IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

THE DOW CHEMICAL COMPANY,	:	
	:	
Plaintiff,	:	
	:	
v.	:	
	:	Civil Action No. 05-737-JJF
NOVA CHEMICALS CORPORATION (CANADA), and NOVA CHEMICALS INC. (Delaware),	:	
	:	
Defendants.	:	

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MEMORANDUM OPINION

June 25, 2009
Wilmington, Delaware

Joseph J. Farnan Jr.

Farnan, District Judge

This is a patent infringement case brought by The Dow Chemical Company ("Dow") against NOVA Chemicals Corporation (Canada) and NOVA Chemicals, Inc. (Delaware) (collectively, "NOVA") alleging infringement of United States Patent Nos. 5,847,053 ("the '053 patent") and 6,111,023 ("the '023 patent"), which pertain to specific ethylene/α-olefin blends comprising (1) at least one homogeneously branched ethylene/α-olefin interpolymer and (2) a heterogeneously branched ethylene/α-olefin interpolymer. ('053 patent at 1:25-35.) The parties briefed their respective positions on claim construction, and the Court conducted a Markman hearing on the disputed terms. This Memorandum Opinion provides constructions for five of the six disputed terms.

BACKGROUND

The patents-in-suit relate "to compositions comprising specific ethylene/α-olefin polymer blends." ('053 patent at 1:25-27.) In particular, the patents pertain to polymer blends comprising an "(A)" component consisting of at least one "homogeneously branched" ethylene/α-olefin interpolymer and a "(B)" component consisting of at least one "heterogeneously branched" ethylene polymer. According to the specification, the combination of these two types of polymers results in a composition having "synergistically enhanced physical

properties," including both high tensile strength and high impact strength. (Id. at 1:38-2:5.)

DISCUSSION

I. The Legal Principles of Claim Construction

Claim construction is a question of law. Markman v. Westview Instruments, Inc., 52 F.3d 967, 977-78 (Fed. Cir. 1995), aff'd, 517 U.S. 370, 388-90, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996). When construing the claims of a patent, a court considers the literal language of the claim, the patent specification and the prosecution history. Markman, 52 F.3d at 979. Of these sources, the specification is "always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term." Phillips v. AWH Corporation, 415 F.3d 1303, 1312-17 (Fed. Cir. 2005)(quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)). However, "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'" Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906 (Fed. Cir. 2004)(quoting Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1327 (Fed. Cir. 2002)).

A court may consider extrinsic evidence, including expert and inventor testimony, dictionaries, and learned treatises, in order to assist it in understanding the underlying technology, the meaning of terms to one skilled in the art and how the invention works. Phillips, 415 F.3d at 1318-19; Markman, 52 F.3d at 979-80. However, extrinsic evidence is considered less reliable and less useful in claim construction than the patent and its prosecution history. Phillips, 415 F.3d at 1318-19 (discussing "flaws" inherent in extrinsic evidence and noting that extrinsic evidence "is unlikely to result in a reliable interpretation of a patent claim scope unless considered in the context of intrinsic evidence").

In addition to these fundamental claim construction principles, a court should also interpret the language in a claim by applying the ordinary and accustomed meaning of the words in the claim. Envirotech Corp. v. Al George, Inc., 730 F.2d 753, 759 (Fed. Cir. 1984). If the patent inventor clearly supplies a different meaning, however, then the claim should be interpreted according to the meaning supplied by the inventor. Markman, 52 F.3d at 980 (noting that patentee is free to be his own lexicographer, but emphasizing that any special definitions given to words must be clearly set forth in patent). If possible, claims should be construed to uphold validity. In re Yamamoto, 740 F.2d 1569, 1571 (Fed. Cir. 1984).

II. The Meaning of the Disputed Terms

Dow asserts that NOVA infringes all 16 claims of the '053 patent and all 16 claims of the '023 patent. The following is an illustrative independent claim from the '053 patent, with the disputed terms emphasized:

> 1. A film made from an ethylene polymer composition, wherein the composition **comprises** (A) from about 10 percent (by weight of the total composition) to about 95 percent (by weight of the total composition) of at least one **homogeneously branched linear ethylene/α-olefin interpolymer** having:
>
> (i) a density from about 0.89 grams/cubic centimeter (g/cm^3) to about 0.935 g/cm^3,
>
> (ii) a molecular weight distribution (Mw /Mn) from about 1.8 to about 2.8,
>
> (iii) a melt index (I2) from about 0.001 grams/10 minutes (g/10 min) to about 10 g/10 min,
>
> (iv) no high density fraction,
>
> (v) a single melting peak as measured using differential scanning calorimetry, and
>
> (vi) a **slope of strain hardening coefficient greater than or equal to 1.3**; and
>
> (B) from about 5 percent (by weight of the total composition) to about 90 percent (by weight of the total composition) of at least one **heterogeneously branched linear ethylene polymer** having a density from about 0.93 g/cm^3 to about 0.965 g/cm^3.

('053 patent at 15:31-54.) The following is an illustrative independent claim from the '023 patent, again with the disputed terms emphasized:

> 1. An ethylene polymer composition comprising
>
> (A) from about 10 percent (by weight of the total composition) to about 95 percent (by weight of the total composition) of **at least one ethylene interpolymer** having:
>
> (i) a density from about 0.89 grams/cubic centimeter (g/cm^3) to about 0.935 g/cm^3,

(ii) a melt index (I2) from about 0.001 grams/10 minutes (g/10 min.) to about 10 g/10 min.,

(iii) a **slope of strain hardening coefficient greater than or equal to 1.3**, and

(iv) a Composition Distribution Branch Index (CDBI) greater than 50 percent; and

(B) from about 5 percent (by weight of the total composition) to about 90 percent (by weight of the total composition) of at least one **ethylene polymer** characterized as having a density from about 0.93 g/cm^3 to about 0.965 g/cm^3 and **comprising a linear polymer fraction**, as determined using a temperature rising elution fractionation (TREF) technique.

('023 patent at 15:59-16:39.) Both the claims of the '053 patent and '023 patent are directed to polymer compositions consisting of at least two polymers, an "(A)" polymer and a "(B)" polymer. The claims of the two patents differ with respect to the physical properties used to describe the "(A)" and "(B)" components of the polymer blend.

The claim construction dispute that the parties emphasize the most concerns the definition of one such physical property. Specifically, according to NOVA, the claim term "slope of strain hardening coefficient of greater than or equal to 1.3" is indefinite because the specification fails to both adequately specify the units for the "slope of strain hardening coefficient" and set forth a method for measuring this physical parameter. In these circumstances, NOVA contends that one of skill in the art, upon reading the specification, would be unable to determine whether an accused polymer composition falls within the scope of the claims.

