IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

ARCELORMITTAL FRANCE,and ARCELORMITTAL ATLANTIQUE ET LORRAINE,	)	
Plaintiffs,	)	
v.	)	Civ. No. 10-050-SLR
AK STEEL CORPORATION, SEVERSTAL DEARBORN, INC, and WHEELING-NISSHIN, INC.,	)	
Defendants.	)	

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MEMORANDUM OPINION

Dated: December 16, 2010
Wilmington, Delaware

ROBINSON, District Judge

I. INTRODUCTION

Plaintiffs ArcelorMittal France and ArcelorMittal Atlantique et Lorraine (collectively "plaintiffs") brought suit in January 2010 against defendants AK Steel Corporation, Severstal Dearborn, Inc., and Wheeling Nisshin, Inc. (collectively "defendants"), alleging infringement of claim 1 of U.S. Patent No. 6,296,805 ("the '805 patent"). (D.I. 1) The parties agreed to forego summary judgment practice in favor of an expedited trial, set to commence on January 10, 2011. (D.I. 68) Currently before the court are the parties' proposed claim constructions and briefing on the same. The court has jurisdiction over these matters pursuant to 28 U.S.C. § 1338.

II. BACKGROUND

Claim 1 of the '805 patent discloses:

> 1. A hot-rolled coated steel sheet comprising a hot-rolled steel sheet coated with an aluminum or aluminum alloy coating, wherein the steel in the sheet comprises the following composition by weight:
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> 0.15%‹carbon‹0.5%
> 0.5%‹manganese‹3%
> 0.1%‹silicon‹0.5%
> 0.01%‹chromium‹1%
> titanium‹0.2%
> aluminum‹0.1%
> phosphorus‹0.1%
> sulfur‹0.05%
> 0.0005%‹boron‹0.08%,
>
> the remainder being iron and impurities inherent in processing, and the steel sheet has a very high mechanical resistance after thermal treatment and the aluminum or aluminum alloy coating provides a high resistance to corrosion of the steel sheet.

It is defendants' position that claim construction will be dispositive of infringement; defendants, therefore, were given the opportunity to identify the two claim terms for which they sought construction, which terms "shall be the sole bases for any non-infringement assertions with respect to independent claim 1." (D.I. 68) The parties pursued discovery and exchanged constructions of the disputed terms.

Based on the above procedure, the court has limited the claim construction exercise to the following limitations: (1) "a hot-rolled steel sheet coated with an aluminum or aluminum alloy coating;" and (2) "the steel sheet has a very high mechanical resistance after thermal treatment."

III. STANDARD OF REVIEW

The meaning of a patent and the terms of art within its claims are questions of law exclusively for the court. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996). The claims of a patent define the invention to which the patentee has rights. *Philips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). Claim terms are generally construed in accordance with the ordinary and customary meaning they would have to one of ordinary skill in the art. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). "[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Philips*, 415 F.3d at 1313. In addition to considering the specification, the court considers the relevant prosecution history of an asserted patent. *Id.* at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the

inventor understood the invention and whether the inventor limited the invention in the course of the prosecution, making the claim scope narrower than it would otherwise be." *Id.*

"In the patent claim context, the term 'comprising' is well understood to mean 'including but not limited to.'" *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1319 (Fed. Cir. 2009) (citing *CIAS, Inc. v. Alliance Gaming Corp.*, 504 F.3d 1356, 1360 (Fed. Cir. 2007)). Its use as a transitional phrase[1] creates a "presumption that the body of the claim is open." *Crystal Semiconductor Corp. v. TriTech Microelectronics, Intern., Inc.*, 246 F.3d 1336, 1348 (Fed. Cir. 2001); *see also Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) ("'Comprising' is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.") and *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1271 (Fed. Cir. 1986) ("'Comprising' opens a method claim to the inclusion of additional steps, but does not affect the scope of the structure recited within the steps.").

The term "'[c]omprising,' while permitting additional elements not required by a claim, does not remove limitations that are present." *Power Mofset Techs., L.L.C. v. Siemens AG*, 378 F.3d 1396, 1409 (Fed. Cir. 2004). A patentee cannot recover a relinquishment in claim scope made during prosecution through an expansive application of "comprising." *See Board of Regents of the University of Texas System v.*

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[1]Where "comprising" is used in the body of the claim, rather than as a transition, it is interpreted according to the normal rules of claim construction. *See, e.g., Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1271 N.8 (Fed. Cir. 1986).

