic record, it is clear that Plaintiff's first proposed definition-"to settle or decide by choice of alternatives or possibilities"-is inadequate. It is too broad and it fails to consider the involvement of a computer. *See* Ferguson, 350 F.3d at 1338 ("The words used in the claims must be considered in context...."). Considering that the stipulated definition of "computer" is "a programmable electronic device that can store, retrieve, and process data," FN63 expanding the definition to encompass "settle[ing] or decid[ing]" would be inappropriate. In contrast, Plaintiff's second proposed definition, which is nearly identical to Defendants' first proposed definition-"to fix the form or character of beforehand"-is more consistent with the patentee's intended use. Thus, the Court concludes that "determine" means "to fix."

FN63. (Joint Claim Construction Br. at 1.)

The parties also disagree over whether the "determin[ation]" requires a computer calculation. Defendants argue that a computer calculation is required. FN64 Plaintiff is not so categorical. It argues that the "determin[ation] can come by way of a "*computer calculation* of raw data" or by way of a "*computer implementation* of [an individual's] mental assessment" of the data. FN65

FN64. (*See* Defs.' Opening Claim Construction Br. at 24; Defs.' Reply Br. at 5.)

FN65. (Pl.'s *Markman* Presentation at 10 (emphasis in original); Pl.'s Claim Construction Br. at 30-32; *Markman* Hr'g Tr. at 11-12 .)

The Court agrees with Plaintiff's view. The claim states that data concerning the FCC unit is inputted into a computer "in order to determine" an injection schedule composed of "a basic cycle time," "a first period of the basic cycle time," "a second period of the basic cycle time," and "an addition amount of the catalyst." '236 patent, col. 15, ll. 64, 66, col. 16, ll. 1, 3. The claim does not state, however, that a computer calculation or a computer implementation of an individual's mental assessment is necessary to achieve this result. But the specification teaches that either may be performed. For instance, the specification states that the "basic cycle time is used to establish (*by engineering calculations and/or computer programs*) a regular schedule of introduction for a particular catalyst ingredient in a FCC unit being used for a given FCC task." '236 patent, col. 8, l. 65-col. 9, l. 1 (emphasis added). It also states that "by inserting the[ ] known values into ... equations, *an individual or computer program can determine* an initial or primary schedule for the introduction of catalyst X." Id., col. 10, ll. 20-24 (emphasis added). In both instances, the specification contemplates that a computer or an individual will perform certain calculations to determine the injection cycle. Thus, a "determin[ation]" may be carried out by way of a computer calculation of the data or a computer implementation of an individual's calculation of the data.

G. Summary

Accordingly, the Court concludes that the phrase "entering the data concerning the FCC unit into a programmed computer in order to determine ..." means "inputting the data relating to the FCC unit into a programmed computer for the purpose of fixing, by way of a computer calculation of the data or a computer implementation of an individual's calculation of the data ...".

VI. "(4) an addition amount of the catalyst which is capable of raising the concentration of the catalyst from the lower concentration limit to the upper concentration limit" '236 patent, col. 16, ll. 3-6.

Plaintiff asserts that this phrase means an "addition amount of the catalyst which is capable of raising the concentration of the catalyst additive from a concentration area within the lower boundary to a concentration area within the upper boundary." FN66 Defendants assert that it means "the quantity in weight of catalyst that is determined to have the ability to increase the concentration or weight percentage of the catalyst from the lower concentration limit established in Step I to the upper concentration limit established in Step I when injected during the first period (T_1) of the basic cycle period." FN67 The Court will examine the terms "the upper concentration limit" and "the lower concentration limit" and "an addition amount" in turn.

FN66. (Pl.'s Claim Construction Br. at 29.)

FN67. (Defs.' Opening Claim Construction Br. at 26.)

A. "the upper concentration limit" and "the lower concentration limit"

As to "the upper concentration limit" and "the lower concentration limit," the Court has previously construed the former to mean "an upper boundary (but not necessarily the maximum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage)" and has construed the latter to mean "a lower boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage)." *See supra* Analysis Part II.C. Because these phrases are used consistently throughout the claim, the Court gives them the same constructions here. *See* Phonometrics, Inc., 133 F.3d at 1465.

