

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MULTI-COLOR CORPORATION,
Petitioner,

v.

BROOK & WHITTLE LIMITED,
Patent Owner.

Case PGR2025-00025
U.S. Patent No. 11,961,422

**PETITIONER'S REPLY TO
PATENT OWNER'S RESPONSE**

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Exhibit 1001:	U.S. Patent No. 11,961,422
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Exhibit 1003:	Petitioner's Gatorade Label
Exhibit 1004:	Petitioner's Febreze Label
Exhibit 1005:	PET-CG-02 – Critical Guidance protocol for clear PET articles with labels and closures
Exhibit 1006:	PET Standard Laboratory Processing Practices
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Exhibit 1010:	Evaluation of the Near Infrared (NIR) Sorting Potential of a Whole Plastic Article (SORT-B-01)
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Exhibit 1017:	Brook+Whittle webpage print, retrieved from https://brookandwhittle.com/recyclable-light-blocking-shrink-sleeves/
Exhibit 1018:	Association of Plastic Recyclers recognition correspondence
Exhibit 1019:	Watson Standard Technical Data Sheet
Exhibit 1020:	U.S. Patent Publication No. 2017/0223879 to Mitchell et al.
Exhibit 1021:	Second Declaration of Mr. Craig Bushman
Exhibit 1022:	<i>Brook + Whittle LTD v. Nestle USA, Inc. et al.</i> , 2:24-cv-00735-JRG-RSP, D.I. 63 (Defendant's Motion to Stay Pending Resolution of Related Declaratory Judgment Action)
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Exhibit 1026:	U.S. Appln. No.: 18/667,677, "Recyclable heat shrink film for recyclable container," (Prosecution History)
Exhibit 1027:	PET-CG-02, Critical Guidance protocol for clear PET articles with labels and closures, Revision Date 04.11.2019
Exhibit 1028:	PET-P-00, PET Standard Laboratory Processing Practices, Revision Date 09.17.2019
Exhibit 1029:	PET-S-04, PET Package Materials Balance Test, Revision Date 11.16.2018

Exhibit 1030:	PET-S-01, Labels for PET - Wash Water Test, Revision Date 11.16.2018
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Exhibit 1048:	Deposition Transcript of Dr. Phillips, May 21, 2026
Exhibit 1049:	Deposition Transcript of Dr. Reitman, May 28, 2026

Exhibit 1050:	S.P. Morell & Co., <i>Metallic Pigments – The Science of Optics</i> (retrieved from https://www.spmorell.com/newsletters/metallic_pigments/metallic_pigments.html (last visited June 17, 2026))
Exhibit 1051:	Schlenk Metallic Pigments GmbH, <i>World of Metallics Pigments: Pigments for Printing Inks</i> (Mar. 2011) (retrieved from https://www.schlenk.com/fileadmin/editorsCMS/Medien/04_Aktuelles_und_Highlights/Mediacenter/Catalogue_Pigments_for_Printing_Inks.pdf (last visited June 17, 2026))
Exhibit 1052:	US Patent Application No. 18/667,677 June 11, 2026, Non-Final Rejection

I. INTRODUCTION

The claim term “recyclable” lies at the heart of every challenged claim, yet the '422 patent defines it through several disparate and conflicting guidelines – ink wash-off after caustic wash, APR PET-CG-02 certification, and NIR sorting protocols – never specifying which controls or how they reconcile. By way of example only, despite the fact that the '422 patent explicitly states PET-CG-02 “certif[ies]” a label is recyclable, Dr. Phillips opines PET-CG-02 does not determine whether a label is recyclable and is not sufficient to determine whether a label satisfies the claim term “wherein the recyclable shrink label is recyclable.” And, both Parties’ experts agree these guidelines are subjective, lacking objective criteria. Under *Nautilus*, such a claim does not inform a POSITA of its scope with reasonable certainty, and is therefore invalid as indefinite.

Separately, the Gatorade Label - a commercially sold, APR-recognized recyclable shrink sleeve - anticipates claims 1-3 and 5-19, and the Mitchell and Febreze combinations render claim 4’s layer ordering obvious.

II. PERSON OF ORDINARY SKILL IN THE ART

PO challenges the level of skill of a POSITA, but does not explain how its proposal would alter the outcome. In addition, both Dr. Bushman and Dr. Deible exceed the level of skill proposed. EX1013; EX1014. And, PO glosses over the

fact that Dr. Phillips has no experience in: APR guidance, label analysis and procedures, APR evaluation of labels, heat shrink labels, ink systems for labels, opacity layers, or light blocking layers. EX1048, 148:22-154:5; 176:6-177:9.

