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Paper 77
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CORNING INCORPORATED
Petitioner

v.

DSM IP ASSETS B.V.
Patent Owner

Case IPR2013-00050
Patent 6,323,255 B1

Before FRED E. McKELVEY, GRACE KARAFFA OBERMANN, JENNIFER S. BISK, SCOTT E. KAMHOLZ, and ZHENYU YANG, *Administrative Patent Judges.*

KAMHOLZ, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Petitioner Corning Incorporated ("Corning") filed a petition (Paper 2, "Pet.") to institute an *inter partes* review of claims 1-19 ("the challenged claims") of U.S. Patent No. 6,323,255 B1 (Ex. 1001) ("the '255 patent"). The Board instituted trial for the challenged claims on the following grounds of unpatentability asserted by Corning:

References [1]	**Basis**	**Claims challenged**
Bishop and Trapasso	§ 103	1-7, 12-17, and 19
Bishop, Trapasso, and Szum	§ 103	6
Bishop, Trapasso, Jackson, and Szum	§ 103	8-11
Szum and Trapasso	§ 103	1-8, 12-14, and 16-19
Szum, Trapasso, and Jackson	§ 103	9-11

Decision to Institute 2 (Paper 11, "Dec.").

After institution of trial, Patent Owner DSM IP Assets B.V. ("DSM") filed a Patent Owner Response (Paper 39, "Resp."), and Corning filed a Reply to the Patent Owner Response (Paper 54, "Reply"). DSM filed a Supplemental Response (Paper 60, "Suppl. Resp.") with leave of the Board, and Corning filed a Supplemental Reply (Paper 61, "Suppl. Reply"). DSM filed a Motion for Observations on Cross-Examination of Corning Reply

[1] The references relied upon are: U.S. Patent No. 4,849,462 (Ex. 1002) ("Bishop"); U.S. Patent No. 5,664,041 (Ex. 1003) ("Szum"); U.S. Patent No. 5,554,785 (Ex. 1004) ("Trapasso"); and U.S. Patent No. 4,900,126 (Ex. 1005) ("Jackson").

Declarants (Paper 63, "Obs."), and Corning filed a Response to the Observations (Paper 68, "Obs. Resp.").

DSM also filed a Motion to Amend Claims (Paper 40), which DSM later corrected, with leave of the Board, to make clear that the motion is contingent on a finding that the claims sought to be replaced are unpatentable (Paper 75, "Corr. Mot. to Amend"). In it, DSM proposed claims 20, 21, and 22 to substitute for patented claims 1, 15, and 19, respectively. Motion to Amend 1. Corning filed an Opposition to the Motion to Amend Claims (Paper 53). DSM filed a Reply to the Opposition (Paper 62, "Amend Reply").

DSM also filed a Motion to Exclude certain of Corning's Evidence (Paper 64, "Mot. to Exclude"). Corning filed an Opposition, (Paper 69, "Excl. Opp."), and DSM filed a Reply (Paper 72, "Excl. Reply").

Corning relies upon declarations of Dr. Michael Winningham (Ex. 1006) and Ms. Inna Kouzmina (Ex. 1007) in support of its Petition. DSM relies upon a declaration of Dr. Christopher Bowman (Ex. 2026) in its Response, along with a deposition of Dr. Winningham (Exs. 2021-2025) and portions of Ms. Kouzmina's deposition (Exs. 2018, 2019). Corning relies upon a responsive declaration of Dr. Winningham (Ex. 1029), along with a deposition of Dr. Bowman (Exs. 1030-1035) and a portion of Ms. Kouzmina's deposition (Ex. 1036) in its Reply. DSM relies upon a supplemental declaration of Dr. Bowman in its Supplemental Response (*see*

IPR2013-00052, Ex. 2037).[2] Corning relies upon depositions of Dr. Winningham (Ex. 1038)[3] and Dr. Dotsevi Sogah (Ex. 1037) in its Supplemental Reply.

Oral argument was conducted on February 11, 2014. A transcript is entered as Paper 76.

The Board has jurisdiction under 35 U.S.C. § 6(c). This final written decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Corning has proved that claims 1-19 of the '255 patent are unpatentable.

DSM's Corrected Motion to Amend Claims is *denied*.

DSM's Motion to Exclude Corning Evidence is *denied-in-part* and *dismissed-in-part*.

B. The Invention

The '255 patent is titled "Radiation-Curable Composition" and generally relates to compositions that may be used as, e.g., optical fiber coatings and exhibit "reduced discoloration over time and/or high

[2] The Board denied DSM authorization to file Dr. Bowman's supplemental declaration in this proceeding. Paper 57, 4-5. DSM nevertheless cites to this declaration in support of its Supplemental Response argument. Suppl. Resp. *passim*. We exercise our discretion and address Dr. Bowman's supplemental declaration for the limited purpose discussed below. DSM also cites to a declaration of Dr. Dotsevi Sogah in its Supplemental Response. Supp. Resp. 1 (citing IPR2013-00043, Ex. 1060). We exercise our discretion and consider Dr. Sogah's declaration as well.

[3] Ex. 1038 is a rough transcript. DSM submitted an official transcript as Ex. 2035.

elongation." Ex. 1001, 1:4-7. The compositions in particular include "at least one transesterified and/or high-purity monomer," *id.* at 1:7-9, to which is attributed the improved discoloration and elongation properties. *Id.* at 3:5-13. It is acknowledged in the '255 patent that Trapasso discloses transesterified monomers having "excellent purity," but it is asserted that Trapasso does not disclose the usefulness of these monomers in making optical fiber coatings, nor that they improve the discoloration and elongation properties. *Id.* at 2:20-33. Claims 1 and 17, reproduced below, are the independent claims in the '255 patent and illustrate the claimed subject matter:

> 1. A radiation-curable composition comprising:
> (i) a radiation-curable oligomer; and
> (ii) at least one transesterified monomer, said transesterified monomer having a purity level of greater than 95% and less than 100 ppm of an organotin catalyst;
> (iii) a silane adhesion promoter;
> wherein said composition upon cure has a ΔE value of less than 20 when exposed to low intensity fluorescent light for a period of ten weeks.
>
> 17. A radiation-curable composition comprising:
> (i) a radiation-curable oligomer; and
> (ii) at least one transesterified monomer having a purity level of greater than 95% and less than 100 ppm of an organotin catalyst, said at least one transesterified monomer being selected from the group consisting of isodecyl acrylate, isobomyl acrylate, and phenoxyethylacrylate;
> wherein said composition upon cure has a ΔE value of less than 20 when exposed to low

> intensity fluorescent light for a period of ten weeks.[4]

Claims 2-16 depend directly or indirectly from claim 1, and claims 18-19 depend from claim 17. Claims 2-3 further specify the oligomer. Claims 4-11 specify use of the composition in fiber optics. Claims 12 and 13 further specify the monomer and the silane adhesion promoter, respectively. Claim 14 further requires a photoinitiator. Claims 15, 16, 18, and 19 specify additional material properties of the composition.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Claim terms also are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc*., 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a

[4] The term "isobomyl" in limitation (ii) appears to be a typographical error that instead should have read --isobornyl. *See, e.g.*, Ex. 2028, 116:22 (p. 2 of Amendment dated January 30, 2001).

definition, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

1. "A ΔE value of less than 20 when exposed to low intensity fluorescent light for a period of ten weeks" (claims 1, 17)

Corning argues that curing, under any conditions, followed by any ΔE test protocol satisfying the recited conditions, meets this limitation. Pet. 21. Corning argues, nevertheless, that it followed the curing and ΔE testing procedure as specified at column 16, lines 18-37 in the '255 patent when testing the prior art compounds. Pet. 28 (citing Ex. 1007 ¶¶ 18-19). DSM argues that the limitation should be construed as encompassing this same procedure. Resp. 14-15. The parties agree, therefore, that the scope of this limitation at least includes ΔE measurements made by the procedure specified in the '255 patent. Whatever other measurement protocols this limitation encompasses, it certainly encompasses at least the one measurement protocol that the '255 patent spells out for curing and measuring ΔE. *See Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) ("We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification."). The limitation requires no further construction.

2. "Transesterified monomer" (claims 1, 17)

Corning argues that the term "transesterified monomer" should be construed as "esterified monomer," because the term "transesterified" refers to the process used to make a monomer that contains an ester group, rather than to the chemical composition of the monomer. Pet. 23-24. Corning argues that either a transesterification or a direct esterification reaction

scheme may be employed to make a particular esterified monomer, and that the particular reaction scheme selected does not affect the resulting chemical composition. *Id.* at 24 (citing Ex. 1006 ¶ 93). Corning also argues that "transesterified monomer" should be construed as encompassing "molecules that contain an ester group and an unsaturated group that is capable of polymerization." *Id.* at 26-27 (citing Ex. 1006 ¶¶ 99, 100).

DSM argues that the term should be construed to mean "a monomer diluent prepared by transesterification." Resp. 17. DSM does not challenge Corning's position that an esterified monomer made by transesterification is indistinguishable from the same esterified monomer made by direct esterification. Rather, DSM argues that the two reaction schemes may leave behind different impurities in the monomer, such as leftover reactants or undesired products, which may affect the monomer's performance or the properties of coating compositions made with it. Resp. 17-18 (citing Ex. 2026 ¶¶ 52-58 (citing Ex. 2022, 359:8-360:15; 371:14-372:20)).

Corning asserts (*e.g.*, Pet. 6), and DSM does not deny, that the '255 patent cites Trapasso for its disclosure of transesterified monomers, and incorporates Trapasso by reference. We agree with Corning that the '255 patent cites Trapasso with favor for its teachings of transesterified monomers. *See* Ex. 1001, 2:20-33; 7:33-35. Trapasso's transesterified monomers are, consequently, certainly within the scope of the claim term "transesterified monomers" as that term is used in the '255 patent. *See Oatey*, 514 F.3d at 1276. No further construction of the term is necessary.

3. *"(Meth)acrylate" (claims 2, 3)*

We construed this term as meaning "methacrylate or acrylate" in the Decision to Institute. Dec. 5. We based this construction on testimony by Dr. Winningham that "the parenthetical 'meth' means that the acrylate functionality can be present either as a methacrylate or as an acrylate." Ex. 1006 ¶ 23. Neither party has commented on this interpretation. We maintain it.