A second key claim construction dispute between the parties pertains to the meaning of the well-known transitional phrase "comprising." NOVA contends that, in this case, the term "comprising" requires a special construction to guard against a possible attempt by Dow to creatively read its claims onto non-infringing products. Briefly, NOVA contends that Dow may attempt to artificially decompose indivisible components of non-infringing products into fictitious sub-components, one or more of which Dow would then characterize as meeting a claim limitation while the remaining components Dow would characterize as mere additional elements allowed under the "comprising" transitional phrase.

The remaining claim construction disputes between the parties are typical, generally relating to disagreements over the interplay between the claim language on one side, and the specification and prosecution history on the other. For the reasons that follow, the Court construes the disputed terms as follows.

A. "Slope Of Strain Hardening Coefficient Of Greater Than Or Equal To 1.3"

Dow's Construction	NOVA's Construction
The slope of strain hardening multiplied by the melt index raised to the 0.25 power must be greater than or equal to 1.3.	This claim term is indefinite.

The dispute between the parties has two parts. Not only do the parties dispute whether this claim term is indefinite, but the parties dispute the law and procedure that the Court should apply in addressing the indefiniteness dispute.

1. The Law And Procedure For Addressing Indefiniteness

Dow contends that indefiniteness cases fall into two categories: those that raise issues of fact and those that do not.[1] (See D.I. 197 at 2-5.) Along these lines, Dow notes that the Federal Circuit has confirmed that fact issues can indeed permeate an inquiry into indefiniteness. Specifically, the Federal Circuit recently explained as follows:

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[1] The latter category of cases, Dow contends, break down into two general sub-classes. First, there are cases where the intrinsic evidence demonstrates the definiteness of the claims. In these cases, no amount of extrinsic evidence can be used to "inject ambiguity where none exists." (See id. at 3 (citing Personalized Media Communications, LLC v. ITC, 161 F.3d 696, 706 (Fed. Cir. 1998)).) Second, there are cases "where an irreconcilable contradiction exists within the patent itself." (D.I. 197 at 3.) Presumably, Dow contends that in these cases, the intrinsic evidence demonstrates the indefiniteness of the claims conclusively, and no amount of extrinsic evidence can rescue the claims.

> A determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims. To the extent there are any factual findings upon which a trial court's indefiniteness conclusion depends, they must be proven by the challenger by clear and convincing evidence.

Tech. Licensing Corp. v. Videotek, Inc., 545 F.3d 1316, 1338 (Fed. Cir. 2008) (internal citations omitted).

Though acknowledging that "the determination of indefiniteness is ultimately a question of law," (D.I. 197 at 2), Dow further contends that "the Federal Circuit treats indefiniteness differently from claim construction." (D.I. 214 at 3.) Most importantly, Dow contends that Federal Circuit precedent calls for any fact issues surrounding indefiniteness to be submitted to the jury. (See D.I. 197 at 2, 6 (citing BJ Services Co. v. Halliburton Energy Services, Inc., 338 F.3d 1368, 1372 (Fed. Cir. 2003) ("Like enablement, definiteness, too, is amenable to resolution by the jury where the issues are factual in nature.")).) Furthermore, Dow takes the position that the trier of fact should consider the evidence pertaining to indefiniteness "as a whole." (D.I. 214 at 2.) Thus, Dow appears to be of the view that in considering indefiniteness, the Court should not necessarily adopt a preference for the intrinsic evidence over the extrinsic evidence, as is normally done during the claim construction process. See Phillips v. AWH, 415 F.3d 1303, 1317 (Fed. Cir. 2005).

NOVA responds, first and foremost, that "claim construction [is] a purely legal issue," which the Federal Circuit reviews de novo "including any allegedly fact-based questions relating to claim construction." Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1447, 1451, 1454-56 (Fed. Cir. 1998). NOVA further notes the long-standing and often-repeated principle that "[a] determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." Personalized Media Communs., L.L.C. v. ITC, 161 F.3d 696, 706 (Fed. Cir. 1998). In other words, NOVA emphasizes the link between claim construction and indefiniteness, arguing that to the extent the Federal Circuit admits the existence of fact issues underlying indefiniteness, they should be handled by the Court within the context of the claim construction process. Thus, NOVA does not envision a role for the jury when it comes to indefiniteness. Likewise, NOVA maintains that the Court should evaluate evidence pertaining to indefiniteness in accordance with Supreme Court and Federal Circuit authority on claim construction. See generally Markman v. Westview Instruments, Inc., 52 F.3d 967, 981 (Fed. Cir. 1995); Phillips, 415 F.3d at 1303. Accordingly, NOVA contends that in deciding indefiniteness the Court has the "authority to wholly dismiss . . . extrinsic evidence," such as expert witness

testimony, in favor of more reliable intrinsic evidence. (See D.I. 204, Exh. 1 at 2-3, 6.)

On reviewing the authority on this topic, the Court concludes, first, that it is indeed authorized, where appropriate, to address indefiniteness within the context of claim construction using the machinery normally used to handle claim construction. See Praxair, Inc. v. ATMI, Inc., 543 F.3d 1306, 1319 (Fed. Cir. 2008) ("Indefiniteness is a matter of claim construction, and the same principles that generally govern claim construction are applicable to determining whether allegedly indefinite claim language is subject to construction."); Datamize, LLC v. Plumtree Software, Inc., 417 F.3d 1342, 1348 (Fed. Cir. 2005) ("In the face of an allegation of indefiniteness, general principles of claim construction apply."). Furthermore, the Court should perhaps even endeavor to adopt this route when possible. See, e.g., Enzo Life Scis., Inc. v. Digene Corp., 305 F. Supp. 2d 406, 408 (D. Del. 2004) ("The claims at issue do not have technical or relational terms that may be understood differently by one of ordinary skill in the art. Instead, Digene's arguments of indefiniteness involve allegations of internal contradiction based upon the wording of the claims. Thus, as the construer of patent claims, the Court may reach the merits of the indefiniteness question.").