III. CLAIM CONSTRUCTION

As the Board already recognized, the prosecution history describes circumstances in which a label is not recyclable, but “it is still necessary to determine when a label is ‘recyclable’ according to the claim language.” (Paper 14, 12-13). Based on the specification, the Board identified multiple descriptions of recyclability, including caustic wash performance, APR certification, and SORT protocols, and preliminarily concluded that “any of these standards can be used to determine if a shrink label is ‘recyclable.’” *Id.*

Despite the Board’s clear instruction for additional clarity, PO maintains that “recyclable” should be construed as “capable of being recycled without removing the label from a container before or during the recycling process.” POR, 13-14. But PO then explains that recyclability “would naturally include requiring the label includes inks that wash off the label such that the reusable resin can be reclaimed when the label and container are recycled together.” *Id.*

PO’s position is wrong, highlighted by several important facts. First, PO’s own expert, Dr. Phillips, expressly rejected the position that labels with no inks after washing are therefore “recyclable.” Rather, Dr. Phillips testified there are

numerous additional, and subjective, evaluations that should be undertaken.

Second, the '422 patent discloses guidance documents that “certif[ies]” when a label is “recyclable,” and those guidance documents do not consider, much less provide any objective standard, regarding inks washing off. Third, PO admits that “[t]he specification provides *multiple characterizations*,” and those admitted multiple characterizations are not consistent with PO’s proposal. *Id.* Fourth, throughout the POR, PO supplements its proposed construction with additional evaluations purportedly necessary to establish whether a label is “recyclable.” PO’s evolving construction is evidence of indefiniteness of the term “recyclable,” not a cure for it.

IV. GROUND 1: THE GATORADE LABEL ANTICIPATES CLAIMS 1-3 AND 5-19

Ground 1 is a straightforward anticipation case. The Gatorade Label is a commercially sold shrink sleeve system the Association of Plastic Recyclers (“APR”) recognized as meeting or exceeding its Critical Guidance Protocol for recyclability. EX1013, ¶¶47-48. Dr. Deible subjected the Gatorade Label to extensive analytical testing - FTIR, SEM-EDS, Raman spectroscopy, ICP, and UV-Vis spectrophotometry - and confirmed it discloses every limitation of claims 1-3 and 5-19. EX1014, ¶¶59–106; EX1046, ¶8.

PO does not challenge that the Label comprises a PET shrink film, its light-blocking component blocks at least 80% of incident light and comprises aluminum particulate, or that ink removal occurs during caustic wash without visible contamination of PET flake. Instead, PO imposes requirements untethered to the intrinsic record—whole-label area averaging, mandatory laser diffraction, and entire-label testing—while criticizing testing its own expert substantially replicated and corroborated. PO’s approach does not defeat anticipation; the Gatorade Label samples alone establish every limitation. EX1046, ¶¶11–133; EX1014, ¶¶59–106.

A. Claim 1

Claim 1 reduces to four disputes following one pattern: PO does not dispute what Dr. Deible observed, but imports limitations into the claims to avoid Dr. Deible’s findings.

i. The PET film and the recited first and second surfaces

PO does not dispute that the Label contains a PET heat shrink film, identified through FTIR, with a measured thickness of approximately 40–60 µm. POR, 16; EX1014, ¶¶60–64. Those measurements identified the recited “first surface” and opposite “second surface” defining that thickness. EX1046, ¶¶14–17. Dr. Deible also described the cross-sectional images’ orientation relative to the coating layers and container. EX1014, ¶¶64–66; EX1046, ¶¶18–21. The ‘422

patent identifies the first surface as container-facing and the second as outward-facing. EX1001, 6:42–47; EX1046, ¶¶19. Figures 5-6 establish that the aluminum light-blocking layer is nearest the container-facing surface, satisfying the “disposed adjacent the first surface” limitation. EX1014, ¶¶65–66; EX1046, ¶¶24–26.

PO’s objection is semantic, not structural. PO does not contend the film boundaries were misidentified, the measurements erroneous, or the layers misoriented. EX1046, ¶¶17, 20. PO complains only that Dr. Deible did not relabel the structure with the words “first surface” and “second surface.” But anticipation requires no talismanic recitation where a POSITA would recognize the arrangement. *Blue Calypso v. Groupon*, 815 F.3d 1331 (Fed. Cir. 2016) (“a reference can anticipate a claim even if it ‘d[oes] not expressly spell out’ all the limitations...if a person of skill in the art...‘would at once envisage’ the claimed arrangement or combination.”).

ii. The 80% light-blocking limitation

PO does not dispute that the silver regions block at least 80%—approximately 85%—of incident light. POR, 18; EX1046, ¶¶32–33. PO instead proposes a whole-label averaging requirement found nowhere in the claims or ‘422 patent. Claim 1 recites “a light blocking layer” “constructed for the recyclable shrink label to block at least 80% of incident light having wavelengths in a range of 200 nm to 900 nm.” EX1001, cl. 1. It does not use “entire,” does not require

every portion to satisfy the threshold, and does not require the layer to extend continuously across the label. Every working Example measures percent light blocked through printed sample constructions—not an area-weighted average across a commercial label. EX1001, Examples 1–5; EX1046, ¶¶27–30.