4. "Radiation-curable oligomer" (claims 1, 17)

Corning argues that "radiation-curable oligomer" should be construed to encompass "molecules that contain a chain with an unsaturated group capable of polymerization." Pet. 25-26 (citing Ex. 1001, 3:30-42; Ex. 1006 ¶ 98). DSM argues that the term should be given its plain meaning. Resp. 20-21 (citing Ex. 2026 ¶ 62). We agree with DSM. All of the references underlying the instituted challenges concern oligomers that are curable by radiation. No further construction is necessary.

5. "Fiber optic coating composition" (claim 4)

Corning argues that this term should be given no patentable weight because it refers solely to an intended use of the claimed compositions. Pet. 24-25 (citing Ex. 1006 ¶¶ 94, 95). DSM does not address construction of this term in its Response.

We disagree with Corning that the term is to be accorded no patentable weight. It limits the scope of the claim to compositions that are capable of being used to form fiber optic coatings. *See In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). Accordingly, we construe "a fiber optic

coating composition," as that term appears in claim 4, to mean "capable of being used to form a fiber optic coating."

6. "inner primary optical fiber coating composition" (claim 5)

Corning argues that this term should be given no patentable weight because it refers solely to an intended use of the claimed compositions. Pet. 24-25 (citing Ex. 1006 ¶¶ 94, 95).

DSM argues, citing testimony from Corning's expert, Dr. Winningham, that one of ordinary skill would understand that a composition intended for making an inner primary coating would have a "relatively low" modulus and glass transition temperature (Tg), because inner primary coatings are designed to be soft and compliant, to protect the fiber from damage during handling. Resp. 18-20 (citing Ex. 1006 ¶ 15; Ex. 2024, 768:15-25). DSM points out that the '255 patent specifies particular ranges for modulus and Tg for compositions that are formulated for use as an inner or outer primary coating. *Id*. at 19-20 (citing Ex. 1001, 10:58-61; *see id.* at 11:6-10).

The limitation imposes at least the requirement that the claimed composition be capable of the intended use. *See In re Schreiber*, 128 F.3d at 1477. DSM's arguments, however, do not persuade us that the broadest reasonable interpretation in light of the specification should be narrower than this. The words "relatively low" introduce imprecision into the meaning of the claim, rather than eliminate it, because it is not clear to what the properties are compared or how low is low enough.

The specification passages DSM cites for numerical ranges of modulus and Tg do not cure this problem, because they are too imprecise to amount to special definitions. The passages are reproduced below:

> [Compositions after cure] having a modulus in the lower range, for instance, from 0.1 to 10 MPa, preferably 0.1 to 5 MPa, and more preferably 0.5 to less than 3 MPa are typically suitable for inner primary coatings for fiber optics. In contrast, suitable compositions for outer primary coatings, inks and matrix materials generally have a modulus of above 50 MPa, with outer primary coatings tending to have a modulus more particularly above 100 up to 1,000 MPa and matrix materials tending to be more particularly between about 50 MPa to about 200 MPa.

Ex. 1001, 10:58-67.

> Thermal mechanical measurements can be used to optimize the glass transition temperature (Tg) which may be from 10° C. down to -70° C. or lower for compositions formulated for use as inner primary coatings and 30° C. to 120° C. or higher, more preferably above 40° C., for compositions designed for use as outer primary coatings, inks and matrix materials.

Id. at 11:6-12.

First, DSM does not explain which of the several exemplary ranges disclosed for modulus of inner primary coatings is applicable to the claim construction. Moreover, the specification describes those exemplary ranges merely as being "typically suitable." While this passage can be taken as an indication that compositions after cure having moduli in the disclosed ranges are within the claim scope, it does not indicate whether moduli outside the

range are beyond the claim scope. The passage does not amount to a special definition because it lacks reasonable precision. *See In re Paulsen*, 30 F.3d at 1480.

With regard to Tg, the specification again is imprecise, because it states that Tg "may" be in some range. The term "may" indicates that the value can, but need not, be in the disclosed range. Moreover, the range is not specified unambiguously, because the lower bound is given as "-70° C. or lower." This could mean that there is no lower bound at all. DSM has not explained how this ambiguous disclosure amounts to a reasonably precise definition. *Id.*

For these reasons, we construe "an inner primary optical fiber coating composition," as that term appears in claim 5, to mean "capable of being used to form an inner primary optical fiber coating."

7. "Outer primary optical fiber coating composition" (claim 6)

For reasons analogous to those given above, we construe "an outer primary optical fiber coating composition," as that term appears in claim 6, to mean "capable of being used to form an outer primary optical fiber coating."

8. "An elongation at break" (claim 15)

Corning argues that curing under any conditions, followed by an elongation at break test protocol satisfying the recited conditions, meets this limitation. Pet. 21-22. Corning argues, nevertheless, that it followed the curing and elongation-at-break testing procedure as specified at column 15, line 5 to column 16, line 15 in the '255 patent when testing the prior art compounds for elongation at break. Pet. 34 (citing Ex. 1007 ¶¶ 21-26).

DSM argues that the limitation should be construed as requiring that the samples be fully cured by ultraviolet radiation, not simply under any conditions. Resp. 15-16 (citing Ex. 2026 ¶ 50). DSM argues further that the '255 patent describes how to determine cure speed, at column 14, line 50 to column 15, line 3. *Id.* at 16 (citing Ex. 2026 ¶ 50).

Whatever other measurement protocols this limitation encompasses, it certainly encompasses at least the one measurement protocol that the '255 patent provides for curing and measuring elongation at break. *See Oatey*, 514 F.3d at 1276. DSM has not explained the relevance of the "cure speed" disclosure to the construction of the "elongation at break" limitation. The limitation requires no further construction.

9. "A modulus of above 50 MPa"; "a modulus in the range of 0.1 to 10 MPa" (claims 18 and 19, respectively)

The parties agree that these limitations encompass measurements at least of tensile modulus, also known as Young's modulus, as described in the '255 patent. Pet. 23; Resp. 16 (both citing Ex. 1001, 15:5-16:4). Whatever other measurement protocols this limitation encompasses, it certainly encompasses at least the one measurement protocol that the '255 patent provides for curing and measuring tensile modulus. *See Oatey*, 514 F.3d at 1276. The limitation requires no further construction.

B. Reliability of Dr. Winningham's testimony

DSM argues that Dr. Winningham's opinions are unreliable because he "fails to understand" the legal standards for obviousness. Resp. 48-50. In particular, DSM argues that Dr. Winningham gave no consideration to the relevant time period when making obviousness determinations. *Id.* DSM

quotes the following portion of Dr. Winningham's deposition in support of this argument:

> Q. Does the time, does the year make any difference in terms of who that skilled scientist would be in that relevant art?
> A. I'm not making that distinction.
> Q. So at any time?
> A. Yes.

Id. (quoting Ex. 2023, 424:18-23).

Corning dismisses this argument as "hypertechnical" and argues that Dr. Winningham made a thorough analysis of the evidence. Reply 11-12.

We address the admissibility of Dr. Winningham's testimony below in our decision on DSM's motion to exclude evidence. To the extent that DSM's argument goes to the weight to be accorded Dr. Winningham's testimony, it is not persuasive. DSM identifies no particular instances in which Dr. Winningham's silence as to the relevant time period weakens his testimony. We agree with Corning that the thoroughness of Dr. Winningham's testimony outweighs the relatively minor concern DSM expresses. We also are not persuaded that Dr. Winningham made the admission in deposition that DSM argues. DSM's question appears to address whether Dr. Winningham made any distinctions about the qualifications and experience of a skilled scientist over time, not whether Dr. Winningham based his obviousness opinions on the knowledge of that skilled scientist at the time the invention was made. We do not find Dr. Winningham's supposed admission relevant to the issue of whether he failed to consider the relevant time period in his obviousness opinions.

C. Obviousness Based on Bishop

1. Obviousness of claims 1-7, 12-17, and 19 over Bishop and Trapasso

Overview of Bishop

Bishop relates to optical glass fiber coatings curable by ultraviolet light. Ex. 1002, 1:11-15. Bishop describes the incorporation of various organofunctional silanes to improve adhesion of the coating to glass fiber in humid environments, including gamma-mercaptopropyl trimethoxy silane. *Id.* at 1:45-46.[5] Bishop describes several coating compositions based on "Desolite 950-030," which is described as containing urethane acrylate oligomer, *N*-vinyl pyrrolidone, phenoxyethyl acrylate, diethoxyaceto-phenone, and phenothiazine. *Id.* at 3:9-12. The urethane acrylate oligomer is described as being constituted by polypropylene glycol, among other things. *Id.* at 3:12-20.[6] The urethane acrylate oligomer is radiation-curable, as may be inferred from Bishop's disclosure of subjecting the Desolite 950-030 coatings to ultraviolet radiation. *Id.* at 5:40-47. Among the coatings based on Desolite 950-030 is one, identified as "Example 4.4" by Corning (Pet. 28), which further contains mercaptopropyl trimethoxy silane. Ex. 1002, 6:13-18. The diethoxyacetophenone in Desolite 950-030 is

[5] Bishop's disclosure of mercaptopropyl trimethoxy silane as a mercapto functional silane adhesion promoter in optical fiber coatings is acknowledged in the '255 patent at col. 10, ll. 34-36.

[6] The '255 patent indicates that oligomers made from polypropylene glycol contain polyether groups. Ex. 1001, 3:58-4:11.

identified as a photoinitiator, *id.* at 4:38-39, and Bishop discloses that photoinitiators may be used in mixtures, *id.* at 4:43-44.

Overview of Trapasso

Trapasso discloses the use of organotin-catalyzed transesterification reactions for producing acrylate ester monomers, including phenoxyethyl acrylate. Ex. 1004, 1:11-21; 16:15-34. Trapasso explains that the esters have many commercial applications, including as UV coatings and as reactive diluents for radiation curable oligomers. *Id.* at 1:22-35. Trapasso discloses that the acrylate ester monomers, thus prepared, have purity levels greater than about 95% (*id.* at 5:20-30) and contain less than 100 ppm of organotin catalyst (*id.* at 11:24-27). Trapasso also discloses that the high-purity transesterified esters have lower color and enhanced cure rates compared to esters made by direct esterification. *Id.* at 3:18-21; 5:33-35.

