

UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

In the Matter of

CERTAIN UV CURABLE COATINGS  
FOR OPTICAL FIBERS, COATED  
OPTICAL FIBERS, AND PRODUCTS  
CONTAINING SAME

Inv. No. 337-TA-1031

COMMISSION OPINION

On July 6, 2017, the presiding Administrative Law Judge (“ALJ”) in the above-identified investigation issued Order No. 33, an initial determination (“ID”) granting Respondent Momentive UV Coatings (Shanghai) Co., Ltd.’s motion for summary determination that claims 16-18, 21, and 30 of U.S. Patent No. 7,706,659 (“the ’659 patent”)<sup>1</sup> are invalid for indefiniteness under 35 U.S.C. § 112, ¶ 2. The ID finds “no genuine disputes of material fact” that the term “molecular weight” is indefinite. *See* Order No. 33 at 1, 2, and 9. For the reasons set forth below, the Commission has determined to review the ID and on review, to reverse and vacate the ID.

I. **BACKGROUND**

A. **Procedural Background**

By publication in the Federal Register on December 5, 2016, the Commission instituted Investigation No. 337-TA-1031, based on a complaint filed by Complainants DSM Desotech, Inc. of Elgin, Illinois and DSM IP Assets B.V. of Herleen, Netherlands (collectively, “DSM” or “Complainants”). *See* 81 *Fed. Reg.* 87588-9 (Dec. 5, 2016). The Complaint alleges violations of section 337 based upon the importation into the United States, the sale for importation, and the

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<sup>1</sup> The ID, at pages 1 and 9, mistakenly refers to U.S. Patent No. 7,076,659 instead of U.S. Patent No. 7,706,659.

sale within the United States after importation of certain UV curable coatings for optical fibers, coated optical fibers, and products containing same by reason of infringement of claims 1-8, 10-15, and 18-22 of U.S. Patent No. 6,961,508 (“the ’508 patent”),<sup>2</sup> claims 1-10 and 13-15 of U.S. Patent No. 7,171,103, claims 2-4, 9, 11, 12, and 15 of U.S. Patent No. 7,067,564 (“the ’564 patent”), and claims 1-3, 9, 12, 16-18, 21, and 30 of U.S. Patent No. 7,706,659 (“the ’659 patent”).<sup>3</sup> *See id.* The notice of investigation identifies two respondents: Momentive UV Coatings (Shanghai) Co., Ltd. of Shanghai, China (“MUV”) and OFS Fitel, LLC of Norcross, Georgia (“OFS”). *See id.* In addition, the Office of Unfair Import Investigations is a party in this investigation. *See id.*

On May 10, 2017, the ALJ issued Order No. 17 construing certain terms of the asserted claims. In particular, the ALJ construed “molecular weight” as “the sum of the atomic weights of the atoms in the molecule.” *See* Order No. 17, App. A at 38-39 (May 10, 2017). The ALJ also found that “[w]hether the scope of any claim containing this limitation is indefinite is left to be determined after all necessary evidence has been developed and submitted.” *Id.* at 39.

On May 22, 2017, MUV filed a motion for summary determination that claims 16-18, 21, and 30 of the ’659 patent are invalid for indefiniteness under 35 U.S.C. § 112, ¶ 2 (hereinafter, “MUV’s Mot.”). Along with its motion, MUV also filed a memorandum in support thereof (“MUV’s Mem.”) and a statement of undisputed material facts (“SMF”). On June 1, 2017, DSM filed an opposition to MUV’s motion (“DSM’s Opp’n”) and on June 5, 2017, the Commission Investigative Attorney (“IA”) filed a response in support of MUV’s motion (“IA’s Resp.”).

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<sup>2</sup> Claim 10 of the ’508 patent was subsequently terminated from the investigation. *See* Order No. 12 (Apr. 13, 2017), *unreviewed*, Comm’n Notice (May 11, 2017).

