**IN THE UNITED STATES DISTRICT COURT**
**FOR THE DISTRICT OF DELAWARE**

| | | |
|---|---|---|
| THE DOW CHEMICAL COMPANY,<br><br>Plaintiff,<br><br>v.<br><br>NOVA CHEMICALS CORPORATION (CANADA) and NOVA CHEMICALS INC. (DELAWARE),<br><br>Defendants. | ) | C.A. No. 05-737 (JJF) |

**REPLY TO COUNTERCLAIMS OF DEFENDANTS NOVA CHEMICALS CORPORATION AND NOVA CHEMICALS INC.**

Plaintiff, The Dow Chemical Company ("Dow"), files this Reply in response to the Counterclaims dated August 10, 2006, filed by Defendants, NOVA Chemicals Corporation, and NOVA Chemicals Inc. (collectively "NOVA").

**REPLY**

**COUNTERCLAIMS**

**PARTIES AND JURISDICTION**

1. NOVA Chemicals Corporation is a corporation organized under the laws of Canada with a principal place of business at 1000 Seventh Avenue S.W., Calgary, Alberta T2P SC6, Canada.

**Answer:**

Upon information and belief, Plaintiff admits the allegation.

2. NOVA Chemicals Inc. is a corporation organized under the laws of Delaware with a principal place of business at Westpointe Center, 1550 Caraopolis Heights Road, Moon Township, Pennsylvania 15108.

**Answer:**

Upon information and belief, Plaintiff admits the allegation.

3. On information and belief, Dow is a corporation organized under the laws of Delaware with a principal place of business at 2030 Dow Center, Midland, Michigan 48674.

**Answer:**

Admitted.

4. This Court has jurisdiction over these Counterclaims pursuant to at least 28 U.S.C. §§ 1331, 1338, 1367, and 2201.

**Answer:**

Admitted.

5. Dow is subject to personal jurisdiction in this judicial district for the present Counterclaims, at least because it commenced the present action and because, upon information and belief, it is a Delaware corporation.

**Answer:**

Admitted.

6. These Counterclaims are for declaratory judgment relief arising under 28 U.S.C. §§ 2201 and 2202, and the patent law of the United States, 35 U.S.C. § 101 *et seq*.

**Answer:**

Admitted.

**COUNTERCLAIM I: DECLARATORY JUDGMENT OF NO INFRINGEMENT OF THE '053 PATENT**

7. NOVA adopts and incorporates in this Counterclaim paragraphs 1-6 above, as if set forth herein.

**Answer:**

Plaintiff's answers for paragraphs 1-6 are incorporated, as if set forth herein.

8. Claim 1 of the '053 patent is addressed to a "film made from an ethylene polymer composition," the composition comprising, *inter alia*, "at least one heterogeneously branched linear ethylene polymer having a density from about 0.93 g/cm$^3$ to about 0.965g/cm$^3$."

**Answer:**

Admitted that the quoted language appears in U.S. Patent No. 5,847,053, issued on December 8, 1998 ("the '053 patent"). The term "addressed" is vague and ambiguous in its usage in this paragraph. To the extent "addressed" means that claim 1 in its preamble refers to such a film, admitted.

9. Claim 6 of the '053 patent is addressed to "An ethylene polymer composition comprising," *inter alia*, "at least one heterogeneously branched linear ethylene polymer having a density from about 0.93 g/cm$^3$ to about 0.965g/cm$^3$."

**Answer:**

Admitted that the quoted language appears in the '053 patent. The term "addressed" is vague and ambiguous in its usage in this paragraph. To the extent "addressed" means that the preamble of Claim 6 refers to such an ethylene polymer composition, admitted.

10. Claims 1 and 6 of the '053 patent are the only independent claims of the '053 patent.

**Answer:**

Admitted.

11. The ‘053 patent states, *inter alia*, at column 7, lines 28-30 that “The ethylene polymer to be combined with the homogenous ethylene/α-olefin interpolymer is a heterogeneously branched (e.g., Ziegler polymerized) interpolymer….”

**Answer:**

Admitted.

12. On information and belief, prior to filing its Complaint in the present action, Dow did not have information showing that any accused NOVA SURPASS® product contains a heterogeneously branched polymer, as that term is used in the ‘053 patent.

**Answer:**

Denied.

13. On information and belief, prior to serving its Complaint in the present action, Dow had information that NOVA SURPASS® products do not contain a heterogeneously branched polymer, as that term is used in the ‘053 patent.

**Answer:**

Denied.

14. The ‘053 patent states, *inter alia*, in column 7, lines 33-36 that “Heterogeneously branched ethylene/α-olefin interpolymers differ from the homogeneously branched ethylene/α-olefin interpolymers primarily in their branching distribution.”

**Answer:**

Admitted.

15. The ‘053 patent states, *inter alia*, in column 7, lines 36-41 that “heterogeneously branched LLDPE 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).”

**Answer:**

Admitted.

16. On information and belief, prior to filing its Complaint in the present action, Dow did not identify a polymer component in any accused NOVA SURPASS® product as having "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)," as those terms are used in the '053 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege, attorney work product, and pursuant to the agreement between Dow/Nova signed by Dow on December 6, 2005 and signed by Nova on December 9, 2005 (the "Agreement for Dow/Nova Discussion").

17. The '053 patent states, *inter alia,* at column 7, lines 57 - 66 that Dowlex® 2045 is "a heterogeneously branched ethylene/1-octene copolymer…."

**Answer:**

Admitted.

18. The '053 patent states, *inter alia,* at column 8, lines 4-7 that "Dowlex® 2045 also has a distinct peak at an elution temperature of about 98°C., indicating the 'linear' fraction of the whole polymer."

**Answer:**

Admitted.

19. On information and belief, prior to filing its Complaint in the present action, Dow did not measure "a distinct peak at an elution temperature of about 98°C," as those terms are used in the '053 patent, for any accused NOVA SURPASS® product.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege, attorney work product, and pursuant to the Agreement for Dow/Nova Discussion.

20. The ‘053 patent states, *inter alia*, at column 8, lines 23-26 that “The heterogeneously branched ethylene/α-olefin interpolymers and/or copolymers also have at least two melting peaks as determined using Differential Scanning Calorimetry (DSC).”

**Answer:**

Admitted.

21. On information and belief, prior to filing its Complaint in the present action, Dow did not identify in any accused NOVA SURPASS® product any interpolymers and/or copolymers that “have at least two melting peaks as determined using Differential Scanning Calorimetry (DSC),” as those terms are used in the ‘053 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege, attorney work product, and pursuant to the Agreement for Dow/Nova Discussion.

22. During the prosecution leading to the ‘053 patent, Dow distinguished its claimed products from blends of multiple homogeneous polymers.

**Answer:**

Denied.

23. On information and belief, prior to serving its Complaint in the present action, Dow had information that SURPASS® products contain only “homogenously branched” copolymers, as those terms are used in the ‘053 patent.

**Answer:**

Denied.

24. On information and belief, Dow served its complaint in this action knowing that NOVA did not infringe the ‘053 patent.

**Answer:**

Denied.

25. NOVA has not infringed and is not infringing the '053 patent with its SURPASS® polyethylene products, either directly, contributorily, and/or by inducement.

**Answer:**

Denied.

26. NOVA is entitled to a declaratory judgment that it has not infringed and is not infringing the '053 patent with its SURPASS® polyethylene products, either directly, contributorily, and/or by inducement.

**Answer:**

Denied.

**COUNTERCLAIM II: DECLARATORY JUDGMENT OF INVALIDITY OF THE '053 PATENT**

27. NOVA adopts and incorporates in this Counterclaim paragraphs 1-6 above, as if set forth herein.

**Answer:**

Plaintiff's answers for paragraphs 1-6 are incorporated, as if set forth herein.

28. "Example 4" of the '053 patent is directed, *inter alia*, to an "in-situ blend… wherein the homogenously branched substantially linear polymer is made in a first reactor.... [And a] heterogeneously branched ethylene/1-octene copolymer is made in a second reactor operated sequentially with the first reactor…."

