IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

MHL TEK, LLC	§	
	§	
Plaintiff,	§	
	§	
v.	§	CIVIL ACTION NO. 2:07-cv-289
	§	
NISSAN MOTOR CO., ET AL.,	§	
	§	
Defendants.	§	
	§	

MEMORANDUM OPINION AND ORDER

After considering the submissions and the arguments of counsel, the Court issues the following order concerning the claim construction issues:

I. Introduction

Plaintiff MHL TEK LLC ("MHL") filed the above entitled cause, cause number 2:07-cv-289, against various foreign car manufacturers on July 13, 2007. Defendants include Nissan Motor Co., Ltd., Nissan North America, Inc., Nissan Technical Center North America, Inc., Hyundai Motor Co., Hyundai Motor America, Hyundai Motor Manufacturing Alabama, LLC, Kia Motors Corporation, Kia Motors America, Inc., Dr. Ing. h.c. F. Porsche AG, Porsche Cars North America, Inc., BMW AG, BMW of North America, LLC, BMW Manufacturing Co., LLC, Isuzu Motors, Ltd., Isuzu Motors America, Inc., Subaru of America, Inc., Subaru of Indiana Automotive, Inc., (collectively, "defendants") and Volkswagen AG, Audi AG, and Volkswagen

Group of America, Inc. (collectively, "Volkswagen").[1]

In its complaint, MHL asserts claims of infringement of three different U.S. patents – the U.S. Patent No. 5,731,516 ("the '516 Patent"), U.S. Patent Nos. 5,663,496 ("the '496 patent") and 5,741,966 ("the '966 patent"). In an order dated March 31, 2009, the Court granted defendants' motion to dismiss plaintiff's allegations based on infringement of the '496 patent and the '966 patent. (Dkt. No. 269). The defendants have a pending motion to dismiss plaintiff's remaining claims of infringement of the '516 patent. (Dkt. No. 292).

II. Background of the Technology

The invention of the '516 patent relates to a tire pressure monitoring system ("TPMS") that claims to improve the performance and safety of vehicle tires. Plaintiff claims that the first prototype TPMS sensors developed were merely attached to the wheel and were incapable of transmitting a good quality signal from the tire to the receiver when the wheel was moving. This was due to a phenomenon known as Doppler frequency shifting, whereby signal quality deteriorates when the receiver is stationary, but the transmitter on the wheel is constantly rotating. The inventors of the '516 patent claim that they came up with the idea of using the wheel as an antenna for the TPMS sensor. MHL terms this as a pioneering breakthrough because the field of art as it existed in 1994 understood that RF signals should be kept away and insulated from large masses of metal.

Defendants, on the other hand, contend that in 1994, TPMS was a mature field of art. They point out that electronic tire pressure monitoring systems had been patented as early as

[1] Plaintiff MHL has filed a similar case involving the same three patents against various domestic car manufacturers. *See* Cause No. 2:08-cv-125.

1936. *See, e.g.*, United States Patent No. 2,037,016 (Patent titled "Indicating System for Pneumatic Tires," disclosing an invention that relates to an electrical system for indicating air pressure within a pneumatic tire). Defendants contend that in 1994, General Motors and Porsche had been selling vehicles equipped with TPMS sensors for over five years, and Schrader Electronics, a TPMS manufacturer, had publicly displayed a TPMS sensor that was identical to accused sensors used in defendants' auto products today.

The '516 patent issued from U.S. Patent Application 08/642,156 ("the '156 application"), which was a divisional application of U.S. Patent Applications 08/332,200 ("the '200 application") and 08/476,613 ("the '613 application"), and has an effective filing date of October 31, 1994. The defendants point out that the '516 patent is also currently subject to *ex parte* reexamination, in which all ten claims presently stand rejected.