Notably, PO’s construction would require portions bearing no light-blocking layer to satisfy a limitation directed to that layer’s performance, reading the ‘422 patent’s own embodiments out of the claims. EX1046, ¶¶29–31. The ‘422 patent expressly contemplates embodiments where the layer is not present across the entire film. *Id.* The Board should reject an interpretation that excludes disclosed embodiments. *See Helmsderfer v. Bobrick Washroom*, 527 F.3d 1379, 1383 (Fed. Cir. 2008).

The measurements are undisputed. Dr. Reitman confirmed the silver portions satisfy the threshold. EX2012, ¶79; EX1046, ¶¶32–33.

iii. The particle-size limitation

PO does not dispute that the light-blocking component comprises aluminum particulate. PO instead demands laser diffraction and averaging requirements not present in claim 1. POR, 21–22. Claim 1 recites only “a particulate having a particle size of 0.1 μm to 100 μm ,” saying nothing about methodology, laser diffraction, or average diameter. EX1001, cl. 1; EX1046, ¶¶35–37. As Dr. Deible explained, laser diffraction is performed on pigment dispersed in fluid before

formulation and cannot meaningfully be performed on pigment cured within a finished label; cross-sectional SEM is the accepted in-situ technique. EX1046, ¶¶37. Industry convention confirms aluminum flakes are themselves “particles” with dimensions within the claimed range. EX1050; EX1051; EX1046, ¶¶38, 41. Dr. Deible's measurements corroborate this. EX1014, ¶70; EX1046, ¶¶39–42.

iv. Recyclable with a PET container

The Label is APR-recognized. EX1013, ¶¶47–48; EX1046, ¶45. Dr. Reitman agreed a POSITA would consider APR guidance in assessing recyclability. EX1049, 57:21–58:10; EX1046, ¶47. And, both experts observed ink separating during caustic wash. EX1049, 32:21–33:1; EX1046, ¶¶46, 49. Dr. Deible observed that recovered PET flakes showed no visible contamination or staining. EX1014, ¶77; EX1046, ¶¶48–53.

PO proposes an indefinable standard under which “significant” retained ink defeats recyclability. POR, 24-26. PO’s experts could not identify how much retained ink is “significant,” what amount renders a label non-recyclable, or what “free or substantially free” means. EX1049, 104:14–106:9; EX1046, ¶44. And, as the Board already recognized, what is important is that recovered PET flakes showed no visible contamination or staining. Paper 14, 10.

PO’s testing criticisms also fail. The clear PET control flakes assessed contamination and staining—the precise harm PO invokes—not complete ink

removal. EX1046, ¶¶48, 51–53. PO’s experts never performed plaque inspection, wash-water evaluation, or quantitative contamination assessment - the evaluation PO calls “objective” and “dispositive” - relying instead on the visual flake observations which demonstrate no discoloration. POR, 89–93; EX1046, ¶¶58, 63. Meanwhile, Dr. Reitman’s protocol biased toward ink retention through reduced agitation and lower temperatures. EX1046, ¶55; EX2012, ¶¶60, 64; POR, 38; EX1046, ¶¶66, 74–78. Even PO’s PFE evidence evaluated recyclability through multiple factors, not partial ink retention alone, and the post-wash photographs show the tested samples included silver-ink-bearing portions. EX2038; EX1046, ¶¶61–63, 68–72.

The pattern is unmistakable: PO does not dispute that ink separated during washing or that Dr. Deible observed no visible flake contamination, asking instead for undefined standards untethered to the ‘422 patent and unsupported by its own experts. What is undisturbed is that the Gatorade Label is a commercially sold, APR-recognized recyclable shrink sleeve that blocks light as disclosed in Claim 1.

B. Claim 2

Claim 2 recites that the label “compris[es] an indicia layer.” EX1001, cl. 2. The Label includes printed graphics, text, and trademarks constituting indicia. EX1046, ¶84. The ‘422 patent confirms an indicia layer may comprise one or more inks and “need not be constant, continuous, or complete across the entirety of the

shrink film.” EX1001, 15:54–16:53; EX1046, ¶¶81–85. PO’s discrete-layers requirement improperly imports limitations from selected embodiments. POR, 44–45.

C. Claim 3

SEM-EDS and Raman analyses identify rutile TiO_2 in a stratum vertically distinct from the aluminum layer. EX1014, ¶81; EX1046, ¶87. Rutile titanium dioxide is a white pigment, which the ‘422 Patent identifies as suitable for the high-opacity layer. EX1046, ¶¶87-91; EX1001, 12:1–5. Dr. Phillips’ “adjacent regions” theory addresses lateral color zones and does not rebut the cross-sectional evidence of stacked strata. EX2013, ¶¶131–35; EX1046, ¶92.