**Answer:**

Admitted that the quoted language appears in the '053 patent. The phrase "directed, *inter alia*, to" is vague and ambiguous in its usage in this paragraph. To the extent "directed, *inter alia*, to" is intended to mean that Example 4 discloses an in-situ blend, admitted.

29. The ‘053 patent does not report a slope of strain hardening coefficient (SHC) value for the blend of “Example 4.”

**Answer:**

The term “report” is vague and ambiguous in its usage in this paragraph. To the extent “report” means disclose, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses a slope of strain hardening coefficient (SHC) value for the blend of “Example 4.”

30. The ‘053 patent does not report an SHC value for any component identified as a component of the blend of “Example 4.”

**Answer:**

The term “report” is vague and ambiguous in its usage in this paragraph. To the extent “report” means disclose, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses a slope of strain hardening coefficient (SHC) value for at least a component identified as a component of the blend of “Example 4.”

31. The ‘053 patent does not report an SHC value for any component identified as a component of an in-situ blend.

**Answer:**

The term “report” is vague and ambiguous in its usage in this paragraph. To the extent “report” means disclose, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses a slope of strain hardening coefficient (SHC) value for at least a component of an in-situ blend.

32. The ‘053 patent does not provide conditions to separate an in-situ blend of polymers into components.

**Answer:**

The phrase “provide conditions” is vague and ambiguous as used in this paragraph. To the extent “provide conditions” means disclose how to identify the components of an in-situ blend of polymers, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses how to identify the components of an in-situ blend of polymers.

33. The ‘053 patent does not provide conditions to separate an in-situ blend of polymers into separate components where the polymer components have overlapping temperature rising elution fractionation (TREF) elution temperatures.

**Answer:**

The phrase “provide conditions” is vague and ambiguous as used in this paragraph. To the extent “provide conditions” means disclose how to identify the components of an in-situ blend of polymers, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses how to identify the components of an in-situ blend of polymers where the polymer components have overlapping temperature rising elution fractionation (TREF) elution temperatures.

34. The ‘053 patent states, *inter alia*, at column 6, lines 40-42 that “FIG. 1 shows the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

**Answer:**

Admitted.

35. The ‘053 patent states, *inter alia*, at column 6, lines 61-62 that “FIG. 1 graphically depicts the relationship between the density of the homogeneously branched substantially linear ethylene polymers and ethylene/α-olefin polymers as a function of their slope of strain hardening coefficient.”

**Answer:**

Admitted.

36. The ‘053 patent describes “FIG. 1” differently at column 6, lines 40-42 than at column 6, lines 61-62.

**Answer:**

The term “differently” is vague and ambiguous in its usage in this paragraph. Admitted that the text in the ‘053 patent at column 6, lines 40-42 is not identical to the text at column 6, lines 61-62.

37. The “FIG. 1” described in the ‘053 patent at column 6, lines 40-42 is not contained in the ‘053 patent.

**Answer:**

Admitted.

38. On information and belief, prior to April 28, 1993, at least one of the named inventors of the ‘053 patent was aware of a figure as described at column 6, lines 40-42 of the ‘053 patent.

**Answer:**

Upon information and belief, denied.

39. On information and belief, prior to April 28, 1993, at least one member of Dow's Patent Department who participated in the prosecution leading to the '053 patent was aware of a figure as described at Column 6, lines 40-42 of the '053 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege.

40. The figure labeled "Figure 1" appearing on the fourth page of the issued '053 patent does not depict "the various stages of the stress/strain curve used to calculate the slope of strain hardening," as described in the '053 patent at column 6, lines 40-42.

**Answer:**

The term "depict" is vague and ambiguous in its usage in this paragraph. Admitted that Figure 1 does not expressly illustrate "the various stages of the stress/strain curve used to calculate the slope of strain hardening." Denied that the '053 patent does not disclose "the various stages of the stress/strain curve used to calculate the slope of strain hardening." The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '053 patent discloses "the various stages of the stress/strain curve used to calculate the slope of strain hardening."

41. The figure labeled "Figure 2" appearing on the fifth page of the issued '053 patent does not depict "the various stages of the stress/strain curve used to calculate the slope of strain hardening," as described in the '053 patent at column 6, lines 40-42.

**Answer:**

The term "depict" is vague and ambiguous in its usage in this paragraph. Admitted that Figure 2 does not expressly illustrate "the various stages of the stress/strain curve used to calculate the slope of strain hardening." Denied that the '053 patent does not disclose "the various stages of the stress/strain curve used to calculate the slope of strain hardening." The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date

of the ‘053 patent discloses “the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

42. The ‘053 patent does not contain a figure showing “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘053 patent at column 6, lines 40-42.

**Answer:**

Admitted that no figure in the ‘053 patent expressly illustrates “the various stages of the stress/strain curve used to calculate the slope of strain hardening.” Denied that the ‘053 patent does not disclose “the various stages of the stress/strain curve used to calculate the slope of strain hardening.” The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses “the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

43. A figure showing “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘053 patent at column 6, lines 40-42, is necessary for the understanding of the subject matter claimed in the ‘053 patent.

**Answer:**

Denied.

44. The ‘053 patent states, *inter alia,* at column 6, line 67 that “Table 1 displays the data of FIG. 1 in tabular form:”

**Answer:**

Admitted.

45. The data contained in Table 1 of the ‘053 patent corresponds to the data of the “FIG. 1” described in the ‘053 patent at column 6, lines 61-67 and depicted on the fourth page of the ‘053 patent.

**Answer:**

Admitted.

46. The data contained in Table 1 of the ‘053 patent is not data showing “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘053 patent at column 6, lines 40-42.

**Answer:**

The term “showing” is vague and ambiguous as used in this paragraph. Admitted that Table 1 does not expressly illustrate “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘053 patent at column 6, lines 40-42. Denied that the ‘053 patent does not disclose “the various stages of the stress/strain curve used to calculate the slope of strain hardening.” The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses “the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

47. Independent Claims 1 and 6 of the ‘053 patent contain a limitation requiring that component “A” have “a slope of strain hardening coefficient greater than or equal to 1.3.”

**Answer:**

Denied. Under the doctrine of equivalents, claim limitations cover their literal scope and equivalent subject matter.

48. All claims of the ‘053 patent contain a limitation that component “A” have a “slope of strain hardening coefficient” at least greater than or equal to 1.3.

**Answer:**

Denied. Under the doctrine of equivalents, claim limitations cover their literal scope and equivalent subject matter.

49. The ‘053 patent states, inter alia, at column 6, lines 45-50 that:

> The slope of strain hardening coefficient (SHC) is calculated according to the following equation:
>
> $$SHC = (slope\ of\ strain\ hardening)*(I_2)^{0.25}$$
>
> where $I_2$ =melt index in grams/10 minutes.

**Answer:**

Admitted.

50. The “slope of strain hardening” parameter appearing in the SHC equation defined in the ‘053 patent at column 6, lines 45-50 is disclosed to be determined using “FIG. 1,” wherein “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.”

**Answer:**

Denied.

51. A figure showing a “strain hardening region” is not present in the ‘053 patent.

**Answer:**

This paragraph is vague in that the phrase “strain hardening region” has no context. To the extent this paragraph seeks an admission that in none of the figures of the ‘053 patent is there a representation of a polymer with a strain hardening region, denied.

52. The determination of a "parallel line in the strain hardening region" is not disclosed in the '053 patent.

**Answer:**

Denied.

53. In the prosecution leading to the '053 patent, Dow did not cite any printed publication or public use, as those terms are used in 35 U.S.C. § 102, from prior to April 28, 1993 that contains the SHC definition at column 6, lines 45-50 of the '053 patent.