The abstract of the '516 patent states:

> A pneumatic tire monitoring system is disclosed which provides a pressure sensor/transponder unit for each pneumatic tire of a vehicle to monitor tire pressure. A coded signal transmitted from each transponder unit is received by a multi-purpose receiver which may provide information to the vehicle operator or to other vehicle systems and subsystems. Each transponder unit is characterized by ultra low power consumption to extend the useful battery life. The transponder units may be mounted within the vehicle tires, or externally mounted. Impedance matching circuitry allows the use of the wheel rims with the transmitting antenna so as to avoid doppler shift induced by the rotating antenna and frequency drift induced by capacitive coupling.

'516 Patent, at Abstract.

Claim 1 is exemplary of the '516 patent as a whole and reads as follows:

> 1. Apparatus for monitoring inflation pressure of a pneumatic tire mounted on a conductive wheel, the apparatus comprising:
>
> a cylindraceous housing having a passage to allow air ingress and egress to and from the pneumatic tire, the housing including an elongate portion adapted for extension through an aperture of the wheel, the housing also including a

> conductive portion, the elongate portion being sized to allow the conductive portion of the housing to contact the conductive wheel to allow transmission of the signal using the conductive wheel;
>
> a pressure transducer disposed within the housing in fluid communication with the pneumatic tire for providing a signal indicative of the inflation pressure;
>
> an electronic circuit for monitoring the signal and conditioning the signal for transmission to a remote receiver; and
>
> a needle and spring disposed within one end of the elongate portion to selectively control inflation or deflation of the pneumatic tire.

'516 Patent at Cl. 1.

III. General Principles Governing Claim Construction

"A claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention." *Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed. Cir. 1999). Claim construction is an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

To ascertain the meaning of claims, the court looks to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. Under the patent law, the specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. A patent's claims must be read in view of the specification, of which they are a part. *Id.* For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id.* "One purpose for examining the specification is to determine if the patentee has limited the scope of the claims." *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir.

2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee's claims. Otherwise, there would be no need for claims. *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics*, 952 F.2d 1384, 1388 (Fed. Cir. 1992). And, although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994).

This court's claim construction decision must be informed by the Federal Circuit's decision in *Phillips v. AWH Corporation,* 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the court set forth several guideposts that courts should follow when construing claims. In particular, the court reiterated that "the *claims* of a patent define the invention to which the patentee is entitled the right to exclude." 415 F.3d at 1312 (emphasis added) (*quoting Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To that end, the words used in a claim are generally given their ordinary and customary meaning. *Id*. The ordinary and customary meaning of a claim term "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id*. at 1313. This principle of patent law flows naturally from the recognition that inventors are usually persons who are skilled in the field of the invention. The patent is addressed to and intended to be read by others skilled in the

particular art. *Id*.

The primacy of claim terms notwithstanding, *Phillips* made clear that "the 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." *Id*. Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of "a fully integrated written instrument." *Id*. at 1315 (*quoting Markman*, 52 F.3d at 978). Thus, the *Phillips* court emphasized the specification as being the primary basis for construing the claims. *Id*. at 1314-17. As the Supreme Court stated long ago, "in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims." *Bates v. Coe*, 98 U.S. 31, 38 (1878). In addressing the role of the specification, the *Phillips* court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998):

> Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

Consequently, *Phillips* emphasized the important role the specification plays in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. The prosecution history helps to demonstrate how the inventor and the PTO understood the patent. *Phillips*, 415 F.3d at 1317. Because the file history, however, "represents an ongoing

negotiation between the PTO and the applicant," it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id*. Nevertheless, the prosecution history is intrinsic evidence. That evidence is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims.

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* court condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), that a court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Id*. at 1319-24. The approach suggested by *Texas Digital*–the assignment of a limited role to the specification–was rejected as inconsistent with decisions holding the specification to be the best guide to the meaning of a disputed term. *Id*. at 1320-21. According to *Phillips*, reliance on dictionary definitions at the expense of the specification had the effect of "focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of the claim terms within the context of the patent." *Id*. at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id.* What is described in the claims flows from the statutory requirement imposed on the patentee to describe and particularly claim what he or she has invented. *Id*. The definitions found in dictionaries, however, often flow from the editors' objective of assembling all of the possible definitions for a word. *Id*. at 1321-22.