D. Claims 5-19

PO advances no independent arguments regarding claims 6–9 and 14–19. The record confirms: FTIR establishes the film consists of PET (claim 5), EX1046, ¶¶94-96; the rutile TiO_2 satisfies claim 10, EX1046, ¶¶101-103; the EDS spectra identifying aluminum satisfy claim 11, EX1046, ¶¶104-106; and even adopting Dr. Reitman's figures, the Label falls within the recited ppr ranges of claims 12 and 13—PO's evidence confirming, not rebutting, anticipation. EX1046, ¶¶107-117. Claims 14–16 follow from the undisputed structural arrangement: the Label on its PET bottle is the claimed "article" (claim 14), EX1046, ¶¶118-120; the container-facing first surface faces the container's external surface (claim 15), EX1046,

¶¶121-123; and the printed indicia on that surface satisfy claim 16. EX1046, ¶¶124-126.

V. GROUND 2: THE GATORADE LABEL–MITCHELL COMBINATION RENDERS OBVIOUS CLAIM 4

A. The Combination Discloses Each Element of Claim 4

Claim 4 differs from claims 1 and 3 only in positioning the high-opacity layer between the indicia and light-blocking layers. EX1046, ¶¶136-137. The Label discloses every other limitation. EX1014, ¶¶118–123; EX1046, ¶¶136-137. Mitchell supplies the ordering. As the Examiner found during prosecution, “[i]t would have been obvious...to provide the metallization layer (high opacity layer) such that it is positioned between the printing (indicia layer) and the third layer/skin (7; light blocking layer) to ensure the printing is visible and provide (sic) a metallic look to the label.” EX1002, 239. PO never disputed this finding.

Applying Mitchell to the Label yields claim 4: the indicia are printed first, then the white high-opacity layer, then the aluminum light-blocking layer. EX1014, ¶123; EX1046, ¶137. Though Dr. Deible had not independently reviewed Mitchell before deposition, he reviewed the prosecution history applying it and later reviewed Mitchell itself without changing his opinions. EX1046, ¶135.

i. Motivation to Combine

The motivation is supported by what is known in the art and the prosecution history. Positioning a white opaque layer between graphics and a metallic layer preserves graphic visibility and vibrancy while maintaining the metallic appearance. EX1002, 239; EX1046, ¶139. Selecting among a few known arrangements for a known benefit is routine design choice, and Dr. Deible agreed visibility motivated the arrangement. EX1046, ¶¶140-143.

ii. Reasonable Expectation of Success

A POSITA would also have had a reasonable expectation of success. The combination adds and removes no layers and introduces no new materials—the same PET film and inks are merely arranged in a different sequence. EX1014, ¶122; EX1013, ¶¶59, 65; EX1046, ¶150. As Dr. Deible explained, the optics are straightforward: light traverses each layer regardless of sequence, and the aluminum layer dominates attenuation wherever positioned. EX1046, ¶145. Mitchell does not teach away on the alleged basis that it is not recyclable, as Ground 2 relies on it solely for layer ordering. It is improper to attack references individually on unrelated matters. *In re Keller*, 642 F.2d 413, 426 (CCPA 1981); *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012); EX1046, ¶146. Claim 4 is thus the predictable use of a known arrangement for its known benefits in an unchanged, commercially successful recyclable label.

B. Patent Owner's purported secondary considerations are entitled to no weight

PO bears the burden of tying its alleged "Objective Indicia" to the claimed invention, yet conducted no coextensiveness analysis to invoke a presumption of nexus. EX1048, 198:19-22 (Q:“Did you ever evaluate whether a Brook & Whittle product falls within the scope of the '422 patent claims? A:I did not.”).

i. PO is not entitled to a rebuttable presumption of nexus

A presumption arises only where the objective evidence is tied to a specific product that embodies, and is coextensive with, the claimed invention. *Henny Penny v. Frymaster*, 938 F.3d 1324, 1332 (Fed. Cir. 2019). PO never invokes the presumption—and could not, having never evaluated whether any product falls within the Challenged Claims. EX1048, 198:19-22.

ii. PO fails to affirmatively establish nexus

Absent the presumption, PO “bears the burden of showing that a nexus exists between the claimed features of the invention and the objective evidence.” *WMS Gaming v. Int'l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999). The evidence must show the alleged considerations are the “direct result of the unique characteristics of the claimed invention.” *Fox Factory v. SRAM, LLC*, 944 F.3d 1366, 1374 (Fed. Cir. 2019). PO merely associates praise with its “GreenLabel® BlockOut™” product, describing it as “a recyclable, light-blocking shrink sleeve”

(POR, 65), without identifying which claimed features are embodied or shown to drive the praise.

iii. *PO's own evidence demonstrates that the alleged praise is directed to unclaimed features*

“Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011). EX2021 evaluates entries on artwork quality, shrink application, seaming, and shelf appeal—none are claimed. EX2019 touts a “100% sorting rate through NIR sortation equipment”—also unclaimed. EX2019, 6.

iv. *PO's remaining assertions are unsupported*

PO's long-felt-need argument rests on a single Nesquik example—which is insufficient as a matter of law. *In re Kavanagh*, 851 F. App'x 1028, 1034-35 (Fed. Cir. 2021). And, the Nesquik development concerned unclaimed attributes like materials, aesthetics, and sorting. EX2017, 3. PO's copying argument fails for lack of “evidence of efforts to replicate a specific product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010).