Nevertheless, the Court understands the authority on this issue as allowing, in appropriate circumstances, for the submission an indefiniteness dispute to the jury. Indeed, the Federal Circuit's statement in BJ Services that "definiteness . . . is amenable to resolution by a jury" has not, to the Court's knowledge, been explicitly overruled. BJ Services, 338 F.3d at 1372-73. Likewise, the Federal Circuit's recent statement in Technology Licensing admitting the potentiality for fact questions in an indefiniteness inquiry cannot, in the Court's view, be easily squared with the rigid view advanced by NOVA that the Court must always address indefiniteness within the context of claim construction as a pure legal issue. See Technology Licensing, 545 F.3d at 1316. Along these lines, thr Court noted long ago that "[t]he Federal Circuit has repeatedly stated that indefiniteness is a legal question, and, at the same time, held that in certain circumstances, 'evidence beyond the claims and written description may be reviewed.' Derived from such statements is an inherent tension as to the appropriateness of resolving indefiniteness questions as a matter of law." Enzo,305 F. Supp. 2d at 408 (quoting Solomon v. Kimberly-Clark Corp., 216 F.3d 1372, 1379 n.4 (Fed. Cir. 2000)).

In fact, numerous other district courts have acknowledged that an indefiniteness inquiry cannot always be strictly equated with or incorporated into the claim construction inquiry. In the

Court's view, the most notable district court opinion on this issue is the Southern District of New York's opinion in System Mgmt. Arts, Inc. v. Avesta Techs., Inc., 137 F. Supp. 2d 382, 399-400 (S.D.N.Y. 2001). There, the Southern District of New York noted conflicting expert testimony in denying a motion for summary judgment on indefiniteness. In so doing, the Court explained as follows:

> [W]hile the Federal Circuit has often stated that the indefiniteness inquiry is "drawn from" the district court's role as a construer of patent claims, see, e.g., Personalized Media, 161 F.3d at 705, the circuit court has not expressly held that these inquiries are one and the same, nor that the indefiniteness inquiry can not involve underlying questions of fact. Moreover, to state that the indefiniteness inquiry is a question of law or "legal conclusion," id., does not answer the question. The Federal Circuit has recognized that some questions of law involve underlying issues of fact. See Union Pacific Res. Co. v. Chesapeake Energy Corp., 236 F.3d 684, 57 U.S.P.Q.2D (BNA) 1293, 1296 (Fed. Cir. 2001) (patent enablement is "question of law" but "as is often true of legal questions . . . the ultimate legal conclusion of enablement rests on factual underpinnings . . . .").
>
> The reasoning of those courts holding that the indefiniteness inquiry may involve underlying issues of fact is persuasive. Indeed, to hold otherwise would seem to mask the actual role being played by the district court.

System Mgmt., 137 F. Supp. at 400. Numerous district courts - both before and after System Mgmt. - appear to have followed this or similar reasoning. See, e.g., A.K. Stamping Co. v. Instrument Specialties Co., 106 F. Supp. 2d 627, 644-45 (D.N.J. 2000) (denying a motion for summary judgment of indefiniteness when a

"trier of fact" could conclude based on "the testimony of three engineers" that the claims were not indefinite); TC Mfg. Co. v. Polyguard Prods., Inc., No. 06 C 8392, 1999 U.S. Dist. LEXIS 14730 (N.D. Ill. Sept. 14, 1999) (denying a motion for summary judgment of indefiniteness where there was "support in the record presented for the dispute of a material fact" and concluding that the "issue must await for a resolution at trial where the facts can be evaluated and found . . . ."); Hako-Med USA, Inc. v. Axiom Worldwide, Inc., No. 8:06-cv-1790, 2008 U.S. Dist. LEXIS 64953, at *6 (M.D. Fla. July 29, 2008)(affirming a magistrate judge's recommendation denying summary judgment of indefiniteness where the magistrate was unable to determine indefiniteness as a matter of law because questions of fact remained); Presidio Components, Inc. v. Am. Tech. Ceramics Corp., No. 08-cv-355, 2008 U.S. Dist. LEXIS 65149, at *9 (S.D. Cal. Aug. 22, 2008) ("As several district courts have observed, however, while the Federal Circuit has described the indefiniteness inquiry as a question of law, where evidence beyond the claims and written description may be reviewed, factual issues are likely to arise.").

In light of the above persuasive authority, the Court concludes that the law on indefiniteness is not as rigid as NOVA contends. Although it may generally behoove the Court to address indefiniteness as a legal matter in the context of claim construction, there may arise cases where genuine issues of fact

simply preclude such a treatment. In these circumstances, the question of indefiniteness must be addressed by the trier of fact.

2. Decision

The slope of strain hardening coefficient ("SHC") is calculated as follows:

$$SHC=(slope\ of\ strain\ hardening)\,(I_2)^{0.25}$$

where I_2 is the melt index in grams/10 minutes. ('053 patent at 6:45-50.) NOVA raises two arguments in support of the position that the claim term "slope of strain hardening coefficient of greater than or equal to 1.3" is indefinite. First, NOVA contends that this claim term is indefinite because the units for the slope of strain hardening are indeterminable, thus making it impossible to determine the proper units for SHC. Second, NOVA contends that the claim term is indefinite because neither the claims nor specification adequately set forth the methodology for determining the slope of strain hardening. The Court will address each of these arguments in turn.

As to the issue of units, the Court notes that the specification includes a section directed specifically to the determination of the slope of strain hardening coefficient. See '053 patent at 6:8-43. This passage describes the preparation of the test sample to be used in determining the slope of strain hardening strictly in units of pounds and inches. See, e.g.,

'053 patent at 6:13-15 ("The plaque is . . . then pressed under pressure of about 200 psi."); id. at 6:6:17-18 ("The test piece is 0.315 inches wide and 1.063 inches long."). Based on this, Dow contends, one of skill in the art could determine that the slope of strain hardening is also to be determined using English units (i.e, pounds and inches). In support of this position, Dow submits the declaration of its expert witness, Dr. Benjamin S. Hsiao. (See D.I. 149 ¶ 13.) The specification further explains that the actual test for determining the slope of strain hardening should be done using an Instron Tensile Tester at a "crosshead speed of 1 inch/minute." See '053 patent at 6:25-26. Describing the test parameters for determining the slope of strain hardening in units of inches, Dow contends that this further confirms that the slope of strain hardening should also be understood as being in English units. (See D.I. 148 at 13; D.I. 149 ¶ 13.)