<sup>3</sup> Claims 1-3, 9, and 12 of the ’659 patent are not the subject of Order No. 33 or MUV’s motion. The “relevant claims” herein are claims 16-18, 21, and 30 of the ’659 patent.

On July 6, 2017, the ALJ issued the subject ID (Order No. 33) granting MUV's motion. On July 14, 2017, DSM filed a petition for review of the subject ID ("DSM's Pet.") and on July 21, 2017, Respondents filed a response to DSM's Petition ("Respondents' Pet. Resp.").<sup>4</sup> On July 24, 2017, the IA also filed a response to DSM's Petition ("IA's Pet. Resp.").<sup>5</sup>

**B. Overview of the '659 Patent**

The '659 patent, entitled "Coated Optical Fibers," issued on April 27, 2010, from a U.S. Patent Application filed November 9, 2005 with the United States Patent and Trademark Office ("USPTO"). The '659 patent claims priority (as a continuation) to the '564 patent and (as a continuation-in-part) to a U.S. Patent Application filed November 22, 2000 (now abandoned). The '659 patent generally relates to "coated optical fibers comprising soft primary coatings . . . having a sufficient high resistance against cavitation." *See* '659 patent at Abstract. The '659 patent explains that "[t]he primary coating generally will be a radiation curable coating based on (meth)acrylate functional oligomers and radiation-curable monomers with photoinitiator(s) and additives." *See id.* at 10:61-64. The '659 patent further explains that, "[i]n contrast to the normal practice in radiation curable oligomer synthesis wherein the low Mw-fractions<sup>6</sup> are restricted to a minimum or avoided, it is preferred according to the present invention to modify the Mw-distribution by introducing a sufficient amount of a low Mw oligomer or multifunctional monomer to obtain the desired cavitation strength and/or strainhardening." *See id.* at 13:57-63.

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<sup>4</sup> Respondent OFS did not file a response to MUV's motion but joined MUV in its response to DSM's petition.

<sup>5</sup> On July 19, the Chairman granted the IA's request for a one-day extension of time to file a response to DSM's petition. *See* Secretary's Letter dated July 19, 2017 (EDIS Doc. ID No. 617588).

<sup>6</sup> "Mw" in the context of the '659 patent specification refers to "molecular weight."

Respondents allege that the term “molecular weight” in claims 16-18, 21, and 30 (the relevant claims) of the ’659 patent is indefinite. *See* MUV’s Mem. at 2. Claims 16 and 30 of the ’659 patent are independent and claims 17, 18, and 21 depend from claim 16. Claims 16 and 30 recite:

**16.** Primary coating composition when cured having an equilibrium modulus, as measured according to ASTM D5026-95a, of about 1.2 MPa or less, a storage modulus at 23° C. ( $E'_{23}$ ) and a cavitation strength at which a tenth cavitation appears ( $\sigma_{cav}^{10}$ ) of at least about 1.0 MPa as measured at a deformation rate of  $0.20 \text{ min}^{-1}$ , said cavitation strength being at least about 1.4 times said storage modulus at 23° C., wherein said primary coating composition comprises:

- (a) 20-98% by wt. of at least one oligomer having *a molecular weight* of about 1000 or higher;
- (b) 0-80% by wt. of one or more reactive diluents;
- (c) 0.1-20% by wt. of one or more photoinitiators; and
- (d) 0-5% by wt. of additives.

**30.** Primary coating having an equilibrium modulus, as measured according to ASTM D5026-95a, of about 1.2 MPa or less and a calculated volumetric thermal expansion coefficient  $\alpha_{23}$  of  $6.85 \times 10^{-4} \text{ K}^{-1}$  or less, wherein said primary coating is obtained by curing a composition comprising:

- (a) 20-98% by wt. of at least one oligomer having *a molecular weight* of 1000 or higher;
- (b) 0-80% by wt. of one or more reactive diluents;
- (c) 0.1-20% by wt. of one or more photoinitiators; and
- (d) 0-5% by wt. of additives.