BENQ America Corp., 533 F.3d 1362, 1372-72 (Fed. Cir. 2008); *see also Dippin' Dots, Inc. v. Mosey*, 476 F.3d 1337, 1343 (Fed. Cir. 2007) ("'[C]omprising' is not a weasel word with which to abrogate claim limitations.") (citation omitted). Similarly, "[t]he signal 'comprising' does not render a claim anticipated by a device that contains less (rather than more) than what is claimed." *In re Skvorecz*, 580 F.3d 1262, 1267-68 (Fed. Cir. 2009).

During the claim construction exercise, it is imperative that the court keep in mind the purpose of claims, that is, to provide notice to the public of what a patent covers and does not cover. As jurors are told in virtually every patent trial, the claims are "word pictures" intended to define, in words, the boundaries of the invention described and illustrated in the patent.

IV. DISCUSSION

For purposes of this proceeding, the following facts are undisputed, as taken from plaintiffs' opening claim construction brief. (D.I. 126 at 1-2) All steel sheets are made by first subjecting a thick steel slab to a hot-rolling operation, which allows making a coil of steel sheet having a thickness that may be reduced to about 2 mm. If thinner steel sheets are desired, the hot-rolled steel sheet is further cold-rolled to obtain the desired thickness. Such steel sheets can either be uncoated or coated after rolling the sheet to the desired thickness.

The '805 patent is directed to a boron-containing steel sheet that is coated with aluminum prior to the sheet being formed into, for example, automobile parts. The chemical composition of the boron-containing steel sheet covered by the claims of the

'805 patent can be transformed into a much higher strength steel as a result of a high-temperature thermal treatment process known as "hot-stamping." The pre-applied aluminum-based coating protects the steel from the harmful effects of oxidation that otherwise occur as a result of the high temperature required for thermal treatment.

A. "Hot-Rolled Steel Sheet"

1. Claim language

The word "comprising" lies at the heart of the parties' dispute over the first claim limitation: "A hot-rolled coated steel sheet **comprising** a hot-rolled steel sheet coated with an aluminum or aluminum alloy coating." The specific question before the court is whether the term "comprising" broadens the meaning of "[a] hot-rolled coated steel sheet" to include cold-rolled steel sheets.

2. Specification

The specification includes references to both hot-rolled and cold-rolled steel sheet. In this regard, however, the applicants did **not** use the phrases "hot-rolled steel sheet," "cold-rolled steel sheet," and "sheet" interchangeably. For instance, the title of the patent is "Coated Hot- **and** Cold-Rolled Steel Sheet Comprising a Very High Resistance After Thermal Treatment." (emphasis added) The abstract likewise speaks to "[h]ot-rolled steel sheet which then can be cold-rolled." The applicants characterized the "subject" of the invention as "hot-rolled steel sheet, which then can be "cold-rolled." ('805 patent, col. 1:47-48; see also col. 1:6-7; col. 2:29-30) The "purpose" of the invention was described as "produc[ing] a hot- **or** cold-rolled steel sheet of a desired thickness, coated." (Col. 1:37-38) (emphasis added) While acknowledging that "sheet"

can be cold-rolled after it has been hot-rolled, the applicants used the word "sheet" (not "hot-rolled steel sheet") to describe steel sheet in general terms. (*See, e.g.*, col. 1:15; col. 2:22, 42, 46; col. 3:15, 20, 24, 35, 44, 49, 60; col. 4:7, 34, 41, 52) The applicants specifically recognized that "[t]he sheet according to the invention which derives, by reason of its processing, from a hot-rolling mill, possibly may be cold rerolled again depending on the final thickness desired." (Col. 2:37-40) Indeed, the only description of an actual thickness given in the patent ("the sheet having a thickness of approximately 1 mm," col. 4:8), according to plaintiffs, must be a cold-rolled sheet product.