In addition, Dow contends that an understanding of English units for the strain hardening coefficient would follow from the patent's explicit reference to the use of an Instron testing instrument because this instrument operates by default in terms of "US Customary" units, which, like English units, use inches for length and pounds for force. (D.I. 148 at 13.) The parties have each submitted copies of manuals for the Instron instrument, and, on reviewing the manual submitted by NOVA, the Court

concludes that Dow's argument regarding the Instron instrument has some force. Indeed, although the Instron manual explains that the instrument may be operated using multiple unit systems, the manual explains that "the raw data file is stored in US Customary units." (D.I. 205, Exh. AL at 10-3.) Likewise, when referring to the display of raw data, the manual notes for emphasis that "[s]ince all raw data is stored in US Customary units, all displayed data is in US Customary units also (i.e., lbs., in., etc.)." (Id. at 11-2.) In addition, the Instron manual appears to explicitly confirm that US Customary units are the default units, instructing that a particular menu option "allows you to edit the raw data in either SI, Metric, or Mixed units instead of the default US Customary units." (Id. at 11-13 (emphasis added).) Thus, in the Court's view, one of skill in the art could easily conclude that the native units used in connection with the Instron device are pounds and inches and that the slope of strain hardening should thus be computed in such units. This conclusion is made all the more likely by the fact, noted above, that the patent describes the test to determine the slope of strain hardening in terms of English units. In light of this evidence - and the presumption of validity afforded issued patents - the Court is unable to conclude, as a matter of law, that the claims of the '053 and '023 patents are invalid as

indefinite for failure to adequately specify the units for the slope of strain hardening.

With regard to the methodology for determining the "slope of strain hardening," the Court again looks to the specification, which explains as follows:

> The slope of strain hardening is calculated from the resulting tensile curve by drawing a line parallel to the strain hardening region of the resulting stress/strain curve. The strain hardening region occurs after the sample has pulled its initial load ((i.e., stress) usually with little or no elongation during the initial load) and after the sample has gone through a slight drawing stage (usually with little or no increase in load, but with increasing elongation (i.e., strain)). In the strain hardening region, the load and the elongation of the sample both continue to increase. The load increases in the strain hardening region at a much lower rate than during the initial load region and the elongation also increase, again at a rate lower than that experienced in the drawing region. FIG. 1 shows the various stages of the stress/strain curve used to calculate the slope of strain hardening. The slope of the parallel line in the strain hardening region is then determined.

'053 patent at 6:27-43. NOVA contends that the above description is fatally deficient. First, NOVA contends that the passage fails to adequately explain how to draw a "line parallel to the strain hardening region" because the "strain hardening region" can, rather than being linear, actually be curved. (See D.I. 129, Exh. G ¶¶ 14-15 (NOVA's expert, Dr. Charles Stanley Speed, opines on the curvature of the strain hardening region).) In these circumstances, NOVA contends, there are multiple methods of drawing a line that may be regarded as being "parallel" to the

curved "strain hardening region." (Id.) For instance, NOVA contends that one could draw a line "having the greatest slope in the strain hardening region" or, as another option, a 10% secant line, which corresponds to the "line between the failure or break point and the point at 10 percent extension back from the break point." (Id.) To the extent the patentee intended to set forth a single, definitive manner for drawing the line parallel to the strain hardening region, NOVA contends that this was to be in "FIG. 1" of the patent, but that this Figure is missing from the patent, a fact that Dow does not dispute. (See D.I. 141 at 2.) Given this uncertainty as to how the slope of strain hardening should be determined, NOVA contends that the claims must now be held indefinite as a matter of law.

The Court does not agree. Although, a figure is indeed missing from the specification, the text describing how to draw the line parallel to the strain hardening region is rather detailed. Indeed, the passage first instructs that the line should be drawn "parallel" to the strain hardening "region." Based on this guidance, one of skill in the art would be dissuaded from drawing secant lines or tangents that are not substantially parallel to the true strain hardening "region." As to how one of skill in the art could identify the true strain hardening region, the specification includes numerous details. To wit, the specification explains that the strain hardening

region is the region where (1) the sample has pulled its initial load, (2) the sample has already gone through a slight drawing stage, (3) the load and elongation both continue to increase, (4) the load increases at a much lower rate than during the initial load region, and (5) the elongation also increases at a rate lower than experienced in the drawing region. See '053 patent at 6:25-44. NOVA's expert, Dr. Hsiao, explains that based on this description one of skill in the art would be able to identify this strain hardening region as a true linear "region" that occurs after the slope of the tensile curve stops arcing upwards but before it possibly begins to decrease again. (See D.I. 149 at 30-31.) To the extent the tensile curve begins to decrease after the true strain hardening region, Dr. Hsiao explains that one of skill in the art would not confuse this with the strain hardening region, but would instead attribute this to either a rupture of the sample or slippage of the sample in the test apparatus. (Id.) On reviewing NOVA's claim construction briefing and the supporting declaration of its expert, Dr. Speed, the Court concludes that NOVA has not effectively refuted this understanding of how one of skill in the art would identify the strain hardening region. Accordingly, the Court declines to find the claims indefinite as a matter of law.

However, the Court also cannot, at this stage, eliminate the possibility that the claims will ultimately be found indefinite.

Indeed, the patent's failure to explicitly set forth the units for the slope of strain hardening coefficient and include a figure exemplifying the manner for computing the slope of strain hardening is, in the Court's view, troubling. And NOVA has presented a wide range of compelling evidence and arguments that, in light of this, one of skill in the art would be unable to determine the proper scope of this claim limitation. As just one example, NOVA has elicited testimony from numerous Dow engineers who, after reviewing the patents-in-suit, expressed an inability to calculate the slope of strain hardening. (See, e.g., D.I. 142, Exh. Q at 153:19-154:3; id., Exh. R at 161:7-162:16.) A named inventor on the patents-in-suit was even unable to explain how to carry out this calculation after reviewing the relevant portions of the specification. (See D.I. 130, Exh. I at 209-212 (excerpts of deposition transcript of inventor Pak-Wing Steve Chum).) In these circumstances, a trier of fact would, in the Court's view, be entitled to conclude that the claims are indefinite.

Accordingly, the Court shall construe the term "slope of strain hardening coefficient of greater than or equal to 1.3" to mean, as Dow contends, "the slope of strain hardening multiplied by the melt index raised to the 0.25 power must be greater than or equal to 1.3." However, although the Court has provided a construction for this term, NOVA may still present its

indefiniteness theory to the jury. Halliburton Energy Services, Inc. v M-I LLC, 514 F.3d 1244, 1251 (Fed. Cir. 2008) ("[E]ven if a claim term's definition can be reduced to words, the claim is still indefinite if a person of ordinary skill in the art cannot translate the definition into meaningfully precise claim scope.").