Each of claims 16-18, 21, and 30 requires “at least one oligomer having *a molecular weight* of about 1000 or higher.”<sup>7</sup> DSM and the IA argued, and the ALJ agreed, that the term “molecular weight” should be construed as “the sum of the atomic weights of the atoms in a

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<sup>7</sup> Claims 17, 18, and 21 depend from claim 16 and thereby include the “molecular weight” claim limitation indirectly.

molecule.” *See* Order No. 17, App. A at 38-39. However, the ID agrees with MUV and the IA that the term “molecular weight” is indefinite. *See* ID at 9. The ID reasons that “[t]he definition of ‘molecular weight’ in the *Markman* Order does not resolve the meaning of ‘average molecular weight’ or ‘number average molecular weight’ or whether any of those terms refers to one oligomer or to a distribution of oligomers.” *See id.* at 8. In its petition for review, DSM states that the adopted construction refers to actual molecular weight and as such, it is not indefinite. *See, e.g.*, DSM’s Pet. at 4-6. The IA and MUV disagree and argue that the claims are indefinite because it is unclear as to whether “molecular weight” refers to an average molecular weight, a theoretical molecular weight, or an actual molecular weight. *See* Respondents’ Pet. Resp. at 1; IA’s Pet. Resp. at 7.

## II. LEGAL STANDARDS

### A. Standard of Review

The Commission may review an ID either upon petition by one of the parties or on its own motion. *See* 19 C.F.R. §§ 210.43, 210.44. Review will be ordered if it appears:

- (i) that a finding or conclusion of material fact is clearly erroneous;
- (ii) that a legal conclusion is erroneous, without governing precedent, rule or law, or constitutes an abuse of discretion;  
or
- (iii) that the determination is one affecting Commission policy.

*See* 19 C.F.R. § 210.43(b)(1), (d)(2).

In addition, the Commission will “order review of an initial determination or certain issues therein when at least one of the participating Commissioners votes for ordering review.” *See* 19 C.F.R. § 210.43(d)(3).

**B. Summary Determination Standard**

Under Commission Rule 210.18, summary determination “shall be rendered if pleadings and any depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a summary determination as a matter of law.” 19 C.F.R. § 210.18(b).

“[I]n deciding a motion for summary judgment, ‘the evidence of the nonmovant is to be believed, and all justifiable inferences are to be drawn in his favor.’” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371, 1377 (Fed. Cir. 2007) (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986)). “The summary judgment movant [] has the initial responsibility of identifying the legal basis of its motion, and of pointing to those portions of the record that it believes demonstrate the absence of a genuine issue of material fact.” *Novartis Corp., v. Ben Venue Labs., Inc.*, 271 F.3d 1043, 1046 (Fed. Cir. 2001) (citing *Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986)).<sup>8</sup> “Once the movant has made this showing, the burden shifts to the nonmovant to designate specific facts showing that there is a genuine issue for trial.” *Id.* (citation omitted). “[M]ere denials or conclusory statements are insufficient’ to survive summary judgment.” *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1337 (Fed. Cir. 2010) (citation omitted).

**C. Claim Construction**

Claim construction is a “matter of law exclusively for the court.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (*en banc*), *aff’d*, 517 U.S. 370 (1996).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d

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<sup>8</sup> The standards for summary judgment in district courts apply to summary determinations before the Commission. *See Amgen Inc. v. Int’l Trade Comm’n*, 565 F.3d 846, 849 (Fed. Cir. 2009) (citing *Hazani v. United States Int’l Trade Comm’n*, 126 F.3d 1473, 1476 (Fed. Cir. 1997)).

1303, 1314 (Fed. Cir. 2005) (*en banc*). In construing disputed terms, the Court should first look at the claims themselves, for “[i]t is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *See Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)).