VI. GROUND 3: THE GATORADE LABEL–FEBREZE LABEL COMBINATION RENDERS OBVIOUS CLAIM 4

As with Ground 2, the Gatorade Label supplies every limitation of claim 4 except the relative ordering of the indicia, high-opacity, and light-blocking layers. EX1014, ¶¶124–141; EX1046, ¶¶148-149. Unlike Ground 2, the missing arrangement is supplied by another commercially sold shrink sleeve label—the Febreze Label.

A. Claim 4

i. The Combination Discloses Each Element of Claim 4

The Febreze Label’s cross-sectional analysis shows the high-opacity layer positioned between the indicia and light-blocking layers, exactly as claim 4 requires. EX1014, ¶¶124–141; EX1046, ¶149. PO’s objections—that the Febreze Label was not shown to comprise PET, was not shown to be recyclable, and is an aerosol can in a different market—improperly attack the reference in isolation. POR, 72-73; EX1046, ¶150; *In re Keller*, 642 F.2d at 426. Ground 3 relies on the Febreze Label only for the layer ordering; the recyclable PET label remains the Gatorade Label. EX1046, ¶150.

ii. Motivation to Combine

Both labels were manufactured by the same entity using the same gravure-printing process and substantially the same aluminum and titanium-dioxide inks.

EX1013, ¶¶53–66; EX1046, ¶151. A POSITA would have recognized them as variations of the same printed-stack architecture differing principally in layer sequence, and the known visual benefits of the Febreze arrangement provided ample reason to apply it to the Gatorade Label. EX1046, ¶151.

iii. Reasonable Expectation of Success

A POSITA would also have had a reasonable expectation of success, as the claimed arrangement had already been implemented in a commercially sold label produced using the same techniques and substantially the same materials. EX1013, ¶¶61–63; EX1046, ¶152. Nothing suggests that transferring a known layer sequence between such labels would present difficulty or unpredictability. EX1046, ¶152.

VII. GROUND 4: CLAIMS 1-19 ARE INDEFINITE

A. The law governing indefiniteness

A patent claim is indefinite if it has several meanings, and a POSITA would not be able to make a confident choice as to which meaning is appropriate.

Nautilus, Inc. v. Biosig Instruments, Inc., 572 U.S. 898, 901, 910 (2014). As explained below, the ‘422 patent is indefinite because there are, according to both PO’s expert and Petitioner’s expert, numerous subjective considerations, which

only amount to guidelines, known by a POSITA for evaluating what renders a label “recyclable.”

B. The ‘422 patent describes what renders a label “recyclable” in several disparate ways

First, the ‘422 patent provides labels are considered recyclable “if no inks are retained on the film after a caustic wash cycle...”. EX1001, 6:61-65. A POSITA understands that ink wash-off from crystallizable PET films is sufficient to fall within the scope of the claim term “wherein the recyclable shrink label is recyclable” and that “no inks” may be retained. EX1047, ¶18.

Dr. Phillips disagrees that “no inks” being retained is sufficient to determine whether a label is “recyclable.” EX1048, 92:17-93:9; 80:17-82:13. That is “[b]ecause there’s a number of other tests that should be performed.” EX1048, 121:22-122:17; 93:10-94:3. For this reason alone, it is unclear to a POSITA whether no inks being retained after a caustic wash is a sufficient requirement. EX1047, ¶21.

In addition and in direct contradiction, the ‘422 patent provides that labels meeting “certain industry standards, including...APR...PET-CG-02...can be considered as certifying that the film is fully recyclable with the container or bottle.” EX1001, at 11:29-53 (emphasis added); EX1047, ¶31. A POSITA understands when a label meets the PET-CG-02 guideline, that “certif[ies]” the

label is fully recyclable, and requires meeting PET-CG-02. *Id.* This is inconsistent with the ‘422 patent requirement of “no inks” retained on the film. EX1047, ¶¶32.

In addition, the ‘422 patent provides “the labels of the present disclosure are recyclable according to...SORT-B-01...SORT-B-03, or both.” EX1001, 11:29-53; EX1047, ¶¶40-42. It is simply unclear what renders a label “recyclable” and what renders a label “fully recyclable,” and which of SORT-B-01 or SORT-B-03, or both, must be met for a label to be “recyclable” or “fully recyclable.” *Id.*

Also in direct contradiction, PO asserts that “[a] POSITA would therefore understand the ‘422 patent explains that the scope of the claims covers a label capable of being recycled with the container (i.e., a label that contains inks that wash off such that the label can be reclaimed as reusable resin along with the container).” (POR, 75, 80) (emphasis added). This guideline is also inconsistent, and leads to a different determination whether a label is “recyclable.” EX1047, ¶¶22-25.