Analysis

Corning contends that claims 1-7, 12-17, and 19 would have been obvious over Bishop's Example 4.4 modified by Trapasso's disclosure of high-purity transesterified phenoxyethyl acrylate. Pet. 32. We address the challenged claims in turn.

a. Claim 1

Corning argues that Bishop's Example 4.4 inherently possesses all the material property limitations required by claim 1, as demonstrated by testing recounted in Ms. Kouzmina's declaration. Pet. 28-29. According to Corning, Trapasso suggests the desirability of using high-purity transesterified phenoxyethyl acrylate esters, which have known commercial uses as, e.g., reactive diluents for radiation curable oligomers, due to their lower color and improved cure rate. Pet. 30-31 (citing, *inter alia*, Ex. 1004,

3:18-30). Corning concludes that one of ordinary skill in the art would have found it obvious to use Trapasso's high-purity esters in Bishop's optical coating compositions to obtain these benefits. Pet. 31.

With regard to the requirement in claim 1 that the composition when cured have "a ΔE value of less than 20 when exposed to low intensity fluorescent light for a period of ten weeks," Corning acknowledges that the references do not disclose this property, and instead, argues that the evidence in Ms. Kouzmina's declaration demonstrates it to be inherent in Bishop's Example 4.4. Pet. 28-29. Ms. Kouzmina states that Example 4.4 was prepared "pursuant to the instructions contained in Bishop." Ex. 1007 ¶ 5. The phenoxyethyl acrylate used was prepared by direct esterification without organotin catalyst, not by transesterification, and the resulting monomer had a purity of about 90.4%. Ex. 1007 ¶ 7 n.3. Ms. Kouzmina states that color change tests were conducted on the Example 4.4 composition "in accordance with the procedures set forth in the '255 patent at 16:16–38." Ex. 1007 ¶ 18. The procedure is summarized in paragraph 19 of the Kouzmina Declaration. Results are presented in Table A and show that Example 4.4 had a ΔE value of 8.3 (average of three samples). Ex. 1007 ¶ 20.

Corning acknowledges that the Example 4.4 composition as made and tested does not satisfy the claim limitation that the monomer have a purity level of greater than 95%. Pet. 29. Corning contends, however, that because the resulting composition already satisfies the ΔE limitation, and because Trapasso's high-purity monomer has a lower color than that used in Example 4.4, the composition that would result from modifying Example 4.4 to include Trapasso's high-purity monomer would be expected to continue to satisfy the ΔE limitation. Pet. 31. Corning further supports the argument

that there would have been a reasonable expectation of success with evidence from Dr. Winningham that "[s]killed scientists would have recognized that the beneficial properties Trapasso sets forth with regard to its esterified products have a clear benefit in coatings for optical fibers." Ex. 1006 ¶ 107.[7]

DSM makes several arguments in response: (1) the different impurities that result from transesterification compared to direct esterification may have affected Corning's measured ΔE values, such that Corning's test results indicate nothing about whether the asserted combination of Bishop and Trapasso would have possessed the claimed ΔE value (Resp. 24-30); (2) one of ordinary skill would not have had reason to combine Bishop and Trapasso (Resp. 30-32); and (3) one of ordinary skill would not have had a reasonable expectation of success to achieve the claimed compound from combining Bishop and Trapasso (Resp. 32-35). We address these arguments in turn.

[7] Dr. Winningham states that a "skilled scientist in the art of fiber optic coatings is a person with at least a masters degree in chemistry or material science and engineering, and 5 years of experience in the research, development, or manufacture of optical fiber coatings." Ex. 1006 ¶ 8. Dr. Bowman states that a person of ordinary skill would have a B.S. degree in chemistry, chemical engineering, materials science, or a related field, and 3-5 years' post-graduate experience, including experience in photopolymerization, molecular synthesis, polymer characterization, polymer chemistry, and optical fibers. Ex. 2026 ¶ 42. We adopt Dr. Bowman's description of the level of one of ordinary skill, because it is reasonable and is not challenged by Corning.

(1) Impurities

DSM argues that Bishop's Example 4.4 does not disclose expressly the "transesterified monomer" and "monomer has a purity level of greater than 95%" limitations of claim 1. Resp. 24-25. DSM argues further that Corning's experts did not know what impurities contaminated their reproduction of Bishop's Example 4.4. *Id*. at 25 (citing Ex. 2026 ¶ 77; Ex. 2022, 370:13-24; Ex. 2017, 266:6-17). According to DSM, Dr. Winningham acknowledged that there may have been color bodies and unreactive diluents present, as a result of using a monomer prepared by direct esterification, and that those impurities may have been different from the impurities that would have been introduced by using a monomer prepared by transesterification. *Id.* (citing Ex. 2022, 369:11–372:20; Ex. 2026 ¶ 77 (quoting Ex. 2022, 364:3–365:7)). DSM argues that Corning's test data does not show that Bishop, or Bishop modified to include Trapasso's transesterified monomer, meets the claimed ΔE value, because Corning did not show that its reproduction necessarily contained the same contaminants that the claimed composition would have. *Id.* at 25-26 (citing Ex. 2026 ¶ 78).

DSM also argues that Corning has not established that the monomer it used in preparing samples for testing accurately reflects the purity and composition of the monomer as it existed at the time of invention in 1998. Resp. 26 (citing Ex. 2026 ¶ 79).

Corning argues, in reply, that creating and testing the composition resulting from the combination of Bishop and Trapasso would not have been appropriate, because such a composition did not actually exist in the prior art. Reply 2-3. Corning argues that it demonstrated that Bishop's Example

4.4 satisfied the ΔE value claimed and that, pursuant to Dr. Winningham's testimony, one of ordinary skill would reasonably expect it to continue to satisfy the ΔE value once modified to include a monomer prepared by transesterification. Reply 3-4. Regarding DSM's argument that the monomers Corning used might not have resembled those available in 1998, Corning cites Dr. Winningham's responsive declaration as evidence that (a) Corning used phenoxyethyl acrylate and isobornyl acrylate monomers supplied by Sartomer in preparing its samples, and (b) Dr. Winningham contacted a representative of Sartomer, who confirmed that these monomers are made the same way now (November 2013) as they were then. Reply 4-5 (citing Ex. 1029 ¶¶ 30-32). DSM dismisses this evidence as based on inadmissible hearsay (Paper 63 ¶ 3).

DSM's argument that impurities make Corning's ΔE measurements unreliable is not persuasive, because it fails to address Corning's basic proposition of unpatentability. Corning's principal evidence of the obviousness of combining Bishop and Trapasso comes from Trapasso itself: that Trapasso recognized the use of monomers as diluents in radiation-curable coating compositions, identified various benefits of the substitution of transesterified monomers for direct-esterified monomers, and addressed the same particular monomers as Bishop, including phenoxyethyl acrylate. *See* Pet. 30-31 (citing, *inter alia*, Ex. 1004, 3:18-30). Corning uses the ΔE testing data not for showing a rationale to combine, but rather in partial support of its argument that one of ordinary skill would have had a reasonable expectation of success. *See* Pet. 30-31. Corning also relies on the fact that Trapasso describes an improved synthesis of the same monomer

Bishop uses in Example 4.4—phenoxyethyl acrylate—to argue reasonable expectation of success. *See* Pet. 31.

DSM's argument does not credibly undermine Corning's evidence that one of ordinary skill in the art would have had a reasonable expectation of success in substituting Trapasso's purer version of phenoxyethyl acrylate for that described in Bishop. DSM's argument is also speculative. Dr. Bowman states that direct esterification and transesterification result in different impurities, and Dr. Bowman and Dr. Winningham agree that those impurities may have effects on color (*see, e.g.*, Ex. 2026 ¶ 56; Ex. 2022, 371:14-372:20). But DSM has not cited credible evidence that these differences, even if assumed to exist, would have led one of ordinary skill to doubt that the ΔE value would remain within the scope of claim 1 after substituting Trapasso's phenoxyethyl acrylate for Bishop's.

DSM's argument that Corning failed to show that the "modern" monomers it used were substantially the same as those available in 1998 is unpersuasive because it is entirely speculative. DSM cites no credible evidence on which to base its theory that phenoxyethyl acrylate and isobornyl acrylate are made any differently now than then.

In all, DSM's attacks on the probative value of Corning's replication and testing of Bishop's Example 4.4 do not identify a defect in Corning's theory of unpatentability, which, at heart, does not depend on the testing evidence.

(2) Reason to combine

DSM argues that nothing in Trapasso would have suggested that use of transesterified phenoxyethyl acrylate would have reduced the ΔE value after cure and aging. Resp. 30-32 (citing Ex. 2026 ¶¶ 86, 91; Ex. 1006

¶ 107). In particular, DSM argues that transesterification requires additional steps for synthesis and purification compared to direct esterification. *Id.* at 30. DSM argues that these additional steps "may be disadvantageous from a cost and feasibility perspective and discourage the use of transesterification relative to direct esterification in the absence of any other benefits." *Id.* DSM concludes that these difficulties would have taught away from employing transesterified monomers in Bishop's Example 4.4 coating. *Id.* at 30-31. Dr. Bowman echoes these arguments word-for-word. Ex. 2026 ¶ 91. DSM argues that Trapasso fails to identify any benefits of transesterified monomers for use in fiber optic coatings or for post-cure properties such as elongation or ΔE, a fact specifically noted in the '255 patent. Resp. 30-31 (citing Ex. 1001, 2:20-33 (discussing Trapasso)). At most, says DSM, Trapasso lauds transesterified monomers for their low color before cure and improved double-bond functionality. *Id.* at 30 (citing Ex. 1006 ¶ 107 (discussing Ex. 1004, 3:18-30)).

Corning argues, in reply, that the benefits Trapasso identifies for using transesterified monomers instead of directly esterified monomers are relevant to the making of radiation-curable coating compositions and are sufficient evidence that one of ordinary skill would have had a legitimate technical reason to make the substitution. Reply 8-11. Corning also argues that the reason to combine references need not be the same as the reasons that led the inventor to the claimed subject matter. Reply 7 (citing *In re Fulton*, 391 F.3d 1195, 1202 (Fed. Cir. 2004)).