B. "Comprising (A) . . . And (B)"

Dow's Construction	NOVA's Construction
A composition that includes at least A and B but may also include additional, unnamed elements.	Composition must contain the recited "homogenously branched linear ethylene/α-olefin interpolymer" (A) and the recited "heterogeneously branched linear ethylene polymer" (B). Composition may include other components. However, all "homogenously branched linear ethylene/α-olefin interpolymer(s)" must satisfy the requirements of element (A) and all "heterogeneously branched linear ethylene polymer(s)" must satisfy the requirement of element (B).

"'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." Genentech, Inc. v. Chiron Corp., 112 F.3d 495, 501 (Fed. Cir. 1997); see also Kustom Signals, Inc. v. Applied Concepts, Inc., 264 F.3d 1326, 1332 (Fed. Cir. 2001) ("The open-ended transition 'comprising' does not free the claim from its own

limitations."). As this Court recently explained, see Glaxo Group, Ltd. v. Teva Pharms. USA, Inc., No. 07-713-JJF, 2009 U.S. Dist. LEXIS 37494, at *3-*5 (D. Del. Apr. 30, 2009), because the term "comprising" is a term of art in patent law, the Court is unwilling to adopt a specialized definition for this term absent some evidence in the internal record suggesting that such a definition is appropriate. The Court finds no such evidence. Accordingly, for the term "comprising," the Court will adopt a standard jury instruction, such as the one prepared by the American Institute of Intellectual Property ("AIPLA"),[2] or, alternatively, a standard instruction of similar ilk that the parties find agreeable.

NOVA's argument on this claim term is, in the Court's view, a premature request for the Court to address an infringement issue within the context of claim construction. Indeed, the principle case relied upon by NOVA, Jeneric/Pentron, Inc. v. Dillon Co., 205 F.3d 1377, 1382 (Fed. Cir. 2000), was not directly addressing the construction of "comprising," but whether an accused product might infringe under a proper understanding of

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[2] The AIPLA instruction for infringement of "comprising" claims explains that the "word 'comprising' means including the following but not excluding others" and instructs the jury that "the fact that [the Defendant]'s [[product][method]] might include additional [[components][method steps]] would not avoid literal infringement . . . ." AIPLA's Model Patent Jury Instructions 15 (2008), http://www.aipla.org/Content/ContentGroups/Publications1/Publications_available_for_viewing1/2008_03_27_AIPLA_Model_Jury_Instructions.pdf

the term "comprising." In Jeneric/Pentron, the asserted claim was directed to a porcelain composition "comprising," among other things, 0-1% CeO_2. Id. at 1379. The accused product, however, contained 1.61% CeO_2. Attempting to establish infringement, the patentee argued that the CeO_2 in the accused product should be broken down into two "functional" components: (1) a portion including 0.92% of the CeO_2 that served as an "antigreening agent" and that met the relevant claim limitation, and (2) a second portion including the remaining 0.69% of the CeO_2 that served as an "opacifying or fluroescing" agent and that was merely an additional allowed component under the "comprising" transitional phrase. Id. at 1382. The Federal Circuit rejected this argument, explaining that the claim "does not place functional limitations on the percentage of cerium oxide" and that an attempt to "carve out" a portion of the cerium oxide for the purpose of establishing infringement would read out the expressly claimed cerium oxide ranges. Id. at 1383.

NOVA warns the Court that Dow may take the same tack as the plaintiff in Jeneric/Pentron. As an example, NOVA notes that the claim calls for the "homogeneously branched linear ethylene/α-olefin interpolymer" to have, among other things, a density of about 0.89 g/cm^3 to about 0.935 g/cm^3. NOVA theorizes that under Dow's proposed construction, Dow could fractionate a non-infringing interpolymer having a density of 0.94 g/cm^3 into a

first component having a density of 0.92 g/cm^3, which would meet the claim limitation, and a second component having a density of 0.96 g/cm^3, which Dow would then characterize as simply an extra component allowed under the "comprising" transitional phrase. (See D.I. 141 at 8-9.) In these circumstances, NOVA contends, Dow would be reading out the express claim limitation regarding polymer density.

To the extent Dow's infringement theory is merely an attempt to artificially decompose a single polymer component into sham sub-components, Jeneric/Pentron may well be precisely on point such that summary judgment of non-infringement would be warranted. However, the claimed polymer compositions comprise "at least one homogeneously branched linear ethylene/α-olefin interpolymer" and "at least one heterogeneously branched linear ethylene polymer." Thus, the claims appear to explicitly contemplate the possibility of multiple unique polymer components. To the extent the accused products include genuinely unique polymer components in addition to the two specifically claimed polymer components, the presence of those additional components would not preclude a finding of infringement given the transitional phrase "comprising." Whether the accused products contain such additional components, however, is a question that the Court is simply not capable of addressing on the current factual record and, more importantly, one that is simply not

appropriately addressed by the Court during claim construction. Accordingly, the Court will not adopt NOVA's prophylactic claim construction designed to guard against Dow's alleged - yet presently unrealized - intention of reading out claim limitations.

C. "Homogeneously Branched Linear Ethylene/α-Olefin Interpolymer"

Dow's Construction	NOVA's Construction
"Homogeneously branched" means a polymer in which the comonomer is randomly distributed within a given interpolymer molecule and wherein substantially all of the interpolymer molecules have the same ethylene/comonomer ratio within that interpolymer. "Linear ethylene/α-olefin interpolymer" means an interpolymer that does not have long chain branching.	Ethylene α-olefin interpolymer in which the comonomer is randomly distributed within a given interpolymer molecule and wherein substantially all of the interpolymer molecules have the same ethylene/comonomer ratio within that interpolymer. Such interpolymer has a CDBI greater than about 30 percent and no long chain branching. Such interpolymer is not substantially linear as defined in the patent.

To a large degree the parties agree on the construction of this claim term. However, the parties still dispute two aspects of the construction of this term. First, the parties dispute whether this claim term should be construed to require that the interpolymer have a comonomer distribution branching index ("CDBI") of greater than about 30 percent (NOVA's position) or not (Dow's position). Second, the parties dispute whether the Court's construction should clarify that the "homogeneously

branched linear ethylene/α-olefin interpolymers" are not "substantially linear as defined in the patent" (NOVA's position) or not (Dow's position).