3. Prosecution history

In its first iteration, claim 1 read (consistent with the specification) "[h]ot-rolled steel sheet which then may be cold-rolled, coated," and "having the following composition by weight," after which the quantities of each compound were enumerated. (D.I. 155 at JA-038) Claim 1 was rejected by the examiner (*Id.* at JA-066), who declared that "the phrase [hot-rolled steel sheet] 'which then may be cold-rolled, coated' is indefinite since it is unclear if the steel sheet is coated or if it is optionally coated. For examination purposes, the claim has been treated as meaning a coated, hot-rolled steel sheet which may be optionally cold-rolled." (*Id.* at JA-077)

In response, the applicants amended claim 1 to the language at issue, explaining that "[t]he rejection of the claims under 35 U.S.C. § 112, second paragraph is obviated by appropriate amendment." Specifically, the term "a coated steel sheet" was added, the reference to "which may be then cold-rolled" was deleted, "aluminum-based" was

replaced with "aluminum or aluminum alloy coating," and "comprising" was inserted in two places as follows: "A hot-rolled coated steel sheet **comprising** a hot-rolled steel sheet coated with an aluminum or aluminum alloy coating, wherein the steel in the sheet **comprises** the following composition by weight[.]" (*Id.* at JA-099) (emphasis added)

4. Extrinsic evidence

There is no dispute that, to a person of ordinary skill in the art in July 1998, "hot-rolled steel sheet would be understood to be a flat rolled steel sheet that has been reduced to its final thickness by hot rolling and is uncoated." (D.I. 159 at DA 510, 705-07, 793, 795) Therefore, although "[a]ll flat steel products have been hot-rolled" in the first instance (*Id.* at DA-689), "cold-rolled sheet" is understood to be steel sheet that is "further reduced by cold rolling and not coated." (*Id.* at DA-705) In general, then, in the steel-making art, "hot-rolled and cold-rolled are considered two different products" with different structures. (*Id.* at DA-510, 793)

5. Discussion

As an initial matter, the applicants did not simply claim "a steel sheet" having a particular composition; they claimed a "hot-rolled" sheet. The "hot-rolled" source limitation renders the claim a product-by-process claim. *See gen. Amgen Inc. v. Hoffman-LA Roche Ltd.*, 580 F.3d 1340, 1361 (Fed. Cir. 2009) (claims to a "pharmaceutical composition comprising a therapeutically effective amount of human erythropoietin . . . wherein said erythropoietin is purified from mammalian cells grown in culture" required analysis under product-by-process standards). Recently, the Federal

Circuit resolved a longstanding conflict in the law relating to the interpretation of product-by-process claims when it adopted en banc the rule originally set forth in *Atlantic Thermoplastics Co. v. Faytex Corp.*, 970 F.2d 834 (Fed. Cir. 1992). That is, process terms in product-by-process claims serve as limitations for purposes of determining infringement. *See Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282, 1293-95 (Fed. Cir. 2009) (overruling *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1583 (Fed. Cir. 1991) (holding that such claims are not limited by the process)).

As is so often the case in a claim construction exercise, the court must resolve the tension between the applicants' intent and the effectuation thereof created by their choice of language. Plaintiffs essentially seek to transform its product-by-process claim into a product claim to any steel sheet having the recited composition, regardless of the process by which it was forged. Plaintiffs justify this broad reading by stressing that "comprising" allows the inclusion of nondisclosed process steps. While "comprising" presumptively signals openness of a claim,[2] the breadth of the claim is not unlimited. The court declines to render the "hot-rolled" limitation superfluous in the manner plaintiffs urge.

Both the intrinsic and extrinsic records demonstrate that a hot-rolled steel sheet

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[2]The parties did not address the product-by-process nature of the claims. The court has not located Federal Circuit authority (following *Atlantic Thermoplastics* or, more recently, *Abbott*) declining to extend the presumption of openness following the use of "comprising" in the product-by-process context. At least one (pre-*Abbott*) case has held that product-by-process claims following the "comprising" transition may include additional, nonstated process steps. *See DeKalb Genetics Corp. v. Syngenta Seeds, Inc.*, Civ. No. 06-1191, 2007 WL 4564196, *13-14 (E.D. Mo. Dec. 21, 2007).

is a different product with a different structure than a cold-rolled steel sheet, and that the word "sheet" is used in the steel-making industry to connote both or either. Plaintiffs' expert, Dr. Robert H. Wagoner, confirmed through his declaration that "[a]ll cold-rolled steel sheets have been hot-rolled during their production, but only some hot-rolled sheets have also been cold-rolled." (D.I. 128 at ¶ 16) According to plaintiffs, cold-rolling is required for reducing the thickness of steel to less than 2 mm, as is increasingly demanded by, e.g., the automobile industry.