We agree with Corning on this point. The disadvantages DSM identifies are both speculative and not supported by credible evidence. Dr. Bowman's opinion as to the disadvantages of transesterification repeats

DSM's attorney argument word-for-word. *Compare* Resp. 30-31 *with* Ex. 2026 ¶ 91. Dr. Bowman does not disclose underlying facts or data on which his opinion is based; we give it, therefore, little weight. *See* 37 C.F.R. § 42.65(a).

The mere existence of disadvantages resulting from a modification, moreover, does not refute the obviousness of the modification, especially when the prior art indicates that the modification also offers an advantage. Tradeoffs regarding features, costs, manufacturability, or the like, do not necessarily prevent the combination. *See Medichem, S.A. v. Rolabo, S.L.,* 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine."); *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another."). The disadvantages DSM asserts, when set against the advantages disclosed in Trapasso that Corning identifies, show at most that the choice of transesterification may involve a trade-off of advantages and disadvantages. This trade-off does not amount to a teaching away. *See Medichem, S.A. v. Rolabo, S.L.,* 437 F.3d at 1165.

We agree with Corning, as well, that the rationale put forward for combining references need not follow the inventor's reasoning for making the invention. *See In re Fulton*, 391 F.3d at 1202. In this case, Corning has identified credible reasons—set forth in Trapasso itself—for making the proposed substitution. The prior art need not have appreciated properties

that would have resulted from the combination and that the inventor touts as particular benefits of the invention. *In re Lintner*, 458 F.2d 1013, 1016 (CCPA 1972). Although an appreciation in the prior art of the resulting properties may bolster a finding of obviousness, it is not necessary. *In re Dillon*, 919 F.2d 688, 697 (Fed. Cir. 1990) (en banc).[8]

(3) Expectation of success

DSM argues that one of ordinary skill in the art would not have had a reasonable expectation to achieve a composition having the claimed ΔE value after cure by modifying Bishop with Trapasso, because (a) Trapasso does not teach that its monomers would reduce post-cure yellowing (citing Ex. 2026 ¶ 86), (b) neither Trapasso nor Bishop says anything at all about ΔE values; (c) Corning "has not presented any information that would support that a properly made formulation of Bishop would have had" the claimed ΔE value (citing Ex. 2026 ¶ 89); and (d) Corning's *ex post facto* testing of Bishop to determine a ΔE value for Bishop is impermissible, because obviousness cannot be predicated on what was unknown at the time of invention (citing *In re Newell*, 891 F.2d 899, 901 (Fed. Cir. 1989)). Resp. 32-35.

DSM's arguments are unpersuasive. Arguments (a) and (b) essentially repeat argument (2) and are unpersuasive for the reasons

[8] "Properties . . . *are* relevant to the creation of a *prima facie* case in the sense of affecting the motivation of a researcher to make compounds closely related to or suggested by a prior art compound, but it is not required . . . that the prior art disclose or suggest the properties newly-discovered by an applicant in order for there to be a *prima facie* case of obviousness."

discussed above. Corning's position is not that one of ordinary skill in the art would have thought to use Trapasso's transesterified monomers in Bishop's coating composition in order to achieve a low ΔE value; rather, Corning argues that one of ordinary skill would have thought to use Trapasso's monomers because of a natural preference to start with purer reactants and to avoid the color problems that Trapasso says its monomers avoid.

Argument (d) is an unelaborated reiteration of one of DSM's Preliminary Response arguments, which we found unpersuasive. As explained in the Decision to Institute, Corning does not *predicate* its obviousness challenges on the undisclosed latent property. That is, Corning does not argue that the ΔE value *itself provides the rationale* for combining prior-art references to reach the claimed subject matter. Corning instead predicates the obviousness of combination upon express teachings in the cited references as well as expert testimony. *See* Dec. 10-12.

As to argument (c), Dr. Bowman's declaration paragraph 89 includes the statement "Corning has not presented any information that would support that a properly made formulation of Bishop would have [had the ΔE] characteristic, ..." This statement is a word-for-word reproduction of DSM's argument in the Response. *Compare* Resp. 34 *with* Ex. 2026 ¶ 89. Dr. Bowman does not disclose underlying facts or data on which his opinion is based; we give it, therefore, little weight. *See* 37 C.F.R. § 42.65(a).

In its Supplemental Response, however, DSM asserts that "Corning's GPC [gel permeation chromatography] data does not prove that Corning properly synthesized the prior art oligomers." Supp. Resp. at 5. DSM argues that the GPC data is relevant to this challenge, because Corning used

oligomer RT-15 to replicate Bishop's Example 4.4. *Id.* at 6 (citing Ex. 1034, 1005:18-19; Ex. 2029).

According to Dr. Bowman, when synthesizing an oligomer, the presence of a significant amount of low molecular weight starting materials would indicate an incomplete synthesis. Ex. 2037 (IPR2013-00052) ¶ 7.[9] Dr. Bowman also states that unreacted starting materials can detrimentally impact the functional properties of the resulting coating composition. *Id.* In Dr. Bowman's view, the starting materials of Corning's sample co-eluted with the tracer, which made it "difficult, if not impossible, to determine from these [GPC] spectra whether the oligomer functionalization reaction is complete in Corning's oligomer compositions." *Id.* ¶ 12. Dr. Bowman estimates "there might be 30 or 40 percent of small molecular weight compounds that are present in those [Corning oligomers]." Ex. 1030, 171:16-19.

Corning disagrees. Suppl. Reply 3. Dr. Sogah, an expert for Corning, explains: "The main purpose of analyzing a GPC chromatogram that is run on a GPC designed to assess oligomer formation is to see if oligomer peaks appear in the high molecular-weight region of the chromatogram." Ex. 1060 (IPR2013-00043) ¶ 56.[10] Dr. Sogah states that a skilled polymer chemist would not analyze the low molecular-weight region to confirm oligomer formation. *Id.* ¶ 57. "Even if a skilled scientist were to focus on the low molecular-weight region of the GPC chromatogram[,] . . . there is no

[9] *See supra* note 2.

[10] *See supra* note 2.

information available in the Corning GPC chromatograms in this region to indicate that the oligomer has not been properly formed." *Id.* ¶ 58; *see also id*. ¶¶ 59-60. In Dr. Sogah's opinion, given the highly reactive nature of the reagents used in the oligomer formation, together with the long reaction time Corning used to prepare the oligomers, it would be "highly unlikely" that the unreacted starting materials would be present in amounts of 30-40%, as Dr. Bowman alleges. *Id.* ¶¶ 64-66. Dr. Sogah further points out:

> Additionally, oligomers in general are fairly viscous, to the point that this viscosity is observable to the naked eye. Having 30-40% unreacted HEA [the starting material], or any other liquid, in the final product of an oligomer synthesis would certainly affect the viscosity of the resulting product. A skilled chemist with experience synthesizing oligomers would immediately recognize that such a resulting product does not have the viscosity and other physical attributes associated with a typical oligomer. For example, HEA is volatile and has a very strong, pungent odor which a skilled chemist would almost certainly notice when handling this material. For all the reasons stated above, I think it would be highly unlikely that a skilled chemist with experience in synthesizing oligomers would be confused into thinking that the final "oligomer" product being synthesized actually contained 30-40% small molecular weight compounds, such as unreacted HEA.

Id. ¶ 68.

We find Dr. Sogah's explanation more persuasive. First, after Corning submitted Dr. Sogah's declaration rebutting Dr. Bowman's opinion, DSM cross-examined Dr. Sogah extensively, *see* Ex. 1037, but did not call our attention to any of his deposition testimony in its Motion for

Observations on Cross-examination of Corning Reply Declarants. *See* Paper 63.

More importantly, DSM's scientists do not appear to have given much consideration to the low-molecular-weight region of the GPC spectrum. *See* Ex. 1030, 144:6-147:22. Indeed, when DSM's scientist presented the oligomer test data to Dr. Bowman, she did not include data of the low-molecular-weight region. *See id.* at 146:12-15 ("So the one that I'm sure had been done before it was the di -- the diisocyanate diacrylate. They had run that before. She thought she knew where it should show up, but couldn't pull out that data."); *id.* at 146:20-25 ("And I think the same thing was true of the lauryl acrylate as was true of the diisocyanate diacrylate. She knew from her experience where it would show up, but I again indicated I needed more than her experience, that I wanted see that run as a sample itself . . . ."). Dr. Bowman's account confirms Dr. Sogah's position, i.e., when analyzing a GPC chromatogram to assess oligomer formation, a skilled polymer chemist would focus on the oligomer peaks in the high-molecular-weight region, and not the peaks of the starting materials or tracer in the low-molecular-weight region. Ex. 1060 (IPR2013-00043) ¶¶ 56, 57.

We find that Corning has established that it properly prepared the oligomer it used for testing. DSM has not presented enough evidence to lead us to doubt the quality of Corning's oligomer preparation.

Upon consideration of the arguments and evidence presented, we determine that Corning has demonstrated the unpatentability of claim 1 for obviousness over Bishop and Trapasso. We agree with Corning that Bishop discloses all limitations of claim 1 except for a transesterified monomer

having a purity level of greater than 95% and less than 100 ppm of an organotin catalyst, and that Trapasso discloses the missing features.

We credit Dr. Winningham's testimony that one of ordinary skill in the art would have thought to use Trapasso's transesterified monomer in preparing Bishop's radiation-curable coating composition Example 4.4, because of the benefits Trapasso discloses, including lower color and increased double-bond functionality. *See* Ex. 1006 ¶ 107 (citing Ex. 1004, 3:18-30). We also credit Dr. Winningham's opinion that one of ordinary skill would have had a reasonable expectation of success, because Trapasso describes an alternative technique for producing exactly the same monomer—phenoxyethyl acrylate—as is disclosed in Bishop's Example 4.4 *Id*. ¶¶ 103-105, 108 (citing Ex. 1002, 3:6-20; 5:40-43; Ex. 1004, 16:14-34). Dr. Bowman's opposing testimony that Trapasso's transesterified monomers have disadvantages that would have discouraged their use, *see* Ex. 2026 ¶ 91, is not credible, because it is speculative and unsupported by facts or data. *See* 37 C.F.R. § 42.65(a).