**Answer:**

Admitted that, upon information and belief, Plaintiff did not cite a printed publication from prior to April 28, 1993 that expressly states: "The slope of strain hardening coefficient (SHC) is calculated according to the following equation: $(slope\ of\ strain\ hardening)*(I_2)^{0.25}$ where $I_2$ =melt index in grams/10 minutes." In all other respects, denied. One or more printed publications cited by Plaintiff and/or the Examiner disclose information defining all parts of the equation as described at column 6, lines 45-50 of the '053 patent.

54. In the prosecution leading to the '053 patent, the Examiner did not cite any printed publication or public use, as those terms are used in 35 U.S.C. § 102, from prior to April 28, 1993 that contains the SHC definition at column 6, lines 45-50 of the '053 patent.

**Answer:**

Admitted that, upon information and belief, the Examiner did not cite a printed publication from prior to April 28, 1993 that expressly states: "The slope of strain hardening coefficient (SHC) is calculated according to the following equation: $(slope\ of\ strain\ hardening)*(I_2)^{0.25}$ where $I_2$ =melt index in grams/10 minutes." In all other respects, denied. One or more printed publications cited by Plaintiff and/or the Examiner disclose information defining all parts of the equation as described at column 6, lines 45-50 of the '053 patent.

55. On information and belief, Dow is not aware of any publication or public use, as those terms are used in 35 U.S.C. § 102, from prior to April 28, 1993, that contains the SHC definition at column 6, lines 45-50 of the '053 patent.

**Answer:**

Admitted that, upon information and belief, Plaintiff is not aware of a printed publication from prior to April 28, 1993 that expressly states: "The slope of strain hardening coefficient (SHC) is calculated according to the following equation: $(slope\ of\ strain\ hardening)*(I_2)^{0.25}$ where $I_2$ =melt index in grams/10 minutes." In all other respects, denied. Plaintiff is aware of one or more printed publications from prior to April 28, 1993 that, singularly or combined, disclose information defining all parts of the equation as described at column 6, lines 45-50 of the '053 patent.

56. The '053 patent indicates that the $I_2$ parameter in the equation at column 6, lines 45-50 has the units of "grams/10 minutes."

**Answer:**

Admitted.

57. The '053 patent does not provide any units for the "slope of strain hardening" parameter in the equation at column 6, lines 45-50.

**Answer:**

Admitted that '053 patent does not expressly state specific units to be used for the "slope of strain hardening" parameter in the equation at column 6, lines 45-50. In all other respects, denied. The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '053 patent discloses units to be used for the "slope of strain hardening" parameter in the equation at column 6, lines 45-50.

58. On information and belief, prior to April 28, 1993, at least one of the named inventors of the '053 patent was aware of units for the "slope of strain hardening" parameter, as that parameter is used in the '053 patent at column 6, lines 45-50.

**Answer:**

Admitted.

59. The '053 patent does not provide any units for the "SHC" parameter in the equation at column 6, lines 45-50.

**Answer:**

Admitted that '053 patent does not expressly state specific units to be used for the "SHC" parameter in the equation at column 6, lines 45-50. In all other respects, denied. The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '053 patent discloses units to be used for the "SHC" parameter in the equation at column 6, lines 45-50.

60. In the section of the '053 patent entitled "Determination of the Slope of Strain Hardening Coefficient" beginning at column 6, line 6, the '053 patent refers to both English units (*e.g.*, psi at column 6, line 12) and metric units (*e.g.*, grams/cm$^3$ at column 6, lines 57-58).

**Answer:**

Admitted.

61. The '053 patent does not state whether English or metric units should be used for the "slope of strain hardening" parameter in the equation at column 6, lines 45-50.

**Answer:**

Admitted that there is no express statement stating whether English or metric units should be used at column 6, lines 45-50. In all other respects, denied. The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the

‘053 patent discloses whether English or metric units are appropriate for the “slope of strain hardening” parameter in the equation at column 6, lines 45-50.

62. The ‘053 patent does not state what units should be used for the “slope of strain hardening” parameter in the equation at column 6, lines 45-50.

**Answer:**

Admitted that there is no express statement stating whether specific units for the “slope of strain hardening” parameter should be used in the equation at column 6, lines 45-50. In all other respects, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘053 patent discloses what units should be used for the “slope of strain hardening” parameter in the equation at column 6, lines 45-50.

63. The ‘053 patent incorporates by reference patents that collectively use multiple different units for the slope of a stress/strain curve, including “lbs./in/ /oz./yd.$^2$” in United States Patent No. 3,458,706, “MPa” in United States Patent No. 4,597,920, “KPa” in United States Patent No. 5,059,481, “GPa” and “gm/denier” in United States Patent No. 4,413,110, “psi” in United States Patent No. 4,663,220, and “Kpsi” in United States Patent No. 4,865,902,

**Answer:**

Denied.

64. At column 27, lines 26-29 of U.S. Patent No. 4,413,110, the numerical value reported in units of “GPa” is different from the numerical value reported in “g/d.”

**Answer:**

Admitted that at column 27, lines 26-29 of U.S. Patent No. 4,413,110, that patent states, “[t]he measurement 140 GPa (1587 g/d) . . .” and that the two numerical values “140” and “1587” are different.

65. The numerical value for the SHC parameter in the equation at column 6, lines 45-50 of the '053 patent depends on, *inter alia*, the units used for the "slope of strain hardening" parameter.

**Answer:**

The paragraph is vague and ambiguous in that no polymer is identified. Plaintiff interprets this paragraph to mean that the value for the SHC parameter for all polymers in all situations in the equation at column 6, lines 45-50 of the '053 patent depends on, *inter alia*, the units used for the "slope of strain hardening" parameter. Under this interpretation, denied.

66. The '053 patent does not specify units for the "slope of strain hardening" parameter.

**Answer:**

Denied. The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '053 patent discloses appropriate units for the "slope of strain hardening" parameter.

67. On November 1, 1999, the patent application leading to Dow's United States Patent No. 6,723,398 B1 ("the '398 patent") was filed in the United States Patent Office.

**Answer:**

Upon information and belief, admitted.

68. A true and correct copy of the '398 patent is attached hereto as Exhibit A.

**Answer:**

Upon information and belief, admitted.

69. The ‘398 patent states, *inter alia*, at column 2, lines 45-49 that “FIG. 2 shows the various regions of a typical tensile curve (as load in pounds versus extension in inches) and the particular region used to determine the slope of strain hardening.”

**Answer:**

Admitted.

70. The ‘398 patent includes on page 4 “FIG. 2,” which corresponds to the description in the ‘398 patent at column 2, lines 45-49.

**Answer:**

Admitted.

71. “FIG. 2” of the ‘398 patent shows “various stages of the stress/strain curve used to calculate the slope of strain hardening.”

**Answer:**

This paragraph is vague and ambiguous in that no polymer is specified. Admitted that “FIG. 2” of the ‘398 patent illustrates “various stages of the stress/strain curve used to calculate the slope of strain hardening” for the polymers that are the subject of Figure 2 of the ‘398 patent. Denied that “FIG. 2” of the ‘398 patent shows “various stages of the stress/strain curve used to calculate the slope of strain hardening” for all polymers in all situations.

72. As depicted in “FIG. 2” of the ‘398 patent, the “Strain Hardening Region” begins before the “point of 10% extension before failure.”

**Answer:**

Admitted that for the polymers that are the subject of “FIG. 2” of the ‘398 patent, the “Strain Hardening Region” may begin before the “point of 10% extension before failure.” Denied, however, that all polymers would behave exactly as illustrated in “FIG. 2” of the ‘398 patent, or that the “Strain Hardening Region” begins before the “point of 10% extension before failure” for all polymers in all situations.

73. The ‘398 patent discloses that a subsection of the “strain hardening region” is used to determine the “slope of strain hardening.”

**Answer:**

Admitted that for the polymers that are the subject of “FIG. 2” of the ‘398 patent, the ‘398 patent discloses that a subsection of the “strain hardening region” can be used to determine the “slope of strain hardening.” Otherwise denied that the ‘398 patent discloses that a subsection of the “strain hardening region” is used to determine the “slope of strain hardening” for all polymers in all situations.