In addition, the claims “must be read in view of the specification, of which they are a part.” *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979). As the Federal Circuit explained in *Phillips*, the specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* (quoting *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). The Federal Circuit concluded that “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316 (quoting *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

In addition to the specification, courts “should also consider the patent’s prosecution history, if it is in evidence.” *Id.* at 1317 (quoting *Markman*, 52 F.3d at 980). The Federal Circuit explained that the prosecution history which is “part of the intrinsic evidence, consists of the complete record of the proceedings before the [USPTO] and includes the prior art cited during the examination of the patent.” *Id.* (citation omitted). The Federal Circuit cautioned that “because the prosecution history represents an ongoing negotiation between the [USPTO] and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Id.* (citation omitted). “Nonetheless, the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of

prosecution, making the claim scope narrower than it would otherwise be.” *Id.* (citation omitted).

While extrinsic evidence “can shed useful light on the relevant art,” it is “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *See Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004)). Importantly, the extrinsic evidence may not be used to contradict the claim language or the patent specification. *See Vitronics*, 90 F.3d at 1584 (“[E]xtrinsic evidence . . . may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language. Nor may it contradict the import of other parts of the specification.”) (citations omitted).

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention”; or (2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see also Omega Eng’g, Inc., v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations



omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” See *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); see also *Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted).

#### **D. Indefiniteness**

Statutory definiteness requires that the patent “specification [] conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” See 35 U.S.C. § 112, ¶ 2.<sup>9</sup> “[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. --, 134 S. Ct. 2120, 2124 (2014).

### **III. ANALYSIS**

The Commission has determined that the ID errs by applying the common dictionary definition of “molecular weight.” The record evidence demonstrates that “molecular weight” and “average molecular weight” are used interchangeably in the context of the ’659 patent specification and that a person having ordinary skill in the art would understand “molecular weight,” in the context of an oligomer component of the claimed primary coating composition, to mean “average molecular weight.” In addition, because the ’659 patent discloses one method of measuring average molecular weight only, namely “number average molecular weight,” the

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<sup>9</sup> The effective date of the ’659 patent pre-dates the America Invents Act (“AIA”) enacted by Congress on September 16, 2011. Thus, the pre-AIA version of the cited statute applies to the asserted patents.

Commission has determined to construe the claim term “molecular weight” as “number average molecular weight.” Based on its construction, the Commission has further determined that the term “molecular weight” is not indefinite. Accordingly, the Commission has determined to review the ID, and on review, to reverse and vacate the ID.

**A. Claim Construction**

The Commission finds that the ID errs by applying the common dictionary definition of “molecular weight,” as adopted in the *Markman* Order dated May 10, 2017. *See* Order No. 17, App. A at 38-39 (“Complainants’ and Staff’s construction which reflect a common dictionary definition (including chemical dictionary definitions), is adopted here.”). While the common dictionary definition (“the sum of the atomic weights of the atoms in the molecule”) may be proper in other contexts (*e.g.*, a discrete oligomer molecule, small molecules), it is inconsistent with the ’659 patent’s claim language, the specification, and the extrinsic evidence. Indeed, the intrinsic evidence, supported by relevant extrinsic evidence, shows that the claimed oligomer is a component or ingredient in the primary coating composition and that the oligomer exists in a range or distribution of molecular weights. The record evidence (as discussed more fully below) also demonstrates that “molecular weight” and “average molecular weight” are used interchangeably in the context of the ’659 patent, and that a person of ordinary skill in the art would understand, with reasonable certainty, that “molecular weight,” in the context of an oligomer component of the claimed primary coating composition, means “number average molecular weight.”<sup>10</sup>

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<sup>10</sup> The *Markman* “Order adopts the definition of a [person of ordinary skill in the art] that Complainants[] and Staff have agreed upon,” *i.e.*, “[a] person of ordinary skill in the art would have at least a B.S. in Chemistry, Chemical Engineering, Materials Science or a related field, approximately three to five years of postgraduate experience, including some experience in one or more of photopolymerization reactions, molecular synthesis, polymer characterization, polymer chemistry, and optical fibers.” *See* Order No. 17 at 13, 15.