Phillips does not preclude all uses of dictionaries in claim construction proceedings.

Instead, the court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the court emphasized that claim construction issues are not resolved by any magic formula. The court did not impose any particular sequence of steps for a court to follow when it considers disputed claim language. *Id*. at 1323-25. Rather, *Phillips* held that a court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant.

IV. Agreed Constructions

Claim Language	**MHL's Proposed Construction**	**Defendants' Proposed Construction**	**VW's Proposed Construction**[2]
"in fluid communication with"	allowing any gas or liquid to flow between		
"a signal indicative of the inflation pressure"	a signal containing data representative of a value of inflation pressure		

V. Terms in Dispute

1. cylindraceous housing

Claim Language	**MHL's Proposed Construction**	**Defendants' Proposed Construction**	**VW's Proposed Construction**
"cylindraceous housing"	a housing including at least one portion that resembles a cylinder	a housing that is cylindrical in shape	a housing that resembles a right circular cylinder in shape, as shown in Figures 4–7 of the '516 patent
"the housing"	No construction necessary.	the cylindraceous housing	

The dispute that existed between the parties concerning the construction of

[2] Defendant Volkswagen has filed separate briefs on claim construction issues in this case. Although it is in agreement with defendants' proposed constructions on most of the dispute terms, it separately offers constructions

"cylindraceous housing" was whether the entire housing has to be of cylindrical shape.

In its briefs, the plaintiff had argued that the dictionary definition of the term is appropriate here, noting that the term "cylindraceous" is not defined in the specification or file history of the '516 patent. MHL cited to the Oxford English Dictionary which defines cylindraceous as "*of the form of or resembling a cylinder; cylindrical*." *See* Oxford English Dictionary (2d. ed. 1989). Based on this definition, MHL argued that the ordinary meaning of cylindraceous is not the same as cylindrical.[3] As such, MHL argued, the term "cylindraceous housing" only requires that a portion – not the entirety – of the housing be cylindrical.

Defendants' position is that plaintiff's proposed construction would in effect rewrite the claims to say that only a portion of the housing – no matter how small – has be cylindraceous, thereby completely reading the term "cylindraceous" out of the claim. Further, defendants contend that use of the word "resembles" in plaintiff's proposed constructions imports a degree of subjectivity into the claims that is inappropriate.[4]

At the hearing, the defendants devoted a portion of their argument to convince the Court that it would be appropriate to construe the term "cylindraceous" as being "generally cylindrical." The plaintiff, in rebuttal, indicated that it was in agreement with the defendants on this construction. Therefore, the Court rejects plaintiff's proposed construction that only a portion – any portion – of the housing needs to be cylindrical. It adopts the parties agreed

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on some of the terms.

[3] MHL points out that The Webster's Third New International Dictionary of the English Language Unabridged (1993) has a similar definition: "*somewhat like a cylinder*." MHL notes that the suffix *-aceous* means "*resembling*."

[4] With regard to this term, defendant Volkswagen separately argues that the housing resembles a "right circular cylinder" as shown in Figures 4–7 of the '516 patent. Volkswagen takes the position that the term should be limited to the embodiments disclosed in those figures.

construction that the term "cylindraceous" means "generally cylindrical." "Cylindraceous housing," therefore, means "a housing that is generally cylindrical in shape."

Although it agrees with the defendants that the antecedent basis of term "the housing" is "cylindraceous housing," MHL insists that "the housing" does not warrant any further construction by the Court. The Court clarifies that the term "the housing" refers to "the cylindraceous housing."