74. The ‘398 patent states, *inter alia*, at column 11, lines 6-11 that:

> The slope of strain hardening is conveniently taken as a line representing a 10 percent secant tangent which is calculated from the failure point to the point where 10 percent extension before the failure point (where 10 percent extension before is equal to 90 percent of the total extension or strain).

**Answer:**

Denied.

75. The ‘053 patent does not disclose that the slope of strain hardening is conveniently taken as a line representing a 10 percent secant tangent which is calculated from the failure point to the point where 10 percent extension before the failure point (where 10 percent extension before is equal to 90 percent of the total extension or strain).

**Answer:**

Admitted that the ‘053 patent does not expressly state that “the slope of strain hardening is conveniently taken as a line representing a 10 percent secant tangent which is calculated from the failure point to the point where 10 percent extension before the failure point (where 10 percent extension before is equal to 90 percent of the total extension or strain).” In all other respects, denied. The ‘053 patent combined with the presumed knowledge of a person skilled in the art at

the time of the effective filing date of the '053 patent discloses how to determine the slope of strain hardening.

76. The '398 patent states, *inter alia*, at column 11, lines 12-15 that:

> A more precise methodology for calculating the slope of strain hardening is performing linear regression analysis using the tensile curve datapoints that represent the last 10 percent extension before the failure point.

**Answer:**

Admitted.

77. The '053 patent does not disclose that a more precise methodology for calculating the slope of strain hardening is performing linear regression analysis using the tensile curve datapoints that represent the last 10 percent extension before the failure point.

**Answer:**

The '053 patent does not expressly state that "a more precise methodology for calculating the slope of strain hardening is performing linear regression analysis using the tensile curve datapoints that represent the last 10 percent extension before the failure point." In all other respects, denied. The '053 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '053 patent discloses how to determine the slope of strain hardening.

78. The '398 patent, at column 10, lines 61-64, identifies the "line parallel to the strain hardening region" as a "10 percent secant line."

**Answer:**

Denied.

79. The ‘053 patent does not identify the “line parallel to the strain hardening region” as a “10 percent secant line.”

**Answer:**

Admitted.

80. The ‘053 patent does not identify any subsection of the “strain hardening region” from which the “slope of strain hardening,” as those terms are used in the ‘053 patent, is or should be determined.

**Answer:**

Denied.

81. No drawing containing the information in “FIG. 2” of the ‘398 patent related to the region used to determine the “slope of strain hardening” or the units for “slope of strain hardening” is contained in the ‘053 patent.

**Answer:**

Admitted that there are no drawings in the ‘053 patent; there are only computer-generated figures.

82. ASTM dimensions for stress/strain curves in accordance with ASTM D-882 are pressure vs. % extension.

**Answer:**

This paragraph is vague and ambiguous. Pressure vs. % extension is not an expression of “dimensions.” The term “ASTM dimensions” is vague and ambiguous as used in this paragraph. Plaintiff consequently lacks information, knowledge, and belief to either admit or deny this averment.

83. The slope of the strain hardening, as depicted in “FIG. 2” in the ‘398 patent, has units of “pounds/inch.”

**Answer:**

Admitted.

84. The ‘053 patent does not disclose that “slope of strain hardening” should be in units of “pounds/inch.”

**Answer:**

Denied.

85. The units “pounds/inch” do not correspond to the dimensions of pressure vs. % extension.

**Answer:**

The term “correspond” is vague and ambiguous as used in this paragraph. “Pressure vs. % extension” is not an expression of “dimensions.” Denied that “pounds/inch” can never relate to “pressure vs. % extension.”

86. On information and belief, one or more of the named inventors of the ‘053 patent was aware of the preferred subsection of the “strain hardening region” used to determine the “slope of strain hardening” and/or the units to be used in determining that parameter prior to April 28, 1993.

**Answer:**

This paragraph assumes a fact that Dow denies, namely that there was a preferred subsection as of April 28, 1993, of the “strain hardening region” for all polymers in all circumstances or situations for use in determining the “slope of strain hardening.” Denied.

87. On information and belief, one or more attorneys in Dow’s Patent Department who participated in the prosecution leading to the ‘053 patent was aware of the preferred subsection of the “strain hardening region” used to determine the “slope of strain hardening” and/or units to be used in determining that parameter prior to April 28, 1993.

**Answer:**

This paragraph assumes a fact that Dow denies, namely that there was a preferred subsection as of April 28, 1993, of the “strain hardening region” for all polymers in all circumstances or situations for use in determining the “slope of strain hardening.” Denied.

88. On information and belief, at the time Dow served its complaint in this action, Dow knew that "FIG. 1" referred to at Column 6, lines 40-42 was not present in the '053 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege and attorney work product.

89. On information and belief, at the time Dow served its complaint in this action, Dow knew that the '053 patent failed to disclose units for the "slope of strain hardening" parameter that appears in the SHC equation described at Column 6, lines 45-50.

**Answer:**

Assumes facts that Plaintiff denies: that the '053 patent failed to disclose units for the "slope of strain hardening" parameter that appears in the SHC equation described at Column 6, lines 45-50.

Denied.

90. On information and belief, at the time Dow served its Complaint in this action, Dow knew that the use of different units for the "slope of strain hardening" parameter in the equation

$$SHC = (\text{slope of hardening}) * (I_2)^{0.25}$$

would result in different SHC values when calculated using this equation.

**Answer:**

Assumes facts that Plaintiff denies: that different values for SHC would result for all polymers in all circumstances from the use of different units for the "slope of strain hardening" parameter.

Denied.

91. On information and belief, at the time Dow served its complaint in this action, Dow knew that its '053 patent failed to adequately disclose the SHC parameter recited in each claim of the '053 patent and/or failed to disclose the best mode for determining SHC because of the omission from the '053 patent specification of the "FIG. 1" referred to at column 6, lines 40-42.

**Answer:**

Assumes facts that Plaintiff denies: that Plaintiff's '053 patent failed to adequately disclose the SHC parameter recited in each claim of the '053 patent and/or failed to disclose the best mode for determining SHC because of the omission from the '053 patent specification of the "FIG. 1" referred to at column 6, lines 40-42. Denied.

92. On information and belief, at the time Dow served its complaint in this action, Dow knew that its '053 patent failed to furnish a drawing necessary for the understanding of the subject matter sought to be patented.

**Answer:**

Assumes facts that Plaintiff denies: that Plaintiff's '053 patent failed to furnish a drawing necessary for the understanding of the subject matter sought to be patented. Denied.

93. On information and belief, at the time Dow served its complaint in this action, Dow knew that its '053 patent failed to furnish any units for the "slope of strain hardening" parameter that appears in the SHC equation described at Column 6, lines 45-50, which units are necessary for calculation of SHC.

**Answer:**

The use of the term "furnish" in this paragraph is vague and ambiguous. To the extent this paragraph seeks an admission that Dow knew that the units for the slope of strain hardening parameter are not disclosed in the '053 patent, then this paragraph assumes a fact that Dow denies. Denied.

94. The claims of the '053 patent are invalid for failure to comply with the conditions for patentability specified by 35 U.S.C. § 101, *et seq*., including sections 102, 103, 112, and/or 113.

**Answer:**

Denied.

**COUNTERCLAIM III: DECLARATORY JUDGMENT OF NO INFRINGEMENT OF THE '023 PATENT**

95. NOVA adopts and incorporates in this Counterclaim paragraphs 1-6 above, as if set forth herein.

**Answer:**

Plaintiff's answers for paragraphs 1-6 are incorporated, as if set forth herein.

96. Claim 1 of the '023 patent is addressed to "An ethylene polymer composition comprising," *inter alia*, "at least one ethylene polymer characterized as having a density from about 0.93 g/cm$^3$ to about 0.965g/cm$^3$ and comprising a linear polymer fraction, as determined using a temperature rising elution fractionation (TREF) technique."