C. PO concedes the ‘422 patent guidelines have no objective criteria

As explained above, the ‘422 patent provides that labels are considered recyclable if no inks are retained on the film after a caustic wash cycle. EX1001, 6:61-65. Dr. Phillips admits that there is no objective test as to how much ink must be removed from the label for the label to be “recyclable.” EX1048, 92:17-93:9.

With regard to the fact that the ‘422 patent states that meeting PET-CG-02 “certif[ies]” that the film is fully recyclable, PO asserts PET-CG-02 is merely “complementary” (POR, 85) and only “help[s] identify the testing to perform in order to determine whether a label meets APR certification standards” (POR, 87). It merely suggests that other assessments and other testing can be undertaken, such as a “flow chart,” without any objective criteria. *Id.* PO concedes this point further by identifying the Wash PET-P-04 evaluation as merely “relevant.” *Id.*

These various assessments and testing cannot provide any objective standard because whether APR guidelines such as PET-CG-02 are met is a subjective determination made by a panel of three members. EX2010, 238:12-242:16; EX1047, ¶39. Unlike PO’s experts, Dr. Bushman has personal knowledge regarding this subjective determination, as he has served as a member of such a panel. EX2010, 239:3-24. And, the members of the panel change, and their respective backgrounds impact whether APR guidance recognition is provided in a given situation. *Id.*, 240:10-241:3.

With respect to the ‘422 patent and SORT-B-01, SORT-B-03, “or both,” neither provides objective criteria. EX1047, ¶40. SORT-B-01 recites that “[g]ood results” and “poor results” will impact whether there is compliance. EX1010, 1. According to Dr. Phillips, a POSITA does not know what “good results” or “poor results” are. EX1048, 166:17-168:12. “Good results” and “poor results,” which

according to the '422 patent and SORT-B-01 are evaluated when considering whether a label is "recyclable," are not associated with any objective standard and are subjective. EX1047, ¶40.

With respect to PO's argument that whether a label is "recyclable" is determined by whether the label can be reclaimed as reusable resin, Dr. Phillips testified that "recyclable" could be where you reclaim all of the material and also "where you lost some of it in the process, but it is still recyclable." EX1048, 133:3-134:3. When asked how much of the material can be lost for the label to still be deemed "recyclable," Dr. Phillips testified that "[t]here's no number on that. That's not something I can answer." *Id.*; EX1048, 144:8-15; EX1049, 31:5-32:2; 36:2-21. It is also dependent upon the use of the resin, which is different for each manufacturer. EX1048, 26:6-28:2.

D. The '422 patent identifies that PET-CG-02 "certif[ies]" whether a label is "recyclable," but that guideline incorporates other subjective criteria

Even if PET-CG-02 was a standard and not merely a guideline, PET-CG-02 refers to numerous other tests, but it is not understood by a POSITA which of those other tests must be met. EX1047, ¶33. According to Dr. Phillips, "a [POSITA] would refer to some of these procedures, but not necessarily all of them." EX1047, 163:17-164:13. By way of example only, PET-CG-02 references a "Wash water evaluation report" (EX1027, 4), but a POSITA does not understand if this is

required to meet PET-CG-02. EX1048, ¶34. Dr. Phillips agrees. EX1048, 155:17-156:13. And, a POSITA does not know what level of contamination of the wash water would cause a POSITA to determine that a label is not recyclable because, according to Dr. Phillips, there is no criteria. EX1048, 157:2-10; 162:21-163:8. Indeed, “if some inks wash off,” then “no person of ordinary skill in the art would have experience to be able to have a gauge of – not an absolute gauge...” EX1048, 181:19-182:15. When not enough ink is washed off “depends on the person and their experience.” *Id.*

PET-CG-02 also references a “Clumping test” (EX1027, at 4; EX1047, ¶35), but a POSITA does not understand whether this required to meet PET-CG-02, and Dr. Phillips agrees. EX1047, ¶35; EX1048, 159:1-8; 161:5-16.

Decidedly, as noted above, the ‘422 patent explicitly states that a label that meets PET-CG-02 “certif[ies]” that the film is fully recyclable with the container or bottle. In direct contradiction, Dr. Phillips opined that if a label meets PET-CG-02, that is not sufficient by itself to recyclable as that term is used in the ‘422 patent. EX1048, 99:15-20; 103:10-16. And, Dr. Phillips also opined that a label can still be deemed recyclable even if that test is not met. EX1048, at 28:11-30:3; 97:7-11. Thus, a POSITA does not know whether meeting PET-CG-02 is sufficient for a label to be “recyclable.” EX1047, ¶¶55-58.