First, the claim language is inconsistent with the ID's "common dictionary definition" construction ("the sum of the atomic weights of the atoms in the molecule") and with DSM's position that the term molecular weight means actual molecular weight. *See Phillips*, 415 F.3d at 1312 ("It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'") (citation omitted). The relevant claims recite a "[primary coating] composition compris[ing]:

- (a) **20-98% by wt. of at least one oligomer having a molecular weight of about 1000 or higher;**
- (b) 0-80% by wt. of one or more reactive diluents;
- (c) 0.1-20% by wt. of one or more photoinitiators; and
- (d) 0-5% by wt. of additives."

Based on the claim language as well as the intrinsic and extrinsic evidence, it is evident that the claimed "at least one oligomer" does not refer to a single discrete oligomer molecule, but to an oligomer ingredient or component of the claimed primary coating composition (along with other ingredients including reactive diluents, photoinitiators, and/or additives), *i.e.*, a mixture or population of oligomer molecules. *Accord* Comm'n Op. at 13 (reviewing ID on summary determination of non-infringement) (Aug. 4, 2017). Thus, in the context of the relevant claims, "molecular weight" cannot refer to "actual molecular weight," as suggested by DSM, but instead refers to an average molecular weight which is how oligomer components of primary coatings are characterized by those skilled in the art. *See, e.g.*, MUV's Mot., Ex. A, Nairn Decl. at ¶ 19 ("A person of ordinary skill in the art would understand, based on the plain language of the claims, that the claimed oligomer refers to a distribution of molecules and that the molecular weight is an average molecular weight."); DSM's Pet., Ex. E, Sancaktar Decl. at ¶ 23 ("[E]ach oligomer molecule in a sample of oligomer may be made up of a different number of repeating structural

units. Naturally then, each oligomer molecule may have a different number of atoms within it, and therefore a different molecular weight. Accordingly, it is common, and well understood by persons of ordinary skill in the art, that the oligomer component included in a primary coating composition is described not by a single molecular weight, but instead by a molecular weight distribution . . . .”); Comm’n Op. at 17 (reviewing ID on summary determination of non-infringement) (Aug. 4, 2017) (“The synthesis of a target oligomer will generally result in a distribution of reactive oligomers.”) (citing Initial Report of Prof. Christopher N. Bowman); *see also Teva Pharm. USA, Inc. v. Sandoz Inc.*, 789 F.3d 1335, 1338, 1341 (Fed. Cir. 2015) (“*Teva*”) (although the patent claims recite “molecular weight” of a polymer component, the court noted that the parties agree it means “average molecular weight”). In the context of the claimed oligomer component or ingredient of the primary coating composition, “molecular weight” necessarily refers to an average molecular weight because the oligomer component exists in a range of individual oligomer molecules, having different chain lengths and corresponding actual molecular weights. And while “actual molecular weight” can properly refer to the molecular weight of an individual oligomer molecule, this term is inadequate to characterize an oligomer component.

This interpretation is consistent with the ’659 patent specification, which uses “molecular weight” and “average molecular weight” interchangeably. For example, the specification explains that “[p]referably, the oligomer is a urethane (meth)acrylate oligomer” (*see* ’659 patent at 11:23-24) and that “[p]referred oligomers are polyether based acrylate oligomers, polycarbonate acrylate oligomers, polyester acrylate oligomers, alkyd acrylate oligomers and acrylated acrylic oligomers” (*see id.* at 12:12-15). The specification further explains that:

The *number average molecular weight* of the urethane (meth)acrylate used in the composition of the present invention is

preferably in the range from about 1,200 to about 20,000, and more preferably from about 2,200 to about 10,000. If the *number average molecular weight of the urethane (meth)acrylate is less than about 1000, the resin composition tends to vitrify at room temperature*; on the other hand, *if the number average molecular weight is larger than about 20,000, the viscosity of the composition becomes high, making handling of the composition difficult*.