**Answer:**

Admitted that the quoted language appears in U.S. Patent No. 6,111,023, issued on August 29, 2000 ("the '023 patent"). The term "addressed" is vague and ambiguous in its usage in this paragraph. To the extent "addressed" means that claim 1 in its preamble refers to such a film, admitted.

97. Claim 9 of the '023 patent is addressed to "A film made from an ethylene polymer composition, wherein the composition comprises," *inter alia*, "at least one ethylene polymer characterized as having a density from about 0.93 g/cm$^3$ to about 0.965g/cm$^3$ and comprising a linear polymer fraction, as determined using a temperature rising elution fractionation (TREF) technique."

**Answer:**

Admitted that the quoted language appears in the '023 patent. The term "addressed" is vague and ambiguous in its usage in this paragraph. To the extent "addressed" means that the preamble of Claim 9 refers to such an ethylene polymer composition, admitted.

98. Claims 1 and 9 of the '023 patent are the only independent claims of the '023 patent.

**Answer:**

Admitted.

99. During the prosecution leading to the '023 patent, Dow stated, *inter alia*, that "the term 'linear fraction' or 'linear polymer fraction' (at least as used in the present application) refers to heterogeneously branched ethylene polymers."

**Answer:**

Admitted that the quoted language appears as part of a broader statement made during prosecution. Denied that this incomplete quotation is the definition of the phrase "linear fraction" or "linear polymer fraction."

100. The '023 patent states, *inter alia*, at column 8, lines 13-16 that "The ethylene polymer to be combined with the homogenous ethylene/α-olefin interpolymer is a heterogeneously branched (e.g., Ziegler polymerized) interpolymer…."

**Answer:**

Admitted.

101. On information and belief, prior to filing its Complaint in the present action, Dow did not have information showing that any accused NOVA SURPASS® product contains a heterogeneously branched polymer, as that term is used in the '023 patent.

**Answer:**

Denied.

102. On information and belief, prior to serving its Complaint in the present action, Dow had information that NOVA SURPASS® products do not contain a heterogeneously branched polymer, as that term is used in the '023 patent.

**Answer:**

Denied.

103. The '023 patent states, *inter alia*, in column 8, lines 19-22 that "Heterogeneously branched ethylene/α-olefin interpolymers differ from the homogeneously branched ethylene/α-olefin interpolymers primarily in their branching distribution."

**Answer:**

Admitted.

104. The '023 patent states, *inter alia,* in column 8, lines 22 - 27 that "heterogeneously branched LLDPE 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)."

**Answer:**

Admitted.

105. On information and belief, prior to filing its Complaint in the present action, Dow did not identify a polymer component in any accused NOVA SURPASS® product as having "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)," as those terms are used in the '023 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege, attorney work product, and pursuant to the Agreement for Dow/Nova Discussion.

106. The '023 patent states, *inter alia*, at column 8, lines 43-45 that Dowlex® 2045 is "a heterogeneously branched ethylene/1-octene copolymer…."

**Answer:**

Admitted.

107. The '023 patent states, *inter alia*, at column 8, lines 57-60 that "Dowlex® 2045 also has a distinct peak at an elution temperature of about 98°C., indicating the 'linear' fraction of the whole polymer."

**Answer:**

Admitted.

108. On information and belief, prior to filing its Complaint in the present action, Dow did not measure "a distinct peak at an elution temperature of about 98°C," as those terms are used in the '023 patent, for any accused NOVA SURPASS® product.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege, attorney work product, and pursuant to the Agreement for Dow/Nova Discussion.

109. The ‘023 patent states, *inter alia*, at column 9, lines 9-12 that “The heterogeneously branched ethylene/α-olefin interpolymers and/or copolymers also have at least two melting peaks as determined using Differential Scanning Calorimetry (DSC).”

**Answer:**

Admitted.

110. On information and belief, prior to filing its Complaint in the present action, Dow did not identify in any accused NOVA SURPASS® product any interpolymers and/or copolymers that “have at least two melting peaks as determined using Differential Scanning Calorimetry (DSC),” as those terms are used in the ‘023 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege, attorney work product, and pursuant to the Agreement for Dow/Nova Discussion.

111. During the prosecution leading to the ‘023 patent, Dow distinguished its claimed products from blends of multiple homogeneous polymers.

**Answer:**

Denied.

112. On information and belief, prior to serving its Complaint in the present action, Dow had information that SURPASS® products contain only “homogenously branched” copolymers, as those terms are used in the ‘023 patent.

**Answer:**

Denied.

113. On information and belief, Dow served its complaint in this action knowing that NOVA did not infringe the ‘023 patent.

**Answer:**

Denied.

114. NOVA has not infringed and is not infringing the '023 patent with its SURPASS® polyethylene products, either directly, contributorily, and/or by inducement.

**Answer:**

Denied.

115. NOVA is entitled to a declaratory judgment that it has not infringed and is not infringing the '023 patent with its SURPASS® polyethylene products, either directly, contributorily, and/or by inducement.

**Answer:**

Denied.

**COUNTERCLAIM IV: DECLARATORY JUDGMENT OF INVALIDITY OF THE '023 PATENT**

116. NOVA adopts and incorporates in this Counterclaim paragraphs 1-6 above, as if set forth herein.

**Answer:**

Plaintiff's answers for paragraphs 1-6 are incorporated, as if set forth herein.

117. "Example 4" of the '023 patent is directed, *inter alia*, to an "in-situ blend… wherein the homogenously branched substantially linear polymer is made in a first reactor.... [And a] heterogeneously branched ethylene/1-octene copolymer is made in a second reactor operated sequentially with the first reactor…."

**Answer:**

Admitted that the quoted language appears in the '023 patent. The phrase "directed, *inter alia*, to" is vague and ambiguous in its usage in this paragraph. To the extent "directed, *inter alia*, to" is intended to mean that Example 4 discloses an in-situ blend, admitted.

118. The ‘023 patent does not report a strain hardening coefficient (SHC) value for the blend of “Example 4.”

**Answer:**

The term “report” is vague and ambiguous in its usage in this paragraph. To the extent “report” means disclose, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses a slope of strain hardening coefficient (SHC) value for the blend of “Example 4.”

119. The ‘023 patent does not report an SHC value for any component identified as a component of the blend of “Example 4.”

**Answer:**

The term “report” is vague and ambiguous in its usage in this paragraph. To the extent “report” means disclose, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses a slope of strain hardening coefficient (SHC) value for at least a component identified as a component of the blend of “Example 4.”

120. The ‘023 patent does not report an SHC value for any component identified as a component of an in-situ blend.

**Answer:**

The term “report” is vague and ambiguous in its usage in this paragraph. To the extent “report” means disclose, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses a slope of strain hardening coefficient (SHC) value for at least a component of an in-situ blend.

121. The ‘023 patent does not provide conditions to separate an in-situ blend of polymers into components.

**Answer:**

The phrase “provide conditions” is vague and ambiguous as used in this paragraph. To the extent “provide conditions” means disclose how to identify the components of an in-situ blend of polymers, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses how to identify the components of an in-situ blend of polymers.

122. The ‘023 patent does not provide conditions to separate an in-situ blend of polymers into separate components where the polymer components have overlapping temperature rising elution fractionation (TREF) elution temperatures**.**

**Answer:**

The phrase “provide conditions” is vague and ambiguous as used in this paragraph. To the extent “provide conditions” means disclose how to identify the components of an in-situ blend of polymers, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses how to identify the components of an in-situ blend of polymers where the polymer components have overlapping temperature rising elution fractionation (TREF) elution temperatures.

123. The ‘023 patent states, *inter alia*, at column 7, lines 18-19 that “FIG. 1 shows the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

**Answer:**

Admitted.

124. The ‘023 patent states, *inter alia,* at column 7, lines 38-41 that “FIG. 1 graphically depicts the relationship between the density of the homogeneously branched substantially linear ethylene polymers and ethylene/α-olefin polymers as a function of their slope of strain hardening coefficient.”