Dr. Phillips then offered testimony regarding the subjective guidelines disclosed by the APR that further demonstrates that “recyclable” is indefinite. Dr. Phillips testified that while “the highest level of recycled material is when the material meets the specifications defined by the APR,” “the material can still be considered recyclable resin if it does not meet that highest standard.” EX1048, 20:21-22:5. That is because, according to Dr. Phillips, “[t]he APR method is – accepts a certain level of impurity.” *Id.* The level of impurities allowed for by the APR specifications “comes back to the experimental results.” *Id.* However, the level of impurity allowed is not defined, and is also subjective in that it is dependent upon the results of all of those results. EX1047, at ¶¶69.

E. The ‘422 patent identifies other guidelines to determine whether a label “recyclable” and PO’s expert admits they are subjective

Fully Recyclable vs Recyclable. The ‘422 patent recites that labels are “recyclable” according to SORT-B-01, SORT-B-03, or both, and that “the labels of the present disclosure are ‘fully recyclable.’” EX1001, 11:29-53. The ‘422 patent does not provide any criteria distinguishing between fully recyclable and recyclable. EX1047, ¶¶41-42.

The only explanation offered by Dr. Phillips is that “fully recyclable” and “recyclable” are interchangeable because they are used commonly in the field as “similar concepts.” EX1048, 135:3-136:10. However, Dr. Phillips has no APR

testing experience, no APR review experience, and no experience in heat shrink labels or ink systems, to support his opinion. EX1048, 148-154, 174-178. Dr. Bushman, with his more than 16 years of experience in the field of labels and label construction, and involvement with the recyclability of labels, disagrees that these two terms are interchangeable or “similar concepts.” EX1047, ¶43. Regardless, this only adds confusion to the ‘422 patent’s disclosures that “no inks” is sufficient for a label to be “recyclable,” meeting PET-CG-02 “certif[ies]” a label is “fully recyclable,” and that SORT-B-01, or SORT-B-03, “or both,” renders a label “recyclable.”

Free vs Substantially Free Of Inks. The ‘422 patent provides “[a]ccording to an embodiment, the labels are free or substantially free of inks that cannot be washed off in a caustic wash.” EX1001, 11:29-53. PO asserts that “[t]he ‘422 Patent explicitly defines the term ‘substantially’ such that the term ‘can be understood to modify the term that follows by at least 90%, at least about 95%, or at least about 98%.’” (POR, 81). Inconsistently, however, the ‘422 patent provides that “heat shrink films (e.g., PET shrink films) are considered recyclable if no inks are retained on the film.” EX1001, at 6:61-65; EX1047, ¶45. Moreover, Dr. Phillips testified that “substantially removing the ink” is only “guidance,” and a POSITA would refer to other APR guidance tests. EX1048, 93:10-94:9; 95:9-20; EX1047, ¶46.

Free vs Substantially Free Of Colored Plastics. The '422 patent provides “the labels are free or substantially free of colored plastics (including white plastics) that cannot be recycled.” EX1001, at 11:29-53. Consideration of ink removal has nothing to do with and is inconsistent with criteria relating to colored plastics. EX1047, ¶¶48-49. In addition, PO provides no objective criteria regarding the fact that colored plastics are “often,” but not all of the time, not recyclable. EX2010, 238:12-242:16; EX1047, ¶50.

Contamination or Discoloration of PET flake. Applicant cited the APR Resource Document that “[a]n important consideration for inks on shrink sleeve labels is that the ink not contaminate or discolor PET flake when mixed in hot caustic wash water used in the recycling process.” Evaluation of contamination or discoloration of PET flake is inconsistent with an evaluation of the amount of ink that washes off PET flake. EX1047, ¶¶51-53.

Numerous Guidelines. According to Dr. Phillips, “if the inks completely wash off the film, and those inks do not contaminate or discolor PET flake during a hot caustic wash,” that is not sufficient for a label to meet the requirement “wherein the recyclable shrink label is recyclable with a PET container.” EX1048, 80:17-82:13. All of the other APR guidelines would also have to be considered, including PET-CG-02, PET-B-02, RES-LBL-2, “a NIR IR test for separation,” “other separation tests, magnetic separation tests,” “tests associated with the

shredding process,” “caustic wash and tests associated with the material that comes from the caustic wash,” tests associated with “the extrusion process,” tests “on the pellets” that are made from the extrusion process, and tests on samples of “plaques” resulting from an injection molding process. EX1048, 17:17-20:5; 80:17-82:13. When asked whether all of these tests have to be passed for a label to be determined “recyclable,” Dr. Phillips testified that “[w]ell, it’s really dependent. The answer is that it will depend on the results of each test.” EX1048, 19:11-20:5. Dr. Phillips testified that a POSITA does not know the most important results of these tests. EX1048, 82:14-83:19; EX1047, ¶¶54, 66-68.