In particular, we agree with Corning that the "ΔE value" limitation is an inherent property for at least one composition that meets all other limitations of claim 1, namely, Bishop's Example 4.4 as modified to include Trapasso's transesterified phenoxyethyl acrylate. We need not rely on Corning's ΔE test data from the replicated Bishop's Example 4.4. The ΔE value would have emerged as a natural consequence of making the combination, even though it might have remained latent and unrecognized. The inventors of the '255 patent did not create something unobvious merely by recognizing a latent property in an otherwise obvious composition. *See In re Kao*, 639 F.3d 1057, 1072 (Fed. Cir. 2011) (affirming holding of

obviousness even where "the only claim element not expressly disclosed in the prior art was the previously-unknown, yet inherent, . . . property.").

Likewise, Corning did not have to show that the prior art recognized the newly-appreciated property discovered by the inventors. *See In re Dillon*, 919 F.2d at 693. It was enough for Corning to show that a single composition within the scope of the claim would have been obvious; it did not need to show that all compositions within the scope of the claim would have been obvious. *See In re Lintner*, 458 F.2d at 1015 ("Claims which are broad enough to read on obvious subject matter are unpatentable even though they also read on nonobvious subject matter.").

For these reasons, we determine that Corning has proved, by a preponderance of the evidence, that claim 1 is unpatentable under 35 U.S.C. § 103(a) for obviousness over Bishop and Trapasso.

b. Claim 17

Claim 17 is the other independent claim in the '255 patent and is identical to claim 1 except that it eliminates the requirement for a silane adhesion promoter and specifies that the transesterified monomer be selected from a group consisting of phenoxyethyl acrylate, among others. Corning's arguments and evidence concerning claim 17 parallel those for claim 1: that Bishop's Example 4.4 possesses all limitations of claim 17 except the purity of the phenoxyethyl acrylate, and that Trapasso's disclosure of the benefits of high-purity phenoxyethyl acrylate would have made the combination obvious. Pet. 28-32. DSM does not direct any of its arguments specifically to claim 17. Upon consideration of the arguments and evidence presented, we determine that Corning has proved the unpatentability of claim 17 under 35 U.S.C. § 103(a) for obviousness over Bishop and Trapasso, by a

preponderance of the evidence, for the same reasons given above with respect to claim 1.

c. Claims 2-7, 12-16, and 19

DSM directs no arguments specifically to any of claims 2-7, 12-16, and 19 with regard to the challenge for obviousness over Bishop and Trapasso. We address these claims in turn.

(1) Claims 2, 3, 12, 13, and 14

These dependent claims each further specify chemical components of the composition of claim 1. Claim 2 specifies that the oligomer is a urethane (meth)acrylate oligomer, and claim 3 further specifies that the (meth)acrylate oligomer of claim 2 comprises at least one polyether, polycarbonate, hydrocarbon, or polyester group. Claim 12 specifies that the monomer is phenoxyethyl acrylate, claim 13 specifies that the silane adhesion promoter is a mercapto functional silane adhesion promoter, and claim 14 specifies that the composition further includes a mixture of photoinitiators.

Corning argues that the "urethane acrylate oligomer" in Bishop's Example 4.4 meets the limitations of claims 2 and 3. Pet. 32. As noted above in II.A.3, we interpret "(meth)acrylate" to mean "methacrylate or acrylate." Bishop's urethane acrylate oligomer therefore satisfies this limitation. As to claim 3, Bishop discloses that the urethane acrylate monomer is constituted by polypropylene glycol. Ex. 1002, 3:16. Dr. Winningham testifies that polypropylene glycol contains a polyether group. Ex. 1006 ¶ 110. We credit Dr. Winningham's testimony and determine that the polypropylene glycol in Bishop's urethane acrylate

monomer contains at least one polyether group and satisfies the limitation of claim 3.

As to claim 12, Corning argues that both Bishop's Example 4.4 and Trapasso disclose the use of phenoxyethyl acrylate as the monomer. Pet. 33. As to claim 13, Corning argues that Bishop's Example 4.4 includes mercaptopropyl trimethoxy silane, which is a mercapto functional silane. *Id.*[11] The limitations of both claims are met.

As to claim 14, Corning acknowledges that Bishop's Example 4.4 contains only one photoinitiator—diethoxyacetophenone—but argues that Bishop elsewhere discloses that "photoinitiators may be used singly or in mixtures." Pet. 34 (citing Ex. 1002, 4:43-45). Corning argues that it would have been obvious to include a second photoinitiator in Example 4.4 in view of Winningham's declaration evidence that it is "common to use multiple photoinitiators" having strong absorbances in different areas of the light spectrum in order to make efficient use of the curing radiation and "increase the cure rate or cure speed." Pet. 34 (quotations from Ex. 1006 ¶ 26). We credit Dr. Winningham's testimony and determine that it would have been obvious to modify Bishop's Example 4.4 to include multiple photoinitiators in order to make efficient use of the curing radiation.

(2) Claims 4-7

Claims 4-6 each depend from claim 1 and specify that the composition of claim 1 is "a fiber optic coating composition," "an inner primary optical fiber coating composition," or "an outer primary optical

[11] *See supra* note 5.

fiber coating composition," respectively. Claim 7 is directed to "a coated fiber optic" having a cured coating formed from the composition of claim 1.

Corning argues that claims 4-6 state mere intended uses of the composition and, therefore, do not further limit claim 1. We disagree with Corning, as discussed above at II.A.5-7, and construe each of these terms as requiring that the composition be capable of being used to form the recited type of coating.

Alternatively, with respect to claims 4 and 5, and also as to claim 7, Corning argues that Bishop expressly discloses the use of Example 4.4 as an optical fiber coating that would be recognized as an "inner primary" coating because it directly contacts the glass fiber. Pet. 32-33 (citing Ex. 1002, 1:31-34; Ex. 1006 ¶¶ 112-113). DSM agrees that an inner primary coating contacts the glass fiber and cites Dr. Winningham's testimony on this point with favor. Resp. 19 (citing Ex. 1006 ¶ 15; Ex. 2024, 768:23-25). We credit Dr. Winningham's testimony and determine that claims 4, 5, and 7 would have been obvious over Bishop and Trapasso.

Corning makes no alternative argument as to claim 6. We determine, therefore, that Corning has not demonstrated the unpatentability of this claim for obviousness over Bishop and Trapasso by a preponderance of the evidence.

(3) Claims 15, 16, and 19

These claims specify further material properties. Claim 15 depends from claim 14 (which depends from claim 1) and requires that the composition have "an elongation at break of at least 110%." Claim 16 depends from claim 1 and requires that the monomer have "an APHA value

of less than 40." Claim 19 depends from claim 17 and requires that the composition, after cure, have "a modulus in the range of 0.1 to 10 MPa."

Regarding claims 15 and 19, Corning argues that its testing of Bishop's Example 4.4 reveals it to have an elongation at break of 124% and a Young's modulus of 2.4 MPa. Pet. 34-36; Ex. 1007 ¶¶ 26-27. Corning argues that modifying Bishop's Example 4.4 to have higher-purity phenoxyethyl acrylate would not be expected to affect these measurements. Pet. 34-36; Ex. 1006 ¶¶ 118, 119. We credit the testimony of Ms. Kouzmina and Dr. Winningham on these points.

Regarding claim 16, Corning points out that Trapasso discloses that its transesterified phenoxyethyl acrylate has an APHA value of 5. Pet. 35 (citing Ex. 1004, 16:14-35). We agree that the monomer of Bishop's Example 4.4, if substituted by phenoxyethyl acrylate as disclosed by Trapasso, would have possessed an APHA value within the claimed limit.

For these reasons, we conclude that Corning has demonstrated the unpatentability of claims 1-5, 7, 12-17, and 19, but not claim 6, under 35 U.S.C. § 103(a) for obviousness over Bishop and Trapasso, by a preponderance of the evidence.

2. Obviousness of claim 6 over Bishop, Trapasso, and Szum

Claim 6 specifies that the composition of claim 1 is "an outer primary optical fiber coating composition." As discussed above at II.A.7, we construe this claim as requiring that the composition is capable of being used to form an outer primary optical fiber coating composition. Corning argues that claim 6 would have been obvious over Bishop and Trapasso in view of Szum's disclosure that when optical fibers have two coatings, the coatings

may be the same. Pet. 37 (citing Ex. 1003, 4:40-47; Ex. 1006 ¶ 123). Corning argues that Szum teaches that an inner primary coating composition such as Bishop's Example 4.4 may also be used to form an outer primary coating composition. *Id.*

DSM argues that Bishop is directed exclusively to inner primary coating compositions because Bishop's compositions include an adhesive for sticking to the glass fiber when placed in contact with it. Resp. 35-37 (citing Ex. 2026 ¶¶ 94, 96-98). DSM argues that Bishop does not disclose the suitability of its compositions for outer primary coating use and that one of ordinary skill would not be motivated to use them for that purpose. *Id.*

DSM's arguments are not persuasive, because they do not address Corning's proposition of unpatentability. Corning does not rely on Bishop for the rationale to use Bishop's Example 4.4 as an outer primary coating composition; rather, it relies upon Szum for the teaching that the same composition may be used to form both inner and outer primary coatings. *See* Pet. 37. DSM acknowledges the disclosure in Szum on which Corning relies but does not explain how Szum is mistaken or why Corning errs in relying upon the cited passage. In particular, DSM does not cite credible evidence to overcome the teaching by Szum that the inclusion of an adhesion promoter in Bishop's compositions, including Example 4.4, makes these compositions suitable for use to form outer primary coating compositions.

For these reasons, we determine that Corning has demonstrated the unpatentability of claim 6 under 35 U.S.C. § 103(a) for obviousness over Bishop, Trapasso, and Szum, by a preponderance of the evidence.