But the parties dispute whether the upper and lower boundaries referred to in the instant phrase are the same boundaries that were determined during the "obtaining data" step. Defendants contend that they are the same.FN68 The Court agrees. As noted above, when a previously identified element is referred to in a patent after it has been introduced by "a" or "an," "the definite article ['the'] should be used." Robert C. Faber, *Landis on Mechanics of Patent Claim Drafting* s. 23 (2002); *see Zenith Elec.,* 1995 U.S. Dist. LEXIS 6177, at *12. By using the definite article "the" in "the lower concentration limit" and "the upper concentration limit," the patentee is referring to "an upper concentration limit" and "a lower concentration limit" that were previously established during the "obtaining data" step.FN69

FN68. (Defs.' Opening Claim Construction Br. at 25.)

FN69. That the boundaries may change over time, *see supra* Analysis Part II.B, does not alter the construction that the boundaries are previously established during the "obtaining data" step.

B. "an addition amount"

As to "an addition amount," the parties dispute whether it raises catalyst concentration somewhere *within* the upper and lower boundaries (Plaintiff's view), or whether it raises catalyst concentration *from* the lower boundary *to* the upper boundary (Defendants' view).

The Court agrees with Defendants' view. First, the claim explicitly states that the "addition amount ... is capable of raising the concentration ... *from* the lower concentration limit *to* the upper concentration limit." '236 patent, col. 16, ll. 3-6 (emphasis added). It does not say "within" the upper and lower limits. Second, the specification teaches that an addition amount is an amount "which, when added to a minimum amount, gives the maximum amount...." Id., col. 8, ll. 57-61. Third, the prosecution history describes an addition amount as "... the amount of catalyst needed *to get from* the minimum permissible additive concentration ... *to* the maximum permissible concentration...." (Defs.' Opening Claim Construction Br. Ex. 4 at I-3153 (emphasis added).) Finally, after illustrating in an example that one ton of catalyst is added to every one ton of catalyst lost, the prosecution history states that the '236 patent answers the question of how this amount of catalyst should be added. (*See* id. Ex. 4 at I-3151 .) Thus, the intrinsic record reveals that the "addition amount" is the amount of catalyst added to raise the concentration of the catalyst from the desired lower concentration boundary to the desired upper concentration boundary.FN70

FN70. That the boundaries may change over time, *see supra* Analysis Part II.B, does not alter the construction that the addition amount raises the catalyst concentration from the lower boundary to the upper boundary.

C. Summary

Accordingly, the Court concludes that the disputed phrase "(4) an addition amount of the catalyst which is capable of raising the concentration of the catalyst from the lower concentration limit to the upper concentration limit" means "(4) an amount of catalyst added to raise the concentration of the catalyst from the previously established lower boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) to the previously established upper boundary (but not necessarily the maximum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage)."

VII. "placing the FCC unit under control of a computerized control device and thereby ..." '236 patent**, col. 16, ll. 11-12.**

Plaintiff defines this phrase as "controlling the FCC unit and/or equipment normally associated with the FCC unit by virtue of addition or withholding of catalyst additive such as by a valve regulated by a computerized control device." FN71 Defendants contend that no construction is necessary.FN72

FN71. (Pl.'s Claim Construction Br. at 32.)

FN72. (Defs.' Opening Claim Construction Br. at 26.) Alternatively, Defendants rely on their definition of this phrase found in the Joint Claim Construction Brief at page 21. (Id.) But this page does not lay out a complete definition; it merely defines "placing the FCC unit under control" and "a computerized control device."

The Court finds that the specification confirms Plaintiff's view that the FCC unit is controlled by adding or withholding catalyst additive by a valve regulated by a computer. The specification teaches that "[c]ontrol over an FCC unit operating according to the general teachings of this patent disclosure will be achieved through *only* addition of (or withholding of) a particular catalyst additive to solve a particular problem ...." '236 patent, col. 7, ll. 51-55 (emphasis added). It also teaches, by reference to Figure 1, that "the entrainment of the catalyst 14 into the stream of plant air 34 is preferably controlled by valve 58 which is, in turn, most preferably regulated and monitored by a computer memory and control device 70." Id., col. 15, ll. 23-26. "The objective and contemporaneous record provided by the intrinsic evidence is the most reliable guide to help the court determine which of the possible meanings of the terms in question was intended by the inventor to particularly point out and distinctly claim the invention." Texas Digital, 308 F.3d at 1203 (citation omitted). Accordingly, the Court concludes that the phrase "placing the FCC unit under control of a computerized control device and thereby ..." means "placing the FCC unit under control through the addition or withholding of catalyst additive by a valve regulated by a computerized control device and thereby ...".