The applicants at bar did not claim a "sheet" having certain properties, or a method of producing a sheet having such properties comprising hot-rolling. Instead, they specifically claimed a sheet made by hot-rolling. The specification demonstrates that the applicants recognized that cold-rolling was an optional, additional step that could be applied to a hot-rolled steel sheet, yet cold-rolling was removed from claim 1, and never presented as a dependant claim.

Plaintiffs' proposed construction,[3] based on the word "comprising," broadens the scope of the claim to include an "additional transformation" (as described by one of the inventors, D.I. 159 at DA-792-93) resulting in a different steel with a different structure. Even if this structure falls within the enumerated weight percentages of components, it cannot be said that "hot-rolled steel sheet" is broad enough to encompass "any" steel sheet having those same characteristics.[4] Applicants had the ability to present their

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[3]"A steel sheet that has been hot-rolled during its production and coated with aluminum or aluminum alloy. To obtain the desired thickness, the hot-rolled steel sheet may be cold-rolled before coating." (D.I. 126 at 11)

[4]If the converse were true, the court would essentially be construing the product-by-process claim as a product claim in the manner advocated in *Scripps*.

claim in this manner, but did not. Plaintiff has a colorable argument that, by deleting "which may be then cold-rolled" and adding "comprising" by the same amendment, the applicants intended to achieve broad coverage. (D.I. 126 at 14-15) However, the inventors' "subjective intent is irrelevant to the issue of claim construction."[5] *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1338 (Fed. Cir. 2009).

For the foregoing reasons, the court declines to vitiate the "hot-rolled" limitation by construing the claims to encompass hot-rolling followed by cold-rolling. *See, gen., Jeneric/Pentron, Inc. v. Dillon Co., Inc.*, 205 F.3d 1377, 1382-83 (Fed. Cir. 2000) (rejecting patentee's efforts to expand a claimed range of 0-1% cerium oxide to encompass 1.61% cerium oxide in accused product by arguing that 1.61% was composed of two sub-percentages of cerium oxide accomplishing different functions); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1271 (Fed. Cir. 1986) (finding that using "comprising" to expand claim to a 2 x 2 x 2 puzzle to cover a 3 x 3 x 3 or 4 x 4 x 4 puzzle would vitiate limitation to "eight cube pieces as a composite cube"). Therefore, the court construes the limitation "hot-rolled steel sheet coated with an aluminum or aluminum alloy coating" to mean "a steel sheet that has been reduced to its final thickness by hot-rolling and coated with an aluminum or aluminum alloy coating."[6]

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[5]Plaintiff did not offer inventor testimony in this regard, perhaps in recognition of the foregoing. (D.I. 126 at 14)

[6]The court makes no finding with respect to infringement based upon its construction. The court is not aware of the details of defendants' processes. The court's construction does not necessarily preclude the possibility that defendants infringe by producing, by hot-rolling, a coated steel sheet having the claimed properties, regardless of subsequent processing steps and the ultimate characteristics of their final

B. "The Steel Sheet Has A Very High Mechanical Resistance"

1. Claim language

The "mechanical resistance" of the "steel sheet" in claim 1 is disclosed as being "very high" after thermal treatment. The parties agree that the claimed "mechanical resistance" refers to ultimate tensile strength of the steel sheet.

2. Specification

The invention is described in terms of "ensuring" that steel sheet having the disclosed composition by weight has a "very high mechanical resistance after thermal treatment." (Col. 1:61-62) Although the term "very high mechanical resistance" is not defined in the specification, the phrase "mechanical resistance" is discussed in multiple passages and modified in as many ways therein. First, the applicants describe the purpose of the invention as "**mak[ing] it possible to obtain** a mechanical resistance **in excess of 1000 MPa**." (Col.1:41-42) (emphasis added) Thereafter, the applicants explain that

> [t]he thermal treatment applied at the time of a hot-shaping process or after shaping **makes it possible to obtain high** mechanical characteristics which **may exceed 1500 MPa** for mechanical resistance. . . .