3. Obviousness of claims 8-11 over Bishop, Trapasso, Jackson, and Szum

Claims 8-11 relate to fiber optic ribbon assemblies in which the composition of claim 1 serves various roles. Corning argues that these claims recite non-limiting statements of intended use, and even if such statements are considered limitations, the claims would have been obvious over Bishop, Trapasso, and Szum in view of Szum's and Jackson's disclosures that optical fibers may be ribbonized (citing Ex. 1003, 5:18-19, 29-33; Ex. 1005, 1:11-18), that a coating composition may include a colorant (citing Ex. 1005, 7:21-24), that colorants are also termed "inks" (citing Ex. 1005, 3:44-47), and that fibers can be bound in the ribbon by a UV-curable matrix composition that resembles the primary coating of the fibers (citing Ex. 1005, 3:3-6; 5:37-42; 8:23-34). Pet. 38-40 (also citing Ex. 1006 ¶¶ 125-128 (citing Ex. 1006 ¶ 64)).

In response to this challenge, DSM relies upon its arguments concerning the challenge to claim 1 over Bishop and Trapasso and the challenge to claim 6 over Bishop, Trapasso, and Szum. Resp. 37 (citing Ex. 2026 ¶¶ 100-101). DSM directs no arguments to claims 8-11. Upon consideration of the parties' arguments and evidence, we are persuaded that it would have been obvious to incorporate the claimed coating composition in a ribbon assembly, in view of Szum's and Jackson's disclosures that optical fibers may be ribbonized. We also agree that it would have been obvious to color the composition or to use it to form a matrix material, in view of Jackson's disclosure that these are typical uses for optical fiber coatings. We credit Dr. Winningham's testimony that a coating composition containing a colorant constitutes an ink. *See* Ex. 1006 ¶ 64.

For these reasons, we determine that Corning has demonstrated the unpatentability of claims 8-11 under 35 U.S.C. § 103(a) for obviousness over Bishop, Trapasso, Jackson, and Szum, by a preponderance of the evidence.

D. Obviousness based on Szum

1. Obviousness of claims 1-8, 12-14, and 16-19 over Szum and Trapasso

Overview of Szum

Szum discloses "improved curable coating compositions for glass substrates and . . . glass substrates, such as optical fibers, coated with the compositions." Ex. 1003, 1:11-13. Szum teaches several examples of compositions, some of which are described as inner primary fiber optic coatings, and others of which are described as outer primary fiber optic coatings. *Id.* at 10:17-13:45. Among them is "Example 1," which includes a radiation-curable oligomer (formed from 2-hydroxy ethyl acrylate, toluene diisocyanate, and a polypropylene glycol diol), an esterified monomer (phenoxyethyl acrylate), a single photoinitiator (1-hydroxycyclohexyl phenyl ketone), and a mercapto functional silane adhesion promoter (gamma mercaptopropyl trimethoxy silane), among other things. *Id.* at 10:16-33. Szum's Example 4 includes a radiation-curable oligomer (formed from 2-hydroxy ethyl acrylate, toluene diisocyanate, and a polytetramethylene glycol diol), an esterified monomer (phenoxyethyl acrylate), and two photoinitiators (1-hydroxycyclohexyl phenyl ketone and 2,4,6-trimethyl benzoyl diphenyl phosphine oxide), among other things. *Id.* at 11:11-29.

Analysis

Corning contends that claims 1-8, 12-14, and 16-19 would have been obvious over Szum's example compositions modified by Trapasso's disclosure of high-purity transesterified phenoxyethyl acrylate. Pet. 40-50. Specifically, Corning argues that claim 1 would have been obvious over Szum's Example 1 modified by Trapasso, and claim 17 would have been obvious over any of Szum's Examples 1, 2, or 4, modified by Trapasso. *Id.* at 42. The argument is largely analogous to that based upon Bishop's Example 4.4 as modified by Trapasso. Ms. Kouzmina testified that the Szum example compositions were synthesized and subjected to tests to determine their material properties, including ΔE value (claim 1) and modulus. We address the challenged claims in turn.

a. Claim 1

Just as it argued in the Bishop/Trapasso challenge, Corning here argues that Szum's Example 1 meets all chemical limitations of claim 1 except that of the monomer having a purity level of greater than 95%, and that it meets the ΔE limitation, after cure, as evidenced by testing. Pet. 40-45. Ms. Kouzmina describes the preparation of the Szum examples in paragraphs 9-17 of her Declaration and the testing for ΔE in paragraphs 18-20. The results of testing are reported in paragraph 20 and indicate that Szum's Example 1 has a ΔE value of 5.9, which is less than 20, as required by claim 1. Ex. 1007 ¶ 20.

Corning argues that it would have been obvious to substitute Trapasso's high-purity monomers for those used in Szum's Example 1, for reasons analogous to those given in the Bishop/Trapasso challenge. Pet. 43-44. DSM's arguments opposing this challenge are nearly identical in

reasoning to those given in response to the Bishop/Trapasso challenge. Resp. 37-48. They are equally unpersuasive here, for reasons analogous to those discussed above at II.C.1.a. The only new argument appears on pages 41-42 of the Response, in which DSM argues that Szum does not specify how the phenoxyethyl acrylate is to be synthesized, and that it is possible to have made it in the presence of an organotin catalyst, such that residual catalyst would have exceed the 100 ppm limit claimed. Resp. 41-42 (citing Ex. 2022, 357:18-23; Ex. 1004, 1:11-14; Ex. 2026 ¶ 111). This argument is also unpersuasive, because it is not directed to Corning's basic proposition of unpatentability. Corning relies on Trapasso's specific teaching that monomers can be prepared by transesterification such that less than 100 ppm of organotin catalyst remains. *See* Pet. 42:13-15 (citing Ex. 1004, 11:24-27).

DSM also argues, in its Supplemental Response, that Corning did not prove that it formulated oligomer RT-05 (Szum's Examples 1 and 2) or oligomer RT-32 (Szum's Examples 4) correctly. Suppl. Resp. 6 (citing Ex. 1034, 1004:24-25, 1007:8-15; Exs. 2030-2034). We are not persuaded by this argument, for reasons given above at II.C.1.a(3).

Upon consideration of the arguments and evidence presented, we determine that Corning has demonstrated the unpatentability of claim 1 for obviousness over Szum and Trapasso, for essentially identical reasons as discussed above with regard to the challenge based on Bishop and Trapasso. We agree that the references, taken together, disclose all limitations of claim 1, and that the "ΔE value" limitation is an inherent property that would have emerged as a natural consequence of making the combination, even though it might have remained latent and unrecognized. *See In re Kao*, 639 F.3d at 1072.

For these reasons, we determine that Corning has proved that claim 1 is unpatentable under 35 U.S.C. § 103(a) for obviousness over Szum and Trapasso, by a preponderance of the evidence.

b. Claims 2-8, 12-14, and 16

Regarding claims 2 and 3, we agree with Corning that the oligomer in Example 1 is an acrylate and that it includes at least one polyether group by virtue of its containing polypropylene glycol. As to claims 4-8, we agree with Corning that Szum discloses the use of its compositions for making fiber optic coatings, inner primary coatings, outer primary coatings, and ribbon assemblies. We agree with Corning that the phenoxyethyl acrylate in Example 1 meets the recitation of claim 12 and that the gamma mercaptopropyl trimethoxy silane meets the recitation of claim 13. We are persuaded by Corning's argument regarding claim 14 that it would have been obvious to modify Example 1 to include a second photoinitiator, for reasons given above in II.C.1.c(1). As to claim 16, we are persuaded by Corning's argument that Szum's Example 1, if modified to include Trapasso's high-purity phenoxyethyl acrylate, would include a monomer that has an APHA value of less than 40. *See* II.C.1.c(3), *supra*.

c. Claims 17-19

Corning's arguments and evidence concerning claim 17 parallel those for claim 1: that Szum's Examples 1, 2, or 4 each possess all limitations of claim 17 except the purity of the phenoxyethyl acrylate, and that Trapasso's disclosure of the benefits of high-purity phenoxyethyl acrylate would have made the combination obvious. Pet. 40-45. DSM does not direct any of its arguments specifically to claim 17. Upon consideration of the arguments and evidence presented, we determine that Corning has proved the

unpatentability of claim 17 under 35 U.S.C. § 103(a) for obviousness over Szum and Trapasso, by a preponderance of the evidence, for the same reasons given above with respect to claim 1.

As noted above, the testing reported in Ms. Kouzmina's declaration shows that Example 1 has a ΔE value of 5.9, which is within the limit recited in claim 17. *See* Ex. 1007 ¶¶ 18-20. Example 1 otherwise meets the chemical limitations of claim 17 if modified to include Trapasso's high-purity phenoxyethyl acrylate. Ms. Kouzmina also reports that tests of replicated Szum's Example 1 indicated a modulus of 4.6 MPa, which is within the limit recited in claim 19. *See* Ex. 1007 ¶¶ 21-25, 27.
Ms. Kouzmina further reports that Szum's Examples 2 and 4 were prepared (Ex. 1007 ¶¶ 12-17) and tested for ΔE (¶¶ 18-20) and for modulus (¶¶ 21-27). Testing shows that Example 2 has a ΔE value of 2.7, which is within the limit recited in claim 17, and a modulus of 733 MPa, which is within the limit of claim 18. Example 4 similarly has a ΔE value of 1.5, which is within the limit recited in claim 17, and a modulus of 677 MPa, which is within the range recited in claim 18.

For these reasons, we conclude that Corning has demonstrated the unpatentability of claims 1-8, 12-14, and 16-19 under 35 U.S.C. § 103(a) for obviousness over Szum and Trapasso, by a preponderance of the evidence.

2. Obviousness of claims 9-11 over Szum, Trapasso, and Jackson

Corning argues that claims 9-11 are unpatentable for obviousness over Szum, Trapasso, and Jackson for reasons similar to those given in the challenge of these claims for obviousness over Bishop, Trapasso, Szum, and Jackson. Pet. 50-51. DSM directs no arguments specifically to these claims.

Resp. 48. Upon consideration of the parties' arguments and evidence, we are persuaded that these claims would have been obvious, for the same reasons as given above in II.C.3.