2. "contact" and "conductive" terms

Claim Language	MHL's Proposed Construction	Defendants' Proposed Construction	VW's Proposed Construction
"contact"	No construction necessary; alternatively, provide/providing a direct or indirect electrical connection to allow a signal to be conducted there through"	Touch	

The parties dispute the construction of various terms related to the conductive portion of the housing and the wheel, and the contact between the two. MHL argues that the term "contact" is a commonly used word in the electrical field and needs no construction. MHL contends that in the context of the '516 claim language and patent specification, "contact" merely refers to an electrical contact that allows a signal to be conducted from a conductive portion of the housing to the conductive wheel. MHL points to dependant claim 4 that recites a "conductive elastomeric seal" that is capable of providing an electrical path between the housing and the wheel. *See* '516 patent, cl. 4. Therefore, MHL argues, the claims strongly support the inclusion of indirect contact.

Defendants also cite to the claim language in response. Claims 1, 7 and 10 recite the "elongate portion being sized to allow . . . contact the conductive wheel to allow transmission of the signal using the conductive wheel." *See, e.g., id.* at cl. 1. Defendants argue that if the applicants intended to claim an indirect electrical connection that did not require "touching," the size of the elongate portion would be irrelevant. Defendants further argue that dependent claim 4 does not require an elastomeric seal to be "squeezed between" the housing and the conductive wheel. To the contrary, they contend that Figure 7 shows that the seal does not need to come between the two or prevent the housing from directly touching the wheel. Defendants direct the Court to the dictionary definition of "contact" to generally mean "touching." *See, e.g.*, THE AMERICAN HERITAGE COLLEGE DICTIONARY, 299–300 (3d ed. 1993) ("contact" means "[a] coming together or touching, as of objects or surfaces"); THE NEW SHORTER OXFORD ENGLISH DICTIONARY, Vol. 1, 491 (1993) (defining "contact" as "[t]he state or condition of touching; an instance of touching").

Volkswagen argues that the description of various structures in the specification disclosed by the applicants as establishing electrical conductivity implies direct metal-to-metal contact between housing and wheel. For example, Volkswagen points to the patentee's disclosure of a "whisker connector 172" in Figure 4 to provide electrical conductivity between housing and the wheel rim in one. *See id.* at Fig. 4, col. 10, ll. 14–18. Moreover, Volkswagen argues, the applicants have used the term "contact" synonymously with a direct contact throughout the specification. *See, e.g.*, *id.*, col. 9, ll. 59–61; col. 8, ll. 53–55.

The Court is not persuaded by the defendants' arguments. The Court agrees that in absence of any conflicting disclosure in the specification, the ordinary meaning of the term

"contact" would be "touching." *See TurboCare Div. of Demag Delaval Turbomach. Corp. v. General Electric Co.*, 264 F.3d 1111, 1124 (Fed. Cir. 2001) (construing the ordinary meaning of the term "contact" as "touching"). However, the Court finds that the inventors here clearly anticipated and disclosed the use of a seal that would "prevent air within the tire from escaping." A person of ordinary skill in the art would indeed appreciate the need for a seal between the housing and the wheel. Similarly, the use of a protective coating on a metal wheel designed to guard against road conditions would not be novel to such a person. Further, the Court finds that the manner in which the housing contacts the wheel is not an essential element of the invention. As both sides argue, the focus of the invention is to be able to use the wheel as an antenna for transmission of the tire pressure signal. *Cf. On Demand Machine v. Ingram Indus.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006) (holding that the focus of a patent guides the determination of the scope of the invention claimed). The Court finds it unnecessary, therefore, to limit the manner in which a contact may be made between the housing and the wheel. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (stating that claims are to be given their broadest meaning unless there is a clear disclaimer or disavowal).

The Court defines "contact" as "touching, either directly, or through a conductive seal."