VIII. "a nominal addition amount of the catalyst (having a nominal weight) " '236 patent**, col. 16, ll. 15-16.**

The parties agree that "nominal" means "approximate or assumed (but not necessarily actual)" and "nominal weight" means "an approximate or assumed (but not necessarily actual) weight." FN73 Plaintiff construes the entire phrase to mean "an assumed or approximate addition amount of the catalyst additive (having an assumed or approximate weight)." FN74 Defendants define it as "an amount of catalyst that is injected into the FCC unit and is assumed to be the same weight as that of the 'addition amount' determined in Step II." FN75

FN73. (Joint Claim Construction Br. at 1-2.)

FN74. (Pl.'s Claim Construction Br. at 33.)

FN75. (Defs.' Opening Claim Construction Br. at 27.)

A. "addition amount"

With respect to "addition amount," the Court has previously defined this phrase to mean "the amount of catalyst added to raise the concentration of the catalyst from the desired lower concentration boundary to the desired upper concentration boundary." *See supra* Analysis Part VI.B. Because this phrase is used consistently throughout the claim, the Court gives it the same construction here. *See* Phonometrics, Inc., 133 F.3d at 1465.

B. "nominal addition amount"

With respect to the "nominal addition amount," the Court agrees with Defendants that this phrase refers to "an approximate or assumed amount of catalyst that corresponds to the 'addition amount' previously determined." FN76 As seen from the claim's context, the term "nominal" modifies "addition amount" and there is no indication that this "addition amount" is anything other than the "addition amount" determined in the "entering the data" step. For example, the claim states that one will "enter[ ] the data concerning the FCC unit into a programmed computer in order to determine ... (4) *an addition amount* of the catalyst .... " '236 patent, col. 15, 1. 62-col. 16, 1. 3 (emphasis added). Later, the claim states that one will "place[ ] the FCC unit under control of a computerized control device and thereby ... (2) introduc[e] *a nominal addition amount of the catalyst (having a nominal weight)* into the FCC unit." Id., col. 16, II. 11-16.

FN76. (Id.)

C. Summary

Accordingly, the Court concludes that the phrase "a nominal addition amount of the catalyst (having a nominal weight)" means "an approximate or assumed amount of catalyst added to raise the concentration of the catalyst from the previously established lower concentration boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) to the previously established upper concentration boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) (having an approximate or assumed but not necessarily actual weight)."

IX. Order of "Obtaining," "Entering," and "Placing"

The final issue is whether Claim 1 must be performed in sequential steps of (1) "obtaining data," (2) "entering the data" into a computer, and (3) "placing the FCC under control of a computerized control device," or whether the steps may be carried out in any order. *See* '236 patent, col. 15, ll. 50, 62, col. 16, II. 11. Defendants argue that the patented method must be performed sequentially.FN77 Plaintiff does not contest this point. At oral argument, Plaintiff's counsel stated the following:

FN77. (Defs.' Opening Claim Construction Br. at 27-30.)

[T]he claim breaks down essentially into three steps-a step of obtaining data concerning the FCC unit in order to establish four recited matters; ... then, entering that data to determine essentially an injection schedule and an injection amount[;] and, then, placing the FCC unit under control of a computerized control device....
Now, the main argument as far as today's presentation and the *Markman* hearing pertains to the steps of obtaining data and entering data. Now, the defendants in their briefs suggest that there's a fundamental dispute on the order of the steps. That's a strawman argument.... We haven't asserted an out-of-order claim construction.... We didn't put a lot of time and attention to it because we don't see it as a major issue.FN78

FN78. (*Markman* Hr'g Tr. at 5.)