III. MOTION TO AMEND

A. DSM's Burden

An *inter partes* review is neither a patent examination proceeding nor a patent reexamination proceeding. The proposed substitute claims, in a motion to amend, are not entered automatically and then subjected to examination. Rather, the substitute claims will be added directly to the patent, without examination, if the patent owner's motion to amend claims is granted. The patent owner is not rebutting a rejection in an Office Action, as though this proceeding were a patent examination or a patent reexamination. Instead, the patent owner bears the burden of proof in demonstrating adequate written description support and patentability of the proposed substitute claims over the prior art, and thus entitlement to add these proposed substitute claims to its patent.

B. Proposed Claims

DSM's proposed claims are listed below, with additions underlined and deletions struck-through:

> Claim 20 (Proposed substitute for claim 1): A radiation-curable composition comprising:
> (i) a radiation-curable oligomer; and
> (ii) at least one transesterified monomer, said transesterified monomer having a purity level of greater than 95% and less than 100 ppm of an organotin catalyst;
> (iii) a silane adhesion promoter;

> wherein said composition upon cure has a modulus of 1.4 MPa or less and a ΔE value of less than 20 when exposed to low intensity fluorescent light for a period of ten weeks.
>
> Claim 21 (Proposed substitute for claim 15): The composition of claim 14, wherein said composition, after cure, has an elongation at break of at least ~~110~~ 130%.
>
> Claim 22 (Proposed substitute for claim 19): The composition of claim 17, wherein said composition, after cure, has a modulus ~~in the range of 0.1 to 10~~ of 1.4 MPa or less.

Corr. Mot. to Amend 1-2.

C. Written Description

DSM states that support for the amendments may be found in the original application (Ser. No. 09/163,188, Ex. 2028) as follows:

Proposed claim	Limitation	Citation to Orig. Appl.
20	"modulus of 1.4 MPa or less"	33: Table 1
21	"elongation at break of at least 130%"	25:19-26:4
22	"modulus of 1.4 MPa or less"	33: Table 1

Corr. Mot. to Amend 2. DSM cites the Bowman Declaration, paragraphs 127-131, 139-142, and 149-154, as "further elaborat[ing]" on written

description support.[12] *Id.* Of those paragraphs, only paragraphs 130, 142, 153, and 154 directly address support for the limitations proposed to be added.

1. "Modulus of 1.4 MPa or less"

This limitation appears in proposed claims 20 and 22. In its motion to amend, DSM points to Table 1 as providing support for this limitation. Corr. Mot. to Amend 2. Paragraphs 130, 153, and 154 of Dr. Bowman's declaration also relate to this limitation. In those paragraphs, Dr. Bowman cites the following passage from the original application in support of the proposed limitation:

> The radiation-curable compositions of the present invention may be formulated such that the composition after cure has a modulus as low as 0.1 MPa and as high as 2,000 MPa or more. Those having a modulus in the lower range, for instance, from 0.1 to 10 MPa, preferably 0.1 to 5 MPa, and more preferably 0.5 to less than 3 MPa are typically suitable for inner primary coatings for fiber optics.

Ex. 2026 ¶¶ 130, 154 (citing Ex. 2028 25:10-14); Ex. 1001, 10:55-61.

In paragraphs 130 and 154, Dr. Bowman also states that the original application provides "much additional support for and detailed discussions relating to" the "1.4 MPa or less" limitation proposed for claims 20 and 22, but he does not identify or explain what that support may be, beyond a

[12] DSM's relegation to a declaration of its detailed explanation of written description amounts to an attempt to circumvent its page limit. We exercise our discretion, nevertheless, and consider this evidence.

general citation to pages 7 through 16 of the original application. Ex. 2026 ¶¶ 130, 154 (citing Ex. 2028, 7:8-16:20). Although Dr. Bowman does not explain what disclosure in this extended section of the application relates to a modulus limit of 1.4 MPa, we exercise our discretion to consider this portion of the application. We do not find, however, any reference at all to modulus, let alone the particular numerical limitation of 1.4 MPa.

The sole reference to "1.4 MPa" in the evidence relied upon by DSM occurs in Table 1, which is reproduced below from page 33 of the original application. The table lists modulus, reported in MPa, in the next-to-last row and shows that both Example 1 and Comparative Example A have a modulus of 1.4 MPa:

Components	Example 1	Comparative Example A
Aliphatic Polyether Urethane Acrylate Oligomer	65.40	65.40
Phenoxyethyl Acrylate (Sartomer)	--	20.00
Transesterified, High-purity Phenoxyethyl Acrylate* (CPS)	20.00	--
Monofunctional Acrylate Diluent	10.00	10.00
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide (LUCIRIN TPO)	3.00	3.00
IRGANOX 1035 (Ciba Geigy)	0.50	0.50
γ-mercaptopropyltrimethoxy silane	1.00	1.00
Polyether modified dimethylpolysiloxane (BYK 333)	0.1	0.1
PROPERTIES		
Viscosity (mPa·s)	7770	7770
Cure Speed (J/cm^2)	0.65	0.67
Tensile strength (MPa)	1.00	0.8
Elongation (%)	186	153
Modulus (MPa)	1.40	1.4
ΔE (low intensity fluorescent) @ week 7	14	31

Table Notes:
*CPS Chemical Company, Inc. specifies that this monomer has a minimum purity of 98% (as analyzed using the 11 meter RTx200 column).

Aside from bare assertions that this disclosure supports the proposed limitation, DSM makes no credible argument for how the measurement of this property in one example demonstrates possession of the genus of compositions encompassed by the "modulus of 1.4 MPa or less" limitation. *See Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1349 (Fed. Cir. 2010) ("[T]he specification must demonstrate that the applicant has made a generic invention that achieves the claimed result and do so by showing that the applicant has invented species sufficient to support a claim to the functionally-defined genus."). DSM has not explained how a single example is sufficient basis on which to base the proposed claim.

Other examples in the '255 also exhibit a modulus of less than 1.4 MPa. In particular, Examples 2 and 3 in Table 2 are reported as having moduli of 0.9 MPa and 1.1 MPa, respectively. Corr. Mot. to Amend 4; Ex. 1001, 14:19-42. DSM argues that one of ordinary skill would recognize the benefits of coatings having moduli in the range of 1.4 MPa to 0.9 MPa. Corr. Mot. to Amend 5. But Examples 1, 2, and 3 do not provide sufficient written description support for the proposed limitation, because more than half the claimed modulus range is not exemplified. At best, Examples 1, 2, and 3 might support a limitation of 0.9 MPa to 1.4 MPa (though we do not make such a determination), but not the full scope of the proposed modulus limitation set out in the substitute claims. *See Ariad*, 598 F.3d at 1349.

Nor do the "typically suitable" modulus ranges Dr. Bowman cites from the '255 patent provide adequate written description for the proposed substitute claims. *See* Ex. 2026 ¶ 130, 154. The disclosed ranges are 0.1 to 2,000 MPa or more; 0.1 to 10 MPa; 0.1 to 5 MPa; and 0.5 to less than 3 MPa. *Id*. None of these ranges specifies the 1.4 MPa upper limit of the

proposed substitute claim. Nor do any of the ranges indicate that the range has no lower limit; they all instead specify a non-zero lower limit. DSM has not explained persuasively how any of these ranges show possession of a composition having a modulus in the proposed range. *See In re Ruschig*, 379 F.2d 990, 995 (CCPA 1967) (explaining need for "blaze marks" in the specification to single out written description for claims narrowed by amendment).

Nor has DSM explained persuasively how the generic disclosure, in combination with the specific examples, provides adequate written description support for the proposed subgenus modulus limitation set out in the substitute claims. *See In re Smith*, 458 F.2d 1389, 1394-95 (CCPA 1972) (disclosure of genus and one species is not necessarily sufficient description of intermediate subgenus).

DSM argues that Corning's failure to refute Dr. Bowman's declaration evidence as to the proposed substitute claims is "fatal" to Corning's opposition. Amend Reply 1-2. We disagree. As the moving party, DSM bears the burden of proof to establish that it is entitled to the relief requested. *See* 37 C.F.R. § 42.20(c). As explained above, we have determined that DSM's argument and Dr. Bowman's evidence do not establish that the disclosure in the '255 patent adequately supports the proposed substitute claims. Corning's failure to rebut DSM's evidence does not undercut our determination.

For these reasons, we determine the DSM has failed to show adequate written description support for proposed substitute claims 20 and 22. We do not reach the issue of whether DSM has shown patentability over the prior art of proposed substitute claims 20 and 22.

2. "Elongation at break of at least 130%"

This limitation appears in proposed substitute claim 21. In its motion to amend, DSM points to page 25, line 19 through page 26, line 4 of the application as filed as providing support for this limitation. Corr. Mot. to Amend 2. Dr. Bowman also cites this portion of the application in support of the limitation, as well as Table 2, on page 34 of the application. Ex. 2026 ¶ 142. The passage on pages 25 and 26 discloses:

> Elongation and tensile strengths of these materials can also be optimized depending on the design criteria for a particular use. For cured coatings formed from radiation-curable compositions formulated for use as an inner primary coating on optical fibers, the elongation is typically greater than 100 %, more preferably the elongation is at least 110%, more preferably 120%.

See also Ex. 1001 10:67-11:6. Table 2 lists two examples, of which only one (Example 3) reports an elongation at break of at least 130%.

As with the modulus limitation of proposed claims 20 and 22, DSM has failed to show that the '255 patent provides adequate written description for a claim that specifies an elongation at break of at least 130%. The specification passage quoted above does not mention 130%. Neither DSM nor Dr. Bowman explains how one of ordinary skill in the art would have interpreted that passage as unambiguously disclosing a range of "at least 130%." *See In re Ruschig*, 379 F.2d at 995. And being only one example in a larger genus, Example 3 is insufficient, by itself, to demonstrate possession of the full scope of the proposed substitute claim. *See Ariad*, 598 F.3d at

1349. DSM's argument that Corning failed to submit rebuttal evidence is unpersuasive, as explained above.

For these reasons, we determine the DSM has failed to show adequate written description support for proposed substitute claim 21. We do not reach the issue of whether DSM has shown patentability over the prior art of proposed substitute claim 21.

IV. MOTION TO EXCLUDE

A. Burden of the Moving Party

A party moving the exclusion of evidence bears the burden of proving its entitlement to the relief requested. 37 C.F.R. § 42.20(c).

B. DSM's Objections

DSM presents five objections to categories of evidence and requests exclusion of each of those five categories. Mot. to Exclude 1-2.[13] We consider each objection in turn.