See *id.* at 11:62-12:4 (emphasis added). The specification also states that:

The at least one oligomer preferably has a *molecular weight of about 4000 or more*, more in particular of about 5000 or more. Generally, *in view of viscosity requirements, the molecular weight is about 20,000 or less*, preferably about 15,000 or less, more preferably about 10,000 or less. Any oligomer can be used, but wholly aliphatic polyether urethane oligomers are preferred. Also, polyether/polyester and polyether/polycarbonate combined urethane acrylate oligomers are preferred.<sup>11</sup>

See *id.* at 15:38-46 (emphasis added); see also *id.* at 28:44-57 (claim 16) (“20-98% by wt. of at least one oligomer having a *molecular weight of about 1000 or higher*”) (emphasis added); *id.* 20:41-43 (“Coatings D to F each contain as the oligomer, an aliphatic polyether-polycarbonate based urethane acrylate oligomer having an *average Mw of 4000 . . .*”) (emphasis added); claim 2 of the ’564 patent (which recites “number average molecular weight of about 1000 or higher,” and, as recognized by DSM, “otherwise parallels the ’564 Patent’s limitation,” see DSM’s Pet. at 2).<sup>12</sup> Thus, the references to the same lower (1,000) and upper (20,000) boundaries below which “the resin composition tends to vitrify at room temperature” and “above which the viscosity of the composition becomes high, making handling of the composition difficult,” in the context of both “molecular weight” and “average molecular weight,” shows that the specification uses “molecular

<sup>11</sup> For instance, in Example 3, “[a] primary coating composition was formulated using 38.8 wt% of an aliphatic polyether-polycarbonate based urethane acrylate oligomer having an average Mw of 4000 . . . .” See ’659 patent at 26:26-28 (Example 3).

<sup>12</sup> DSM contrasts the ’564 patent claims which “expressly refer[] to ‘*number average molecular weight*,’” see DSM’s Pet. at 2 (emphasis in original), but claim differentiation is “a rule of thumb that does not trump the clear import of the specification.” See *Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1323 (Fed. Cir. 2011).

weight” and “average molecular weight” interchangeably. And this interchangeable use of “molecular weight” and “average molecular weight” is also consistent with the understanding of persons having ordinary skill in this art. *See, e.g.*, MUV’s Mot., Ex. A, Nairn Decl. at ¶ 19 (“A person of ordinary skill in the art would understand, based on the plain language of the claims, that the claimed oligomer refers to a distribution of molecules and that the molecular weight is an average molecular weight.”); *Teva*, 789 F.3d at 1338, 1341 (although the patent claims recite “molecular weight” of a polymer component, the court noted that the parties agree it means “average molecular weight”); *Edwards*, 582 F.3d at 1329 (“The interchangeable use of the two terms is akin to a definition equating the two.”).

DSM’s argument that “molecular weight” refers to a “molecular weight fraction” is not supported by the intrinsic evidence. First, the claims require a “molecular weight” not a “molecular weight fraction.” In fact, the only portion of the specification that refers to a molecular weight fraction (which DSM cites) is inconsistent with DSM’s position. *See* ’659 Patent at 13:57-63 (“In contrast to the normal practice in radiation curable oligomer synthesis wherein the low Mw-fractions are restricted to a minimum or avoided, it is preferred according to the present invention to modify the Mw-distribution by introducing a sufficient amount of a low Mw oligomer or multifunctional monomer to obtain the desired cavitation strength and/or strain hardening.”). Indeed, the specification shows that the patentee merely distinguished the practice of avoiding “low Mw-fractions” and explained that the invention actually shows that “a sufficient amount of a low Mw oligomer” improves cavitation strength and/or strain hardening. *See id.* at 13:57-63. Here, “a low Mw oligomer” logically refers to an oligomer component having “low *average* molecular weight” because “a low *actual* molecular weight oligomer” does not make sense in the context of a mixture or population of oligomer molecules. Moreover, nowhere does