Claim Language	**MHL's Proposed Construction**	**Defendants' Proposed Construction**	**VW's Proposed Construction**
"conductive"	"allowing direct and/or alternating current to pass"	This term should not be construed in isolation. (but in context of terms below)	
"conductive wheel"	No construction necessary, except for the term "conductive"	a wheel that allows a current of electricity to pass continuously along it	a wheel consisting of an electrically conductive material, such as aluminum or the like

"conductive portion of the housing" / "conductive portion"	No construction necessary, except for the term "conductive"	portion of the cylindraceous housing that allows a current of electricity to pass continuously along it	a portion of the housing consisting of an electrically conductive material, such as aluminum or the like

With regard to the various "conductive" terms, plaintiff contends that the only term that the Court needs to construe is the very term "conductive." Defendants, on the other hand, contend that the term "conductive" should not be construed in isolation. Instead they propose constructions for "conductive wheel" and "conductive portion of the housing."

Plaintiff argues that because the '516 patent invention is directed to a high frequency RF-based TPMS, alternating current ("AC") conductive paths must be included in the term "conductive" or "conductive wheel." Where the specification uses "electrical conductivity," MHL argues that a person with ordinary skill in the art would understand this term to include both direct and alternating current. MHL argues that the inventors disclosed and anticipated AC current flow from the sensor to the wheel that acts as an antenna. The plaintiff argues that the specification makes multiple references to "impedance" and "impedance matching," which would only be relevant to an AC conductive contact.[5] Therefore, MHL argues that even plastic that may be considered a good insulator can be the dielectric material of a capacitor, thereby being "conductive" of the high frequency current envisioned by the invention of the '516 patent.

[5] Plaintiff points out that the '516 patent specification discloses an "impedance matching" circuit that compensates for undesired extraneous capacitive coupling effects due to, for example, the wheel standing in water. '516 Patent, col. 12, ll. 56-65. MHL contends that unless there was a capacitive contact between the sensor and the wheel, there would be no reason to compensate for undesired extraneous capacitive coupling effects. Both an impedance matching circuit and a capacitive coupling are only relevant to alternating current – in this case the high frequency RF signal that is to be transmitted from the sensor.

Defendants argue that it is the "housing" and the "wheel" that are "conductors."[6] According to the defendants, MHL's construction makes every material a conductor because every material allows alternating current to pass to some degree. Defendants insist that plastic is non-conductive, and the mere potential to be used as a dielectric in a capacitor does not make a material "conductive."

Volkswagen separately argues that the Court should adopt the understanding of the term "conductive" and "non-conductive" as disclosed by the specification. '516 patent, col. 10, ll. 12–14 ("Preferably, housing 154 is made of a lightweight, electrically conductive material, such as aluminum or the like."); *see also id.*, col. 9, ll. 54–57 ("Non-conductive cap 122 includes a non-conductive spacer 130 made of a suitable material, such as plastic"). Volkswagen further points to various technical dictionary definitions of the term "conductive" as being a "material that offers a low resistance to the passage of electric current."

The Court finds plaintiff's argument persuasive with regard to conduction of high frequency AC signals in the patented invention. There is clear support in the specification that the inventor intended both the use of alternating current being conducted to the wheel and a elastomeric seal being used in the path of the current.[7] Further, the Court is not convinced that a construction that allows both DC[8] and AC[9] to pass would necessarily read out the term

[6] Defendants note that the IEEE dictionary defines "conductor" as "a substance or body that allows a current of electricity to pass continuously along it." *See* THE IEEE STANDARD DICTIONARY OF ELECTRICAL AND ELECTRONICS TERMS 176 (3d ed. 1984).

[7] Further, plaintiff has presented the Court with engineering drawings done by the inventors at the time of the invention. *See* Plaintiff's Reply, Keane Decl., Ex. E. The drawings confirm the inventors' understanding, at the time of the invention, that the patented system anticipated a capacitor element, Cx, introduced by "Paint, Primer, Anodize, etc." along the path of the A/C signal being transmitted to the receiver. *Id*. These figures, however, were not disclosed as part of the patent application and are, therefore, not a part of the intrinsic evidence that Court relies upon in coming to its construction.