1. Testimony by Dr. Winningham Concerning ΔE

DSM seeks to exclude testimony by Dr. Winningham that the prior-art coatings possess the claimed ΔE value. Mot. to Exclude 1. DSM identifies the evidence to exclude as "found, for example, in paragraphs 101, 104, 120, 122, 124, 125, 128, 129, 134, 141, 154, 156, and 158 of Exhibit 1006 and associated charts therein." *Id.* n.1. DSM argues that the evidence should be

[13] DSM presents a bulleted list of objections, rather than identifying them by number. For purposes of this decision, we consider the objections as if numbered in the order presented.

excluded for unreliability, because Dr. Winningham failed to take into account whether the impurities in the monomers Corning used to replicate the prior-art coatings accurately represent the impurities in the monomers available at the time the claimed invention was made. *Id.* at 3, 6-7. DSM argues that this omission "fatally undermines" the basis of his testimony. *Id.* at 7.

DSM's challenge to this evidence suffers from several defects. First, DSM does not identify properly the evidence it seeks to exclude. DSM lists several paragraphs from Dr. Winningham's Petition Declaration as "example[s]" of evidence it seeks to exclude. *See* Mot. to Exclude 1. We will not engage in guesswork, or scour the record, to determine what other evidence falls within this category. Accordingly, we regard this category as encompassing only those paragraphs identified by number in the motion.

Second, DSM's motion fails to identify where in the record Corning relies upon this evidence. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767, Sec. K (Aug. 14, 2012). We require this information in order to determine the effect that exclusion of the evidence will have on the proponent's case. DSM's failure to identify where this evidence is relied upon undermines our efforts to secure the just, speedy, and inexpensive resolution of this proceeding. *See* 37 C.F.R. § 42.1(b).

Third, DSM does not make clear the nature of the unreliability it asserts, i.e., whether the unreliability lies in the principles and methods Dr. Winningham employed in producing the testimony, or in his application of those principles and methods to facts of the case. *See* FED. R. EVID. 702. In particular, DSM does not explain what principle Dr. Winningham improperly employed or applied in failing to consider differences between

the impurities of monomers made at the time of invention and of those made now.

Fourth, DSM comes forward with no credible evidence to support its objection. DSM relies only on the testimony of Dr. Bowman that Corning provided no evidence that modern monomers mimic those available in 1998. *See* Resp. 26 (citing Ex. 2026 ¶ 79). This testimony does not explain why the absence of evidence on this issue undermines the reliability of Dr. Winningham's testimony to a degree requiring exclusion. In short, we discern nothing in the record to indicate that DSM's "now-versus-then" objection is anything more than sheer speculation.

For these reasons, we overrule DSM's first objection.

2. Testimony by Dr. Winningham Concerning Obviousness

DSM seeks to exclude testimony by Dr. Winningham concerning obviousness of the challenged claims over various prior-art combinations. Mot. to Exclude 1. DSM identifies the evidence to exclude as "found, for example, in paragraphs 106-109, 110-119, 121, 123, 126-127, 129, 136-153, 155, 157, and 159 of Exhibit 1006 and associated charts therein." *Id.* n.2. DSM argues that Dr. Winningham's testimony concerning obviousness is unreliable because (a) Dr. Winningham does not explain the legal framework he employed in reaching his opinions, including the level of ordinary skill, and (b) he does not address the proper time frame for assessing obviousness. Mot. to Exclude 5. DSM does not address issue (a) further in its motion. As to issue (b), DSM argues that Dr. Winningham did not attach any significance to the point in time at which obviousness is to be

assessed, and did not appreciate that obviousness is to be assessed at the time the invention was made. *Id.* (citing Ex. 2023 424:18-23).[14]

Corning argues that Dr. Winningham focused his analysis on technology as it existed in November 1996, and that Dr. Winningham does not rely on any knowledge gleaned after the September 1998 filing date of the '255 patent. Excl. Opp. 2 (citing Ex. 1006 ¶ 10). DSM responds that Dr. Winningham admitted he did not take the prior time frame into account and that in at least one instance, Dr. Winningham "appears to have relied" on teachings in the '255 patent in forming his opinion on obviousness. Excl. Reply 2 (citing Ex. 2023 424:18-23; Ex. 1006 ¶¶ 38, 41-64, 108, 138).

DSM again identifies the challenged evidence by reference to "example" paragraphs rather than with unambiguous specificity. We regard DSM's challenge as being limited to the particular paragraphs identified by number and no others. DSM also does not identify where in its Petition Corning relies on the challenged evidence.

We are not persuaded by DSM that Dr. Winningham failed to base his obviousness testimony on a proper legal standard. Dr. Winningham provided a detailed discussion of the state of the art prior to the filing of the '255 patent (Ex. 1006 ¶¶ 8-31). We agree with Corning that Dr. Winningham's testimony was given with awareness of the filing date of the '255 patent (*see* Ex. 1006 ¶ 32) and with reference to the state of the art prior to that time. *See* Ex. 1006 ¶ 10 (providing overview of relevant

[14] The cited evidence is taken from the deposition of Dr. Winningham and is reproduced in section II.B, above.

technology as of November 1996). We are unpersuaded that Dr. Winningham admitted to failing to take the correct time frame into account for obviousness, as discussed above in section II.B.

We also are not persuaded by DSM's arguments that Dr. Winningham's obviousness testimony is unreliable because he "appears to have relied" on teachings from the '255 patent to rationalize the asserted prior-art combinations. The question of whether Dr. Winningham's opinions possibly were skewed by hindsight bias goes to the weight his evidence is accorded, not its admissibility.

For these reasons, we overrule DSM's second objection.

3. Dr. Winningham's Responsive Declaration

DSM seeks to exclude the entirety of Dr. Winningham's Responsive Declaration (Ex. 1029) as exceeding the scope of reply and, with respect to paragraphs 30-32, as hearsay and unreliable. Mot. to Exclude 1. DSM's argument in the motion does not, however, address any portion of Dr. Winningham's Responsive Declaration other than paragraphs 30-32. We regard this challenge as being limited to those three paragraphs.

We do not rely on paragraphs 30-32 of Dr. Winningham's Responsive Declaration in our final written decision. Because we do not rely on that evidence, we dismiss DSM's third objection as moot.

4. Testimony by Dr. Winningham Concerning Preparation of Prior-Art Coatings

DSM seeks to exclude testimony by Dr. Winningham that Corning accurately reproduced certain prior-art examples of optical fiber coatings. Mot. to Exclude 2. DSM identifies the evidence to exclude as "found, for

example, in paragraphs 66 and 68-71 of Exhibit 1006" and "the testimony (see above) relying on those samples." *Id.* & n.2. DSM argues that this testimony is unreliable because Dr. Winningham did not state that he reviewed any underlying data in giving his opinions as to the fidelity of Corning's reproduction of the prior-art coatings. Mot. to Exclude 10. DSM also argues that Corning did not disclose the underlying data in its petition, contrary to 37 C.F.R. § 42.65(a), such that all testimony relating to the reproduced compounds is without basis and should be excluded. *Id.* at 11.

DSM again identifies the challenged evidence by reference to "example" paragraphs rather than with unambiguous specificity. DSM's reference to "see above" for additional challenged testimony is also ambiguous, because the challenged testimony is not identified. We regard DSM's challenge as being limited to the particular paragraphs identified by number and no others. DSM also does not identify where in its Petition Corning relies on the challenged evidence.

DSM does not persuade us that Dr. Winningham's silence as to whether he considered underlying data is a sound basis on which to exclude expert testimony. The degree to which an expert discloses the facts or data on which an opinion is based affects the weight accorded the expert's testimony, not to its admissibility. 37 C.F.R. § 42.65(a).

For these reasons, we overrule DSM's fourth objection.

5. Corning's Supplemental Reply

DSM seeks to exclude Corning's Supplemental Reply (Paper 61) and the evidence filed with it (Exs. 1037-1038) on the basis that both exceed the scope of DSM's Supplemental Response. Mot. to Exclude 2. DSM does not

identify any portion of the Supplemental Reply that exceeds the scope of reply; rather, DSM argues that Corning's submission of transcripts of depositions of Dr. Winningham (Ex. 1038) and Dr. Sogah (Ex. 1037) were not authorized. Mot. to Exclude 13. We regard DSM's challenge as limited to these two exhibits, because they are the only material that DSM identifies with particularity.

DSM's objection to these exhibits is moot. As to Exhibit 1038, the objection is moot because DSM resubmitted the transcript of Dr. Winningham's deposition as Exhibit 2035. As to Exhibit 1037, the objection is moot because we do not rely on any evidence contained in it in the final written decision.

For these reasons, we dismiss DSM's fifth objection as moot.

DSM has not shown that it is entitled to exclusion of any of the challenged evidence. DSM's motion to exclude will be denied as to the overruled objections and dismissed as moot as to the other objections.

V. CONCLUSION

Corning has proved, by a preponderance of the evidence, that claims 1-19 of U.S. Patent No. 6,323,255 B1 are unpatentable. In particular, Corning has shown that:

1. Claims 1-5, 7, 12-17, and 19 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Bishop and Trapasso;
2. Claim 6 is unpatentable under 35 U.S.C. § 103(a) for obviousness over Bishop, Trapasso, and Szum;
3. Claims 8-11 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Bishop, Trapasso, Jackson, and Szum;

4. Claims 1-8, 12-14, and 16-19 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Szum and Trapasso; and
5. Claims 9-11 are unpatentable under 35 U.S.C. § 103(a) for obviousness over Szum, Trapasso, and Jackson.

DSM has not shown that it is entitled to claim the subject matter of proposed substitute claims 20-22.

DSM has not shown that it is entitled to exclusion of any challenged Corning evidence.

VI. ORDER

For the reasons given, it is

ORDERED that claims 1-19 of U.S. Patent No. 6,323,255 B1 are determined to be UNPATENTABLE;

FURTHER ORDERED that DSM's Corrected Motion to Amend is DENIED;

FURTHER ORDERED that DSM's Motion to Exclude Corning Evidence is DENIED-IN-PART and DISMISSED-IN-PART;

FURTHER ORDERED that because this is a final decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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