Third Party and FDA Guidelines. Dr. Phillips testified that while “the APR methods are one benchmark...there are other benchmarks that people can look at and do look at for a lower quality recyclable material.” EX1048, 42:7-45:6.

“Those [benchmarks] are dictated by the manufacturers.” *Id.* And, according to Dr. Phillips, whether a label is recyclable depends upon the particular manufacturer and the level of PET quality each product requires. *Id.* Otherwise stated, standards are “dictated by downstream manufacturers of what material they would be willing to use.” EX1048, 22:15-23:22. Those downstream manufacturers have different criteria for what they are willing to use and not use. EX1048, 24:17-25:15. This is subjective and different for each manufacturer. EX1047, ¶¶59-60.

Whether PET-CG-02 Certifies A Label Is Recyclable. Despite the fact that the ‘422 Patent explicitly states that a label that meets PET-CG-02 “certif[ies]” a label is recyclable, Dr. Phillips opines that meeting PET-CG-02 does not certify that the film is recyclable and is not sufficient to determine whether a label is “recyclable.” EX1048, 14:7-16:16. Thus, a POSITA does not know whether PET-CG-02 is sufficient for a label to be considered “recyclable.” EX1047, ¶¶61-67.

Also, in connection with Applicant citing RES-LBL-2 during prosecution, according to Dr. Phillips “there’s, of course, many takeaways that a [POSITA] could have from looking at this document and its inclusion [in the prosecution history]. At the very highest level, I would say that – I would speculate, I guess is the better phrase, that the applicant is indicating that the APR methods are important criteria for whether the label is recyclable with the container.” EX1048, 54:18-55:12; 61:10-64:10; EX1047, ¶¶61-67

Summary. When asked “[s]o ultimately, then, who determines whether the label material is recyclable as that term is used in the ‘422 patent?”, Dr. Phillips testified that “[w]ell, I would have to speculate here. In this case it’s – the test results would be available, and then if people determine that those test results are acceptable for additional use, then they are using it.” EX1048, 34:18-35:3. In like manner, Dr. Phillips testified that “I can’t say hard and fast that it has to meet the APR guidelines, right? Instead, the ‘422 patent is saying these are methods that

one would look at and tests that one would look at to see if it's recyclable.”

EX1048, 114:4-18. This is dependent upon the subjective analysis of test results.

EX1047, ¶74.

**F. PO's Reliance on the Withdrawn § 112 Rejection Confirms,
Rather Than Cures, the Indefiniteness**

PO contends that overcoming a § 112 rejection in the '677 application (a continuation) “bolsters” definiteness. POR, 96-97. PO is legally and factually wrong. First, neither the Examiner nor PO addressed whether the amended language clarified the claims' metes and bounds; the Examiner withdrew the rejection only after characterizing the language as reciting "the intended use and/or process of using the claimed label," which is "not germane to... patentability...”. EX2028, 23, 26; EX1052, 6-7. Second, as a matter of law, withdrawal of a § 112 rejection neither establishes reasonable-certainty notice nor bolsters the validity of the challenged claims. *Teva Pharms. v. Sandoz, Inc.*, 789 F.3d 1335, 1342-45 (Fed. Cir. 2015).

Dated: June 17, 2026

Respectfully submitted,

/Brett A. Schatz/

Brett A. Schatz, Reg. No. 59,764

Louis H. Sitler, Reg. No. 81,818

Wood, Herron & Evans LLP

600 Vine Street

Suite 2800

Cincinnati, OH 45202

(513) 707-0418

Attorneys for Petitioner

CERTIFICATION UNDER 37 C.F.R. § 42.24

The undersigned hereby certifies that the foregoing Petitioner's Reply to Patent Owner's Response contains 5,468 words as measured by the word-processing system used to prepare this paper, and is in compliance with the word limit set forth in 37 C.F.R. § 42.24.

Dated: June 17, 2026

/Brett A. Schatz/
Brett A. Schatz, Reg. No. 59,764
Louis H. Sitler, Reg. No. 81,818
Wood, Herron & Evans LLP
600 Vine Street
Suite 2800
Cincinnati, OH 45202
(513) 707-0418

Attorneys for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing document has been served via electronic mail upon the following on June 17, 2026:

W. Todd Baker, Reg. No. 45,265
Steven Dirks
Kelly Tripathi
Tera Stone

KIRKLAND & ELLIS LLP.
1301 Pennsylvania Ave., N.W.
Washington, D.C. 20004
Tel.: (202) 389-3135 Fax: (202) 389-5200
BWhittle_PGR_KE@kirkland.com

/Louis H. Sitler/
Louis H. Sitler
Wood, Herron & Evans LLP
600 Vine Street
Suite 2800
Cincinnati, OH 45202