As to whether this claim term should be understood in terms of a numerical CDBI range, the Court concludes that supplemental briefing is required. The Court notes that the agreed upon portion of the construction calls for, among other things, "substantially all of the interpolymer molecules [to] have the same ethylene/comonomer ratio within that interpolymer." Calling for "substantially all" interpolymer molecules in a sample containing an extraordinarily large number of molecules to have "the same" ethylene comonomer ratio, this limitation appears to be rather stringent. Of course, whether this is truly stringent can only be evaluated within the context of the relevant art and the specification of the '053 patent. However, on looking to the specification for additional guidance in this regard, the Court remains unsatisfied. Indeed, the specification explains that the claimed homogeneous polymers can have a CDBI as low as 30%. ('053 patent at 3:48-52.) The specification clarifies that the CDBI is the "weight percent of the polymer molecules having a comonomer content within 50 percent of the median total molar comonomer content." Thus, by weight, 70% of the interpolymer molecules in a homogeneously branched interpolymer may apparently have an ethylene/comonomer ratio outside a range within 50% of

the median molar comonomer content. The Court is uncertain as to whether this can be fairly squared with a requirement that "substantially all" interpolymer molecules have "the same" ethylene/comonomer ratio. Thus, on this issue, the Court requests that the parties provide clarification. In so doing, the parties may wish to provide numerical examples to illustrate the relevant concepts as they apply to exemplary homogeneously and heterogeneously branched interpolymers.

In addition, insofar as the parties' proposed constructions rely on the phrase "within that interpolymer," the Court finds these constructions to be somewhat unclear. Accordingly, the Court further requests the parties clarify what they intend to mean by this phrase.

With respect to whether the Court's construction of this term should include the clarification that the "homogeneously branched linear ethylene/α-olefin interpolymers" are "not substantially linear as defined in the patent," the Court concludes that such a clarification is unnecessary. The Court is unpersuaded that this clarification would add anything material over the parties' already lengthy proposed constructions. The specification explains that "[t]he homogeneously branched ethylene/α-olefin interpolymer is preferably a homogeneously branched substantially linear ethylene/α-olefin interpolymer as described in U.S. Ser. No. 08/776,130 now U.S. Pat. No.

5,272,236." U.S. Patent No. 5,272,236, in turn, explains as follows:

> The term "substantially linear" polymers means that the polymer backbone is either unsubstituted or substituted with up to 3 long chain branches/1000 carbons. Preferred polymers are substituted with about 0.01 long chain branches/1000 carbons to about 3 long chain branches/1000 carbons, more preferably from about 0.01 long chain branches/1000 carbons to about 1 long chain branches/1000 carbons, and especially from about 0.3 long chain branches/1000 carbons to about 1 long chain branches/1000 carbons.
> no doubt different

(U.S. Patent No. 5,272,236 at 3:48-57.) Thus, "substantially linear" polymers may have a maximum of three long chain branches. However, the parties have already agreed that the term "homogeneously branched linear ethylene/α-olefin interpolymers" should be construed to have no long chain branching whatsoever. In these circumstances, the Court sees no reason to include a phrase clarifying that such polymers also cannot have more than three long chain branches.

D. "Heterogeneously Branched Linear Ethylene Polymer"

Dow's Construction	NOVA's Construction
A polymer having a distribution of branching different from and broader than the homogeneously branched ethylene/α-olefin.	Ethylene polymer having a distribution of branching different from and broader than the homogeneously branched ethylene/α-olefin, including having a highly branched portion, a medium branched portion and an essentially linear portion.

Though the parties are in partial agreement as to the meaning of the term "heterogeneously branched linear ethylene polymer," NOVA contends that the term should be understood to further require a distribution of polymers having three distinct portions: "a highly branched portion, a medium branched portion and an essentially linear portion." As principle support for this limitation, NOVA points to the following passage in the specification of the '053 patent:

> Heterogeneously branched ethylene/a-olefin interpolymers differ from the homogeneously branched ethylene/a-olefin interpolymers primarily in their branching distribution. For example, heterogeneously branched LLDPE [linear low density polyethylene] polymers have a distribution of branching, including a highly branched portion (similar to a very low density polyethylene), a medium branched portion (similar to a medium branched polyethylene) and an essentially linear portion (similar to linear homopolymer polyethylene). The amount of each of these fractions varies depending upon the whole polymer properties desired. For example, linear homopolymer polyethylene has neither branched nor highly branched fractions, but is linear. A very low density heterogeneous polyethylene having a density from about 0.9 g/cm 3 to about 0.915 g/cm 3 (such as Attane® copolymers, sold by The Dow Chemical Company and Flexomer® sold by Union Carbide

> Corporation) has a higher percentage of the highly short chain branched fraction, thus lowering the density of the whole polymer.

('053 patent at 7:33-51 (emphasis added); D.I. 127 at 18-19.)

NOVA further notes that in describing "heterogeneously branched ethylene polymers" the specification explains, with reference to examples, that "[t]he amount of each of these [three] fractions varies depending upon the whole polymer properties desired." ('053 patent at 7:41-43.) Based on this, NOVA contends that "the specification actually makes clear that what differs among heterogeneously branched polymers is not whether or not they contain these three components. It's just the relative proportions of these three components." (D.I. 194 at 119:7-12.)

Dow responds that NOVA's relied upon passage refers only to an exemplary "heterogeneously branched linear ethylene polymer" – specifically, linear low density polyethylene ("LLDPE"). Indeed, Dow notes that in describing the three polymer fractions present in LLDPE it explicitly introduces LLDPE as an "example" of a "heterogeneously branched linear ethylene polymer." Dow further notes that the specification nowhere states that all types of "heterogeneously branched linear ethylene polymers" must have all three types of branched polymers. In fact, Dow contends, the '053 patent claims polymer compositions including a range of "heterogeneously branched linear ethylene polymers." High density polyethylene ("HDPE"), for example, though possibly

including a medium branched polymer fraction and an essentially linear polymer fraction, does not necessarily include a highly branched portion, but is nevertheless still a "heterogeneously branched linear ethylene polymer."

The Court does not import mere examples from the specification into the claims. See Phillips v. AWH Corp., 415 F.3d 1303, 1323 (Fed. Cir. 2005). In addition, "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'" Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906 (Fed. Cir. 2004)(quoting Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1327 (Fed. Cir. 2002)). The Court agrees with Dow that when the specification refers to the three polymer fractions in LLDPE, it is merely describing an exemplary embodiment of one component of the invention. Indeed, as set forth above, LLDPE is explicitly introduced as an "example." Furthermore, on reviewing the specification, the Court is unable to identify any "clear intention" to limit this claim term to only a polymer having three distinct portions with different branching properties. Accordingly, the Court will construe the term "heterogeneously branched linear ethylene polymer," to mean, as Dow contends, "a

polymer having a distribution of branching different from and broader than the homogeneously branched ethylene/α-olefin."