[8] By defendants' own proposed construction, the term "conductive" allows direct current to pass.

"conductive" from the claim.[10] *See Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so."). Further, given that the disclosed embodiment uses an alternating current, the Court finds no need to mandate that "conductive" be required to conduct direct current as well. *See Intel Corp. v. U.S. Int'l. Trade Com'n*, 946 F.2d 821, 836 (Fed. Cir. 1991) ("Where a specification does not require a limitation, that limitation should not be read from the specification into the claims." quoting *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987 (Fed. Cir. 1988)).

The Court, therefore, defines the term "conductive" as "capable of allowing a direct current or an alternating current of electricity to pass through it."

The terms "conductive wheel," "conductive portion of the housing," and "conductive portion" may be defined based on the construction of the term "conductive."

Claim Language	**MHL's Proposed Construction**	**Defendants' Proposed Construction**	**VW's Proposed Construction**
"conductive elastomeric seal"	No construction necessary, except for the term "conductive," which is construed above.	This claim term is indefinite.	Indefinite; alternatively, "a seal consisting of a rubberlike silicone (or plastic) material in which suspended metal particles conduct electricity"

The defendants argue that the term "conductive elastomeric seal" is indefinite because an "elastomeric seal" is a rubber, which cannot be conductive. Defendants contend that the

[9] The Court appreciates the fact that a dielectric used in a capacitor may not in itself be a conductor of either type of electric current. However, it is undisputed that the path between the sensor and the wheel has to allow an alternating current to "pass" for the patented invention to work as disclosed. Therefore, the term "conductive" has to be inclusive of allowing AC to "pass."

[10] For instance, Volkswagen proposes a construction for "conductive" as a "material, such as aluminum or

resistance of elastomeric materials can vary enormously depending on attributes such as the compression forces applied to them.[11] The defendants argue that the '516 patent does not provide any standard for measuring the degree of conductivity and is, therefore, indefinite under Federal Circuit law. *See Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1372 (Fed. Cir. 2008); *see also Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255–56 (Fed. Cir. 2008) (finding the term "fragile gel" indefinite because it was ambiguous as to the requisite degree of the fragileness of the gel and failed to place any limit on the scope of what was invented beyond the prior art).

Plaintiff argues that a person with ordinary skill in the art would understand that an elastomeric seal is conductive if, as recited in the claim itself, it "provide[s] an electrical path." '516 patent, cl. 7, 10. Plaintiff contends that the claim is not so "insolubly ambiguous" that one skilled in the art cannot practice the invention because he or she cannot "understand the bounds of the claim when read in light of the specification." *See Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001) (claims are indefinite "only if reasonable efforts at claim construction prove futile"). Indeed, as Volkswagen points out, a claim construction of this term is possible if the Court looks to extrinsic evidence to find some structural guidance. The McGraw-Hill Dictionary of Scientific and Technical Terms defines "conductive elastomer" as "a rubberlike silicone material in which suspended metal particles conduct electricity."

The Court does not find this term to be indefinite. Firstly, the Court finds that "the components of the term have well-recognized meanings, which allow the reader to infer the

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the like." Ordinarily, aluminum would conduct both types of current.