(Col. 2:50-53) (emphasis added) Elsewhere, the applicants state that, "[a]fter thermal treatment, **a substantial** mechanical resistance, which **may exceed 1500 MPa**, is obtained." (Col. 3: 52-54) (emphasis added) Finally, the applicants presented table 2 as providing examples of "**maximal** resistance of the steel sheet according to the

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products.

invention after thermal treatment," ranging from 1665 to 1695 MPa. (Col. 4:52-61) (emphasis added)

3. Prosecution history

In originally filed claim 1, the applicants recited "the sheet **ensuring** a very high mechanical resistance after thermal treatment." (D.I. 155 at JA-038) The applicants amended this limitation, changing it to "the steel sheet **has** a very high mechanical resistand after thermal treatment." (D.I. 155 at JA-101)

4. Extrinsic evidence

The term "very high mechanical resistance" is not a standard term in the steelmaking industry and does not have an ordinary meaning. Plaintiffs argue in this regard that, because having a "very high mechanical resistance" is simply a mechanical characteristic of the steel disclosed in claim 1, their proposed construction is correct, that is, "the steel sheet is **capable of obtaining**, as a result of thermal treatment, a very high mechanical resistance, i.e., an ultimate tensile strength in excess of 1000 MPa." (D.I. 126 at 15) (emphasis added) And, indeed, plaintiffs' expert has opined that any steel sheet meeting the compositional limits of claim 1 would be capable of achieving a mechanical resistance over 1000 MPa with a proper heat treatment.[7] (D.I. 159 at DA 719, 723-24)

The record indicates in this regard that the thermal treatment applied to a boron steel, the subject matter of the claimed invention, is a determining factor for its strength.

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[7]Plaintiffs further contend that "thermal treatment" should be construed to mean "heating the steel sheet to a temperature at which austenite is formed, followed by cooling." Defendants argue that "[t]hermal treatment refers in the art to controlled heating and cooling following the rolling of the sheet." (D.I. 125 at 16)

(D.I. 159 at DA-792) As the specification states, "The final mechanical characteristics are adjustable and depend on the carbon content of the steel and on the thermal treatment." (Col. 2:54-56) This is consistent with the testimony of inventor Jacques Devroc, who stated that it was the client who "carried out thermal treatment to obtain the mechanical characteristics that the client required." (D.I. 159 at DA-792)

5. Discussion

Claim 1 recites a broad range of steel compositions, with no guidance as to the range of thermal treatments that could be applied to each of said compositions. Indeed, the applicants recognized this variability, describing in the specification that the thermal treatment to be applied to the metal in the sheet is dictated by the composition and thickness of the casting sheet, and the "level of resistance to be achieved." (Col. 3:60 - col. 4:22) With no industry standard as to what a "very high" mechanical resistance is, and the undisputed record that a client is left to its own devices to determine what thermal treatment is required to obtain the desired level of resistance based on the particular composition and thickness of steel with which it is working, plaintiffs' suggestion that the limitation is simply describing a latent characteristic of the steel sheet disclosed in claim 1 fails to satisfy the public notice requirement of the claim.

Therefore, the court construes this limitation to mean that "the flat-rolled steel has been subjected, after rolling, to additional controlled heating and cooling and has an ultimate tensile strength of 1500 MPa or greater." This construction is consistent with the prosecution history, as it requires the steel sheet to actually have, as opposed to the capability of having, a certain tensile strength. Moreover, the court has

concluded that the words "very high" must be given meaning within the context of the specification, which describes as "high" and "substantial" MPa (the measure of mechanical resistance) "which may exceed 1500" and does not characterize at all the phrase "in excess of 1000 MPa."

V. CONCLUSION

For the reasons given above, the court adopts defendants' proposed constructions of the two limitations in dispute. An appropriate order shall issue.

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Plaintiffs,	)	
v.	)	Civ. No. 10-050-SLR
AK STEEL CORPORATION, SEVERSTAL DEARBORN, INC., and WHEELING-NISSHIN, INC.,	)	
Defendants.	)	

ORDER

At Wilmington this 16th day of December, 2010, consistent with the memorandum opinion issued this same date and with the tenets of claim construction set forth by the United States Court of Appeals for the Federal Circuit in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005);

IT IS ORDERED that the disputed claim language of the patent in suit, U.S. Patent No. 6,296,805 ("the '805 patent"), shall be construed as follows:[1]

1. "**Hot-rolled steel sheet**" means "a steel sheet that has been reduced to its final thickness by hot-rolling and coated with an aluminum or aluminum alloy coating.

2. "**The steel has a very high mechanical resistance**" means that the flat-rolled steel has been subjected, after rolling, to additional controlled heating and cooling

[1]To accomplish an expedited trial, the court limited the parties to two claim terms providing the bases for defendants' non-infringement assertions. (D.I. 68)

and has an ultimate tensile strength of 1500 MPa or greater.

United States District Judge