**Answer:**

Admitted.

125. The ‘023 patent describes “FIG. 1” differently at column 7, lines 18-19 than at column 7, lines 38-41.

**Answer:**

The term “differently” is vague and ambiguous in its usage in this paragraph. Admitted that the text in the ‘023 patent at column 7, lines 18-19 is not identical to the text at column 7, lines 38-41.

126. The “FIG. 1” described in the ‘023 patent at column 7, lines 18-19 is not contained in the ‘023 patent.

**Answer:**

Admitted.

127. On information and belief, prior to April 28, 1993, at least one of the named inventors of the ‘023 patent was aware of a figure as described at column 7, lines 18-19 of the ‘023 patent.

**Answer:**

Upon information and belief, denied.

128. On information and belief, prior to April 28, 1993, at least one member of Dow's Patent Department who participated in the prosecution leading to the '023 patent was aware of a figure as described at Column 7, lines 18 - 19 of the '023 patent.

**Answer:**

Plaintiff declines to answer the averments in this paragraph on the grounds of attorney-client privilege.

129. The figure labeled "FIG. 1" appearing on the fourth page of the issued '023 patent does not depict "the various stages of the stress/strain curve used to calculate the slope of strain hardening," as described in the '023 patent at column 7, lines 18-19.

**Answer:**

The term "depict" is vague and ambiguous in its usage in this paragraph. Admitted that Figure 1 does not expressly illustrate "the various stages of the stress/strain curve used to calculate the slope of strain hardening." Denied that the '023 patent does not disclose "the various stages of the stress/strain curve used to calculate the slope of strain hardening." The '023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '023 patent discloses "the various stages of the stress/strain curve used to calculate the slope of strain hardening."

130. The figure labeled "FIG. 2" appearing on the fifth page of the issued '023 patent does not depict "the various stages of the stress/strain curve used to calculate the slope of strain hardening," as described in the '023 patent at column 7, lines 18-19.

**Answer:**

The term "depict" is vague and ambiguous in its usage in this paragraph. Admitted that Figure 2 does not expressly illustrate "the various stages of the stress/strain curve used to calculate the slope of strain hardening." Denied that the '023 patent does not disclose "the various stages of the stress/strain curve used to calculate the slope of strain hardening." The '023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date

of the ‘023 patent discloses “the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

131. The ‘023 patent does not contain a figure showing “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘023 patent at column 7, lines 18-19.

**Answer:**

Admitted that no figure in the ‘023 patent expressly illustrates “the various stages of the stress/strain curve used to calculate the slope of strain hardening.” Denied that the ‘023 patent does not disclose “the various stages of the stress/curve used to calculate the slope of strain hardening.” The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses “the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

132. A figure showing “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘023 patent at column 7, lines 18-19, is necessary for the understanding of the subject matter claimed in the ‘023 patent.

**Answer:**

Denied.

133. The ‘023 patent states, *inter alia,* at column 7, line 44 that “Table 1 displays the data of FIG. 1 in tabular form:”

**Answer:**

Admitted.

134. The data contained in Table 1 of the ‘023 patent corresponds to the data of the “FIG. 1” described in the ‘023 patent at column 7, lines 38-44 and depicted on the fourth page of the ‘023 patent.

**Answer:**

Admitted.

135. The data contained in Table 1 of the ‘023 patent is not data showing “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘023 patent at column 7, lines 18-19.

**Answer:**

The term “showing” is vague and ambiguous as used in this paragraph. Admitted that Table 1 does not expressly illustrate “the various stages of the stress/strain curve used to calculate the slope of strain hardening,” as described in the ‘023 patent at column 7, lines 18-19. Denied that the ‘023 patent does not disclose “the various stages of the stress/strain curve used to calculate the slope of strain hardening.” The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses “the various stages of the stress/strain curve used to calculate the slope of strain hardening.”

136. Independent Claims 1 and 9 of the ‘023 patent contain a limitation requiring that component “A” have “a slope of strain hardening coefficient greater than or equal to 1.3.”

**Answer:**

Denied. Under the doctrine of equivalents, claim limitations cover their literal scope and equivalent subject matter.

137. All claims of the ‘023 patent contain a limitation that component “A” have a “slope of strain hardening coefficient” at least greater than or equal to 1.3.

**Answer:**

Denied. Under the doctrine of equivalents, claim limitations cover their literal scope and equivalent subject matter.

138. The ‘023 patent states, *inter alia*, at column 7, lines 22-28 that:

> The slope of strain hardening coefficient (SHC) is calculated according to the following equation:
>
> $$SHC = (slope\ of\ strain\ hardening)*(I_2)^{0.25}$$
>
> where $I_2$ =melt index in grams/10 minutes.

**Answer:**

Admitted.

139. The “slope of strain hardening” parameter appearing in the SHC equation defined in the ‘023 patent at column 7, lines 22-28 is disclosed to be determined using “FIG. 1,” wherein “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.”

**Answer:**

Denied.

140. A figure showing a “strain hardening region” is not present in the ‘023 patent.

**Answer:**

This paragraph is vague in that the phrase “strain hardening region” has no context. To the extent this paragraph seeks an admission that in none of the figures of the ‘023 patent is there a representation of a polymer with a strain hardening region, denied.

141. The determination of a "parallel line in the strain hardening region" is not disclosed in the '023 patent.

**Answer:**

Denied.

142. In the prosecution leading to the '023 patent, Dow did not cite any printed publication or public use, as those terms are used in 35 U.S.C. § 102, from prior to April 28, 1993 that contains the SHC definition at column 7, lines 22-28 of the '023 patent.

**Answer:**

Admitted that, upon information and belief, Plaintiff did not cite a printed publication from prior to April 28, 1993 that expressly states: "The slope of strain hardening coefficient (SHC) is calculated according to the following equation: $(slope\ of\ strain\ hardening)*(I_2)^{0.25}$ where $I_2$ =melt index in grams/10 minutes." In all other respects, denied. One or more printed publications cited by Plaintiff and/or the Examiner disclose information defining all parts of the equation as described at column 7, lines 22-28 of the '023 patent.

143. In the prosecution leading to the '023 patent, the Examiners did not cite any printed publication or public use, as those terms are used in 35 U.S.C. § 102, from prior to April 28, 1993, that contains the SHC definition at column 7, lines 22-28 of the '023 patent.

**Answer:**

Admitted that, upon information and belief, the Examiner did not cite a printed publication from prior to April 28, 1993 that expressly states: "The slope of strain hardening coefficient (SHC) is calculated according to the following equation: $(slope\ of\ strain\ hardening)*(I_2)^{0.25}$ where $I_2$ =melt index in grams/10 minutes." In all other respects, denied. One or more printed publications cited by Plaintiff and/or the Examiner discloses information defining all parts of the equation as described at column 7, lines 22-28 of the '023 patent.

144. On information and belief, Dow is not aware of any publication or public use, as those terms are used in 35 U.S.C. § 102, from prior to April 28, 1993, that contains the SHC definition at column 7, lines 22-28 of the '023 patent.

**Answer:**

Admitted that, upon information and belief, Plaintiff is not aware of a printed publication from prior to April 28, 1993 that expressly states: "The slope of strain hardening coefficient (SHC) is calculated according to the following equation: $(slope\ of\ strain\ hardening)*(I_2)^{0.25}$ where $I_2$ =melt index in grams/10 minutes." In all other respects, denied. Plaintiff is aware of one or more printed publications from prior to April 28, 1993 that, singularly or combined, discloses information defining all parts of the equation as described at column 7, lines 22-28 of the '023 patent.

145. The '023 patent indicates that the $I_2$ parameter in the equation at column 7, lines 22-28 has the units of "grams/10 minutes."

**Answer:**

Admitted.

146. On information and belief, prior to April 28, 1993, at least one of the named inventors of the '023 patent was aware of units for the "slope of strain hardening" parameter, as that parameter is used in the '023 patent at column 7, lines 22-28.