the specification, or any of the disclosed embodiments, support characterizing or selecting the molecular weight of an oligomer based on a fraction of the molecular weight distribution. *See, e.g.,* SMF at ¶ 19; *see also SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1285 (Fed. Cir. 2005) (“A claim construction that excludes a preferred embodiment, moreover, ‘is rarely, if ever, correct.’”) (citation omitted). Instead, “[e]ach of the oligomer molecular weight values described in the ‘Examples’ of the ’659 patent is an ‘average Mw’ (average molecular weight) or ‘theoretical molecular weight.’” *See* SMF at ¶ 19 (citing ’659 patent at 25:40 (Comparative Experiment A), 26:13 (Example 2), 26:28 (Example 3), 26:42 (Comparative Experiment C)); *see also Phillips*, 415 F.3d at 1316 (“The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.”) (quotation omitted). In addition, European patent application EP-A-0894277, which is incorporated in the ’659 patent specification at 13:24-32, teaches measuring the number average molecular weight of oligomers by vapor pressure osmometry (“VPO”), *i.e.*, in a manner that does not discriminate between individual molecules or fractions of molecules (*i.e.*, the entire sample is considered to calculate the number average molecular weight). *See* Comm’n Op. at 14-15, 15 n.10 (reviewing ID on summary determination of non-infringement) (Aug. 4, 2017).<sup>13</sup>

The two references to “theoretical molecular weight” in the ’659 specification (*see* ’659 patent at 25:39-40 (“A coating was prepared using 0.50 wt % of a polyether urethane acrylate (theoretical molecular weight≈9000) . . . .”) (Comparative Experiment A), 26:40-41 (“A coating was prepared using 60 wt % of a polyether urethane acrylate (theoretical molecular weight≈4000 . . . .”) (Comparative Experiment C)) do not diminish our analysis (or render the claims indefinite as

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<sup>13</sup> The discussion of the VPO technique in EP-A-0894277 (incorporated in the ’659 patent specification at 13:24-32) also contradicts DSM’s assertion (based on extrinsic evidence) that Gel Permeation Chromatography (“GPC”) is required to determine the claimed molecular weight of the claimed oligomer component. *See* DSM’s Pet. at 3-4.

Respondents and the IA contend) because the relevant claims do not recite “theoretical molecular weight,” but “molecular weight.” In fact, those references further support our conclusion that “molecular weight” means “average molecular weight” in the context of the ’659 patent claims and specification, and further contradict DSM’s position that “molecular weight” refers to “actual molecular weight” or to a “molecular weight fraction.” Indeed, a “theoretical molecular weight” of about 4000 or 9000 in the context of an oligomer refers to a “theoretical *average* molecular weight,” rather than a “theoretical *actual* molecular weight,” given the nature of the oligomer component which includes a distribution of molecules with different chain lengths. *See, e.g.,* DSM’s Pet., Ex. E, Sancaktar Decl. at ¶ 23 (“[I]t is common, and well understood by persons of ordinary skill in the art, that the oligomer component included in a primary coating composition is described not by a single molecular weight, but instead by a molecular weight distribution . . . .”); *compare* ’659 patent at 26:9-10 (“A coating was formulated using 69.7 wt% of a polyether urethane acrylate oligomer having a polyether backbone comprising on average two blocks polypropylene glycol having an average Mw of about 4000 . . . .”) (Example 2).