[11] Defendants cite to an unrelated patent on conductivity of certain classes of elastomers. *See* U.S. Patent

meaning of the entire phrase with reasonable confidence." *Bancorp Services, L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1374 (Fed. Cir. 2004). Moreover, a person of ordinary skill in the art of the patent would understand how much conductivity a rubber seal would need in order to "provide an electrical path" for signals such as those being transmitted from the sensor. '516 patent, col. 11, ll. 35–37. The embodiments disclosed in the specification detail the circuits that may be used to generate the signal that needs to be transmitted. Similarly, the use of a wheel as an antenna helps identify frequencies that may be used to transmit the signal. Additionally, the use of the elastomeric seal as a seal that would effectively prevent air from escaping from the tire indicates the amount of pressure or compression forces that the seal would be subjected to. Given this detail, a skilled person would easily understand the characteristics of the current that would need to be conducted through the seal, and would thereby understand the metes and bounds of the claim. *See Exxon Research*, 265 F.3d at 1375 ("If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds."); *Miles Labs., Inc. v. Shandon Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993) (refusing to find a claim indefinite where "the patent disclosed adequate information to enable a skilled artisan to make and use the claimed invention").

Based on the extrinsic evidence forwarded by the defendants, the Court construes the term to mean "a seal consisting of a rubberlike silicone (or plastic) material which is conductive."

No. 3,806,471.

Claim Language	MHL's Proposed Construction	Defendants' Proposed Construction	VW's Proposed Construction
"transmission of the signal using the conductive wheel"	No construction necessary, except for the term "conductive." Alternatively, "the wheel rim to act as an antenna by transmitting, as an electromagnetic wave, a signal containing data representative of a value of inflation pressure"	the wheel rim to act as the antenna by transmitting the signal representing the air pressure in the tire as an electromagnetic wave	the wheel rim to act as the (only) antenna by transmitting the signal representing the air pressure in the tire as an electromagnetic wave

The parties also dispute the construction of the terms "transmission of the signal using the conductive wheel" or "transmission of the signal using the conductive wheel as an antenna." Defendants argue that the claim language supports their proposed construction. According to the defendants, "transmission of the signal using the conductive wheel" requires the use of the conductive wheel to transmit the signal indicative of the pressure in the tire.[12] '516 patent, cl. 1. Further, defendants argue, the specification states that "[a]n objective of the present invention is to provide a wheel rim as an antenna to communicate between a centrally located processing unit [a]nd remotely located vehicle tire sensing units." '516 patent, at 4:8–13. There is no alternate embodiment of an antenna disclosed in the specification.[13] Furthermore, defendants argue that the prosecution history restricts the patentee to a limited scope. The examiner agreed to allow claim 1, distinguishing the use of the wheel as an antenna from prior art that used separate antennae devices. *See* Feb. 19, 1997 Office Action in '516 Patent Prosecution History, at 4.

[12] Defendants also point out that recently, MHL filed an amendment in the presently pending reexamination of the '516 Patent clarifying the meaning of this very term "to mean that the wheel is being used as an antenna." *See* Response to March 12, 2009 Office Action in Ex Parte Reexamination of '516 Patent, at 12 (adding the phrase "as an antenna" to claims 1 and 7).

[13] Defendants point out that the '516 patent criticizes the use of other types of antennae. *See, e.g.*, '516

Defendants note that the applicants subsequently agreed to amend all claims to incorporate the limitation highlighted by the examiner.[14] *See* June 18, 1997 Amendment in '516 Patent Prosecution History, at 5.

MHL argues that nothing in the prosecution history or the specification constitutes an express disclaimer of the use of additional antennas that may be fastened to the wheel. The Court agrees. In light of the applicants' express criticism of the antennae used in the prior art and a persuasive prosecution history that emphasizes the use of the wheel as an antenna in this invention, the Court restricts the scope of the claims to require that the wheel be used as an antenna. However, the Court is not persuaded by defendants' arguments that a system that uses anything in addition to the wheel as an antenna would be beyond the scope of the claims. The Court does not read the presented prosecution history and the inventors' criticism of the prior art as requiring such a limitation. When read in context, the inventors did not criticize just any rotating antenna but rather criticized an antenna that is subjected to a "doppler frequency shift" because it is "not oriented with its center of mass along the axis of rotation of the vehicle tire." '516 patent, col. 2, ll. 25-30. The Court refuses to find that adding a second antenna to the patented system would escape the scope of the patent claims. *See Paragon Solutions, LLC v. Timex Corp.*, 566 F.3d 1075, 1088-89 (Fed. Cir. 2009) (finding that where an exercise monitoring system patent criticized prior art as not providing an "instantaneous" feedback in the specification and the prosecution history, it did not completely precluded all types of delays from being construed into the claim terms).