**Answer:**

Admitted.

147. The '023 patent does not provide any units for the "slope of strain hardening" parameter in the equation at column 7, lines 22-28.

**Answer:**

Admitted that '023 patent does not expressly state specific units to be used for the "slope of strain hardening" parameter in the equation at column 7, lines 22-28. In all other respects,

denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses units to be used for the “slope of strain hardening” parameter in the equation at column 7, lines 22-28.

148. The ‘023 patent does not provide any units for the “SHC” parameter in the equation at column 7, lines 22-28.

**Answer:**

Admitted that ‘023 patent does not expressly state specific units to be used for the “SHC” parameter in the equation at column 7, lines 22-28. In all other respects, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses units to be used for the “SHC” parameter in the equation at column 7, lines 22-28.

149. In the section of the ‘023 patent entitled “Determination of the Slope of Strain Hardening Coefficient” beginning at column 6, line 52, the ‘023 patent refers to both English units (*e.g.*, psi at column 6, line 59) and metric units (*e.g.*, grams/cm$^3$ at column 7, lines 35-36).

**Answer:**

Admitted.

150. The ‘023 patent does not state whether English or metric units should be used for the “slope of strain hardening” parameter in the equation at column 7, lines 22-28.

**Answer:**

Admitted that there is no express statement whether English or metric units should be used at column 7, lines 22-28. In all other respects, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses when English or metric units are appropriate for the “slope of strain hardening” parameter in the equation at column 7, lines 22-28.

151. The ‘023 patent does not state what units should be used for the “slope of strain hardening” parameter in the equation at column 7, lines 22-28.

**Answer:**

Admitted that there is no express statement stating whether specific units for the “slope of strain hardening” parameter should be used in the equation at column 7, lines 22-28. In all other respects, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the ‘023 patent discloses what units should be used for the “slope of strain hardening” parameter in the equation at column 7, lines 22-28.

152. The ‘023 patent incorporates by reference patents that collectively use multiple different units for the slope of a stress/strain curve, including “lbs./in/ /oz./yd.$^2$” in United States Patent No. 3,458,706, “MPa” in United States Patent No. 4,597,920, “KPa” in United States Patent No. 5,059,481, “GPa” and gm/denier” in United States Patent No. 4,413,110, “psi” in United States Patent No. 4,663,220, and “Kpsi” in United States Patent No. 4,865,902.

**Answer:**

Denied.

153. At column 27, lines 26-29 of U.S. Patent No. 4,413,110, the numerical value reported in units of “GPa” is different from the numerical value reported in “g/d.”

**Answer:**

Admitted that at column 27, lines 26-29 of U.S. Patent No. 4,413,110, that patent states, “[t]he measurement 140 GPa (1587 g/d) . . .” and that the two numerical values “140” and “1587” are different.

154. The numerical value for the SHC parameter in the equation at column 7, lines 22-28 of the '023 patent depends on, *inter alia*, the units used for the "slope of strain hardening" parameter.

**Answer:**

The paragraph is vague and ambiguous in that no polymer is identified. Plaintiff interprets this paragraph to mean that the value for the SHC parameter for all polymers in all situations in the equation at column 7, lines 22-28 of the '023 patent depends on, *inter alia*, the units used for the "slope of strain hardening" parameter. Under this interpretation, denied.

155. The '023 patent does not specify units for the "slope of strain hardening" parameter.

**Answer:**

Denied. The '023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '023 patent discloses appropriate units for the "slope of strain hardening" parameter.

156. On November 1, 1999, the patent application leading to Dow's United States Patent No. 6,723,398 B1 ("the '398 patent") was filed in the United States Patent Office.

**Answer:**

Upon information and belief, admitted.

157. A true and correct copy of the '398 patent is attached hereto as Exhibit A.

**Answer:**

Upon information and belief, admitted.

158. Pack-Wing S. Chum is a named inventor on both the ‘398 patent and the ‘023 patent.

**Answer:**

Admitted.

159. On information and belief, Pack-Wing S. Chum was and/or is an employee of Dow.

**Answer:**

Admitted.

160. On information and belief, Pack-Wing S. Chum was aware of the contents of the specification of the application leading to the ‘398 patent at least by January 10, 2000.

**Answer:**

The term “aware” is vague and ambiguous as used in this paragraph. Admitted that the ‘398 patent states on its face that a Pack-Wing S. Chum was a named inventor of U.S. Patent No. 6,723,398 B1.

161. Osborne K. McKinney prosecuted both the application leading to the ‘398 patent and the application leading to the ‘023 patent.

**Answer:**

Upon information and belief, admitted.

162. On information and belief, Osborne K. McKinney was and/or is an employee of Dow.

**Answer:**

Admitted.

163. The "Utility Patent Application Transmittal" dated November 1, 1999, for the application leading to the '398 patent was signed by Osborne K. McKinney.

**Answer:**

Upon information and belief, admitted.

164. The "Utility Patent Application Transmittal" dated November 1, 1999, for the application leading to the '398 patent was submitted while the application leading to the '023 patent was pending at the United States Patent and Trademark Office.

**Answer:**

Upon information and belief, admitted.

165. The application leading to the '398 patent was not disclosed by or on behalf Dow in the application leading to the '023 patent.

**Answer:**

Admitted that application No. 08/927,393, filed on August 27, 1997, did not reference the later filed application No. 09/430,919, filed on November 1, 1999.

166. The application leading to the '398 patent was not cited by the Examiner in the application leading to the '023 patent.

**Answer:**

Upon information and belief, admitted that the Examiner did not cite application No. 09/430,919, filed on November 1, 1999, in application No. 08/927,393, filed on August 27, 1997.

167. The '398 patent states, *inter alia*, at column 2, lines 45-49 that "FIG. 2 shows the various regions of a typical tensile curve (as load in pounds versus extension in inches) and the particular region used to determine the slope of strain hardening."

**Answer:**

Admitted.

168. The ‘398 patent includes on page 4 “FIG. 2,” which corresponds to the description in the ‘398 patent at column 2, lines 45-49.

**Answer:**

Admitted.

169. “FIG. 2” of the ‘398 patent shows “various stages of the stress/strain curve used to calculate the slope of strain hardening.”

**Answer:**

This paragraph is vague and ambiguous in that no polymer is specified. Admitted that “FIG. 2” of the ‘398 patent illustrates various stages of the stress/strain curve used to calculate the slope of strain hardening” for the polymers that are the subject of Figure 2 of the ‘398 patent. Denied that “FIG. 2” of the ‘398 patent shows “various stages of the stress/strain curve used to calculate the slope of strain hardening” for all polymers in all situations.

170. As depicted in “FIG. 2” of the ‘398 patent, the “Strain Hardening Region” begins before the “point of 10% extension before failure.”

**Answer:**

Admitted that for the polymers that are the subject of “FIG. 2” of the ‘398 patent, the “Strain Hardening Region” may begin before the “point of 10% extension before failure.” Denied, however, that all polymers would behave exactly as illustrated in “FIG. 2” of the ‘398 patent, or that the “Strain Hardening Region” begins before the “point of 10% extension before failure” for all polymers in all situations.

171. The ‘398 patent discloses that a subsection of the “strain hardening region” is used to determine the “slope of strain hardening.”

**Answer:**

Admitted that for the polymers that are the subject of “FIG. 2” of the ‘398 patent, the ‘398 patent discloses that a subsection of the “strain hardening region” can be used to determine the “slope of strain hardening.” Otherwise denied that the ‘398 patent discloses that a subsection of the “strain hardening region” is used to determine the “slope of strain hardening” for all polymers in all situations.

172. The ‘398 patent states, *inter alia*, at column 11, lines 6-11 that:

> The slope of strain hardening is conveniently taken as a line representing a 10 percent secant tangent which is calculated from the failure point to the point where 10 percent extension before the failure point (where 10 percent extension before is equal to 90 percent of the total extension or strain).