In sum, “average molecular weight” is “[t]he construction [of ‘molecular weight’] that stays true to the claim language and most naturally aligns with the patent’s description of the invention.” *See Phillips*, 415 F.3d at 1316 (quotation omitted). On the other hand, the common dictionary definition of “molecular weight” adopted by the ALJ, which corresponds to “actual molecular weight” (*see* DSM’s Pet. at 4), is inconsistent with the intrinsic evidence and may even lead to inoperable embodiments. *See AIA Eng’g Ltd. v. Magotteaux Int’l S/A*, 657 F.3d 1264, 1278 (Fed. Cir. 2011) (“[A] construction that renders the claimed invention inoperable should be viewed with extreme skepticism.”). For example, according to DSM, a primary coating composition comprising 20% by wt. of an oligomer fraction having an actual molecular weight of



about 1000 or higher would satisfy the “20-98% by wt. of at least one oligomer having a molecular weight of about 1000 or higher” limitation. See DSM’s Pet. at 3. However, in that case, the average molecular weight of the oligomer component in the primary coating composition may still be below 1000 if a larger fraction of the oligomer component has an actual molecular weight of less than 1000. Consequently, the primary coating composition may be inoperable as it would tend to “vitrify at room temperature.” See ’659 patent at 11:66-12:1 (“If the number average molecular weight of the urethane (meth)acrylate is less than about 1000, the resin composition tends to vitrify at room temperature . . .”).

Thus, a person having ordinary skill in the art would understand, based on the language of the claims and in the context of the ’659 patent specification, with reasonable certainty, that the plain meaning of “molecular weight” is “average molecular weight.” In addition, “average molecular weight” was construed as “number average molecular weight” in the parent ’564 patent and no other method of measuring average molecular weight is described or identified in the ’659 and ’564 patents.<sup>14</sup> See *Cloud Farm Assoc. LP v. Volkswagen Grp. of Am., Inc.*, 674 Fed. Appx. 1000, 1006 (Fed. Cir. 2017) (“The same term should be construed consistently throughout the same patent and any related patents sharing a common specification.”) (citing *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1159 (Fed. Cir. 1997)); see also DSM’s Opp’n, Ex. D, DSM’s Resp. to SMF at ¶ 5 (“MUV conceded during the *Markman* proceedings that all references to “average molecular weight” mean “number average molecular weight.”) (citing Respondents’ *Markman* Br. at 30). Accordingly, the Commission has determined to construe the claim term “molecular weight” as “number average molecular weight.”

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<sup>14</sup> “Theoretical molecular weight” is distinct from a “measured value” as recognized by Respondents’ expert, see MUV’s Mot., Ex. A, Nairn Decl. at ¶ 23.

**B. Indefiniteness**

In view of our construction of the claim term “molecular weight” as “number average molecular weight,” the Commission has also determined to reverse and vacate the ID’s findings on indefiniteness. Indeed, none of the parties argued that the term “molecular weight,” if construed as “number average molecular weight,” would be indefinite. Nor did they argue that the same term in the context of the parent ’564 patent was indefinite. *Compare Teva*, 789 F.3d at 1344-45 (finding the term “molecular weight” indefinite where the term could mean peak average molecular weight (Mp), number average molecular weight (Mn), or weight average molecular weight (Mw), and “[t]he claims do not indicate which measure to use”).

**IV. CONCLUSION**

For the foregoing reasons, the Commission has determined to review the ID and on review, to reverse and vacate the ID.

By order of the Commission.



Lisa R. Barton  
Secretary to the Commission

Issued: August 11, 2017

**CERTAIN UV CURABLE COATING FOR OPTICAL  
FIBERS, COATED OPTIONAL FIBERS, AND PRODUCTS  
CONTAINING SAME**

Inv. No. 337-TA-1031

**PUBLIC CERTIFICATE OF SERVICE**

I, Lisa R. Barton, hereby certify that the attached **COMMISSION OPINION** has been served by hand upon the Commission Investigative Staff, Claire K. Comfort, Esq., and the following parties, as indicated, on **August 11, 2017**.



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