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patent, col. 2, ll. 25–32.

[14] Defendants also contend that the applicants also had to limit the scope of the claims in a parent

The Court, therefore, construes this term as: "the wheel rim to act as an antenna by transmitting, as an electromagnetic wave, a signal containing data representative of a value of inflation pressure."[15]

3. antenna

Claim Language	MHL's Proposed Construction	Defendants' Proposed Construction	VW's Proposed Construction
"antenna"	No construction necessary.	that part of a transmitting or receiving system that is designed to radiate or to receive electromagnetic waves	

Plaintiff argues that the term "antenna" does not need any construction. If the Court were to adopt defendants' construction, MHL argues that the Court exclude the word "designed" from the construction. Plaintiff argues that the invention uses the wheel already available in the vehicle, not one that was specially designed or intended by automakers to function as an antenna. The defendants argue that the word "designed" includes within the construction the fact that the system is configured to use the wheel as an antenna. The Court fails to read defendants' proposed construction as reflecting the intended meaning. The Court, therefore, construes "antenna" as "that part of a transmitting or receiving system that radiates or receives electromagnetic waves."

4. conditioning the signal for transmission to a remote receiver

Claim Language	MHL's Proposed Construction	Defendants' Proposed Construction	VW's Proposed Construction
"conditioning the	converting the signal into	converting the signal indicative of the	

application of the '516 patent to require the use of the conductive wheel as the antenna.

[15] The parties have agreed that the related term "a signal indicative of the inflation pressure" means "a signal containing data representative of a value of inflation pressure."

signal for transmission to a remote receiver"	a radio frequency (RF) format to be transmitted to a remote receiver	inflation pressure into a form that is suitable for transmission to a remote receiver

The parties agree that the phrase "conditioning the signal for transmission to a remote receiver" means "converting the signal . . . for transmission to a remote receiver." The dispute is over whether a conversion into a radio frequency (RF) "format" is necessary.

Plaintiff argues that the specification discloses transmission of tire pressure data by radio waves and contemplates use of an RF signal. *See* '516 patent, Figs. 10a-10c; col. 2, ll. 64-67; col. 13, ll. 26-56 (discussing various aspects of the invention related to RF transmissions). Further, plaintiff points out, the specification discloses an communication protocol utilizing pulse width modulation (PWM). *See id.* at col. 15:33-61. Therefore, plaintiff argues, the invention disclosed in the '516 patent is directed solely to a RF-based TPMS.

The defendants argue that MHL's attempt to read a limitation into the claims should be rejected. They note that the phrase "a radio frequency (RF) format" does not even appear in the specification. Defendants argue that the specification discloses several embodiments for "conditioning the signal for transmission to a remote receiver" and, therefore, this term is entitled to a broader scope. *See* '516 patent, col. 9, ll. 2–5, ll. 25–31; col. 12, ll. 38–65; col. 15, ll. 17–20, 33–61.

It is clear from the specification that the invention is based on the use of RF signals alone. Each of the embodiments disclosed makes use of a RF signal for transmission. Given that the focus of the invention is to be able to use the wheel of the vehicle as an antenna, the Court finds that converting the signal into an RF one is an essential component of the invention. The Court

construes this term as follows: "converting the signal into a radio frequency (RF) signal to be transmitted to a remote receiver."

VI. Conclusion

The court adopts the constructions set forth in this opinion for the disputed terms of the patents. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the court.

SIGNED this 28th day of August, 2009.

T. JOHN WARD
UNITED STATES DISTRICT JUDGE