E. "At Least One Ethylene Interpolymer"

Dow's Construction	NOVA's Construction
A polymer made from ethylene and at least one other comonomer.	At least one substantially linear ethylene polymer prepared from a catalyst with constrained geometry about the metal atom as described in U.S. Patent No. 5,272,236

This claim term appears only in the '023 patent and is used to refer to the "(A)" component of the claimed polymer blends. The dispute between the parties is essentially whether this claim term should be limited to "substantially linear" ethylene polymers (NOVA's position) or not (Dow's position).[3] NOVA contends that the prosecution history of the '023 patent confirms that this claim term should be so limited. However, "[i]n order to disavow claim scope during prosecution a patent applicant must clearly and unambiguously express surrender of subject matter."

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[3] NOVA's construction also includes the requirement that this term refer to a polymer prepared from a "catalyst with constrained geometry about the metal atom." However, NOVA's briefing includes little, if any, discussion of this "catalyst" requirement. In fact, NOVA appears to equate this "catalyst" requirement with the limitation that the polymer be "substantially linear." (See D.I. 141 at 19 ("NOVA proposes that the claim term 'at least one ethylene interpolymer' be construed to be limited to a 'substantially linear ethylene polymer,' i.e., a 'polymer prepared from a catalyst with constrained geometry about the metal atom as described in U.S. Patent No. 5,272,236.'").) Accordingly, the Court understands NOVA as taking the position that the "substantially linear" requirement is interchangeable with the "catalyst" requirement.

See Voda v. Cordis Corp., 536 F.3d 1311, 1321 (Fed. Cir. 2008)(citations omitted). Furthermore, "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." Phillips, 415 F.3d at 1317. Accordingly, this Court is cautious in narrowing the scope of claims based on the prosecution history. As set forth below, in the Court's view, NOVA has not identified anything in the prosecution history justifying its proposed construction.

First, NOVA notes that during prosecution of the '023 patent, Dow stated that an amendment to the specification was made "to more distinctly set forth that the present invention [was] directed to substantially linear ethylene polymers," a limitation that was expressly present in all the original claims. (D.I. 141 at 18 (emphasis added) (citing D.I. 128, Exh. F at F-053).) However, after making this statement, Dow canceled the original claims in favor of new claims that did not include the "substantially linear" limitation. (See D.I. 128, Exh. F at F-074 to F-077.) The examiner thereafter acknowledged that the new claims, which are at issue in this case, were not limited to "substantially linear" ethylene polymers but were instead "generic in scope." (Id. at F-091.) In these circumstances, the Court cannot conclude that Dow's early statement during

prosecution regarding the scope of the invention is effective to limit the scope of the issued claims.

Second, NOVA points to a declaration that Dow submitted in support of patentability (the "Markovich Declaration") in which Dow allegedly referred to two polymer blends made from substantially linear ethylene polymers as "Inventive Examples" and another polymer blend made from something other than substantially linear ethylene polymers as a mere "Comparative Example." (Id. at 18-19.) Having characterized the polymer blends with substantially linear ethylene polymers as "inventive," NOVA contends that Dow demonstrated an intent to limit claim scope. However, the Court has reviewed the Markovich declaration, and, in the Court's view, Dow was distinguishing the "Inventive Examples" largely on the basis of performance properties, such as slope of strain hardening coefficient, and not on the basis of the presence of a "substantially linear" polymer. (See D.I. 129, Exh. F at F-079.) Furthermore, it appears that the so-called "Comparative Example" referred to in the Markovich declaration was 38.14% "substantially linear" polymer, a percentage nearly identical to the two so-called "Inventive Examples." (Id. at F-081 to F-082.) Thus, the Court cannot conclude that Dow was using the Markovich Declaration to describe "inventive" blends as including a "substantially linear" polymer.

Finally, NOVA contends that "[i]n his statement of his Reasons for Allowance, the Examiner indicated his understanding that the claims were directed to blends made from 'substantially linear' ethylene polymers," and that Dow failed to respond to this statement. (Id. at 19.) However, although such statements by the examiner are perhaps relevant to claim construction, "an applicant's silence regarding statements made by the examiner during prosecution, without more, cannot amount to a 'clear and unmistakable disavowal' of claim scope." Salazar v. Procter & Gamble Co., 414 F.3d 1342, 1345 (Fed. Cir. 2005). Furthermore, on reviewing the examiner's Reasons For Allowance, which the Court finds somewhat unclear, the Court concludes that the examiner was, as Dow contends, simply withdrawing an incorrect inherency rejection. In particular, the examiner's rejection appears to have been based on a misunderstanding that a particular prior art reference disclosed polymer blends made using the same processes used to prepare the polymer blends disclosed in the patent. To the extent the examiner unilaterally distinguished the claimed polymer blends from the prior art, it appears to have been on the basis of an exemplary catalyst used to prepare one component of the polymer blends, which yielded "polyolfeins[sic] with different properties" from those in prior art polymer blends. (See D.I. 129, Exh. F at F-163.) However, the Court sees no evidence that either the examiner - or patentee

- understood the claims as being limited to polymer blends prepared using only a single particular catalyst. The Court is thus unpersuaded that the Examiner's Reasons for Allowance establish a clear and unmistakable disavowal of claim scope.

Having concluded that the prosecution history does not support NOVA's proposed construction, the Court turns to Dow's proposed construction. Dow notes that the '023 patent expressly defines the term "interpolymer" as follows:

> The term 'interpolymer' is used herein to indicate a copolymer, or a terpolymer, or the like. That is, at least one other comonomer is polymerized with ethylene to make the interpolymer. Ethylene copolymerized with two or more comonomers can also be used to make the homogeneously branched substantially linear interpolymers useful in this invention. Preferred comonomers include the C 3 -C 20 a-olefins, especially propene, isobutylene, 1-butene, 1-hexene, 4-methyl-1-pentene, 1-heptene, 1-octene, 1-nonene, and 1-decene, more preferably 1-butene, 1-hexene, 4-methyl-1-pentene and 1-octene.

'023 patent at 4:1-12 (emphasis added). The Court concludes that this intrinsic evidence adequately supports Dow's proposed construction. Accordingly, the Court will construe the term "at least one ethylene interpolymer" to mean, as Dow contends, "at least one polymer made from ethylene and at least one other comonomer."

F. "Ethylene Polymer . . . Comprising A Linear Polymer Fraction"

Dow's Construction	NOVA's Construction
Ethylene polymer means a polymer made from ethylene. A linear polymer fraction is a fraction that is neither highly branched nor medium branched.	A heterogeneously branched ethylene polymer containing a polymer fraction that is neither branched nor highly branched but is linear.