To determine whether a method recites an order, courts apply a two-part test: "First, [the court] look[s] to

the claim language to determine if, as a matter of logic or grammar, they must be performed in the order written.... If not, [the court] next look[s] to the rest of the specification to determine whether *it* directly or implicitly requires such a narrow construction." Altiris, Inc. v. Symantec Corp., 318 F.3d 1363, 1369-70 (Fed.Cir.2003) (citations and internal quotations omitted) (emphasis in original).

Looking to the claim language, grammar and logic dictate that the steps must be performed in the order written. To start, the "obtaining data" and the "entering the data" steps both refer to the same "data." As a matter of grammar, the "entering the data" step uses the antecedent basis, "the," when referring to "the data." This indicates that this is the same data obtained in the "obtaining" step. As a matter of logic, one would not first "enter" data concerning the FCC unit into a computer and then later "obtain" the data. Rather, logic dictates that one must first "obtain" the data and then "enter" it into a computer. Similarly, the "entering the data" and the "placing" steps both refer to the same "first period." As a matter of grammar, the "placing" step uses the antecedent basis, "the," when referring to "the first period." This refers back to "a first period" that was introduced during the "entering the data" step. As a matter of logic, one would not "place[ ] the FCC unit under [the] control of a computerized control device" without first "entering the data ... into a programmed computer." Rather, logic dictates that one would first enter the data into a computer and then place the FCC unit under the control of a computerized control device.FN79

FN79. Although it is not necessary to go beyond the claim language to determine that the steps recite an order, the specification also requires such a construction. For instance, the specification repeatedly refers to the "steps" of "obtaining," "entering," and "placing" in describing the patented method. *See* '236 patent, col. 8, l. 14-col. 13, l. 55. It also numbers the steps as "(I)," "(II)," and "(III)." *See* id., col. 11, ll. 20-65.

Conclusion

Based upon the foregoing and all of the files, records, and proceedings herein, IT IS ORDERED that the following terms in Claim 1 of United States Patent No. 5,389,236 have the following meanings:

Claim Language:	Court's Construction:
"obtaining data concerning the fluid catalytic cracking unit in order to establish ..."	"obtaining data relating to the fluid catalytic cracking unit for the purpose of establishing (such as by trial and error) ..."
"(1) an upper concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit"	"(1) an upper boundary (but not necessarily the maximum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) that is capable of producing the desired

	producing the desired performance from the FCC unit"
"(2) a lower concentration limit for the catalyst which is capable of producing the desired performance from the FCC unit"	"(2) a lower boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) that is capable of producing the desired performance from the FCC unit"
"(3) a rate of consumption of the catalyst by the FCC unit"	"(3) a ratio of the catalyst lost by the FCC unit over time, or a ratio of the catalyst additive lost by the FCC unit over the fresh catalyst lost"
"(4) an addition rate at which catalyst is introduced into the FCC unit"	"(4) a ratio of the catalyst added into the FCC unit over time, or a ratio of the catalyst additive added into the FCC unit over the fresh catalyst"
"entering the data concerning the FCC unit into a programmed computer in order to determine ..."	"inputting the data relating to the FCC unit into a programmed computer for the purpose of fixing, by way of a computer calculation of the data or a computer implementation of an individual's calculation of the data ..."
"(4) an addition amount of the catalyst which is capable of raising the	"(4) an amount of catalyst added to raise the concentration of the catalyst

concentration of the catalyst from the lower concentration limit to the upper concentration limit"	from the previously established lower boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) to the previously established upper boundary (but not necessarily the maximum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage)"
"placing the FCC unit under control of a computerized control device and thereby ..."	"placing the FCC unit under control through the addition or withholding of catalyst additive by a valve regulated by a computerized control device and thereby ..."
"a nominal addition amount of the catalyst (having a nominal weight)"	"an approximate or assumed amount of catalyst added to raise the concentration of the catalyst from the previously established lower concentration boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) to the previously established upper

	established upper concentration boundary (but not necessarily the minimum boundary) of a range of catalyst concentrations (which may be expressed as a weight percentage) (having an approximate or assumed but not necessarily actual weight)"
Order of "obtaining," "entering," and "placing"	The method described in the '236 patent recites an order and must be performed sequentially.

D.Minn.,2005.
Intertac, Inc. v. Nol-Tec Systems, Inc.