**Answer:**

Denied.

173. The ‘023 patent does not disclose that the slope of strain hardening is conveniently taken as a line representing a 10 percent secant tangent which is calculated from the failure point to the point where 10 percent extension before the failure point (where 10 percent extension before is equal to 90 percent of the total extension or strain).

**Answer:**

Admitted that the ‘023 patent does not expressly state that “the slope of strain hardening is conveniently taken as a line representing a 10 percent secant tangent which is calculated from the failure point to the point where 10 percent extension before the failure point (where 10 percent extension before is equal to 90 percent of the total extension or strain).” In all other respects, denied. The ‘023 patent combined with the presumed knowledge of a person skilled in the art at

the time of the effective filing date of the '023 patent discloses how to determine the slope of strain hardening.

174. The '398 patent states, *inter alia*, at column 11, lines 12-15 that:

> A more precise methodology for calculating the slope of strain hardening is performing linear regression analysis using the tensile curve datapoints that represent the last 10 percent extension before the failure point.

**Answer:**

Admitted.

175. The '023 patent does not disclose that a more precise methodology for calculating the slope of strain hardening is performing linear regression analysis using the tensile curve datapoints that represent the last 10 percent extension before the failure point.

**Answer:**

Admitted that the '023 patent does not expressly state that "a more precise methodology for calculating the slope of strain hardening is performing linear regression analysis using the tensile curve datapoints that represent the last 10 percent extension before the failure point." In all other respects, denied. The '023 patent combined with the presumed knowledge of a person skilled in the art at the time of the effective filing date of the '023 patent discloses how to determine the slope of strain hardening.

176. The '398 patent identifies the "line parallel to the strain hardening region" as a "10 percent secant line."

**Answer:**

Denied.

177. The ‘023 patent does not identify the “line parallel to the strain hardening region” as a “10 percent secant line.”

**Answer:**

Admitted.

178. The ‘023 patent does not identify any subsection of the “strain hardening region” from which the “slope of strain hardening,” as those terms are used in the ‘023 patent, is or should be determined.

**Answer:**

Denied.

179. No drawing containing the information in “FIG. 2” of the ‘398 patent related to the region used to determine the “slope of strain hardening” or the units for “slope of strain hardening” is contained in the ‘023 patent.

**Answer:**

Admitted that there are no drawings in the ‘023 patent; there are only computer generated figures.

180. ASTM dimensions for stress/strain curves in accordance with ASTM D-882 are pressure vs. % extension.

**Answer:**

This paragraph is vague and ambiguous. Pressure vs. % extension is not an expression of “dimensions.” The term “ASTM dimensions” is vague and ambiguous as used in this paragraph. Plaintiff consequently lacks information, knowledge, and belief to either admit or deny this averment.

181. The slope of the strain hardening, as depicted in “FIG. 2” in the ‘398 patent has units of “pounds/inch.”

**Answer:**

Admitted.

182. The ‘023 patent does not disclose that “slope of strain hardening” should be in units of “pounds/inch.”

**Answer:**

Denied.

183. The units “pounds/inch” do not correspond to the dimensions of pressure vs. % extension.

**Answer:**

The term “correspond” is vague and ambiguous as used in this paragraph. “Pressure vs. % extension” is not an expression of “dimensions.” Denied that “pounds/inch” can never relate to “pressure vs. % extension.”

184. Subsequent to the November 1, 1999, filing of the application leading to the ‘398 patent, Osborne K. McKinney presented arguments on behalf of Dow in the application leading to the ‘023 patent based on, *inter alia*, values of the “slope of the strain hardening coefficient.”

**Answer:**

Denied.

185. On information and belief, one or more of the named inventors of the ‘023 patent was aware of the preferred subsection of the “strain hardening region” used to determine the “slope of strain hardening” and/or the units to be used in determining that parameter prior to April 28, 1993.

**Answer:**

This paragraph assumes a fact that Dow denies, namely that there was a preferred subsection as of April 28, 1993, of the “strain hardening region” for all polymers in all circumstances or situations for use in determining the “slope of strain hardening.” Denied.

186. On information and belief, one or more attorneys in Dow's Patent Department who participated in the prosecution leading to the '023 patent was aware of the preferred subsection of the "strain hardening region" used to determine the "slope of strain hardening" and/or units to be used in determining that parameter prior to April 28, 1993.

**Answer:**

This paragraph assumes a fact that Dow denies, namely that there was a preferred subsection as of April 28, 1993, of the "strain hardening region" for all polymers in all circumstances or situations for use in determining the "slope of strain hardening." Denied.

187. On information and belief, at the time Dow served its complaint in this action, Dow knew that its '023 failed to furnish a drawing necessary for the understanding of the subject matter sought to be patented.

**Answer:**

Assumes facts that Plaintiff denies: that Plaintiff's '023 failed to furnish a drawing necessary for the understanding of the subject matter sought to be patented. Denied.

188. On information and belief, at the time Dow served its complaint in this action, Dow knew that its '023 patent failed to adequately disclose the SHC parameter recited in each claim of the '023 patent and/or for failed to disclose the best mode for determining SHC because of the omission from the '023 specification of the "FIG. 1" referred to at column 7, lines 22-28.

**Answer:**

Assumes facts that Plaintiff denies: that the '023 patent failed to disclose the SHC parameter and that the '023 patent failed to disclose the best mode for determining SHC. Denied.

189. On information and belief, at the time Dow served its complaint in this action, Dow knew that the '023 patent failed to disclose units for the "slope of strain hardening" parameter that appears in the SHC equation described at column 7, lines 22-28.

**Answer:**

Assumes facts that Plaintiff denies: that the '023 patent failed to disclose units for the "slope of strain hardening" parameter that appears in the SHC equation described at column 7, lines 22-28.

Denied.

190. On information and belief, at the time Dow served its Complaint in this action, Dow knew that the use of different units for the "slope of strain hardening" parameter in the equation

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

would result in different SHC values when calculated using this equation.

**Answer:**

Assumes facts that Plaintiff denies: that different values for SHC would result for all polymers in all circumstances from the use of different units for the "slope of strain hardening" parameter.

Denied.

191. On information and belief, at the time Dow served its complaint in this action, Dow knew that its '023 patent failed to furnish any units for the "slope of strain hardening" parameter that appears in the SHC equation described at column 7, lines 22-28, which units are necessary for calculation of SHC.

**Answer:**

The use of the term "furnish" in this paragraph is vague and ambiguous. To the extent this paragraph seeks an admission that Dow knew that the units for the slope of strain hardening parameter are not disclosed in the '033 patent, this paragraph assumes a fact that Dow denies.

Denied.

192. The claims of the '023 patent are invalid for failure to comply with the conditions for patentability specified by 35 U.S.C. § 101, *et seq*., including sections 102, 103, 112, and/or 113.

**Answer:**

Denied.

**RIGHT TO ASSERT ADDITIONAL COUNTERCLAIMS**

193. NOVA's investigations into the allegations set forth by in Dow's Complaint are ongoing and discovery has not yet commenced. NOVA expressly reserves the right to assert and pursue additional counterclaims.

**Answer:**

Admitted that discovery has not yet commenced. Plaintiff is otherwise without sufficient knowledge or information to admit or deny the allegations.

**PRAYER FOR RELIEF**

For the reasons set forth above, Dow prays for the Court's entry of judgment for it and against NOVA as follows:

Plaintiff incorporates its requested relief in its original Complaint and further requests this Court declare the '053 and '023 patents valid.

MORRIS, NICHOLS, ARSHT & TUNNELL LLP

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September 20, 2006

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CERTIFICATE OF SERVICE

I, Rodger D. Smith II, hereby certify that on September 20, 2005, I caused the foregoing to be electronically filed with the Clerk of the Court using CM/ECF, which will send notification of such filing(s) to the following:

Richard L. Horwitz
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I also certify that copies were caused to be served on September 20, 2006, upon the following in the manner indicated:

**BY HAND**

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