This claim term appears only in the '023 patent and is used to refer to the "(B)" component of the claimed polymer blends. The disputes between the parties are (1) whether the phrase "ethylene polymer" should be limited to heterogeneously branched polymers (NOVA's position) or not (Dow's position) and (2) whether the phrase "linear polymer fraction" permits some small amount of branching (Dow's position) or not (NOVA's position).

As to the first dispute, NOVA contends that the "SUMMARY OF THE INVENTION" portion of the specification describes the overall invention as including two components: a homogeneously branched polymer and a heterogeneously branched polymer. (See D.I. 127 at 2 (citing '023 patent at 2:25-67.) According to NOVA, the specification then consistently describes the invention itself as including these two specific components, failing to set forth an embodiment in which the second component is a generic ethylene polymer rather than a heterogeneously branched polymer. Indeed, NOVA notes that the specification even includes a section specifically entitled "THE HETEROGENEOUSLY BRANCHED ETHYLENE

POLYMER." (Id. at 24-25.) There, the specification explains that "[t]he ethylene polymer to be combined with the homogeneous ethylene/α-olefin interpolymer is a heterogeneously branched (e.g., Ziegler polymerized) interpolymer of ethylene . . . ." ('023 patent at 8:14-18.) The Court further notes that the Abstract explains generally that "[t]he ethylene polymer compositions have at least one homogeneously branched substantially linear ethylene/α-olefin interpolymer and at least one heterogeneously branched ethylene polymer." (Id. at Abstract.) Likewise, the "BACKGROUND OF THE INVENTION" attributes the "surprising" physical properties of the new polymer compositions specifically to the combination of a homogeneously branched polymer and a heterogeneously branched polymer. (See '023 patent at 2:4-8 ("Surprisingly, we have now discovered that film can have synergistically enhanced physical properties, when the film is made from a blend of at least one homogeneously branched ethylene/a-olefin interpolymer and a heterogeneously branched ethylene/a-olefin interpolymer.").)

"Statements that describe the invention as a whole, rather than statements that describe only preferred embodiments, are more likely to support a limiting definition of a claim term." C.R. Bard, Inc. v. United States Surgical Corp., 388 F.3d 858, 864 (Fed. Cir. 2004). On reviewing the specification, the Court agrees with NOVA that it characterizes the invention as a whole

as including (1) a homogeneously branched polymer, and (2) a heterogeneously branched polymer. In particular, as NOVA notes, the "SUMMARY OF THE INVENTION" explains in general terms that the invention pertains to novel polymer compositions, and then sets forth two distinct aspects of the invention. In both aspects, the polymer compositions comprise a "(B)" component that is a "heterogeneously branched ethylene polymer." (See '023 patent at 2:25-67.) Although, as Dow notes, this portion of the specification does not use the term "the present invention," the Court assigns this fact little weight given that the patentee has explicitly labeled this portion of the specification as "THE SUMMARY OF THE INVENTION." Furthermore, as noted above, the Abstract includes an additional statement of general applicability in which the polymer compositions are characterized - as a whole - as including a "heterogeneously branched ethylene polymer." On reviewing the remainder of the specification, the Court sees no evidence - and Dow does not cite any - suggesting that the patentee contemplated any embodiment in which the "(B)" component was something other than a heterogeneously branched polymer. On the contrary, as noted above, the specification includes a section specifically detailing "THE HETEROGENEOUSLY BRANCHED ETHYLENE POLYMER" that is part of the inventive compositions. (See '023 patent at 8:14 - 9:12.) Likewise, all embodiments disclosed in the specification include a

heterogeneously branched ethylene polymer.

Dow attempts to rebut this evidence in the specification largely through the prosecution history. In particular, Dow notes that prior to examination, Dow deleted the words "heterogeneously branched" from the claims in favor of broader generic language, and that the examiner thereafter acknowledged the broader scope of the claims. (See D.I. 148 at 34 (citing D.I. 129, Exh. F at F-091).) However, in the Court's view, this aspect of the prosecution history does not overcome the patentee's clear characterization in the specification of the overall invention as specifically including a heterogeneously branched polymer. Indeed, "the claims cannot be of broader scope than the invention that is set forth in the specification." On Demand Mach. Corp. v. Ingram Indus., 442 F.3d 1331, 1340 (Fed. Cir. 2006). Dow does not cite any authority, and the Court is not aware of any, suggesting that the prosecution history can be used to broaden the scope of claims beyond that which is supported by the specification.

With respect to whether the phrase "linear polymer fraction" should be understood to allow some small amount of branching, the Court refers to the portion of the specification, noted above, specifically directed to "THE HETEROGENEOUSLY BRANCHED ETHYLENE POLYMER" used in the claimed polymer compositions. There, as Dow notes, the specification describes linear low density

polyethylene ("LLDPE") as an exemplary heterogeneous polymer that may be used in the invention, noting further that LLDPE contains a "highly branched portion," a "medium branched portion," and an "essentially linear portion." ('023 patent at 8:19-27.) In connection with this description, the specification refers to a figure depicting the results of a temperature rising elution fractionation ("TREF") study on Dowlex® 2045, a type of heterogeneously branched LLDPE. (Id. at 8:38-44.) The specification explains that this figure graphically depicts the relative amounts of each polymer fraction in Dowlex® 2045. In so doing, it refers to a distinct peak in the TREF study appearing at 98° C (i.e., the rightmost peak in the figure), explaining that this is "the 'linear' fraction of the whole polymer." (Id. at 8:59-62.) Thus, the specification correlates the 98° C "'linear fraction" with the least branched "essentially linear portion" of LLDPE. In other words, in describing the heterogeneously branched ethylene polymers used in the claimed invention, the specification confirms that the term "linear" may be used to refer to polymers that include some small degree of branching. (See also D.I. 132 ¶ 7 (Dow's expert, Dr. Joao B.P. Soares, confirms that the 98° C peak in Dowlex contains molecules with some short chain branches).) Because Dow's construction of the phrase "linear polymer fraction" properly permits some degree of light branching, the Court will adopt it.

Accordingly, the Court will construe the term "ethylene polymer . . . comprising a linear polymer fraction" to mean "a heterogeneously branched ethylene polymer containing a polymer fraction that is neither highly branched nor medium branched."

CONCLUSION

For the reasons discussed, the Court has construed the disputed terms and/or phrases of the '053 and '023 patents as provided herein. An Order consistent with this Memorandum Opinion will be entered setting forth the meanings of the disputed terms and/or phrases in the '053 and '023 patents.